USDA

CRS
CATHOLIC RELIEF SERVICES

Making money from vanilla

TECHNICAL INFORMATION, LESSON PLANS, AND HANDOUTS FOR TRAINING PARTICIPANTS

This publication was made possible by the generous support of the American people through the United States Department of Agriculture, (USDA). Project Agreement Number: FCC-617-2020-004-00. Vines is a five-year USDA-funded Food for Progress project designed to make Uganda the world's next leading supplier of high-quality vanilla, increasing annual exports from 50 Metric Tons (MT) to 350MT per year by 2025. Vines will collaborate with both the private and public sector to increase vanilla production, improve quality, strengthen compliance with food safety standards and develop sustainable market linkages with both U.S. and global vanilla companies. The program aims to directly transform the lives of 16,200 farmers, create 15,820 new jobs, and strengthen 836 Micro, Small and Medium Enterprises (MSMEs) as well as 25 processing companies that support the market system.

The Vines project is implemented by Catholic Relief Services (CRS) in association with Technoserve, Frontier Co-op, Purdue University, Virginia Dare and the Sustainable Vanilla Initiative. The work is being conducted through value chain consortiums that include farmers, private sector processors, and international buyers.

Catholic Relief Services serves the poor and disadvantaged overseas. Without regard to race, creed or nationality, CRS provides emergency relief in the wake of natural and man-made disasters and promotes the subsequent recovery of communities through integrated development interventions. CRS' programs and resources respond to the U.S. Bishops' call to live in solidarity—as one human family—across borders, over oceans, and through differences in language, culture and economic condition.

Catholic Relief Services
228 West Lexington Street Baltimore,
MD 21201-3413 USA

Editorial team: Shaun Ferris, Annet Masika, Jackline Biira, Sharon Biira, and Paul Mundy

Layout and design: Valerie Sheckler

Illustrations by Allan Bulamu, John Varrieur and Shaun Ferris

Photos by Flavia Lanyero, Shaun Ferris, Annet Masika, Sharon Biira, Jackline Biira

Additional written contributions from John Varrieur, and gender and safeguarding support from Ashlen Nimmo and Valerie Rhoe-Davis

Suggested citation: CRS 2022. Making Money from Vanilla. Catholic Relief Services, Baltimore, MD

Table of Contents

List of Tables

List of Figures

Preface

This is the first guide in a series of manuals on *Making money from vanilla.* It is intended for use by trainers, extension agents and other actors who work with vanilla farmers in Uganda. The focus of this guide is the **Lesson plans**, that extension agents will use to build the capacity of smallholder farmers. The lessons provide a series of ways in which farmers can improve their livelihoods, upgrade their agroforestry-based vanilla production systems and diversify their production. This will enable them to earn more money through increased sales of quality vanilla, and other products, and improve their links to buyers and markets.

Who are these manuals for?

Making money from vanilla is intended mainly for **trainers** and **field agents**. These may be:

- **Extension agents** who work for the government extension agency or a private company. It is their job to advise male and female farmers on the best way to grow and market their crops.
- **Local traders or buyers** and other actors who buy vanilla from them. To get the best quality and quantity of vanilla, they advise farmers on production methods. They may also advise farmers on growing other crops.

Other people who may be interested include farmers, community leaders, trainers, and students.

- **Farmers:** *Making money from vanilla* describes participatory training approaches to enable farmers to gain knowledge and skills in vanilla production. By "farmer," we mean any adult or youth- female or male- who works on a farm that grows vanilla, including hired workers.

What is in these manuals?

Making money from vanilla consists of three separate but interrelated manuals:

- **Technical information.** This manual contains technical information about vanilla and how to grow it as part of an agroforestry system. It also has information about the VINES project, which promotes vanilla production in Uganda.
- **Lesson plans.** This contains suggestions on how to teach the technical information to groups of trainers or farmers. It also has quizzes to test their knowledge before and after each lesson. Each lesson includes various activities: presentations, discussions, practical field work, question-and-answer sessions, and so on. You should try to make each session participatory and interesting. Remember that many participants have a lot of experience with vanilla and can contribute their knowledge. They may also have questions that you (or other participants) can answer.
- **Handout.** This has materials to duplicate and hand out to participants during the lesson. They can take these home with them to practice or to share with their neighbors and other farmers.

Each manual contains 16 chapters (or lessons), each covering a particular aspect of vanilla production.

How to use these manuals

Self-study

Read through the *Technical information* manual chapter by chapter, trying to absorb the information presented. Before each chapter, test your knowledge by answering the short quiz in the *Lesson plans* manual. After reading each chapter, do the quiz again to check what you have learned. If you get all the answers right, congratulations! Go on to the next chapter. If you did not get all the answers right, go back to review that section again before moving on to the next chapter.

To train field agents

These manuals are designed for teaching field agents who will go on to teach the same material to farmers. It is important that the field agents understand both the *technical content* (in the Technical information manual) and know how to teach it (in the *Lesson plans* manual).

Here is one way to help them become familiar with both aspects:

- Sit together in a group. First, read through the chapter in the *Technical information* manual. You could try taking turns to read the text out loud to each other, and then discuss any points that need clarification. Alternatively, ask them to study the technical information beforehand and discuss it with them in plenary. Use the *Quizzes* to test the participants' understanding of the materials they have covered.
- When everyone has fully understood the technical content, turn to the equivalent lesson in the *Lesson plans*. Read through this together. Get individual participants to act as the trainer and to lead the other participants (pretending to be farmers) through the exercises. Then act out the lesson together, practicing the exercises. Get the participants to take turns at acting as the facilitator. Check the quiz questions and *Handout* so everyone knows how to use them.
- After this dry run, discuss how the lesson went and what changes or improvements might be needed when working with farmers. Try to anticipate the questions or problems that farmers (male and female, of different ages and educational levels) may have. Invite the participants to (constructively) critique each other's performance as the facilitator. This will help the trainers know how to make the lesson work in their situation.

Try to make the training of trainers as realistic as possible. If the *Lesson plan* calls for the group to do something in a vanilla garden, go into a garden and practice the activity with them.

To teach farmers and other rural people

Once you have taken this course and passed the *Quizzes*, you can use the guide to work with farmers to develop their skills.

First, remind yourself of the material in the *Technical information* section. Then follow the instructions in the *Lesson plan* with the group of farmers. You can enlarge some of the *Handouts* to use as posters or flip charts during the discussion. Make multiple copies of the *Handout* to give to the farmers to use during the lesson and to take away with them afterwards. Use the *Quizzes* to check their understanding of the material.

Every group and every situation is different, so this manual cannot anticipate every situation and problem you may come across. You should adapt the relevant ideas as necessary and use this guide as a basis for building your own learning events. If in doubt, check with your supervisor or ask your colleagues for advice.

INTRODUCTION:

The VINES training program

Introducing the characters in the manual

Technical information

Topics covered

- The VINES project.
- The training-of-trainers program.
- Planning and managing lessons.

Key messages

VINES is a 5-year project aimed at expanding and improving vanilla production across Uganda.

Improving vanilla production is good for everyone: male and female farmers, field agents, vanilla companies and Uganda as a whole.

VINES uses a training-of-trainers approach. A specialist first trains field agents, and they then pass on what they have learned to farmers.

The *Making money from vanilla* course is a live document and will be updated during the course of the project.

The VINES project

VINES is a 5-year project that aims to expand and improve vanilla planting across Uganda in a way that will be beneficial for farmers there. It will last from 2020 to 2025. It is funded by the United States Department of Agriculture (USDA) and implemented by the Catholic Relief Services (CRS) in partnership with TechnoServe.

The VINES project works together with a number of vanilla-processing companies in Uganda. It also works with vanilla farmers and exporters and with buyers in the United States and other countries who buy Ugandan vanilla.

The VINES project will help you work with male and female farmers to improve their vanilla production. It will provide you with the technical information and support that you need in your work.

- Boosting vanilla production is good for **farmers** because it will let them earn more money from this important and valuable crop.
- It is good for **vanilla companies** because more vanilla means more product to buy, process and sell.
- It is good for **Uganda** because vanilla is an important export crop.
- It is good for **you** because if the farmers you advise produce more and earn more, your employer will realize that you are doing a good job.

The vanilla production training program

This training program will lead you through a series of sessions on how to advise farmers on growing vanilla. We realize that you probably already know quite a lot about growing vanilla. This course will help refresh your knowledge. More importantly, it will give you some guidelines on how to help farmers learn about vanilla and apply their knowledge to their own farms. Our common goal is to help farm families earn more money from vanilla.

Each lesson in this program covers one or more topics. The first few lessons cover issues such as the vanilla market, organizing trainings for farmers, and helping them decide on how to grow vanilla in their farms. The later lessons focus on technical aspects of vanilla production, such as land preparation, vine planting, shade management, soil and water management, and pest and disease management. If you have lessons with each farmer group every 1 or 2 weeks, the whole course will take about 6 months.

Training of trainers

This manual recommends a **training-of-trainers** model:

- **Step 1: Initial training for field agents.** For each lesson, a trainer will run through the topic with the field agents. The field agents will have a chance to discuss the topic, ask questions, learn from each other, and think about how to teach the same material to farmers with whom they work.
- **Step 2: Training for farmers.** Then it is the field agent's turn to deliver the training to the farmers. This "echo training", by the field agent will organize training sessions for farmers in their area and teach them the same topics that they covered in Step 1.

The lessons in the training program fall into five categories:

- **Introduction.** This lesson is intended for the trainers only. It should **NOT** be delivered to the farmers.
- **Lessons 1–3: Understanding the context of vanilla farming.** This focuses on the vanilla market and value chain, and the farmers' vision for their vanilla production.
- **Lessons 4–6: Managing the farm.** This looks at the initial steps: deciding where to grow vanilla, preparing a field, and deciding what crops to grow alongside vanilla.
- **Lessons 7–14: Cultivating vanilla.** This focuses on the techniques needed to cultivate vanilla and produce healthy, productive vines.
- **Lesson 15-16: Harvesting and diversification.** These are the final lessons. They look at harvesting techniques to ensure the highest quality of vanilla beans and how to make money from vanilla and the other farm products.

Table T0.1. Outline of the training program

	Subject	Training of trainers		Echo training with farmers
Introduction lesson				
	VINES training program	●		(no echo-training)
Understanding the vanilla farming context				
1	Introducing the vanilla production project	●	→	●
2	The vanilla market	●	→	●
3	Setting a vision for vanilla	●	→	●
Managing the farm				
4	Site selection, security and land preparation	●	→	●
5	Shade management	●	→	●
6	Crop planting systems and spacing	●	→	●
Cultivating vanilla				
7	Soil and water management	●	→	●
8	Planning and planting tutors	●	→	●
9	Vine selection and planting	●	→	●
10	Weeding	●	→	●
11	Pruning	●	→	●
12	Disease and pest management	●	→	●
13	Looping vanilla vines	●	→	●
14	Flowering and pollination	●	→	●
Harvesting and Diversification				
15	Harvesting	●	→	●
16	Diversified agroforestry system	●	→	●

VINES teams

The VINES project operates through teams consisting of managers, extension agents and traders who work with an anchor vanilla-processing company. The processing companies manage their own extension teams to work with the farmers who supply it with vanilla. The teams will provide you with the guidance and support you need to play your role as a trainer.

Introducing the characters in the manual

This manual follows two vanilla farmers, **John** and **Mary**, as they try to improve their vanilla production. John and Mary own a 3-acre (1.3 hectare) farm in Kasese, southwest Uganda. They have been growing vanilla on their farm alongside banana and coffee for the past 7–8 years. In some years, they earn a lot of money from their vanilla vines, but in other years, their income from vanilla is lower.

They like growing vanilla but want to know if this is a good crop for them. They want to know how to get the best production out of their vanilla farm and get advice on what types of crop mixes will give them the best income over the next 5–10 years. John and Mary both want a stable income from their farm. They each have ideas on how to use the money they hope to earn: school fees, home improvements, and a motorbike. They discuss these ideas together.

Figure T0.1. John and Mary are vanilla farmers

Peter and **Alice** are local extension agents. Their job is to advise John, Mary and other vanilla farmers in the district, and provide them with information and access to other services to produce vanilla and other crops. They provide advice on farm management, how to keep records on costs and income, and how to market vanilla and other crops.

Joseph is a vanilla buyer. His job is to buy quality vanilla for his company. In order to do that, he advises male and female farmers how to grow and harvest vanilla. He also arranges for them to get suitable planting material and other inputs, advises them on cultivation techniques, and organizes harvesting dates and transport of the vanilla beans.

Peter, Alice, and Joseph advise farmers. In this manual, we refer to them all as **field agents**. Field agents can provide many different types of services, including, agronomic advice, soil testing and soil and water management advice, financial advice, providing farmers and farmer groups with advice on their business approach. Some agents will provide free information, others will charge a fee for their training and or services given, or may charge a commission for providing certain services such as input supplies, testing quality of soils and or vanilla etc. Some field agents will provide multiple roles such as advising on production, farm security and act as a buying agent for a leading processing company. Successful field agents are aware of the different challenges the farmers both women and men may face, and their different needs, and s/he will work to tailor their services and support accordingly. As more women play a larger role and make more decisions on-farm, it is particularly important to recognize their specific needs. All of the services offered by field agents aim to help farmers to grow more quality vanilla and improve their incomes from vanilla-based farming.

Figure T0.2. Peter and Alice are extension agents. John and Mary are vanilla farmers, and Joseph is a vanilla buyer

This manual guides you to help farmers produce more and better-quality vanilla and other crops, and to become better business partners for the vanilla company. It will show you how to help farmers like John and Mary increase their vanilla

production by working closely with local extension agents and using sustainable production methods.

Good **relationships** are important in business. They are based on an understanding between the farmers and their business partners—the buyers. The buyer must understand the needs of farmers and the problems they face and must help solve them. The farmer must understand the importance of trust and reliability in delivering the expected amount and quality of product to the buyer at the agreed time and place.

Farmers must cope with many **challenges** associated with vanilla production and marketing. The weather and prices are both uncertain, farmers must deal with pests and diseases, and the climate is changing. Farmers must manage their family labor (or hire workers) to do all the work on the farm and in the household. They must protect a valuable crop like vanilla from thieves.

One way to deal with these uncertainties is by **diversifying** their farm: by growing a range of crops and not relying too much on any one crop. In many parts of Uganda, vanilla is a good choice: it can bring in good returns, but it is never a sole crop: it must be grown together with other crops that provide shade and support. Each crop provides different income streams, often at different times of the year, this helps with seasonal cash flow on the farm.

Each farmer, and each farm household, faces a different situation and has a **different set of opportunities** open to them. Male and female farmers may have different priorities and may make different choices. The same is true of farmers of different ages: a young, single farmer is likely to have different interests and different possibilities from someone who is older with a large family able to help on the farm. The same goes for farmers with a large holding on fertile soil in an accessible location, versus a smallholder with a remote, infertile plot. This means there is no one size fits all: the field agent should help each farmer, and each household, make decisions that are best suited for them.

Inclusion of women and men in vanilla upgrading plans

A core component of the Uganda VINES Project is to create awareness and encourage extension agents to take actions that enable women to benefit from your services. Your support will enable women to benefit more equitably from their involvement in vanilla production, harvesting and marketing. As part of the VINES training, you will have participated in the '*Integrating Gender into Last-Mile Agent Services training*. Use the information and skills that you gained from that training and put what you learned into practice within the Making Money from Vanilla trainings. Throughout this manual, there are gender issues that you can raise and use all opportunities to find ways to promote practices that will provide more equitable outcomes for all members of the household.

Roles and responsibilities: Typically, both women and men in a farm household are engaged in growing vanilla. Ideally, the wife and husband should make joint decisions about the farm: what to grow, how to manage the crop, when and how to sell it, etc. But all too often, one of them (usually the husband) makes most of the important decisions and pockets the income, while the wife does much of the work. Results from the VINES Gender Analysis, found that men led most of the vanilla production, harvesting and marketing activities at the farm level, whereas women provided a support role for many of the tasks. A key barrier for women was that they were not involved in previous technical training.

To help men and women recognize their value in working on the farm, it is important to ensure that both men and women take part in the training, and that both participate actively. If possible, both the wife and husband should attend. If this is not possible, try to ensure that at least 30% of the participants are women, and that the women's voices are heard.

If women are hesitant to take part, find out why. Are the sessions at an inconvenient time and place? Is security a problem? Is childcare needed? Would separate sessions for women be useful? Adjust the plans accordingly.

Throughout the lessons, make sure that both women's and men's concerns are met. Be aware that expanding vanilla production may mean reducing the production of some other crop. It may also mean the need to hire more labor or require additional labor from other family members.

Workload: Many vanilla production practices such as planting tutors and vines, weeding, pruning, pollination and harvesting overlap with other work that women must fulfill such as food production. However, women may be asked to spend more time in the field for specialized work such as pollination. If family members are asked to do more work, it is important that the household consider how this affects family members' workload and participation in key activities, like going to school. Families need to discuss and plan together how to share labor, including hiring labor. As an extension agent, you can raise awareness about this aspect when teaching about a practice by discussing who would normally do this activity and asking how this would affect their workload and ability to do other activities. You can encourage participants to discuss with their partner/spouse at home.

Access and control of resources and assets: Participating in vanilla production requires access to and decision-making power over the use of finance, labour, land and other agriculture resources. The VINES Gender Analysis and Baseline study found that men generally owned the land, in accordance with the local culture, where sons inherit land from their fathers. Lack of land ownership may require women to negotiate with their spouse/partner on changes in the cropping system or using resources. However, regarding ownership and control of assets, no major differences were reported in access to resources, but men always remain the owners with rights to lend to the neighbor or dispose of assets. As the practices promoted in this manual requires the use of productive assets and equipment, it is important to understand what assets women have access to and when specific assets are needed. As an extension agent, you can acknowledge the different power structures that male and female farmers have and as required, consider solutions to address limitations to access of resources to implement practices. You should also encourage couples to jointly attend training sessions to learn together, to discuss new options and make decisions together.

Decision-making Power: Expanding production and enhancing the quality of vanilla gardens means making choices on things like where to plant vanilla, how to expand vanilla production and how much money to invest in adopting good practices such as fencing, when to prune, pollinate, and whom to sell to at harvest. Once farmers receive their payments, they also must decide how to use the income from the vanilla and income from other intercrops. To ensure decisions result in equitable household benefits and that they meet household needs, key household members such as a spouse/ partner should discuss and make joint decisions. The baseline survey found that women have a say in ways to improve production decisions, but that overall men

tended to dominate decision-making for crop production, marketing, and income use. Extension agents need to understand the local dynamics around decision-making and adjust training methods to promote more discussions within the family and use of joint decision-making. It is especially important for extension agents to hold training sessions with farmer groups that include couples at critical times in the year when key decisions are made to allow couples to discuss the adoption of practices and how that affects the household.

Gender Based Violence (GBV): Be alert to potential consequences of changes in the farming system, especially when prices of vanilla either increase rapidly or fall rapidly and always promote joint decision-making and positive communication among husbands and wives. A key outcome of the VINES Project is to increase income from the sale of vanilla, which is an important outcome for good practices to be maintained. However, it is important to recognize that differences in opinions between partners can cause tensions, lead to arguments about use of resources and that GBV are all issues that can occur. The baseline survey reported that inequalities in income and lack of clear production roles have led to increased GBV. As an extension agent you should be aware that rising incomes, especially if more money goes to women, may lead to frictions, and increase GBV. If you recognize tensions, or are informed about possible GBV within your groups, be sure to make efforts to support couples in understanding how they can work as a family, and all contribute to household needs. Your efforts to encourage couples to discuss and make joint decisions on crop systems, practices to adopt, and use of income can help mitigate tensions within the family and the potential increase in GBV.

It is also important to make sure the needs and concerns of diverse members of the community are taken into consideration. Be as inclusive in your work as is practical, young people, for example, may have different concerns and needs from their elders. Someone with a disability, who is keen to work in the vanilla sector, may also face some unique challenges and have different needs relating to farming and the training. A successful training and an effective trainer will take these different needs into consideration and adapt the training or tailor approaches accordingly to engage as many people as possible.

As you implement this manual, if you have gender-related questions or concerns, please reach out to the VINES Agroforestry team to seek ideas and support.

Safeguarding

What is safeguarding? Safeguarding is our responsibility to ensure that our staff and programs honor and protect the rights and dignity of all people—especially children and vulnerable adults—to live free from abuse and harm.

How should trainers and CRS staff/representatives conduct themselves? All trainers are expected to uphold the highest standards for behavior and create a safe and respectful environment during the training and during any interactions with community members. All CRS staff and other representatives (interns, volunteers, partners, suppliers, and service providers) are expected to uphold the highest standards for behavior and adhere to the Safeguarding Policy and Code of Conduct and Ethics.

DO's

Below is a list of promoted behaviors:

- Treat all training participants and people in the community with respect and dignity
- Be aware of the power you have and never abuse your power
- Promote the safety and wellbeing of everyone we interact with
- Actively prevent all forms of harm, abuse, exploitation, and harassment
- Ensure our activities do no harm

What should trainers and CRS staff/representatives NOT do? All forms of abuse, exploitation and harm towards training participants, other project participants, other community members and harassment of CRS staff/affiliates is prohibited.

Don'ts

Below is a list of prohibited behaviors:

- Denying or violating a person's rights and causing harm to somebody
- All forms of abuse, exploitation, discrimination and harassment
- Abusing power or position to gain something
- Denying assistance or requesting anything in exchange for assistance
- Exchanging money, employment, goods or services for sexual favors
- Sexual activity with children (anyone under 18)
- Shouting, using inappropriate words, or abusive language towards community members or participants
- Intimidating someone
- Using physical violence
- Making disrespectful comments or jokes based on sex, gender, disability, or other characteristic
- Inappropriate touching and unwanted/ unwelcomed closeness
- Speaking to someone in a sexual way or making sexual jokes and comments
- Any sexual relationship between those providing humanitarian assistance and a person benefitting from such humanitarian assistance that involves improper use of rank or position

This is not a complete list. All actions/behaviors that could be considered abusive, harmful, unethical, or could increase people's risk of experiencing harm must be avoided.

What is the guidance for reporting?

- *Report any concerns:* If you have a concern about misconduct or any form of harm caused by anyone working for or representing CRS, it must be reported.
- *Escalate, don't investigate:* Your responsibility is to report confidentially through one of the reporting channels. Do not wait or investigate.
- *Confidentiality:* It is critical for the safety and wellbeing of all involved that safeguarding concerns are not shared with anyone other than the person to whom you are reporting.

How can reports be made?

Reporting Channels		
Scope	**Channel**	**Description**
Global	**CRS email**	Email: alert@crs.org Received by CRS headquarters
	Ethics Point	Report through www.ethicspoint.com, which will be received by an external safeguarding company and then forwarded to CRS headquarters (For non-emergencies)
Country Program	**CRS People**	Reports can be made directly to the **CRS Uganda Country Representative** Email: infoUganda@crs.org WhatsApp number: 0741 672 901 CALL US—FREE OF CHARGE 0800 334 330 Available Monday to Friday Time: 8am-5.00pm
	Program Specific	At a program-level, there are channels in place for community members to share feedback and raise any concerns

Literacy and numeracy level of participants

Many of the farmers with whom you will work have limited education. Some may not be able to read and write. Try to find out early on in the course what the educational level of the farmers is. If any participants are illiterate or have low literacy levels, tailor your approach accordingly to make sure all participants can understand and benefit from the training.

Instead of writing words, you can do quick drawings (Figure T0.3).

Figure T0.3. Illustrations and icons to help farmers of low literacy levels

Some aspects of vanilla farming (indeed, of any farming) require farmers to do arithmetic. Examples are calculating costs and income, the area of a vanilla garden, and the number of shade trees or vanilla vines needed. Some farmers may find this difficult.

You can get around this in various ways.

- Use cut-up pieces of paper or dried beans as “money” in roleplays and in calculations.
- For distances and plant spacings: use a piece of string of the required length (e.g., 3 meters) instead of a tape measure.
- Use paces instead of a tape-measure (a big stride by an adult person is about 1 meter long).
- Draw a diagram on a flip chart and get the participants to count the number of items (such as trees or vanilla vines).
- Instead of writing numbers on a sheet of paper, draw tally lines, like in Figure TO.4.

Figure TO.4. Another way to represent numbers

Planning lessons with farmers

To teach the information in this manual, you will need to form a group of farmers who are interested in learning about vanilla. Here are some guidelines:

Group size. Around 30 farmers from the same village or area who grow vanilla, or who are interested in growing it. Make sure that the group includes both women and men farmers (at least 30% women). If there are more than 30 potential members in one area, you should organize separate groups. Some farmers may have a lot of experience in growing vanilla. Others may be beginners. You should find out at the start how much knowledge and experience they have. That will help you plan your lessons.

Location. Most of the lessons will take place outside, on a vanilla farm. Find a farmer who is willing to let you use their farm for the lessons. You can also hold lessons in different farms each week. The farm does not have to be a “good example”: in fact, it may be better if it has some deficiencies that the participants can point out. Make sure that you check with the owner first; you do not want to embarrass him or her by drawing attention to too many problems.

Some of the sessions are classroom-based, or may need to take place indoors or under a roof—for example if it is raining. Ideally, the room should be close to the vanilla garden so the participants can move outside to do field activities after the classroom work.

If the weather makes it impossible to work in the field, you will need to bring examples (for example of soil or plants) with you to use in teaching.

When considering the training location, understand how the location may affect people’s ability to attend. Women, in particular, may face constraints attending training far from their homes due to child caring, security, domestic responsibilities, etc. You should consult with group members, including women and men of different ages and people living with disabilities about the most convenient locations for holding the training. Ask if there are any obstacles or security/safety concerns about

the route to and from, in addition to the final location. If childcare is being offered or young children will attend along with their parent, identify training venues that have safe spaces for children to be watched.

Day and time. Arrange with the group to meet at a convenient day and time. Considerations:

- Make sure the timing fits into your own schedule and is safe and convenient for both men and women farmers.
- If you plan activities outside, meet during the day and avoid people having to travel back in the dark as it might be unsafe when participants walk home!

Duration. Plan for each session to last between 1 and 2 hours. Sessions may last longer than this if there is a lot of discussion or if they include fieldwork. But remember that people are busy and may need to get home.

Number of sessions. The full training consists of 16 sessions. It is important that the participants come to each session. However, many farmers have experience in vanilla production and may prioritize a few sessions. If field agents are paid, farmers may only want to pay for 4-5 key lessons.

Tools and materials. Make sure you bring everything you need with you, or that it is available on site. You will need the following:

- Large pieces of paper (flip charts) and marker pens, or a blackboard and chalk.
- Paper (or exercise books) and pens for participants to make notes.
- Handouts.
- Field tools: these will depend on what the lesson is about. Items include a secateur, panga (machete), spade, bowl, water, knife, safety pins (for pollination), etc. See the individual lessons for suggestions.

Flexibility. Make sure you know what you want to teach and how to teach it. But you must also be flexible and prepared to adapt to the situation—for example if the farmers already have a lot of knowledge about the subject (or very little), or if it starts to rain heavily during the fieldwork.

Order of lessons. The lessons do not have to be taught in the order they are presented in the manuals. Because Uganda has two rainy seasons and two dry seasons, it also has two cycles of vanilla flowering and harvesting a year. Plan to teach lessons at an appropriate time of year, depending on what will be happening in the field in the next few weeks. For example, cover the lesson on flowering and pollination when the vanilla is beginning to flower. Some of the lessons (such as that on weeding) can be taught at any time of year. Plan ahead, so you can tell the participants if they need to bring any equipment with them to the following session.

Attendance

Normally the same group of participants should attend all the sessions. This is because each lesson builds on the previous one, so if someone misses one lesson, they may not understand everything in the next one. Nonetheless, some participants may not be able to attend every lesson. Inevitably, not all the farmers who are interested in vanilla will be able to attend the lessons.

Find out why participants have not been able to attend. If there is a trend, work out what to do about it. For example, ensure that lessons are held earlier in the day to avoid participants traveling in the dark.

If women start to drop out, discuss with them what challenges they are experiencing and what would help them to attend. If appropriate, consider having a discussion with their husbands or other family members about the training and remind them of the importance of both partners learning the vanilla production skills.

Many men nowadays travel regularly to local and more distant towns in search of work. When the men travel, the women must tend to farm and the vanilla gardens, and so their knowledge and skills need to be as good as that of the men.

For some sessions, it may be a good idea to invite people outside the core group of participants to attend. Two examples:

- In the first lessons (on visioning, farm planning, etc.) it is especially important to hear the opinions of all household members. Consider holding extra visioning sessions for people who are unable to attend the first one.
- If someone other than the regular participant is responsible for doing a particular type of work (such as pollination), invite those people, who may be regular farm labour, to attend the relevant lessons.

Reinforcing learning

You will notice that some of the lessons contain some repetition of points made in previous lessons. This is deliberate. If we see or hear something several times, we are more likely to remember it.

Some ideas to reinforce learning:

1. At the beginning of each lesson, hold a brief review of what was covered in the previous lesson. This will reinforce the participants' learning and give them a chance to ask questions or make comments. Many of the lessons are built around practical tasks that the participants will go on to do in their own farms. They are quite likely to have questions or comments after this experience.
2. The review at the start of each lesson also gives a chance for those who were unable to attend the previous lesson to catch up.
3. Present the same information in different ways: in a presentation, on a handout or poster, and in a practical session.
4. Encourage the participants to share what they have learned with others who are unable to attend the lessons.
5. Give them extra copies of the *Handouts* to share with their friends and neighbors. At the same time, these handouts should not be seen as an excuse to skip attending the lessons.
6. After each lesson, you can send messages (SMSs, social media, photographs) by mobile phone to the participants, who consent to be contacted through on their mobile phone, to reinforce what you have just covered.

Monitoring and evaluation

Monitoring and evaluation are important to assess the effectiveness of the training. The trainers need to check how they are doing, whether the participants understand and appreciate the lessons, whether they feel comfortable and confident in participating, and whether the topics are relevant. At the end of each session, the trainer should get the participants' feedback about the training.

Monitoring attendance

Keep a list of the names and numbers of male and female participants who attend each session. Report these numbers to the project management. Check the names and numbers for trends in attendance (see above under *Attendance*).

Session monitoring and evaluation

Evaluate each session during and immediately after delivering it. You can do this in five ways.

1. **Review of previous lesson.** From the second lesson on, at the start of each lesson, ask if there are any questions about what the previous lesson covered. If this leads to a lot of discussion, set aside time to deal with it. But limit the amount of time devoted to this (perhaps to 10 minutes), as you need to leave time to cover the material in the new lesson.
2. **Observe the participants' reactions** during the session. Are they enthusiastic? Or are they tired and yawning? Are they actively participating or idly sitting? Do you see differences between the men and women, or between older and younger people? If yes, check with them so you understand their interests and anything that may hinder them from taking active part in the sessions.
3. **Quizzes.** Each lesson contains a quiz: a short series of questions that you can use to check the participants' understanding of the lesson contents. You can use the quizzes in three ways:
   - To test your own knowledge.
   - To test the participants' knowledge at the start of the lesson. This will help you tailor the content of the lesson to the level of their knowledge. Asking the questions is also a good way to introduce the topic and stimulate discussion about it. For lessons divided into sections, you can ask the relevant questions at the start of that section.
   - To test the participants' knowledge at the end of the lesson. This will give you an idea of whether the lesson was effective, and what subjects you may need to cover again in subsequent lessons.

Depending on participants literacy level, you may need to read the questions out loud and allow participants to give responses orally. If the literacy levels are high, consider printing the quizzes and handing them out to the participants on paper.

4. **Informal feedback.** Ask participants these questions at the end of the session:
   - What did you like best today and why?
   - What can we improve in our next meeting?
   - Is the time for the meeting too long? Or too short? At the right time?
   - How is the location of the meeting?
   - What other feedback, questions, or comments about the training would you like to share?
5. **Self-assess your performance.** Identify what went well and what difficulties or problems you experienced. Think about what you can do better next time.

Checklist for preparations

Two weeks before training

Contact the communities you will be training.

What local leaders or authorities (if any) need to be informed?

Determine the location for the training. Is this place convenient and safe for participants?

Make people (both men and women) aware of the upcoming meeting. Tell them the location, time and duration.

Mobilization: Ask local leaders to help get people to the meetings on time.

Consider people with **disabilities**: how can they find out about the meeting? What accommodations may need to be made to enable their participation?

Check for any **safety** concerns: the timing and route to and from the site.

One week before the training

Get answers to the following questions.

- How many farmers are coming to the training? How many men/women?
- Confirm that the location is available. Are enough mats, benches or chairs available?
- Is childcare needed, or space for young children?
- Will anyone have a problem attending? What can be done to resolve this?
- What information needs to be communicated to participants ahead of time? Are participants clear on the training date, location and time?
- Have all the training materials required been identified and gathered?

Day before the training

Carefully review the training module to be covered.

Rehearse the training session the day before so you are well-prepared.

Talk through the materials with your team. Be sure that you are comfortable with all the ideas.

Be sure that you stick to the agreed time of 1–2 hours per session. If sessions are going to last for 3 hours be sure to tell the group members in advance.

Avoid providing lunch for participants, this is a business meeting. You may need to offer participants water.

Lesson plan

This lesson is intended for the field agents who will act as trainers. It helps them prepare the training sessions that they will deliver to farmers. **Do not teach this lesson to the farmers.**

Lesson objectives

After this lesson, the participants will be able to:

1. Briefly explain the VINES project.
2. Explain how the VINES training program works.
3. Outline the contents of this manual.
4. Describe how to plan lessons on vanilla with farmers.
5. Create a respectful learning environment
6. Integrate Gender into the Value Chain
7. Provide an overview of safeguarding and how to provide feedback if there are any concerns.

This first, introductory lesson is for the field agents who will act as trainers. It is to help you plan your training activities.

Duration

2 hours.

Introductions

Greet the participants and explain what the session is about: an introduction to the VINES training program and the participants' role in teaching it.

Ask the participants to divide up into pairs. Each person should find someone they do not already know. Make sure participants are comfortable with their learning partner.

Ask one person in each pair to interview the other person in the pair. They should find out that person's:

- **Name, personal information**: where they are from, their family.
- **Background:** what are their experiences with vanilla farming? Where have they worked previously?
- **Current job**: employer, location, job responsibilities.
- **Experience in working with farmers** and in giving training.
- **Experience with vanilla** and other crops.

Give the group 5 minutes to do this interview (use the timer on your mobile phone). Then ask the pairs to swap roles: the person who was interviewed now asks the same questions of the other person. Give them another 5 minutes to finish this task.

Then ask each person in the room to introduce the person they have just interviewed. Each person should speak for 1 minute (again, use the timer on your phone).

When all the participants have been introduced, introduce yourself and explain your role:

- You will be facilitating the training, which the participants will be echo-training with groups of farmers over the coming months.
- The course consists of a series of lessons. All of them except this first lesson are designed to be echo-taught (taught to farmers).
- The course will cover both the technical topics of producing vanilla and other crops, as well as issues such as planning, marketing, and economic and social issues.
- The participants already have a lot of knowledge and experience with vanilla. They should draw on this both in the training of trainers and in the echo-training that they will conduct with farmers.
- The participants should feel free to ask questions and contribute their knowledge at any time.

The VINES project

Briefly introduce the VINES project to the participants. Explain the project goals, and the role that training of farmers will play in the project. Say that you will discuss the VINES project in more detail in the next lesson.

Explain that the participants will have a vital role in the project. Their job is to organize groups of male and female farmers to take part in training, then facilitate that training. Each participant will organize one or more groups and provide those groups with training at intervals throughout the vanilla season.

The training will consist of a series of sessions over a period of several months. Each session will cover aspects of vanilla production, the production of other crops such as coffee and banana, and topics such as farm planning, business management and marketing. Each session incorporates gender and age-related information.

The sessions, both of this training of trainers' course and the echo training, will be timed according to the vanilla production calendar.

Training of trainers

Explain how training of trainers works:

- **Training of trainers.** For each topic, you will facilitate a training-of-trainers session with the current participants. This session will cover the topics that the trainers will discuss with the farmers in the following week. This training session will cover both the technical content and the teaching methods that the trainers can use with the farmers. The trainers will also have the opportunity to ask questions, share their own experiences and discuss approaches.

- **Training for farmers.** The trainers will then repeat the training session with the group (or groups) of farmers they are advising. The trainers are free to adapt the training content and methods to suit the needs of each group, as long as this fulfils the goals of the VINES project.

See the *Handout* of the training plan.

The training manual

Invite the participants to look at the training manuals. Explain the following:

The *Technical information* manual contains the technical content, each focusing on a particular topic relating to vanilla. Each chapter corresponds to one training session. It should be covered at the appropriate time throughout the vanilla season.

The *Lesson plans* manual contains suggestions on how to teach the technical content. It also has quizzes to test the participants' knowledge before and after the session, or to use as discussion starters.

The *Handouts* manual contains materials to hand out to the participants. Some of these can be enlarged and used as flip charts or posters.

Many of the illustrations and stories feature John and Mary, a couple who farm vanilla in southwestern Uganda. The stories are intended to highlight problems that vanilla farmers face. The trainers are encouraged to add stories from their own experience.

Planning sessions

Discuss each of the following issues with the participants:

Group formation. Describe the need to form groups of around 30 farmers per village for training purposes. Describe strategies and actions they can take to recruit at least 30% women to join the group. Explain that the goal is for the group to have both women and men to give people an equal opportunity, as women and men are both typically involved in growing vanilla, so it is important that female and male farmers learn and benefit from the training. Some farmers may have a lot of experience with vanilla; other farmers may have little or no experience.

Location. Describe the need for two types of location: a farm location so that people can see how things work, and a sheltered location (if it is raining), and one or more vanilla farms. Most lessons will be done at a farm location. Explain that it may be possible to meet at the same farm each time, or at a different farm for each lesson. Describe the need to consult with group members to identify locations and routes to the location that are convenient and safe for men, women and people with disabilities. Check whether the location will be appropriate for children if they come with their parents.

Day, time and duration. Explain that the trainers will have to find a convenient time to meet the participants. This must be suitable for both female and male farmers, and should be during the day to allow for field work and time to get home safely. Each lesson should last 1–2 hours. The trainers will need to plan for multiple sessions throughout the vanilla season.

Equipment. Discuss the types of equipment the trainers will need.

Lesson activities. Explain that each lesson will consist of a combination of activities: presentations, discussions, field work, etc. The lesson plans are suggestions for how to teach the content, but the trainers should feel free to use another method if appropriate and to help meet the participants' various learning needs.

Organizing groups

Explain that the participants will need to organize vanilla farmers in the villages that they serve into groups for training purposes. Each group should have around 30 farmers.

Divide the participants into groups of three or four. If the participants will work as teams during the project, the team members should be in the same group.

Invite the groups to discuss how to organize farmers in their area. Each group should decide:

- Which village (or villages) they plan to serve.
- How they will identify and contact female and male farmers in those villages.
- What they will do to ensure women, youth and people with disabilities are members of the group.
- How they will organize the farmers into groups for training.
- Where they will meet, how to identify suitable vanilla gardens to use for the field activities, and how they will check that the locations are convenient and safe for the different participants.

See Table LO.1, for a form for each group to fill in. Give the groups 15 minutes to discuss these questions, then invite three or four groups to report back to the plenary.

Table L0.1. Plan for organizing groups

Complete one form per village

Name and location of village	
How to identify farmers to attend VINES training	
How to ensure women, youth and people with disabilities that are vanilla farmers (or would like to be vanilla farmers) are members of the group.	
How to contact and include men, women, young people and farmers with a disability.	
How to organize farmers into training groups.	
Location of training: indoors	
Location of training: vanilla gardens	
How to check that the locations are convenient and safe for everyone	
Plan for a special session on gender and working as a family	
Provide farmers with CRS safeguarding policies	

Creating a respectful learning environment

Female and male participants may not have the same learning needs and interests, or the same degree of comfort and confidence speaking and sharing ideas openly. It is the trainer's job to create a respectful training environment where everyone feels safe, included and valued. Everyone should feel that their experiences and opinions matter.

There are several actions the trainers can take to help create a respectful learning environment. Some ideas:

- Value the experiences and opinions of different participants equally.
- Encourage women and men to participate equally by alternating between women and men in discussions. Sometimes small groups can discuss ideas first, and then share with the larger group.
- Use participatory training approaches that will encourage the engagement of all participants. Possibilities include voting, ranking, small group work, role-plays, drawing and games.
- Ask the participants to come up with rules for participation. For example:
  - Come on time
  - Listen respectfully to all opinions
  - Give space for different members to speak
  - Don't interrupt someone else
  - Don't talk with other people during the lesson
  - Don't use your phone during the lesson.
- If there are problems, remind the participants of the rules they have agreed on.
- After each session, reflect individually on participation. Which participants engaged actively, and which ones did not and why? Use this reflection to guide your approach in the next session.

Integrating Gender into the Vanilla Value Chain

As part of your initial training, you should have attended the "'Integrating Gender into Last-Mile Agent Services training". During that training we learned about gender-based constraints and opportunities and how you as an extension agent, can deliver knowledge and inputs and how you can adapt your training sessions to provide effective capacity building to different types of clients, particularly women and youth.

During the training course, there will be many times when you can discuss key gender topics as part of the training course. At your first meeting with a farmer group, you should raise some critical gender issues, such as sharing workloads, sharing benefits from growing vanilla and working to avoid gender-based violence.

However, we suggest that as the first session is going to be busy that you hold a session on key gender issues at Lesson 3, to discuss some of the major gender constraints faced by men, women, girls and boys on the farm, these include:

- Roles and responsibilities
- Workload
- Access and Control of assets and resources
- Decision making power.

See more details for the gender integration in Lesson 3.

Safeguarding

Safeguarding is the process and actions used to protect children and adults, to provide safe and effective care. This includes all procedures designed to prevent harm to a child and vulnerable adults. Safeguarding is all our responsibility, to ensure that our staff and programs honor and protect the rights and dignity of all people—especially children and vulnerable adults—to live free from abuse and harm.

All trainers are expected to uphold the highest standards for behavior and create a safe and respectful environment during the training and during any interactions with community members. All CRS staff and other representatives (interns, volunteers, partners, suppliers, and service providers) are expected to uphold the highest standards for behavior and adhere to the Safeguarding Policy and Code of Conduct and Ethics.

All forms of abuse, exploitation and harm towards training participants, other project participants, other community members and harassment of CRS staff/ affiliates is prohibited.

If there are any complaints, concerns or reports of abuse, this should be reported, through the official CRS safeguarding channels. These channels are given on the safeguarding handout.

If you have a concern about misconduct or any form of harm caused by anyone working for or representing CRS, it must be reported.

Your responsibility is to report confidentially through one of the reporting channels. Do not wait or investigate.

It is critical for the safety and wellbeing of all involved that safeguarding concerns are not shared with anyone other than the person you are reporting to as indicated in the safeguarding handout.

Share the channels with the participants and answer any questions that they may have in regard to safeguarding.

Monitoring and evaluation

Explain the importance of recording results, monitoring the work and sharing ideas by evaluating if new ideas worked or not—for the vanilla project as a whole, for the trainers, and for the participants.

Describe the monitoring and evaluation methods:

- Attendance register, with sex and age
- Quizzes before and after the session
- Informal questions after the session
- Self-assessment of your own performance.

Conclusion

Briefly review what you have covered in this session. Ask if there are any questions.

Ask the questions in the *Quiz* to make sure that the participants have understood the content.

Thank the participants for their attention. Tell them what the next session will focus on.

Quiz

1. What is the VINES project? Who is it funded by? Who implements it?

2. How does a training of trainer's program work?

3. How many farmers should be in each group?

4. What actions can you take to recruit women as group members?

5. Why is it important to have women and men in the group?

6. How many hours should a training lesson last?

7. What determines when (in what season) each training session is held?

8. What determines where each of the training session is held?

9. How do you assess if a lesson is working well?

10. What are steps you, as the trainer, can take to create a respectful learning environment?

11. What does safeguarding mean in terms of children and women working in the vanilla value chain?

Expected answers

1. VINES is a 5-year project to expand and improve vanilla production across Uganda. United States Department of Agriculture (USDA) and implemented by the Catholic Relief Services (CRS) in partnership with TechnoServe.
2. A specialist first trains the trainers, who then go on to train farmers. This second step is called “echo training” or farmer training
3. About 20-30.
4. Encourage both women and men (and husbands and wives) to attend. Make sure the time and place are safe and convenient for women. Possibly provide childcare. Consider holding separate sessions for women.
5. Both women and men are typically involved in growing vanilla. Ideally, the wife and husband should make joint decisions, to increase the benefits for the entire household.
6. Keep the duration to the planned 1-2 hours. Share information with the community members about the benefits for the family when both women and men participate.
7. The timing of activities in the field.
8. The need to do practical exercises in the field; have shelter in case of rain, have a convenient and safe location for participants.
9. Monitoring participants’ reactions during the session; responses to the quiz, feedback at the end of the session; self-assessment by the trainer.
10. Value everyone’s experiences and opinions; encourage everyone to participate equally; use participatory training methods; get the participants to set their own rules / norms.
11. Safeguarding is a process that we use to protect children and adults, especially vulnerable adults from harm.

CHAPTER 1.

Introducing the vanilla production project

The field agent meets the farmers in the field

Technical information

Topics covered

- Safeguarding
- Farming calendar.
- Vanilla calendar.
- Benefits of mixed farming.

Safeguarding message

As this is the first time that you will meet the community, this is when you should provide all stakeholders with information about the CRS safeguarding policy. Leave safeguarding handouts with all partners.

Safeguarding is all our responsibility, to ensure that our staff and programs honor and protect the rights and dignity of all people—especially children and vulnerable adults—to live free from abuse and harm.

All trainers are expected to uphold the highest standards for behavior and create a safe and respectful environment during the training and during any interactions with community members. All CRS staff and other representatives (interns, volunteers, partners, suppliers, and service providers) are expected to uphold the highest standards for behavior and adhere to the Safeguarding Policy and Code of Conduct and Ethics.

All forms of abuse, exploitation and harm towards training participants, other project participants, other community members and harassment of CRS staff/ affiliates is prohibited.

If there are any complaints, concerns or reports of abuse, this should be reported, through the official CRS safeguarding channels. These channels are given on the safeguarding handout.

If you have a concern about misconduct or any form of harm caused by anyone working for or representing CRS, it must be reported.

Your responsibility is to report confidentially through one of the reporting channels. Do not wait or investigate.

It is critical for the safety and wellbeing of all involved that safeguarding concerns are not shared with anyone other than the person you are reporting to as indicated in the safeguarding handout.

Key messages

Drawing up a farming calendar helps in planning activities on the farm.

Vanilla is grown in a mixed farming system, with shade trees and crops such as coffee and banana to provide shade, and other crops in other fields. All these elements are necessary to achieve an adequate and stable income.

Farming calendar

A farming calendar shows the types of activities the farmers do throughout the year, who does what, and the constraints that they face during different seasons.

It is important to know who does the work: men, women, boys, girls, hired laborers, or some combination of these. This shows who needs to learn what skills, and if one household member is overburdened with work at particular times of the year.

Remember that each household member has other activities apart from farming: off-farm work, school, and regular daily household work. On some occasions, suggesting more work for vanilla production may not be possible, because other tasks may not get done or there may need to be adjustments in the household to help people manage the different tasks. Try to find out if the changes you are suggesting are practical and possible.

Also consider reasons that may prevent a change happening, because of things like the timing of rains and dry season, the availability of labor, off-farm work, and the price of crops they sell.

Mixed farming

The project has various aims:

- To help farmers to improve their vanilla production methods, grow more vanilla, and get better prices for their mature vanilla beans.
- To help farmers increase their incomes from the farm, by growing vanilla within a mix of other crops.
- To ensure that everyone in the family benefits fairly.

Given that vanilla prices are volatile, prices are high in some seasons and low in others. Farmers need to think about their vanilla production as a long-term business. Over a 7–10-year period, there will be times when prices are high, perhaps up to $50 (UGX 170,000) per kilogram of green pods, whereas at other times the price may fall as low as $7 (UGX 25,000) per kilo.

The purpose of mixed farming is for farm households to enjoy the benefits of growing vanilla but to also earn money from different sources. If they grow a range of crops, they will not depend entirely on vanilla for their income. The price of vanilla can vary a lot over time, so farmers will need to grow other crops to maintain a steady income throughout the year. They can sell a range of crops at different times of the year and where possible take advantage of the changing prices from season to season.

Farmers also need to grow enough food, and the right types of food, to feed themselves and their families. Growing vanilla should not come at the cost of growing less food, worse nutrition, or a lot more work for one or more people in the household.

All members of the family should be involved in decision making and as family members contribute to the production of vanilla they should be rewarded fairly for their effort.

This manual covers vanilla as well as various other crops that can be intercropped with it in an agroforestry system. Most farmers will also have other plots where they grow other crops, and they may also keep livestock and have other sources of income, such as trading or wage employment. They must ensure that they maintain a balance between their various farm and non-farm enterprises.

Examples of intercropping with vanilla in the same field:

- Banana and vanilla
- Coffee and vanilla
- All three together.

Examples of crops that may be grown separately from vanilla:

- Food crops: cassava, maize, beans, vegetables
- Cash crops: cocoa, avocado.

Discussion points

- Most farms have one or two major crops, along with a number of other enterprises. For some families, off-farm income may be very important. Regular migration to seek urban work is increasingly common in rural communities.
- The most important crops probably include a staple crop (such as maize, cassava or bananas) that the farmers must have to feed their families, and a cash crop (such as maize, bananas, coffee or vanilla) they use to earn income.
- Within the family, men and women may have different priorities and opinions. A man may think of the main cash crop as being the most important, while a woman may put the family's main source of food first.
- Farmers often grow certain crops for certain reasons: for food security, income, nutrition, familiarity, availability of a market, etc.
- Vanilla can be very profitable in some years, but less profitable in other years, depending on how much farmers grow and the market price. It is important for vanilla farm households to have other cash crops they can fall back on if the vanilla price is low.
- Farmers often find it difficult to put figures on the income and costs for most, if not all, of their enterprises.

Lesson plan

This lesson introduces the vanilla production project to the community and farmer group. You will help the participants understand the importance of managing their farm as a business. You will emphasize the importance of growing vanilla within a mixed cropping system, so that they have several different incomes.

This first session with farmers is very important! At this meeting you will establish your working relationship with the farmers and the community.

Learning objectives

After this lesson, the participants will be able to:

- Describe the vanilla production project.
- Draw up a calendar of activities on the farm and in vanilla production.
- Describe how vanilla is grown in a mixed cropping system.
- Explain safeguarding and how to report abuse.

Preparation

- Prepare the crop calendar sheet before you arrive.
- Have the calendar ready to draw on before the farmers arrive.

Duration

2-3 hours. There are several issues to cover in this meeting. You will need to take care of time. There are two main sessions, the first on crop calendars and the second on mixed cropping.

Welcome and introductions

You introduce yourself to the group (and get to know them too). You should engage each member of the group individually, so each person feels welcome.

- Thank the participants for coming to the meeting.
- Introduce yourself and your organization. Mention other programs your organization has implemented in the local area.
- Ask the leaders to briefly introduce themselves.
- Ask each farmer to briefly introduce themselves.

Purpose of the meeting

Tell the participants that the purpose of this first meeting is:

- To explain the project.
- To provide an overview of CRS's Safeguarding policy.
- To talk about thinking of farming as a business.
- To plan for the next meetings in the weeks and months to come.

The VINES project

Explain to the training participants about your job and the VINES project. Share the following information:

My name is _____ .

I am an extension agent for _____ (name of processing company).

We are working with the VINES project to greatly expand vanilla planting across Uganda in a way that will be profitable for Uganda farmers.

The VINES project is a 5-year project that began in 2020 and will work until 2025. It is managed by Catholic Relief Services and TechnoServe.

The project is working with vanilla farmers—both women and men—processors, exporters and even vanilla buyers in the United States and other countries who buy Ugandan vanilla.

My job is to bring you technical information and help coordinate project support so that you can plant healthy and profitable vanilla gardens.

The purpose of our project is to help you and your family make money with vanilla! It's important that everyone in your household benefits from this income.

There are many parts to successful vanilla production and sales. We will work together in a series of training sessions to help you improve your farms.

Agreeing on rules for the lessons and creating a respectful learning environment

Explain that different participants may have different interests. You want everyone to benefit from the lessons, and everyone should feel able to speak up.

Ask the participants what rules the group should follow. Write these rules on a flipchart. Suggest your own rules if they miss out anything important.

For example:

- Come on time.
- Tell the participants how long the session will last.
- Listen respectfully to all opinions (men and women of all ages).
- Give space for different members to speak.
- Don't interrupt someone else.
- Don't talk with other people during the lesson.
- Don't use your phone during the lesson.
- Keep sessions to time, and check as you go. Stop at the agreed time.
- Be sure everyone understands the instructions.

The farming calendar

Time to complete task: 20 minutes

Tell the participants that this is a learning exercise. After they complete the general farm calendar, then you will repeat it for vanilla.

Help them create a **farming calendar for their village**. You can do this on a large sheet of paper (tape together several sheets if necessary) using marker pens. Show the participants the names of the months from January to December across the top of the sheet and show them when the rainy seasons are.

Tips - Save time! Prepare the calendar outline before you start.

Ask the participants to list their main crops. List these down the left side of the calendar. Make sure they include vanilla and cash crops that are grown with it.

For each crop, ask the participants what they do in each month of the year: land preparation, sowing, weeding, harvesting, marketing etc.

Discuss the activities with the participants. Question to ask:

- What is the most important crop or activity they do at these times of year?
- When do they have to hire labor to get the work done?

Activity / List of crops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beans	Harvest	Land prep Sow	Weed		Harvest					land prep Sow	Weed	Harvest
Maize	Harvest Dehusk	Plow Sow	Weed		Harvest	Dehusk				Plow Sow	Weed	Harvest Dehusk
Coffee												
Vanilla												
Banana												
School												

Figure L1.1. Partially completed farming calendar

The vanilla calendar

Time to complete task: 40 minutes

Now repeat the exercise and help the participants create a similar calendar focusing just on vanilla and the tutors (the trees used to support the vanilla vines).

Also on this calendar Ask who within the household does each activity. Note this by writing:

- **M** for men
- **W** for women
- **B** for boys
- **G** for girls
- **H** for hired labor.

If more than one person does the work, show who does the most work by writing the letter twice (**MM**).

Have one row for each activity. You can write the type of activity under each month, make coloured lines, or draw little pictures to show the activity. Show who does the different tasks by adding an M (men), W (women), B (boys), G (girls) or H (hired labor) to the appropriate row.

Discussion:

Review the farming calendar and the vanilla calendar with the participants. ASK:

- Looking at the two calendars, when are the busiest times of the year and why?
- Do farmers hire labour at specific times? Such as pollination or harvesting?
- When are women the busiest and why?
- Which tasks are done mainly by men or women?
- When are children not in school? How does working on the farm affect school participation?
- How will adding a vanilla garden or expanding an existing vanilla garden impact men, women, boys and girls' time allocations and availability? Why is it important to understand this impact?
- Why is it important to understand who does what on the farm?

Explain that what you cover in each session in the course will depend on what the farmers will be doing in the field during the next few weeks. For example, you will talk about pollination shortly before the participants will need to be pollinating their vanilla flower. You will discuss looping around the time they will need to do this.

Take a photograph of the calendars as a record. Transcribe this later into your field notebook for the group.

Keep the sheets so you can refer to them in later sessions.

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pollination			pollinate						pollinate			
			W						W			
Mulching, weeding	mulch, weed											
	W	W	W	W	W	W	W	W	W	W	W	W
Planting tutors		plant tutors							plant tutors			
	M	M							M			
Planting vines			plant vines							plant vines		
			MW	MW						MW	MW	
Looping			loop							loop		
			W	W	W					W	W	W
Harvesting pods	harvest					harvest					harvest	
	MW					MW					MW	MW

M = men, **W** = women, **B** = boys, **G** = girls, **H** = hired labor

Figure L1.2. Example of a vanilla calendar with text

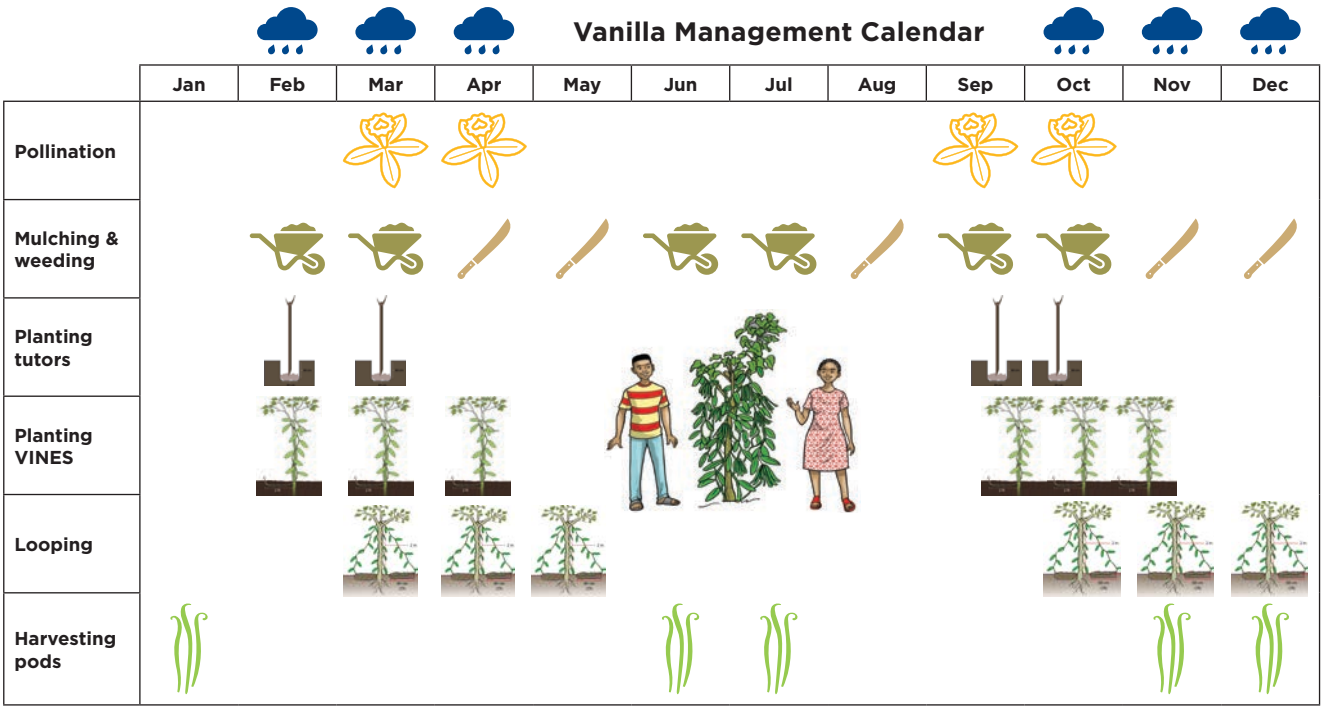


Figure L1.3. Example of a vanilla calendar with drawings

TAKE A BREAK!

Learning about mixed crop farming

Time to complete task: 60 minutes

- Split the participants into small groups with female participants only and male participants only in separate groups.
- Draw an empty table like Table L1.1 on a flip chart.

Tip - Save time! Prepare the empty table before you start the session.

- **Food and Cash Crops.** Ask the participants to name all the crops their household produces, and what they use them for – for food, cash, or both. As they name each crop, write it in the appropriate place in the left column of the table as shown below. Write the use of each crop in the second column. Farms in Uganda typically have one or two major crops (such as maize), plus several minor crops. To save space and time, you can group minor crops, for example as "vegetables".
- **Trees.** Ask the participants what types of trees they grow on their farms. Why do they grow them? Prompt by asking: Do they grow trees to provide shade? Do they have trees for the farm boundary? Why are trees important in the cropping mix?
- **Family and hired labor.** When you have finished creating the list, ask the participants who does the work for each enterprise. Is this done by the family, or does it require hired labor?

As we look across this calendar, there are common tasks such as land preparation, planting, weeding, etc. For the crops we just listed, who within the household usually does the:

- **land preparation?**
- **planting?**
- **weeding?**
- **Harvesting?**
- **Marketing and sales?**

- **Prioritization.** Ask the participants how important each enterprise (crop, livestock or other source of income) is. Ask the participants to give a score to each enterprise:
  - 1: the most important
  - 2: medium importance
  - 3: least important.

Tip: You can use different color markers to score women's scores and men's scores

If you have time: You can make the scoring into an exercise, by giving each woman approximately 15 stones and to each man approximately 15 leaves. Read out each enterprise and ask participants to show how important that enterprise is to them by "voting" with their stones/leaves. Tell them to place 3 stones/leaves on the enterprise/s that are most important to them, 2 stones/leaves on the enterprise/s that are of medium importance and 1 stone/leaf on the enterprises of low importance.

Write these scores in column 4 in the table.

- **Discussion.** Discuss the contents of the completed table. Ask the farmers questions like these:
  - What are the main enterprises? How important is vanilla compared to the other enterprises?
  - Why do farmers grow so many (or so few) crops? Ask the participants to suggest reasons.
  - Why are trees important in the farm mix?
  - Why is it important to understand who does what (women, men, girls, boys, hired help) within the farm enterprise?
- Note that men and women may give different scores. Review the responses from the female participants and the male participants noting any differences. If there are differences, ask why each group scored and prioritized the enterprise how they did.
- **Summarize the discussion**. Draw out the main points made, clarify any uncertain points if possible, and fill in any gaps. Point out that it is difficult to determine the income and costs of many crops. Explain that this course will help the participants do so, so they know how profitable their farm is and how to make it earn them more money.

Table L1.1. Food crops, cash crops and trees in the farm enterprise: Example

Enterprise	Use	Who does the work?	Importance	Grows well with vanilla
		F= Family labor H = hired labor	1 = high 2 = medium 3 = low	✓
1	2	3	4	5
Food crops				
Beans	Food		1	
Cassava	Food		3	
Livestock	Food (milk)		2	
…				
Food and cash crops				
Maize	Food, cash		1	
Banana	Food, cash		1	
Chickens	Food, cash (eggs)		2	
Vegetables	Food		2	
…				
Cash crops				
Vanilla	Cash		2	
Coffee	Cash		3	
Tree crops				
Fruit trees				
Timber trees				
Describe any other income				
Job in town	Income		1	
Daughter's job	Income		1	
Remittances				

TAKE A BREAK!

Safeguarding

As this is the first time that you will meet the community, this is when you should provide all stakeholders with information about the CRS safeguarding policy. Leave safeguarding handouts with all partners.

Safeguarding is all our responsibility, to ensure that our staff and programs honor and protect the rights and dignity of all people—especially children and vulnerable adults—to live free from abuse and harm.

All trainers are expected to uphold the highest standards for behavior and create a safe and respectful environment during the training and during any interactions with community members. All CRS staff and other representatives (interns, volunteers, partners, suppliers, and service providers) are expected to uphold the highest standards for behavior and adhere to the Safeguarding Policy and Code of Conduct and Ethics.

All forms of abuse, exploitation and harm towards training participants, other project participants, other community members and harassment of CRS staff/affiliates is prohibited.

If there are any complaints, concerns or reports of abuse, this should be reported, through the official CRS safeguarding channels. These channels are are given on the safeguarding handout.

If you have a concern about misconduct or any form of harm caused by anyone working for or representing CRS, it must be reported.

Your responsibility is to report confidentially through one of the reporting channels. Do not wait or investigate.

It is critical for the safety and wellbeing of all involved that safeguarding concerns are not shared with anyone other than the person to whom you are reporting.

Conclusion

Briefly review what you have covered in this session. Ask if there are any questions.

Ask the questions in the *Quiz* (see below) to make sure that the participants have understood the content.

Thank the participants for their attention. Tell them when the next session will be and what it will be about.

Explain that after that, you will hold regular meetings to discuss particular topics and problems about vanilla production, depending on the calendars the participants have created.

Say that it is important that people attend every meeting. If someone cannot attend one meeting, they should find out what was discussed from someone else who attended.

Quiz

1. What is the name of the project? Who is the project implemented by?

2. What are the main crops grown by male participants? By female participants?

3. Why is it important to understand who (men, women, young men, young women) does what in the farming system?

4. When is the flowering season for vanilla?

5. When are the harvest seasons for vanilla?

6. Why is it important to grow a mix of crops, and not just vanilla?

7. Why are trees important in the crop mix?

8. Why is safeguarding important?

Expected answers

1. VINES. Implemented by CRS and Technoserve.
2. (Depends on the participants' responses during the lesson).
3. To know what skills they need, whether particular people are doing most of the work, and whether they are being rewarded for their efforts.
4. (Depends on the participants' responses during the lesson).
5. (Depends on the participants' responses during the lesson).
6. To have a stable income and to ensure food security and nutrition for the family.
7. Two provide shade, fuelwood, construction materials, fruit, etc.
8. It protects the most vulnerable people, such as children and women from abuse.

Handout 1.1: Outline of the training plan

	Subject	Training of trainers		Echo training with farmers
	Introduction lesson			
	VINES training program	●		(no echo-training)
	Understanding the vanilla farming context			
1	Introducing the vanilla production project	●	→	●
2	The vanilla market	●	→	●
3	Setting a vision for vanilla	●	→	●
	Managing the farm			
4	Site selection, security and land preparation	●	→	●
5	Shade management	●	→	●
6	Crop planting systems and spacing	●	→	●
	Cultivating vanilla			
7	Soil and water management	●	→	●
8	Planning and planting tutors	●	→	●
9	Vine selection and planting	●	→	●
10	Weeding	●	→	●
11	Pruning	●	→	●
12	Disease and pest management	●	→	●
13	Looping vanilla vines	●	→	●
14	Flowering and pollination	●	→	●
	Harvesting and Diversification			
15	Harvesting	●	→	●
16	Diversified agroforestry system	●	→	●

Handout 1.2: Feedback channels

USDA

CRS
CATHOLIC RELIEF SERVICES

DO YOU HAVE ANY QUESTIONS, SUGGESTIONS OR FEEDBACK ON:

QUALITY OF OUR SERVICES, CONDUCT OF CRS STAFF AND PARTNERS, VOLUNTEERS, FRAUD AND ANY FORM OF ABUSE

TALK TO US

Talk to any CRS or VINES staff anytime and anywhere.
Monday to Friday 8am - 5pm.
They will record your feedback/issue and send to office
USE any language.

DISCUSS WITH US

Provide feedback, ask questions, make requests and suggestions to VINES project during community meetings, focus group discussions with CRS and partner staff.

CALL US - FREE OF CHARGE

0800 334 330

Available Monday to Friday, Time: 8am - 5:00pm
Send us a WhatsApp 0741 672 901

WRITE TO US

Email us your feedback, suggestions, questions and concerns

InfoUganda@crs.org

This poster is made possible through the support of the American people through the United States Department of Agriculture (USDA). The contents of this poster are the responsibility of Catholic Relief Services and do not neccessarily reflect the views of USDA nor the United States Government.

Handout 1.3: Farming calendar

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rains												
Crops												
Livestock												
Outside work												
School												

Handout 1.4: Vanilla calendar

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rains												
Pollination												
Mulching, weeding												
Planting vines												
Looping												
Harvesting												

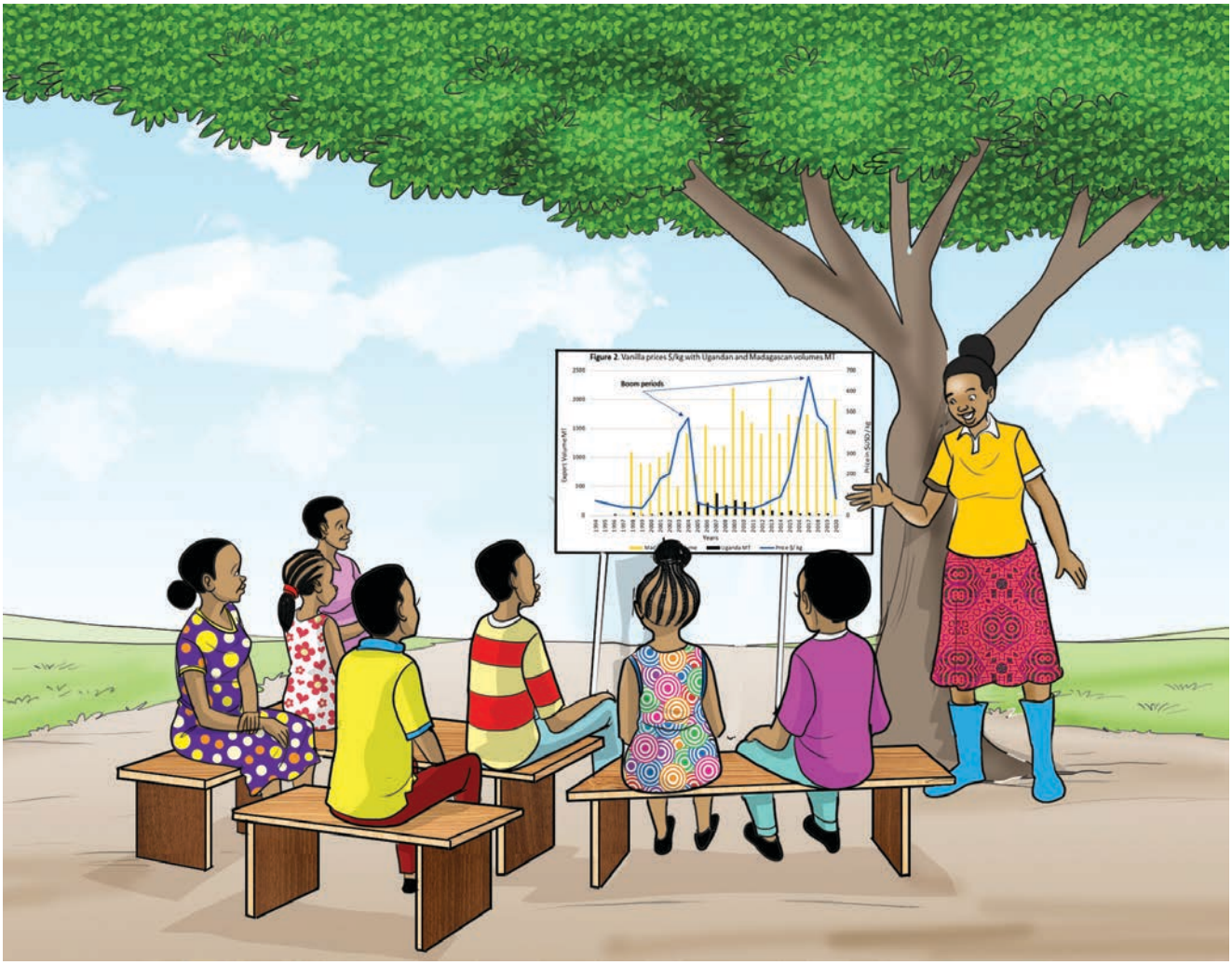
M = men, **W** = women, **B** = boys, **G** = girls, **H** = hired labor

Handout 1.5: Mixed cropping systems food and cash in the farm enterprise

Enterprise	Use	Who does the work?	Importance	Grows well with vanilla
		F = Family labor H = Hired labor	1 = high 2 = medium 3 = low	✓
1	2	3	4	5
Food				
Food and cash				
Cash				
Trees				
Other income such as off farm				

CHAPTER 2.

The vanilla market



Explaining vanilla prices to farmers

Technical information

Topics covered

- Vanilla production in Uganda and the world.
- Why vanilla prices are volatile.
- How the vanilla value chain functions.
- Ways to improve the vanilla value chain for farmers.

Key messages

- The vanilla value chain is made up of everyone involved in producing, processing and marketing vanilla. It includes farmers, primary processors, exporters, secondary processors, retailers and consumers.
- Actors who support the value chain provide various types of services: inputs, infrastructure (roads) and communications (phone service), extension advice, market information, research and financial services.
- VINES will help farmers strengthen their relationships with other actors in the chain and with these service providers.
- Vanilla is an important export crop for Uganda.
- Farm households who grow vanilla can earn a good income and use it to benefit the family.
- The price of vanilla can vary widely from year to year. Sometimes it can rise very fast, but it can also fall quickly.
- The price of vanilla depends on the world market. Companies in Uganda have little influence over it.
- Farmers should not rely too much on vanilla. They should also grow other cash crops to protect themselves if the price of vanilla falls.
- Even if the price is low for a couple of years, farmers should not be discouraged. If they tend their vines, they will be ready to sell more when the price goes up again.

The vanilla market

It is important for you to understand how the market for vanilla works. This will make it possible for you to advise farmers on their vanilla production.

Farming households must also understand the market so they can make informed decisions about which crops to grow for sale.

Vanilla production worldwide

Most vanilla is produced in two countries: Madagascar and Indonesia. Other major producers are Mexico, Papua New Guinea, China, Turkey, Tonga and Uganda. Most of the vanilla that is sold comes from Madagascar, which sells 70–80% of the vanilla on the world market see Figure T2.1.

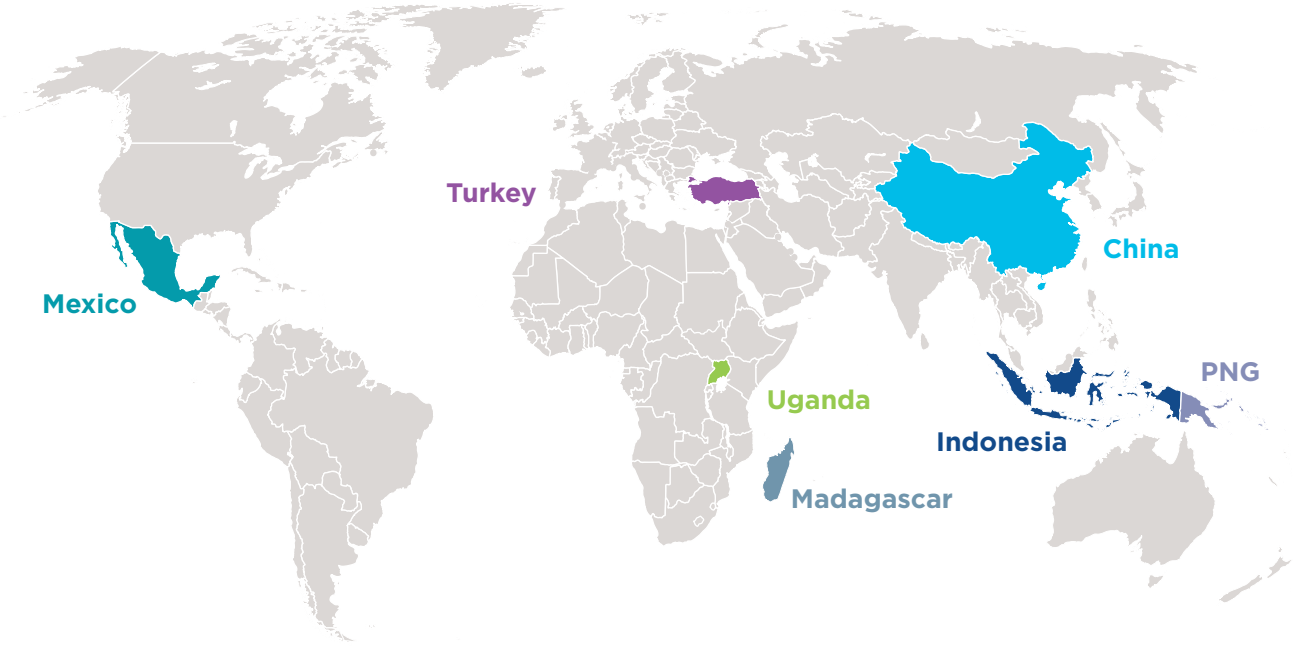


Figure T2.1. Major vanilla producers

Madagascar is a large island in the Indian Ocean, about twice the size of Uganda. Madagascan farmers and traders have traditionally dominated the world vanilla market and were the main producers until the late 1980s. The Madagascan government and a small number of trading houses in Madagascar controlled the supply of vanilla and world prices based on an international trading agreement. Other countries had smaller quotas which they could use to sell their produce internationally. This controlled market system changed in the 1990s, when the World Trade Organization and the International Monetary Fund liberalized markets, allowing other countries to start producing and selling vanilla.

However, the change in trading arrangements led to many countries producing vanilla, and this caused a sudden glut in the vanilla market. Prices of farm-cured vanilla fell from $70 or $80/kg to below $35/kg, and farmers in Madagascar who were accustomed to better prices stopped growing the crop. With no other major sources of supply, a supply shortage ensued. This triggered a surge in vanilla prices from 1999 to 2004, as shown in Figure T2.2.

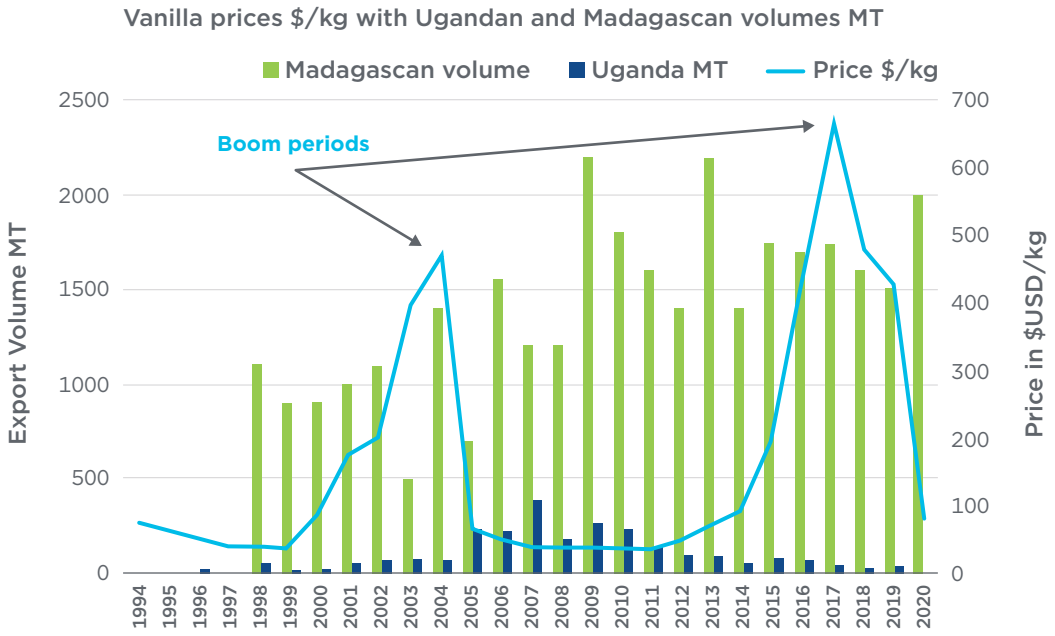


Figure T2.2. Changes in world market prices of cured vanilla

* (bright blue line) and volumes of cured vanilla sold by Madagascar (green bars) and Uganda (blue bars), 1994–2020. Source Henry Todd Virginia Dare Ltd.

The boom in prices from 1999 until 2005 marked the point when Uganda entered into the world vanilla market as a more commercial player. Figure T2.2 shows how Uganda produced approximately 50 tonnes of cured vanilla per year in 1998–2004, followed by a sudden rise in production in 2005. Production peaked in 2007, when the country had a bumper crop of over 350 tonnes.

Green vs cured vanilla

Green vanilla pods sell for about one-sixth or less of the price of cured vanilla beans. The ratio of green to cured is about 1:5 or 1:6 based on dry-weight loss. It takes approximately 2–3 months to cure vanilla using traditional drying methods. Quick curing systems can cure vanilla in 15-20 days. The drying and curing process requires a lot of labor, as well as specialized equipment and skills. In Uganda, curing is done mainly by factories that have standard methods and generally produce a more uniform and better-quality product than curing on-farm.

Artificial vs natural vanilla

The main flavor of vanilla is called vanillin. This can be imitated by an artificial substance made from wood. This artificial vanilla flavoring is much cheaper than natural vanilla made from pods. Its taste is difficult to distinguish from the natural product, even for experts. Some “vanilla-flavored” food products contain artificial, not natural, vanilla.

But natural vanilla still has a market, especially in higher-priced products. Vanilla’s fragrance and flavors includes vanillin plus many other flavinoids that give natural vanilla a specific flavor profile. Buyers working in flavor houses that supply higher value markets, sell natural vanilla at a much higher price than synthetic vanilla.

Vanilla in Uganda

Vanilla has been grown in Ugandan kitchen gardens for more than 100 years. It was probably introduced into Uganda from India. But it was not until the early 2000s that Ugandan farmers and processors started to realize the value of vanilla, the unique production opportunities in Uganda and the prospects for commercializing the crop.

As prices rose in 1999–2004, farmers in Uganda (and across the world) became aware of this new market opportunity and they started to plant the crop. It takes three years from planting vanilla to harvesting it, so there was a long lag between the price spike and the ability of farmers to respond by harvesting vanilla.

Ugandan farmers were at first excited about the new vanilla crop, and production reached a peak in 2007. The farmers thought they had a new and much appreciated source of income. But the sudden increase in global supply pushed the market into oversupply, and this led to a drop in vanilla market prices.

Despite this setback, it was a major achievement for Ugandan farmers and processors to suddenly upgrade from growing vanilla in kitchen gardens in 2002 to producing over 20% of the world market supply by 2007. This remarkable growth was the result of technical assistance for vanilla farmers in Uganda and an agile private sector, which was able to capitalize on the market opportunity. At that time, farmers enjoyed prices of over $100/kg.

The oversupply led to falling prices, but many farmers stayed with vanilla. Even though prices were low from 2005 to 2010, the farmers hoped to benefit if prices went up again. But many drifted out of vanilla.

This volatility is caused by the unique structure of the vanilla market. It is more pronounced than for many other export crops. When prices are high, many farmers rush into planting the vanilla, but they then have to wait 3–4 years to get a return from their first harvest. If farmers pull out completely when prices fall, they cannot easily start producing vanilla again, so low prices reduce the level of production.

It is important for farmers to understand the price volatility issue, its implications for their income, and its effects on their farm and family. They must understand that prices can go up and down quite dramatically. No company in Uganda can control the prices.

One of the consequences of major swings in price is theft. Theft is a big problem when prices are high. Farmers have to put fences around their vanilla plantings. To protect the crop during high price periods, farmers have dogs. They have dogs to guard the vanilla farm, or hire people to watch the fields at night. But such security costs a lot of money. Some farmers have their sons stay up at night to guard the field, but this can harm their health, safety and their schooling.

The combination of low prices, high production costs and theft has frustrated many farmers, who have swapped vanilla for other crops such as coffee, cocoa and bananas.

Since 2010

After 2010, technical assistance for the vanilla industry waned, and Uganda experienced a slow but steady decline in production. In 2020, Uganda produced less than 50 tonnes. Prices leveled out at about $100/kg for cured vanilla, or a green-bean price of $12–$15/kg.

From 2005 until 2012 prices for cured vanilla remained steady at the low level of around $100/kg. Then in 2013, the growing demand for natural ingredients started to push prices up. This new demand quickly caught up with vanilla supply and triggered another supply crisis. Prices climbed rapidly from 2014 to 2017. By 2018, shortages forced prices to new record levels of $700/kg for cured vanilla. Vanilla was more expensive per kilogram than silver. Naturally these very high prices were good for those farmers who were producing vanilla. Once again, more farmers were motivated to plant vanilla.

Vanilla markets are difficult to assess. Not all cured vanilla is sold every year. Traders can store produce for at least 5 years, and some buyers think the quality improves over time if it is stored well. All of this adds to the mystique of the vanilla market.

Supply and demand

The **price** of vanilla (as with any other product) depends on the balance between supply and demand.

Supply is the amount of the product that is available on the market. For vanilla, this depends on the amount that farmers grow, which can vary from year to year. Factors include the number of vines in production, the weather, pests and diseases, and yields.

Demand is the amount of the product that processors want to buy. For vanilla, this does not vary much. But if the price is high, processors may use cheap artificial vanilla instead of the expensive natural product.

The price of vanilla depends on how much vanilla of a certain quality is on the market, and the demand for vanilla.

Supply	
■ If the **supply goes down**, the **price tends to go up**.	**Supply ↓ price ↑**
■ If the **supply goes up**, the price goes **down**.	**Supply ↑ price ↓**
Demand	
■ If demand goes **up**, the price goes **up**.	**Demand ↑ price ↑**
■ If demand goes **down**, the price goes **down**.	**Demand ↓ price ↓**

The farmers may be familiar with this in local markets for crops such as maize or onions.

- Immediately after the harvest, many farmers want to sell their maize or onions. The **supply** is **high** ↑, so the **price** goes **down** ↓.
- In between the harvest seasons, there is less maize and fewer onions to buy. The supply is **low** ↓, so the price tends to be **high** ↑.

The same is true for meat:

- Before a feast day, a lot of people want to buy meat so they can celebrate. **Demand** is **high** ⬆, so the price goes **up** ⬆.
- At other times of the year, there is **less** ⬇ demand for meat, so the price tends to be **lower** ⬇.

Buying and selling vanilla

Agents sometimes agree with farmers on a volume of vanilla to buy. They do not agree on a price until the time of sale, as nobody knows what the world market price will be until the time of sale.

The agents may give an indicative price that they will pay a month or two in advance of a sale. In some rare cases, agents may provide farmers with some limited cash advances, or pay for security to incentivize farmers to sell to them. This type of agreement is based on trust over several years. It is not a common practice.

Farmers generally sell to the highest bidder, and the level of loyalty to farmers is not well understood. This is partly because not all buyers are in the market every year. Farmers must then be ready to find buyers if their regular customer is either not buying or not offering a competitive price.

Many buyers help farmers manage mixed farms with a view to buying produce from more than one crop. For example, they may buy vanilla, coffee and chili from the same farmers. This reduces the risk for both the farmers and the company. It gives a more stable income to farm households and builds a better business relationship, trust and loyalty between the farmers and buyers.

Dealing with volatile markets

Many crops, and especially export crops, go through periods of high and low prices. These swings are caused by global market conditions that are entirely beyond the control of farmers, processing companies and national markets.

It is in the interests of both farmers and processing companies if farmers do not depend too much on vanilla (or indeed, on any one crop). If farmers depend too much on vanilla:

1. They will suffer if the prices fall, if the weather is bad, or if the crop is attacked by pests or diseases. They will become discouraged and will stop growing vanilla when the prices are low.

2. The buyers and processors will find it difficult to get enough vanilla when prices are low. They will not be able to supply vanilla to their customers. They will find it difficult to build a trusting business relationship with the farmers.

How companies deal with volatile prices

Vanilla processing companies deal with higher prices in various ways:

- **By passing on the high (or low) prices to farmers.** If prices are high, they have to pay farmers more, otherwise the farmers will sell to another buyer. That means farmers benefit from high world prices. If prices are low, the processors have no choice but to reduce the amount they offer to farmers to stay competitive in the export market. The processors have high costs for processing and storage.
- **By buying more (or less) vanilla.** Companies may adjust the amount of vanilla they buy. Their ability to do so depends on the contracts they have with exporters or importers.
- **By storing cured vanilla and selling it when the prices are higher.** Companies can store cured vanilla until the prices recover. To some extent this smooths out the variation in prices that they offer to farmers.

How farmers can reduce their exposure to price variation

Farmers cannot store vanilla themselves as the green beans are perishable, and the farmers do not have the skills and equipment needed to cure the beans to make them easier to store.

Farmers can reduce their exposure to volatile prices in various ways:

- **By growing a mix of crops.** If one crop fails, or if the prices are low, then they will still earn money from the other crops.
- **By looking for other buyers.** If they do this, they should consider the options carefully. They should select buyers who are reliable, who have a reputation for paying promptly, buy quality vanilla, and who provide services such as advice and inputs. They should look for buyers who will buy other crops, such as coffee and cacao, and who have an interest in a long-term relationship with the farmer.
- **By selling as a group.** Farmers can organize into groups to sell their vanilla. By selling in bulk, they can negotiate better prices and conditions, as well as for services such as advice and inputs. Dealing with a group is attractive for the company too, as it is more convenient and cheaper than dealing with many individual farmers. Companies are often prepared to pay a premium for the reliability that comes from dealing with a group.

The vanilla value chain

What happens to the vanilla after the farmer sells it?

Value chain actors

The **buying agent** inspects the farmer's vanilla. They agree on a quantity and a price, and the agent buys the vanilla on behalf of the processing company. The agent arranges for a company **collector** to pick up the vanilla and take it to the processing plant.

The **primary processor** sorts the vanilla pods into grades, based on length of the pods. The pods are then cured. Curing using traditional methods is slow process that can take two to three months and in some cases longer. It involves a series of steps. After sorting, green vanilla pods are blanched or frozen to stop the ripening/maturing process. The blanching should be done within 24–48 hours of harvesting. The blanched pods are then cured using a cycle of sun-drying and "sweating". Sweating involves wrapping beans in woolen blankets and storing them in large wooden boxes. The pods are normally dried for 2–3 hours per day and then sweated. This process is repeated for 60–90 days, until the moisture content of the beans gets to about 20%. Once cured, the beans are stable and can be stored for months and even years prior to sale.

Most exporters want to cure the pods within 3 months so they can be sold on the world market. Several companies are developing more rapid curing methods which can cure the pods within 1 month. This means that they can sell produce much earlier in the year, which is attractive to buyers and can command a better price.

The **exporter** packs the cured vanilla into bundles of 50 or 100 beans. The cured beans can be wrapped in waxed paper and then stored in cotton bags (not plastic), and placed in cardboard boxes for export to their country of destination. Most of the vanilla sold from Uganda goes to high-value markets in Europe, the United States and Japan.

In the destination country, the **secondary processor** further sorts and processes the vanilla. The vanilla pods are also blended to achieve specific flavor profiles to match consumer needs.

There are two main ways to prepare vanilla: grinding the mature, cured pods into a powder, or most commonly, extracting the flavor. The secondary processors turn the vanilla flavoring into products.

The secondary processor sells bulked vanilla flavoring products to industrial food manufacturers, which then makes products such as vanilla ice cream and vanilla flavored desserts, cakes, biscuits, and into smaller packs for individual consumers. Some vanilla is used in cosmetics.

The secondary processor also sells the products to a **retailer** such as a supermarket. The retailer then sells the products to **consumers**.

The very finest vanilla is sold as cured pods to chefs and consumers who prepare their own vanilla recipes. Most vanilla is sold as an extract or powder to the food industry to make processed food products, and to retail customers to use in home cooking.

All of these actors are linked together in what we call the **vanilla value chain**. These actors are shown in the middle row in Figure T2.3.

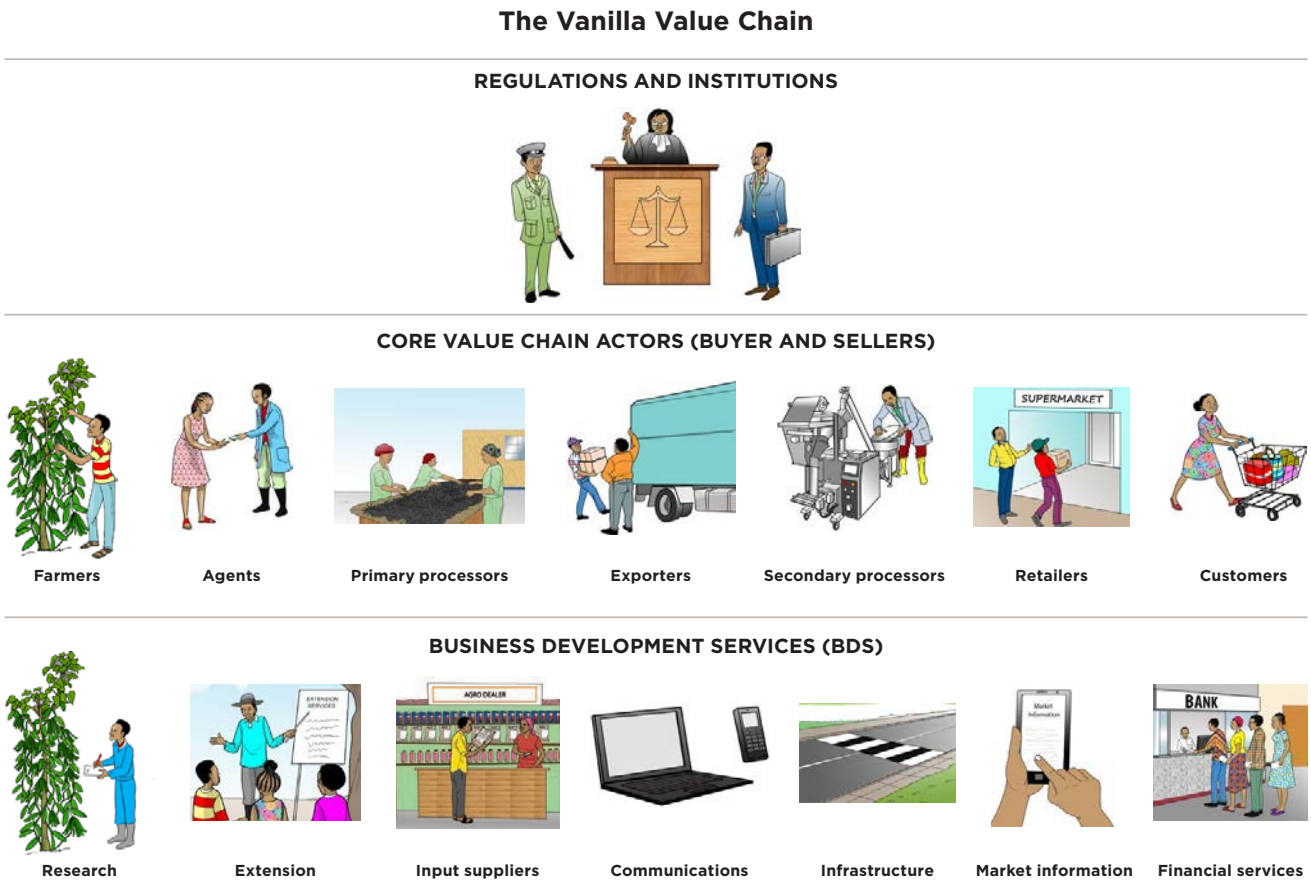


Figure T2.3. The core value chain links farmers with agents, processors, exporters, retailers and consumers

Supporting and managing the chain are regulators such as the government and the legal system, and business services such as input suppliers, extension agents and banks.

Business services

The value chain actors cannot operate in isolation. We can think of two types of "chain supporters" who make the vanilla chain possible. The first is **business services** (shown in the bottom row of Figure T2.3).

Input suppliers provide farmers with seed, fertilizer, pesticides, tools and equipment that they need to grow their crops.

Infrastructure such as roads, markets, electricity, and water supplies make it possible for farmers to produce and sell their crop, and for processors to transport and market it. Transport firms, ports, schools, and health services are also important.

Communications services such as mobile phones and the internet allow farmers and other value chain actors to keep in touch with each other.

Extension agents advise farmers on vanilla production as well as on other crops and on farm management in general. They ensure their services are relevant to their female and male clients.

Market information services are available via mobile phone, on the internet, and through the radio and other mass media. They give farmers information about prices, the weather, and other things that may affect their production.

Researchers develop new varieties of vanilla and improved cultivation methods. They also study the economics of vanilla production and can give advice to field agents and extension staff.

Financial services such as banks and microfinance institutions provide credit to farmers and to other actors along the value chain. Processing companies need credit so they can buy vanilla from farmers and to cover their processing costs before they can sell it. Exporters need finance to cover their costs and insurance to cover the risks of shipping the vanilla.

Regulation

The value chain would also not function smoothly without the regulation that government provides. This includes the laws that govern transactions, the legal system, the police, and government bodies that set and monitor trade rules and standards. These are shown in the top row in Figure T2.3.

Understanding the value chain

If we look at Figure T2.3, we can see different ways of improving the vanilla value chain so it works better for all, including the farmers.

Cooperation among chain actors. Extension workers can help farmers work together with vanilla buyers and other actors along the value chain, including processors and exporters. If the farmers understand the market needs, they will be in a better position to produce good quality vanilla pods in the right volume and at the right time. Improving their business relationships and building more reliable sales and contracting relationships will reduce farmers' costs and risks. They can draw on the vanilla buyers' expertise to increase their production and quality. Where there is a clear business case, buyers can work with their extension teams and adapt commercial strategies that recognize barriers that different farmers (women, youth, people living with disability) may face. When supporting different segments makes business sense there is a greater likelihood to design and support approaches that reduce these barriers. For vanilla there is a strong business case to engage more younger farmers if Uganda is going to increase productivity. There is also evidence that working with households, men and women, is important, particularly for buyers seeking the right level of productivity per plant and highest quality, season on season, as this requires close attention by the farming household, to maintain consistent detail throughout the 9 month growing period.

Cooperation among farmers. Individual farmers can only do so much by themselves. But if they organize into groups, in which diverse members can contribute and benefit fairly, they will be in a much better position. They can negotiate with input suppliers for discounts or bulk supplies. They can access extension services, learn as a group, and exchange ideas and experience. Diverse groups of young and old, men and women bring a wide range of knowledge and ideas. They can market their produce as a group, for example by arranging for the buyer to pick up a full load of vanilla in one go at a convenient location.

Making better use of business services. Farmers can learn how to use business services more effectively. For example, they can learn how to use market information services, what types of financial services are available, and how to get the most recent technology from research institutes.

Extension workers, buyers, banks and other services can find ways to expand their services and make them available and accessible to a broader range of current and potential vanilla growers. For example, they can ensure that women can get extension advice and can obtain loans.

Better understanding of regulations. Understanding laws such as harvest dates and standards such as quality of pods, will help farmers improve their product quality and avoid pitfalls such as mixing pods of different qualities. Strong links with the local authorities may help improve policing and reduce the risk of theft.

New prospects

Ugandan vanilla producers now have an opportunity similar to the one of 20 years ago. Prices are low at the moment, but demand for real (not synthetic) vanilla is growing. As volumes fall, prices are likely to rise—if farmers have vanilla to sell.

Uganda has ideal growing conditions for vanilla. It has two harvesting seasons, so can supply the market before Madagascar (which has only one season) comes on stream.

Extreme volatility in the market creates uncertainty and major financial risks for everyone. International buyers are eager to avoid major price swings. Food processors who use vanilla also want to avoid volatility. They are wary of buying ingredients (such as vanilla) whose price may vary wildly. If market prices swing too much they instead prefer to use cheaper, artificial vanilla to flavor their products. If prices of natural vanilla rise, they may switch to the cheaper artificial product, further worsening the price swings.

Farmers and their families in Uganda must understand the potential and risks of vanilla production. If farmers want to benefit from vanilla in the long run, they must be able to maintain production and quality even when prices are low. If they pull out of production, they will not be able to take advantage when the prices rise again, since they must wait several years before their vines start to produce.

At the same time, Ugandan farmers should not rely only on vanilla. They should also raise other crops that they can grow alongside their vanilla vines. These other crops will cushion them when vanilla prices are low. It is in the interests of Ugandan vanilla companies to encourage farmers to spread their risks in this way, and to buy the other crops as well as the vanilla.

How VINES can help

VINES supports the vanilla value chain in Uganda in various ways:

Farmers. VINES helps farmers produce more and better-quality vanilla. It encourages them to work together with buyers and business services to improve their production and marketing.

Couples. VINES supports couples to communicate openly, support each other in their farm work and household chores, and to make decisions together.

Business services. VINES builds the capacity of various business services to serve the vanilla value chain. This includes identifying young agricultural entrepreneurs who want to invest in vanilla, and strengthening or establishing new business opportunities, such as nursery providers, input suppliers, aggregators and market agents. It also entails helping businesses to extend their services to male and female vanilla farmers, and ensure that these services are appropriate for their needs.

Regulation. VINES also works with government agencies and local administrators to find ways of improving the business environment for growing and trading vanilla.

VINES aims to find ways to improve all aspects of the value chain so Uganda can become a leading global supplier of vanilla. This will generate jobs, income and economic growth.

A major weakness in Uganda's vanilla value chain has been the link between farmers and processors. Marketing has been largely informal and unregulated, with little cooperation between companies and the farmers from whom they buy.

Farmers need more diverse options for selling their vanilla, and companies need to improve the quality and consistency of the product they buy. Farmers and buyers need to strengthen their links so that both can profit.

Farmers need to produce and sell high-quality, mature vanilla that is harvested in the correct way and at the right time. Buyers and extension agents need to advise them how to do this. They also need to advise and help farmers to grow a wider range of crops so they do not rely only on vanilla.

Lesson plan

Lesson objectives

After this lesson, the participants will be able to:

- Describe vanilla production in Uganda and the world.
- Explain why vanilla prices are volatile.
- Explain how the vanilla value chain functions.
- List ways to improve the vanilla value chain for farmers.

Duration

2 hours.

Rules/Norms

Before beginning the lesson, remind the group about the norms established in lesson one. Ask for volunteers to share what the norms were. If anything is missed, remind the group.

Vanilla producers

Present the information about the world production of vanilla: the main producers, the history of Uganda's production, and the current levels of production. Major points:

- The major vanilla producer is Madagascar.
- Madagascar sells virtually all of its vanilla crop overseas, it sells nearly 80% of the world's commercial vanilla, some 2000 tons, and sets international prices.
- Any changes in production caused by poor weather or international sales caused by market disruptions in Madagascar has major effects on world market prices.
- Uganda is a relatively minor producer, but it has potential to produce more, and has big advantages because of its climate, soils and double growing season.
- Vanilla prices are very volatile. They depend on supply and demand in the world market. They are not controlled by farmers, processing companies or exporters.
- Vanilla offers farmers in Uganda good opportunities to make money. But the farmers must be patient: they must accept that in some years the prices will be low, but in other years the prices will be high.

Vanilla prices

Objective

After this exercise the participants will be able to explain why vanilla prices are so volatile.

Equipment needed

Flip chart or large pieces of paper, marker pens

Suggested procedure

- Ask the farmers about the following terms and get them to give examples.
  - What does “supply” mean?
  - What does “demand” mean?
- Make sure that all the farmers understand the meaning of the two words. Fill in any gaps and correct any errors in the definitions.
- Then ask what factors affect the **supply** of tomatoes (or another crop the participants are familiar with), using a brainstorming mode. Write each of the factors named on a flip chart.
- Repeat by asking what factors affect **demand** for tomatoes.
- Ask the farmers (for each question, ask them to give examples):
  - What happens to the price of tomatoes if the **supply** goes **up**? (Answer: the price falls.)
  - What happens to the price of tomatoes if the **supply** goes **down**? (Answer: the price rises.)
  - What happens if the **demand** goes **up**? (Answer: the price rises.)
  - What happens if **demand** goes **down**? (Answer: the price falls.)
- Explain that vanilla follows the same rules as any agricultural product, such as cabbages or maize. But it is unusual because what is important is not how much vanilla is produced in their village, or even in Uganda, but how much is produced around the world. If Madagascar has a good year and produces a lot of vanilla, the world price is likely to fall. If Madagascar produces only a little, the world price will go up.
- Ask what they would do if they see that the vanilla price is high. (Answer: they will try to produce more vanilla.)
- Ask them how they will do this. (Answer: they will plant lots of vanilla vines.)
- Point out that it takes at least 3 years between planting a vanilla vine and when it produces its first harvest. Farmers around the world will have been watching the price of vanilla, and as soon as it rises, they start planting vanilla vines. All those vines will start producing after 3 years. What will happen to the vanilla price? (Answer: it will fall).

- Ask them what farmers do if the price of vanilla is low. (Answer: farmers will neglect their vines and may even uproot them and plant something else.)
- Ask them what would happen then (Answer: The vanilla price will go up again!)
- Ask the participants what they can do to avoid falling into this trap of volatile prices. Answers:
  1. Plant vanilla, but keep producing and maintaining the vines, even if the price is low. They will then be able to profit when the price goes back up again.
  2. Grow other crops apart from vanilla to tide them over the periods with low vanilla prices.
- Summarize the discussion.

Mapping the value chain roleplay

Objective

- After this roleplay, the participants will understand who the actors in the vanilla value chain are, how the chain functions, and which actors support it.
- Try to make the roleplay fun and entertaining. As you enlist each volunteer in the roleplay, get them to stand on the rope next to the previous person in the chain.
- You can also do the same exercise without volunteers and the equipment. You can draw the value chain on a big sheet of paper instead. (It is more fun, and is likely to be more memorable, if you use volunteers.)

Equipment needed

A piece of rope or string, about 10 m long.

Objects:

- **For farmers**: 3–4 green vanilla beans (If you can't get vanilla beans and cured pods, use something else instead, such as vegetable beans.)
- **For buyer**: a toy car.
- **For primary processor**: 3–4 cured vanilla pods (or another type of beans), a cloth, a small box.
- **For exporter**: a cloth bag, a toy boat.
- **For secondary processor**: a cooking pot, a packet of biscuits.
- **For consumer**: a shopping basket.

Pieces of A4 paper with the following written on them with a marker pen (one name on each sheet) (see the *Handout*.)

- Farmers, Buyer, Primary processor, Exporter, Secondary processor, Retailer, Consumer, Bank, Researcher, Extension agent, Input supplier, Communications, Infrastructure, Market information, Security guard, Government.
- You can make this roleplay more entertaining and easier to follow for participants with different literacy levels if you give them hats or some other object (such as a hoe for the farmer) or item of clothing to represent each of these professions.

Pieces of A4 paper with the following written on them with a marker pen (one name on each sheet and a drawing; use a different color from the other papers):

> Technology, Advice, Fertilizer, Information, Roads, Electricity, Market prices, Security, Regulation.

Small pieces of paper cut up the paper to the same size as banknotes.

Encourage volunteers to take on non-traditional roles within the value chain. A young woman as the buyer, a woman as the exporter, a young man as an input supplier, a man as the consumer, etc.

Suggested procedure

- Explain to the participants that a value chain is the series of people and organizations that produce, process, market and consume a product. Together with them, you will map out the value chain for vanilla. You will need their help to do this.
- Stretch out the rope on the floor in a straight line. Explain that at one end of the line are the farmers. Ask for a male and female volunteer to act as **farmers,** who are married. Ask these people to stand at one end of the rope. Give them the sheet saying "Farmers" to hold up, plus the green beans.
- Ask the participants what happens to the vanilla after the farmers have harvested it. They will respond by saying that the farmers sell it to a buyer.
- Ask for a volunteer to represent the **buyer**. Ask him or her to stand next to the farmers on the rope. Give him or her the sheet saying "Buyer" to hold up, the toy car, and some "money". Get the buyer to use the money to buy the beans from the farmer. (This can be entertaining if they haggle out loud over the price!). The couple should discuss the final price together before agreeing to it. Once the money is given to the male farmer, he hands his wife half of it.
- Ask the participants what happens to the vanilla after the buyer has bought it. They will respond that the buyer takes it to the primary processing company.
- Invite a volunteer to act as the **primary processor**. Ask this person to stand on the rope. Give them the appropriate A4 sheet to hold, plus some money and the cloth. Get the volunteer to use the money to buy the vanilla from the buyer. Make sure that the amount agreed is higher than the amount paid to the farmer, otherwise the buyer will be out of pocket! Point out that the company usually employs the buyer, so the money that changes hands is money from the company and may include some of the buyer's salary.
- Ask the participants to describe what the primary processor does. If the participants do not know the details, explain it to them. Give the volunteer who represents the primary processor the cloth (to wrap the beans in) and the box to store the beans in), and some money with which to buy the vanilla. Get him or her to stand next to the primary processor, buy the beans and to go through the processing motions required. Mention things like grades and volumes as bargaining points that can improve the price paid to farmers, as processors want to buy large amounts of mature, long vanilla beans.
- Ask the participants what happens next to the vanilla. Explain that the primary processor sells them to an **exporter**, who ships them abroad. Get another volunteer to act as the exporter; give them some bigger, "international money" to buy the beans and the toy boat to carry them to the importing country.

- Then ask what happens to the vanilla when it arrives at the destination (in the USA, Europe or Japan). Get another volunteer to play the **secondary processor**. Give them some money to buy the beans, the cooking pot to use to process the beans, and the packet of vanilla flavored biscuits (the product they make).
- Get yet another volunteer to act as the **retailer**—the shop where customers buy the vanilla products. Give this person some money to buy the biscuits from the secondary processor and to set up a shop.
- Get a final volunteer to act as a **consumer** (with the shopping basket) to buy the biscuits.
- Explain that the line of people along the rope all make up a "value chain". For the chain to work, each person must have some money to buy the product from the previous person in the chain. If something goes wrong in the chain, then it breaks down, and the farmer does not get any money.
- Ask the participants what is needed for the chain to work. Encourage them to answer things like "they need money" or "they need information", or "they need quality beans," or "they need labor-saving equipment." For each function, get further volunteers to act as the **bank** (the source of money), **researcher** (technology), **extension agent** (advice), **input supplier** (fertilizer), **communications** (information), **infrastructure** (roads, electricity), **market information** (market prices), **security guard** (security), **police**, (security) **government** (regulation), **certifiers** (organic certification). Get these volunteers to stand next to the person in the value chain that they interact with most (but not on the rope itself: that is the value chain.)
- Explain that each of these other volunteers are "chain supporters". They are also vital for the value chain to function smoothly.
- Thank everyone and invite them to go back to their places and sit down. Ask the **consumer** to distribute the biscuits to all the other participants.

Improving the value chain

Ask the participants for ideas on how to improve the value chain from the farmers' point of view. Stimulate a discussion of their ideas. Points to bring out:

- **Improving production**, being able to produce more vanilla beans per vine, improving quality, by enhancing cooperation within the family and making decisions together that affect productivity and output use.
- **Diversification of farms**, to reduce exposure to price changes, provide multiple sources of income, increasing output at the farm level etc.
- **Cooperation between farmers and other members of the chain**, especially buyers and primary processing companies. Improving market linkages, improving reliability etc.
- **Cooperation among farmers**, such as forming groups to market their vanilla. Ensuring men, women, youth and the elderly participate and have a voice in the group.
    - **Making better use of business services**, to help with accessing better inputs, accessing information, accessing finance.
- **Businesses** tailoring services to women and young people.
- **Better understanding of regulations,** such as organic certification, when police can help with security, etc.

Explain what the VINES project is doing to improve the value chain. Points to bring out:

1. **Farmers.** Helping farmers produce more and better-quality vanilla, encouraging them to work with buyers and business services.
2. **Couples**. Helping couples to communicate openly, support each other in their farm work and household chores, and making decisions together.
3. **Business services.** Building the capacity of business services to serve the vanilla value chain.
4. **Regulation.** Working with the government and local authorities to improve the business environment.

Conclusion

Briefly review what you have covered in this session. Ask if there are any questions.

Ask the questions in the Quiz (see below) to make sure that the participants have understood the content.

Thank the participants for their attention. Tell them when the next session will be and what it will be about.

GENDER TIP

Remind the group to come to the next lesson with their spouse/partner, as we will be working on visioning, and it is important that they are involved in the process of discussing and developing the vision. A shared vision for the farming household comes about when family members who work and benefit from the farming system are involved and have input into the visioning process.

Quiz

1. Which is the biggest vanilla producer in the world? Which is the second-biggest?

2. How much vanilla does Madagascar produce?

3. In which year did Uganda produce the most vanilla?

4. How much does Uganda produce now?

5. What is the highest price of vanilla in the past 10 years?

6. What is the lowest price of vanilla in the past 10 years?

7. What was the price of vanilla last season?

8. Why does the price of vanilla go up and down so much?

9. Why do vanilla farmers stop growing vanilla?

10. Who are the main actors in the vanilla value chain?

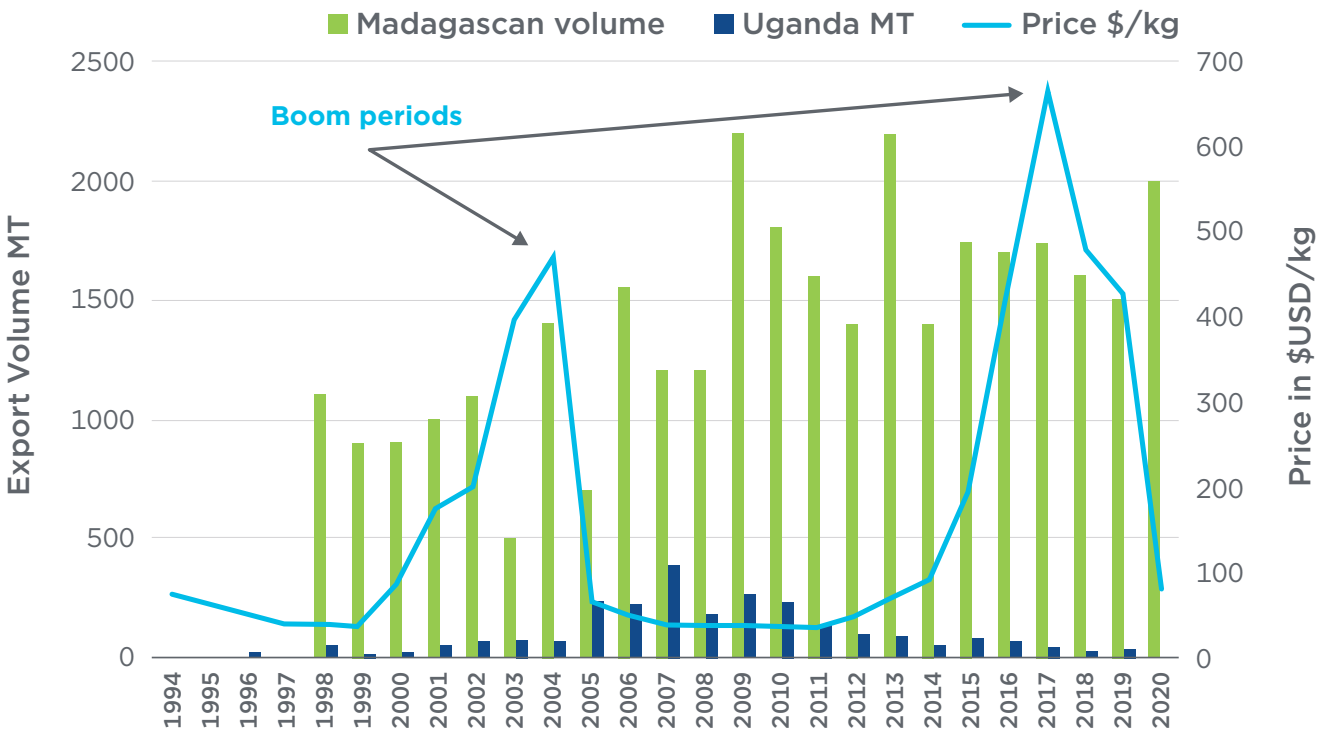
11. How can value chain actors address problems that women or young people might face?

Expected answers

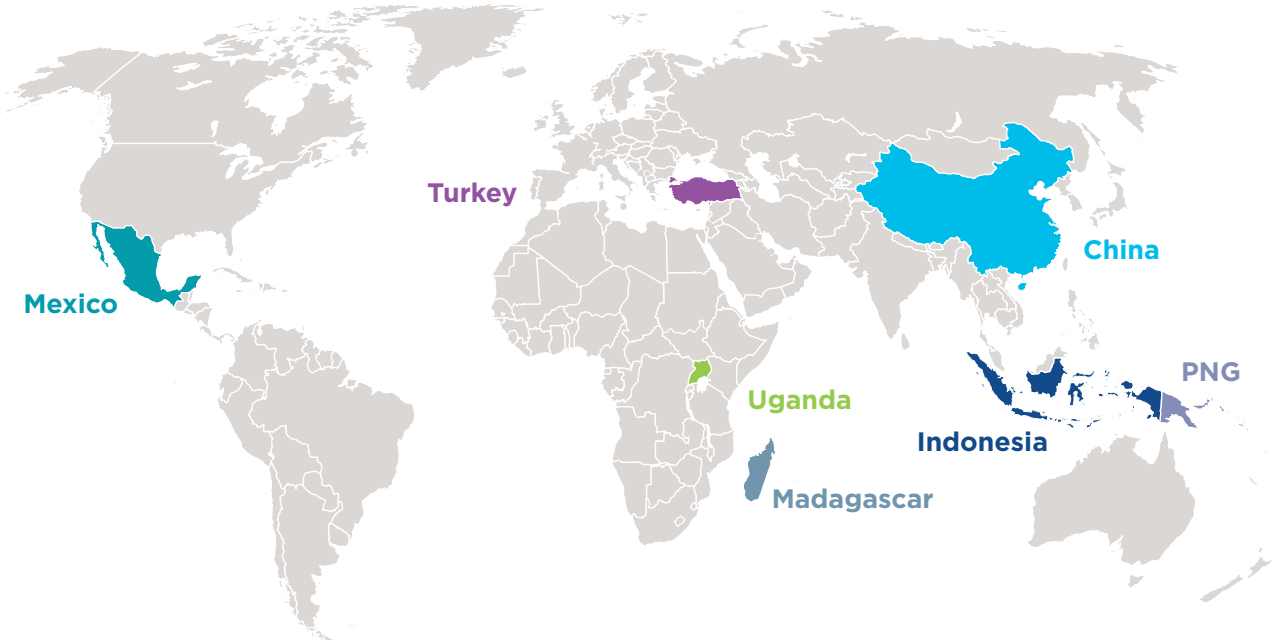
1. Madagascar (1), Indonesia (2).
2. Between 1,500 and 2,000 tonnes a year, or 70–80% of the vanilla on the world market.
3. 2007.
4. Less than 50 tonnes.
5. $700 per kilogram of cured vanilla (in 2018).
6. Below $35 per kilogram of cured vanilla (in 1999 and 2011).
7. (Check the price data for the previous season.)
8. Because the supply of vanilla is unstable due to poor weather, farmers dropping out of production, or many farmers starting to produce at the same time.
9. Low prices make it unattractive.
10. Farmers, agents, primary processors, exporters, secondary processors, retailers and consumers.
11. Support women and young people to produce more and better-quality vanilla, help couples work and make decisions together, help women and young people get business services such as credit and advice.

Handout 2.1: Vanilla price fluctuations

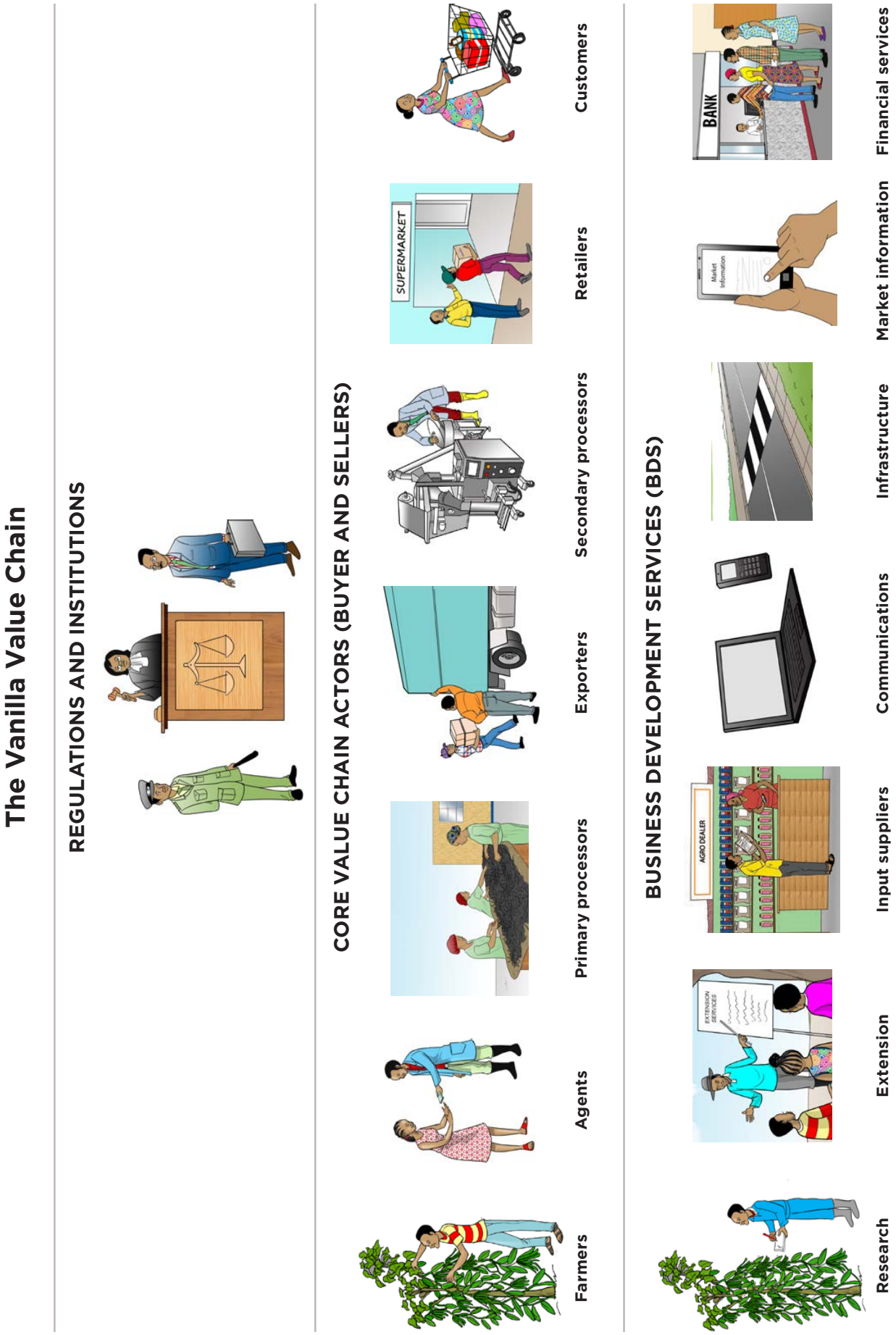
Vanilla prices $/kg with Ugandan and Madagascan volumes MT



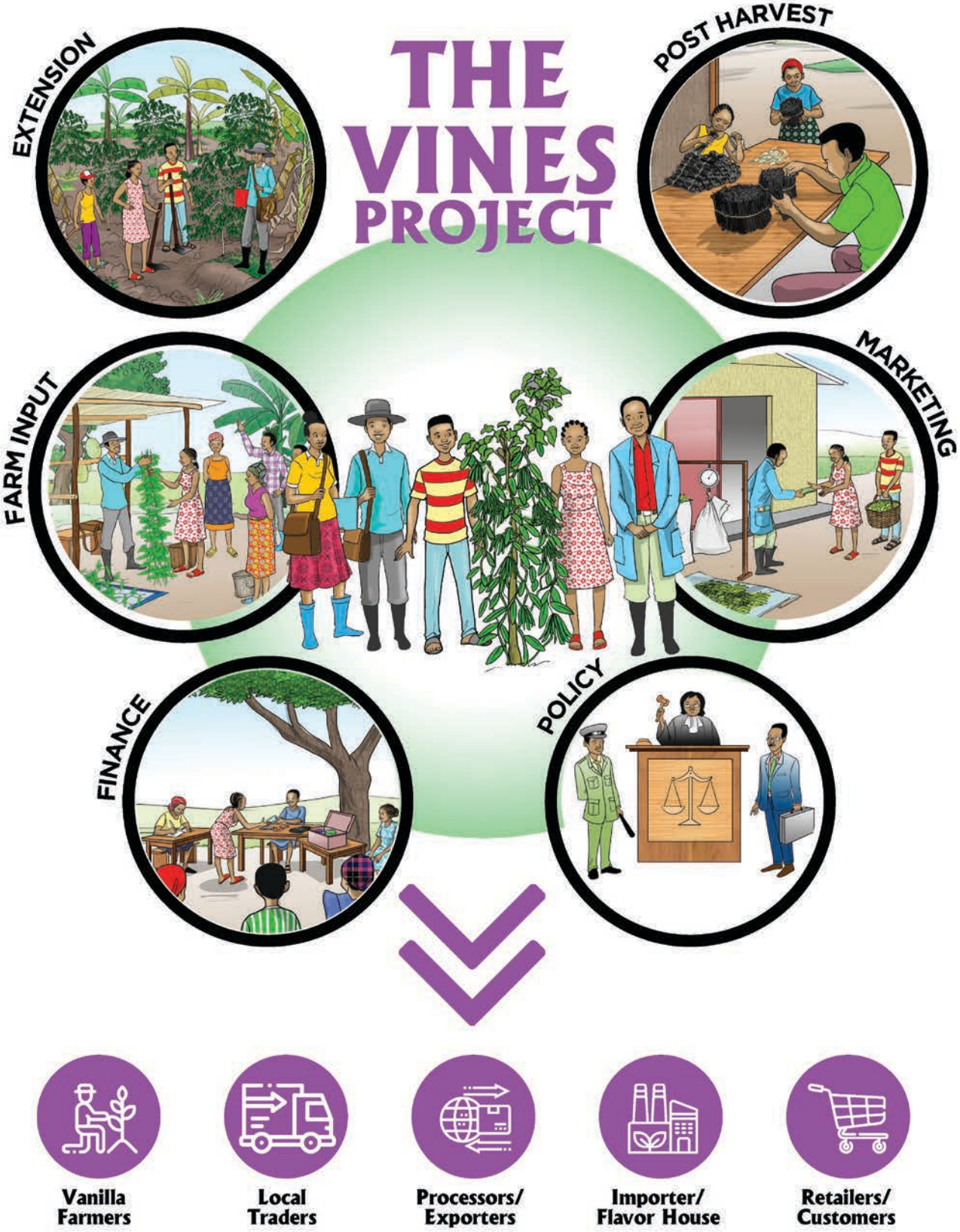
Major vanilla producers



Handout 2.2: The Vanilla Value Chain



Handout 2.3: The VINES project components



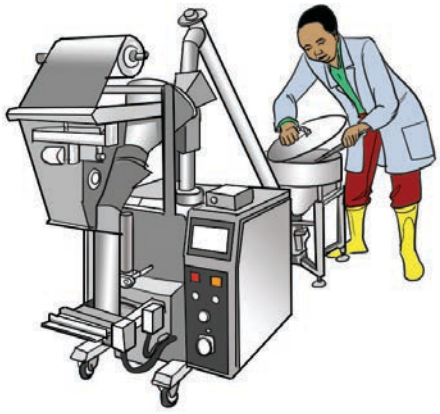
Handout 2.4: Vanilla value chain actors and support services

Farmers

Buyer

Primary processor

Exporter



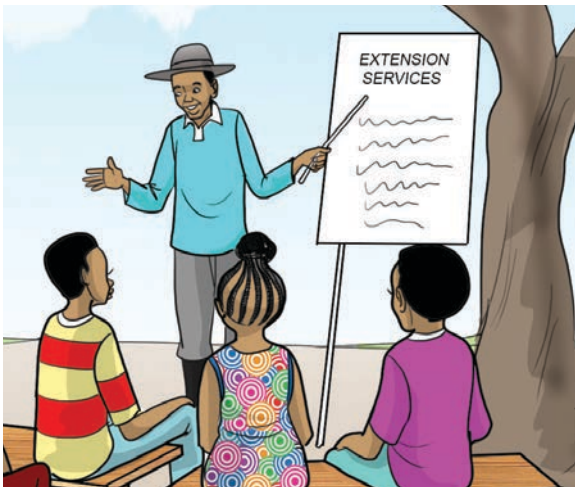
Secondary processor

Retailer

Customer

Bank

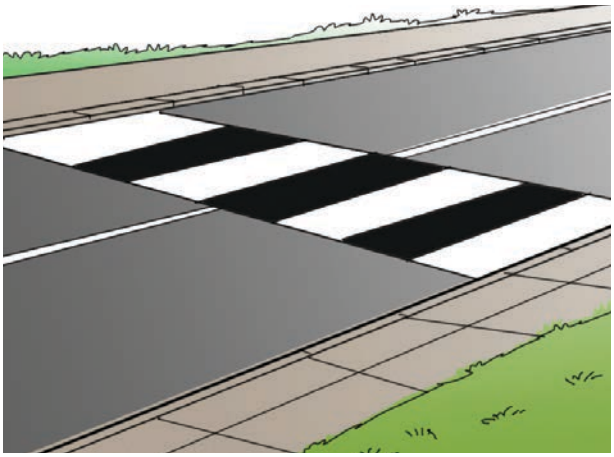
Researcher



Extension agent

Input supplier

Communications



Infrastructure

Market information

Security guard

Government

CHAPTER 3.

Setting a vision for vanilla

Meeting with farmers in the field

Technical information

Topics covered

- Visioning and how farmers can use this method to improve production and quality.
- Identifying what farmers would like to learn to improve their farming system.
- Setting goals and lessons for upgrading farming systems over the next 3–4 seasons.

Key messages

Drawing up a vision enables farm households and community members to set their goals for the community, farm and vanilla production, and to plan activities that will help them achieve these goals.

Visioning also helps the field agent understand the community members' goals and needs, and enables them to design interventions accordingly.

Why do visioning?

Every village, every farm, and every farm family is different. They have different situations, needs, potentials and capabilities. But they also have certain things in common. They face common problems, have common goals, and they can learn from each other, plan together, and collaborate on activities that benefit them all.

A visioning exercise helps the farmers analyze their current situation and imagine what they can realistically achieve by a certain time in the future. That in turn enables them to work out how they will go about realizing the change. To make things manageable, the visioning does not look too far into the future—around 5–7 years. This is within the range that most farmers will be able to envisage realistically. It divides this period into three:

- Long term (5–7 years into the future)
- Medium term (3–5 years)
- Short term (within the next year)

Leading the participants through the visioning exercise has two main benefits:

- **It helps farmers plan.** It enables the farmers and their families to set their own goals and plans, both as individuals and as a group. They can think through what they want to do in the future and make plans for their vanilla and other crops.
- **It helps you offer better guidance.** It also gives you a good idea of what their needs and goals are, so you can plan how best to advise them. You can plan the next sessions based on what they say. For example, if they want to focus on a particular problem or goal, you can adapt the course accordingly.

While dreaming of a better life is good, the vision and plans that the farmers come up with must be realistic! There is no point in them proposing something that is impossible, or that relies on significant outside funding. Make it clear that the farmers must be able to pay for any improvements themselves, and that they will have to do all the work themselves. The role of the vanilla project is not to provide funding or equipment. Instead, it is to provide information, advice, linkages that they can use to improve their own farms and help them increase production and income.

The vision and plan do not have to be 100% accurate at this stage. They will also not be very detailed. They will change over time as the farmers learn and gain information during the course.

Nonetheless, the vision and plan will give the farmers a direction in which they wish to move. Throughout the course, they should go back to the vision and the plan that they develop in this session, check whether they are on track, and decide on any changes that might be needed.

How to do visioning

Visioning can be done by drawing pictures about current situation and a picture about a future situation. Pictures can help to involve a group and get ideas about where things are now and what are the aspirations of farmers. The following pictures show how visioning can be applied to village setting. In this case participants were asked to draw how they see their village now. They were then asked to show what they want their village to look like in the next 7 years, see Figures below. This type of exercise helps people to think through the types of changes they want to see. This same approach can be applied to farming and how to improve vanilla production on a farm.

A shared vision of the farm comes about when all the family members who work on the farm and who benefit from it can take part in creating the vision.

If possible, encourage both the husband and wife to attend this session so both can contribute. Those who attend should also discuss the vision with other members of the household so they understand what is planned and can contribute their own ideas.

Farms and households are closely linked. The farm provides income and food for the household, and the household provides the labor and skills needed on the farm. Even if a family member is not directly involved in the farm work, they still support it —for example by doing household work, which helps family members carry out other activities on and off-farm.

What our village looks like

What our village will look like in the future

Visioning about farming

It is possible to do visioning at different levels:

- What should your **community** look like in 7 years' time?
- What should your **farm** look like in 7 years?
- What should your **vanilla production** look like in 7 years?

We suggest you start in the middle, with the farm. This is for two reasons:

- **Agronomy.** Vanilla is a crop that depends on shade from trees. These trees can be used to produce timber, fuelwood, fruit and other products. Vanilla may also be intercropped with coffee and other crops. Therefore, it makes sense from an agronomic point of view to consider the farm as a whole.
- **Economy.** As discussed in Chapter 2 on *The vanilla market*, the price of vanilla can change dramatically from season to season and year to year. Farmers need to have other crops that they can rely on while the vanilla price is low. This is another argument to consider not just vanilla, but to plan the farm as a whole.

Once the farmers have thought about what their farm should look like, you will then shift the focus to vanilla and the role that it can play in helping them achieve their goals.

Figure T3.1. Field agents meet farmers in their farms to assess current farming system

Visioning process

This session focuses on farming systems, the current crop mixes, the main activities in the year, and the practices used to support the production. The session introduces some new ideas and discusses activities that farmers could use to upgrade their farming systems, to consider new types of mixed cropping systems, and consider some new methods for increasing crop production. You should facilitate this process and work with the farmers to think about new ideas.

The session will also set goals for an upgrading process and list out priorities that farmers have for learning. What particular aspects of the vanilla farming system do they want to learn about?

It consists of seven parts:

- Introduction
- Current farm situation
- Future farm situation
- Visioning
- Setting goals for vanilla
- Prioritizing and planning activities
- Planning future sessions.

Planning future sessions

You should plan the next sessions based on what the participants say during this one. The content of the sessions should follow timing of activities in the field (see the calendar the participants prepared earlier). You can add new topics or give more emphasis to existing topics depending on the participants' interests.

Because you are encouraging participants to discuss their vision with other family members, give them an opportunity in the next session to talk about any changes they want to make in their vision.

Lesson plan

Lesson objectives

After this lesson, the participants will be able to:

- Describe the current situation on their farm.
- Describe the future situation of their farm.
- Explain their vision for their vanilla farm in the short, medium and long term.
- List the activities they plan to do to achieve this vision.
- Include women and men in the vanillla upgrading plans.

Duration

2 hours.

Introduction

Greet the participants (and especially welcome any spouses who are attending and ask them to introduce themselves). Explain what the session is about: creating a vision for what they want their farms, and especially their vanilla, to be like in the future. This will make it possible for each of them to plan their own farm.

Organize the participants into small groups of 4–6 people or 2–3 couples. Give each group some large sheets of paper and marker pens.

Then inform the groups that you would like them to draw two maps. Starting with what their current farms looks like and how the different crops are arranged in the fields and then to draw a second map to show how their homes and fields will change as they improve the cropping mix over the next 7 years.

Current farm situation

Farm map. Ask each group to draw a map of a farm (this could be a farm belonging to one of the group members, or an imaginary but realistic "typical" farm). The map should show the farmer's house, the family farm, the plots of specific family members, paths and roads, storehouse, trees, crops and livestock. The map does not have to be accurate, but it should show the main parts of the farm for both the male and female partner, the main crops and livestock, and the mix of crops in the vanilla planting.

Go around the groups to make sure they have understood what to do and are following the instructions properly.

Products. When they have finished, ask the groups to think of what each crop or animal produces in terms of food, income or other products (such as manure or fuelwood). Ask them to add these products to the map (if they are not already included).

Inputs and services. Ask the groups to think of the services they use to produce and market their crops and livestock. Examples are finance, transport, extension advice, seeds, fertilizer and markets. Ask them to add these to the drawing. Note which of these inputs and services are used for which crop.

Presentation. When the groups have finished, get them to pin their maps to the wall so that everyone can see them. Ask one or two groups to present what they have drawn.

Discussion. Ask the groups to explain various aspects of the farm. Why is each item there, and what benefit does it bring? What is working well, and what does not work well? Ask about crops grown by the husband and wife, and any differences between the family plots and those managed by individuals. For example:

> *Why do you grow bananas and not some other crop? What inputs and services do you need to grow and market bananas? Why do some crops have inputs like improved seed and fertilizer and while others don't?*
>
> *What works well in terms of the inputs and services you need for bananas? What does not work well?*
>
> *What is similar across the various plots in the farm? What is different?*

Visioning

Presentation. When the groups have finished their map of the future get them to pin their maps to the wall so that everyone can see them. Ask one or two groups to present what they have drawn.

Future farm situation

Farm map. When the participants have finished their current farm map, ask them to repeat the same exercise but this time, ask each group to draw a second map of what their farms will look like in seven years time. This map should show how the farm will change and what it will look like after 7 years of investment. This map should show the changes and upgrades in farming system and future mix of crops and livestock on the farm. Go around the groups to make sure they have understood what to do and are following the instructions properly.

Products. Ask the groups to add crops or animals according to food and income or both.

Inputs and services. Ask the groups to think of the services they will use in the future to improve their production and sales.

The next step in the visioning process is to ask the participants what types of changes they would like to see in the next 5-7 years, so that they can increase their production and incomes.

> *What sort of changes would you like to make in the next 5–7 years so that you can increase your production?*
>
> *What can you do to help achieve those changes? What can your husband or wife do?*
>
> *What can the community do?*

Quietly wait a minute while they think.

> *Now let's list some ideas. Who can help us start?*

List the ideas that the participants suggest on a sheet of paper. Call on different types of participants: men and women, young and older, as well as from both members of a couple.

Ask the participants to point out which of the ideas are **long-term activities**, which would take 5–7 years to complete if they started now. Write these ideas on a separate sheet. Complete the list with help from the group.

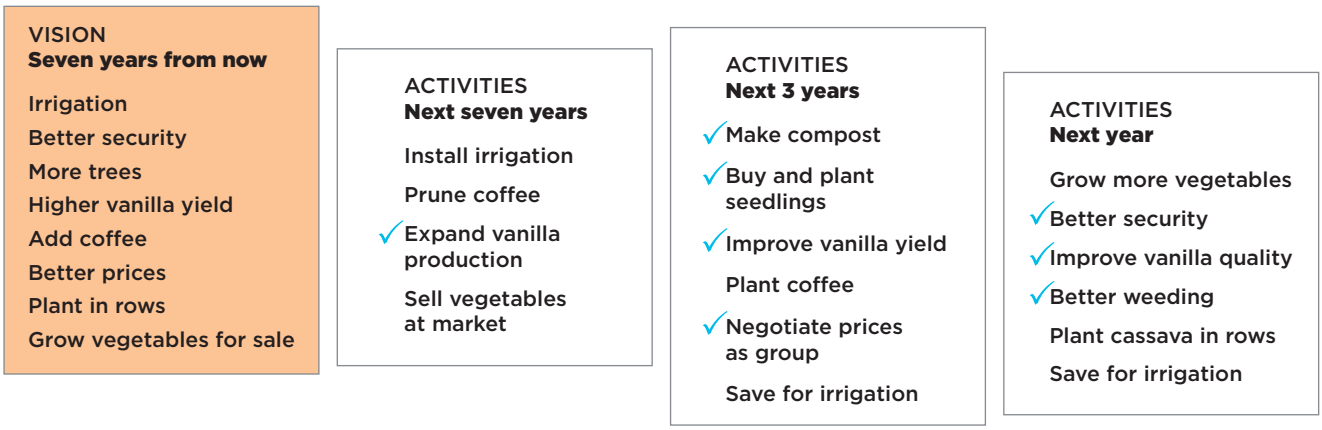


Figure L3.2. Example of visioning. The ticks show which activities are directly related to vanilla.

Ask what are the **medium-term activities** that the group would like to carry out.

Which activities might only take 3 or 5 years to complete if we start now?

Write them on a separate sheet. Complete the list with help from the group.

Ask what **short-term activities** the group can do in the next year or next production cycle.

Which activities can we do this year, in this growing season?

Put these on a separate sheet. Complete the list with help from the group.

Setting goals for vanilla

A vision for vanilla

Introduce the goals of the vanilla project to the participants. Say the following:

As we all can see, you have some great ideas for improving your farms. I hope that this project can help you put those ideas into practice.

We have some ideas for how to improve vanilla production on your farms. We think these ideas will help you achieve many of the things that you have mentioned.

We would like to present our vision for vanilla. This is what we would like to help you to achieve:

***Yield.** High production, with over 500 grams per vine. Or you tell us your yield goal!*

***Pollination.** Pollinating the vines to get consistent yields each season, and maintain vine health and viability.*

Production

- Diversified crops and trees to make farms still profitable even when vanilla prices are low.
- Different crops for food and income.
- Crops that have several uses (compost, timber, nutrition, etc.).

Quality. *High-quality vanilla, picked at the right time.*

Sustainability. *Farms are sustainable, maintaining healthy soils and beneficial wildlife.*

Income

- Farmers get a steady income from vanilla even when prices fall.
- Farm family members equitably benefit from the steady income.
- Farmers get peak prices when prices go up.
- Theft is controlled by communities.
- Prices are well negotiated and fair between farmers and traders.
- Local and national laws help farmers grow and sell vanilla fairly.
- Strong extension support for vanilla farmers.
- Business services that reach and meet the needs of both female and male farmers.

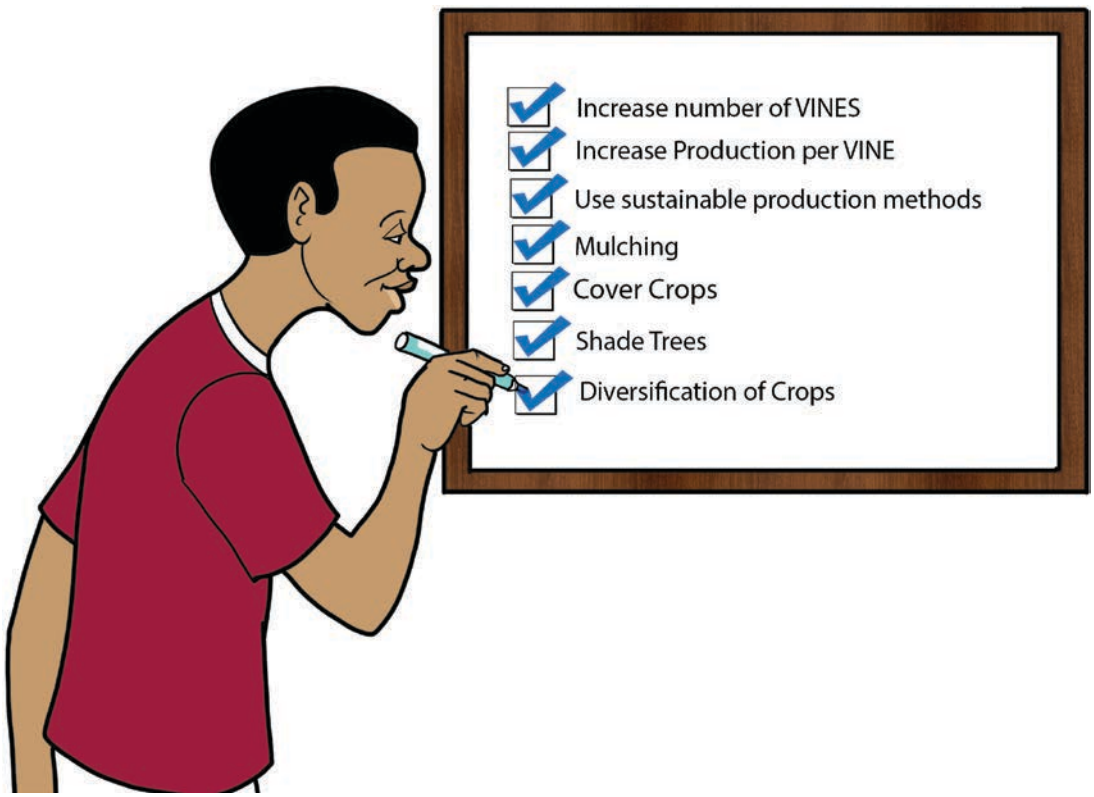


Figure L3.1. Setting goals with farmers

Getting feedback

Gather the participants' feedback on these ideas. Divide the participants into groups of only men and only women to discuss and respond to the ideas. Some questions to ask:

> *Do you think these ideas can help you achieve some of your vision?*
>
> *Which ideas do you think are particularly good, and why?*
>
> *What do you think might be a challenge in implementing this vision?*
>
> *Are there any other difficult or bad things about this vision?*
>
> *What might be a challenge in implementing this vision? For you personally? For your husband or wife? For your family?*
>
> *What might help you and your family achieve this vision? What is needed for you personally? For your family?*

Invite each group to report back to the plenary.

Planning activities

Go through the lists of activities again to identify what the participants need to start in the next year so they can be completed in the next 3 to 5 years.

Be sure to separate activities that will be done on the farm and activities that will be done at the group level. For this exercise focus on the farm level.

The participants should be very specific and realistic about what activities they will undertake in the next year. The priorities should reflect the majority opinions of participants.

Identify vanilla activities

Help the participants first identify vanilla-related activities in their lists. Say the following:

> *Let us look at our short term (1–2 years) and medium term (3–5 years) activities and identify all the activities that are related to vanilla.*
>
> *Looking at the short-term list, let's put a tick next to any activity that is related to vanilla.*

Read the list, one by one, to help farmers who are illiterate to participate. Count the number of short-term activities and tell the participants how many there are.

> *Now let us look at the medium-term list for the next 3–5 years. Let's also put a tick next to any activity that is related to vanilla.*

Read the list, one by one, to help farmers who are illiterate to participate. Count the number of medium-term activities and tell the participants how many there are.

Order activities

Divide the participants again into single-sex groups and invite them to order the vanilla-related activities they have identified. Say the following.

> *We have _____ activities for the next 1–2 years. We need to order these activities so we can make a reasonable plan for getting these things done.*
>
> *Which is the **first activity** in the list that we should start working on?*
>
> *When do we need to start this? Why is that?*
>
> *Who should work on this activity?*
>
> *How does this affect other farm and non-farm activities?*
>
> *Does everyone agree?*

Give this a number 1 when there is consensus. Note and discuss any differences in the ordering between groups.

> *What is the **next activity** we should start working on?*
>
> *When do we need to start this? Why is that?*
>
> *Who should work on this activity?*
>
> *Does everyone agree?*

Write the number 2 by this one.

Number all the activities in the list in the same way.

Repeat sequence for the medium-term activities (3–5 years).

Invite the groups to report back on their priorities to the plenary.

Work out the details

Make a table on another sheet of paper with several rows and columns (see Table L3.1). Write the headings across the top, as in the table.

For the short-term activities, list the numbered items in the rows.

Invite the group to fill in the table as far as possible. For some items this will be easy. For others it will be more difficult, and more discussion will be necessary, or the participants will not have the information they need to make decisions. Write question marks in these cells and say you will discuss them later during the course.

Repeat this on a separate sheet for the medium-term activities.

Take a photograph of the completed sheets as a record. Transcribe this later into your field notebook for the group.

Keep the sheets so you can refer to them in later sessions.

To achieve the group vision, there are things that we need to do individually and it will require efforts at the household level. There are certain things that need to be done by individuals and households to help make progress on this vision.

Homework: Ask the participants to review the group vision with their spouses and family members and to discuss how they can help contribute to the group vision:

1. How can the family and household help contribute to the group vision developed?
2. What would need to change in the farm and household to help contribute to the group vision?
3. How might these changes impact different family members?

Tell the group members that the answers to these questions will be discussed in the next lesson.

Reviewing Homework

Before the next meeting ask the lead farmer to meet with the group to review the planning activities and discuss any outstanding issues that came from discussions at the household level.

The lead farmer should:

ASK the participants if they discussed the group vision with their families.

ASK for a volunteer to share how their household vision discussion and how the family activities connect with the group vision. Discuss if there are any changes needed to the group vision now that the participants had a chance to discuss with their families.

Table L3.1. Example of planning vanilla activities for the short and medium term

Short term, 1–2 years					
Number	**Activity**	**Who**	**What**	**When**	**Support needed**
1	Better weeding	Individual vanilla growers	Weed and mulch regularly around vanilla vines	Monthly schedule	
2	Better security	Individual vanilla growers	Form patrols to monitor gardens	Start of harvest season	Village leader
3	Improve vanilla quality	Individual vanilla growers	?	?	?
…					

Medium term, 3–5 years					
Number	**Activity**	**Who**	**What**	**When**	**Support needed**
4	Buy and plant saplings	Vanilla growers as a group	Buy saplings from nursery	Early next year	Tree nursery
5	Improve vanilla yield	Individual vanilla growers	?	?	Extension agent
6	Negotiate prices as a group	Vanilla growers as a group	Form growers' cooperative to market vanilla	Next year	Village leader, extension agent
…					

Let's talk about Gender in the vanilla value chain

Time to complete task: 15-20 minutes

At the end of this session it is time to talk to the group about gender and the roles of women and men in vanilla chain upgrading. This may be a new topic for many people in the group, in terms of gender roles and gender equity.

Ask the group to focus on some gender constraints faced by men, women, girls and boys on the farm, some important topics include:

- Roles and responsibilities
- Workload
- Access and control of assets and resources
- Decision-making power

To discuss these topics break participants into 4 groups. Assign each group a gender topic listed above. Ask each group to:

- Discuss what these gender issues mean to the participants.
- Discuss gender-based constraints females may face within Uganda vanilla value chain for each of the topics.

Plenary share out by each group – 4 minutes each

Trainer states, "In addition to looking at these gender-based constraints, we also need to recognize the potential that this project can have in increasing gender-based violence within the household."

It is important to recognize that GBV is an issue within the vanilla producing communities. The baseline survey reported that inequalities in income and lack of clear production roles have led to cases of increased GBV. Your efforts should aim at supporting couples understand how families can work together and how everyone in the family can contribute to household needs. As part of your work, you can encourage couples to discuss workplans and make joint decisions on crop systems, which production practices to adopt, when to hire labor if workloads are too much for the family, and how to use income at harvest, can help mitigate the potential for GBV.

Ask, "What else can you do to mitigate increases in GBV?"

What should you do if you have concerns about GBV resulting from this project?

If you have concerns that the project may be contributing to GBV, please reach out to the VINES team to share your concerns and seek guidance. Do not directly intervene as this is a delicate and potentially risky situation. As non-specialists, it is not our role to directly respond to GBV issues. The proper procedures need to be followed to avoid any additional harm. If someone discloses any experience of violence directly to us, it is critical you respond in a way that upholds the person's right to safety, confidentiality, non-discrimination, dignity and respect. If the person would like additional information about available services and support in the community, please share with them the list of resources indicated in the safeguarding handout. Remember, it is not your role to intervene. If you have any concerns about harm caused by a Vines staff, please share your concerns with the CRS Country Representative at InfoUganda@crs.org or through WhatsApp at 0741672901 or call on 0800 334 330 (toll free line).

Conclusion

Briefly review what you have covered in this session. Ask if there are any questions.

Ask the questions in the Quiz (see below) to make sure that the participants have understood the content.

Thank the participants for their attention. Tell them when the next session will be and what it will be about.

Quiz

1. What are the main long-term goals for your farm?

2. What are the medium-term goals for the next 3–5 years?

3. What are the short-term goals that you can achieve in the next 1–2 years?

4. Why is it important for couples to develop their vision and goals together?

5. How can producing vanilla help you achieve these goals?

6. What types of support will you need to achieve these goals?

7. How can you help to identify and address tensions within families that may lead to gender based violence?

Expected answers

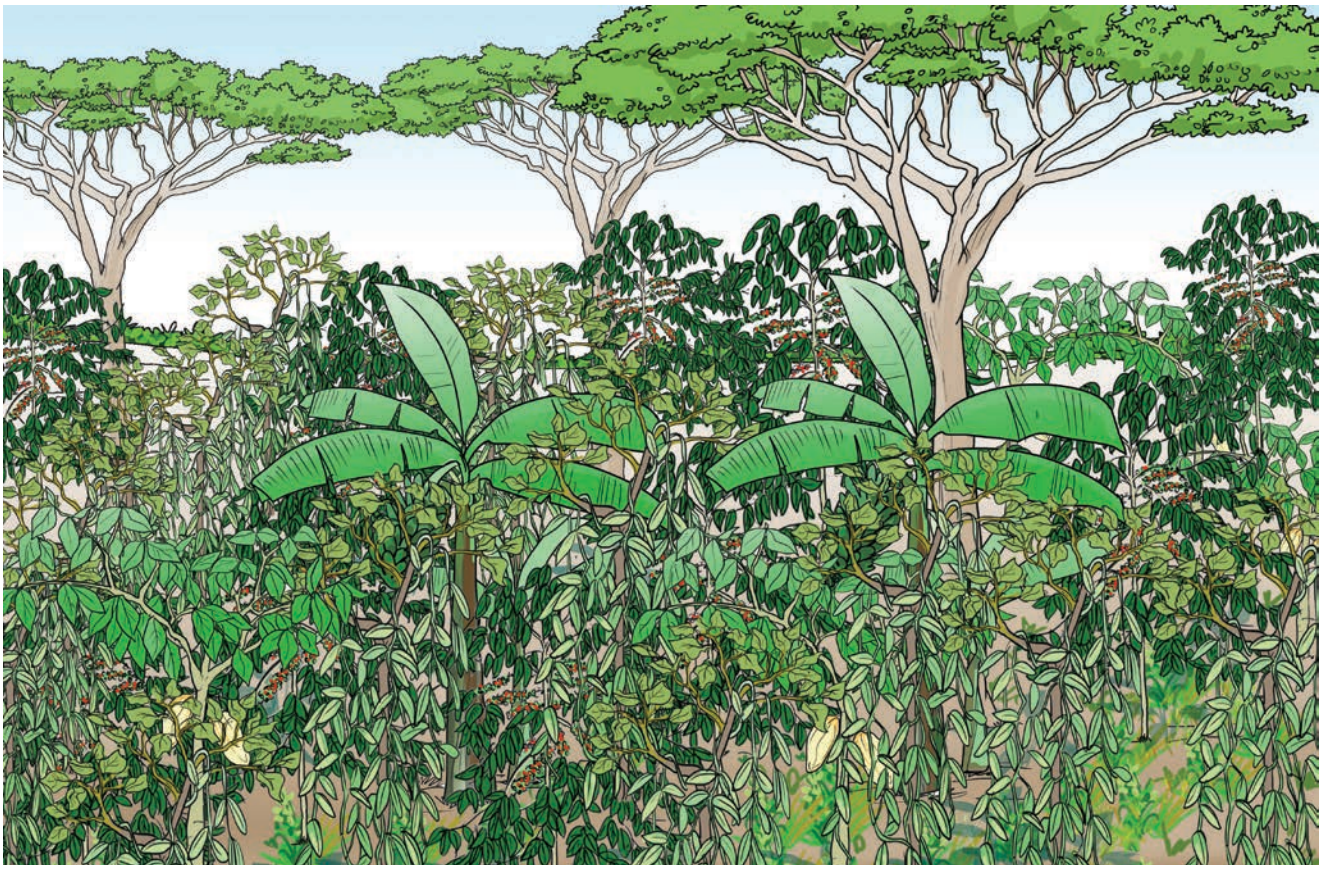
1. (Depends on the participants' responses)
2. (Depends on the participants' responses)
3. (Depends on the participants' responses)
4. Because they are both involved in managing the farm and the household. They may have different interests and priorities. Both need to contribute and make decisions if they are to be successful in achieving their vision.
5. By generating income.
6. (Depends on the participants' responses. Should include support from family members, community members and other actors in the value chain.)
7. Talk with members of the group if you see any signs of tensions or abuse. Do not intervene, share any information through the feedback channels.

Handout 3.1: Forms for planning short and medium-term activities

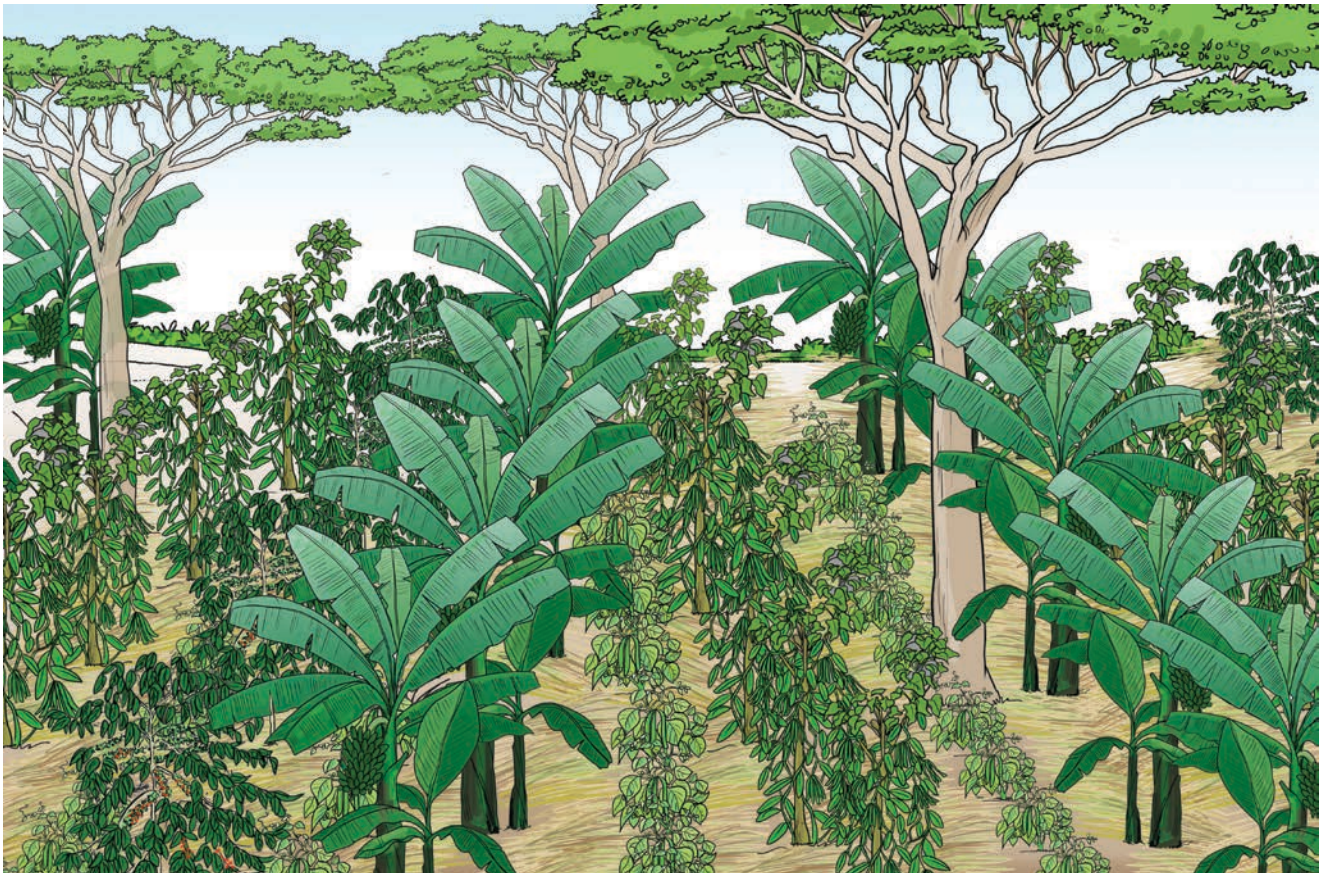
Short term, 1–2 years					
Number	**Activity**	**Who**	**What**	**When**	**Support needed**
1					
2					
3					

Medium term, 3–5 years					
Number	**Activity**	**Who**	**What**	**When**	**Support needed**

Handout 3.2: Current and future farm situation



What our farms look like now



What our farms will look like in the future

CHAPTER 4.

Site selection, security and land preparation

Mary and John clearing land to plant vanilla

Technical information

This chapter is useful for farmers who are new to vanilla. It will help them decide:

- Whether their farm is suitable for vanilla.
- If so, where to plant it.

It is also useful for farmers who already grow vanilla. It will help them decide:

- Should they expand their vanilla plantings or open new gardens somewhere else on their farm where the soil and other conditions are more suitable?
- Can they expand their vanilla plantings, within existing plots and if so, where would be best?
- Can they do something to improve the growing conditions for vanilla on their land?

Topics covered

- The farm and plot conditions that are good for growing vanilla.
- Ensuring security for the farm and vanilla garden.
- The options for the crop mix in a new vanilla garden.
- Ways to plant vanilla within existing farms.

Key messages

Vanilla requires very specific growing conditions: a dry season of 2–3 months, no more than gentle slope, fertile, well-drained soil that is high in organic matter, and plenty of shade.

Vanilla is grown with other crops in the same field that will provide shade. The vanilla and these other plants must be grown at the right spacing to produce good vanilla yields.

The land must be prepared correctly and kept free of weeds.

Because it is a valuable crop, theft and security are a concern.

The costs of establishing a vanilla garden will vary from one situation to another. Major establishment costs include land preparation, fencing and security.

Climate

Vanilla is grown in nearly 40 districts in Uganda (Figure T4.1). It grows well in forested areas, with high humidity and rainfall over 1,100 mm/year. The main areas of production are in the southwestern Rwenzori highlands, with the center of production in Kasese and Bundibugyo districts. Another major production area is Mukono and Buikwe districts in the central region.

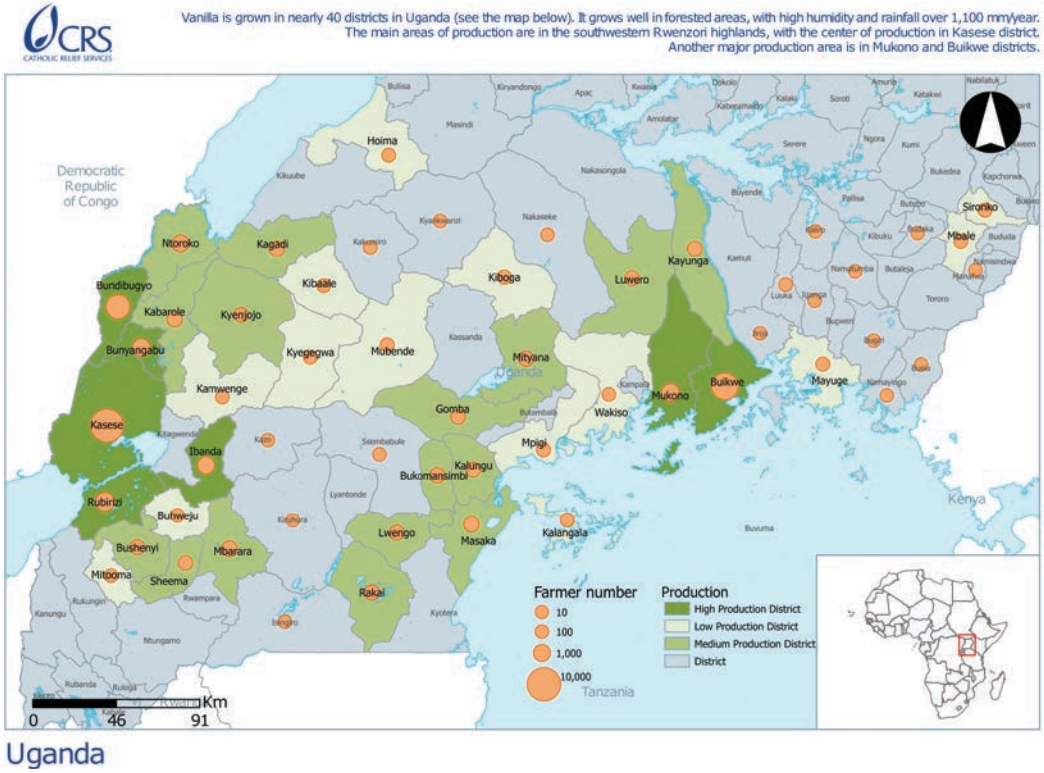


Figure T4.1. Main vanilla production areas in Uganda

Vanilla needs a dry season of 2–3 months to stimulate flowering. Uganda is lucky: much of the country has two rainy seasons and two dry seasons. That gives it two flowering and production seasons for vanilla each year.

If the dry season lasts longer than 4 months, production is limited. The humidity should not exceed 75%, particularly during the pollination period. The optimum temperature for vanilla is 27°C.

Slope

A gentle slope or relatively flat area is best for vanilla growing. Some farms in Uganda do grow vanilla on slopes, though steep slopes are not suitable.

Even on gentle slopes, care should be taken to reduce erosion. When clearing the land, build structures to conserve the soil and to avoid runoff. Options include terracing, contour trenches, grass bunds and tree lines.

All cultivation should be done along the contour (across the slope) to minimize erosion and improve the infiltration of rainwater.

Soil types

Vanilla grows best in fertile soils that are high in organic matter, have a good water-holding capacity but are well-drained.

Vanilla does not grow well in waterlogged areas as it has shallow roots. Too much water, or standing water, affects the root development. The soil must not be compacted.

The soil should be neutral to slightly acidic, with a pH between 6.0 and 7.0. Determining the pH will require a soil test or analysis from a service provider. The vanilla plant likes a layer of 15–20 cm of mulch. Mulching and adding organic matter such as compost and farmyard manure will often improve the soil structure and quality.

Table T4.1. Soil requirements for vanilla

Soil type	Loamy soil	Clay soil	Sandy soil
Characteristics	• Brown and crumbly in texture. • Rich in organic matter. • Holds moisture well but drainage is also good.	• Sticky to handle when wet. • Dry, sunny conditions can bake it hard. • Does not drain well, so waterlogging may be a problem.	• Low nutrients, so will need regular fertilization. • Does not hold water well, so will need irrigation. • No organic matter.
Good for vanilla?	• Yes	• No – due to waterlogging	• No – low in organic matter, does not hold water
Improvements needed	• Avoid continuous digging, use cover crops to maintain high levels of organic matter and water in the soil.	• Add manure, compost and mulch to increase the organic matter in the soil.	• Add mulch so that the soil can hold more water and nutrients.

Soil tests

A professional soil test will give the farmer information about the soil type and the levels of important nutrients in the soil. Soil tests can be obtained through national research stations, which generally have soil-testing laboratories. Farmers can also get their soil tested for a fee through private providers. In Uganda the cost of soil test is approximately UGX 90,000 (US$ 25).

Find out whether it is possible to get a soil test done locally, how to do so, and how much this costs.

Farmers who cannot get professional soil testing can dig a hole 60 cm (2 feet) deep in their farm and look at the profile (the different layers in the soil). They can also do simple tests to find out the soil texture and acidity. These will give them an idea of the type of soil that they have.

Shade

Vanilla is an orchid that naturally grows in the bottom layers of a tropical forest, so it likes shade. This is best provided by two levels of shade:

- A loosely spaced canopy of taller trees. These should have open canopies (like *musizi*, *Maesopsis eminii*), not dense crowns (like mango).
- A loosely spaced middle layer of bushes or short trees, such as coffee and banana.

All woody tree species that are unsuitable as either shade or supports must be removed. For more information, see Chapter 5 on *Shade management*.

Plant spacing

For the best production, vanilla plants should be spaced 3 × 3 m apart. They should be planted next to tutors (support plants), but not too close to other crops (such as bananas or coffee).

The middle-layer shade plants (such as intercrops of banana or coffee) should also be at 3 × 3 m spacing. Closer than this, and they will provide too much shade and will compete with the vanilla for water and nutrients. Too far apart, and they will not provide the shade the vanilla needs.

A spacing of 3 × 3 m gives 440 vanilla plants per acre or 1,000 plants per hectare.

Figure T4.2. Remove some plants to make space for tutors and new vanilla plants. That will enable an optimum plant population and increase the productivity of the farm as a whole

Security

Vanilla is a high-value crop, and thieves may steal the vines to use as planting material and the pods when they start to mature. To avoid losses, investing in security is important, especially when vanilla prices increase. Vanilla gardens that are close to the house can be protected more easily. Farmers normally establish a strong or thick live fence, using trees and thorn bushes around their gardens. Some farmers use barbed wire around the vanilla garden to further protect the crop from determined thieves. Many farmers cover their fences in banana leaves and have secret doors in the fence to stop people from being able to see the crop.

Figure T4.3. A vanilla garden, newly fenced using barbed wire

Figure T4.4. Kristoff Kasuke, a vanilla grower shows the hidden door into his protected garden

*Some farmers reinforce the wire fence with other materials and plants to deter thieves.

When farm-gate prices of green vanilla beans fall to UGX 24,000–40,000 per kilogram (US$ 5–12), there is little theft. However, when prices go over UGX 75,000–100,000/kg ($20–30/kg), theft increases dramatically, and large-scale, commercial vanilla farmers resort to higher levels of security.

Farmers have a range of additional security measures. They hire guards at night, lay booby traps in the farm, and keep dogs in the vanilla gardens when the vanilla beans are mature. Farmers also frequently sleep in their vanilla gardens, particularly when the vanilla beans are about to be harvested. In villages that have many gardens, communities establish neighborhood watches and work with the police and local authorities to ward off thieves.

Farmers should consider keeping their vanilla gardens near the house and work with their neighbors to improve security. Farmers whose gardens are near each other can work together to keep their harvest safe.

Selecting a site

Farmers should select a site that is most favorable for growing vanilla, such as high rainfall areas, in soils that are well-drained and with high levels of organic matter. Farmers should try to select land that is not too steep, to avoid soil erosion. Areas in the highlands are particularly not suitable for vanilla production. It is possible that some parts of a farm are more suitable than others.

Existing fields. If farmers plant vanilla into an existing field, they must make sure that the vanilla vines have enough space to grow. The soil must not be compacted where vines will be planted, and there must be enough shade, but not too much.

It is best to plant vanilla in rows at a spacing of 3 x 3 meters to realize the best plant population, to make weeding and harvesting easier, and to produce high yields. It may be necessary to remove some trees or other crops that are already growing in the field to make room for the vanilla.

Table T4.2. Site problems and solutions

Problem	Solution
Slope	
Slope too steep	Build terraces or contour bunds and trenches to prevent erosion. Plant along the contour (not up and down the slope).
Soil texture	
Soil too sandy	Add manure, compost and mulch to increase water retention.
Soil too clayey	Add manure, compost and mulch to improve soil structure and drainage.
Soil structure	
Soil too shallow	Less than 20-30 cm of Soil not suitable for vanilla cultivation. For shallow soils above 30cm, add manure, compost, mulches.
Soil compacted	Use a forked hoe to break up a hardpan. Avoid trampling around crops; keep to paths. Add mulch to protect soil from impact of rain.
Not enough mulch	Add mulch. If necessary, bring in mulch from elsewhere.
Soil acidity	
Soil pH	To test for pH, farmers will need to find a local service provider / field agent who can provide this soil test. They can also advise on improving soils.
Soil too acidic	Add lime.
Soil too alkaline	Add mulch, manure and compost.
Soil fertility	
Soil infertile	Add manure and mulch. Do a soil test and apply the appropriate quantity of manure to supply the missing nutrients.
Water	
Waterlogging	If caused by a hardpan, double dig the land. Dig drainage ditches. The farmer should ensure the site selected for vanilla planting is not prone to water logging.
Soil too dry	Add manure and mulch to retain moisture. Provide irrigation.
Shade	
Not enough shade	Plant shade trees.
Too much shade	Prune or remove/cut excess trees and intercrops.
Security	
Far from house	Hire guards, keep dogs, form patrols, set up alarm.
Fence insecure	Build or repair. Reinforce fence with growing bushes or shrubs or thorny tree species.
Plant spacing	
Vanilla too dense	Select vines to remove and or sell to other farmers.
Vanilla too sparse	Add new vines at appropriate spacing.
Intercrops too dense	Remove some of the plants in the intercrops.
Intercrops too sparse	Add more intercrops at the correct spacing.

Land preparation

Vanilla is often grown on gently sloping land, or on land which has trees, and is not suited for mechanized farming. Farmer will generally not prepare the land with a tractor, but instead will prepare the land with a hoe. If the soil is compacted, or there is a hardpan, it may be necessary to double-dig the soil (dig down to a deeper level). The soil preparation and planting methods are covered in later chapters.

If the land is flat and tractor services are available, the new field can be plowed before planting. Mechanical plowing is faster than manual land preparation. Any plowing should be done along the contour to prevent erosion.

In new fields, the land can be cleared and dug using a hoe. The farmer should weed the land at the same time and prepare it for planting. Land preparation breaks up the soil, breaks up any hard pan, improves the soil structure and the rate of water infiltration.

In existing fields, it may not be possible to prepare the whole area without disturbing the crops already there. Instead, the farmer should use a tape measure or string to mark where to plant vanilla at a spacing of 3 × 3 m.

Weeds

All grasses such as elephant grass, couch grass, spear grass and other problematic weeds must be removed before planting vanilla. This minimizes the need to weed with a hand hoe or panga (machete) after planting the vanilla. Vanilla plants have shallow roots that are easily damaged by a hoe or panga, so weeds near the vanilla plants must be removed by hand. The weeds that are removed can be used as mulch or to make compost. See Chapter 10 on *Weeding* for details.

Figure T4.5. John and Alice are right to weed the vanilla garden by hand. Mary should not use a hoe as it may damage the shallow vanilla roots

Organic production. If the farmers are planning organic production or are targeting an organic market, they should **not use herbicides and other inorganic chemicals on the farm**. They should instead remove weeds by hand.

Conventional production. If farmers are planning conventional production, they should seek guidance from the extension agent on the use of agrochemicals.

Agrochemical use. With any agrochemical, farmers should ask for advice on how to use it from the supplier and extension agent. They should use the chemical carefully, follow the recommended dose rates and time of application, use tested spraying equipment, and always wear appropriate protective clothing.

Burning. The farmers should not burn the vegetation as this reduces the organic matter in the soil and reduces its fertility.

Dos and don'ts

- Don't choose a site with rocky, clay, compacted or waterlogged soil.
- Do consult your spouse and other family members that use the farm and farm products to understand the implications of introducing new crops and making decisions together.
- Do control soil erosion and water runoff.
- Do reorganize the spacing and management of existing crops to give vanilla the optimal spacing.
- Do manage existing shrubs and trees. Trim them back or remove them if necessary.
- Do remove weeds such as couch grass and spear grass.

Let's talk about money

Before the lesson: Gathering information on costs and incomes

Before you can talk about finances with farmers in a lesson situation, you will need to get a realistic idea of current costs and incomes. You should do some homework before the lesson to gather this information.

Collecting accurate information on costs, prices and income is difficult. Most farmers do not keep regular records on their finances. They have different costs as they don't all do the same things, and they have farms of different sizes. This means that any discussion about finances takes time.

Many farmers are reluctant to discuss financial arrangements in front of their friends and neighbors. Therefore, it is best not to gather financial information from a group, as this will not be accurate or reliable.

Instead, it is best to talk with farmers about money on a one-to-one basis. Interview 4–5 individual farmers separately, include women farmers in your sample, using a form to gather the information in a systematic way. See the examples below and the *Handout* for these forms. Ask each farmer how big their vanilla garden is, and what they paid for materials and labor to complete a particular task.

If farmers do not trust you, they may give you inaccurate information. This means that you will need to build relationships with farmers and build their trust. Tell them that any information you collect on prices and income is only being used for learning. Tell them that individual information on finances will not be shared with others.

Field notebooks

When you interview farmers, record the information in your field notebook. If you don't have a field book, get one!

TIP: Every agent should have a field notebook to record information.

Use common units

As you collect information, be sure to use a common unit area, such as acres or hectares. Ask the farmer how big their plot is and convert all the figures to amounts per hectare or acre. This makes it possible to compare figures between different farms.

Calculating averages

Once you have interviewed 4–5 farmers, you can see if the figures are similar. If most of the farmers have a similar cost per unit area, then you can be reasonably confident that the numbers are accurate and reflect actual costs. If so, calculate the average costs for the activity.

However, if there are large differences in the costs, you will need to ask the farmers with the highest and lowest costs some probing questions. Ask them why the costs are high or low. The answers to these questions may explain why the costs are different. Farmers do not all do things the same way, so they have different costs. For example, some farmers do not have to clear as much vegetation, or the cost of labor may be higher in their area. If the responses are not clear, you may need to ask more farmers the same set of questions, until you start to see similar responses.

Prepare a cost sheet showing the average costs (or the range of costs) for each activity.

Information required for this chapter

Below are suggestions on how to collect information on the costs of the following activities:

- Land preparation
- Fencing
- Security.

Cost of land preparation

1. Ask the 4–5 male and female farmers you are interviewing to list the tasks for land preparation. Write these in the left-hand column in the form (see Table T4.3 for an example, and the *Handout* for an empty form).
2. For each task, ask the farmer how many workers (family or hired) are needed, and for how many days. Fill this information in the correct rows and columns in the form. If they use their own labor or unpaid family labor, include this as well.
3. Ask how much the workers are paid per day. Write this in the "Wage" column. Use the same wage figure for their own and for unpaid family members.
4. Ask how large the field is (in hectares), and note this in the appropriate place in the form.
5. Calculate the costs in Ugandan shillings and US dollars.
6. Calculate the total cost per hectare.
7. Check with the person you are interviewing if they think the costing is too low or too high. If they have paid less, ask them how they were able to make savings. If they have higher costs, ask why.

In 2021, the cost for clearing and land preparation by hand for 1 hectare of vanilla was about UGX 400,000 – 500,000 (US$ 100–130[1]). The actual cost that an individual farmer will pay depends on many things, such as the daily wage rate, the land type and the difficulty of the work. Labor rates in rural Uganda vary, depending on the task. Basic work is UGX 3,500/day. Harder work such as land preparation and digging is up to UGX 5,000/day.

Table T4.3. Example of costs of land preparation

Materials and labor	No. of workers	Wage per day UGX	Days	UGX	US$	
Land/shrub clearing	4 (2 family)	5,000	5	100,000	28	A
1st cultivation	4 (2 family)	5,000	5	100,000	28	B
Other cultivations						C
Other work (e.g., erosion control)	4 (2 family)	5,000	3	60,000	17	D
Total		**A + B + C + D**		**260,000**	**73**	**E**
Size of field (hectares)				0.4	0.4	F
Total per hectare		E / F		650,000	183	G

1 The conversion rate in February 2022 was US$ 1 = UGX 3600

Cost of fencing

Security is a major issue when prices of vanilla are high, and some say that thieves steal vanilla whatever the price! How much does it cost to set up a fence for a vanilla garden? Follow the same approach as with the land preparation.

Costs of fencing may vary widely. For example, some farmers use barbed wire and strong posts. Others will plant trees and use live posts to fence the land.

1. Find 4–5 farmers in your location that have set up security fencing.
2. Find out the area and the perimeter of each plot. It is best to measure these, as most farmers don't know. You can do this by measuring the perimeter with a long tape-measure. If you have a smartphone, you can download an app (search for "GPS field area measure") to give you an approximate size.
3. Find out what materials are used to fence the gardens. Posts may be living or dead—either freshly cut or treated against termites. Some farmers use barbed wire, while others use plain wire or no wire. Check with 4–5 farmers to get an idea of the materials and labor needed to put up the fencing. Some farmers hire workers to help with fencing, while others do the work themselves with help from the family or neighbors.
4. Write the information on the form and make an average costing, or show the range of costs (Table T4.4 and Table T4.5).
5. Ask farmers if they think the costs are too low or too high. If they paid less, ask them how they were able to make any savings. Or did they have higher costs? Ask why.

Table T4.4. Example of fencing costs (upper end costs)

Fencing costs	Units	Cost per unit	Days	Total UGX	US$	
Materials						
Cut posts for plot	80	2,000		160,000	44	A
Wood treatment	3 liters	50,000		150,000	41	B
Barbed wire 1 acre plot 1 pkt 550 meters	6	350,000		2,100,000	580	C
Other costs						**D**
Labor	**No. of workers**	**Cost per day**				
Family labor	2	5,000	4	40,000	11	E
Hired labor						F
Total		**A + B + C + D + E + F**		**2,450,000**	**680**	**G**
Size of field (hectares)				0.4	0.4	H
Total per hectare			G / H	6,125,000	1,700	I

Table T4.5. Example of fencing costs (lower end costs)

Fencing costs	Units	Cost per unit	# days	Total UGX	US$	
Materials						
Live posts	80–100	Cut in forest		0	0	A
Labor						
Transport	1 trip	40,000		40,000	11	B
Family labor	2	2,000	2	20,000	6	C
Total		**A + B + C**		**60,000**	**17**	**G**
Size of field (hectares)				0.4	0.4	H
Total per hectare		G / H		150,000	42.0	I

Cost of security

Security is important to protect valuable crops such as vanilla. Many farmers resort to hiring security guards or having family members patrol the gardens at night.

Repeat your costing approach. Do a quick survey of 4–5 farmers, interviewing them separately to get an idea of the costs of security in the area. Analyze your data and see if the costs are similar, or if there are wide variations. If there is a large range, find out why before you talk to the group.

Costs will vary depending on the types of security. Options include family labor, guard dogs, alarms, and hiring guards. In the example shown in Table T4.6, the farmer has hired 2 guards for 120 days a year. They are on duty only as the vanilla beans mature—for two months, twice a year. Family members also guard the garden.

Table T4.6. Example of costs of security per year

Security costs	No. of workers	Wage per day UGX	Days	UGX	US$	
Family guards (unpaid)	3	5,000	150	2,250,000		A
Security guards	2	5,000	120	1,200,000	330	B
Total				**3,450,000**	**960**	**C**

During the lesson: Sharing information

You need to collect and analyze all this information before the lesson so you have a good idea of what the real costs are.

During the lesson, at first **do not reveal** your figures to the participants. This is for two reasons:

- The participants will learn better if they come up with their own figures and think through the calculations themselves under your guidance.
- You want to encourage discussion about what the costs are, not present numbers that everyone will automatically accept because they come from you.

Instead, get the participants to do their own calculations as a group. If their figures are wildly different from the ones you have gathered, then you can ask questions to find out why. If the participants have problems coming up with realistic numbers, you can always suggest the figures that you have collected.

Lesson plan

Learning objectives

After this lesson, the participants will be able to:

- Identify the farm and plot conditions that are good for growing vanilla.
- Make decisions on the level of security for the farm and vanilla plot.
- Discuss the "crop mix" options for establishing a new vanilla farm.
- Consider ways to plant vanilla within existing farms.

Location

Try to find two sites close to each other:

- A cultivated plot with coffee or banana that does not currently have any vanilla, but where the farmer is considering growing the crop.
- An uncultivated plot that might also be used to grow vanilla.

Get the farmer's permission beforehand.

Duration

3.5 hours.

Session 1: Field walk. 90 minutes: 45 minutes walking through the two fields, 45 minutes discussion.

Session 2: Money talk. 90 minutes.

Session 3: Planning activities. 30 minutes.

Training periods

January and June.

Introduction

Greet the participants and tell them the topic of this session: site selection and land preparation. Ask them what they would like to learn about this topic.

If necessary, remind participants about the rules for participation (see Lesson 1).

Ask the participants the questions in the Quiz to check what they already know about site selection and land preparation.

Figure L4.1. Mary and John with the extension agent planning where to put their vanilla plot

John and Mary plant vanilla

Read out this story to the participants.

In 2016, vanilla prices in Uganda rose from UGX 15,000 to 50,000 ($5 to $15) per kilogram of green vanilla. When John and Mary learned of this increase, they immediately bought and planted 200 tutors and 200 vines. They planted these in a garden that already contained trees, coffee bushes and bananas. They thought that introducing vanilla in their existing garden would help them get value out of the land. Because the soil was hard, they used a hoe and pickaxe to dig holes to plant the tutors and vanilla.

John and Mary continued managing their vanilla even though they had problems with weeds and the hard soil that stopped the crops from growing well. Mary found she was spending an increasing amount of time weeding the garden. They also had less food to eat because they had removed some crops to make way for vanilla. They expected the vanilla would produce a yield after three years. But after three years it had not yet started flowering. Their neighbor, who had expanded her vanilla farm at the same time as John and Mary, watched her vanilla flowering and was expecting returns.

John and Mary were discouraged and had started arguing with each other. They were about to uproot their vanilla crop, but decided to ask an extension agent for advice. The agent visited their farm and spoke to both of them. The agent told them the site they had chosen was not really suitable for growing vanilla as the soils were compacted and infested with couch grass. The agent suggested they find another location with deep, fine soil, remove the couch grass, plant ground cover crops to help control the weeds and apply mulch and manure.

Ask the participants these questions:

What mistakes did John and Mary make? What caused their vanilla to grow poorly?

How did this affect their family?

What should they have done differently?

Ask the farmers to describe how they started growing vanilla, and any problems they encountered.

Session 1. Walking through a field

Give copies of the "Form for notes on site selection" (in the *Handout*) to the participants to take their own notes.

Walk with the participants through the two fields: the cultivated field and the uncultivated plot. Ask the participants to identify any positive or negative aspects for vanilla growing. Point out any important aspects that they miss.

At selected locations, stop and discuss specific aspects slope, soil, water, shade, location, etc. See the exercises below on how to do this.

Materials required

- Samples of different soil types: sand, loam, clay
- Spade
- Soil pH meter or testing kit
- 3 m tape measure, or string with markers every 3 m. (have some string for participants)
- Bottle of water
- Clean containers for soil samples
- Baking powder and vinegar
- Spoon
- Buckets of water
- Sticks and ribbons to mark locations
- Forms (see *Handout*), pencils

Slope

Questions. *Is the slope too steep? Is erosion control needed? How might erosion be controlled?*

Discuss the possibilities: contour planting, contour trenches, grass bunds, trash bunds, other erosion-control measures.

Soil texture

Questions. *Is the soil texture right—not too much sand or clay?*

Take a small handful of soil, wet it with some water (bring a container with you!), and roll it into a ball between your hands. Then squeeze it out with your thumb to form a flat ribbon.

- If it forms a ribbon 7 cm long without breaking, it is clay.
- If it forms only a short ribbon 1 cm long before breaking, it is sand.
- Somewhere between these are various types of loam, which are better for vanilla.

Add small amounts of water to a small handful of soil, working to form a bolus

The bolus is at the appropriate moisture content when the bolus just glistens

Loam soil

Sandy soil

Figure L4.2. Simple methods for testing soil texture

Soil structure

Questions. *Is the soil deep and well-drained?*

Bring a spade. Dig a hole at least 30–70 cm (1–2 feet) deep and check the vertical profile of the soil.

- **How deep is the topsoil** – the dark layer with a lot of organic matter? A deep, dark topsoil indicates a lot of humus, good fertility and ability to hold water (the organic matter binds water and keeps the soil moist).
- **How deep is the soil overall?** Deeper down, the soil may be stony and lighter in color. A soil that is too shallow (less than 20-30 cm) is not good for vanilla because its roots will not be able to penetrate deeply. Shallow soils also tend to dry out easily.
- **Is there a layer of mulch?** Mulch helps suppress weeds, protects the soil from erosion, and keeps the soil beneath moist. The mulch gradually breaks down to form humus and enrich the soil.

Soil acidity

Questions. *Is the soil acidic, neutral, or alkaline?*

Some ways of finding or estimating the pH of the soil:

- Use a test kit or pH meter.
- Mix two samples of soil: one with the same amount of vinegar, and the other with a mixture of baking soda and water. If the sample with vinegar produces bubbles, the soil is alkaline. If the one with baking soda produces bubbles, it is acidic. The more bubbles, the more alkaline (or acidic) the soil is. If there are no bubbles in either sample, the soil is neutral.
- Collect a sample of the soil and find someone to test it for you (check with your local extension agent).
- Ask the farmer whether they have had the soil tested.

Soil fertility

Questions. *Is the soil fertile enough to grow vanilla?*

Some ways of checking the soil fertility:

- Use a test kit.
- Collect a sample of the soil and take it to the lab for testing.
- Ask the farmer whether they have had the soil tested and whether they apply fertilizer (and if so, what type). Remind the farmers that they should not use inorganic fertilizers if they are producing certified organic vanilla.
- Check for typical signs of nutrient deficiency in crops:
  - Poor growth, yellow leaves: **nitrogen** deficiency (should also be due to lack of water).
  - Yellow or purple leaves, browning at the leaf edge, poor flowering or fruiting: **potassium** deficiency.
  - Slow growth, dull yellow leaves: **phosphorus** deficiency.

Water

Questions. *Does the soil have a good ability to hold water? Is it well drained? Is it subject to waterlogging?*

Some ways of checking this:

- Check the soil texture and structure (see above).
  - If the soil is sandy or on a steep slope, it is probably **poorly drained**. It will not retain water well.
  - If it is clayey, if there is a hardpan or if it is flat, it may be **poorly drained**.
  - If it is loamy, does not have a hardpan, and is on a slight slope or relatively flat area, it is probably **well drained**.
- Dig a hole. Is the soil waterlogged? Does the hole fill with water?
- Dig a hole about 30 cm (12 inches) square and 30–45 cm (12–18 inches) deep. Fill the hole with water and watch how quickly it drains. Then fill the hole again and measure the depth of the water. Measure the depth every hour for 2–3 hours. The water level of well-draining soil will drop at least 2.5 cm (1 inch) an hour. (Because this test takes time, you can tell the participants how to do it and ask them to do it themselves.)

Check whether there is a source of water nearby in case irrigation is needed.

Shade

Questions. *Is there enough shade in the field? Is there too much?*

Stand in the field and **look up**. You should be able to see patches of sky. At least 50% of the sky should be visible.

Now **look down**. There should be small patches of sunlight on the ground. The shaded areas should not be in deep shadow.

Check the type and spacing of trees that are providing the shade. Trees with dense canopies (such as mango and cacao) are not suitable. Trees that are too widely spaced will not provide enough shade.

Plant spacing

Questions. *Are the crops spaced correctly? Should there be more, or fewer of them?*

Provide the farmers with some string or tape measures, and some pieces of colored ribbon. Get the participants to check the plant spacings. They should mark with colored ribbon any plants that need to be removed or pruned, and mark any spaces that need to be filled (put a stick with a ribbon in the ground). Remember that it is best to plant both the vanilla and the intercrops in rows.

Existing plants

Questions. *Are there other plants on this site that would need to be removed to establish the vanilla garden?*

How does removing or transplanting these plants affect:

- The availability of nutritious and staple foods?
- Existing income generating activities?
- The workload of the various family members?

Location and security

Questions. *Is the location suitable from a security point of view?*

Is it close enough to the house to allow frequent management and monitoring?

Is it surrounded by a strong, high fence to keep thieves out?

What could be done to improve security?

Deciding on a site

Questions. *Taking everything into consideration, is the site suitable for growing vanilla? If the farmers were field agents, would they recommend growing vanilla here?*

What are the major drawbacks with the site? What can be done to alleviate them?

Land preparation

Questions. *What is the best way to prepare the land in this field for planting vanilla?*

How long does it take to dig an acre of land for vanilla production? Is it possible to plow? Or would it be better to use hoes to prepare the land, and to dig planting pits?

Where should the tutors and vanilla vines be planted?

Get the participants to mark the locations for planting vanilla with sticks and with rope. Remind them to put the vanilla in rows at a spacing of 3 × 3 m.

If the land is on a slope, remind them to mark out rows that go along the contour, not up and down the slope.

Discuss the various ways of controlling erosion (see under *Slope* above).

Weeds

Questions. *What weeds are there in the field? Are these a problem? What to do about them?*

Ask the participants to check any weeds in the area. Point out weeds that are particularly a problem for vanilla, such as elephant grass, couch grass and spear grass. Explain that these must be removed and used as mulch or compost, **not burned**.

Discuss how to control weeds if the farm is organic, and if it is not organic.

TAKE A BREAK

Session 2. Let's talk about money

Cost of land preparation

Ask the farmers to estimate how much it will cost to prepare each field you have visited for planting vanilla. Recreate the "Form for calculating land preparation costs" (see the *Handout*) on a flipchart sheet and use it to gather this information.

Reminder: Throughout this process, keep in mind the figures that you collected and calculated earlier from the sample of 4–5 farmers. But do not reveal your figures to the participants. They should think through the process themselves.

1. Estimate how big the area is (get the participants to measure it or pace it out if necessary).
2. Calculate the labor costs:
   - Ask if the labor can be done with family or neighbors' support. Or does the farmer have to hire labor to prepare the land?
   - How many days (and how many workers) would it take to clear the land?
   - How many days (and how many workers) would it take to do a first cultivation?
   - What is the daily wage for a laborer? (If the farmers use their family labor, count this too, using the wage for a laborer).
   - Use the information from the discussion to fill the figures in the "Costs of land preparation" form (see *Handout*).
3. Ask what activities can be done using family labor, and what will require external labor.

Remind participants that children's involvement should not affect attendance at school.

4. Discuss these costs with the participants. Are they realistic? Are they affordable? How can the farmers cover the costs?
5. Ask the participants if they think the costing is too low or too high. Ask them to explain if there are large differences. If they paid less, how they were able to make any savings? Or did they have higher costs? Ask why.
6. Ask about other aspects of land preparation. Check whether male and female participants have different opinions.
   - What might be other costs or consequences for using family labor, including children? Does time spent on land preparation take away from other types of work?
   - What problems are there in hiring labor for land preparation? How can you, the family and the community address these?

Cost of fencing

Repeat the exercise to calculate fencing costs, recreating the appropriate form (see the *Handout*) on a flipchart sheet. Again, keep the figures in mind that you have gathered previously to check the validity of what the participants say.

1. Introductory questions to ask:
   - Is security a major issue in your area?
   - When is vanilla usually stolen? 2 months before harvest? 1 month before harvest?
   - How much vanilla is stolen each season? Very little, not sure, a lot?
   - How many farmers have fences?
   - Do buyers help farmers to get loans for building fences?
2. Get the participants to fill in the form:
   - Ask them to list the materials they used to fence the garden.
   - Ask them to list the labor costs for making a fence.
   - Calculate the costs.
3. Discuss with the participants:
   - Does the cost of building a fence avoid large losses in the field?
   - How can farmers make strong fences at the lowest cost?
   - Are there any tricks to making a good fence, such as hidden doors?
   - Are there people who farmers can hire to help them put up a fence?
4. Discuss the costs with the participants. Are they realistic? Are they affordable? How can the farmers cover the costs?
5. Ask the participants if they think the cost is too low or too high. If they paid less, ask them how they were able to make any savings. Or did they have higher costs? Ask why.
6. Ask about other aspects of fencing. Check whether male and female participants have different opinions.
   - What problems might you face in buying the materials?
   - What problems do you face in hiring labor for fencing? How can you, the family and the community address these?

Cost of security

Repeat the exercise once more, this time focusing on security. See the “Form for calculating security costs” in the *Handout*.

1. Ask farmers what type of methods they use for security.
   - Do they use hired guards or family labor?
   - How many days are the guards on duty?
   - Do they think that guards reduce the theft?
   - Are there still problems with theft?
   - Is the security worth it?
   - Do they use less security when vanilla prices fall?

2. Get the participants to fill in the form.
3. Discuss the costs with the participants: Are they realistic? Are they affordable? How can the farmers cover the costs?
4. Ask the participants if they think the cost is too low or too high. If they paid less, ask them how they were able to make any savings. Or did they have higher costs? Ask why.
5. Ask about other aspects of security. Check whether male and female participants have different opinions.
   - What might be other types of costs or consequences for using family labor, including children?
   - What problems do you face in hiring labor for security? How can you, the family and the community address these?

TAKE A BREAK

Session 3. Planning activities

Discuss with the participants what they plan to do on their farms to put what they have learned today into practice.

- Some participants may say they want to start a new vanilla garden.
- Others may want to change the layout of their current gardens, for example by pruning or removing trees or bushes and planting more vanilla.
- Some farmers may want to build a better security fence.

Discuss the timing of such work. The land preparation will need to be completed before new vanilla vines can be planted. Ask the farmers to indicate the week and month that these activities must be done. Ask the farmers to consider how completing this work during those months might affect other farm and non-farm activities and family members' workloads.

If you have time, offer to visit their farms to give them advice. Alternatively, perhaps experienced members of the group can advise farmers with less experience.

Conclusion

Summarize what the participants have learned during the session.

Repeat the questions you asked at the start of the session (see the Quiz). Correct any answers that the participants got wrong.

Tell the participants when the next session will be and what it will be about.

Quiz

1. What do you consider when selecting land for vanilla cultivation?

2. What are the recommended soils for vanilla cultivation?

3. How can you tell if you have enough organic matter to grow vanilla vines?

4. Why do we double-dig the land and in some cases use plows before planting vanilla?

5. What practices are recommended for gently sloping fields for the control of soil erosion?

6. What are the common and problematic weeds that need to be removed from the garden before planting?

7. Why is it important to fence your garden during land preparation, before planting the tutors and vanilla?

8. Why is it important to consider how planting on this site affects food availability, other income generating activities and workload?

9. Who should be involved in making the final site selection decision?

10. What is the estimated cost of site selection and land preparation for 0.4 hectare (1 acre)?

11. What constraints may women face in implementing this guidance?

Expected answers

1. Climate, slope, soil type and texture, shade, plant spacing.
2. Loamy, fertile, rich in organic matter, well-drained, not compacted.
3. Rich, black color, decomposing vegetation.
4. To break up a hardpan in the soil.
5. Plant along the contour, use terraces, contour trenches, grass bunds or tree lines.
6. Elephant grass, couch grass, spear grass.
7. For security reasons, and to allow living fences to become established.
8. Removing plants to make space for vanilla may reduce the amount of food available for the family, the income from the farm, and the amount of work various family members have to do.
9. Both the husband and wife.
10. (Depends on calculations made before and during the lesson.)
11. Women may face additional constraints in implementing these practices given limited control over income, less access to resources, heavy workloads, lack of decision-making over land.

Handout 4.1: Conditions for growing vanilla

Vanilla requires the following specific conditions

- Well drained fertile soils, high in organic matter
- Gently sloping or relatively flat area
- Land must be prepared correctly and should be free of weed
- Vanilla needs a dry season of 2-3 months to stimulate flowering
- Security of the farm, since vanilla is a high value crop
- Shade should be adequate
- Soil should be neutral to slightly acidic with pH between 6.0 and 7.0
- Vanilla and the intercrops should be planted at the right spacing for better yields
- Spacing; vanilla is planted at 3x3m apart, and intercrops such as coffee and banana are also spaced at 3x3m apart
- Vanilla requires high rainfall (1100m/yr) and humidity should not exceed 75%
- Optimum temperature for vanilla is 27 degrees C

Selecting a site:

Vanilla is planted in either an existing field (with other crops) or in new fields.

- Farmers should make sure land is well prepared and vanilla has enough space to grow
- Soils must not be compacted where vines will be planted, and there must be enough shade
- Vanilla should be planted in rows, and spaced at 3x3m

Add small amounts of water to a small handful of soil, working to form a bolus

The bolus is at the appropriate moisture content when the bolus just glistens

Loam soil

Sandy soil

Simple methods for testing soil texture

Handout 4.2: Form for notes on site selection

Subject	Current status, problems	Possible solutions, actions
Slope		
Soil texture		
Soil structure		
Soil acidity		
Soil fertility		
Water		
Shade		
Plant spacing		
Location and security		
Land preparation		
Weeds		

Handout 4.3: Form for calculating land preparation costs

	No. of workers	Wage per day UGX	Days	UGX	
Land/shrub clearing					A
1st cultivation					B
2nd cultivation					C
Other work (e.g., erosion control)					D
Total		**A + B + C + D**			**E**
Size of field (hectares)					F
Total per hectare		E / F			G
Total per 0.4 hectare (1 acre)		G / 0.4			H

Handout 4.4: Form for calculating fencing costs

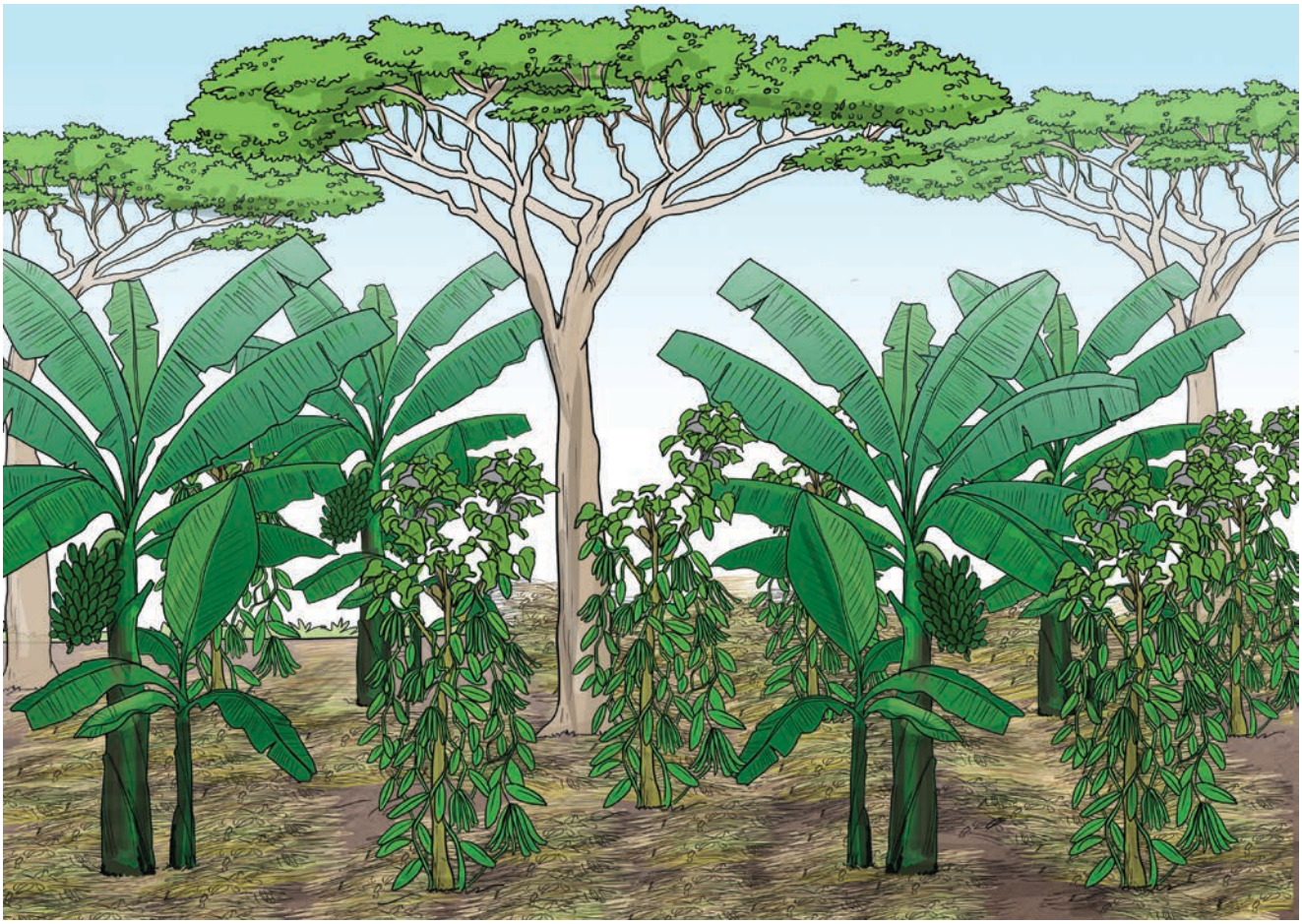
Fencing costs	Units	Cost per unit	# of days	Total UGX	US$	
Materials						
Cut posts for plot						A
Wood treatment						B
Barbed wire: 1 pkt, 550 meters						C
Other costs						D
Labor	# of workers					
Family labor						E
Hired labor						F
Total	**A + B + C + D + E + F**					**G**
Size of field (hectares)						H
Total per hectare			G / H			I

Form for calculating security costs

Guarding costs	No. of workers	Wage per day UGX	Days	UGX	US$	
Family guarding						A
Security guards						B
Other costs						C
Total	**A + B + C**					**D**

CHAPTER 5.

Shade management



Vanilla needs the right amount of shade to grow well

Technical information

Topics covered

- Vanilla production systems.
- Shade requirements for vanilla.
- Spacing of shade trees.

Key messages

Vanilla is a crop that needs a certain amount of shade to produce well.

The shade can be provided in various ways. In Uganda, this is best done through agroforestry: growing crops together with trees in the same field.

The shade comes best from two levels: a loose canopy of tall shade trees, and a middle level of shorter trees and bushes such as coffee and bananas.

Farmers need to manage the amount of shade in their vanilla gardens. Too much shade or too little shade will harm the vanilla crop and reduce yields.

Shade trees take time to grow. To bridge the gap, farmers can use fast-growing crops like banana, and use manure and mulch to enrich the soil.

Production systems

Source: Wikipedia

Figure T5.1. Vanilla growing in a shade house

Many different production systems are used across the world to produce vanilla. In the most intensive, such as in shade houses, farmers can plant up to 10,000 vanilla plants per hectare, or 4,000 per acre. This is at a planting density of 1 × 1 m.

The typical planting density in Uganda is around 1,000–1,100 vines per hectare (400–440 per acre). The vanilla is planted at distances of 3 × 3 m, the same spacing as used for banana.

As vanilla is a relatively new commercial crop in Uganda, the vines are generally planted into existing banana and or coffee farms. Planting vanilla into existing farms means farmers need to find space. The farmer may have to remove some existing plants to create space for the new vanilla vines.

When considering what plants to remove, the farmer should consult his/her spouse and other family members who use the land. They should consider the implications on food availability, income generating activities and workload.

Main types of vanilla-based farming systems in Uganda

The three main types of vanilla-based production systems in Uganda are:

- Banana – vanilla
- Coffee – vanilla
- Banana – coffee – vanilla.

For the crops to grow well, these systems require specific planting densities of all the crops. Both vanilla and coffee require shade to grow well.

Agroforestry

The use of trees in a farming system is called **agroforestry**. Trees are an essential part of producing high quality vanilla and coffee.

Agroforestry combines the cultivation of trees and shrubs together with crops. It benefits the vanilla in various ways:

- **Support.** It provides tutor trees which support the vanilla vines.
- **Shade.** It provides shade and protects the vanilla vines from the wind and rain. The shade keeps the soil moist.
- **Soil and water management**. The tree roots bring up nutrients from deeper layers of the soil for utilization. Leaves act as mulch that maintains the moisture in the soil and enriches its organic matter. Some tree species such as gliricidia are used as tutors. They can fix nitrogen in the soil, providing the crops with additional required nutrients.
- **Security.** Planted as a fence around the plot, trees and shrubs reduce the number of intruders (thieves, unwanted visitors and animals) and increase security.

Benefits of shade

Figure T5.2. Vanilla vines show sunburn (yellow leaves) because of too little shade

Vanilla is an orchid that naturally grows in the lower levels in tropical forests. The vanilla garden should try to create the ideal conditions for vanilla to grow and produce well.

Too little shade

If there is too little shade:

- The vines and leaves will be damaged by sunburn, and the top leaves will turn yellow.
- The vines (and especially the delicate flowers) may be damaged by high winds, hail and storms.
- The soil may dry out. Vanilla is a shallow-rooting crop. If the soil loses moisture, the vine can easily suffer from a lack of water. Shade and organic matter help keep the soil moist.
- The soil and air may become too hot.
- Weeds can grow easily. Shade helps suppress weeds such as couch grass that can steal space and nutrients from the vanilla crop.

Too much shade

- If there is too much shade, the vanilla (and coffee) will not grow well.
- Both vanilla and coffee will produce fewer leaves, flowers and fewer beans.
- In prolonged wet and cloudy weather, crop diseases such as rust and leaf spot may increase.

40–50% shade

50–60% shade

Figure T5.3. The right amount of shade. Look up, and you can see small patches of sky

Sources of shade

Shade in vanilla gardens is best provided at two levels:

- A loose canopy of tall shade trees.
- A middle level of shorter trees and bushes such as banana, coffee and the tutor (support) trees.

What makes a good shade tree?

Good shade trees for vanilla should:

- Have a light, open canopy to allow sunlight through.
- Be able to grow new branches rapidly after pruning.
- Produce a good amount of leaf litter to make mulch.

Ideally, shade trees should also:

- Produce some other product, such as fruit, nuts, fodder, timber, poles, firewood or medicine.
- Be leguminous (they fix nitrogen which improves the soil fertility).
- Grow quickly to provide shade in a new garden.

Shade trees should not:

- Develop a canopy that is too dense to let sun through, such as mango or cacao.
- Compete too much for soil, water and nutrients.
- Grow so large that they are difficult to prune.
- Harbor diseases that can be transmitted to crops such as coffee and vanilla.

Farmers may have trees that are unsuitable for use as shade that they wish to keep for some other reason (for example, because they produce fruit). Each farmer and their spouse will have to decide whether to keep such trees and whether they fit in their vanilla gardens.

If they decide to remove trees that produce food or other valuable products, the couple should together decide how to replace the food or other items they would lose.

Table T5.1. Examples of suitable and unsuitable shade tree species

Suitable shade tree species		Characteristics
Musizi (*Maesopsis emini*)		Rapidly growing tree with a sparse canopy that allows light to penetrate down to crops below. A good shade tree for vanilla and coffee.
Mugavu (*Albizia coriaria*)		A deciduous tree with a heavily branched, spreading, dome-shaped crown. It usually grows up to 35 m tall. The tree is harvested for its timber. A good shade tree for coffee and vanilla.
Mutuba (*Ficus natalensis*)		Ficus trees growing with coffee. The bark of the tree is harvested, without harming the tree to make barkcloth.
Fast-growing temporary shade trees		
Pawpaw		A short tree that produces fruit. Can be used to provide temporary shade while permanent shade trees are growing.

Not suitable		
Avocado		A fruit tree that produces too much shade.
Eucalyptus		A fast-growing tree that produces too much shade and uses too much water. It sheds leaves that hinder the growth of crops below.
Not suitable		
Mango		A fruit tree that produces too much shade.
Cacao		A tree that is short and produces too much shade because it develops a closed canopy.

Shade tree spacing

Shade trees must be planted at the proper spacing and managed to give the right level of shade. The farmer should choose species that will not compete for nutrients, water and light with the existing crops.

The shade trees should be spaced around 15 × 15 m (45 × 45 ft) apart. This gives 42–50 shade trees per hectare (17–20 per acre).

The actual density of the shade trees will depend on the specific location: how hot and sunny it is, its altitude, the soil quality and the types of shade trees used. Smaller species such as pawpaw and bananas provide some shade, but more of them are needed than with taller species to achieve the 30–50% shade cover.

Boundary trees

Around the boundary, farmers can plant a wider range of trees, including fruit trees, that would provide too much shade if they were planted in the middle of the garden.

Trees on the boundary may be planted closer together (5–8 m or 15–24 ft apart) because they will be part of the boundary fence, which is important for security.

The number of boundary trees needed will depend on the length of the perimeter of the plot and the spacing of the trees.

A 0.4 hectare (1 acre) plot that is square has sides of about 64 meters each, or about 260 meters in all. At a spacing of 5 meters between the trees, it will need about 52 trees around the boundary.

Most plots are not square. To find out how many boundary trees are needed for a particular plot, use a tape measure to measure its perimeter in meters. Then divide by 5 (for a spacing of 5 meters between trees).

Number of trees = Perimeter in meters ÷ 5

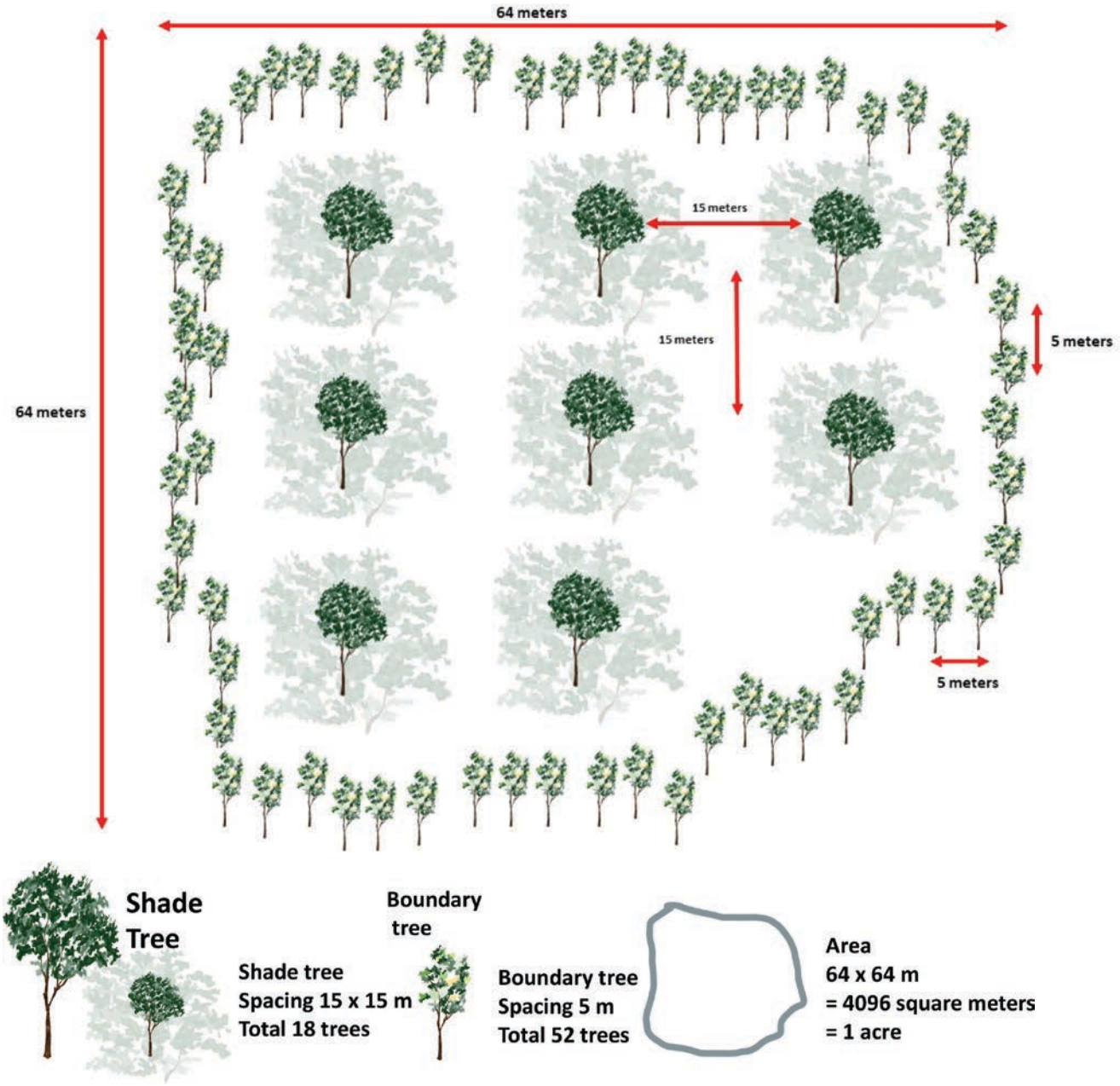


Figure T5.4. Plan of shade and boundary trees for a square, 0-4 ha (1 acre) vanilla garden

Waiting for shade trees to grow

Shade trees take at least 5 years to grow to maturity. To fill this gap, fast-growing species such as banana can be used to fill the gap until the shade trees are tall enough.

The trees shed leaves that eventually break down to improve soil organic matter. But this takes time, so it cannot improve the soil quickly. Farmers should use other soil-improvement techniques such as mulch, manure and compost instead, especially in the first few years.

Managing shade

No shade or shade tree is perfect for all eventualities, so farmers must adjust to the changing conditions.

- In the **dry season,** the level of shade should be between 50 and 70%. This means that when standing under the canopy, three-quarters of the sky will be covered by the leaves and branches of the banana, coffee and shade trees. The conditions will be fairly dark and humid.
- In the **rainy season**, it should be between 30 and 50%. Large patches of sky will be visible through the tree canopy. When standing under the canopy, more than half of the sky will not be covered.

Farmers should walk through their field several times in a season to check the amount of shade.

Not enough shade. If there is not enough shade, and the vanilla shows signs of leaf burn, farmers should allow the shade trees to grow, or plant more of them.

Too much shade. If there is too much shade, and the crops are not growing fast enough, farmers need to prune branches on the trees. Pruning should remove any diseased, unwanted, and intercrossed branches. If there are too many trees or crops that produce too much shade, the farmer should thin them out to get the right amount of shade for vanilla.

When to prune. At the start of the rainy season, before the vanilla flowers. Farmers should prune the shade trees to reduce the amount of shade from 50–60% down to 30–50%. This increases the light levels and increases stress to the plant, which prompts the vanilla to produce more flowers. The farmers should not prune too much and allow too much sunlight to reach the vines as this harms the vine and results in low-quality beans.

Figure T5.5. Overgrown plot with too many plants and too much shade for vanilla

Handling the workload

Establishing and maintaining the right amount of shade takes work. Farmers and their families need to discuss who will do this, when to do it, and how this will affect each family member's other activities on the farm, in the household, and elsewhere. They should ensure that the workload is fairly spread over the people who can perform each task.

Let's talk about money

How much does establishing shade trees for a new vanilla garden cost? Before discussing this with farmers in the lesson, you should do some homework so you know the range of costs.

Interview 4–5 farmers, male and female, who have recently established shade trees in their gardens and ask them about the types of shade and boundary trees, the number and source of the trees, and the materials and labor costs involved. Questions to ask:

Shade trees

- What is the size of your vanilla plot?
- How many shade trees do you have in your plot?
- What types of trees have you planted?
- What did the trees cost to buy, transport and plant?
- Where did you get the trees? From a nursery? From some other source?

Boundary trees

- Have you planted trees around the border of the vanilla plot?
- What type of trees did you plant?
- How many trees did you plant around the border?
- What did the trees cost to buy, transport and plant?
- What was the cost of obtaining the border trees?
- Where did you get the trees?

Use the form in the *Handout* to gather the information on costs. See Table T5.2 and Table T5.3 for examples of completed forms.

Table T5.2. Example: Farmer 1's shade and boundary tree costs

Shade tree costs	Units	Cost per unit UGX	Total UGX	US$	
Trees for shade	17–20	400	8,000	2	A
Live stakes for the boundary (252 meters)	120	500	60,000	17	B
Transport					C
Total		**A + B + C**	**68,000**	**19**	**D**
Size of field (hectares)			0.4	0.4	E
Total per hectare		D / E	170,000	47	F

Table T5.3. Example: Farmer 2's shade and boundary tree costs

Shade tree costs	Units	Cost per unit UGX	Total UGX	US$	
Trees for shade	17–20	400	8,000	2	A
Live stakes for the boundary (200 meters)		No cost (cut from nearby forest)			B
Transport	1	20,000	20,000	6	C
Total		**A + B + C**	**28,000**	**8**	**D**
Size of field (hectares)			0.4	0.4	E
Total per hectare		D / E	70,000	19	F

Write this information in your field notebook.

Check the information from the various interviewees for consistency. If most have a similar cost per unit area, you can be reasonably confident that the numbers are accurate and reflect actual costs.

Follow up if there are major differences among the costs of different individuals. Check why the costs are high or low, and interview more farmers if necessary.

Calculate the average costs (or range of costs, if there are indeed big differences) per hectare (or acre) for shade trees and boundary trees.

Lesson plan

Learning objectives

After this lesson, the participants will be able to:

- Explain why shade is important for vanilla.
- Explain how much shade is needed in which season.
- Name the possible sources of shade.
- Describe how to manage shade in a way that maximizes vanilla production.
- Identify constraints in implementing these practices and how to address them.

Duration

2 hours.

Location

If possible, hold this session in a vanilla garden. This will let you and the participants point out good and bad shade trees, and the need for pruning, felling or for planting more trees.

Training periods

Possible times, January – February or August - September

Attendees

During the first lesson with the farmers, you helped them prepare a vanilla calendar showing who does what tasks throughout the year. Check this calendar to see who is responsible for pruning the trees and maintaining the shade levels in the garden. Invite these people to this session.

If they are unable to attend, tell the participants it is important they pass on to them the information discussed during the lesson.

Materials required

Flip chart and markers.

Introduction

Greet the participants and tell then the topic of this session: shade.

Ask the participants the questions in the Quiz to check what they already know about this subject.

Shade-loving crops

- Ask the farmers whether they can think of any crops that like a lot of sunlight. (Answers: maize, cassava, banana, most vegetables.)
- Ask them to name crops that prefer a certain amount of shade. (Answers: coffee, vanilla.)
- Ask them whether they can name any crops that like to grow in the dark, inside a house. (Answer: none.)

Explain that vanilla likes shade because it is an orchid that grows in forests. But it does not like too much shade, otherwise it will not produce well.

Explain that if vanilla gets too much sunlight, its leaves will turn yellow. If it gets too little, it will not grow well.

If you are in a vanilla garden, point out examples of plants that have too much shade, or too little.

Sources of shade

Explain that vanilla grows best under two levels of shade:

- A high, loose canopy of shade trees
- A middle level of crops such as bananas, coffee and tutor trees.

Growing these trees and crops together is called “agroforestry.”

Ask what other benefits, apart from shade, these other crops have (Answers: protect the soil, keep the soil moist, act as a windbreak, produce other products such as fruit and timber, produce leaf litter, cycle nutrients).

Good and bad shade trees

Ask whether the participants can name (or point out) any **good shade trees**. Make a list of these trees on a flipchart. Ask them why these trees are good (grows quickly, loose canopy, lots of leaf litter, legumes that fix nitrogen…).

Ask whether they can name (or point out) any trees that are **less good**. Make a list of these trees on another sheet. List the reason that they are less good (too much shade, grows too slowly, carries pests and diseases…)

Shade and season

Explain that vanilla needs different amounts of shade in different seasons.

- In the dry season, it should have between 50 and 70% shade. Explain what this means in practical terms (look up, and you can see small patches of sky.)
- In the wet season, it needs between 30 and 50% shade (look up, and a little more than half the sky is visible).
- Before flowering, it needs less shade. This stimulates flowering. But too little shade at this time can result in too many flowers and can weaken the plant and produce poor-quality beans.

Managing shade

Ask the participants how they can manage shade. (Answers: pruning shade trees or intercrops, felling trees, planting more trees).

Ask who prunes trees on their farms. Ask how much work this is, and whether the person responsible has many other things to do.

Ask the participants how they prune trees. If they (or a family member or hired help) climb the trees, talk about the need for safety.

If you are in a vanilla garden, at various locations point out (or ask) what needs to be changed. Should a particular tree be pruned or felled? Should new shade trees be planted?

Explain the best spacing for shade trees (every 12–15 m), or closer together around the boundaries so the trees can act as part of the fence.

Establishing shade trees

Ask the participants how they would go about establishing new shade trees. (Answers: grow your own from seed or cuttings, get from a nursery.)

Ask who should be involved in making decisions related to the type of trees they would use on their farms. Why is this important?

Ask them what types of trees they would choose for their farms, and why.

Ask them what they should do while they are waiting for the shade trees to grow. (Answers: plant quick-growing crops such as banana, provide mulch, compost and manure to increase the soil fertility and make up for the lack of leaf litter.)

Let's talk about money

Refer to the information on costs you collected before the lesson. But do not reveal this information to the participants.

Shade trees

1. Ask the participants to imagine they want to start a new vanilla garden. They will need to plant some shade trees. Where will they get them from? From a nursery, grow them themselves, or find in the forest?
2. Ask them to imagine an average vanilla garden. How big is it (in hectares or acres)? Suggest using 0.4 hectares (1 acre) as an example size.
3. Draw a diagram of the plot on a flip chart. Mark the dimensions of the plot. Add the locations of the shade trees and boundary trees. (Save time by preparing this diagram beforehand.)
4. Get the participants to calculate the number of shade trees needed for a garden of this size (Answer: about 17–20 for a 0.4 hectare plot). If your diagram is accurate, you can get them to count the number rather than calculate it.
5. Ask them how much the shade-tree seedlings will cost each.
6. Draw a cost form (see the Handout) on a flip chart. Get the farmers to fill in the figures for shade trees.

7. Repeat this procedure for the boundary trees. Put the numbers into the cost form and calculate the total.
8. Discuss these costs with the participants. Are they realistic? Are they affordable? How can the farmers cover the costs?
9. Ask the participants if they think the costing is too low or too high. Ask them to explain if there are large differences from their own experience. If they paid less, how did they make savings? Or did they have higher costs? Ask why.
10. Ask about other aspects of shade and boundary trees. Check whether male and female participants have different opinions.
11. What problems might there be in hiring labor, or in using family labor (especially children)? Is anyone likely to have to do an unfair amount of work?

Planning activities

Ask the participants to check the shade levels in their own gardens when they go home. They should decide what to do:

- Do they need to prune?
- Do they need to remove any shade trees?
- Do they need to add any shade trees or boundary trees? If so, how many will they need? Where?

Conclusion

Summarize what the participants have learned during the session.

Repeat the questions you asked at the start of the session (see the Quiz). Correct any answers that the participants got wrong.

Tell the participants when the next session will be and what it will be about.

Quiz

1. Why is shade important for vanilla?

2. What makes a good shade tree for a vanilla farm?

3. Which trees do not make good shade trees for vanilla?

4. What other benefits do shade trees have, apart from providing shade?

5. Who should be involved in deciding what types of shade trees should remain or be planted on the vanilla farm?

6. How can you tell if vanilla has too much shade?

7. How can you tell if there is too little shade?

8. How much shade does vanilla like in the dry season? In the rainy season?

9. What is the recommended spacing for shade trees inside the farm?

10. What constraints do vanilla farmers face in establishing shade trees?

Expected answers

1. Vanilla is an orchid that normally grows in a forest. It produces best with a certain amount of shade.
2. Two levels of shade: tall trees and shorter intercrops (such as coffee and banana) and tutors. The shade trees should have a light, open canopy, grow quickly, and produce lots of leaf litter.
3. Trees that are too short or that have dense canopies.
4. They can produce other useful products, be leguminous (so they fix nitrogen in the soil). They protect the vanilla garden from wind.
5. Both the husband and wife.
6. The vanilla and other crops will not grow well. It may not produce many flowers. There may be disease problems.
7. The vanilla may become yellow and show signs of leaf burn.
8. Dry season: 50–70%. Wet season: 30–50%.
9. 12–15 m spacing.
10. (Depends on the participants' responses.) Possibly cost, availability of seedlings, labor, existing trees in the plot.

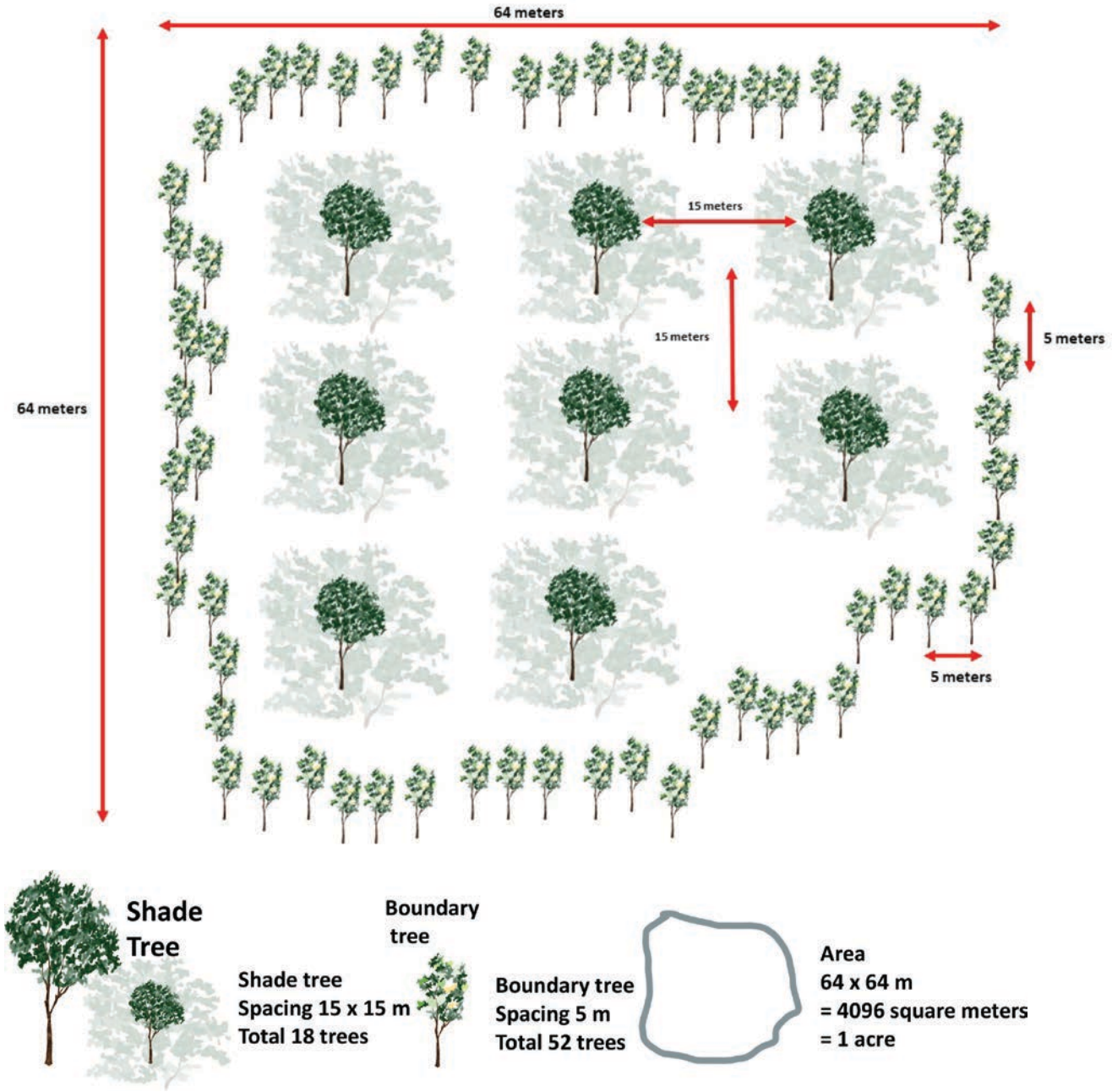
Handout 5.1: Shade management in a vanilla garden

40–50% shade

50–60% shade

The right amount of shade. Look up, and you can see small patches of sky

Why shade? Protects vanilla and other crops from heat and direct sun Keeps the soil moist Acts as wind break Source of organic matter, food, fodder, timber, poles… Controls weeds		
Too much shade Poor growth of vanilla and other crops Few flowers and beans Rust and leaf spot disease	→	Prune trees or intercrops Remove some trees or intercrops
Too little shade Yellow vines and leaves Damage by rain, hail and wind Dry soil; soil too hot Weeds grow easily	→	Allow trees to grow Plant fast-growing intercrops Plant new shade trees Use mulch, compost or manure to protect soil and increase fertility
A good shade tree Light, open canopy Regrows after pruning Produces leaf litter Produces other useful products Fixes nitrogen Grows quickly		
Shade tree spacing In garden: 12–15 m (36–45 ft) Boundaries: 5–8 m (15–24 ft)		**Ideal shade** Dry season: 50–70% Rainy season: 30–50%



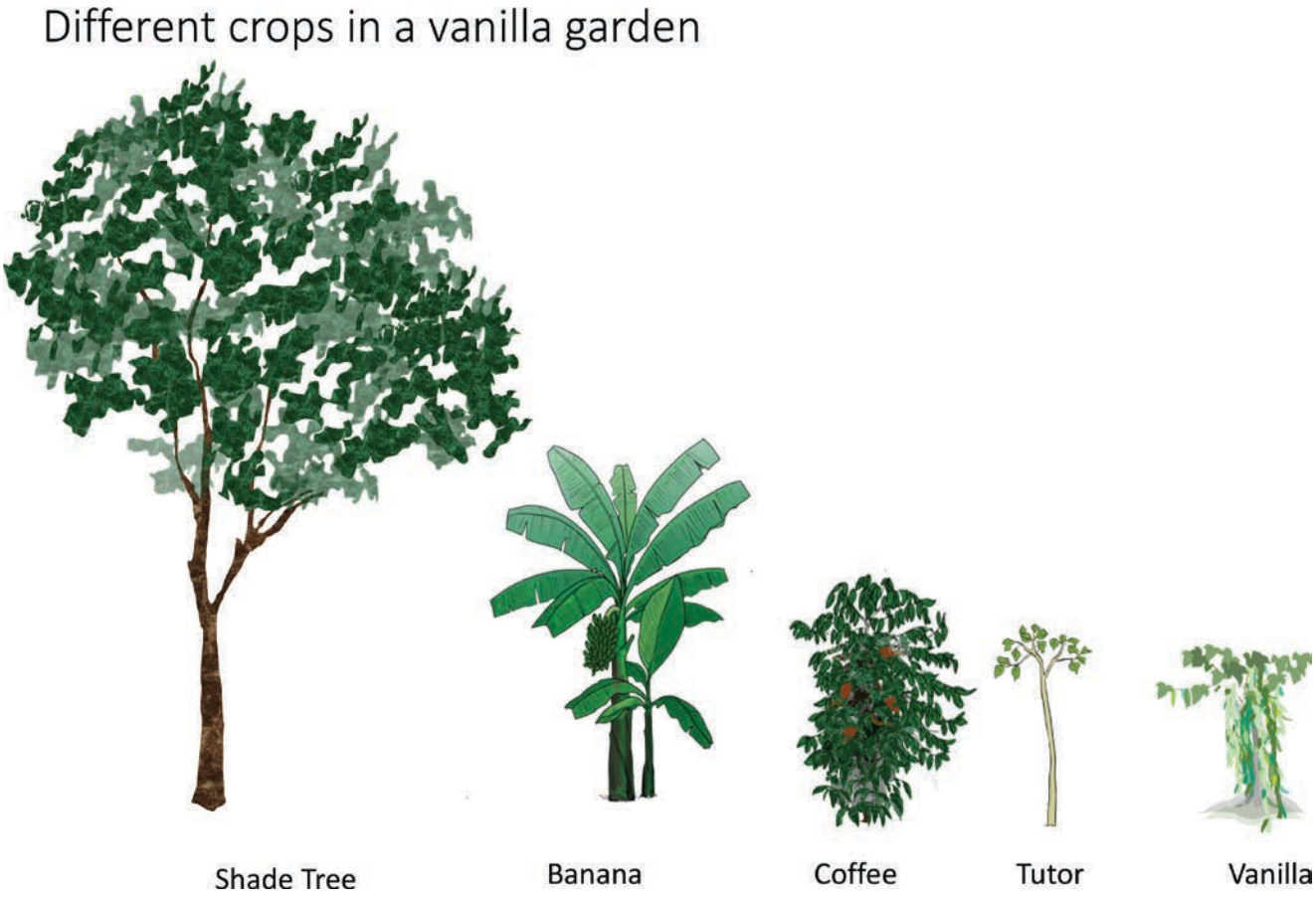
Example of shade and boundary trees in a vanilla garden

Handout 5.2 Form for shade and boundary tree costs

Shade tree costs	Units	Cost per unit UGX	Total UGX	US$	
Trees for shade					A
Live stakes for the boundary					B
Transport					C
Total		**A + B + C**			**D**
Size of field (hectares)					E
Total per hectare		D / E			F

CHAPTER 6.

Crop planting systems and spacing



Main types of crops in vanilla production systems

Technical information

Topics covered

- Vanilla cropping systems with banana and coffee.
- Improving an existing farm.
- Steps in establishing a vanilla garden.

Key messages

Mixed farming systems enable farmers to diversify their risks from single crop production. They make efficient use of labor and provide an immediate source of cash for buying farm inputs and to cover management costs.

Mixed farming systems include:

- **Intercropping**, where several crops are grown in the same field, preferably in rows.
- **Mixed farming**, where they grow different crops in different fields.

Adjusting the plant spacing can improve the production of the various crops in the farm.

Mapping their farms lets farmers calculate their current planting density and improve the planting density for vanilla.

Main vanilla crop planting systems and architecture

Vanilla should be grown using an agroforestry approach, which means combining crops with trees within the same field. The main intercropping combinations used in Uganda are:

- Banana – vanilla
- Coffee – vanilla
- Banana – coffee – vanilla

In addition, vanilla requires a "tutor", or support tree, to which it attaches itself. Both vanilla and coffee also require taller trees to provide shade.

To grow food crops other than banana, the farm household will have to discuss options and use a different field. This is for two reasons:

- Vanilla has shallow roots, and cultivating the food crops will damage them.
- There is too much shade in a vanilla plantation to grow food crops.

Banana – vanilla system

Farmers often grow vanilla intercropped with banana. The banana – vanilla system is probably the simplest one to establish as the spacing for banana and vanilla are the same: 3 x 3 m.

Growing banana together with vanilla has several advantages:

- The banana produces food as well as a regular cash income, as fruit can be harvested every month. The vanilla is harvested twice a year.
- Banana grows quickly and can provide shade for the vanilla while waiting for shade trees to grow.
- Banana produces leaf litter that can act as mulch around the vanilla plants.
- Growing several crops reduces the risk if bad weather damages one of them.

New gardens

Farmers who want to establish a new vanilla farm can clear land and plant the new garden with both crops. They should establish the banana at least one year before the vanilla so it gives adequate shade to the newly planted vanilla. See Lessons 7 and 8 for more information about the sequencing of planting for new farms.

Tall shade trees provide shade, but as it can take up to 5 years for them to grow and produce enough shade. In the meantime, banana is a good way to give initial shade for vanilla.

During the first years of a new plot, the farmer can grow other crops like beans and chili to provide soil cover, produce food, fix nitrogen in the soil and generate income. Farmers should choose intercrops and cover crops that can serve several purposes: nutritious food, vegetative cover and soil nutrients.

Existing gardens

Banana farmers can adjust their farming system to include vanilla by thinning out their banana plants to make space for the vanilla.

Plant spacing

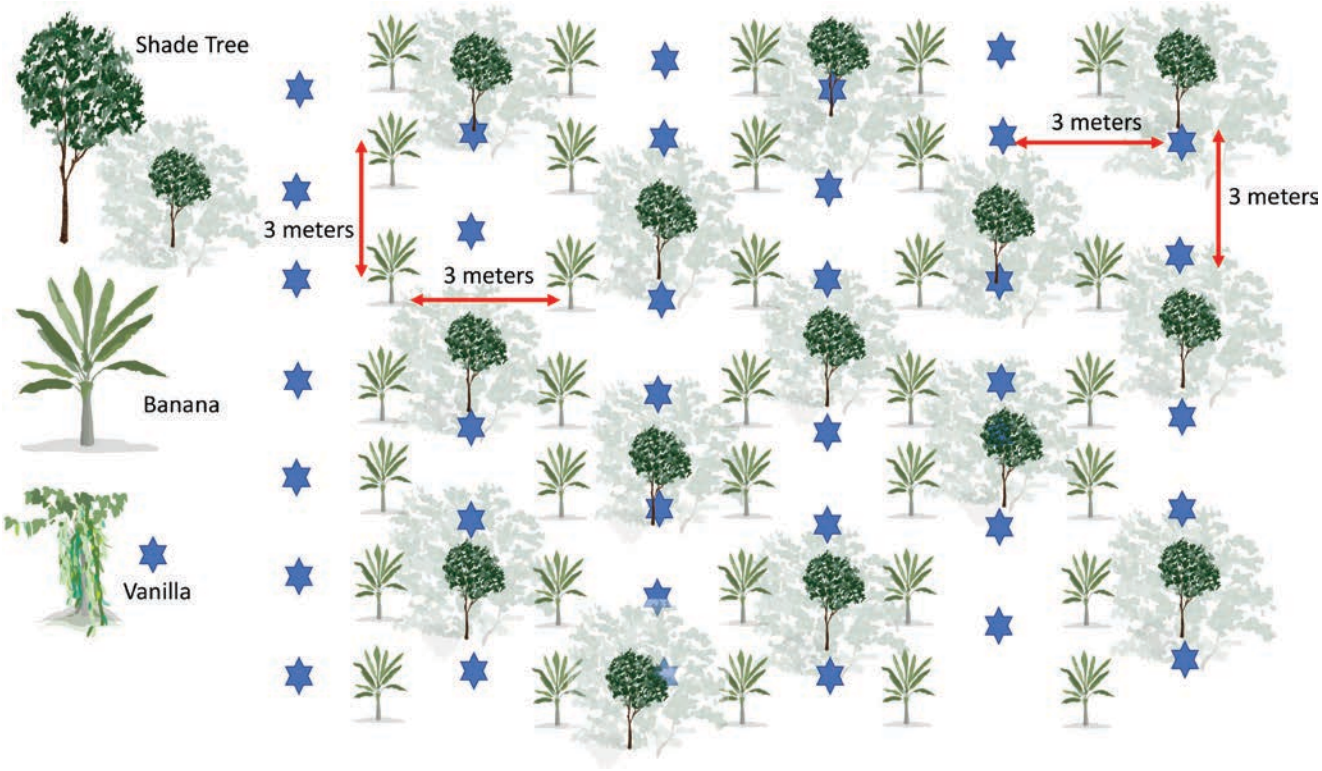
Both the banana and vanilla are planted at a spacing of 3 × 3 meters (9 × 9 feet) (Table T6.1). This will give a density of about 1,100 banana plants and 1,100 vanilla plants per hectare (about 440 per acre).

The shade trees should be spaced at a density of 15 × 15 meters (45 × 45 feet), or 42–50 trees per hectare (17–20 per acre). See the lesson on *Shade management* for details.

Table T6.1. Recommended spacings for one crop (either banana or coffee) grown with vanilla

Crop	Spacing		No. of plants	
	meters	feet	per hectare	per acre
Banana or coffee	3 × 3	9 × 9	1,100	444
Vanilla	3 × 3	9 × 9	1,100	444
Tutor trees	3 × 3	9 × 9	1,100	444
Shade trees	15 × 15	45 × 45	42–50	17–20

Figure T6.1 shows a plan of a mature banana – vanilla garden. The vanilla (planted next to tutors that support it) and banana are planted at a spacing of 3 × 3 m (9 × 9 feet). The shade trees are spaced at 15 × 15 m.



The blue stars show the positions of the vanilla plants.

Figure T6.1. Planting arrangements for banana and vanilla crop mix

If the crop density is too low, the individual plants may each produce a lot of yield. But the overall production per hectare will be low. The aim is to establish a spacing that optimizes production across the area. In an existing field, the aim is to adjust the number and locations of the plants so that the production is optimized.

Vertical layers

Figure T6.2 shows a cross-section of a banana – vanilla garden. This has three layers:

- A top canopy of tall shade trees such as musizi.
- A middle layer of banana.
- A lower layer of vanilla, supported by the tutors.

There is no ground layer of weeds. Weeds do not grow well in the garden because of the shade. The farmer takes care to remove any weeds that might cause problems for the vanilla.

Figure T6.2. Side view of a banana and vanilla garden

Coffee – vanilla system

Growing coffee together with vanilla has several advantages:

- Coffee fits well with vanilla as it also likes to grow under taller shade trees.
- Coffee produces leaf litter that can act as mulch around the vanilla plants.
- Both coffee and vanilla produce cash income, but their prices are not tied to each other. If the price of vanilla falls, the farm family can still earn money from the coffee and vice versa.
- The crops are harvested at different seasons, spreading the income throughout the year.
- Growing several crops reduces the risk if bad weather damages one of them.

New gardens

To establish a new farm, the farmer should plant both coffee and vanilla at the same time. However, this is possible if there are shade trees already in the field, that will provide shade to the coffee and vanilla. The shade trees will need to be pruned to provide the right balance of shade and light for the coffee and vanilla to grow. Alternatively you could plant coffee first and the shade trees, and later introduce vanilla when the shade is adequate.

During the first year, when there is little shade from the coffee and the tutors are growing, the farmer can grow other crops like beans and chili as intercrops between the rows of coffee and vanilla. It may even be possible to continue growing these other crops in the second year.

Existing gardens

If a farmer already has a coffee farm and wants to introduce vanilla, they will need to remove rows of excess coffee trees to make space for the vanilla. Both coffee and vanilla should have a spacing of 3 x 3 meters between plants of the same type.

Figure T6.3 shows a map of a mature coffee – vanilla garden. The vanilla (planted next to tutors that support it) and coffee are planted at a spacing of 3 × 3 m. The shade trees are spaced at 15 × 15 m.

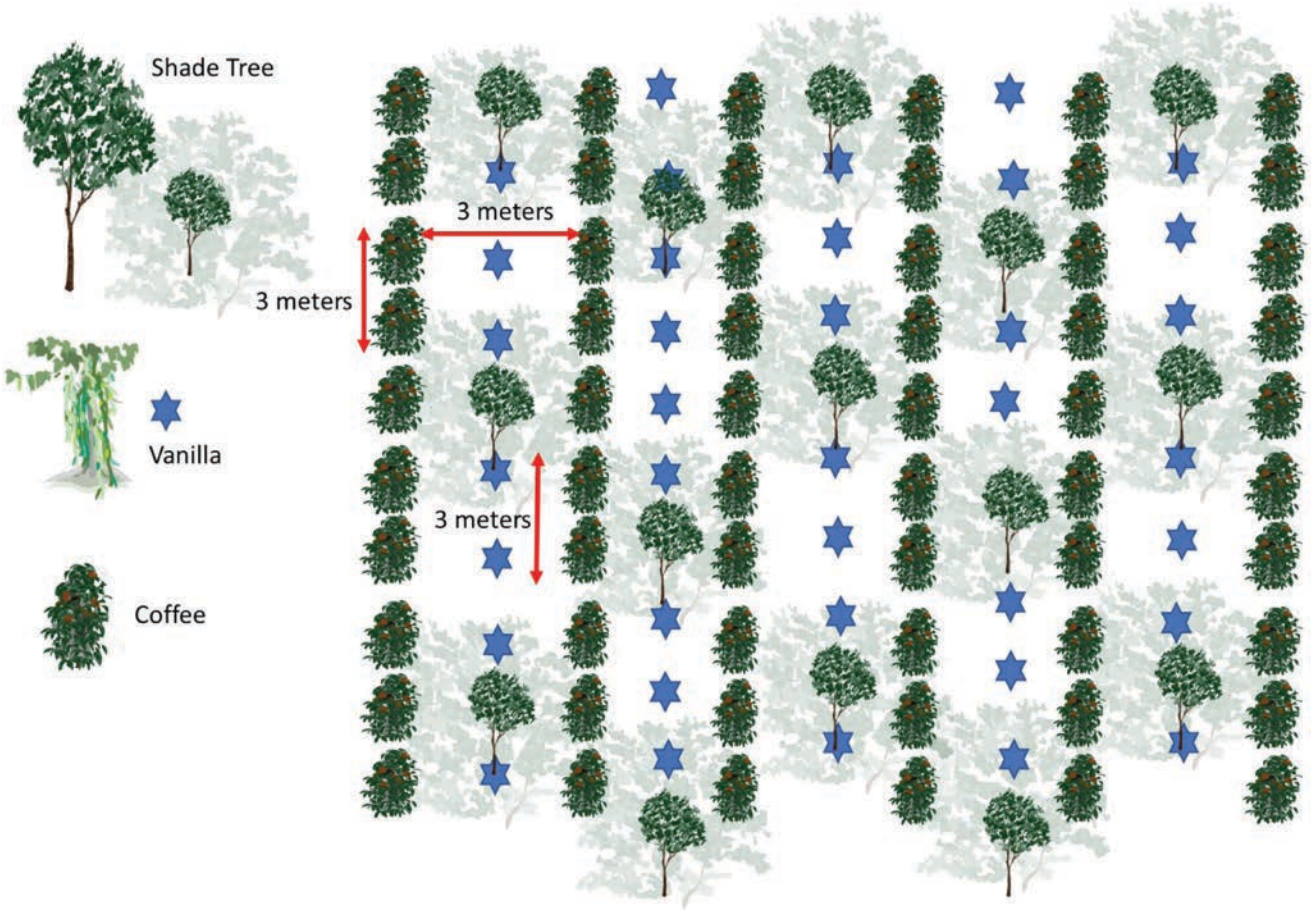


Figure T6.3. Spacing arrangement for a coffee – vanilla system

Vertical layers

Figure T6.4 shows a cross-section of a coffee – vanilla garden.

The garden consists of three layers:

- A top canopy of tall shade trees such as musizi and coconut.
- A middle layer of coffee
- A lower layer of vanilla, supported by the tutors.

There is no ground layer of weeds.

Figure T6.4. Side view of a coffee and vanilla garden

Banana – coffee – vanilla system

Both banana and coffee can be grown in the same field as vanilla. This has several advantages:

- Coffee, banana and vanilla can all grow under taller shade trees.
- The coffee and banana produce leaf litter which can be used as mulch.
- The coffee and vanilla produce cash income. The banana produces both food and cash.
- The three crops are harvested in different seasons.
- Growing several crops reduces the risk of bad weather damaging one of them.

Both intercrops (coffee and banana) can be planted in widely spaced rows at half the recommended density, while the vanilla is planted at a spacing of 3x3m (full density).

Figure T6.5 shows a map of a banana – coffee – vanilla garden. The vanilla (planted next to tutors that support it) and coffee. All the crops are planted at a spacing of 3 × 3 m or 9 x 9 feet. The shade trees are spaced at 15 × 15 m.

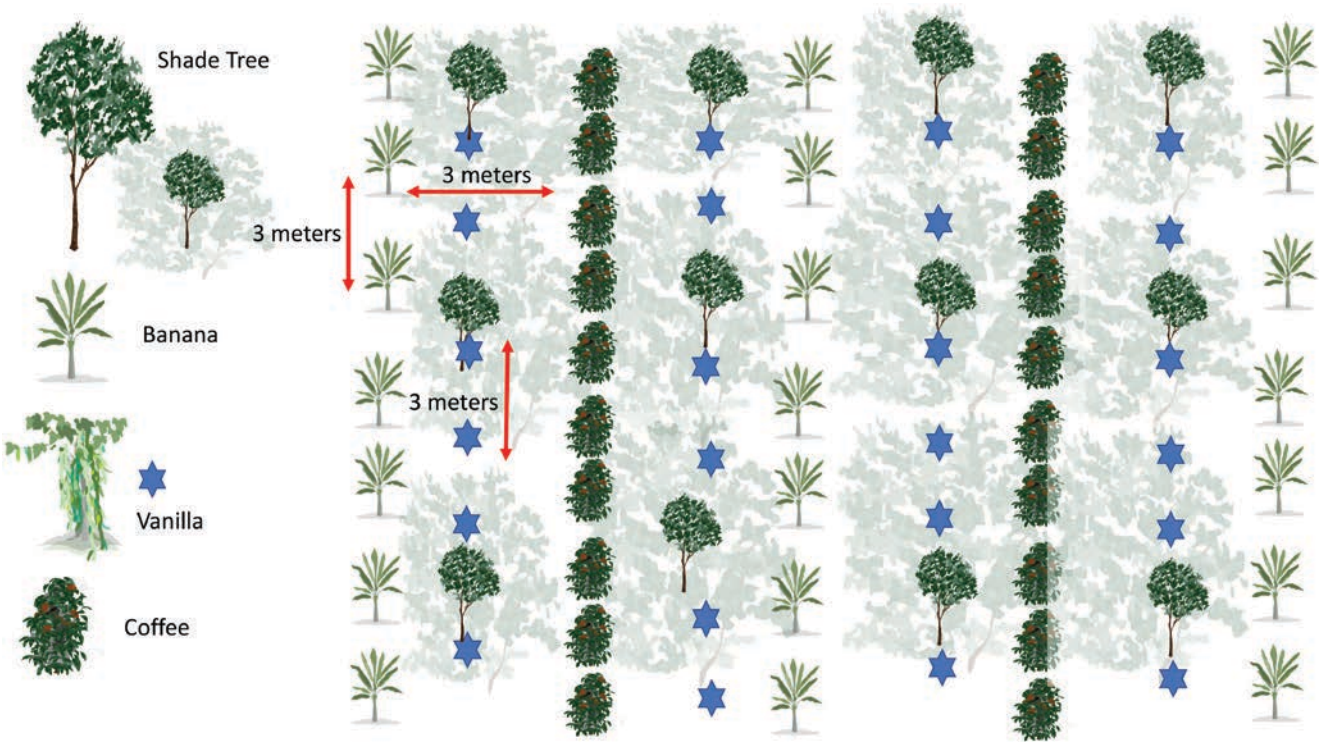


Figure T6.5. Spacing arrangement for a coffee – banana – vanilla system

Vertical layers

Figure T6.6 shows a cross-section of a banana – coffee – vanilla garden. The garden consists of three layers:

- A top canopy of tall shade trees such as musizi.
- A middle layer of coffee and banana.
- A lower layer of vanilla, supported by the tutors.

There is no ground layer of weeds.

Figure T6.6. Side view of a vanilla garden with both coffee and banana

Choosing the right agroforestry practice

Which combination of crops should farmers choose? This depends on:

- The type and amount of land they have access to.
- The crops they already have in the plot.
- Their skills and interests.
- The availability and affordability of planting materials.

The farmer and spouse both need to understand the labor and financial needs for establishing a vanilla garden.

- Can they generate enough money and have sufficient labor when needed?
- Will they have to give up, or change to other crops or activities? If so, what are the implications?
- Who will do the work?

They should make these decisions jointly. Even if one person within the couple does most of the work in the vanilla farm, their spouse and other family members will still be affected. They may have to do more of other types of work, or there may be less of certain types of food on the table. If growing more vanilla means producing fewer bananas, that may be a problem.

Steps in adding vanilla to an existing field

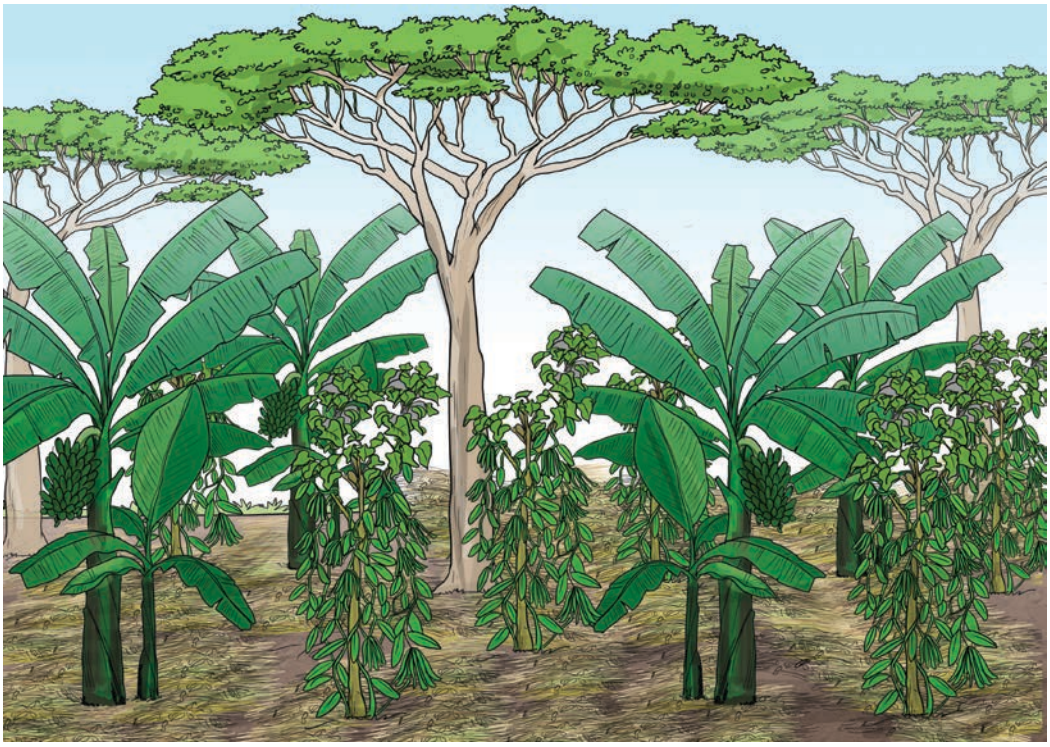
Farmers rarely start from scratch. They must adapt the farm they already have, to growing new crops. This may take several years. Here is one possible sequence:

Farmers removing and changing planting designs to improve production

1. Trim, prune or remove excess shade trees, and plant new shade trees if necessary.
2. Measure the spacing between the current crops.
3. Mark which plants to remove and which ones to trim to make space for the vanilla.
4. Remove or trim those plants.
5. Find another field to grow any crops they have eliminated.
6. Clear weeds.
7. Control erosion, if necessary, using contour bunds or other methods.
8. Plant new crops to fill in any gaps.

Farmers mulching the plot and staking out where to plant shade trees or vanilla

9. Mark where to plant the tutors and vanilla in rows. Prepare the soil in those locations.
10. Apply manure and compost.
11. Obtain tutors and plant them at the correct spacing.
12. Obtain vanilla vines and plant them next to the tutors.
13. Apply mulch.
14. Control weeds.



Well established vanilla garden

New field

The sequence for a new field is similar, except that there are no existing crops to worry about.

1. Decide with spouse what crops to grow as intercrops.
2. Plant shade trees (if not already present). Trim, prune or remove excess shade trees if necessary.
3. Clear land of weeds.
4. Prepare the soil (plow or hand hoe).
5. Install terraces or other soil- and water-conservation measures.
6. Prepare and apply manure and compost.
7. Obtain coffee or banana and plant them at the correct spacing.
8. Obtain tutors and plant them at the correct spacing.
9. Obtain vanilla vines and plant them next to the tutors.
10. Apply mulch.
11. Plant food crops such as beans and chili as intercrops.
12. Control weeds.

Lesson plan

Learning objectives

After this lesson, the participants will be able to:

- Plan (or replan) their vanilla farm.
- Decide what shade trees are needed and where to plant them.
- Decide what other crops to grow alongside vanilla.
- Mark out the locations for the vanilla vines.

Duration

3 hours.

Training periods

Any time in the production calendar.

Location

If possible, hold this lesson in an existing coffee or banana garden where the farmer wishes to grow vanilla.

If this is not possible, adapt the activities accordingly.

Introduction

Greet the participants and tell them the topic of this session: crop planting systems and spacing.

Ask the participants the questions in the Quiz to check what they already know about this topic.

Vanilla planting systems

Ask the participants how they grow vanilla. What are the main crops their household grows alongside vanilla in the same field?

Describe the three main vanilla cropping systems used in Uganda:

- Banana – vanilla
- Coffee – vanilla
- Banana – coffee – vanilla.

Ask the participants what else grows in the same field. (Answers: shade trees, tutors, perhaps food crops and weeds.)

Benefits of agroforestry

Ask the participants to describe the advantages and disadvantages of these systems according to their experience. Discuss the points they make. Make sure you cover the following aspects:

- Agronomic aspects: shade, humidity, mulch, windbreak.
- Effects on vanilla production: plant health, yield, production.
- Other products: source of food, income, fuelwood, timber.
- Reduced exposure to bad weather and price changes.

Plant spacing

Ask the participants what the best plant spacing is for the various crops. Discuss their opinions, then tell them the recommended spacings.

Ask them to measure the distance between the crops in the garden you are in. Is it too densely planted, too open, or just right? Use a tape-measure or a string with knots at one-meter intervals (put some colored cloth in each knot to make them easy to see) to help with measurements.

Is there the right amount of shade, too much, or too little?

Vertical layers

Ask them to look at the garden you are in. How many layers are there? What species make up the layers? Get them to make a drawing of the various layers.

Point out any problems there might be. (Too much/too little shade, wrong species, gaps, lack of a layer, weeds…)

Making a map

Orderly gardens

If you are in an orderly garden with plants in rows, get the participants to make a map of it.

1. Divide the participants into teams. Give each team a tape measure. Get the first team to count the rows of one crop (e.g., coffee) and measure the distances between the rows and between the plant within the rows.
2. Get another team to count the shade trees, identify the species, and measure the distances between them.
3. Get a third team to do the same for the vanilla (if the garden already has vanilla).
4. Get the participants to draw a map of the garden on a large sheet of paper, showing the location of each of the plants in the garden. Use B for banana, C for coffee, T for shade tree, and V for vanilla. Write the distances in meters or feet within and between the rows.
5. Work out the plant density for each species per hectare or acre.
6. Discuss what, if anything, needs to be done to make the garden more suitable for vanilla production. Are the solutions practical, or is it better to live with the current plant spacings because changing them would be too difficult?

Less orderly gardens

If you are in a less orderly garden where the plants are not in rows, it will be more difficult to make a precise map.

1. Get the participants to measure the typical distance between the plants.
2. Ask them to suggest how to establish rows of each crop. Ask them to mark out a few rows with string and sticks stuck in the ground.
3. Ask them to mark plants that should be removed, and places where new plants (crops or shade trees) should be planted.
4. Ask them how practical it would be to make these changes, or would it be better to live with the current situation and adjust the amount of shade through pruning and removing plants that are too densely spaced?

Steps to achieve the recommended spacing

Ask the participants what they would do to convert the current garden into an orderly vanilla garden. (If the garden is already orderly, ask them to look at the illustration of "Too much shade" in the handout.) Get them to list the steps in the right order. Write the list on a flipchart.

Does the solution affect potential food availability or reduce a family member's ability to earn money? If so, could there be alternative locations on the farm for these crops?

Planning activities

Ask the participants which of them needs to plan (or replan) their own vanilla garden.

Ask them, when they go home, to measure the plot and develop a map of their own garden like the one they have just made. Give them paper to draw the map on. Tell them to decide which crops to grow and to work out how many plants of each type they will need.

Conclusion

Summarize what the participants have learned during the session.

Repeat the questions you asked at the start of the session (see the Quiz). Correct any answers that the participants got wrong.

Tell the participants when the next meeting will be and what it will be about.

Quiz

1. What is the best spacing for vanilla in a garden?

2. What other crops can be grown with vanilla?

3. What is the best spacing for banana when grown with vanilla?

4. What is the best spacing for coffee when grown with vanilla?

5. What is the best spacing for tall shade trees in a vanilla garden?

6. How many vertical layers are there in a vanilla garden?

7. What are the advantages of growing banana with vanilla?

8. What are the advantages of growing coffee with vanilla?

9. How does establishing a vanilla garden affect financial and labor resources within the household?

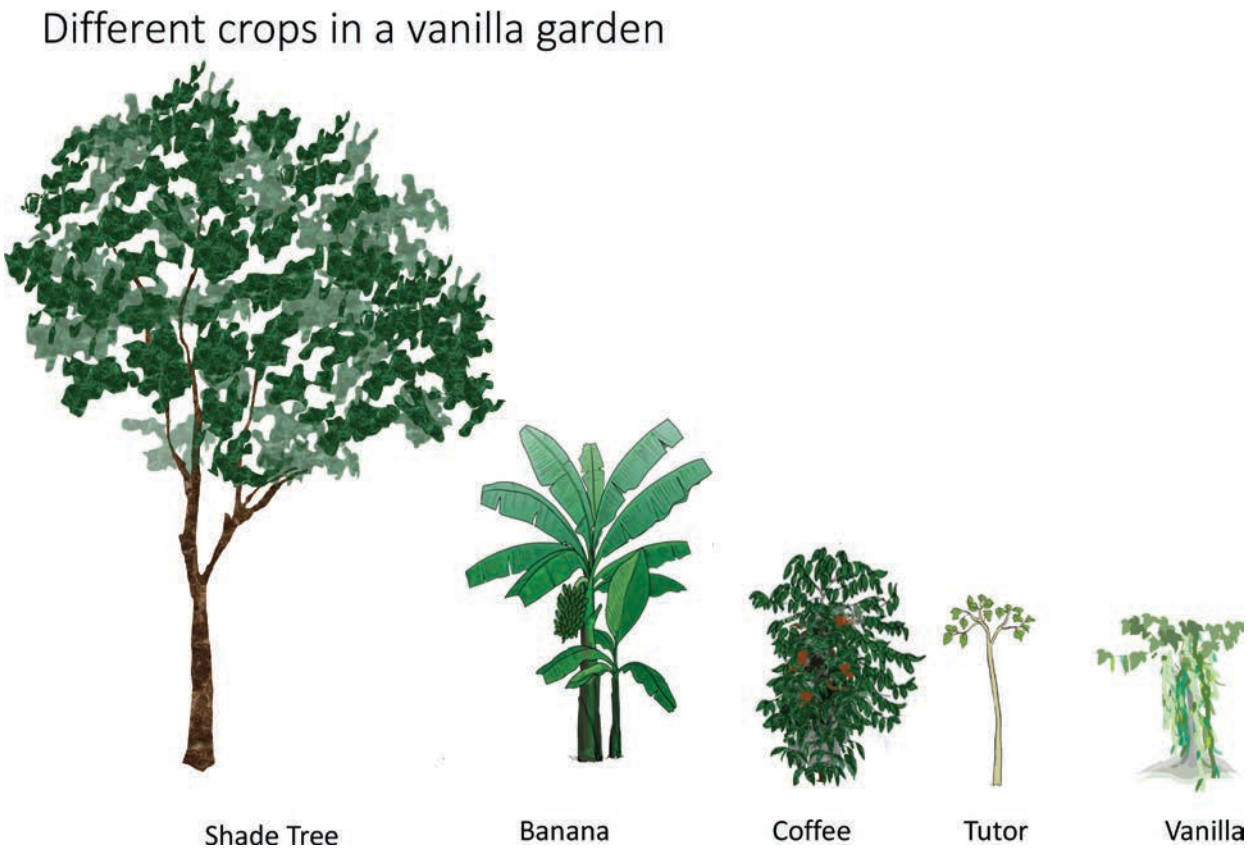
10. How does establishing a vanilla garden affect existing food crops and other income generating activities?

11. What constraints could male and female vanilla farmers face in deciding on their planting system and spacing?

Expected answers

1. 3 × 3 m (9 × 9 feet).
2. Coffee, banana. Food crops only in the first year.
3. 3 × 3 m (9 × 9 feet).
4. 3 × 3 m (9 × 9 feet).
5. 15 × 15 m (45 × 45 feet).
6. Three: shade trees, intercrops, and vanilla.
7. Shade, food, income, fast growth, leaf litter as mulch, reduces risk.
8. Shade, income, also grows under shade, leaf litter as mulch, reduces risk.
9. It takes labor and capital to set up and manage.
10. Clearing land for vanilla may reduce the output of food crops. The labor needed may prevent family members from doing other work, children may miss school.
11. Constraints in deciding what planting system to use could be affected by limited decision making within the household on land usage, insufficient finances to purchase the planting materials for the system being considered as well as workload constraints in transition to a new vanilla planting system.

Handout 6.1: Recommended spacings

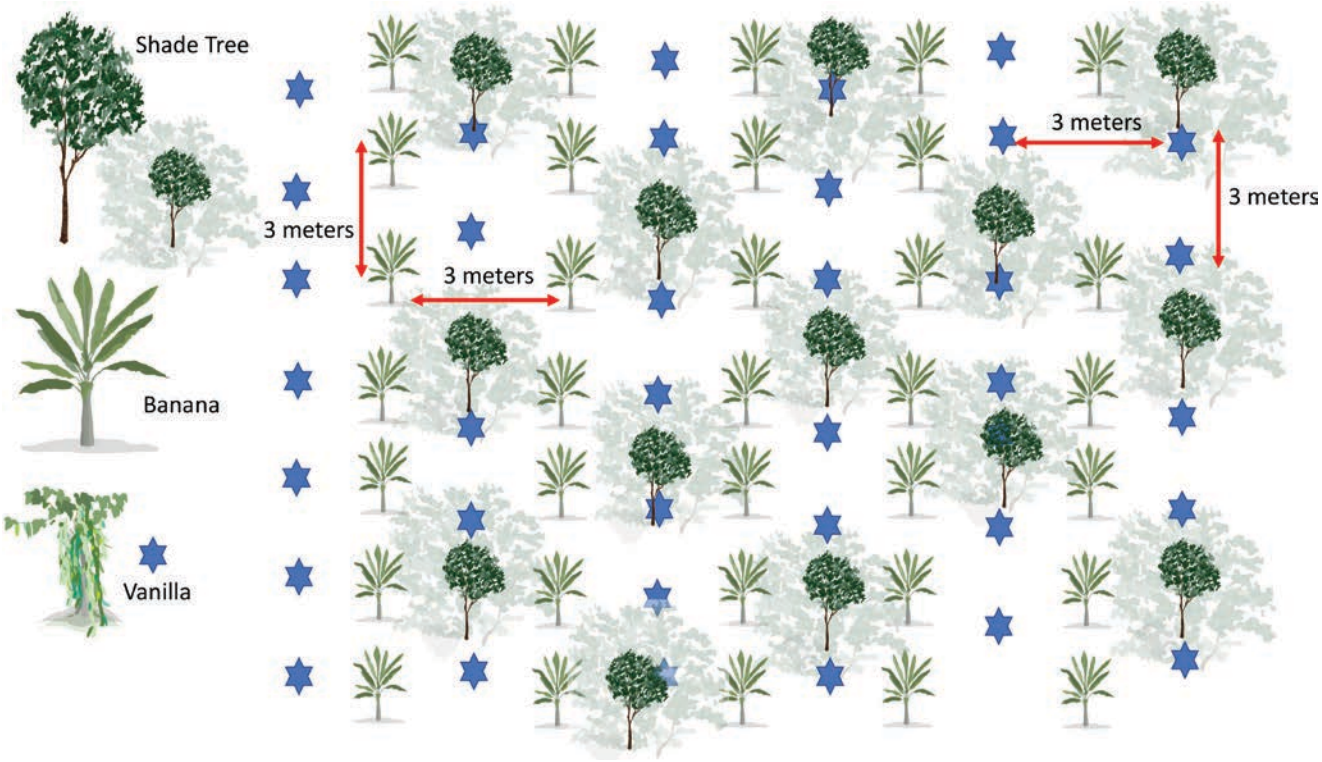


	Shade tree	Banana	Coffee	Tutor	Vanilla
Spacing meters	15 × 15	3 × 3	3 × 3	3 × 3	3 × 3
Spacing feet	45 × 45	9 × 9	9 × 9	9 × 9	9 × 9
No. per hectare	42–50	1,100	1,100	1,100	1,100
No. per acre	17–25	444	444	444	444

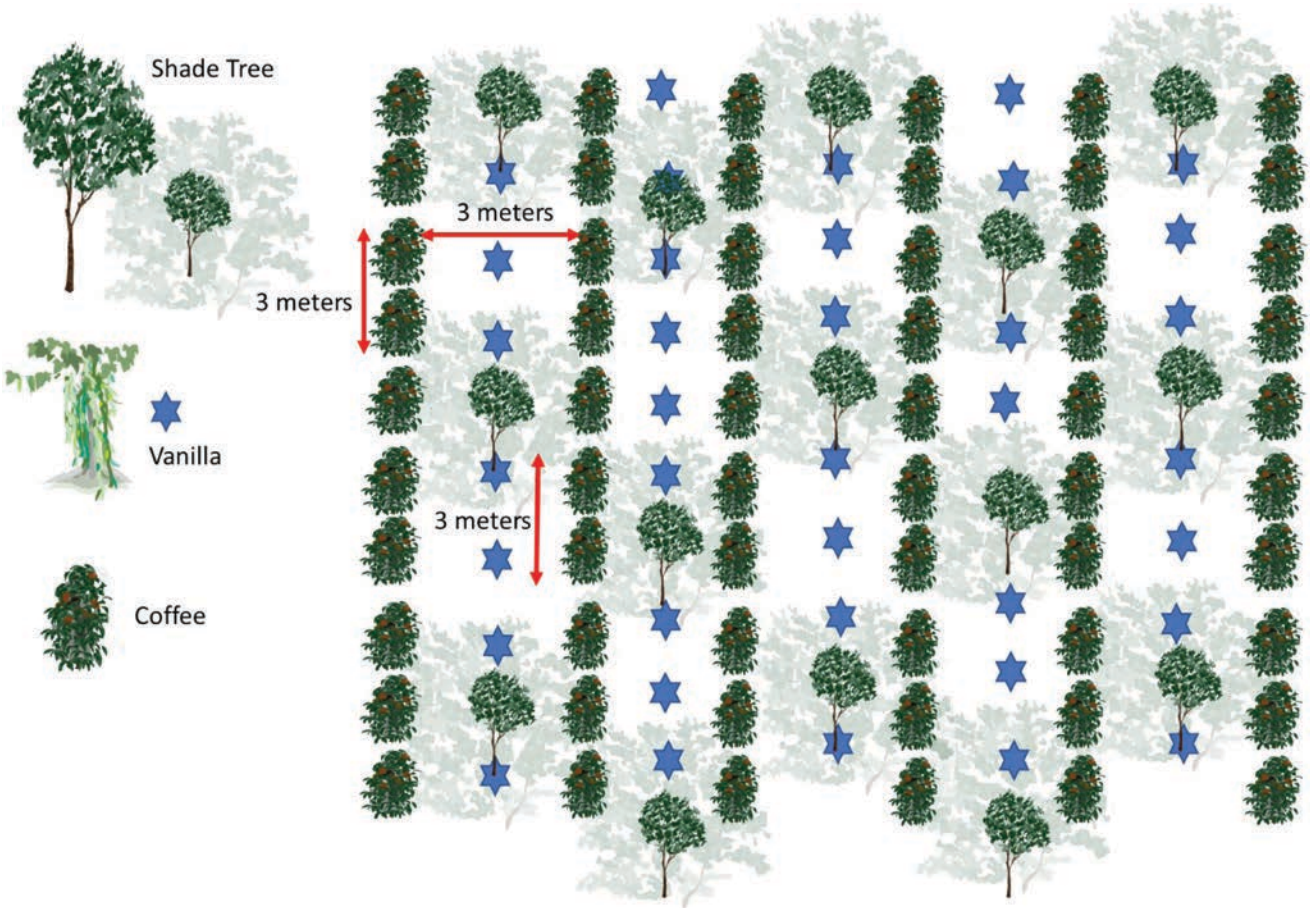
- Vanilla is grown with either banana or coffee or both at a spacing of 9x9 ft for both vanilla and the intercrop.
- If grown with both banana and coffee, then spacing and plant population for these intercrops should be adjusted to avoid overcrowding. You could alternate rows of banana and coffee.

Handout 6.2: Examples of farm plans

Banana – vanilla

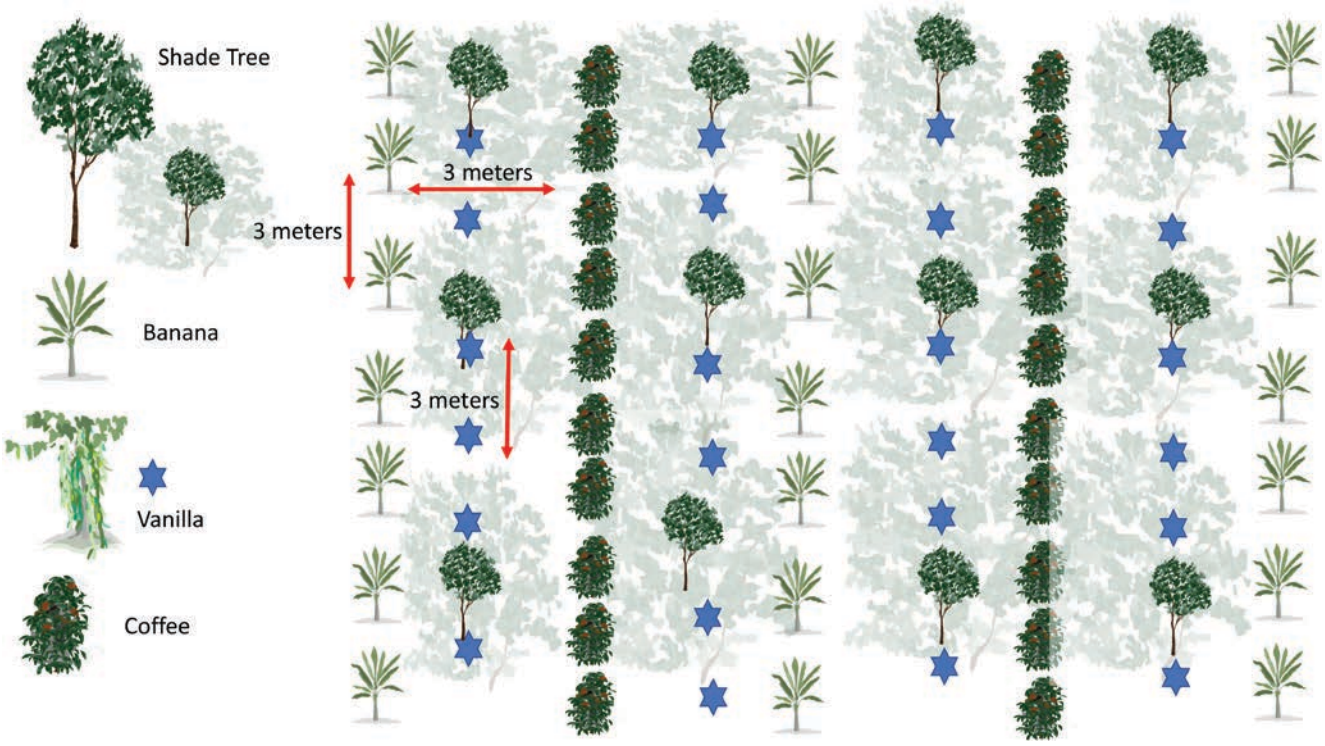


Coffee – vanilla



Handout 6.2: Examples of farm plans (continued)

Banana – coffee – vanilla



Handout 6.3: Amount of shade

Too much shade

Good shade

CHAPTER 7.

Soil and water management

Clean rows of crops with heavy mulch and a cover crop to keep water in the soil

Technical information

Topics covered

Chapter 4 on *Site selection, security and land preparation* covers some aspects of soil and water. Remind yourself of this chapter before reading on.

This current chapter focuses on how to manage the soil and water in a vanilla garden.

- How to identify soil and water problems in a vanilla plantation.
- How to overcome these problems by controlling erosion and using various types of compost, mulch and organic matter to improve the quality of the soil.
- How to make and use compost.

Key messages

Vanilla is a fragile climbing orchid with shallow roots. It is sensitive to the soil and water conditions.

Healthy vanilla requires a moist soil that is rich in organic matter and nutrients. The roots must be protected from the sun and from erosion by a deep layer of mulch.

Compost can be made easily from various types of farm waste and manure.

Soil and water problems

Symptoms of soil and water problems

- Vanilla, tutors or intercrops grow poorly or are unhealthy.
- Vanilla or intercrops produce low yields.
- The soil drains too easily and dries out too quickly.
- The soil is waterlogged.
- The topsoil lacks a dark layer with organic matter, or the dark layer is thin.
- No, or not enough, mulch on the soil surface.

Signs of erosion

- Heavy rainfall runs off rather than sinking into the soil.
- Mud and silt accumulate in depressions in the field.
- Rills (small furrows) running downhill form in the soil surface.
- The roots of vanilla and other plants are exposed.

Controlling erosion

Soil erosion can be a serious problem on slopes. It is especially a problem for vanilla because its roots are shallow.

Ways to control erosion:

- Plant the vanilla and all other crops in rows along the contour, not up and down the slope.
- Slow the flow of water down the slope by using trash lines (piling up dead vegetation along the contour), digging trenches along the contour, or building terraces with grass bunds.
- Keep the soil covered with cover crops or mulch.
- Maintain enough shade in the vanilla plantation. The canopy will break the force of the rain.
- Do not disturb the soil around the vanilla plants, as this will encourage erosion and damage the shallow vanilla roots. Pull out weeds by hand rather than using a hoe.

Intercrops and tutors

Choose intercrops and tutors that will maintain and improve the soil fertility. Other crops can be used to shade the soil and keep it moist, break the force of raindrops, and help reduce erosion. Pruning and leaf litter from the bananas and other intercrops and tutors can be used as mulch.

- Gliricidia makes good tutors and is a legume, which fixes nitrogen in the soil.
- The manure applied to intercrops may also benefit the vanilla plants.

Water management

The vanilla crop has shallow roots and to avoid drying out, the roots need a moist soil throughout the year. Vanilla does not grow if the soil is dry and or is waterlogged. Building up the organic matter of the soil helps increase its ability to hold water. Soils high in organic matter hold more water near the plant roots.

Such soils also absorb rainwater better. The surface of the soil, especially around the roots, should be covered with organic matter and litter.

Heavy rain may run over the surface of the ground, washing the soil away. If this is a problem, the farmer should try to slow down the speed of the water. This can be done by digging contour trenches, making contour bunds, and adding leaf litter and mulch to the soil. The slower the water moves, the more it soaks into the soil and is held there. Water logged conditions are not suitable for vanilla planting.

Mulch

Mulch is a layer of decaying leaves or dry grass that covers the surface of the soil. Vanilla likes a thick layer of mulch, as its roots are close to the surface. A good layer of mulch does several things:

- It protects the soil from the sun and reduces evaporation. It keeps the soil beneath moist.
- It protects the soil from the heavy raindrops, especially during storms, which prevents erosion during heavy downpours. Mulch also prevents the formation of a surface crust that causes runoff. Mulch gives water a chance to infiltrate and percolate into the soil and reduces erosion caused by running water.
- Mulch suppresses weeds.
- The decaying vegetation adds nutrients and organic matter to the soil.

Figure T7.1. Mulch protects the soil, keeps it moist, and suppresses weeds

Using mulch

Immediately after planting the vanilla, cover the area with a layer of mulch. Add more mulch regularly.

Materials that can be used as mulch include leaf litter, crop residues, dry grass, coffee husks, poultry litter, chopped-up banana stems, and household vegetative waste.

Apply a layer of 10–15 cm of mulch in the rooting zone of the vanilla. Keep the mulch away from the stem of the vanilla and tutor.

Do not use coffee husks as mulch in vanilla/coffee plantations as they might spread coffee diseases.

Manure and compost

Manure and compost are important in the following ways:

- They add nitrogen and other essential nutrients to the soil. This can reduce the need for inorganic fertilizers.
- They provide organic matter, which improves the soil's ability to retain water, its drainage characteristics and the ability of plants to absorb nutrients.
- They suppress weeds, plant diseases and pests.
- They encourage beneficial bacteria, fungi, mycorrhiza and other organisms that break down organic matter to create nutrient-rich humus.
- They store carbon in the soil.

Many farms have all the materials needed to make manure and compost on their farms, but do not use it properly. It is important to treat the material as a valuable resource, not as waste.

Types of manure

There are three main types of manure:

Animal manure or farmyard manure. Farmyard manure is the decomposed mixture of dung and urine of farm animals, along with straw, litter and left-over roughage or fodder fed to the animals. The best manure to use as fertilizer is poultry manure, then cattle dung. Make sure it is well decomposed (rotted down) before using it in a vanilla plantation. It takes at least 2-3 months to allow fresh manure to rot down into usable manure.

Animal manure

Fully decomposed manure

Figure T7.2. Animal manure is a valuable resource. Do not waste it

Figure T7.3. Mucuna (velvet bean) makes a good cover crop and green manure

Green manure (cover crops). Green manure or cover crops are crops that are grown and then plowed back or dug back into the soil. In an agroforestry system, cover crops can be grown as long as there is sufficient sunlight reaching the ground. Cover crops can be grown in the vanilla plantations in the first year before the canopy of the agroforestry system closes. As the agroforestry system matures, they will increase the shading and cover crops will not have enough light to grow well. However, cover crops can also be grown in field boundaries, or as alley crops between bananas. Legumes such as mucuna (velvet bean) and clover are good crops to use as green manure as they fix nitrogen.

Compost. Compost is the decomposed remnants of organic materials. It is usually of plant origin, but can also include some animal dung or bedding.

Figure T7.4. Turning over a compost pile

Applying manure and compost

You apply manure or compost at two main times:

- **Before or at planting.** Applying manure before or at planting time helps the intercrop, tutors and vanilla vines become established and grow.
- **During the year.** Apply 2–4 spades of well-decomposed manure or compost around the vanilla plant twice a year. Larger vines with more loops require more manure or compost.

How to make compost

There are two ways to prepare compost: fast and slow.

Fast composting

See the Youtube video: Eddie explaining composting in Uganda.

Step 1. Dig a pit 1 meter deep and 1 meter wide.

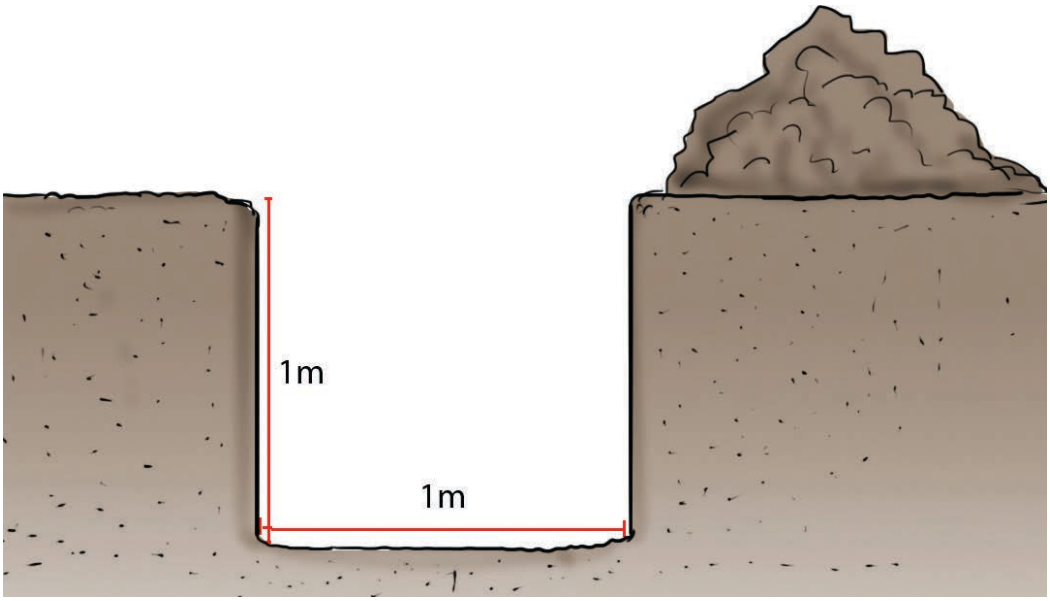
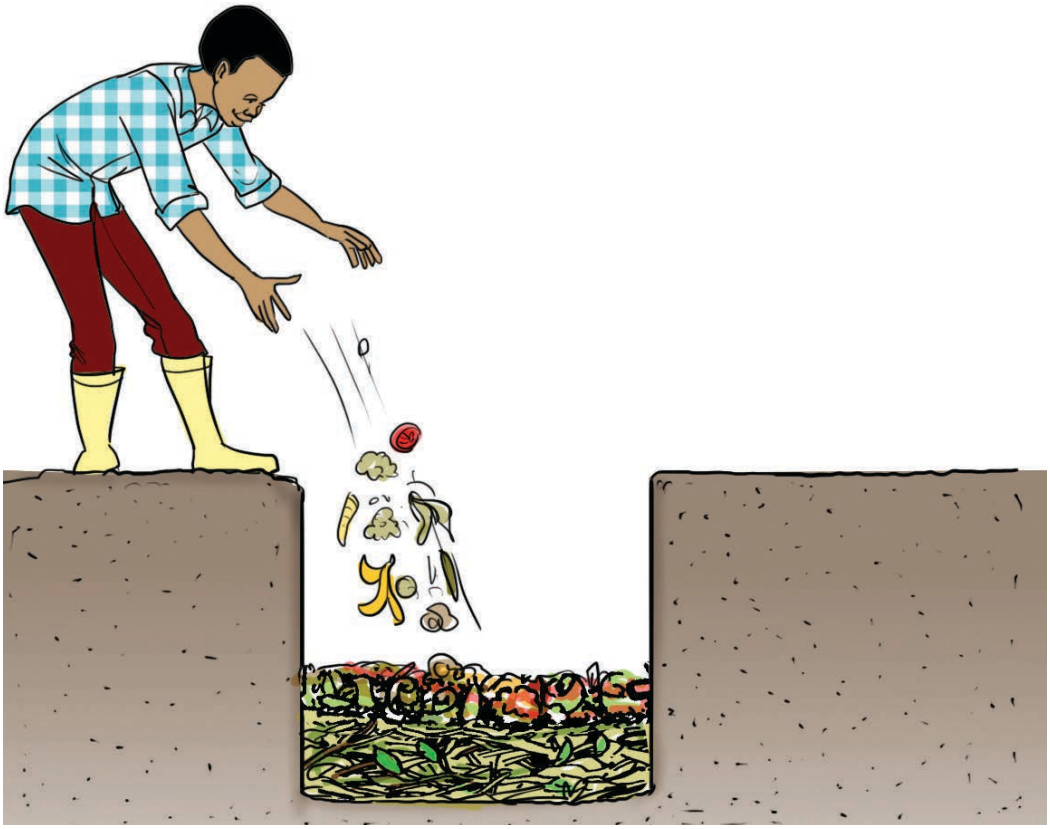


Figure T7.5. Making compost: first, dig a pit

Step 2. Add organic material that will be rotted down.

- Put dry material such as dried maize stalks or sticks in the bottom of the pit.
- Add a thin layer of dried leaves (banana leaves, maize leaves, etc.) on top, and sprinkle it with water from a watering can.



- Add a thin layer of animal dung or the straw from animal bedding. The dung contains lots of microorganisms that will make the pile decompose quickly and form compost.

Figure T7.6. Layers in a compost pit

- Cover that with a thin layer of the soil you have dug from the pit and sprinkle more water.

Figure T7.7. Adding water and more layers

- Add a thin layer of green grass, crop residues, weeds, other vegetation or kitchen waste.
- Build up the pile by adding more alternating layers of dried leaves, dung, soil and green vegetation. Add some water after each layer. Cover the pile with banana leaves and leave it to decompose. The cover keeps in the moisture and helps the compost materials to rot down.

Step 3. Cover the compost and allow to break down

- Stick a long pole into the center of the pile and leave it there. Pull it out every now and then and check the end. This stick is a thermometer: it should be warm. This shows the vegetation and dung are rotting and are forming compost.

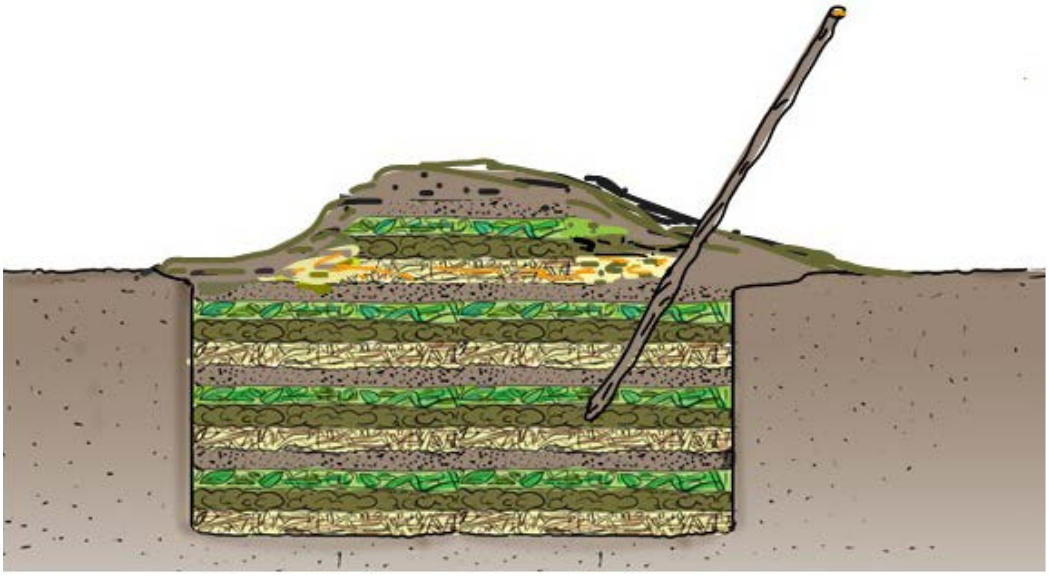


Figure T7.8. Cover the decomposing material and allow to rot down, add stick to test the temperature

Figure T7.9. Turning over the decomposing material

Step 4. Turn over the materials to speed up the process

- After 3 weeks, use a fork, spade or hoe to turn the pile over. Move materials on the outside of the pile into the center so they also rot.

Figure T7.10. Finished compost is brown, earth-like, crumbly and smells clean

- Turn again after another 3 weeks.
- The compost is ready to use after 6–8 weeks. It should be a clean-smelling, crumbly, earth-like brown substance.

Figure T7.11. Compost will be ready to use after 6-8 or more weeks

Slow composting

This method takes longer but is less work and can be used for materials such as sawdust that do not rot easily.

1. Dig a pit about 90 cm (3 feet) deep and 120 cm (4 feet) square.
2. Fill half the pit with material such as paper, branches, wood chips or sawdust.
3. Each day, add kitchen waste or vegetable peelings.
4. Add a layer of soil occasionally along with the kitchen waste.
5. Allow the contents of the pit to decompose.
6. Stick a long pole into the center of the pile and leave it there. Pull it out every now and then and check the end. This stick is a thermometer: it should be warm. This shows the vegetation and dung are rotting and are forming compost.
7. After 4 months, the compost will be ready to use. Take it from the bottom of the pit.

Fertilizer applications

It is best to get a soil test done before applying artificial fertilizer so that you apply the right mix. Ask a specialist how much fertilizer, and what type, is needed (if any). Check whether it makes economic sense to buy fertilizer. Ask about the best application method and time. Do not apply chemical fertilizers if you are growing vanilla or other crops on your farm for organic markets.

Do's and don'ts

Do's

Use locally available organic materials as compost or mulch to cut costs and increase the organic matter of soil.

Use intercrops and prunings from leguminous trees as mulch.

Do everything you can to increase the amount of organic matter in the soil. Use mulch, manure and compost, and sow legumes as cover crops or intercrops.

Don'ts

Do not burn crop residues or stubble. Keep the dead vegetation in the field (or on the farm) and use it as mulch or compost.

Do not put meat, bones, dairy products, oils or grease into the compost pit because these will attract vermin and may spread disease.

Let's talk about money

Before the lesson, find out the costs of making compost. This is likely to be mainly the cost of livestock manure (if farmers use it), as all the other materials come from their own farms.

Ask 4–5 farmers who make compost how much they make for their farm. Then question them about the size of the farm and the costs of the manure, transport and labor. Calculate the average cost per unit area among the farmers you interview.

Table T7.1 shows an example of how to calculate this.

Table T7.1. Example of costs of buying manure to make compost

	Units	Quantity	Cost	UGX	US$	
Cost of manure	1	1 tonne	100,000	100,000	28	A
Cost of transport	1	1 pick up	25,000	25,000	7	B
Cost of labor to make compost	2 workers	5 days	5,000/day	50,000	15	C
Mulch application	2 workers	1 day	5,000/day	10,000	3	D
Total			**A + B + C + D**	**185,000**	**50**	**E**
Size of field (hectares)				0.4	0.4	F
Total per hectare		E / F		462,500	128	G

Lesson plan

Learning objectives

After this lesson, the participants will be able to:

- Describe how to manage the soil and water for vanilla production.

Duration

2 hours.

Training periods

Any season.

Location

In a vanilla garden where the farmer wants to make compost, or already does so.

The farmer should have the materials to make the compost ready (see the list in the exercise on *Making and using compost* below). The farmer should also dig a pit in a suitable location beforehand if possible.

Ask the participants beforehand to bring their own spade or hoe and a panga so they can help with the work. Make sure that all the participants take turns in doing the work. This will keep them involved and help them remember the procedure.

If you cannot find a suitable location, then you can draw diagrams on a flipchart to explain what to do.

Session 1: Introduction

Greet the participants and tell them what the session is about: managing soil and water in the vanilla plantation.

Remind the participants about the session earlier in the course on site selection (see Lesson 4). Briefly review the information discussed then on soil and water.

When asking the following questions, remember to seek out information from diverse participants—men, women, elderly, youth, participants with disabilities.

Ask the participants how they can tell whether they have soil and water problems. Discuss these problems and the possible solutions.

Ask them if any have had a soil test done. Remind them how to do this (if it is possible to have a soil test in the area).

Erosion

Ask if they see anything in the field you are in that might indicate erosion. Remind them what the tell-tale signs of erosion are.

Point out what the farmer is doing to control erosion. Ask them what other things the farmer might do to prevent erosion. Ask them what they do to control erosion on their own farms.

Water

Ask the participants whether water is a problem in their farms, and if so, what they do about it.

Explain that vanilla needs moist, but not waterlogged soils. Ask them what they do to maintain the right amount of soil moisture in their vanilla gardens.

Mulch, manure and compost

Ask the participants how they care for the soil in their vanilla gardens. If someone mentions “mulch” or “manure” or “compost,” ask them what they do.

Group discussions. This exercise is suitable if a significant proportion of the participants have experience with various types of manure and mulch. If most or all of the participants have no experience, it will be better to present the information in a different way.

1. Divide the participants into four groups according to their experience and interests:
    - **Group 1: Livestock manure.** This group will discuss how to prepare and use livestock manure for use in a vanilla plantation. Give this group cards with these words written on them: *Source of livestock manure, Preparation steps, Use, Constraints*.
    - **Group 2: Green manure.** This group will discuss how to grow and use green manure for use in a vanilla plantation. Give this group cards with these words written on them: *Types of green manure, Preparation steps, Use, Constraints*.
    - **Group 3: Compost.** This group will discuss how to make compost for use in a vanilla plantation. Give this group cards with these words written on them: *Materials for compost, Preparation steps, Use, Constraints*.
    - **Group 4: Mulch.** This group will discuss how to use mulch in a vanilla plantation. Give this group cards with these words written on them: *Materials for mulch, Use, Constraints*.
2. Give each group a flipchart and a marker pen.
3. Ask each group to discuss the points written on the cards. For example, Group 3 should discuss what materials to use to make compost, how they would go about making compost, and how they would use it.
4. Ask each group to consider the constraints the adult men and women, young men and women and people with disabilities may face with each of these activities. Think about issues related to accessing the inputs, energy and time needed? How can these constraints be addressed?
5. Give them a few minutes to discuss and write down their ideas. Go around to check that the discussion is focused on the right topics.
6. Ask each group in turn to report back to the plenary.
7. Invite the group to discuss the responses. Make sure the points in the *Technical information* manual for this lesson are covered.

TAKE A BREAK

Session 2: Making and using compost

Materials required

- Materials for composting: Sticks and dry matter, animal dung, green vegetation (grass, crop residues or weeds), kitchen waste, etc.
- Water supply, watering can.
- Hoes, machetes, wheelbarrow, long stick to use as thermometer.
- Bowl or basket of finished compost (bring this with you if the farmer does not already have some).

Suggested procedure

1. Go to where the farmer wishes to make compost.
2. Ask the participants to check the soil. Is there a danger of erosion? Are there any signs of erosion? (Dig a hole to check how deep the organic layer in the topsoil is.) Is there enough mulch? Is there enough shade?
3. If the farmer has not yet dug a pit, ask where it should be. Discuss the pros and cons of the location: distance to the vanilla field, distance to the source of composting materials, availability of water, shade.
4. When a suitable site is chosen, get the participants to dig a pit 1.2 × 1.2 m (4 feet) square and 1 m deep. Get them to heap the soil to one side.
5. Get the participants to put the materials into the pit in layers: sticks, dried leaves, dung, soil, green material and kitchen waste. Get them to sprinkle water on each layer with a watering can. Build up as many layers as there is material available. Cover the pile with banana leaves.
6. Push the long stick into the center of the pile. Explain how to use it as a thermometer.
7. Ask the participants how long it will take for the materials to decompose. Explain how to turn the pile after 3 weeks.
8. Show the can of finished compost (or if the farmer already has another compost pile, check whether this is ready). Explain how to apply the compost to the vanilla.

TAKE A BREAK

Session 3. Let's talk about money

1. Ask the participants where they get the materials to use as mulch in their vanilla garden. (Answer: Probably from their own farm.)
2. Ask them whether they use livestock manure to make compost. Explain that this is a valuable source of soil nutrients. Ask them where they get the manure. (Answer: if they use it, probably from an outside farm.)
3. Some of the participants may keep livestock and already use manure. Others may have animals but not use their manure. A third group may have no livestock, so will have to get the manure from outside.
4. Ask the participants how much it costs to get the manure.
5. Ask for one person who buys manure to act as a volunteer. Ask them the following questions and use the information to fill in the form in the *Handout*.
   - How much compost do you need each year for your vanilla garden (in tonnes or pick-up loads?
   - What is the area of your vanilla garden?
   - How much does it cost to buy 1 tonne of manure?
   - How much labor does it cost to collect the manure?
   - What are the transport costs?
   - How much labor is needed to apply the mulch?
6. Use this information to fill in the form.
7. Work out the cost of each item and calculate the total cost for the plot. Write this in the form.
8. Calculate the total per hectare and write this in the form.
9. Discuss with the participants whether these costs are realistic. Are they too high or low? Where can they find the money at the right time? What constraints are they likely to face in having the money at the right time?
10. Remind the participants of the importance of mulch to increase the yield of the vanilla.

Planning activities

Ask the participants, at home, to check their vanilla gardens for signs of soil and water problems, and to work out how to correct these.

If they do not already have a compost pit, suggest they dig one and start to make compost.

GENDER TIP

To learn more about who does the work and if there are any critical constraints, split the group members into single-sex groups. Each small group will discuss:

- barriers/ constraints they may face in making a compost heap for organic matter?
- ideas to overcome these different constraints.

Have each group share out their constraints and ideas on how to overcome them. Note constraints and which ideas can be done to overcome them, and where there were no identified solutions so that you can support processes to help address key constraints.

Conclusion

Briefly review what you have covered in the session. Ask if there are any questions.

Ask the questions in the Quiz to make sure that the participants have understood the content.

Thank the participants for their attention. Tell the participants when the next meeting will be and what it will be about. Tell them what they will need to bring with them.

Quiz

1. What are the signs of soil and water problems in the field?

2. How can you tell whether erosion is a problem?

3. What can be done to prevent erosion in vanilla plantations?

4. How can intercrops and tutors help improve the soil?

5. Why is mulch important for vanilla?

6. What materials can you use as mulch?

7. What are the three main types of manure and compost?

8. How can you make compost?

9. When, and how often, should you apply manure or compost?

Expected answers

1. Poor plant growth, unhealthy plants, poor yields; soil dries out too quickly or becomes waterlogged, lack of organic matter.
2. Heavy rain runs off rather than seeping into the soil; mud and silt accumulating in depressions, rills forming downslope; roots exposed.
3. Don't plant on steep slopes; plant along the contour; use trash lines, contour trenches or bunds made from grass; keep the soil covered; maintain shade to break the impact of raindrops; don't disturb the soil around vanilla plants.
4. The shade keeps the soil moist. They break the force of raindrops and help prevent erosion. Leguminous tutors such as Gliricidia fix nitrogen in the soil. Prunings and leaf litter can be used as mulch. Manure applied to intercrops benefit the vanilla.
5. Vanilla has shallow roots. Mulch protects the soil and keeps it moist. Mulch suppresses weeds. It adds organic matter and nutrients to the soil as it decays.
6. Leaf litter, crop residues, dry grass, coffee husks, poultry litter, chopped-up banana stems, and household vegetative waste. Do not use coffee husks in vanilla/coffee plantations.
7. Animal manure (or farmyard manure), green manure, and compost.
8. Dig a pit, put in alternating layers of dry matter, animal dung, soil, green matter and kitchen waste. Sprinkle each layer with water. Leave for 3 weeks, then turn the pile over and wait another three weeks.
9. At planting and twice a year after that.

Handout 7.1: Soil and water management in a vanilla farm

Soil and water problems

- Poor growth of vanilla, tutors or intercrops.
- Unhealthy vanilla, tutors or intercrops.
- Poor yields of vanilla or intercrops.
- Soil drains too easily and dries out too quickly.
- Soil is waterlogged.
- Topsoil lacks dark layer with organic matter, or the dark layer is thin.
- No, or not enough, mulch on the soil surface.

Signs of erosion

- Heavy rainfall runs off rather than sinking into the soil.
- Mud and silt accumulate in depressions in the field.
- Rills (small furrows) running downhill form in the soil surface.
- Roots of vanilla and other plants are exposed.

Controlling erosion

- Soil erosion can be a serious problem on slopes. It is especially a problem for vanilla because its roots are shallow.

Ways to control erosion:

- Plant the vanilla and all other crops in rows along the contour, not up and down the slope.
- Slow the flow of water down the slope by using trash lines (piling up dead vegetation along the contour), digging trenches along the contour, or building terraces with grass bunds.
- Keep the soil covered with cover crops or mulch.
- Maintain enough shade in the vanilla plantation. The canopy will break the force of the rain.
- Do not disturb the soil around the vanilla plants, as this will encourage erosion and damage the shallow vanilla roots. Pull out weeds by hand rather than using a hoe.

Mulching

What it is

- Covering the soil with a layer of decaying leaves or dry grass.

Why mulch

- Vanilla has shallow roots, so is susceptible to the soil drying out, if not mulched.

Uses of mulch

- Protects the soil from the sun and keeps it moist.
- Prevents erosion and reduces runoff.
- Suppresses weeds.
- Adds nutrients and organic matter to the soil.

Mulch protects the soil, keeps it moist, and suppresses weeds

Handout 7.2: Manure

Animal manure

Dung, bedding from livestock stable

Animal manure is a valuable resource. Do not waste it

Green manure

Crops such as mucuna and clover, grown and plowed back into the soil.

Mucuna (velvet bean)

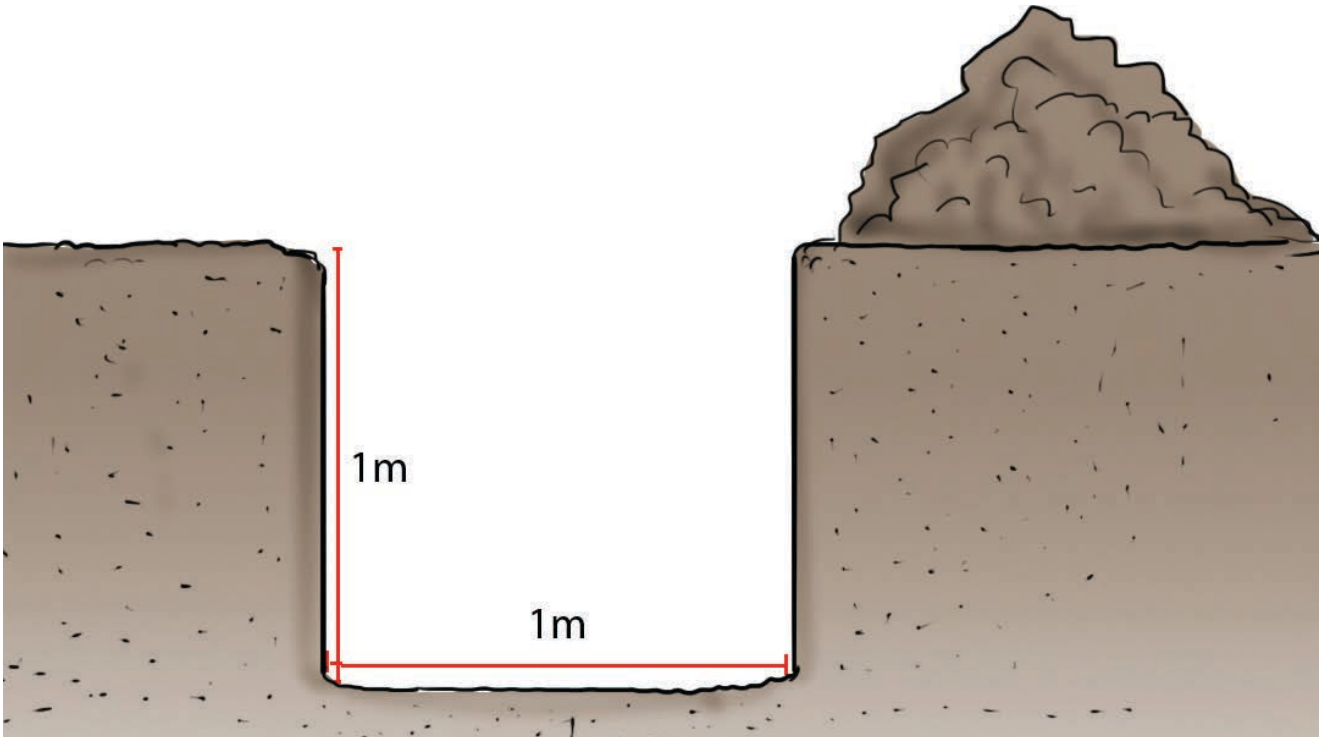
Compost

Plant material and manure that is rotted.

Handout 7.3: Fast composting

Youtube video: Eddie explaining composting in Uganda. https://www.youtube.com/watch?v=XCGMjyw5i4k

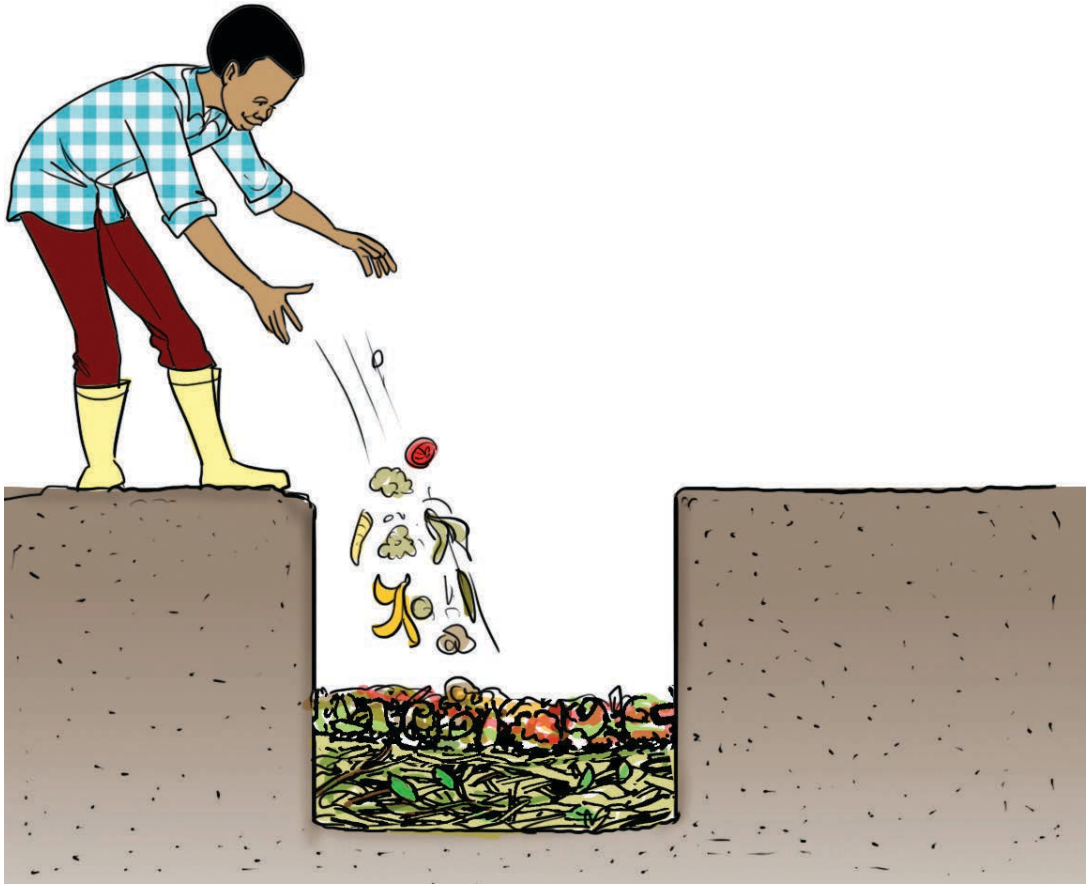
Step 1. Dig a pit 1 meter deep and 1 meter (3 feet) square.



Making compost: first, dig a pit.

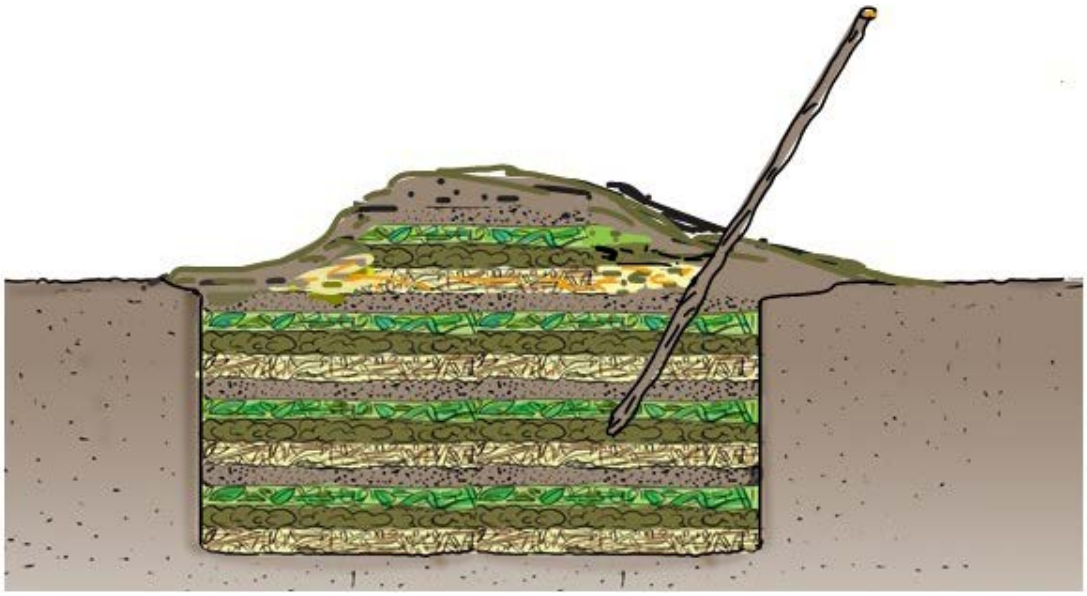
Step 2. Add organic material

- At the bottom: dried maize stalks or sticks.



- Alternating layers of dried leaves, dung or animal bedding, soil, green vegetation, kitchen waste. Add water after each layer.

- Fill the pit in with layers of materials and then cover with soil.



Step 3. Cover the compost and allow to break down

- Stick a long pole into the center of the pile and leave it there. Pull it out to measure the temperature, if it feels warm the composting process is working.

Step 4. Turn over the materials to speed up the process

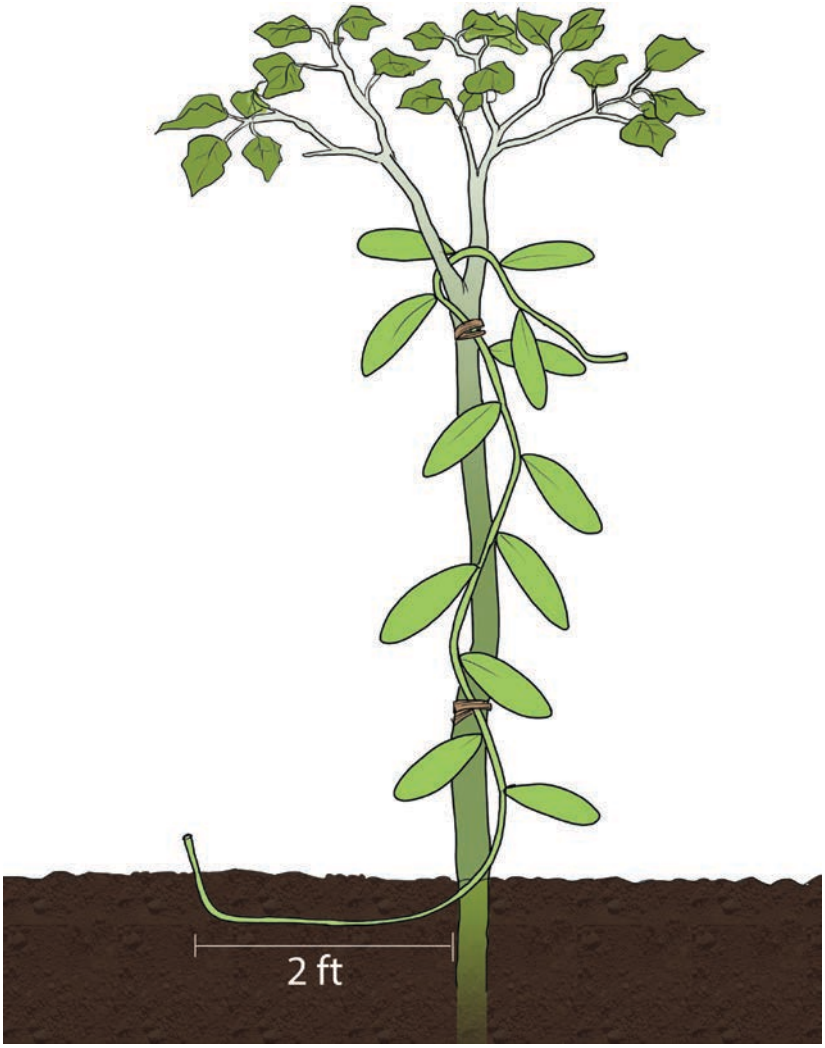
- After 3 weeks, turn the pile over. Turn again after another 3 weeks. The compost is ready to use after 6-8 or more weeks.

Handout 7.4: Form for calculating the cost of manure

	Units	Quantity	Cost / day	UGX	US$	
Cost of manure						A
Cost of transport						B
Cost of labor to make the compost						C
Mulch application						D
Total			**A + B + C + D**			**E**
Size of field (hectares)						F
Total per hectare			E / F			G

CHAPTER 8.

Planning and planting tutors



A tutor is a small tree that supports the vanilla vine

Technical information

Topics covered

- How to select the right type of tutors for a vanilla plantation.
- How to calculate how many tutors are needed.
- How to plant and care for the tutors.

Key messages

Tutors are small trees that support the vanilla vine.

Suitable species include jatropha and gliricidia.

Plant tutors in rows at the same spacing as for vanilla (3 × 3 m), several months before planting the vanilla vines next to them.

Keep the tutors pruned to a height of 2 m.

What is a tutor?

Vanilla is a climbing vine. It needs a tutor (support tree) on which to grow.

Figure T8.1. A vanilla plantation showing vines growing up the tutors

What makes a good tutor

Tutors should be:

- Readily available.
- Grow quickly.
- Have strong branches at about head height (about 1.8 m or 6 feet) to support looping.
- Able to be pruned regularly.
- Give some shade.

They should also:

- Fix nitrogen in the soil.
- Tolerate pests and diseases.
- Have leaves that when pruned will provide mulch and rot down quickly to produce nutrient-rich manure.

Suitable tutor species

Several tree species can be used for vanilla tutors. The most commonly used tutors in Uganda are jatropha and gliricidia.

These species provide adequate shade, can be trimmed to develop branches at about 2 meters high, are resistant to termites, are tolerant to long dry spells, and are easy to prune.

Gliricidia is leguminous (it fixes nitrogen in the soil). The leaves provide good fodder, and the leaves also make good mulch. The leaves decompose readily to provide good manure.

Jatropha

Gliricidia

Figure T8.2. Suitable species for use as tutors

Planning for planting

Each vanilla vine requires one tutor, so the location and number of tutors determine the location and number of vines in the garden.

If they have not already done so, the farmers with their spouses or partners will need to work out how many vanilla vines they want to cultivate and where they will be sited in the garden. That in turn depends on the size of the garden.

They will also need to work out the costs of the tutors and the vines and the labor needed to plant them. They will need money to pay for the planting materials and any hired labor to assist with the planting.

When to plant tutors

Tutors should be planted several months ahead of the vines so that they are well rooted and can carry the weight of the growing vine. Ideally that means planting the tutors during the rainy season, 4–5 months before planting the vanilla. Since Uganda has two rainy seasons, tutors can be planted in one rainy season and vines planted in the following rainy season.

Before the vines are planted, the tutor should have a stem about 5 cm (2 inches) thick and be about 1.8 m (6 feet) tall so that it can support the vanilla vine. Avoid planting tutors and vanilla at the same time.

Where to get tutors

You can collect tutors yourself. This is easier if you have your own plantation or hedgerow of a suitable species. Calculate how many tutors you will need and whether you can harvest enough of the right length and thickness. If you have a large plantation of the right species, you can consider selling tutors to other farmers.

It may be difficult to find enough tutors of the right quality. Therefore, it may be better to buy them. Find someone who knows the requirements and who can supply the right number of cuttings at the right time. Agree on the price.

If you cannot get enough tutors at the same time, consider obtaining them in stages: some in this rainy season, and some in the next. You may have to stagger planting the vanilla to match the number of tutors you have available.

How many tutors

The recommended spacing for tutors (and for vanilla) is:

- 3 × 3 m (about 1,000 per hectare), or
- 9 × 9 feet (about 440 per acre).

How to select tutors

1. Tutors are branches cut from a mature tree. They should be straight, 2.5 m (7.5 feet) long and be at least 5 cm (2 inches) thick.
2. Remove any leaves and any side/short branches from the main stem, leaving one or more short branches and leaves at the top end. These will grow and are needed later to loop the vines around.
3. Tutors should be planted within 3-5 days from being harvested to avoid losses due to wilting.
4. Use a panga to cut the bottom end into a wedge shape (a slanted cut about 5–10 cm long at the bottom of the cutting. This increases the surface area, making it easier for the cutting to absorb water and form roots quickly.

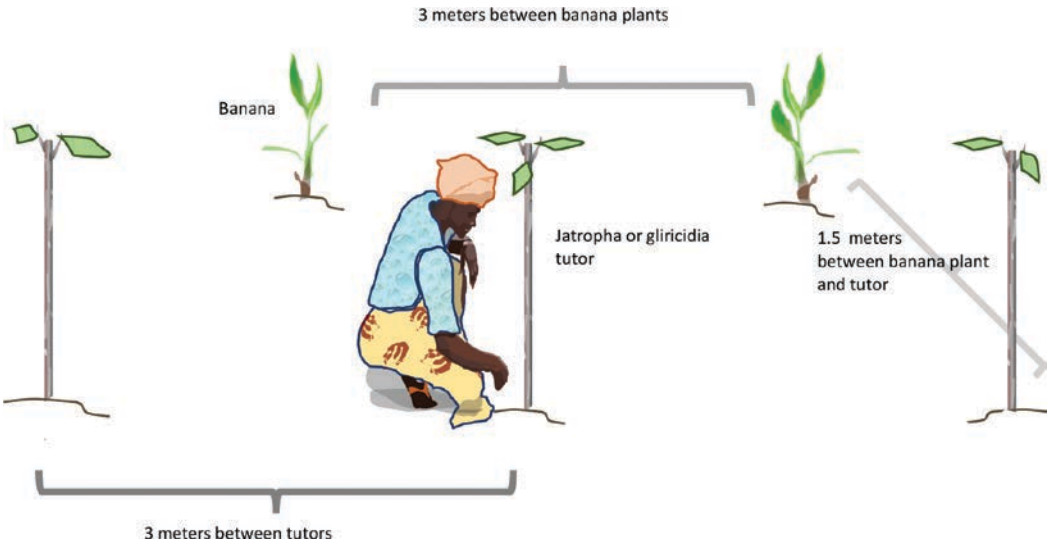


Figure T8.3. Tutors and the intercrop (such as banana) should be spaced at 3 × 3 meters

How to plant tutors

You should prepare the planting holes before obtaining the tutor cuttings.

1. Mark out the locations for where to plant the tutors. The best spacing is in rows at a spacing of 3 × 3 m (9 × 9 feet).
2. Dig holes about 20 cm (8 inches) in diameter and 30 cm (1 foot) deep.
3. Put about 10 cm of loose soil and some compost (if available) in the hole. The bottom of the tutor cutting will rest on this loose material, not on the hard soil at the bottom of the hole.
4. When you have prepared all the planting holes, you are ready to obtain and plant the tutor cuttings.
5. Stand the cutting in the center of the hole and fill the hole with the rest of the soil. Firm the soil down by treading on it.
6. Plant the tutors after it has rained and the soil is moist. If possible, water the tutors after they have been planted.
7. It will take 4–6 weeks for the cutting to put down roots. You can tell if the rooting is successful if the cutting starts to grow new leaves. Keep it watered if necessary.
8. Replace any cuttings that have not started producing leaves after about 4 weeks after planting.

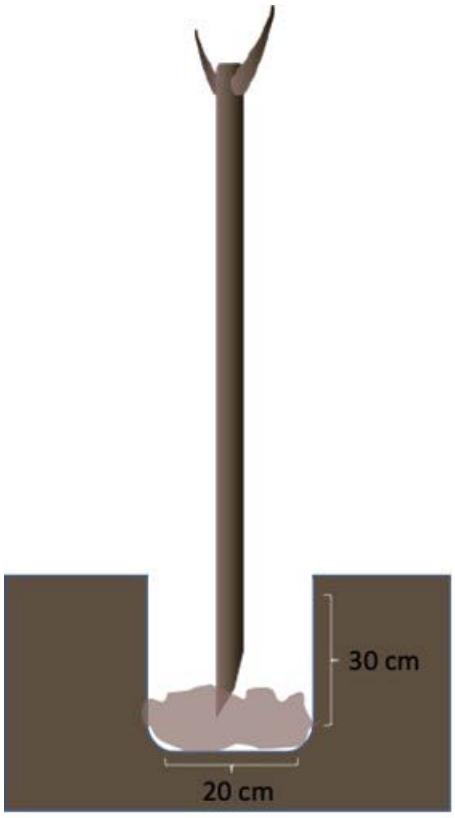


Figure T8.4. Planting a tutor

Pruning

Tutors must be pruned routinely to maintain the right amount of shade for the vanilla to grow properly. The tutors should grow to a height of around 2 meters or 6–8 feet.

Remove side branches from the tutor but leave two to three branches to grow at the top. Allow the growth of side branches at about head height, at least 1.5–2 m (5–6 feet). The vines will be looped over these branches. This height allows for a long growth of the vines, so they have plenty of leaves. The tutor's top branches should not be too high; they need to be within reach so the farmer can loop the vine over them easily. Use the prunings from the tutor as mulch around the vanilla vines.

Do's and don'ts for planting tutors

Do's

- Plan for the tutors. Obtain them and plant them in the rainy season before you plan to plant vanilla.
- If you have to buy the tutors, make sure you have enough money at the right time.
- Measure the spacing carefully. Plant the tutors at a spacing of 3 x 3 m.
- Make sure you have enough labor at the right time to collect and plant the tutors.
- Remember to prune the tutors to control the height. Prune to a few side branches. The tutors will have top leaves that will also provide the vines with some level of shade.

Don'ts

- Don't use tutors that are too small or too thin. They may die, or they may not be able to support the weight of the vanilla vine.
- Don't choose the wrong species to use as a tutor.
- Do not leave gliricidia cuttings out in the sun as they will be sunburned and will not grow well.
- Do not propagate tutors from seed as they will develop a taproot that will compete with the vanilla for nutrients and water. Tutors propagated from seed also take longer to reach the recommended height for planting vanilla.
- Don't plant tutors at the wrong time of year. Plant in the rainy season, when there is enough moisture to encourage the cutting to start rooting.
- Don't plant tutors at the same time as the vanilla vines. The tutors take several weeks to root properly and become established.

Let's talk about money

Different farmers face different situations. Some will already be growing vanilla; others will be interested in starting or expanding a vanilla farm. Their needs and costs will therefore differ.

How much does establishing tutors cost? You should do some homework to find out the range of likely costs before covering this in the lesson.

1. Interview 4–5 farmers separately and ask them about the costs of obtaining and planting their tutors. Questions to ask:
   - What is the size of your vanilla plot?
   - How many tutor trees did you plant on your farm to support the vines?
   - What types of tutor trees did you plant?
   - Where did you get the tutors?
   - How much did you pay for the tutors?
   - Did you have to pay for any hired labor?
2. Write this information in a form (see the *Handout*). Table T8.1 shows an example of a completed form.
3. Check whether the costs per hectare or per acre vary considerably among the farmers. The costs may vary because some farmers may be able to get tutors from their own farm or from a neighbor at minimal cost. Some farmers may use unpaid family labor. The costs of establishing a new vanilla garden may be higher than for a farmer who is merely adding a few vines to an existing garden.
4. Calculate the average costs for a new garden. Ask the interviewees if they think the costs you have calculated are too low or too high. Ask them how they would make any savings, or why their costs were higher.

Table T8.1 shows the costs for a farmer who is planting a new vanilla garden. In this case, the costs are quite high, as the farmer will need to plant 444 tutors. This cost does not include land clearing discussed in Chapter 4 on *Site selection, security and land preparation*.

Table T8.1. Example of costs of planting tutors

Activities	No. of units	Cost / unit	Days	Total UGX	US$	
Tutor cuttings	444 tutors	1,000/tutor		444,000	123	A
Land preparation for planting tutors	3 workers	5,000/day	3	45,000	13	B
Planting	2 workers	5,000/day	3	30,000	8	C
Total			**A + B + C**	**519,000**	**144**	**D**
Size of field (hectares)				0.4	0.4	E
Total per hectare			D / E	**1,297,500**	360	F

Saving for tutors and vines

Buying and planting tutors is cheaper than buying and planting vines—which may cost twice as much. Farmers will have to save up enough money to pay for both. They should adjust the number of tutors and vines to the amount they can afford.

Family labor

Typically, farm families share the work on the farm. Sometimes neighbors will help each other to get some of the heavier work done. In such cases, usually no money changes hands.

However, traditional ways of working as a family are changing and some of the strict divisions of labor are also changing. Time spent tending a vanilla garden (or helping neighbors) is time not spent doing something else—such as doing housework, homework, or earning money from a paid job. For many women, the time spent working on the farm is in addition to other responsibilities caring for children and taking care of the home, meaning they have a very heavy workload.

Some family members do a lot of work on the farm but they are not involved in the decisions about how that money can be used to benefit the household and they may not be fairly recognized for their contributions. They may feel exploited. Some may even harvest some vanilla to sell on their own.

Families should discuss this issue of work and decide on a fair way of distributing the income from the vanilla and other crops, so that all family members and the whole household benefit. The farming family should re-visit their vision and discuss the roles that each family member plays to contribute to the household and group vision. These roles include contributions on the vanilla farm, as well as tending other crops or livestock, and taking care of children and the home. Some of the work is less visible but is very important for the household and family's wellbeing and prosperity. It is important to acknowledge these different contributions, to work together, and to make decisions together that will benefit the household and all members fairly.

Lesson plan

Learning objectives

After this lesson, the participants will be able to:

- Explain how to select, plant and manage tutors.
- Calculate the number of tutors they will need.
- Calculate the costs of buying and planting tutors.
- Plan to save money to buy vanilla vines.

Duration

2–3 hours.

Training periods

February and July (at the first rains).

Location

In a plot where the farmer wants to plant tutors and where there are also some tutors that need pruning. The farmer should provide tutor cuttings to plant.

Ask the participants beforehand to bring their own tools such as a hoe, spade, panga or pruning saw with them so each person can dig some holes and prune some tutors. If everyone does some work, this will save the farmer of the field a lot of effort– and they will be pleased to cooperate with you.

If you cannot find a suitable field for planting, then you can do the planting exercise with just a few holes. Make the exercise as realistic as possible—for example, make sure the holes are spaced 3 m apart.

If you cannot find a suitable field for pruning, then you can do the pruning exercise with one or more small trees (if possible, of the right species). Make the exercise as realistic as possible. Get the farmer's permission beforehand.

Session 1: Introduction

Greet the participants and tell them what the session is about: planting and caring for tutors.

Introduce the subject by asking what the participants already know about tutors. See the questions in the Quiz for some topics to explore.

Esther's story

Tell the story of Esther:

In 2017, Esther heard on the radio that vanilla prices were going up. Her friends and neighbors said the same thing. So she decided to plant some vanilla.

She bought 200 vanilla vines from a nearby farmer who was growing vanilla. She paid for the vines and they were delivered to her farm just in time for the rains.

But then she realized that she needed some tutors to support the vines. She managed to find someone selling jatropha tutors, but they were expensive, so she could not afford enough for all the vanilla vines. She bought 100 jatropha cuttings and planted them and the vanilla.

But she still had another 100 vanilla vines, and needed to plant them quickly. Where could she find another 100 tutors for free?

She decided to use the cassava that she had growing in her farm. She planted the vanilla next to her cassava plants.

Two months later, she realized she had a problem. Three-quarters of the vanilla vines were too heavy for the cassava and for the young jatropha. The tutors were collapsing and drying out, and she ended up losing half her vanilla plants.

Ask the participants:

- Why did so many of the jatropha tutors collapse?

  (They were planted at the same time as the vanilla, so had not yet had time to become established. Maybe some of them were too thin.)

- Why did so many of the cassava tutors collapse?

  (Cassava is not a suitable species to use as a tutor. Its stem is not strong enough to support the weight of the vanilla vines, especially if the vine is being looped.)

- What mistakes did Esther make?

  (She did not plan ahead. She bought the vanilla before she had thought about the need for tutors. She did not have enough money to buy all the tutors she needed. She used cassava, which is not suitable for use as a tutor.)

- What should she have done differently?

  (She should have planned ahead. She should have acquired the tutors first and got them established before getting the vanilla vines.)

- What would have helped Esther to succeed?

  (Financial support, better knowledge on tutors, collaboration with household members, support with other household responsibilities to free up Esther's)

Other possible questions:

- Who could she have asked for advice?
- Where could she have accessed financial support?

Facilitate a discussion of these topics. Ask the participants whether they have encountered similar problems with planning tutors or obtaining the right type of tutors at the right time.

Remind the participants of the correct planting distances for vanilla tutors (3 × 3 m).

Types of tutors

Materials required

Several tutor cuttings of different species: jatropha, gliricidia.

Several unsuitable cuttings: too long or too short, not straight, branching, too thin, wrong species, etc.

Suggested procedure

Reminder: when asking the questions below, seek input from diverse participants.

1. Ask the participants what species are suitable for use as tutors. (Answer: jatropha, gliricidia). Explain why they are suitable. Use the local names if possible.
2. Show the participants photos of these species (see the *Handout* or show slides).
3. Ask the participants what species are **NOT** suitable for use as tutors. Ask them why. (Too weak, too much shade, too tall, branching at wrong height…)
4. Ask the participants to inspect the cuttings you have brought with you. Which are suitable, and why? Which are unsuitable, and why?

Planting tutors

Materials required

Tutor cuttings of jatropha or gliricidia.

Measuring tape, rope, hoes, panga, colored ribbon or strips of cloth, short wooden stakes to mark planting locations.

Suggested procedure

1. Go to the location in the field where the farmer wishes to plant vanilla.
2. Ask the farmer to point out where to plant the vanilla tutors. Give the participants the measuring tape, rope, stakes and ribbons or cloths so they can mark out the locations.
3. Demonstrate how to dig a planting hole the correct size for a tutor (get the participants to do this!). Explain the importance of putting 10 cm of loose soil back in the hole to make it easy for the tutor cutting roots to grow. Use compost if it is available.
4. Show how to plant the tutors, firming up the soil around the cutting afterwards.
5. Discuss the do's and don'ts of planting tutors.

Pruning tutors

Suggested procedure

1. Go into a field with the participants where the farmer needs to have the tutors pruned.
2. Gather around one tutor and ask the participants whether the tutor needs pruning, and if so, how they would prune it.
3. Discuss the correct pruning procedure: height of trimming, how much canopy to leave, which branches to trim and which to leave for looping of vanilla, etc.
4. Demonstrate how to do the pruning (or better, get the participants to do this under your direction).
5. Discuss what to do with the prunings (use as tutor cuttings, firewood, mulch…).
6. Move to the next tree and repeat the process. When everyone has understood what to do, allocate each person a tree to prune and get them to do the pruning under your supervision.

TAKE A BREAK

Session 2: Let's talk about money and the costs of tutors

1. Ask the participants how much it cost them to obtain and plant tutors. It is likely that they don't know the exact figures. Say that you will work it out with them.
2. Ask for one of the participants to act as a volunteer.
3. Ask this person how big their vanilla plantation is (in hectares or acres). Put this number in Line 1 in the *Costs of planting tutors* table in the *Handout*. (You can use either hectares or acres, depending on what the participants understand best.)
4. Ask the volunteer how many tutors they need for their plot. If they are not sure, get the other participants to work it out.
   - Number of tutors = size of plot in hectares × 1,000 per hectare
   - Number of tutors = size of plot in acres × 440 per acre.

   Put this number in the first column of Line 2 in the table.
5. Ask how much each tutor costs. Put this number in the *UGX / tutor* cell on Line 2 in the table.
6. Ask how many workers it would take, and how many days, to prepare the land and dig the planting holes. Put these numbers in Line 3 in the table. Put the daily wage in the *UGX / day* cell.
7. Ask how many workers it would take, and how many days, to plant the tutors. Put these numbers, and the daily wage, in Line 4 in the table.
8. Work out the number of Ugandan shillings each item costs, and put them in the UGX column in the table.
9. Calculate the total cost for the plot. Put this in Line 5.
10. Calculate the total per hectare (or acre). Put this in Line 6.
11. Discuss with the participants whether these costs are realistic. Are they too high or low? Where can they find the money at the right time? What barriers they may face in having the money at the right time?

Planning activities

Ask the participants which of them needs to plant new tutors. Ask them, at home, to work out how many tutors they need and where to get them.

Ask them which of them needs to prune their existing tutors. Invite them to do so before the next lesson.

Let's see what the younger people say!

Split the group members into one group of young men and young women, these are people below 35 years. Then have another group of men and women above 35. Each group will discuss:

- barriers/ constraints they may face in trying to implement this guidance in general.
- constraints they may face in implementing the work on tutors because of being a young man or woman and views from the older group, getting ideas from women and men.
- ideas to overcome these different constraints.

Have each group share out their constraints and ideas to overcome them. Note constraints in which ideas to overcome them were not identified so you can support processes to help address these constraints.

Conclusion

Briefly review what you have covered in the session. Ask if there are any questions.

Ask the questions in the Quiz (see below) to make sure that the participants have understood the content.

Thank the participants for their attention. Tell the participants when the next meeting will be and what it will be about. Tell them what they will need to bring with them.

Quiz

1. Why are tutors important in vanilla production?

2. How much does it cost to buy tutors?

3. Should you buy tutor cuttings, or make your own? What are considerations?

4. What species of tutors can be used for vanilla?

5. How thick and long should tutor cuttings be?

6. What are the important considerations when selecting the type of tutor to use?

7. When do you plant tutors?

8. What is the recommended spacing of tutors?

9. Why is it important to manage tutors?

10. What is the estimated cost of planting tutors on a 0.4 hectare (1 acre) of land?

11. Why is it important to consider financial and labor needs when planting tutors?

Expected answers

1. To support the vanilla to climb and grow.
2. (Depends on participant's responses and your research. In 2021, about UGX 700–1,000 per cutting.)
3. Making your own saves money, but sometimes the quality is not so good.
4. Jatropha, gliricidia,
5. They should be mature, over 5 cm thick and around 2.5 m in length.
6. Tutor should be easy to prune, be tolerant to pests and diseases, have branches at a low height, provide adequate shade, and provide other additional benefits such as fodder and nitrogen fixation.
7. During the rainy season.
8. 3 m × 3 m.
9. To provide adequate shade for the vanilla.
10. (Depends on the participants' responses and your research.)
11. Tutors are planted during the rainy season so labor and financial resources to purchase tutors will compete with the labor and financial resources needed to plant food crops.

Handout 8.1: Tutor species

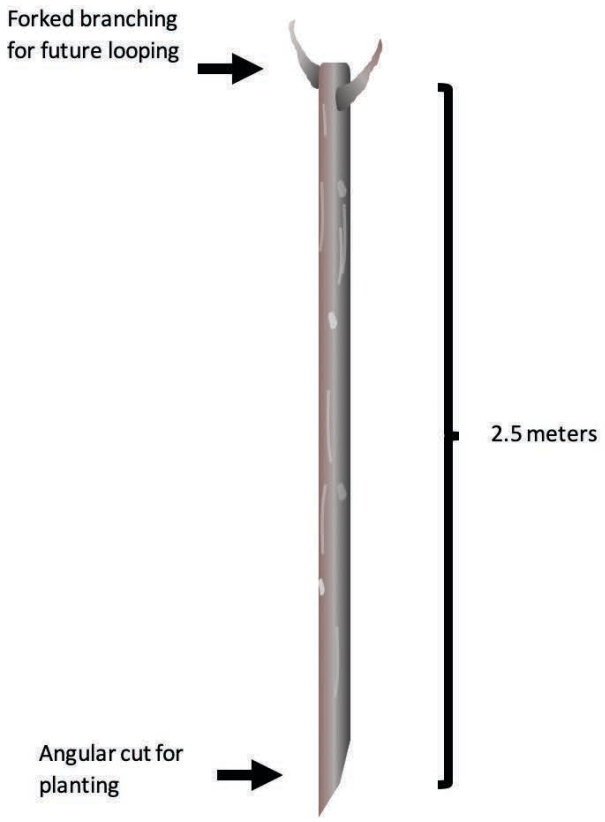
Jatropha

Gliricidia

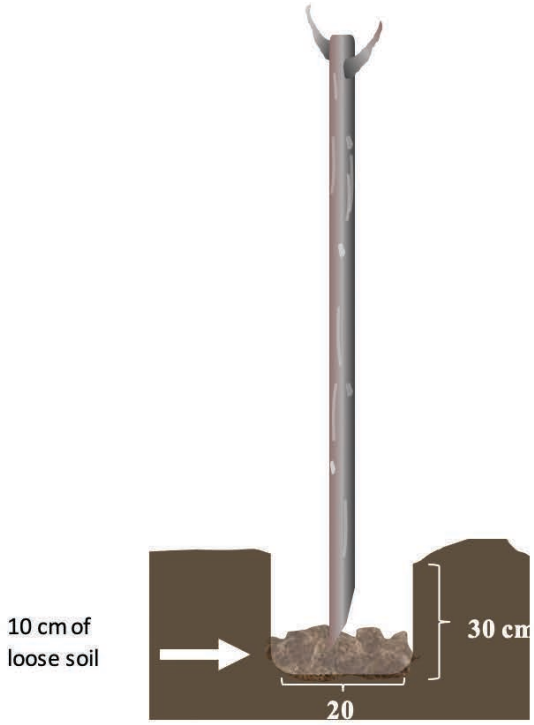
Handout 8.2: Preparing tutors

Plant in rainy season, at least 4-5 months before planting vanilla

Tutor cutting should be straight, 2.5m (7.5 feet) long, at least 5 cm (2 inches) thick

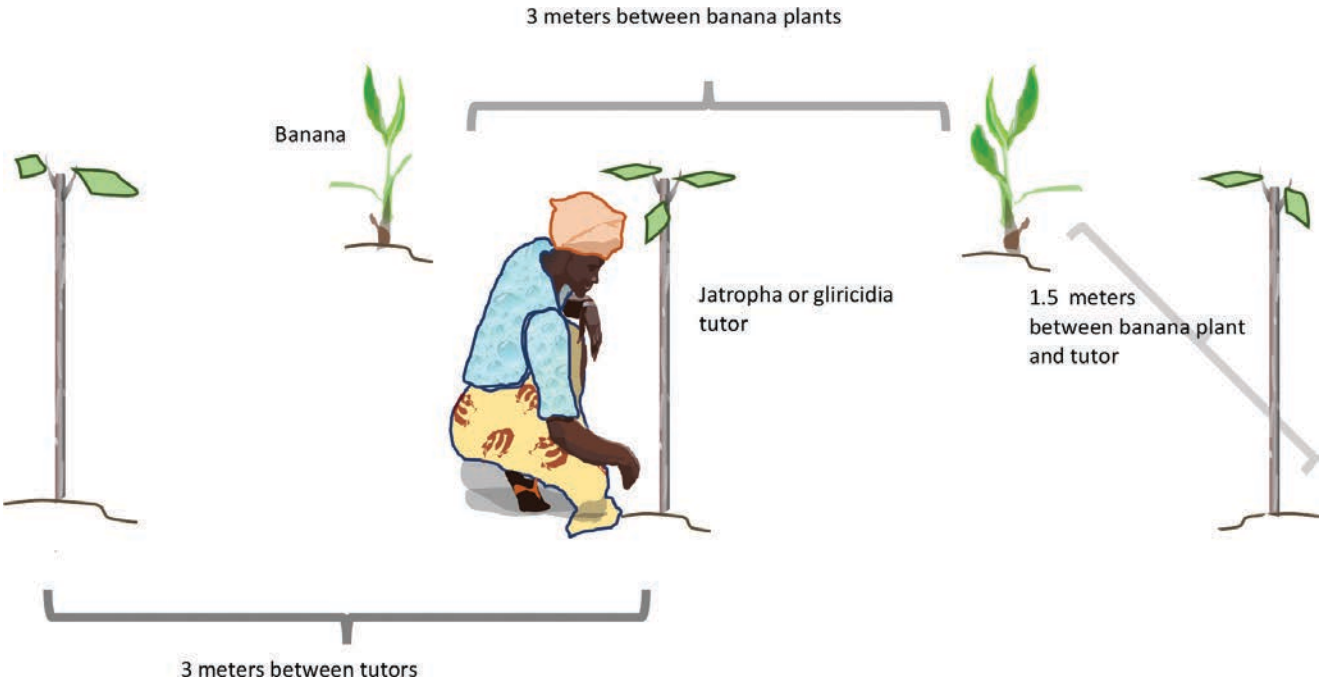


A good tutor



Planting tutors

Spacing



Handout 8.3: Spacing

Do's and don'ts for planting tutors

Do's

- Plan for the tutors. Obtain them and plant them in the rainy season before you plan to plant vanilla.
- If you have to buy the tutors, make sure you have enough money at the right time.
- Measure the spacing carefully. Plant the tutors at a spacing of 3 x 3 m.
- Make sure you have enough labor at the right time to collect and plant the tutors.
- Remember to prune the tutors to control the height. Prune to a few side branches. The tutors will have top leaves that will also provide the vines with some level of shade.

Don'ts

- Don't use tutors that are too small or too thin. They may die, or they may not be able to support the weight of the vanilla vine.
- Don't choose the wrong species to use as a tutor.
- Do not leave gliricidia cuttings out in the sun as they will be sunburned and will not grow well.
- Do not propagate tutors from seed as they will develop a taproot that will compete with the vanilla for nutrients and water. Tutors propagated from seed also take longer to reach the recommended height for planting vanilla.
- Don't plant tutors at the wrong time of year. Plant in the rainy season, when there is enough moisture to encourage the cutting to start rooting.
- Don't plant tutors at the same time as the vanilla vines. The tutors take several weeks to root properly and become established.

Handout 8.4: Costs of planting tutors

1	Area	_____ hectares	_____ acres	E		
					UGX	
2	Tutor cuttings	_____ tutors		_____ UGX / tutor		A
3	Land preparation	_____ workers	_____ days	_____ UGX / day		B
4	Planting	_____ workers	_____ days	_____ UGX / day		C
5	Total for plot			**A + B + C**		D
6	Total per hectare or acre			**D / E**		

CHAPTER 9.

Vine selection and planting

Good quality vines for planting

Technical information

Vanilla is not usually propagated by seed because of germination problems. The seed coat is thick and hard, and the germination may also depend on fungi or other microorganisms in the soil. That makes germination slow and uncertain. Seeds take longer to grow into mature plants than cuttings. For these reasons, vanilla is propagated from cuttings.

Topics covered

- How to make or buy vanilla cuttings.
- When and how to plant the cuttings.

Key messages

Good-quality cuttings are needed to establish a vanilla garden. If you already have a vanilla garden, you can make your own cuttings. Or you can buy them from a reputable supplier.

Prepare the garden carefully beforehand so everything is ready to plant the cuttings when you get them.

Vanilla cuttings are expensive, so plan carefully how many you will need and how to pay for them.

Making cuttings

If you already have a vanilla farm, you can grow your own cuttings to expand your plantation or to renew vines that need replacement.

Things to consider:

1. **Source.** Take cuttings from mature , healthy vines that serve as the mother plants. Cut the young, vigorous, green, non-fruit bearing part of the vine.
2. **Length.** The cuttings should be at least 2 meters (6 feet) long. Cuttings of the right length will flower earlier (in 2.5 years). It is possible to use shorter cuttings, but these will take up to 3–4 years to flower.
3. **Measuring cuttings.** An easy way to measure lengths is to use string. Cut the string into 3 meter lengths, and tie a knot every meter (put a strip of colored cloth in each knot to make them easy to see).
4. **Thickness of the cutting**. The cuttings should be about 2 cm thick. Do not use cuttings that are less than 0.5 cm thick. Cuttings should be more like the thickness of your middle finger, and not your smallest finger.
5. **Trimming.** After cutting them off the plant, re-cut the bottom cut about 1 cm from the bottom end. You can tell the bottom end as it is thicker and the buds are always above each leaf. Remove 4–5 leaves from this end, but leave the leaf stems (holders) on the cutting.
6. **Hardening off.** Hang the cuttings on a fence or tree for 7-10 days (under shade) to harden them off until they form a scar tissue over the cut ends. This is important because it eases root development, and the vine will wilt and is less likely to break when it is unrolled and attached on the tutor.

Buying cuttings

Some things to think of if you buy cuttings:

- **Quantity.** Work out how many cuttings are needed. In some cases, farmers may want to buy cuttings in bulk as a group. Identify a supplier, someone that is close and can supply the right number.
- **Quality.** Make sure the cuttings are the right length (at least 2 meters long) and are healthy (vigorous and disease/pest free). Buy only from a reputable supplier.
- **Timing and availability.** Make sure that the cuttings will be available when you need them, and that the supplier will deliver them to you. You may have to arrange transport to pick them up.
- **Price.** Check the price before you buy. Make sure you have enough money to pay for the cuttings as well as the other things you will need: labor and manure.

Preparing for planting

1. **Tutors.** Make sure the tutors are well established. Do not plant vanilla vines unless the tutors are ready to support them. Tutors need to be planted at least 4-5 months before planting the vines so they will grow roots and be stable.
2. **Shade.** Make sure the plantation has the right amount of shade. Young vanilla will need up to 50% shade.
3. **Weeds.** Clear and prepare the site. Remove all the weeds from the garden.
4. **Manure.** Vines need soil that is high in organic matter. Add compost around the vines when they are planted. Make sure you have enough manure or compost. You will need a tinful (two heaped handfuls) of manure or compost for each vine. Mix the manure or compost with the topsoil that will cover the vine during planting.

Planting

You should plant vanilla at the start of the rainy season. This will provide the vines with enough water to establish themselves. Vines are planted next to the tutor trees.

1. **Make a trench.** Next to each tutor, use a hoe to scrape a shallow trench, 5–10 cm (2–3 inches) deep and 50–75 cm (1.5–2 feet) long. One end of the trench should be about 30 cm (1 foot) away from the tutor.
2. **Plant the vine.** Lay the thicker end of the vine (the end where you had trimmed off the leaves) in the trench, and cover it with soil. Add compost if available. Leave a few centimeters of the short end sticking out of the soil. Press down the soil firmly so the soil comes in contact with the buried part of the vine.
3. **Fixing to the tutor.** Trail the longer end of the vine up the tutor and tie it in place with twine or dried banana fiber/grass. Don't use plastic string as this will cut the growing vine.
4. **Mulching.** Put a layer of mulch over the trench to keep it moist. Keep the mulch away from the tutor stem to avoid the risk of disease. Keep the short end visible above the mulch.
5. **Checking.** Check the vine regularly. If the exposed short end turns black (this may happen within a month), this means the vine has died and will need replacement.

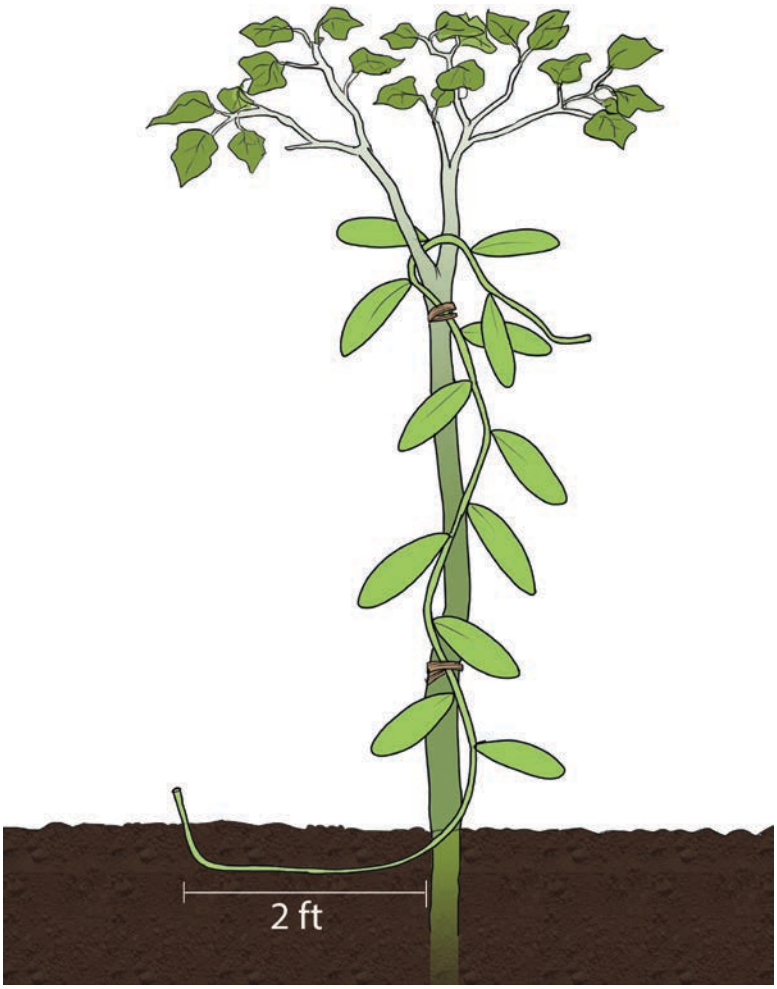


Figure T9.1. A tutor and vanilla vine planted next to it (2 ft = 60 cm)

Not enough planting material

If you do not have enough planting material, you can plant short vine cuttings about 0.5 m (1.5 feet) long in pots containing soil mixed with organic matter, or compost. Attach each vine to a stick to keep it upright and keep it in the shade. Water it regularly and allow it to sprout and grow to the recommended planting length of 2 meters. Then plant them in the field and attach to the tutors.

Do's and don'ts

Do's

- Plant vanilla at the correct spacing.
- Plant vanilla in the rainy season.
- Use a clean, sharp knife. Clean the knife regularly when working with cuttings to avoid transmitting diseases.
- Apply manure or compost and mulch to keep the soil fertile and moist.

Don'ts

- Don't use shorter cuttings as they take a long time to flower, so will delay the vanilla harvest.
- Don't use thin cuttings as they will take long to gain vigor.
- Don't plant vanilla next to short or thin support trees.

Let's talk about money

Planting vines is one of the most expensive activities in growing vanilla. Each vine can cost UGX 1,500 to 3,000 (US$ 0.40–0.80)—probably twice the price of tutors. Suppliers will want cash on delivery.

Farmers need to find out the costs of vines when they are buying their tutors. They should plant the same number of vines as the tutors they have planted. They need to work out how many vines they want to plant, then how many they can actually afford.

If farmers do not have enough money for all the vines they want, they can buy what they can afford in the first season, then save up to buy more in the next season.

Getting the vines

The farmers will need to identify another farmer or farmer group that can supply the number of vines needed. You can help them work out how many vines they need (and can afford). You can also help them find a reputable supplier who can provide the required number of cuttings.

Buying in bulk

Farmers may be able to get a better price if they buy as a group. You can help the group work out how many vines each farmer needs. Then find out the costs of vines and tell the farmers how much money they will each need to pay. Record the number of vines each farmer wants to buy, and actually buys.

Calculating costs

Table T9.1 gives an example of how to calculate the costs and an idea of how much those costs might be.

Do some research to find out the costs before covering this in the lesson. Find farmers who supply vanilla cuttings and ask them the following questions:

- How much is a single vine?
- How much will it be for 100, 200 or 444 vines?
- How much would it be for a larger number of vines, if farmers want to get together to buy in bulk?
- Do the suppliers have enough vines to sell? If not, where can the farmers get the number they need?
- What is the cost of transporting the vines? How will they be transported?

Additional costs when planting vines include labor and manure.

Table T9.1. Example of costs of buying and planting vines

	Item		Unit cost	UGX	US$	
Vine cuttings	444 cuttings		1,500–3,000	666,000 – 1,332,000	185 - 370	A
Transport			36,000	36,000	10	B
Labor	4 workers	3 days	5,000 / day	60,000	17	C
Manure	3 pick-up trucks		100,000/truck	300,000	83	D
Total	**A + B + C + D**			**1,062,000 – 1,728,000**	**295 - 480**	**E**
Size of field (hectares)				0.4	0.4	F
Total per field	E / F			2,655,000 – 4,320,000	737.5 – 1,200	G

Lesson plan

Learning objectives

After this lesson, the participants will be able to:

- Describe how to select vanilla vines for planting.
- Explain how to plant the vines.
- Calculate the costs of obtaining and planting vines.

Duration

2–3 hours.

Sessions

1. Obtaining cuttings
2. Planting vines
3. Cost of buying and planting vines

Training periods

February and July (start of the rainy season).

Location

Find a farmer who wants to plant vanilla vines and whose field you can use for a demonstration. Check first that the field is ready for planting: that there is enough shade, the tutors are well-established, the area has been cleared of weeds, and that the land has been prepared. The farmer should provide the cuttings to plant. There should be at least 1 vine per participant, which they will plant.

Ask the participants beforehand to bring their own spade or hoe so each person can plant some vines.

If you cannot find a suitable field, then you can do the exercise with just a few vines. Make the exercise as realistic as possible. If you cannot find any vines to plant, use some pieces of rope instead.

Introduction

Greet the participants and tell them what the session is about: planting vanilla vines.

Ask them who has experience with planting vines. Seek out information from diverse participants—men, women, elderly, youth, participants with disabilities. Ask them to talk about their experience. When did they plant them? Where did they get the vine cuttings? How long were the cuttings they planted? How did they plant the vines? How long did it take them to plant the vines? Did they do anything to reduce this time? Was it successful? What problems did they encounter?

Ask the participants some of the questions in the Quiz to check their knowledge.

Session 1: Obtaining cuttings

Group discussions. This exercise is suitable if a significant proportion of the participants have experience in planting vanilla. If most or all of the participants have no experience, it will be better to present the information in a more instructional way. Giving people a clear set of steps to follow.

Suggested procedure

1. Divide the participants into three groups:
   - **Group 1: Buying cuttings.** This group will discuss buying vanilla cuttings. Give this group a card with these words written on them: *Quantity, Quality, Timing, Availability, Price, Constraints*.
   - **Group 2: Making your own cuttings.** This group will discuss making their own cuttings. Give this group a card with these words written on them: *Source, Length, Trimming, Treatment before planting, Constraints*.
   - **Group 3: Preparing for planting.** This group will discuss what they have to do before they can plant vanilla. Give this group a card with these words written on them: *Tutors, Shade, Land preparation, Weeds, Manure, Constraints*.
2. Give each group a flipchart and a marker pen.
3. Ask each group to list the things they should consider and the steps they should take for the topic they have been assigned. Ask them to make sure they cover all the items on the card you have given them.
4. Give them a few minutes to discuss and write down their ideas. Go around to check that the discussion is focused on the right topics.
5. Ask each group in turn to report back to the plenary.
6. Invite the group to discuss the responses. Make sure the points discussed in Chapter 9 on *Vine selection and planting* are covered.
7. Remember the gender dynamics, ask the participants to think of special constraints that adult men and women, young men and women, and people with disabilities may face with each of these items. For example:
   - A young person may not have enough money to buy a lot of vines at once.
   - A disabled person may not be able to do the work themselves, so may have to hire someone else to do it for them.
   - A woman may not find it easy to travel to buy the vines.

TAKE A BREAK

Session 2: Planting vanilla

Materials required

- Vanilla vines provided by the field farmer. Also bring some unsuitable cuttings with you for demonstration purposes.
- If you do not have any cuttings, use lengths of rope instead.
- Sharp, clean knife; hoe; twine or dried grass; pot for rooting a short cutting.
- Tin of manure or compost; mulch

Suggested procedure

1. Go into a field with the participants where the farmer wishes to plant vanilla.
2. Ask the participants to check that everything is ready for planting. Ask them:

   Is there the right amount of shade?

   Are the tutors well-established? Are they spaced correctly?

   Has the land been prepared properly?

   Are there any weeds?

3. Show them the vanilla cuttings. Ask:

   Are they the right length?

   Are they mature enough?

   Are they healthy?

   Have they been hardened off?

4. Demonstrate how to strip off the leaves at the thick end of the cutting.
5. Ask one of the participants to plant a cutting by scraping a shallow trench, burying part of a cutting in it, covering it with soil (leaving the short end exposed), and trailing the long end up the tutor.
6. Ask a different participant to repeat this exercise with a new cutting, explaining what they are doing.
7. Ask the participants what they would do if they do not have enough cuttings. Show them how to root a short cutting in a pot. Explain that the short cutting will take longer to grow and flower.
8. Get pairs of participants each to plant several cuttings in appropriate places in the garden. Go around to ensure that each pair is planting the cuttings correctly.

TAKE A BREAK

Session 3: Let's talk about money

Calculating costs

1. Ask the participants how much it costs to buy one vine. They may not know the current costs.
2. Ask one of the participants to act as a volunteer.
3. Ask this person the area of their farm (in hectares or acres) that they are planning to plant. Put this area in the *Size of field* row in the *Form to calculate costs of buying and planting vines*.
4. Ask the volunteer how many vines they need for their plot. If they are not sure, get the other participants to work it out.
   - Number of tutors = size of plot in hectares × 1,000 per hectare
   - Number of tutors = size of plot in acres × 440 per acre.

   Put this number in the first column of the *Vine cuttings* row in the form.
5. Ask how much each vine costs. Put this number in the *Unit cost* cell in this row.
6. Ask how much it will cost to transport the vines from the supplier to the farm. Write this in the *Transport* row.
7. Ask how many workers (including family members) it would take, and how many days, to plant the vines. Put these numbers, and the daily wage, in the *Labor* row.
8. Work out the total costs for each item.
9. Calculate the total cost for the plot. Put this in the *Total* row.
10. Calculate the total per hectare (or acre). Put this in the bottom row.
11. Discuss with the participants whether these costs are realistic. Are they too high or low? Where can they find the money at the right time? What barriers they may face in having the money at the right time.

If the cost is more than what the farmers can afford, calculate the amount for a smaller number of vines. Work with the lead farmers to buy the vines in bulk, this may reduce the cost of the vines, as you are buying many and reduce transport costs.

Planning activities

Ask the participants which of them needs to plant new vanilla cuttings. Ask them to work out how many they will need and where to obtain them.

Ask them to discuss any constraints he/she may face in accessing and planting vanilla cuttings. Discuss how to overcome those constraints.

Suggest they obtain the cuttings and plant them before the next lesson.

Conclusion

Briefly review what you have covered in the session. Ask if there are any questions.

Ask the questions in the *Quiz* to make sure that the participants have understood the content.

Thank the participants for their attention. Tell them when the next meeting will be and what it will be about. Tell them what they will need to bring with them.

Quiz

1. When should vanilla be planted? In which season?

2. What is the recommended spacing for vanilla intercropped with banana or coffee?

3. Should vanilla be grown from seed? Why (or why not)?

4. What requirements must be in place before planting vines?

5. How long should the vine cuttings be?

6. For how long should the vine be kept after being cut before planting? Why?

7. How should the cuttings be protected from contamination and diseases?

8. Where can the farmer get vanilla cuttings?

9. How long and deep should the planting hole for vanilla be?

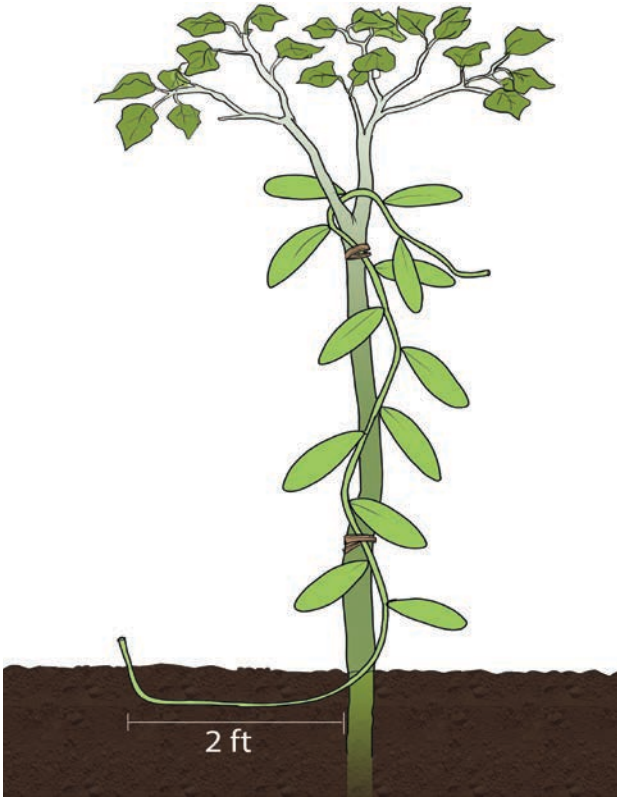
10. How long should the part of the vine in the ground be?

11. What constraints may female and male farmers face in accessing and planting vanilla cuttings?

Expected answers

1. During a rainy season.
2. 3 × 3 m (9 × 9 feet).
3. No, it should be grown from cuttings. Vanilla seeds may not germinate well and the seedlings grow slowly.
4. Requirements:
   - Enough shade.
   - Land cleared of weeds.
   - Planting trenches dug.
   - Enough manure or compost.
   - The tutors ready (planted in the previous rainy season).
   - Cuttings prepared.
5. 2–3 m (6–9 ft).
6. 7–10 days to reduce the moisture content and ease root development.
7. Use a clean, sharp knife.
8. Grow their own, or buy from a reliable supplier.
9. 60 cm (2 feet) of the vine should be laid in a shallow trench and covered with soil.
10. Control over income to purchase vines, insufficient funds to cover delivery costs of vines, time to plant vines given competing demands related to planting food crops.

Handout 9.1: Vine planting

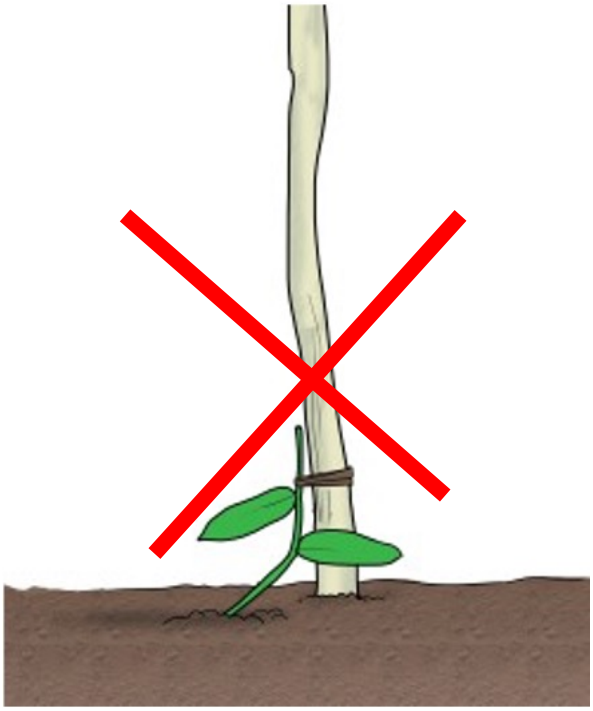


Planting vanilla. Leave the short end showing. If it turns black, the vine has died and must be replaced

Source: Jefferson Shriver

Vines planted in polythene bags, being grown to length for planting

If the vines are too short to plant, put them in a nursery until they are long enough to plant in the next season



This cutting is too short. It will take a long time to grow and produce a harvest. Either, discard or plant into a potting bag, so that it grows and can be planted at a later date.

Handout 9.2: Vine quality and spacing

Good quality vines are needed to establish a vanilla garden

Do's and don'ts

Do's

- Plant vanilla at the correct spacing (3x3 metres apart).
- Plant vanilla in the rainy season.
- Use a clean, sharp knife. Clean the knife regularly when working with cuttings to avoid transmitting diseases.
- Apply manure or compost and mulch to keep the soil fertile and moist.

Don'ts

- Don't use shorter cuttings as they take long time to flower, and will delay the vanilla harvest. Cutting should be 2 meters long.
- Don't use thin cuttings as they will take long to gain vigor.
- Don't plant vanilla next to short or thin support trees.

Form to calculate costs of buying and planting vines

	Item		Unit cost	UGX	US$	
Vine cuttings						**A**
Transport						**B**
Labor	No. of workers	No. of days				**C**
Manure	No. of pick-up trucks					**D**
Total	**A + B + C + D**					**E**
Size of field (hectares)						**F**
Total per hectare	E / F					**G**

CHAPTER 10.
Weeding

Hand weeding around vanilla

Technical information

Weeds are plants that grow where they are not wanted!

Weeds compete with crops for light, water, and nutrients. They may increase pest and disease problems and can interfere with basic crop maintenance and harvesting. Weeds may reduce crop yields or the quality of the crop.

Some weeds are poisonous to animals and humans. They include thorn apple, bittersweet, night shade, *Lantana camara*, and jimson weed. Others, such as blackjack, catch in clothes and can irritate the skin.

Common weeds

Common weeds in vanilla gardens include couch grass, *Commelina* and *Oxalis*.

Couch grass (*Elymus repens*)

Thorn apple (*Datura stramonium*)

Oxalis

Commelina

Lantana camara

Figure T10.1. Common weeds in vanilla gardens

Managing weeds

Vanilla has shallow roots that are easily damaged.

Do not use a hoe or other methods that might damage the vanilla roots.

Instead, you can do these:

- **Hand weeding.** Remove weeds from around the base of the vines by hand. Use the weeds as mulch or to make compost.
- **Slashing.** Slash the weeds or use a forked hoe between the rows.

Weed regularly, at least 3–4 times per year. Do not allow the weeds to develop seeds, as this will cause bigger problems in the future. It is best to remove the weeds before they flower so they do not produce seeds.

- **Mulching.** Cover the bare soil around the vines with a thick layer of mulch.
- **Cover crops.** After planting vanilla, it is possible to sow cover crops such as beans for one or two seasons, before the canopy closes. In a mature plantation, after the vines are fully established, there may not be sufficient sunlight to grow cover crops. However, you may be able to sow legumes or crops such as pumpkins between the rows. Control these intercrops so they do not compete for water or nutrients with the vanilla. You can use the cover crops as food or as fodder. Do not let livestock into the vanilla plantation. Cut and carry the crops and take them to the animals.
- **Herbicides.** If you use herbicides, apply them carefully. Follow the instructions and wear protective clothing. Do not spray near the vanilla or intercrops as the herbicide may affect the plants. Do **not** use herbicides on an organic farm.

Figure T10.2. Vanilla garden with (left) and without weeds (right)

Who weeds?

Weeding vanilla takes a lot of time and is hard work because you must bend over a lot. Weeding, and especially weeding by hand, is often seen as the responsibility of women and children.

Families must make sure that the task of weeding is spread fairly. It should not overburden any one person, especially if they also have to attend school (children), household work such as cooking and childcare (women) and other income generating activities.

Rather than weeding whenever someone happens to have time, it may be best to plan it as a specific task (like with land preparation or harvesting). That way it will be done thoroughly and at the right times.

Lesson plan

Figure L10.1. Hand weeding around vanilla

Duration

1 hour

Training periods

April and September

Objectives

During this session the participants will:

- Learn the most common weeds of vanilla.
- Learn how to control weeds in a vanilla garden.

If weeding is mainly the responsibility of particular members of the household (such as women), try to ensure they come to this session as well as the regular participants.

If possible, hold this whole session in a vanilla garden—one that needs weeding. This will let you point out particular weeds growing in the garden and discuss how to control them. Find a farmer whose vanilla garden needs to be weeded and who is willing to let it be used for a demonstration. Ask the participants beforehand to bring their own machetes so they can slash weeds.

Introduction

Greet the participants and tell them what the session is about: weeding.

Introduce the subject by asking the participants what a "weed" is. See the questions in the *Quiz* for other possible introductory questions.

Problems caused by weeds

Ask the participants why they think weeds are harmful. What problems can they cause? List these reasons on a flipchart. Discuss the reasons and fill in any reasons the participants have missed.

Identifying weeds

Collect a sample of each of the main weeds growing in the garden and put them on the ground or on a table for all to see. If you can identify the weeds, write their names on pieces of paper and put these next to each weed. Get the farmers to help with this: ask what the local names of each weed are and write them on the papers.

Take photos with your phone of each weed and the label, and one photo of the whole collection of weeds. Use the photos to remember which weeds fit to which labels. Then take the paper labels away, mix them up, and ask the participants to match each paper label with the correct weed.

You can make a game of this: give each weed a number, split the participants into teams, and ask the teams to match the weed names with the correct number.

If the participants have a phone that can take photos, ask them to take a photo of the weeds with their names. They can then use the photos to share information with the extension team and other farmers to learn more.

Managing weeds

Ask the participants how they currently control weeds. What methods do they use? Why do they use these methods?

List the weeding methods on another flip chart. Ask the participants to give the advantages and disadvantages of each weeding method. Do not encourage the use of herbicides. Emphasize that the recommended method is hand-weeding.

Weeding method	Advantages	Disadvantages
Hoe	Quick	Damages vanilla roots. Do not use in a vanilla garden!
Hand-weeding	Avoids damage to vanilla roots	Slow, hard on the back
	...	...
...	...	...

Choosing the best weeding method

Here is an entertaining way to illustrate the damage that hoeing can cause to the vanilla roots.

1. Invite a volunteer to put their hand on the bare ground. Tell the participants that their hand represents the roots of the vanilla plant.
2. Cover their hand with a thin layer of soil. “Plant” a couple of weeds in this soil between the volunteer’s fingers.
3. Ask the participants what they think is the best way to remove the weeds. Suggest using a hoe, a machete, or spraying with herbicide. Make a show of this (bring a hoe, machete and sprayer with you).
4. Ask the volunteer what they think the best weeding method would be.
5. Ask if it is OK to use the other methods further away from the volunteer’s hand.

When to weed

Ask the participants when and how often they weed their vanilla gardens. Do they weed the whole garden at once, or little by little? Get them to discuss how many times they should weed in a season.

Who weeds?

Ask the participants who in the household does the weeding in the vanilla garden. Who does it in the other parts of the farm? If different fields are the responsibility of different people, why is this? If one person does all the weeding, why is this? How does that impact the family? How can the task of weeding be better organized or divided up more fairly among household members? How would that impact the family?

Explore the amount of time weeding takes. Which takes longer: weeding vanilla, or weeding the same area of another crop field? Why is this?

Weeding practice

1. Ask the participants if they see a problem with the amount of weeds in the garden you are in.
2. Show them how to hand-weed around the vanilla plants.
3. Explain that they can either pile up the weeds and allow them to dry, and then use them as mulch, or take them to the compost pile to make compost.
4. Divide the participants into groups and get each group to weed one or two rows of the garden. Explain that it is the quality of the weeding, not just speed, that is important. Give them a limited time (10 minutes?) for the task. Make sure each person does both hand-weeding and slashing.
5. Go around each group and check they are weeding correctly: not damaging the vanilla, the tutors, or other crops.
6. Ask the participants to inspect each of the rows. Ask them which row is weeded best. Give a small prize (applause?) to the winners.

Planning activities

Ask the participants to check the weeds in their vanilla gardens and to make sure they have controlled the weeds before the next lesson.

Ask them to discuss any constraints he/she may face controlling the weeds by the next lesson. Discuss how to overcome those constraints.

Conclusion

Briefly review what you have covered in this lesson.

Ask the questions in the *Quiz* to make sure the participants have understood how to weed.

Tell the participants when the next meeting will be. Tell them that the next lesson will be about pruning.

Quiz

1. What are weeds?

2. What problems do weeds cause in a vanilla garden?

3. What are the most common types of weeds in a vanilla garden?

4. How can you control weeds in a vanilla garden?

5. Should you use a hoe to clear weeds in a vanilla garden?

6. Should you use herbicides in a vanilla garden?

7. What are ways for tasks, including weeding, to not over-burden one person?

8. Why is it important to find ways to fairly divide tasks?

Expected answers

1. Weeds are plants that are growing in the wrong place.
2. Weeds compete with crops for light, water, and nutrients. They may increase pest and disease problems, and can interfere with crop maintenance and harvesting. They may reduce crop yields or quality. Some are poisonous to animals and humans, catch in clothes, or can irritate the skin.
3. Couch grass, *Commelina* and *Oxalis*.
4. Hand-weeding, slashing, mulching, cover crops, or herbicides (not in organic gardens).
5. No: this may damage the vanilla roots.
6. Not in an organic garden. Vanilla is mainly grown under organic conditions, and its recommended not to use herbicides on organic vanilla farms. If herbicides are applied (on inorganic farms), ensure safe handling and use of the herbicides.
7. Divide up the tasks fairly among the members of the household (or laborers). Plan for regular tasks (such as weeding).
8. So everyone has an interest in the success of the enterprise, and to avoid overburdening any one person.

Handout 10.1: Weeds

Weeds are plants that grow where they are not wanted.

They compete with crops for light, water and nutrients.

They can carry pests and diseases. They may reduce crop yields or the quality of the crops

Couch grass

Commelina

Oxalis

How to weed

Yes

- Hand-weeding near vanilla vines
- Machete or forked hoe between the rows – but not near the vines
- Mulch, compost
- Cover crops
- Weed 3–4 times a year.
- Do not let weeds flower and form seeds.

No

- Hoes
- Herbicides (on organic farms)

Garden free of weeds

Garden with many weeds

Well mulched garden free of weeds

CHAPTER 11.
Pruning

Pruning crops and vines

Technical information

In mixed agroforestry vanilla gardens, farmers must prune all the main plants: the vanilla vines, the tutors, the shade trees, and the other crops in the system, such as the bananas, the coffee and any other intercrops. Pruning is necessary to maintain the right amount of shade and air circulation in the garden and to maintain high production levels for the various crops.

The **three Ds** of pruning are removing **diseased**, **damaged** and **dead** parts of the plants.

This chapter describes how to prune vanilla, shade trees and tutors, and the crops that are grown with vanilla.

Pruning vanilla

Why

- To remove dead, damaged and unwanted parts of the plant.
- To improve the vine health and aeration and to reduce the occurrence of diseases.
- To encourage strong growth and vigor.
- To direct the vines towards the ground to promote flowering.
- To stimulate the production of flowers and pods.
- To prevent the vine from over-producing and becoming weak.
- To produce cuttings for use as planting material.

When

- Mainly during the **rainy season** (February–April or October–December).
- **After harvest** (November–January, or in June in the dry season). After harvest, cut back the vanilla vines that have borne the beans.
- Discard short cuttings. You can use longer cuttings to grow new vines.

How

- Use secateurs or a knife to remove small, unhealthy, unwanted suckers or shoots.
- Remove unwanted vines. If they are large enough, plant them or sell them.
- Remove any diseased, withered or deformed vines, and vines with rotten buds. These may spread disease to the whole plant.
- Before you move to another vine, disinfect the secateurs or knife with alcohol or ash, or hold them briefly in a flame. This helps avoid spreading disease from one plant to another.
- Remove any withered or diseased vanilla prunings from the garden. Bury them so they do not become a source of disease. Vanilla is prone to *Fusarium*, a fungal disease. Watch out for signs of this and remove any diseased vine. Signs of *Fusarium* include yellowing leaves, root and stem rot, and eventually the loss of the whole plant.

Pruning after harvest to stimulate flowering

Pruning is also needed to avoid having too many offshoots. That will focus the vine's growth to a few main stems that will produce beans.

As the vine grows, it will produce many side branches, each of which may produce flowers and beans.

- If a vine has too many branches, it will produce only a few flowers per branch, and the beans will be small.
- If the vine has too few branches, it will produce a low harvest.

So the farmer must decide how many branches are needed on each vine in each flowering season.

Once the vine has been looped over the tutor, prune it and direct the main stem towards the ground. This will keep the vanilla plant to a maximum height of 2 meters and produce enough vines for flowering and fruiting. Keeping the height to 2 meters makes it easier to pollinate the flowers and harvest the beans.

Directing the vine into a series of loops promotes flowering and new growth. As the vine grows, the new loops should be distributed over the tutor. Do not bunch too many stems on one part of the tutor to keep them from shading each other and to avoid diseases.

When pruning, remove any unhealthy or withered material as it may be a source of disease. Take any unhealthy materials out of the garden and burn or bury them.

Pruning to make planting materials

Vanilla is best planted in the wet season, during the same period as pruning. That means you can prune vines and use the healthy cuttings as planting materials, or sell them to other farmers.

To make cuttings for planting, select the long-branched vines that are hanging down towards the ground. Cut these back to the main vine. Pruning the vine will also stimulate flowering in the coming season.

See Chapter 9 on *Vine selection and planting* for how to prepare cuttings. You may wish to remind the participants about this during this lesson.

A new shoot will already be growing from the bend in the top of the vine, where it starts to bend downwards. This new shoot will later give rise to new vines that you can loop down through the mulch (see Chapter 13 on *Looping vanilla vines*).

Figure T10.1. Vanilla vines at 2 meters are suitable for planting

Pruning to prevent flowering in young vines

Producing flowers costs the vanilla vine a lot of energy. If a vine starts producing flowers before it is old enough, this will weaken the plant and it will not produce beans that are worth harvesting and selling. On young vines less than 3 years old, remove all the flower parts as soon as they develop. The next season the vine will be stronger and will be able to produce a good yield of beans.

Figure T10.2. Vanilla vine with too much growth and in need of pruning

Removing suckers and diseased parts

A “sucker” is a shoot that develops from the base of the vine. Removing suckers improves aeration and helps prevent disease. Remove the suckers at the same time as pruning.

Remove any diseased or abnormal vines. Look especially for rotten buds and remove them. They may be a source of disease.

Good and bad management

Good pruning makes it easier to pollinate the vanilla and harvest the pods. A vine with a good structure, properly looped, will be more productive.

Bad management. Plants and vines are too close to each other, the shade is too heavy, the vine structure is poor, and none of the vines have been looped.

Good management. The vines are well-spaced, and the shade trees have been managed well. The structure is correct: the vines have been looped and pruned.

Figure T10.3. Bad and good management

Pruning shade trees and tutors

Figure T10.4. Regulating shade by pruning tutors and shade trees

Why

- To regulate the amount of shade in the vanilla garden.
- To improve air circulation around the vines.
- To improve the health of the shade trees, tutors, intercrops and vanilla, and reduce the occurrence of diseases.
- To remove dead, damaged and unwanted parts of the plant.
- To encourage strong growth and vigor.
- To increase the light and production of the vanilla and intercrops.
- To produce firewood, building poles, stakes for tutors, and livestock fodder.

When

- Mainly in the rainy season (March–May or August–December). At this time, the vanilla should be under 30–50% shade.

How

- Prune the shade trees and then the tutors to adjust the amount of shade for the vanilla.
- Use a branch-lopper, machete or secateurs to trim unwanted branches. Use a saw for larger branches. Take care when cutting large branches that you do not damage the tutors and vines.
- Use thick, straight branches from tutors as planting materials for new tutors.
- Use branches of shade trees as firewood or construction poles.
- Use the foliage to feed to livestock or to make mulch or compost.

Pruning shade trees

Pruning the shade trees lets in more sunlight and increases the light levels in the vanilla garden. That puts stress on the vanilla vines, which stimulates flowering. But do not prune too much: too much sunlight will harm the vines. The amount of shading changes during the year. The shade should be maintained at 50–70% during the long dry season. Then shade should be reduced to 30-50% during the long rainy season.

Gliricidia is a good choice of shade tree as it usually loses its leaves during the dry season, naturally reducing the shade levels when needed.

Pruning tutors

When pruning tutors, remove the thick, central branches and leave the side-branches intact. That will create a shape like an umbrella, which results in good aeration. Cut the side-branches with a machete or saw about 40-60 cm from the main stem of the tutor, so they can be used to support the vanilla vine loops.

Cut the thinner branches into pieces and put them around the base of the tutor to act as mulch. Use the thick, straight branches to use as tutor stakes elsewhere.

Make sure you do not damage the vanilla vines when pruning the shade trees and tutors.

Figure T10.5. Pruning of shade trees and tutors

Pruning banana and coffee intercrops

Coffee and banana intercropped with vanilla must be managed to give the right amount of shade for the vanilla, but also to produce a good yield of coffee or bananas. Pruning keeps the plants at the correct spacing, maintains the right level of shade, and prevents the banana or coffee from competing with the vanilla for water and nutrients.

Banana

To continuously produce bananas, in each stand allow:

- One mother stalk to grow to maturity and produce fruit.
- One half-grown plant.
- One young sucker.

Remove any extra plants and suckers in the stand. You may be able to sell the suckers or use them elsewhere on the farm. Remove dry and yellow leaves. When bananas are harvested, the stems should be chopped into small pieces, so that they decompose quickly. This also helps to avoid banana weevils from laying eggs and infecting the growing banana plants.

Coffee

It is important to manage coffee well to produce good yields and to make it easy to harvest the berries. Coffee requires shade at about 40–50%. The coffee trees also need to be pruned after each harvest to avoid too many branches, which will reduce productivity. The coffee trees also lose productivity over time and the entire tree should be stumped (cut close to the ground) every 7–10 years.

Coffee shading

Coffee pruning

Figure T10.6. Coffee shading and pruning

Equipment

You will need:

- A pruning saw
- Secateurs
- Alcohol spirit, or bleach or use a fire.

Keep the saw and secateurs sharp so they make clean cuts. Between each coffee bush, clean the equipment with alcohol, or Jik (bleach), or hold the blade briefly in a flame to disinfect it. This is important to avoid spreading disease from one plant to another.

Coffee stumping

Stumping is done on older coffee bushes that are not producing well: too many long branches, and not enough large cherries. It means cutting the older main stem (or stems) of the coffee to allow new stems to grow.

Use the saw to cut the stem at an angle of 45 degrees to stop water from collecting, about 30–50 cm above the ground. Leave several new shoots so the bush can regrow.

Make a smooth cut to prevent disease. Smooth off the cut if necessary.

The bush/stumped coffee tree will not produce a yield in the first year after stumping, so do not stump more than one-third of the bushes in any one year. You will still get a harvest from the other bushes. Farmers typically stump 20% of the plants per year.

Coffee stumping

Regrowing coffee after stumping

Figure T10.7. A well-managed coffee planting. The bushes are about 2 m tall and have an open canopy

Pruning

Pruning rejuvenates the bush by removing unproductive branches and promoting the development of new stems. It results in a stronger bush with a more open canopy, which helps prevent diseases. It allows light to reach the productive branches, resulting in more cherries.

- Prune all the coffee bushes every year after the main crop harvest. Use a pruning saw or a sharp pair of secateurs.
- Prune the bush to a height of about 2 m to make harvesting easier. Leave a maximum of three stems.
- Remove any unwanted suckers and secondary and tertiary branches.
- Remove weaker upper branches and keep the lower branches.
- Remove suckers several times a year.
- Remove branches close to the ground as these can pick up diseases.
- Bury or burn diseased branches at the site. Do not drag them through the garden as this can spread diseases.

Both banana and coffee

If the vanilla garden has both coffee and bananas, you will need to prune them both carefully to keep the right amount of shade but maintain production of all three crops.

Figure T10.8. It is important to maintain the right amount of shade to optimize the production of vanilla and the other crops in the garden

Let's talk about money

Make the most of pruned material. It can be valuable.

- Use (or sell) branches of shade trees as firewood.
- Use big poles as construction materials.
- Sell surplus vanilla vines.
- Sell straight branches from tutors to other farmers who need tutors as support stakes.
- Sell banana suckers as planting materials.
- Use leaves, banana leaves and small sticks as mulch or to make compost.

Calculating the costs of pruning in mixed agroforestry systems

Pruning is an ongoing maintenance job on the farm. Most of this work will be done by the farmer and some by the family. In this case, there will not be out of pocket expenses.

In larger farms, hired labor may be used to do the pruning on a quarterly basis or after the harvests. Pruning the larger trees takes some skill and may require climbing the trees. Farmers may need to hire someone to do this.

Table T10.1. Example of costs of pruning

0.4 ha (1 acre)

Activities	# of units / acre	# of days	Cost / unit	Total UGX	US$	
Pruning shade trees	2 workers	4–5	3,000	30,000	8	A
Pruning tutors	2 workers	2–3	3,000	18,000	4	B
Pruning vanilla	3 workers	3 days	3,000/day	27,000	7	C
Pruning coffee	3–4 workers	3 days	3,000/day	36,000	10	D
Total			**A + B + C + D**	**111,000**	31	E
Size of field (hectares)				0.4	0.4	F
Total per hectare			E / F	277,500	77	G

Lesson plan

Duration

2 hours.

Training periods

February–March and June–July.

Objectives

During this session the participants will:

- Learn why it is important to prune crops.
- Learn how to prune vanilla, shade trees, tutors, banana and coffee.

Materials

Flip chart, markers, pruning equipment, alcohol or bleach.

If possible, hold this whole session in a vanilla garden—one where the various plants need pruning. Pruning can be done wrongly, damaging the plants rather than improving them. Ask the farmer of the garden if it is OK to have the group practice in the garden—under your supervision. Ask the participants beforehand to bring their own pruning equipment: branch loppers, secateurs or machetes.

Introduction

Greet the participants and tell them what the session is about: pruning.

Ask the participants to list all the crops on the farm they prune. They will probably list fuelwood trees, forage trees, tree crops such as coffee, as well as vanilla.

Point out that cutting off a dead banana leaf and picking some leaves off a plant to use as a vegetable are also types of pruning.

See the *Quiz* for other possible questions to ask.

Why prune crops?

Ask the participants which crops they prune. Make a list of the crops on a flip chart. Re-read the list aloud for participants who may be unable to read the flip chart.

Now choose one of the crops (not vanilla) and ask **why** they prune that crop. Make a list of the reasons on a second flip chart sheet. Re-read the list aloud.

Name the **3 Ds** of pruning: removing **dead, diseased** and **damaged** parts of the plant.

Point out that there are other important reasons for pruning vanilla. For example, farmers need to prune the crop to:

- Reduce excessive branching of the vines.
- Focus the growing of the vanilla plant on looping of the vines.
- Make the right shape of the plant, and avoid competition for light.
- Control shade, of all layers of plants in the farming system, top-layer shade trees, middle-layer production crops such as coffee and banana, and the tutors.
- Control the flowering of the vanilla plant.

Pruning vanilla

Ask specifically why they prune vanilla. List the reasons on a third flip chart sheet, and fill in any gaps. Re-read the list and point out the similarities and differences with the reasons they have just named.

Explain when, why and how to prune vanilla vines.

Demonstrate how to prune vanilla vines to do each of the following:

- Prevent flowering in young vines.
- Avoid over-production of leaves, and focus on the lead vine.
- Direct the lead growing vines up to the tops of the tutors without branching.
- Once a vine is looped on the tutor, direct it towards the ground so part of it can be buried in the ground and the tip can be guided back up the tutor.
- Produce new cuttings to sell.
- Stimulate flowering.
- Remove diseased plant parts.

After you have explained the reasons and techniques, go to another vanilla vine and ask the participants what they would do to prune the plant. Correct the responses, if necessary, and get a volunteer to do the pruning. Repeat with several other vines. Point out any particular problems, such as disease or poor vine structure.

Pruning shade trees and tutors

Ask the participants why they need to prune shade trees and tutors. Make a list of the reasons on another flip chart sheet. Fill in any gaps if necessary. Re-read the list of reasons.

Select a shade tree in the garden and explain (and demonstrate) how to prune it.

Select a tutor in the garden and explain (and demonstrate) how to prune it.

Divide the participants into pairs and get each pair to prune a shade tree and one or more tutors. Go around to make sure that they are doing it correctly.

Bring the participants back together and discuss what to do with the pruned materials: make compost, use as firewood or building poles, use as tutor stakes, etc.

Pruning banana

Select a banana plant that needs pruning and explain (and demonstrate) how to prune it.

If the banana plants in the garden are already well-pruned, point this out to the participants. Ask the farmer how they went about pruning and what their considerations were.

If there are no bananas in the garden, use the *Handout* to explain what a well-managed banana plant looks like.

Pruning coffee

Select a coffee bush that needs pruning. Explain (and demonstrate) how to prune it.

Find a coffee bush that needs stumping and explain how to stump it. If you have the permission of the farmer, demonstrate how to do so.

Show how to disinfect the secateurs and pruning saw after pruning each bush.

Let's talk about money

Ask the participants what products the pruning has produced. Make a list on a flip chart.

Ask them what these items can be used for: mulch, compost, firewood, stakes, planting materials, etc.

For those items that can be sold, ask how much each is worth. Point out that these items are not necessarily waste, but could be a source of extra money.

Planning activities

Ask the participants, at home, to check their vanilla gardens and see if they need to prune any of the plants there. Suggest they do so before the next lesson.

Ask them to discuss any constraints he/she may face in pruning their vanilla garden by next lesson. Discuss how to overcome those constraints.

Conclusion

Briefly review what you have covered in this lesson.

Ask the questions in the *Quiz* to make sure the participants have understood how to do pruning.

Tell the participants when the next meeting will be. Tell them that the next lesson will be about managing pests and diseases of vanilla.

Quiz

1. Why is pruning done?

2. What are the three Ds of pruning?

3. When should pruning be done?

4. Why should farmers prune tutors?

5. Why should farmers prune vanilla?

6. How do you prevent the spread of diseases while pruning?

7. What constraints may male and female farmers face in pruning their vanilla garden?

Expected answers

1. Pruning aims at removing the unwanted parts of the plant to maintain optimum shade and air circulation.
2. Remove diseased, damaged and dead plant parts.
3. Pruning of vanilla during the rainy season and after the harvest. Pruning of shade trees and tutors in the rainy season.
4. To maintain optimum shade and air circulation.
5. To get rid of small, unhealthy, and unwanted suckers or shoots. To improve aeration and reduce diseases. To stimulate flowering. To prevent flowering in young vines.
6. Cut off dead, diseased and damaged plant parts. Remove them from the garden and burn them. Disinfect equipment before moving to another plant.
7. Level of decision-making power in pruning the vanilla vines and shade trees, in addition to the existing heavy workload and finding money to pay for labor.

Handout 11.1: Pruning

Vanilla

- Prune in rainy season or after harvest

Why prune

- To remove the **3Ds**: **dead, diseased** and **damaged** parts, and other unwanted parts of the plant.
- To improve the vine health and aeration and to reduce the occurrence of diseases.
- To encourage strong growth and vigor.
- To increase the production of flowers and pods.
- To prevent the vine from over-producing and becoming weak.
- To produce cuttings for use as planting material.

Pruning after harvest to stimulate flowering

Prune the hanging vine that has carried the harvest. Do not use this as planting material. Take it out of the garden. Bury or burn to prevent disease spread.

Pruning to make planting materials

Cut off 2-4 long vines per plant. Count back at least 2 meters from the growing shoot and cut off. Use as planting material.

The new shoot from the top of the vine will produce new vines for looping.

Pruning to prevent flowering in young vines

For young vines less than 3 years old, remove all the flower parts as soon as they develop.

Removing suckers and diseased parts

Remove suckers at the same time as pruning.

Remove any diseased or abnormal vines to prevent disease.

Good and bad management

Bad management. Plants and vines are too close to each other, the shade is too heavy, the vine structure is poor, and none of the vines have been looped.

Good management. The vines are well-spaced, and the shade trees have been managed well. The structure is correct: the vines have been looped and pruned.

Handout 11.2: Pruning shade trees and tutors

Pruning shade trees and tutors

Shade trees

Prune in the rainy season to reach 30-50% shade.

Prune enough: sunlight stimulates vanilla to produce flowers.

Do not prune too much: too much sunlight will harm the vines.

Tutors

When pruning tutors, remove the thick, central branches and leave the side-branches intact. That will create a shape like an umbrella, which results in good aeration. Cut the side branches about 40-60 cm so they can be used to support the loops.

Pruning banana

In each clump:

- One mother stalk to grow to maturity and produce fruit.
- One half-grown plant.
- One young sucker.

Remove extra plants and dry and yellow leaves.

Coffee

Keep saw and secateurs sharp so they make clean cuts. Clean them with alcohol or bleach between each coffee bush.

Stumping

Cutting the older main stem (or stems) of the coffee to allow new stems to grow.

Cut the stem at 45 degrees, about 30–50 cm above the ground. Leave several new shoots so the bush can regrow. Prune off some shoots and leave a maximum of 3 stems.

Make a smooth cut to prevent disease.

Stumped bushes do not produce in the following year. Do not stump more than one-third of the bushes in one year.

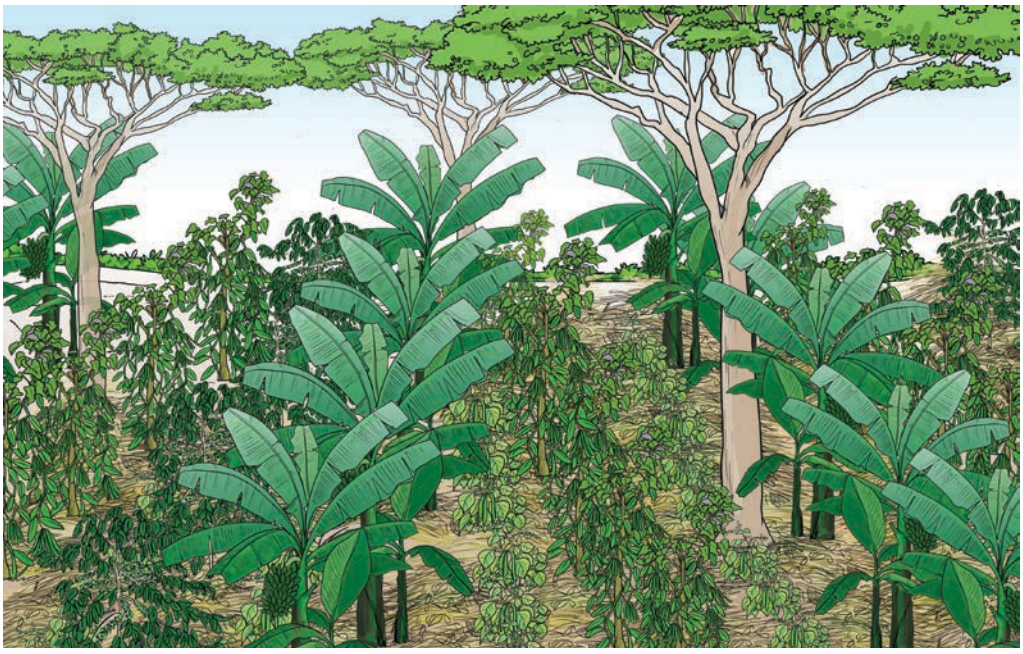
Coffee stumping

Regrowing coffee after stumping

Pruning

Pruning rejuvenates the bush by removing unproductive branches and promoting the development of new stems.

- Prune all the coffee bushes every year after the main crop harvest.
- Prune the bush to 2 m to make harvesting easier. Leave a maximum of three stems.
- Remove unwanted suckers and secondary and tertiary branches.
- Remove weaker upper branches, and keep the lower branches.
- Remove suckers several times a year.
- Remove branches close to the ground.
- Bury or burn diseased branches at the site.
- Prune to maintain the right maintain the right amount of shade to optimize the production of vanilla and the other crops in the garden.



Well pruned crops and shade trees

CHAPTER 12.

Disease and pest management

Vanilla rust disease

Technical information

Vanilla is grown in humid conditions, and close to other plants and trees. That makes it prone to infections. Diseases caused by fungi and similar organisms are especially a problem; they may affect the roots, stem, leaves, beans or shoot tips. The main, and most damaging, disease that affects vanilla is *Fusarium*, which causes various types of rots in the leaves, stems and pods. There is no control for *Fusarium*, which can completely ruin a crop and infect the soil for many years. Farmers need to consider crop sanitation to avoid *Fusarium* at all costs.

Pests are usually less of a problem with vanilla.

Figure T12.1. Vanilla rust disease

Recognizing and controlling diseases and pests

Severe pest and disease problems are often a sign of bad management or bad site selection. For vanilla most challenges come when the crop is waterlogged, or when there is too much shade and not enough ventilation in the crop mix.

Inspection. Check the vanilla garden at least once a week. Walk up and down each row in the garden to check for damage. Take your panga (machete) and something to clean it with (bleach, alcohol or ash). If insects are a problem, take a container with soapy water or bleach to kill them. If you see a problem and need advice, contact a field agent.

Vines. Check each part of the plant: the stems, leaves, shoots, flowers, beans, aerial roots.

Do the plants look healthy? Are they the normal color? Any yellow or brown patches? Any speckles or pest damage? Are they firm or limp? Are there any pests to be seen on the plant?

- A weak plant with a poor root system is open to pest and disease attack. Do not damage the roots or stems during weeding. Pull weeds by hand. Do not tread on the ground near the base of the vine.
- Weak growth? A weak vine is open to pest and disease infection. A strong vine can withstand more damage. Adjust the shade, mulch and looping to permit the vine to grow more strongly. Loop vines with enough nodes every rainy season.
- Prune away diseased parts (see below).

Spacing. If the vines or other plants are too close together, this will reduce air circulation around the vines, and that allows disease to develop. If the plants are too close together, prune or remove excess plants.

Shade. Check the amount of shade in the garden (50-70% shade in the dry season and 30-50% shade in rainy season).

- **Too much shade?** This will reduce the growth and strength of plants, reduce the air circulation, and create good conditions for pests and diseases. Prune the shade trees, tutors, intercrops or vines.
- **Too much sun?** The vanilla leaves will become sunburnt, weak and open to pest and disease attack.

Soil and mulch. Is the soil around the vine light, soft, and not too hard or compacted? Is it moist (but not too wet)? Is the mulch layer in order? Make sure the mulch does not touch the base of the vine. Are there too many weeds? If mulch is not applied regularly, growth will be poor, and the plant will be more open to pest and disease attack. But do not apply too much manure, mulch or irrigation.

Planting materials. Do not use cuttings from diseased plants. Take cuttings only from gardens that are free of disease. Do not transport cuttings or planting materials from disease areas.

Other crops. Check the tutors, shade trees and intercrops for any disease or pest problems.

Pruning

Prune as often as required to remove all the diseased parts of the stem, leaves or roots, or even the whole plant if necessary. This is important to prevent the disease from spreading to other plants.

If the stem is diseased, cut off the part that is visibly damaged or brown. If the whole plant is affected, uproot it.

Clean the pruning tools with alcohol, bleach (Jik) or ash before moving to the next plant.

Burn the pruned and diseased material, or bury it outside the garden.

Using agrochemicals

There are few agrochemicals to treat the more severe pest and disease problems of vanilla. But in most cases, agrochemicals are not required, and it is best to avoid using them if possible. Do not use them at all in organic farms.

If you do apply chemicals, make sure you:

- Choose the right chemical to treat the problem. If you are not sure, get advice from an agronomist or extension worker.
- Follow the instructions carefully. Use the correct sprayer and the right nozzle. Find out how to mix the chemical correctly and how to spray correctly. Use the correct dosage and apply at the right times.
- Use protective clothing (gloves, boots, clothes, mask, goggles). Make sure all equipment is working properly.
- Do not allow agrochemicals to come into contact with pregnant or lactating women or children.
- Store the chemicals in a safe place, out of reach of children and animals. Avoid spilling chemicals when mixing or pouring. Dispose of surplus chemicals and containers safely. Do not reuse containers for something else.
- Ensure women and men within the household receive knowledge on safe use and handling of pesticides. This is important even if men are the ones who normally spray pesticide as women are also exposed to the negative effects of pesticides when she washes the clothes used to protect her husband/partner when spraying. Furthermore, women who are knowledgeable about pesticides, could encourage her husbands to adopt safe practices.

Diseases of vanilla

These are generally the most important problems of vanilla in Uganda. Diseases may be caused by fungi, viruses and other causes. They generally attack a particular part of the plant, which turns yellow or brown and then rots. Some diseases may attack several parts of the plant at the same time, or may spread from one part to another.

Root and stem rot

This is the most serious disease problem with vanilla in Uganda. It is caused by *Fusarium*.

Signs. Root and stem rot may affect the roots, the stems, or both.

Roots. The underground root tips become brown, decay, and die. The infection gradually spreads to the aerial roots. The affected plants produce many aerial roots, but most die before they reach the ground. The stem and leaves become limp, the stem shrivels, and the vines droop. The signs get worse during dry periods, especially in gardens with too much sunlight. The vines may die because the roots have rotted and they cannot take up enough water and nutrients.

Figure T12.2. Root and stalk rot (left), symptoms of a diseased plant (right) caused by the Fusarium oxysporum f. sp. vanillae fungus

Stems. Brown, water-soaked lesions spread to both sides of the stem. Later, elongated patches develop on the stem, and the tissue rots. In advanced stages, the leaves turn yellowish and dry off.

When the stem near the ground (or in the middle of the vines) is infected and shrivels, and if not enough aerial roots have reached the soil, the remaining, more distant parts of the vine start to wilt. The beans may rot.

Figure T12.3. Stem rot

Cause. Fungus (*Fusarium*). Encouraged by too much soil moisture or shading, inadequate fertilization, overcrowding, and drought stress.

Prevention. Plant vanilla in well-draining soils, and if necessary, apply more organic matter. Do not plant vines too closely together; avoid overcrowding.

Check the shade levels. Loop vines with enough nodes every rainy season.

Do not damage the roots or dig the soil around the vines. Avoid walking or standing close to the base of the vine to avoid compacting the soil. Apply mulch but do not allow it to come into contact with the vine.

Loop the vines through the mulch to generate more roots.

Treatment. Prune out and burn the infected plants and roots. Dig out and remove affected soil from area around diseased plants and bring in fresh soil. Any replanting should be done after at least one year.

Check surrounding plants for signs of the disease.

Do not apply chemicals on organic farms

More information.
https://bsppjournals.onlinelibrary.wiley.com/doi/full/10.1111/ppa.12445

https://plantvillage.psu.edu/topics/vanilla/infos

Leaf rot

This is a minor disease which occurs occasionally on mature or old leaves. It is caused by *Fusarium*.

Figure T12.4. Leaf rot of vanilla

Signs. The leaf tip becomes slightly yellowish to brown. It later starts to rot, and the rotting develops backwards, sometimes reaching the middle portions of the leaf.

Cause. Fungus (*Fusarium oxysporum*)

Prevention. Keep the plant aerated, by ensuring that the vines and tutors are well pruned, that the vines are correctly looped, not bunched up. Be sure the roots are not waterlogged and that the plant is healthy. Healthy plants are maintained by regular mulching, by adding organic and well-rotted manure and leaf litter and making sure the soil is well drained.

Treatment. If low incidence, and good growing conditions, you can prune out the affected areas. In some cases with light infection, no action is needed. New shoots will emerge from the lower buds. If very common, check the management, particularly shade, mulch and soil conditions.

Bean yellowing

This is relatively a new disease in Uganda. It is caused by *Fusarium*.

Source: Orchids Asia

Figure T12.5. Bean yellowing, showing the progression from a healthy bean (far left) to a dry, shriveled bean (far right)

Signs. The disease appears on immature beans of about 5–7 months of age, often in August–October. The tips of the beans turn yellow, which slowly extends towards the base of the bean where it is attached to the stalk. The bean splits, starting at the tip, and the affected parts turn brown. Fully affected beans fall off before they mature. The bean may rot at the tip, at the base, or all over. The disease does not affect mature beans.

Cause. Fungus (*Fusarium oxysporum*)

Prevention. There is no effective control of fusarium in vanilla plantations. The best approach is to avoid the disease. You can do this by avoiding contamination, which can happen when new vines or planting material are brought to a farm. Attacks are more common in old and weak vines, if the soil is too damp, or the plants are too closely packed and the humidity is high. If a garden is infected, remove infected plants and either bury or burn them. However, stopping a *Fusarium* infection is extremely difficult and may cause farmers to abandon the crop.

More information. www.orchidsasia.com/vanilladisease01.htm

Inflorescence rot

Signs. At the stage when the flower stalks are growing longer, they turn brown. This brown color gradually spreads to the flower buds, which rot and fall off.

Cause. Fungus (*Colletotrichum*).

Prevention. Prune areas affected by this disease.

More information. www.orchidsasia.com/vanilladisease01.htm

Anthracnose

This disease affects almost all the plant parts: young shoot tips, leaves, roots and beans.

Figure T12.6. Anthracnose

Signs. The first symptoms are seen on tender parts such as immature beans and the tips of aerial roots. On the beans, small groups of very small, dull-red or amber pustules appear, forming discolored patches. The beans turn black at the tip and the middle. They wilt and fall off within 2–3 days. The pustules appear on both sides of the leaves, with more on the upper side. As the disease progresses, the leaves start yellowing and dry out, then die.

Cause. Anthracnose is caused by fungi in the genus *Colletrotrichum*. Anthracnose is encouraged by too much soil moisture, poor drainage, prolonged rainy weather and overcrowding of vines. Diseased and dead leaves, beans and aerial roots lying on the ground can infect other vanilla vines.

Prevention. Collect, prune and burn affected parts to prevent the disease from spreading. Improve drainage. Reduce overcrowding by pruning vines.

Reduce the amount of shade, which lowers the humidity in the garden.

More information.
plantvillage.psu.edu/topics/vanilla/infos

www.orchidsasia.com/vanilladisease01.htm

Rust

A common disease

Signs. Black or brown lesions form on the stem, leaves and fruits.

Cause. Fungus (*Mycoleptodiscus indicus*)

Prevention. Remove affected parts of the plant and bury or burn. Then improve ventilation through better shading and pruning.

Bean rot and vine rot

This disease appears during the rainy season.

Bean rotting

Rotting of the vine base

Figure T12.7. Bean rot and vine rot

Signs. The tips of the beans rot, and the rot slowly extends towards the base of the beans. The affected beans are soft and brown, and are covered with fine, cottony, whitish growth. The whole bunch may rot.

In later stages, the disease advances to the stem, leaves and aerial roots, and spreads downwards. The whole vine decays and dies.

Cause. Oomycete (*Phytophthora meadii*), fungus (*Anthelia rolfisii/Sclerotium rolfsii*). Encouraged by too much shade, continuous rain, crowding of vines, waterlogged conditions.

Prevention. Collect and burn affected parts to prevent the disease from spreading. Improve drainage. Reduce shade and overcrowding.

More information.

www.plantwise.org/KnowledgeBank/pmdg/20207800551

plantvillage.psu.edu/topics/vanilla/infos

www.orchidsasia.com/vanilladisease01.htm

Virus diseases

Source: Hernandez Mexican vanilla Guide

Figure T12.8. Vanilla mosaic virus

Signs. Faint yellow patches on young leaves, with wavy, distorted surfaces and edges. The damage is normally slight.

Causes. Cymbidium mosaic virus (CymMV), Odontoglossum ringspot virus (ORSV). Both are spread by pruning tools.

Prevention. Clean pruning tools after each plant.

More information.

apps.lucidcentral.org/pppw_v10/text/web_full/entities/vanilla_viruses_159.htm

Environmental and physiological problems

These are not diseases, but are caused by aspects of the environment, such as too much or too little shade, water or soil nutrients. However, they can cause similar signs to diseases, and they make the vanilla plant weaker, less productive, and more prone to disease infections.

Sunburn

Figure T12.9. Yellowing of leaves caused by direct sunlight in plantation with poor shade

Signs. The leaves are yellow-green or clear yellow, especially at the top of the plant, where it is being burnt by the sun.

Cause. Too little shade.

Prevention. Maintain the right level of shade in the garden in each season. Do not over-prune shade trees or intercrops.

Plant adequate numbers of shade trees.

Treatment. If vanilla plants are showing signs of sunburn, or blanching of top leaves, then take action to increase shade by planting bananas or shade trees. However, it takes at least one year for bananas to grow, and 3–4 years for shade trees.

Too much shade

Signs. If there is too much shade, the vanilla will grow very slowly, and will produce very few leaves or beans. If the plants are grown too closely together, they may be attacked by fungus, and the stems may turn yellow and brown, then rot.

Causes. High density of shade trees and intercrops such as bananas or coffee.

Prevention. Prune all the crops at different levels: vines, bananas, coffee and shade trees. Adjust the plant density and mix of crops (see Chapter 6 on *Crop planting systems and spacing*.

Make sure the soil is high in organic matter, and is moist but well drained. Avoid waterlogging. Maintain 30–50% shade during the rainy season and 50-70% during the dry season. Prune in the rainy season.

Waterlogging

Signs. Vanilla is particularly prone to waterlogging, which causes poor growth, stem rots and vine wilting.

Causes. Poor soil drainage, as a result of location, a lack of organic matter in the soil, and high rainfall but no drainage.

Prevention. Waterlogging can be prevented in various ways.

- If the garden is on a slope with waterlogging at the bottom, dig trenches along the contours at about 20-30 meter intervals. This will allow water to percolate into the soil and prevent high levels of surface runoff.
- Build bunds along the contours made from grasses and field trash. These will dam flowing water and increase infiltration.

In general, the soil should be given regular inputs of organic matter, using prunings, field trash, harvested materials and if necessary compost. This will increase its ability to absorb and hold water, which prevents any standing water on the surface. Selecting the right site for vanilla is important: avoid areas with clay soils that are prone to waterlogging.

Drought

Signs. Vanilla is not suited to areas that suffer from prolonged periods of drought. This will weaken the plant and can make it more prone to disease such as *Fusarium*. General signs of drought include wilting, slow growth, and leaf drop. In severe cases, the plant will turn yellow and the leaves will shrivel and become brittle.

Causes. Prolonged periods of high sun and limited rain (a dry spell of more than 4 months).

Prevention. Build up the organic matter so that the soil holds enough water to keep the crop healthy during the dry period. Cover the soil with mulch or cover crops to reduce evaporation. Ensure the crop has adequate shade.

Treatment. It is not common to irrigate vanilla, but this may be advisable in times of severe drought. Increase shade where possible and maintain high levels of mulch over the root zone.

Low soil fertility

Signs. Plants suffering from specific nutrient loss will show certain types of leaf color changes. Typically, thin leaves with patches of yellow are a sign of nitrogen nutrient deficiency. A nutrient deficiency in a field may show up in all the crops grown there in the form of weak plants and attacks by pests and diseases.

Causes. Low soil fertility may result from overcultivation, a lack of appropriate intercropping, crop overcrowding, or a shortage of organic matter in the soil.

Prevention.

- Have a soil test done every 3-4 years to assess the soil condition.
- Make sure the planting density is not too high.
- In vanilla gardens, you may use gliricidia as the tutor as it is leguminous and will build up nitrogen in the soil. Larger trees will also bring nutrients up from deep in the soil and return them to the surface through their leaf litter.
- Do not burn leaf litter or harvested trash, but use it as mulch or compost.
- If the soil is highly depleted, apply compost. Do not use inorganic fertilizers on organic farms

Treatment. Have a soil test done to find out the nutrient levels and soil conditions. Add specific nutrients if they are depleted.

Increase the organic matter in the soil by applying mulch and compost. Ensure the crops are planted at the recommended density. Keep the shade levels at the right levels, too much shade and the soil can get waterlogged, too little shade the soil can dry out.

Insect pests

None of the insects that attack vanilla cause major damage in Uganda. It is usually easy to see where the pest has eaten or bored into the plant, and you may even spot the insect on the plant. Damage by insects may make it easier for a disease to infect the plant.

Termites

Figure T12.10. Termites

Signs. A problem during the dry season. Termites can kill or damage the tutor.

Cause. Prolonged drought which creates conditions for termites. Termites mainly attack dead wood.

Prevention. Some farmers apply natural remedies such as local herbs, wood ash and animal urine to keep termites away from the vanilla vines. Get rid of any sources of termites such as ant hills from your garden.

Treatment. Spray with an appropriate chemical at the time of planting. Ask an agronomist or extension worker which chemical are recommended. Do not use chemicals on organic farms.

Podborers

Signs. The beans remain green but are empty. Cut open the pod lengthwise; it is empty.

Cause. The podborers enter the beans before the seeds have grown inside. They eat the flesh inside the bean, while the outside stays green.

Prevention. Scouting and if the insects are at an economic damage threshold, contact your local extension agent for advice.

Treatment. Vanilla is mainly grown under organic conditions. If there is a severe infection, ask an agronomist or extension agent which organic chemical is recommended. Do not use inorganic chemicals on organic farms.

Weevils

Signs. Rotting of shoots, leaf damage, rotting vines.

Cause. Vanilla vine weevil, *Sipalus* sp. The adult weevils feed mainly on the shoots. The injured area quickly rots. They also feed on the leaves by scraping out the fleshy inner parts, leaving a thin, transparent skin on the leaf surface. They lay their eggs in the vine stems. The grubs emerge and feed inside the stem, boring a tunnel along its length. The vine rots, dries and falls.

Prevention. Scout to assess how bad the situation is. If there are only a few insects, remove them by hand. If the weevils are at an economic damage threshold, then seek advice from your local extension agent. Vanilla is mainly grown under organic conditions. Do not apply inorganic chemicals on organic farms.

Other pests

Slugs and snails

Snail on vanilla vine

Figure T12.11. Snail on vanilla vine

Signs. Leaves and pods may be attacked by snails.

Cause. Slugs and snails feed on the roots, leaves and shoots of the vanilla plant. The damage they cause makes it easier for diseases to infect the plants.

Prevention. If there are few snails, it may be possible to remove them by hand. If there is a severe infestation, seek advice from an extension agent.

Chickens

Chickens are a valuable source of eggs and meat. They help control insects and snails in the farm. However, they can also damage the vanilla vines because the vanilla roots are so shallow.

Chickens can damage vanilla roots

Figure T12.12. Chickens can damage vanilla roots

Signs. Roots are exposed. The plant withers.

Cause. Chickens that are reared on free range scratch away the mulch, exposing and damaging the roots of plants.

Prevention and treatment. Keep chickens out of the vanilla garden. Keep the roots covered with an adequate layer of mulch.

Lesson plan

Duration

1.5 hours

Training periods

April and August

Training objectives

During this session the participants will:

- Learn how to identify the major diseases and pests of vanilla.
- Learn how to control these problems.

Do **not** try to teach all the information in the technical information manual on diseases and pests. The participants do not have to know all the Latin names of all the species. This information is included in the manual for your reference only as a trainer.

Materials required

Flip chart and markers, *Handout* with photos, colored ribbons or strips of cloth, secateurs, alcohol, knapsack sprayer, water.

If possible, hold this whole session in a vanilla garden. Visit the garden beforehand to check what types of disease and pest problems there are. Discuss with the farmer; you do not want to embarrass them by pointing out lots of problems and suggesting that they are the result of poor management.

Ask the participants to bring with them photos (on their mobile phone, if they have one) of problems in their own garden. Ask them not to bring diseased plant material with them; you do not want to spread diseases from one farm to another.

Introduction

Greet the participants and tell them what the session is about: diseases and pests of vanilla.

Ask the participants to describe what a **healthy** vanilla plant looks like (green, firm leaves, no discoloration, etc.). Make a list of these characteristics on a flip chart.

Now ask them to think of what an **unhealthy** plant looks like. How can they tell that the plant is unhealthy? Make a list of their suggestions on another flip chart sheet.

Explain that there are different diseases and pests of vanilla, just like there are diseases and pests of other crops, animals, and humans. It is important to know what the problem is so they can decide what to do about it.

Explain that vanilla plants are sensitive. They require the right conditions to grow and produce. If the conditions are not right, the plants will be weaker, and it is easier for diseases and pests to attack them.

You can draw a parallel with people. If someone does not get enough to eat or drink, or if they have to work all day in the sun, or do not get enough sleep, then they will fall ill. If they have no mosquito net, they will get bitten. Just like people, vanilla needs the right conditions to be strong and thrive.

Most important diseases and pests

Divide the participants into several groups and ask each group to think of all the diseases and pests of vanilla that they have encountered in their farms. Give them 5 minutes to make a list.

After 5 minutes, call on each group in turn to name a disease or pest problem. Write each item on the flip chart. Ask what the local name of the disease or pest is, and write this on the flipchart too. If a group repeats what another group has already said, do not note it separately.

When you have completed the list, go through it, and ask for any clarifications that may be needed. For example:

- Are all the pests and diseases mentioned clear?
- Are there any repeats, two names for the same pest or disease?
- Are any details needed?
- Ask questions to identify the disease or pest by name. Write this name next to the item in the list.

Then ask the participants as a whole to vote on which are the three most important problems. Mark these items with a star *.

Most important problems. Say that you will start with the most important disease or pest that they have identified. Show them where it is in the handout, and confirm that this is the same problem. Then discuss the signs, the cause, the prevention and treatment methods.

Rather than giving a lecture on the particular disease, or pest, use questions to find out what the participants already know about the problem. Seek responses from diverse participants. Draw on their knowledge where possible, and correct any misconceptions if necessary.

Repeat with the **second-most important** disease or pest.

Repeat for the **third-most important**.

Types of diseases and pests

Explain that there are three broad types of disease and pest problems: diseases, pests and problems with the environment. Explain how to recognize each broad type of problem.

- **Diseases.** Most of these are caused by fungi.
- **Pests.** These include insects, snails and even chickens.
- **Environmental or physiological problems.** These result when there is too much or too little of something like water, shade or air circulation in the garden. They can weaken the plant and make it more open to disease.

Control of diseases and pests

Explain that many of the diseases are caused by problems in management—especially with too much (or too little shade), too much (or too little) water, and poor management of mulch. Plants that are producing too many pods also become weak and prone to pests and diseases, so farmers should not over work the vines.

Explain that it is better to prevent a disease or pest than to have to treat it. Therefore, if they see an environmental or physiological problem, they should fix it quickly before it results in a disease.

Discuss the various methods of prevention and treatment:

- Plant spacing.
- Sufficient mulch to make the vines strong.
- Not too many pods per cluster on a vine, which weakens the vine.
- Regular inspections of shade, vine growth, roots, mulch, soil moisture, weeds.
- Pruning of vines and shade trees.
- Selection of planting materials.
- Use of chemicals (not on organic farms).
  - Be sure to mention safe use of chemicals.
  - Pregnant women and children should be especially careful to avoid agrochemicals.

Identifying problems in the vanilla garden

Divide the participants into small groups and give each group five pieces of colored ribbon or cloth strips.

Allocate one or two rows of vanilla to each group. Invite them to go down the rows and to check for disease or pest problems. They should tie a ribbon to the part of the vine where they see a problem. If they see the same problem several times, they should not tie another ribbon, but should look for a different type of problem.

For each problem, they should discuss as a group what it is and what they would recommend doing about it.

Tell them to check all the plant parts: vines, leaves, shoots, flowers, beans and roots. They should also check on the amount of mulch, the soil moisture, and the level of shade.

Give the groups several minutes to do this task. While they are doing this, go around to each group and answer any questions they may have.

Call the participants back together again and go with them from one ribbon to another. At each one, ask what the problem is and what to do about it. Correct any errors and add further explanation if necessary. If pruning is required, and with the farmer's permission, demonstrate how to prune the vine to control the problem. Make sure you clean the secateurs after each plant.

Depending on the number of groups, you may not have time to visit all the places marked by ribbons. But make sure you cover the most important diseases and other problems, or those where the participants are most uncertain.

Using chemicals

Most mature agroforestry systems are stable production environments and need few if any agrochemicals. The shade will reduce weeds, and as long as the soil is healthy and there is good ventilation, there are few pests and diseases that will require use of agrochemicals.

If agrochemicals are required, they must be used as shown in the instructions of use. Farmers should only use recommended agrochemicals, and if they have not been trained in the use of agrochemicals, they should seek advice from their local extension officer on safe use and also seek advice from the input supplier, on how to apply, dosage rates, correct nozzle, correct dilution rates, etc. Farmers should be advised not to use chemicals on organic farms.

- Anyone applying agrochemicals should wear protective clothing.
- **Agrochemicals are hazardous, women should be particularly careful in using agrochemicals.**
- **Pregnant women and children should not use agrochemicals.**
- All agrochemical containers should be disposed of safely. Do not use them as water or food containers.

Planning activities

Ask the participants, when they go home, to check their vanilla gardens for signs of diseases or pests. Ask them to decide what (if anything) they should do to control them.

Ask them to discuss any constraints he/she may face in applying pest and disease management practices. Discuss how to overcome those constraints.

Ask them about whether women are using agrochemicals, and if they get any advice on use of agrochemicals? Do women use agrochemicals? Do they get advice on how to use agrochemicals? Who do they get advice from?

Do children ever play with old agrochemical containers. How do farmers dispose of these hazardous materials? Do farmers puncture all agro-chemical contains, so that they cannot be used for water or other activities?

Conclusion

Briefly review what you have covered in this lesson.

Ask the questions in the *Quiz* to make sure the participants have understood how to recognize and control diseases and pests.

Tell the participants when the next meeting will be. Tell them that the next lesson will be about looping vanilla vines.

Quiz

1. List the common diseases found in the vanilla garden. What are the signs of the different vanilla diseases?

2. What methods can be used to control diseases on the farm?

3. What are the common pests that affect vanilla farms?

4. How can we prevent diseases and pests on a vanilla farm?

5. What are some of the safety measures that should be taken when treating diseases and pests on a vanilla farm?

6. What are the recommended ways to use agrochemicals safely?

7. Who should avoid using agrochemicals and why?

8. How should farmers dispose of old agrochemical containers?

9. Why should couples receive knowledge on the use of pesticides?

Expected answers

1. Leaf rot, stem rot, root rot, inflorescence rot, bean rot, anthracnose and their symptoms.
2. Prune away diseased plant parts. Uproot whole plants if necessary. Burn the infected parts. Plant clean planting materials.
3. Termites, podborers, weevils, slugs and snails.
4. Proper spacing, shade management, proper mulching, weed control, planting clean planting materials.
5. Scout the garden regularly to look for disease and pest problems. Remove any infected materials and burn or bury them. Seek advice from the extension agents on control measures.
6. Follow the instructions carefully. Wear safety equipment. Get advice from the extension agent and input supplier. Avoid use of inorganic chemicals on organic farms. Use the correct sprayer and the right nozzle. Know how to mix and spray the chemicals correctly. Spray at the right dosage. Do not go into the garden immediately after spraying.
7. Women (especially pregnant or lactating women) and children should avoid using or coming into contact with agrochemicals.
8. Farmers should dispose of agrochemical containers as specified by the manufacturer and with the advice of the local extension agent and inputs suppliers. Never leave old containers with some chemicals where children could find them. Old containers should be cut so that they cannot be used for water and farmers should dispose of the old containers in a designated disposal area.
9. Men often apply pesticides so he needs to learn how to do it safely, while women may be exposed to pesticides while washing the clothes used to protect her spouse/ partner. Women can also support spouse/ partner to wear protective clothing.

Handout 12.1: Disease and pest management in a vanilla garden

Health checklist

Check the vanilla garden once a week. If you see a problem and need advice, contact a field agent.

Vines. Check the stems, leaves, shoots, flowers, beans, aerial roots.

Do the vines look healthy? Are they the normal color? Any yellow or brown patches? Any speckles or pest damage? Are they firm or limp?

- Do not damage roots. Pull weeds by hand. Do not tread on the ground near the vine.
- Weak growth? Adjust the shade, mulch and looping. Loop vines with enough nodes every rainy season.
- Remove diseased parts. Clean the pruning tools with alcohol, bleach (Jik) or ash in between plants.
- Burn the pruned and diseased material, or bury it outside the garden.

Spacing. Plants too close together? Prune or remove excess plants.

Shade. 50-70% shade in dry season and 30-50% shade in rainy season.

Soil and mulch. Is the soil moist (but not too moist)? Is the mulch layer in order? Make sure the mulch does not touch the base of the vine. Are there too many weeds?

Planting materials. Do not use cuttings from diseased plants. Take cuttings only from gardens that are free of disease. Do not transport shoot cuttings or planting materials from disease areas.

Other crops. Check the tutors, shade trees and intercrops for any disease or pest problems.

- Prune diseased parts of the vine

Prune as often as required to remove all the diseased parts of the stem, leaves or roots, or even the whole plant if necessary. This is important to prevent disease from spreading.

If the stem is diseased, cut off the part that is visibly damaged or brown. If the whole plant is affected, uproot it.

Clean the pruning tools with alcohol, bleach (Jik) or ash in between plants.

Burn the pruned and diseased material, or bury it outside the garden.

Using chemicals

Avoid using chemicals if possible. Do not use them at all in organic farms.

If you do apply chemicals, make sure you:

- Choose the right chemical to treat the problem. If you are not sure, get professional advice.
- When using agro-chemicals, follow the instructions carefully. Use the correct dosage and apply at the right times.
- Use protective clothing (gloves, boots, clothes, mask, goggles). Make sure all equipment is working properly.
- Store the chemicals in a safe place, out of reach of from children and animals. Avoid spilling chemicals when mixing or pouring. Dispose of surplus chemicals and containers safely. Do not reuse containers for something else.
- Pregnant women and children should not use or be exposed to agrochemicals.

Diseases

Diseases may be caused by fungi, viruses and other causes. They generally attack a particular part of the plant, which turns yellow or brown and then rots. Some diseases may attack several parts of the plant at the same time, or may spread from one part to another.

Root and stem rot

This is the most serious disease problem with vanilla in Uganda.

Signs. May affect the roots, the stems, or both.

Roots. The underground root tips become brown and die. The infection gradually spreads to the aerial roots. Many aerial roots, but most die before they reach the ground. The stem and leaves become limp, the stem shrivels, and the vines droop.

The signs get worse during dry periods.

Browning of roots caused by fungus disease

Stems. Brown, water-soaked lesions spread to both sides of the stem. Later, elongated patches develop on the stem, and the tissue rots. Leaves turn yellowish and dry off. More distant parts of the vine start to wilt. The beans may rot.

Stem rot

Signs of stem rot

Cause. Fungus (*Fusarium*). Encouraged by too much soil moisture or shading, inadequate fertilization, overcrowding, and drought stress.

Prevention. Plant vanilla in well-draining soils. Do not plant too close together; avoid overcrowding.

Check the shade levels. Loop vines with enough nodes every rainy season.

Do not damage the roots or dig the soil around the vines. Avoid walking or standing close to the base of the vine to avoid compacting the soil. Apply mulch but do not allow it to come into contact with the vine.

Loop the vines through the mulch to generate more roots.

Treatment. Prune out and burn the infected plants and roots. Dig out and remove affected soil from area around diseased plants and bring in fresh soil. Do not replant until the next rainy season.

Check surrounding plants for signs of the disease.

Leaf rot

Occurs occasionally on mature or old leaves.

Leaf rot of vanilla

Signs. The leaf tip becomes slightly yellowish to brown. It later starts to rot, and the rotting develops backwards, sometimes reaching the middle portions of the leaf.

Cause. Fungus (*Fusarium oxysporum*)

Prevention. Ensure proper looping, mulching, manure application and drainage.

Treatment. If low incidence, and good growing conditions, no action is needed. New shoots will emerge from the lower buds. If very common, check the management, particularly shade, mulch and soil conditions.

If there is a severe infection, seek advice from extension agents.

Bean yellowing

This is relatively a new disease in Uganda.

Source: Orchids Asia

Bean yellowing showing the progression from a healthy bean (far left) to a dry, shriveled bean (far right)

Signs. The disease appears on immature beans of about 5–7 months of age. The tips of the beans turn yellow, which slowly extends towards the base of the bean where it is attached to the stalk. The bean splits, starting at the tip, and the affected parts turn brown. Fully affected beans fall off before they mature. The bean may rot at the tip, at the base, or all over. The disease does not affect mature beans.

Cause. Fungus (*Fusarium oxysporum*)

Prevention. Farmers should remove infected materials and either bury or burn them. If this is a mild infection, only affecting one or two plants, remove the diseased parts. Farmers should avoid water logging and reduce humidity in the vanilla garden, by pruning regularly, avoiding bunching of the vines, making sure the spacing in the garden is correct, that the shading is not too high.

Anthracnose

This disease affects almost all the plant parts: young shoot tips, leaves, roots and beans.

Anthracnose

Signs. The first symptoms are seen on tender parts such as immature beans and the tips of aerial roots. On the beans, small groups of very small, dull-red or amber pustules appear, forming discolored patches. The beans turn black at the tip and the middle. They wilt and fall off within 2–3 days. The pustules appear on both sides of the leaves, with more on the upper side. As the disease progresses, the leaves start yellowing and dry out, then die.

Cause. Fungus (*Colletotrichum*). Encouraged by too much soil moisture, poor drainage, prolonged rainy weather and overcrowding of vines. Diseased and dead leaves, beans and aerial roots lying on the ground can infect other vanilla vines.

Prevention. Collect and burn affected parts to prevent the disease from spreading. Improve drainage. Reduce overcrowding by pruning vines.

Treatment. Reduce the amount of shade, so lowering the humidity in the garden.

Rust

A common disease in Uganda

Signs. Black or brown lesions form on the stem, leaves and fruits.

Cause. Fungus (*Mycoleptodiscus indicus*)

Prevention. Remove affected parts of the plant and bury or burn. Then improve ventilation through better shading and pruning.

Handout 12.2: Environmental and physiological problems

These are not diseases, but are caused by aspects of the environment, such as too much or too little shade, water or soil nutrients. However, they can cause similar signs to diseases, and they make the vanilla plant weaker, less productive, and more prone to disease infections.

Sunburn

Yellowing of leaves caused by intense direct sun light in plantation with poor shade

Signs. The leaves are yellow-green or clear yellow.

Cause. Too little shade.

Prevention. Maintain the right level of shade in the garden in each season. Do not over-prune shade trees or intercrops.

Plant adequate numbers of shade trees.

Chickens

Chickens can damage vanilla roots

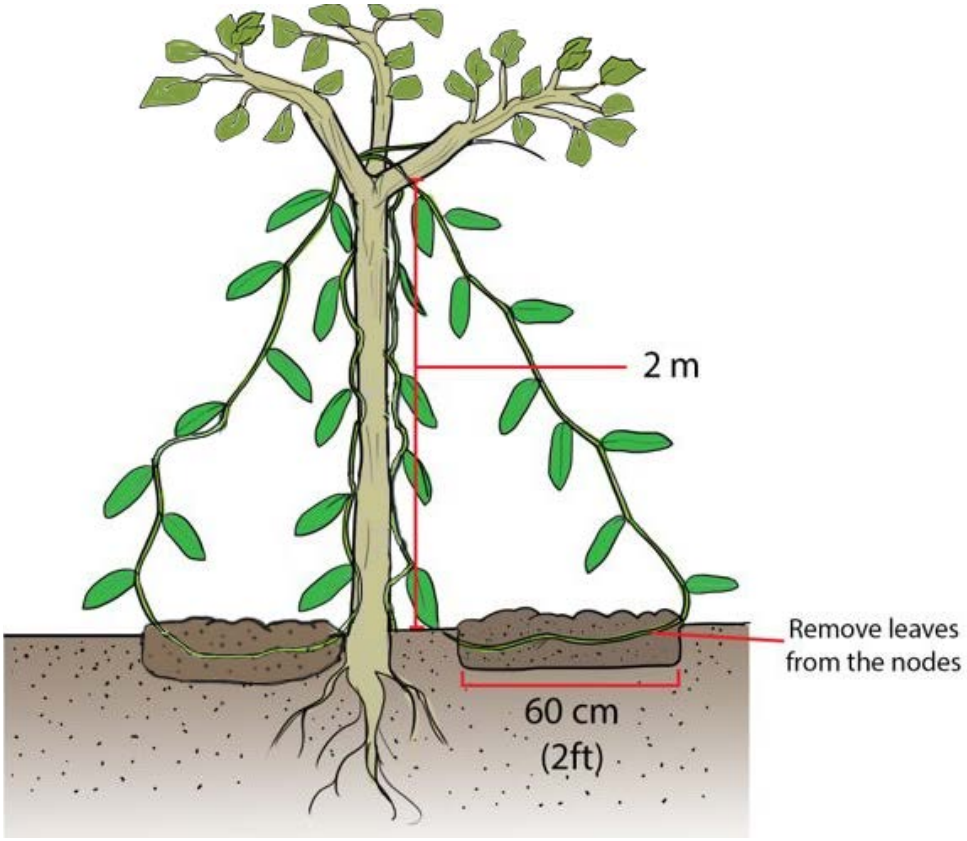
Signs. Roots are exposed. The plant withers.

Cause. Chickens scratch away the mulch, exposing and damaging the roots.

Prevention. Keep chickens out of the vanilla garden. Keep the roots covered with an adequate layer of mulch.

CHAPTER 13.

Looping vanilla vines



Looping involves training the vine down to the ground, burying part in the soil, then training it up the tutor again

Technical information

Because vanilla is a vine, it needs something to climb up: a stake or a tutor tree. If the support is tall enough, the vine can grow up to 10–15 meters in length. But that would make pollination and harvesting impossible.

Instead, the vanilla is trained up support trees known as tutors (see Chapter 8, *Planning and planting tutors*). These are kept short: they are pruned to a height of about 2 meters (see Chapter 11, *Pruning*). When the vine reaches the top fork of the tutor, about 2 meters high, it is directed not to climb any further, so the growing tip hangs down. It will eventually grow downwards until it reaches the ground.

What is looping?

Looping means forming a long vanilla vine into a loop that climbs up the tutor, hangs down until it reaches the soil, forms roots there, then grows back up the tutor again. A single vine may have many loops.

Figure T13.1. A loop buried in the soil. The vine trails down in the center of the photo. A portion is buried, and the growing tip is trained up the tutor stem on the right

Figure T13.2. Farmer tying a newly looped vine to tutor

Why looping?

There are four reasons for looping vanilla:

- Looping keeps the vines within easy reach for pruning, pollination and harvesting.
- Burying part of the vine stimulates it to grow roots. This enables the vine to take up more water and nutrients from the soil.
- Looping stimulates growth, flowering and the development of beans.
- The roots keep the vine vigorous and help it withstand diseases.

How to loop

1. As vines grow, direct their growing tips up the tutor. Prune them at least twice a year after the rainy season to remove the side branches.
2. When a vine reaches the top fork of the tutor, about 2 meters or (6 feet) high, bend it over a branch of the tutor and allow it to hang down. Space the hanging shoot apart from other branches of the vine so they are not bunched together, do not interfere with or shade each other. Keeping the vines apart will help with ventilation and avoid fungal infections.
3. Direct the hanging vine so it grows down towards the ground. Prune the branches so that it keeps growing downwards.
4. When the growing tip has nearly reached the ground, tie it up to keep it off the soil.
5. After 3–4 weeks check it again: it will have grown. Check that it is long enough to reach the ground and have at least 60 cm to spare. If so, it is ready for looping. If it is still not long enough, come back again when it has grown some more.
6. If the hanging vine is long enough, scrape a shallow trench, a few centimeters deep, in the soil, starting about 30 cm away from the tutor. You can use a hoe to make this trench, but be careful not to damage any existing roots. The trench should be about 60cm long.
7. Lay the vine in this trench, starting at the far end, so the growing end is closest to the tutor stem. The vine will make a triangle shape from the top of the tutor to the soil and then back to the base of the tutor.
8. Carefully remove the leaves (about 4 or 5 nodes) from the portion of the vine in the trench, but leave in place the “hangers” that attach the vine to the support. Leave at least two leaves on the growing tip of the vine.
9. Cover the portion of the vine in the trench with soil, compost and mulch. Leave the growing tip exposed, and tie it to the tutor with banana fiber. This tip will attach itself to the tutor and will grow up it to make a new loop.

Planting the loop in the soil should be done during the rainy season, when the soils are soft and moist to encourage the formation of roots. Looping should be done continuously throughout the rainy season to encourage the renewal of the vine. In areas with high rainfall, vanilla grows quickly, so you need to check frequently which vines require looping.

A well-managed vanilla plant can have 7 or more looped vines hanging from the tutor. Each loop develops its own roots, and feeds the vanilla plant. Make sure there is enough space for each loop to grow. Keep the loops separated and well ventilated to allow the leaves to have sunlight and avoid fungal diseases.

Do not wind the vines around the trees, as this makes the vines hard to manage. Attach the vines to the tutor using banana fiber.

Figure T13.3. Guiding the vanilla vines on a tutor

Figure T13.4. Rooting the vines

Lesson plan

Duration

1 hour.

Training periods

March and September (onset of the rainy seasons).

Objectives

During this session the participants will:

- Learn how to loop vanilla vines.

Hold this session in a vanilla garden where it is necessary to loop several vines. Make sure beforehand that the farmer will permit you and the participants to practice looping the vines.

Materials

Compost to cover the looped vines.

Banana fiber to tie the growing tip to the tutor stem.

Introduction

Greet the participants and tell them what the session is about: looping of vanilla.

- Ask the participants if they know what looping is.
- Ask how many of the participants practice looping. Ask them to describe what they do.
- Explain that looping consists of two activities: training the growth of the vine over a branch of the tutor, and burying the hanging vine in the mulch and training it upwards again.
- Ask them why it is important to loop the vines. What are the benefits of looping? What happens if you do not loop the vines?

See the *Quiz* for other possible questions.

Field practice

Find a vanilla vine where one or more shoots need to be trained downwards. Demonstrate how to do this.

- Then find a hanging vine that is long enough to loop in the soil. This vine will be long enough to reach the ground and have another 60 cm (2 feet) of growth to be buried.
- Demonstrate how to dig the planting trench.
- Carefully remove the leaves from the portion you will bury. Leave the leaf hangers. Point these out to the participants.
- Show the participants how to bury the stripped vine and attach the growing end to the tutor stem.
- Divide the participants into small groups and allocate each group one or two rows in the vanilla garden. Invite them to find a vine in their row that is long enough to be looped in the soil. Check that they have chosen a suitable vine, then invite them to loop it. Make sure they are doing this correctly.
- Invite them to find other vines in their row that need looping, and invite them to do so. Go from group to group to check that they are doing the work correctly.

Planning activities

Ask the participants, when they go home, to walk through their vanilla gardens and check which vines need looping. Ask them to do any looping needed before the next lesson.

Ask them to discuss any constraints he/she may face in looping the vines by the next lesson. Discuss how to overcome those constraints.

Conclusion

Briefly review what you have covered in this lesson.

Ask the questions in the *Quiz* to make sure the participants have understood how to do looping.

Tell the participants when the next meeting will be. Tell them that the next lesson will be about flowering and pollination.

Quiz

1. Why is it important to loop vanilla vines?

2. At which stage should looping be done?

3. How far away from the tutor should the looped vine be buried?

4. What time of the year should looping be done?

Expected answers

1. Looping keeps the vines, flowers and beans within easy reach. It renews the vine and develops the roots. It keeps the vine healthy and strong.
2. Looping should be done after the vine has climbed 2 meters up the support tree.
3. About 30 cm.
4. During the rainy season when the soils are soft.

Handout 13.1: Looping vanilla vines

What is looping?

A loop is a long vanilla vine that:

- Climbs up the tutor
- Hangs down until it reaches the soil
- Forms roots there
- Then grows back up the tutor again.

Why looping?

- It keeps the vines within easy reach.
- The buried part grows roots.
- The looping helps growth, flowering and the formation of beans.
- The roots keep the vine healthy.

Rooting the loops in the soil

How to loop

1. Direct vine growth up the tutor, pruning off side branches. When it reaches 2 meters high, loop it over a branch of the tutor and let hang down. Prune off any branches to keep it growing down. Tie it up to keep it off the soil.
2. **In the rainy season.** When it is long enough to reach the ground plus about 60 cm, scrape a shallow trench from about 30 cm away from the tutor.
3. Trim off 4–5 leaves for the part you will bury. Leave the hangers on.
4. Lay the stripped part of the vine in the trench, so the growing tip is close to the tutor. Cover the stripped part with soil, compost and mulch.
5. Train the tip up the stem of the tutor. Tie it on the stem with banana fiber.

Do's

- Check the vines regularly to see which are ready for looping.

Don'ts

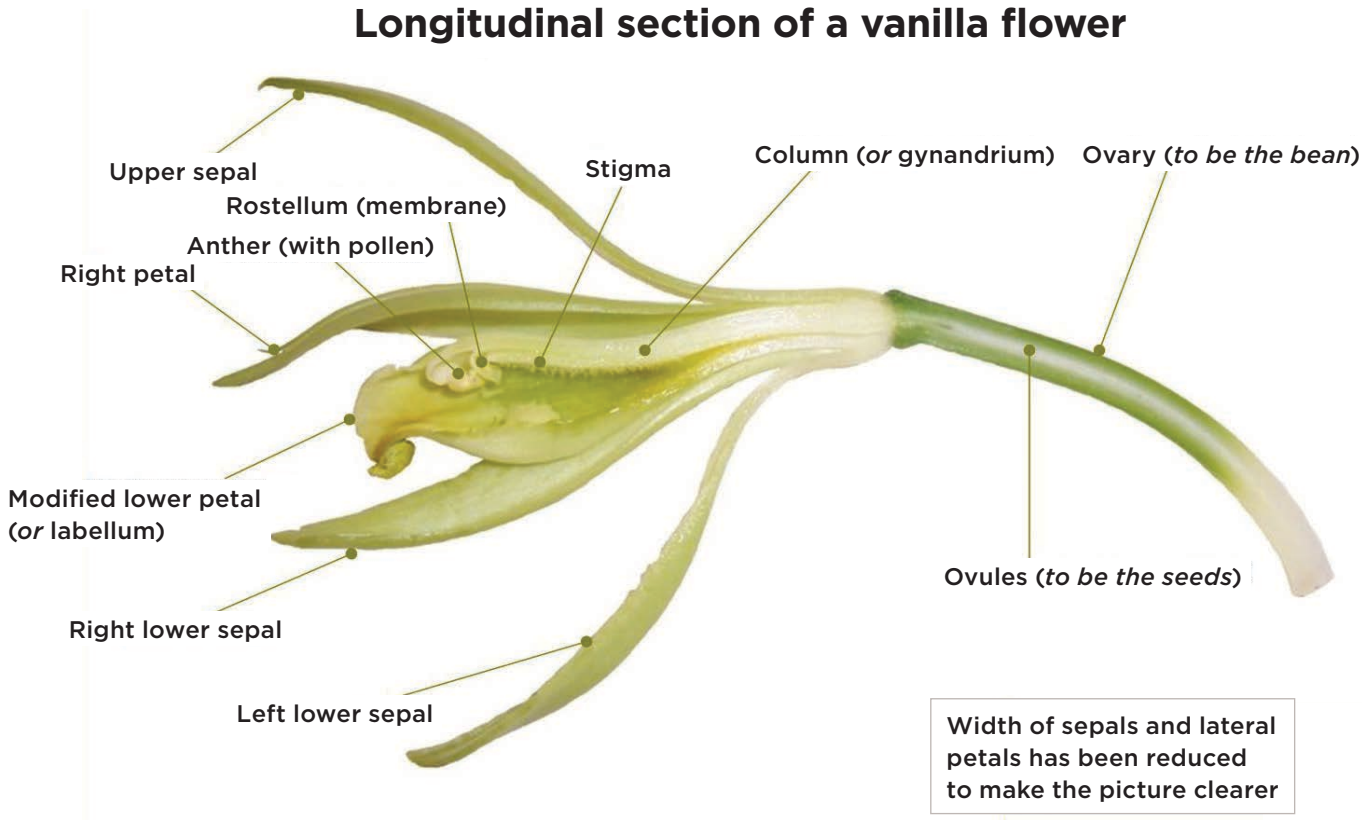
- Don't bunch the loops together. Hang them over different tutor branches to keep them apart.
- Don't wind the vines around the tutor stem.

Guiding vanilla vines on a tutor

Rooting the vines

CHAPTER 14.

Flowering and pollination



Parts of a vanilla flower

Technical information

Flowering

Vanilla vines normally flower 2–3 years after planting, though some take up to 4 years, depending on the length of the cuttings at planting and how well they are maintained. It is not good to stimulate flowering in young plants, as they are not strong enough to flower and maintain growth. Short cuttings take longer to flower than cuttings that are the right length (2–3 meters).

Uganda has two rainy seasons, so there are also two flowering seasons, and two harvesting seasons, each year. Flowering starts at the beginning of the rainy season and continues for 2–3 months. The two major flowering seasons in Uganda are March/April and September/October.

Factors that stimulate flowering:

- **Dry season**. The dry season is ideally about 2 months long.
- **Amount of shade**. Towards the start of the rainy season, reduce the shade to 30–50%. The extra sunlight stresses the vanilla plant and stimulates it to flower. But do not prune too much, as too much sunlight harms the vine and results in low-quality beans.

Pollination

Why pollinate?

For most crops, the pollination is done by insects, the wind, or by the plant itself. For vanilla, there are no insects that can do the pollination. That means the flowers need to be pollinated by hand to produce beans. If you do not pollinate the flowers by hand, you will not get any vanilla beans.

When to pollinate?

During the flowering seasons (the rainy seasons). The flowers will open at different times, and they must be pollinated within 12 hours after they open. Walk through the farm every morning during the flowering seasons and pollinate the new flowers. Do not wait too long, or it will be too late!

It is best to pollinate early in the day, between 09:00 and 12:00, when it is dry and sunny. Pollination is less successful during the afternoon and in wet, cloudy conditions.

In Uganda, most flowers are pollinated in September and October, which then leads to the main vanilla harvest season of June/July in the following year.

Parts of the vanilla flower

A vanilla flower has petals that surround the reproductive organs. Each flower has both male and female parts.

The male part is called the **anther**. This produces pollen.

The female part is called the **stigma**. This is slightly sticky, so pollen will stick to it. If the pollen falls onto the stigma, it will fertilize the flower and it will produce a bean.

Between the male and female parts is a thin sheet or membrane called the **rostellum**. This normally prevents the male part from pollinating the female part, so stops the flower from fertilizing itself.

The anther, stigma and rostellum are all hidden inside the inner petal of the flower, called the **labellum**. This is shaped like a funnel.

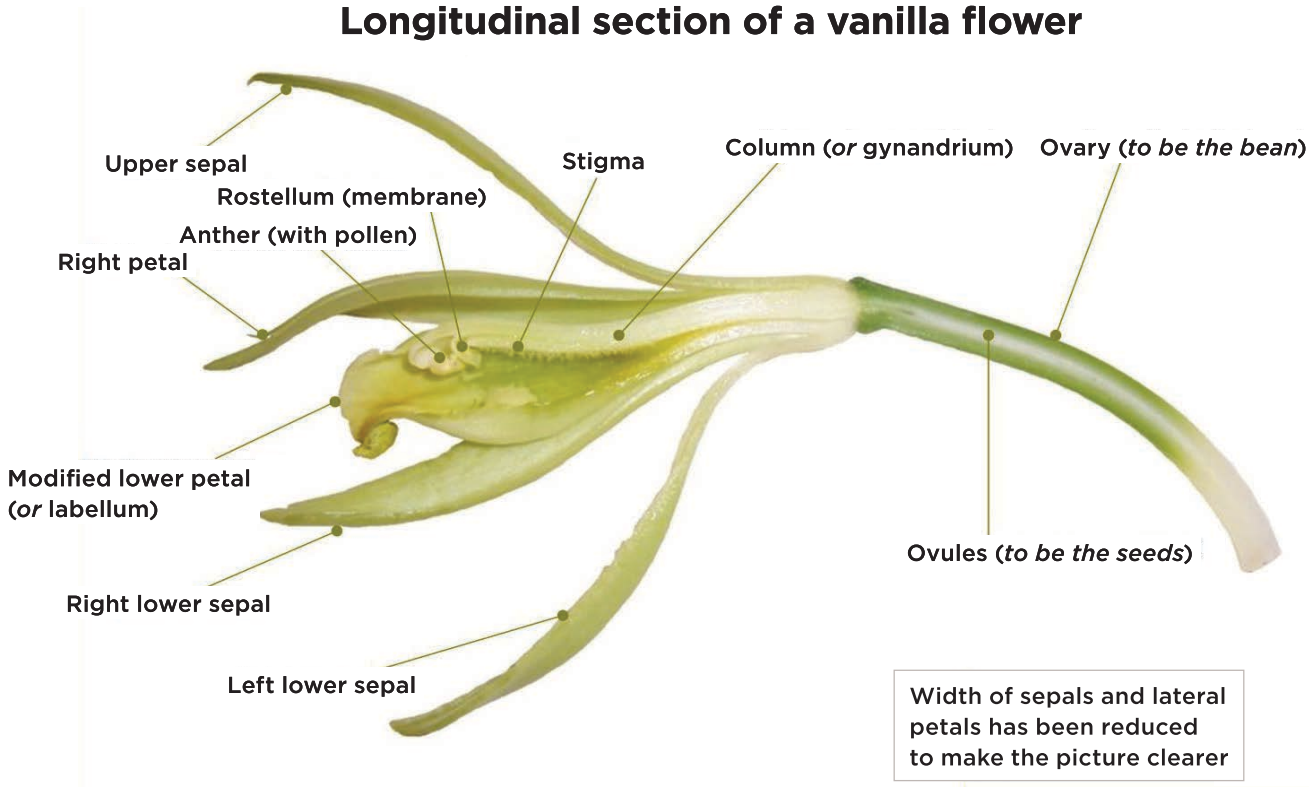


Figure T14.1. Parts of a vanilla flower

How to pollinate?

Pollinating vanilla is a skilled task that requires delicacy and patience.

You will need a splinter of bamboo, a pin or a toothpick.

1. Use the bamboo splinter to slit the **labellum** downwards so you can see the flower parts inside.

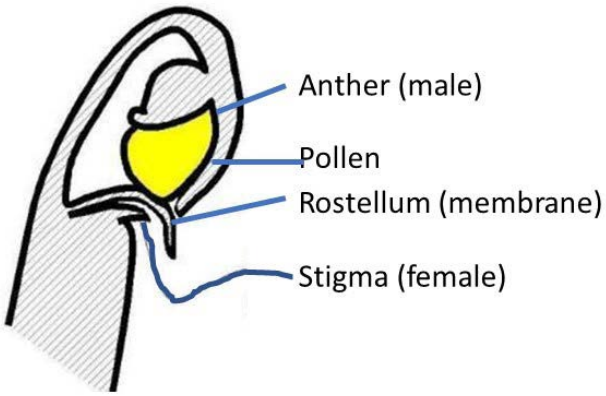


Figure T14.2. Slit the labellum to expose the flower parts inside

2. Use the tip of the bamboo splinter to gently push the **rostellum** (membrane) up underneath the **anther**. There is a space under the anther that the rostellum can fit into. This will allow the anther to make contact with the stigma.

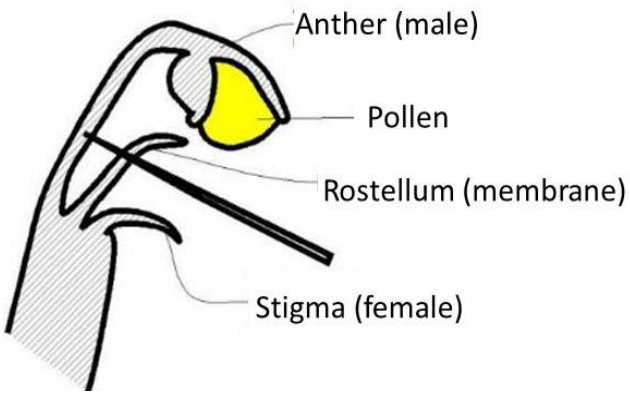


Figure T14.3. Push the rostellum membrane up so the anther can touch the stigma

3. With your thumb, gently push the **anther** down onto the **stigma** so they are touching one another. At the same time, take the splinter out.

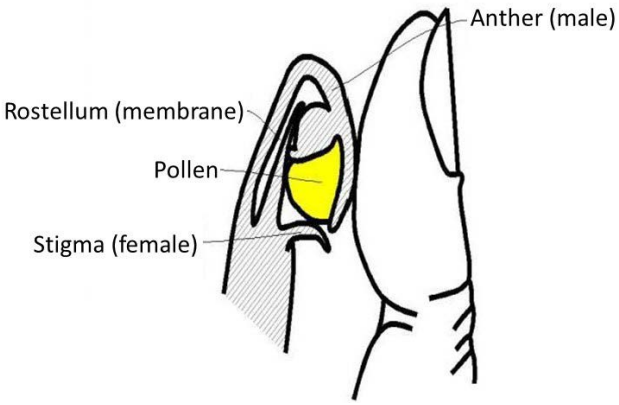


Figure T14.4. Gently press the anther and stigma together

How many flowers should you pollinate?

The flowers grow in clusters of 15–20, with one flower per cluster opening at a time. There may be 20 flowers per bunch. Some farmers pollinate all the flowers, but the more beans per cluster, the smaller the beans—which do not fetch a good price. Pollinating too many flowers also weakens the plant and reduces its productive life. It also increases the costs of pollination.

Pollinating fewer flowers will produce longer, heavier beans that will fetch a better price from the right buyers. Pollinate around **10–12 flowers** per cluster. Not all the flowers will be pollinated successfully, so you should end up with the ideal number of **8–10 beans** per cluster.

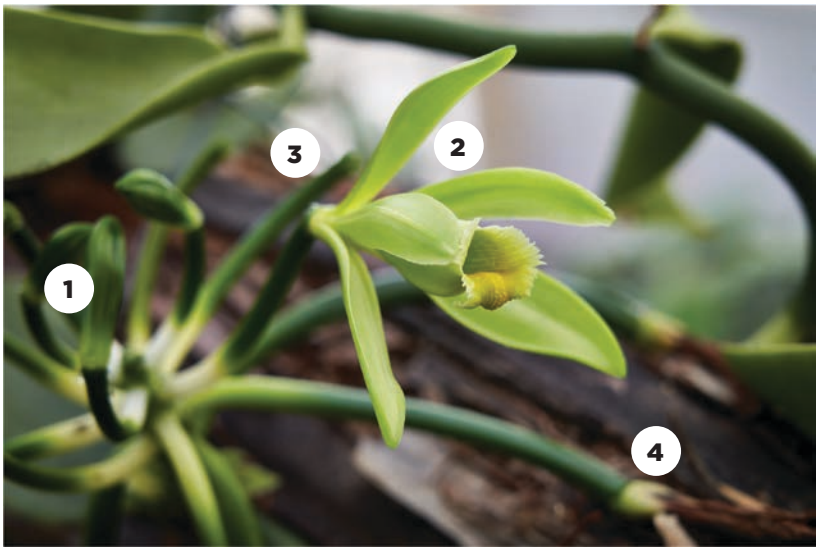
After pollination

If the flower is fertilized, the stem behind it starts to swell. This stem thickens and turns into the bean. The flower dries up and shrivels. One fertilized flower becomes one bean.

If the flower is not pollinated, it will dry up and fall off. It will not produce a bean.

Three months after pollination, check each cluster. Count the beans and remove the small ones so there are **8–10** per cluster. This will let the plant produce bigger and longer beans, which are more valuable.

Most vanilla plants will produce 10–20 clusters of beans.



1 Flower bud

2 Flower open: ready to be pollinated

3 Unpollinated: the flower has dropped off

4 Pollinated: flower dried, stem beginning to swell

Photo: Geoff McKay

Figure T14.5. A cluster of vanilla flowers at different stages

Let's talk about money

Pollination is one of the most important tasks during the vanilla production calendar. If the flowers are not pollinated, there will be no beans. Productivity varies widely. An average vanilla plant produces about 500 g of beans, but some mature vanilla plants produce as many as 2-5 kg of beans each in one harvest season.

Farmers should ensure there is adequate labour on the farm to carry out the pollination. If there are not enough skilled family members, farmers should consider hiring laborers to do some of the pollination work.

- If it takes a worker 1 minute to pollinate 2 flowers, then over a 5-hour day, they could pollinate 600 flowers.
- In **one hectare**, there may be between 80,000 and 200,000 flowers to pollinate in one season. It would take between 130 and 330 workdays to pollinate them.
- For a **one-acre** (0.4 hectare) garden, there would be between 35,000 and 89,000 flowers to pollinate. That would still take between 60 and 150 days. A husband and wife alone will not have enough time to pollinate the flowers in a garden this size. They will need to hire workers to do some of the job.

How much would this cost? If the family does half of the pollination and hires a worker to do the rest, this will cost around UGX 175,000 (US$ 48) for 0.4 hectare (1 acre) (Table T14.1).

Table T14.1. Example of costs of pollinating vanilla in one season

0.4 ha (1 acre) 444 vines with 10 clusters of 10 flowers = approx. 44,400 flowers

Activities	Workdays	UGX per day	Total UGX	US$	
Family labor	35	5,000	175,000	48	A
Hired labor	35	5,000	175,000	48	B
Total		**A + B**	**350,000**	**97**	**C**
Size of field (hectares)			0.4	0.4	D
Total per hectare		C / D	875,000	243	E

Videos

The following videos show how to pollinate vanilla.

How to pollinate vanilla

www.youtube.com/watch?v=SgOI6HPJY3U

www.youtube.com/watch?v=I42TA8aI24o

https://vimeo.com/170380946 Trick Horse Skeeter videos

Lesson plan

Duration

1. 5 hours.

Training periods

March and August.

Training objectives

During this session the participants will:

- Learn how to pollinate vanilla flowers.
- Pollinate 10-12 flowers / cluster not ALL flowers

Hold this session in a vanilla garden where the vines are in flower. If possible, hold the session in the morning on a dry, sunny day. Make sure beforehand that the farmer will permit you and the participants to practice pollinating the flowers.

Materials

Bamboo splinters, toothpicks or safety pins.

Ideally a TV screen connected to a computer for showing videos. If not available, use a computer screen, or share a phone that can show videos.

Introduction

Greet the participants and tell them what the session is about: pollinating vanilla flowers.

Flowering

Ask the participants

- What times of year the do vanilla plants flower?
- How long do they flower?
- What stimulates the flowering?
- What is the difference in flowering between the two rainy seasons?
- Who does the pollination in the household?
- Can the family do all the pollination by themselves?
- Do they hire labor to help with pollination?
- How many flowers should you pollinate per cluster?

Ask them what they can do to stimulate the vanilla plant to produce more flowers. Explain that a certain amount of stress stimulates the flowering, for example by pruning the vine itself, or reducing the amount of shade. In addition, explain that farmers should always follow the recommended steps for pruning and shade management, and avoid over stressing the plant.

Pollination

Ask the participants whether they pollinate the vanilla flowers. Ask two or three participants **how** they do it.

Ask them **why** they do the pollination by hand. Explain that there are no insects that can do the pollination.

Parts of the vanilla flower

Use the technical information to explain the parts of the vanilla flower and the pollination process.

Demonstrating pollination

It is much easier to understand how to do the pollination by watching a video. Show the videos listed in the *Technical information* manual.

If you only have a small screen or a mobile phone, show the videos to the participants in small groups or one by one.

Explain what happens if the pollination is successful or unsuccessful. Point out flowers in the garden at different stages: buds, open flowers, successfully pollinated, and not pollinated.

Demonstrate how to pollinate a flower in the garden. Because it is difficult to see, divide the participants into groups of two or three so they can watch you in turn. Make sure that each person can see exactly what you are doing.

Pollination practice

Give each participant a bamboo splinter (or toothpick or safety pin) and ask them to pollinate some vanilla flowers. Make sure that the participants take turns: each person not only watches other people doing it, but also does it themselves. Go round and make sure that they are doing it correctly.

When everyone has had a chance to practice pollinating flowers, bring the participants back together. Ask if there are any questions.

Check their understanding by asking the questions in the *Quiz*.

How many flowers should you pollinate?

Flowers grow in clusters of 15–20. One flower per cluster opens at a time. There may be 20 flowers per cluster. If farmers pollinate all the flowers, the beans will be small. Small beans do not fetch a good price.

Health warning: Pollinating too many flowers weakens the vine and reduces its productive life. It also increases the costs of pollination.

Pollinating fewer flowers will produce longer, heavier beans that will fetch a better price from the right buyers. The vine will also live longer.

Pollinate around **10–12 flowers** per cluster. Not ALL the flowers will be pollinated successfully, so you should end up with the ideal number of **8–10 beans** per cluster.

Let's talk about money

1. Explain that you are going to work out how long it takes to pollinate the flowers in the garden you are in. Say that you will have to do some arithmetic. Ask someone with a calculator on their phone to help you do the calculations. You can use the tables in the *Handout* to help with the calculations.
2. Ask the farmer of the garden you are in how big it is. Ask how many vines/vanilla plants it contains. (If they don't know, use 0.4 hectare (1 acre) and 444 vines, as in the example calculations below.) Write this number on a flipchart:

	444	**vines**

3. Ask how many clusters of flowers there are on an average vine. (Answer: between 10 and 20.) Use 10 clusters as an example. Write this number on the flipchart and multiply by the number of vines.

	444	vines
×	10	flower clusters per vine
=	**4,440**	**flower clusters**

4. Ask how many flowers they should pollinate in a cluster. (Answer: 10–12.) Use 10 as an example. Write this number on the flipchart and multiply by the number of flower clusters to give the total number of flowers that need to be pollinated in the garden.

	4,440	flower clusters
×	10	flowers per cluster
=	**44,400**	**flowers in garden**

5. Ask them to think of their own experience with the pollination exercise they have just done. How many flowers can a skilled person pollinate in one minute? (Answer: around 2.)

	44,400	flowers in garden
÷	2	flowers per minute
=	**22,200**	**minutes**

6. Work out how many hours that is.

	22,200	minutes
÷	60	minutes per hour
=	**370**	**hours** (rounded)

7. Work out how many days that is (count 5 hours per day)

	370	hours
÷	5	hours per day
=	**70**	**days** (rounded)

8. Ask if they and their husband or wife can afford to spend that amount of time doing just pollination in the vanilla garden. Stimulate a discussion about the amount of time they spend doing various tasks on the farm and in the household.
9. Ask what they would do if they cannot spend so much time themselves doing the pollination. Work out how much hiring a worker to do the extra pollination work would cost.
10. Ask whether it is worth hiring someone to do some of the pollination. How easy is it to find skilled workers at the right time of year?

Planning activities

Remind the participants to check their vanilla gardens frequently and pollinate any flowers that need pollinating—but not to pollinate too many flowers in each cluster.

Ask them to discuss any constraints he/she may face in pollinating flowers when needed. Discuss how to overcome those constraints.

Conclusion

Briefly review what you have covered in this lesson.

Tell the participants when the next meeting will be.

Tell them that the next lesson will be about harvesting.

Quiz

1. What are the main factors that stimulate flowering in vanilla?

2. When does flowering occur in vanilla?

3. Describe how to pollinate vanilla.

4. What are the best practices related to vanilla pollination?

5. How do you ensure the beans grow to a reasonable size after pollination?

Expected answers

1. Dry season (about 2 months) reduction of shade to 30-50%.
2. During rainy seasons in March/April and September/October.
3. Slit the labellum (funnel petal) with a bamboo splinter. Use the splinter to push the membrane out of the way, and press the anther and stigma together.
4. Hand pollination, daily inspections to look out for flowers to pollinate, pollinating flowers between 9 am and 12.00 noon.
5. Remove small beans 3 months after pollination. Keep 8–10 beans per cluster

Handout 14.1: Flowering and pollination

Pollination

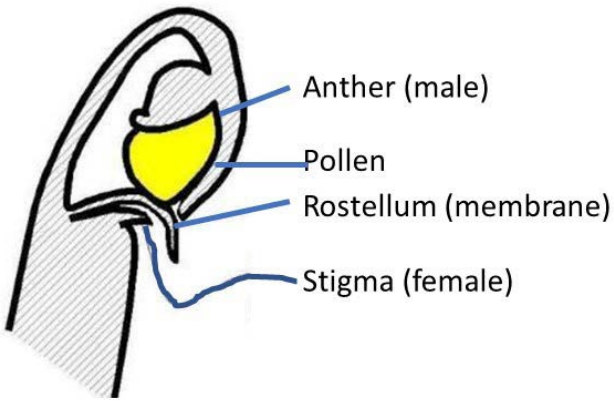
- Vanilla vines usually flower 2-3 years after planting, though some take up to 4 years depending on length of cutting at the time of planting and how well they are maintained.
- Flowering is usually stimulated by the dry season (about 2 months long) and the amount of shade.
- Reduce shade to about 30-50% towards the start of the rainy season but do not prune to much as too much sunlight harms the vines and results in low quality vines.
- There are no insects that pollinate vanilla. That means flowers need to be pollinated by hand.
- Pollination is done during the flowering seasons (rainy seasons).
- It is best to pollinate early in the day between 9.00am and 12.00 noon when it is dry and sunny.
- Pollination is less successful during afternoon and in wet cloudy conditions.
- There is need for adequate labour on the farm to carry out vanilla pollination.

How to pollinate

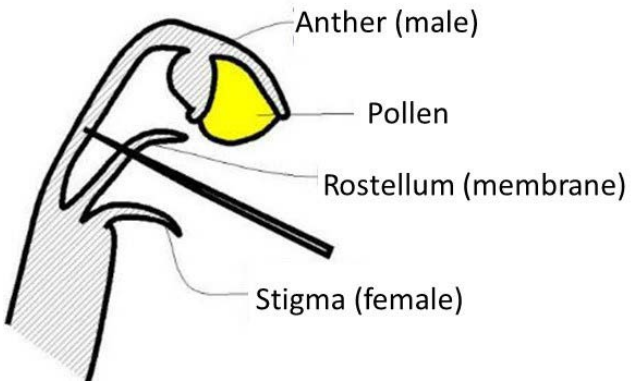
Pollinating vanilla is a skilled task that requires delicacy and patience.

You will need a splinter of bamboo, a pin or a toothpick.

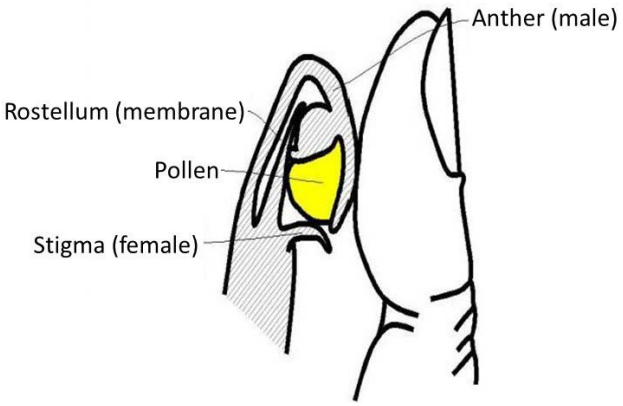
1. Use the bamboo splinter to slit the **labellum** downwards so you can see the flower parts inside.



2. Use the tip of the bamboo splinter to gently push the **rostellum** (membrane) up underneath the **anther**. There is a space under the anther that the rostellum can fit into. This will allow the anther to make contact with the stigma.



3. With your thumb, gently push the **anther** down onto the **stigma** so they are touching one another. At the same time, take the splinter out.



Videos

How to pollinate vanilla
www.youtube.com/watch?v=SgOl6HPJY3U

Comment polliniser la fleur de vanille?
How to pollinate vanilla flowers (in French)
www.youtube.com/watch?v=l42TA8al24o

Pollinating the vanilla flower
https://vimeo.com/170380946 Trick Horse Skeeter videos

After pollination

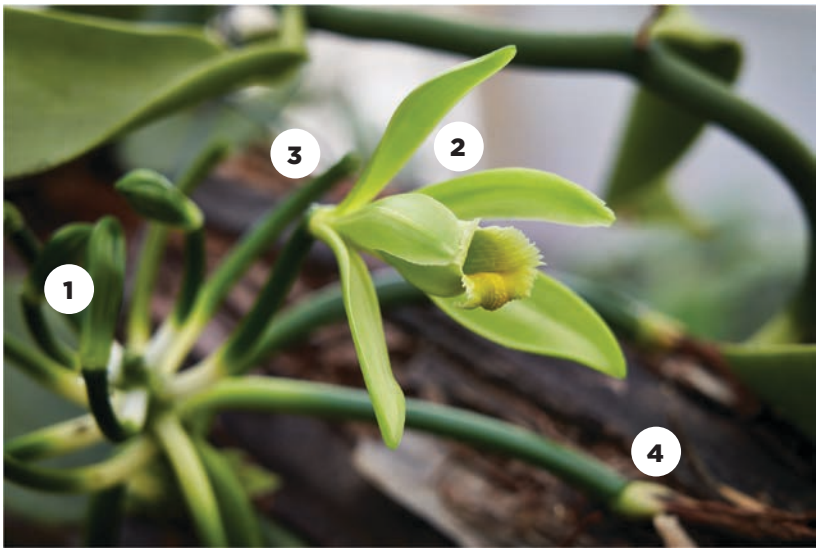
If the flower is fertilized, the stem behind the flower will swell and turn into the bean. The flower dries up and shrivels. One fertilized flower becomes one bean.

If the flower is not pollinated, it will dry up and fall off. It will not produce a bean.

After successful pollination, the bean starts to grow quickly. After 45 days it has reached its maximum length and diameter. After this, it no longer grows. But the bean takes another 7–8 months to mature.

Three months after pollination

Check each cluster. Count the beans and remove the small ones so there are 8–10 per cluster. Most vanilla plants will produce 10–20 clusters of beans.



1 Flower bud

2 Flower open: ready to be pollinated

3 Unpollinated: the flower has dropped off

4 Pollinated: flower dried, stem beginning to swell

Vanilla flowers at different stages

How many flowers should you pollinate?

Flowers grow in clusters of 15–20. One flower per cluster opens at a time. There may be 20 flowers per cluster. If farmers pollinate all the flowers, the beans will be small. Small beans do not fetch a good price.

Health warning: Pollinating too many flowers weakens the vine and reduces its productive life. It also increases the costs of pollination.

Pollinating fewer flowers will produce longer, heavier beans that will fetch a better price from the right buyers. The vine will also live longer.

Pollinate around **10–12 flowers** per cluster. Not ALL the flowers will be pollinated successfully, so you should end up with the ideal number of **8–10 beans** per cluster.

Let's talk about money

Calculating the time needed for pollination

Area of garden (hectares or acres)		A
Number of **vines**		B
Flower clusters per vine	10	C
Number of **flower clusters**		D = B × C
Flowers per cluster	10	E
Total flowers in garden in one season		F = D × E
Number of **flowers** 1 person can pollinate **per minute**	2	G
Number of **minutes** needed to pollinate all the flowers		H = F / G
Minutes per hour	60	I
Number of **hours** needed to pollinate all the flowers		J = H / I
Work hours per day	5	K
Number of **days** needed to pollinate all the flowers		K = I / J

Costs of pollinating vanilla in one season

0.4 ha (1 acre) 444 vines with 10 clusters of 10 flowers = approx. 44,400 flowers

Activities	Workdays	UGX per day	Total UGX	US$	
Family labor					A
Hired labor					B
Total		**A + B**			**C**
Size of field (hectares)					D
Total per hectare		C / D			E

CHAPTER 15.
Harvesting

Good quality vanilla harvested and sold collectively at a farmers' cooperative to earn a better price

Technical information

Protecting the harvest from thieves

If the price of vanilla is high, it is an especially tempting target for thieves—either people from outside, or insiders such as family members and hired laborers who are familiar with the garden. Vanilla is easy to pick and transport, so stealing it is easy.

Ways to protect the vanilla garden include:

- Build a strong fence around the vanilla garden. Use barbed wire and live thorny fences to deter thieves from coming into the garden.
- Cover the fence in banana leaves and other materials so that people cannot see into the garden.
- Hide or lock the entrance to the garden (this is effective if the surrounding fence is strong).
- Have family members guard the garden, especially during the night as the beans come to maturity.
- Hire guards to protect the farm (but make sure the guards themselves do not become thieves!)
- Allow only people you can trust (such as close family members) into the garden at harvesting time. Many farmers do not hire workers but have family members do all the harvesting. Farms larger than 0.4 hectares (1 acre) are usually too big for the family to manage alone. They usually hire full-time staff, so theft is less of an issue.
- Keep dogs in or near the garden. They do not have to be fierce, just have a loud bark!
- Put empty water containers around the farm, so that they crackle when people who don't know the farm walk in. This alerts dogs and guards to unwanted visitors.
- Join a community watch scheme: a community-based security team that watches out for its members.
- Listen to people and hold community meetings with others to discuss the need for improved security and being alert at harvest time. Inform local leaders if there are strangers or people acting suspiciously in the village at harvest time.
- To address stealing within the household, plan with spouse and other family members on how to use the harvest and the income generated from its sell to fairly benefit the household members.

When to harvest

Uganda has two harvesting seasons for vanilla: in December/January, and in June/July.

The mature vanilla beans are ready for harvest 9 months after flowering and pollination.

- Flowers pollinated in March will produce beans ready for harvest in December.
- Flowers pollinated in October will produce beans ready for harvest in July.

A bean is mature when the tip of the bean turns yellow. The bean loses its shine and becomes dull. Two distinct lines appear from one end of the bean to the other.

Because the flowering takes place over a 6-8 week period, the beans also mature at different times. During the harvest season, go through the garden at least once a week to harvest the individual beans. You may be able to harvest a whole bunch if it is ready at the same time.

Harvesting probably takes place over a 1–2 week period. Farmers will harvest as much as possible at one time so they can sell a large amount quickly.

Figure T15.1. Beans turn yellow at the tip when they are ready for harvest

Picking too early

Vanilla pods start to split if they are fully mature. Harvest just before this happens. Alert the buyer if your vanilla beans start to split.

Do not pick beans before they are ready for harvest. When prices are high, farmers often pick early to avoid theft. However, this drastically reduces the quality of the beans. Always aim to pick the vanilla 9 months after flowering.

Because Uganda has two rainy seasons and two dry seasons, there will be beans of two different ages in the vanilla garden on different vines (and even on the same vine) at the same time. Some beans are ready for harvest, and some that are still only a few months old are not.

Some farmers mark their beans, with a pin, or fine pen, so that they know which beans are ready for the upcoming harvests. Do not mistakenly harvest the young beans, and do not be tempted to mix beans of different maturities. Young beans do not weigh as much, and they produce a much lower content of vanillin flavor.

The quality of the vanilla is very important for buyers in Uganda (and in other countries) and also for consumers at the point of sale. Selling immature beans drastically reduces the quality of the overall harvest.

Why not harvest young beans?

It is tempting to harvest the young vanilla beans to earn money immediately. Since the young beans are the same size as the mature beans, it can be difficult to tell them apart. But young beans have no vanillin and therefore reduce the quality of the vanilla harvest. The processing companies test the vanillin content. Beans that are low in vanillin attract low prices.

Farmers should want to develop a good partnership with vanilla buyers. They should try to supply beans of consistently high quality that the buyer and processing firm are pleased to buy and for which they will offer a good price.

Before they buy beans, buyers will check them and pay a price that reflects their quality. If the beans are immature, over-ripe, damaged or diseased, they will fetch a lower price. Maybe the buyer will refuse to buy them.

Various members of the farm family, as well as hired workers, may harvest beans. All should know about the importance of harvesting mature beans. Make sure they know how to distinguish mature from immature beans.

Picking too late

If you wait too long to pick the beans, they will start to split at the bottom and will turn from yellow to dark brown or black. These beans will also produce less aroma and will fetch a lower price. Farmers should inform their buyers about the timing of harvest so they can harvest before there are too many split beans.

If there are split beans, harvest and put them into a separate container and sell them separately.

Figure T15.2. Beans that are over-ripe crack at the bottom

Figure T15.3. A bunch may have beans at different stages of maturity

National harvesting dates

The Ugandan Ministry of Agriculture is working with the Vanilla Exporters Association (VANEX), which is made up of the main vanilla buyers in Uganda, to set specific dates for harvest. In the past two years, the Ministry has made announcements for specific harvesting dates in January and July. The teams are still working to improve the process of setting harvesting dates, as there are differences in maturity of the beans across the country, but the main aim of this work is prevent traders and buyers from early buying and to prevent farmers from picking immature beans.

The harvest dates are being backed up with local ordinances that aim to enforce specific trading windows for vanilla in Uganda. This work is being done to raise the quality of the vanilla in Uganda and help to promote the brand of Ugandan vanilla.

Production levels

The quantity of beans per vine depends on the location, soil fertility and production system. In some parts of Uganda, where soils are fertile and rain abundant, a single vine can produce well over 1 kg of beans. Farmers in Rimi sub-county, Rwenzori, who have good soils, say their best vines each produce over 5 kg of beans in one season.

Figure T15.4 shows a vine with 85 clusters, each with 10–15 beans. If one bean weighs 25 grams, this vine alone produced about 25 kg of beans! This vine is perhaps unusual, but it gives an idea of the production potential.

Figure T15.4. Vanilla vine with 85 clusters of beans

With good agronomic practices, it is realistic to aim for about 8–10 beans per cluster. You will need about 35-40 beans of 25–30 cm (10–12 inches) in length to make 1 kilogram of green vanilla. According to the literature, most farmers in Uganda produce only about 200–350 g of beans per vine. Improving production methods, shade and mulch, it is possible to increase this to 500 g per vine. The target is 1 kg per vine.

Keeping records on yields

There is limited data on the production of vanilla among farmers in Uganda. Work with 4–5 male and female farmers throughout the year and record how many clusters they have on their vines. This will give you a good idea of the actual and potential production levels in your area.

How to harvest

Harvest vanilla beans at a cool time of the day. Pick the beans carefully by hand, or cut them off one by one with scissors or a sharp knife. Put them gently into a basket, plastic bag or tub.

Take care when harvesting: do not damage the beans as this can make it easier for fungal diseases to attack the beans and will reduce their value. The bean quality deteriorates quickly after harvest.

Do not wash the beans in water or alcohol as this may cause them to dry out or become moldy.

Harvest damaged or diseased beans, but put them in a separate container from the good-quality beans. The types of damage include major mechanical damage, splits, rot, and damage by podborers.

Discard any beans that cannot be sold.

Sorting and grading

Farmers should grade the beans only if the buyers are prepared to pay a premium for higher-quality beans. Some buyers want to have only the longest, most mature beans. If this is the case, farmers can grade their beans and sell the best beans at a higher price.

The buyer or processing plant will inspect and grade the beans based on their size, length, color, maturity and appearance. Beans that are damaged, spotted, cracked, diseased or with insect damage are lower quality and will command a lower price.

Figure T15.5. Sorting vanilla beans by size. Longer beans are more valuable

Storage

The harvested beans must be kept out of the sun. Do not store them in plastic bags, and do not vacuum-pack them. Put them in bags or baskets made of natural materials, such as sisal or papyrus. Cover them with fresh banana leaves to keep them fresh. Store them in a cool, shady place until they are sold.

Figure T15.6. Vanilla beans waiting to be sold

Sale

Buyers want to start the curing process at the factory within 24 hours of harvest. It is important to get the harvested beans to the buyer as quickly as possible.

The farmer should arrange with the buyer to pick up the beans the same day as they are picked. They should try to agree on the volume and price beforehand, as well as the time and place of the sale.

Communication in the family

The members of the household—husband, wife and older children—should discuss the sale of vanilla. Everyone should have a say in the sale and how the money is used. That will motivate them all to produce the best-quality vanilla. It will also avoid the temptation for individual family members to sell beans on the side.

Selling as individuals or as a group

In Uganda, most farmers grow and sell their vanilla as individuals. They are not in groups because most buyers prefer to buy on a one-on-one basis and have not encouraged them to form groups. But some farmer groups are emerging.

By selling as a group, farmers can benefit from some economies of scale and bulk selling. They can attract the larger buyers who will pay a more consistent price. Selling in bulk also reduces transport costs to the factory. Direct sales to a known buyer will probably attract the best price on the market at that time.

Farmers who sell individually have no bargaining power. If prices are high, then selling as an individual is probably not a major problem. But when prices are going down, a farmer who sells small amounts of beans as an individual has to accept whatever price the trader is willing to offer.

Negotiating prices

Farmers can learn about world market prices through information services such as Farmgain Africa in Uganda. They can calculate the price of cured and green vanilla. The price of cured vanilla is about 5 times that of green vanilla. For example:

- Cured vanilla price = UGX 360,000/kg (US$ 100)
- Green vanilla price = about UGX 72,000/kg (US$ 20).

In 2021 the price of green vanilla in Uganda was UGX 50,000. Although the price of cured vanilla is higher than for green vanilla, farmers need to know that you will need around 5-6 kilograms of green vanilla to get one (1) kilogram of cured vanilla.

If farmers know their production costs and the current world market prices, they can generate an offer price for the buyer. As a group they may be able to negotiate a fairer price. However, most of the time, prices are set by the buyer.

Loyalty

Groups of farmers can strike a deal with a specific buying house. For example, if they agree to sell to a specific buyer for the next two seasons, they may come to a pricing agreement. The buyers have contracts with exporters or importers, so they need to buy enough beans to fulfill these contracts.

The buyer may provide farmers with a “forward volume contract” to buy a specified amount next season. The price is negotiated at the time of sale based on the world market at the time.

Side selling

Vanilla is valuable so family members may be tempted to sell beans on the side. They may harvest some beans early and sell them to earn extra money. However, if the beans are harvested at the right age, the total income from vanilla will be higher.

Ideas to avoid side-selling:

- The members of the farm family should discuss when to sell, who to sell to, and how to use the income from the sale.
- Make sure that everyone in the family is engaged and benefits from the income earned and not just the person responsible for selling the beans.
- Work out how much extra income the family would earn by selling consistently high-quality beans. Discuss how this extra income will help the family members. Make sure everyone understands this and recognizes how each member benefits from this extra income.

After harvest

After the harvest, check the sections of vines that have produced the beans. If there are no visible buds that will produce beans later, prune these parts of the vines. This will remove the plant parts that will no longer produce and that take space and energy. This pruning will also increase the air circulation and sunlight.

Let's talk about money

Harvesting costs

Table T15.1 shows an estimate of the costs of labor for harvesting. Harvesting is quick, so the costs are relatively low. Most is done with amily labor; therefore, out-of-pocket expenses will be low.

Table T15.1. Example of costs of harvesting

0.4 ha (1 acre), 444 vines

Activities			Cost/unit	Total UGX	US$
Labour	2 people	5 days	5,000	50,000	14
Transport	Boda rides	3-5	5000	15,000	4
Total				**65,000**	**18**

Estimating costs over the season

The time of harvest is the moment when the farm family discovers if all the time and investments of the previous seasons have been successful.

Over the past year, you will have met a lot of vanilla farmers and noted information about various types of costs. Now is a time to write up your notes and calculate the full costs that farmers have invested in the year.

Work with a few trusted farmers to review your cost calculations. Ask them what they actually paid to set up and run their vanilla farms over the past year.

There will be different costings depending on the type of farmer. Existing farmers will have fewer costs than new farmers. Farmers who have expanded their vanilla gardens will have higher costs than those who have kept the same area.

The new farmers will have the highest costs as they have to invest in everything needed to grow vanilla: land clearing, fencing, shade trees, tutors and vines. New farmers also have to wait 2–3 years before they see their first revenue from the vanilla. In the first two years they will have costs but no income from vanilla.

Table T15.2 shows some estimates of typical costs. You can share these with farmers so they can see the cost items. They can use this framework to put in their actual costs.

Table T15.2. Estimated costs of production for vanilla in one season

0.4 ha (1 acre)	New farmers (1st year)		Existing farmers	
	UGX	US$	UGX	US$
Land preparation	260,000	73		
Fencing	2,450,000	680	60,000	17
Security			900,000	250
Shade trees	80,000	23	40,000	11
Planting tutors	519,000	144		
Buying and planting vines	1,359,000	378		
Soil and water management	185,000	50	185,000	50
Weeding	111,000	35	111,000	35
Pruning	50,000	13	273,000	76
Disease and pest management			60,000	17
Looping			110,000	31
Pollination			400,000	111
Harvest			105,000	29
Total costs	**5,014,000**	**1,396**	**2,244,000**	**627**

Have the farmers made a profit?

The next step is to work out what income the farmers are earning from their vanilla. This depends on the volume of production and the price they receive.

- The production volume depends on the yield per vine and the number of vines in the garden.
- The price depends on the world market price, the quality of the beans, and the farmers' ability to negotiate with the buyer.

Ask the farmers how much they sell their vanilla per kilogram. Also check with the prices given by the buyer.

You can use the costs and income to calculate the profit (the "gross margin") that vanilla farmers make.

Table T15.3 shows the estimated gross margin for different yield levels (0.2 kg and 0.35 kg per vine) and different selling prices. If the selling price is high, then the gross margin will be high. If the selling price is low, the gross margin will also be low. If the yields and selling price are very low and the costs are high, the farmer may even make a loss.

Table T15.3. Profit (gross margin) from 400 vines at different selling prices of beans

0.4 ha (1 acre)		New farmers (after three years)*		Farmers with mature vines	
		Yield per vine = 0.2 kg Total production = 80 kg		Yield per vine = 0.35 kg Total production = 140 kg	
Selling price		Income			
UGX/kg	US$/kg	UGX	US$	UGX	US$
360,000	100	28,800,000	8,000	50,400,000	14,000
180,000	50	14,400,000	4,000	25,200,000	7,000
126,000	35	10,080,000	2,800	17,640,000	4,900
54,000	15	4,320,000	1,200	7,560,000	2,100
25,200	7	2,016,000	560	3,528,000	980
Costs (from Table T15.2)					
		5,014,000	1,396	2,244,000	627
Selling price		Profit (gross margin): income minus costs (Losses)			
360,000	100	23,786,000	6,607	48,156,000	13,377
180,000	50	9,386,000	2,607	22,956,000	6,377
126,000	35	5,066,000	1,407	15,396,000	4,277
54,000	15	(694,000)	(193)	5,316,000	1,477
25,200	7	(2,998,000)	(833)	1,284,000	357

*New farmers will start earning an income 3 years after planting vanilla.

This gross margin calculation is for vanilla beans only. It does not take into account:

- Other crops grown in the vanilla garden, such as coffee or banana.
- Crops grown elsewhere on the farm, such as maize or beans.
- The labor and other costs of producing these other crops.
- Other sources of revenue from the vanilla garden, such as the sale of vanilla vines, fuelwood or tutor cuttings.

These items will be considered in Chapter 16 on *Diversified agroforestry systems*.

Lesson plan

Duration

2 hours.

Training periods

May and October/November.

Hold this session in a vanilla garden at the start of the harvesting season. Ask the farmer first if the participants will be allowed to practice harvesting the beans.

Training objectives

To teach participants how to harvest vanilla to get the best quality and price.

Materials required

Training guide, flip chart, markers, charts, vanilla beans (premature, mature, over-ripe, damaged). To avoid spreading disease, do not bring diseased beans into a vanilla garden!

Introduction

Greet the participants and tell them what the session is about: harvesting.

Ask the participants what the best part of the vanilla season is. Answer: harvesting! This is when they see the results of all their hard work and they can earn money from their vanilla.

Problems with harvesting

Farmers' point of view

Split the participants into women and men-only groups for this activity. Ask the participants what the main problems are that **farmers** encounter with harvesting. Make a list of these on a flip chart. Likely answers include:

- Harvesting at the right time, labor, storage, theft, finding a buyer, low price.

Ask each group which are the most important problems from their point of view. Mark these with a star *.

Point out where the women and men agree on the most important issues, and where they differ. Explore the reasons for any overlap or differences.

Buyers' point of view

Ask the participants what the main problems that **buyers** encounter with harvesting. Make a list of these on a separate sheet. Add any common problems that the participants may have missed. Likely answers include:

- Variable quality, damaged beans, immature or over-ripe beans, poor handling, delivering beans quickly to the processor.

Comparing points of view

Compare the three lists (male farmers, female farmers, and buyers). Note any items that appear in two or three of the lists.

Explain that:

- Buyers want to buy beans that are uniform and good-quality. They may be prepared to pay a higher price for such beans.
- What the farmers do at harvest affects the price they get. So it is important to harvest in the right way.
- Farmers should try to build up a good relationship with a trustworthy buyer: one that will last for years and will make both sides money in the long run. The best way to do this is to supply a uniformly good quality product.

Relate the main problems and discuss them one by one. Start with the most important problems that the female and male participants have identified. Make sure that the points below are covered.

Theft

Ask if theft of beans is a problem in their farms or in the village. What do they do to prevent it? What else could they do?

Ask how they could work together to improve security.

Timing of harvesting

Ask the participants the following questions. For each answer, add enough explanation and answer any questions the participants may have.

- How long does it take for a bean to become fully mature after pollination? (Answer: 9 months.)
- If a flower is pollinated in March, when will the bean be ready for harvest? (Answer: December.)
- If a flower is pollinated in October, when will the bean be ready for harvest? (Answer: July.)

If you are in the vanilla garden, divide the participants into several groups, and ask each group to stand around a vanilla vine. Ask one participant in each group to point out beans that are ready for harvest. Check that they are correct. Check that they know how to tell if a bean is ready for harvest. (Answer: it starts turning yellowish.)

Harvesting immature beans

Ask a different participant in each group to point out some immature beans. Check that they know how to identify beans that are immature. (Answer: it is still dark green.)

Ask why they should not harvest immature beans. (Answer: they produce less aroma, may become diseased during processing, and are worth less.)

Explain that it is easy to mistake immature beans as being ready for harvest because they are the same length as mature beans, and may be on the same vine. Everyone who harvests should know how to identify beans that are ready for harvest. Remind the participants to pass on this knowledge to others so they harvest the right beans.

Harvesting over-ripe beans

Ask another participant in each group to point out beans that are over-ripe. Check that they know the signs of over-ripeness. (Answer: it starts to split at the end.)

Ask what they should do with over-ripe beans. (Answer: harvest them but put them into a separate container and sell them separately.)

Damaged or diseased beans

Ask another participant in each group to identify beans on the vine that are diseased or damaged. Ask them to identify the type of damage. (Answer: cuts and scrapes (mechanical damage), splits, rot, insect damage.)

Ask whether they can still sell these beans. What should they do with them? (Answer: do not sell diseased beans. Burn them or bury them.)

How to harvest

Explain how to harvest and handle the beans before they are sold.

With the farmer's permission, invite the groups of participants to hand-pick beans from the vines.

Give them 5 minutes to harvest some beans. Then bring them back together to check what they have done.

Invite each group in turn to show what they have harvested. Ask them to sort the beans into categories:

- Immature beans
- Good-quality beans
- Over-ripe beans
- Diseased or damaged beans

Check that their sorting is correct. Point out that the immature beans should not be harvested. Point out any damage or other features that may downgrade the beans (insect damage, beans too small, etc.).

Sorting and grading

Explain what the farmer should do to sort the beans before sale.

Explain what the processor will do to sort and grade the beans.

Explain the importance of supplying only good-quality, mature beans to the buyer.

Storage

Ask the participants how they store the beans before they are sold. In what type of container? Where? In the sun or in the shade? Loose or wrapped? For how long?

Explain the importance of a cool, dry storage place and a quick delivery to the buyer.

Describe (and demonstrate) how to store beans before they are sold.

Selling

Terms of sale

Ask the participants how they arrange sales. On the day of harvest, or beforehand? With a buyer they know, or someone else? How do they negotiate the volume and price? Do they choose the buyer, or does the buyer choose them? Do they have an agreement beforehand on volume and price?

Ask how the buyer pays. In cash, by mobile phone, or into a bank account? Immediately, in advance, or after some time (how long)?

Ask how they could improve their relationships with the buyer, or how they could find a more reliable buyer.

Selling as individuals or as a group

Ask whether they sell as individuals, or as a group with other farmers. Ask them about the pros and cons of selling as an individual or as a group. Based on their responses, fill in a flip chart with the advantages and disadvantages of each (Table L15.1).

Table L15.1. Selling as individuals or as a group

Selling as individuals	Selling as a group
Advantages	**Advantages**
Independence Speed ...	Can negotiate better price ...
Disadvantages	**Disadvantages**
Low price ...	Need to coordinate dates ...

Discuss how they could improve their relationship with the buyers. What could they do as individual farmers? What could they do as a group? What would they like the buyers to do?

Keeping records of yield and production

Explain that it is a good idea for farmers to keep a record of their bean yields and production. They can count the number of vines, the number of clusters on each vine, the number of sellable beans per cluster, and the total weight of beans they sell.

To calculate the average number of clusters per vine, choose one vine in each row and count the number of clusters it holds. To calculate the number of beans per cluster, count the number of sellable beans on a vine, and divide by the number of clusters.

Table L15.2. Form for calculating the average number of bean clusters

Vine in row...	Number of clusters on vine	Total beans on vine	Number of beans per cluster
	A	B	C = B ÷ A
1	13	78	6
2	10	100	10
3	15	210	14
4	8	72	9
5	11	110	10
6	9	99	11
Total	**66**	**669**	**60**
Average (= Total / Number of vines counted)	**11**	**111**	**10**

Get the participants to do this for the garden you are in.

Ask each participant to report the information in Table L15.3:

- The area of their vanilla garden.
- The number of productive vines it contains.
- The number of clusters on each vine (they will probably have to estimate this).
- The number of beans in each cluster(also an estimate).
- The weight of beans they have harvested last season.

Fill in the form in the Handout, with one row for each farmer.

Table L15.3. Form for recording an individual farmer's vanilla production

Village				
Name of farmer				
	Season 1	**Season 2**	**Season 3**	**Season 4**
Vanilla garden area (hectares)				
Number of vines				
Average number of clusters per vine				
Number of beans per cluster				
Weight of beans harvested				

Table L15.4. Form for recording vanilla production for a group

Village			Season	
Name of farmer	Garden area (hectares)	No. of vines	Average no. of clusters per vine	Weight of beans harvested
John & Mary	0.4	450	10	112 kg
George	0.2	200	9	45 kg
William	...	...	...	...
Kate	...	...	...	...

Let's talk about money

Using the money

Ask how decisions on the use of money earned through vanilla sells are made.

Ask whether they discuss the sale and the use of the money with their spouse or other family members. Ask what the advantages and disadvantages are of discussing these issues and planning with the family on how to use the income.

Calculating costs

Explain that it is now time to look back at the whole season and see what everything has cost, and calculate how much money their vanilla has brought in.

Ask how they would go about calculating this. (Answer: add up all the costs, then take the costs away from the income to find the profit.)

Make an empty table like Table L15.5 on a flip chart.

Ask the participants to list the major costs in vanilla production. Write these down the left side of the table.

Ask for a volunteer who knows how much the major items have cost on their farm. For each item, ask the volunteer how much it cost them. Write these numbers in the second column of the table. Some of the rows may be blank, depending on whether the farm has planted tutors or shade trees in that season, for example.

(If no one volunteers, you can ask the participants to estimate how much the costs are for a 0.4 ha (1 acre) vanilla garden.)

Calculate the total costs. Write this number at the bottom of the table.

Table L15.5. Form for estimating costs of production for vanilla in one season

	UGX
Land preparation	
Fencing	
Security	
Shade trees	
Planting tutors	
Buying and planting vines	
Soil and water management	
Weeding	
Pruning	
Pest and disease management	
Looping	
Pollination	
Harvest	
Total costs	

Point out that new vanilla farmers will have higher costs than existing farmers because they will need to do land preparation and buy tutors and vines.

Calculating profit

On another flipchart, write the total costs from the previous exercise at the top (Table L15.6).

Ask the volunteer how much income they made from selling beans. (If they do not want to say, you can estimate this based on the size of the farm and the market price of beans.) Write this amount in the table.

Ask whether they made any income from selling vines, tutor cuttings or other items from the vanilla farm. Write this amount in the table and calculate the total income from vanilla.

Subtract the costs from the income to give the profit. Write this in the bottom line of the table.

Table L15.6. Form for calculating profit

	UGX	
Total costs		A
• Income from selling vanilla beans		B
• Income from selling vines, tutor cuttings, etc.		C
Total income		D = B + C
Profit		E = D – A

Ask the volunteer whether the result is roughly correct, and whether they are happy with it.

Ask the participants to suggest ways they could reduce the costs.

Ask them how they could increase their incomes from vanilla.

- How can they get better prices?
- Should they sell as individuals or farmer groups, or farmer cooperatives?

Ask the participants if they are motivated to grow more (or less) vanilla based on these calculations.

Conclusion

Briefly review what you have covered in this lesson.

Tell the participants when the next meeting will be.

Say that in the next (and last) lesson, you will talk about the place of vanilla in the whole mix of crops on the farm.

Quiz

1. When should vanilla be harvested? At how many months after pollination?

2. What are the signs of mature vanilla which is ready for harvesting?

3. What are the materials required for vanilla harvesting and handling?

4. What are the problems with harvesting over ripe vanilla?

5. What are the problems with harvesting premature vanilla?

6. How should vanilla be harvested (beans or clusters)? Why?

7. For how long should vanilla be kept before processing?

8. Why is harvesting a key component in vanilla farming?

9. How do you source for laborers at the harvesting time?

10. What difficulties could vanilla farmers face in selling vanilla?

11. What challenges do women face in selling vanilla?

12. What are the benefits of discussing when, where, and how to sell the vanilla as a farming family?

Expected answers

1. When signs of maturity start to appear, 9 months after pollination.
2. The beans change dark green to a pale green or yellow. They lose their shine and become duller. Two distinct lines appear from one end of the bean to the other.
3. Scissors or a sharp knife, baskets, bags.
4. Beans that are over-ripe tend to split and lose their flavor. They are worth less.
5. Beans that are too young do not develop the required aroma. They are more likely to be attacked by fungus during processing. They are worth less.
6. It is best to harvest beans individually because the beans in a bunch ripen at different times.
7. Less than 24 hours.
8. How well the beans are handled after harvesting determines the value of the final product.
9. Hire only trusted workers, or have close relatives do the harvesting.
10. Traders may not come to the farm; they may meet at the village. Traders may come at times of the day that are not easy for women to attend.
11. Prices are difficult to negotiate. Many farmers sell as individuals and don't know if they can get better prices. Farmers fear that if they do not sell quickly, their vanilla may be stolen.
12. Such discussions decrease the likelihood of family members selling vanilla on the side, and of one person misusing the money. The income is more likely to benefit the whole family.

Handout 15.1: When to harvest vanilla beans

9 months after flowering and pollination

- Flowers pollinated in March -> harvest in December.
- Flowers pollinated in October -> harvest in July.

Mature beans:

- Tip turns yellow.
- Bean loses its shine
- Two lines from top to bottom of bean.

Harvest at least once a week in the harvesting season.

Do not pick immature beans.

If there are over ripe beans, harvest and put them in a separate container

Pick diseased or damaged beans and discard them.

Beans turn yellow at the tip when they are ready for harvest

Beans that are over-ripe split at the bottom

A bunch may have beans at different stages of maturity

- Keep harvested beans in a cool, shady place until they are sold.
- Beans must reach the processor within 24 hours of harvest.

Longer beans are more valuable

After harvest

- Prune vines that have no buds.
- Discard the pruned vines.

Handout 15.2: Keeping records

Form for calculating the average number of bean clusters

Vine in row...	Number of clusters on vine	Total beans on vine	Number of beans per cluster
	A	B	C = B ÷ A
1			
2			
3			
4			
...			
Total			
Average (= Total / Number of vines counted)			

Form for recording an individual farmer's vanilla production

Village				
Name of farmer				
	Season 1	Season 2	Season 3	Season 4
Vanilla garden area (hectares)				
Number of vines				
Average number of clusters per vine				
Number of beans per cluster				
Weight of beans harvested				

Form for recording vanilla production for a group

Village			Season		
Name of farmer	Garden area (hectares)	No. of vines	Average no. of clusters per vine	Average no. of beans per cluster	Weight of beans harvested

Let's talk about money

Form for estimating costs of production for vanilla in one season

	UGX
Land preparation	
Fencing	
Security	
Shade trees	
Planting tutors	
Buying and planting vines	
Soil and water management	
Weeding	
Pruning	
Pest and disease management	
Looping	
Pollination	
Harvest	
Total costs	

Form for calculating profit

Total costs		**A**
• Income from selling vanilla beans		**B**
• Income from selling vines, tutor cuttings, etc.		**C**
Total income		**D = B + C**
Profit		**E = D – A**

CHAPTER 16.

Diversified agroforestry systems

A farm map showing fields with different crops

Technical information

This chapter focuses not on vanilla, but on the whole farm. Farmers grow many crops on their farms. They produce both food to eat and products to sell, which bring in money throughout the year.

Farming households should think about their "whole farm as a business". They need to plan and manage their costs, investments and labor from season to season, to ensure not only adequate income but appropriate quantity of nutritious food for home consumption..

Cash crops such as coffee, vanilla and cocoa are sold in international markets, and their prices are affected by many factors beyond the farmers' control. Sometimes their prices will be high; sometimes they will be low.

Vanilla prices are quite volatile, so farmers need to think about their vanilla production as a long-term business. They should consider vanilla as a crop with a 7–10 year return on investment. During this time, there will be seasons when prices are high—perhaps up to UGX 170,000/kg ($50) for green beans. At other times, the price may fall as low as UGX 25,000/kg ($7). This variability means that farmers need other crops to maintain their livelihoods. The information in Figure T16.1 shows a range of crops and livestock that a farmer might produce. This farmer has ten different products. The size of the segments reflects the importance of the product in terms of land used and income.

Cropping mix

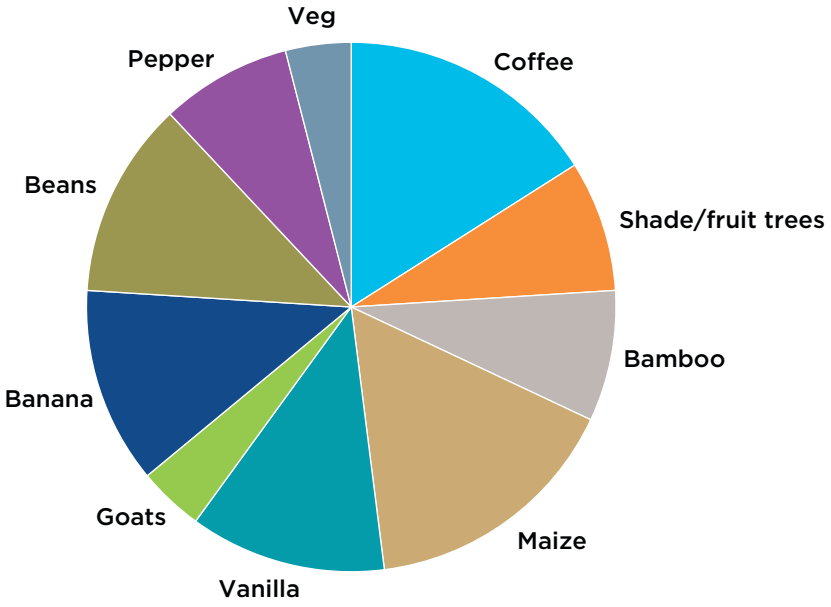


Figure T16.1. Example of a crop and livestock mix to meet food and cash needs

To generate this type of diagram you can ask farmers to give you a list of their products and then ask them to tell you whether the products are for food, cash or other. Then you can ask them to proritize the products in terms of land used or income. It may also be of interest to know who buys the products. Perhaps some buyers are buying more than one product and this hints towards building longer term business relationships with target buyers. See Table T16.1, for a way of recording this information.

Table T16.1. Example of completed form for crop and livestock mix

Crop, livestock or tree	Food	Cash	Other	Totals	Buyer
Coffee		4		4	Godwin
Shade/fruit trees		1	2	2	Shade, fuel, some sales
Bamboo		1	2	2	Construction, some sales
Maize	4	1		5	Mainly consumed, Market
Vanilla		4		4	Godwin Buyers
Goats	2	2		4	Some eaten, some sold to local Butcher
Banana	2	4		6	Some for HH, sales to Janice
Beans	4	2		6	Mostly consumed, local market sales
Pepper		4		4	Sold to Godwin Buyers
Vegetables	3	2		5	Mainly consumed, some sales to local market

* Score of 1-4 with 4 being highest, in terms of value to food security, contribution to income and other services, such as fibre, feed, fuel and construction.

Farmers need some income throughout the year. Some of this comes from harvests that can be predicted. They also need to have some crops or livestock that can be sold at any time to pay for regular expenses such as school fees as well as emergencies such as medical costs, see Table T16.2, which show a range of crops and livestock that a farmer might produce and the income timing.

On a 1-2 hectare (2-5 acre) farm, a farmer can build a system that combines high-value returns with food and nutrition to sustain the family. Each farm mix will be different. If farmers keep records on what they produce, you will have an idea of which mix works well in which locations.

Resilience through diversified production and marketing

Agroforestry is an important part of a resilient farm—one that provides food and cash even in difficult times. Growing several tree crops on the same land lets the farmers take advantage of the different heights of the plants (Figure T16.2).

For the food crops, farmers may use intercropping systems to grow maize and beans together. They may grow vegetables in gardens to provide access to nutritious foods throughout the year. Intensive, mixed production methods are sustainable and competitive if managed well.

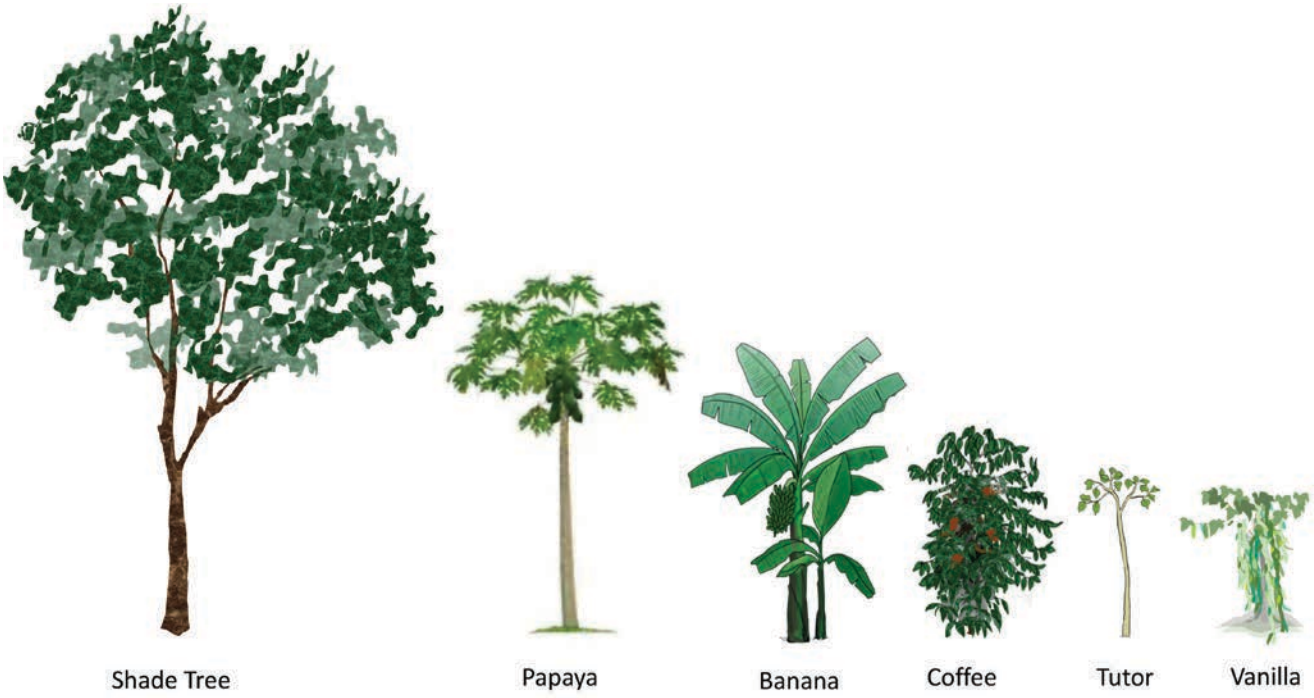


Figure T16.2. Agroforestry crops use many layers in the same field

Mixed cropping or intercropping increases total revenue per unit area by more than 50% compared to mono-cropped banana, coffee, or vanilla, and does not affect the yield of either crop if the correct spacing for the crops (in the intercropping system) is applied. This approach does require high amounts of labor and farmers must be careful to replenish the land with fertilizer and mulch to maintain a sustainable farming system.

Farm planning

Developing the right mix of agroforestry crops that generates a sustainable and profitable farming system takes careful planning. You can help farmers plan their farms by creating maps and choosing what crops and crop mixes will fit best in each location.

Chapter 6 on *Crop planting systems and spacing* gives some ideas on how farmers can grow vanilla alongside banana and coffee. This chapter looks broader: what other crops can they grow elsewhere on the farm to produce the full range of products they need? How can they combine these crops together in an agroforestry system? Guidance on crop selection for vegetables is available in the CRS Garden Toolkit in chapter 4.

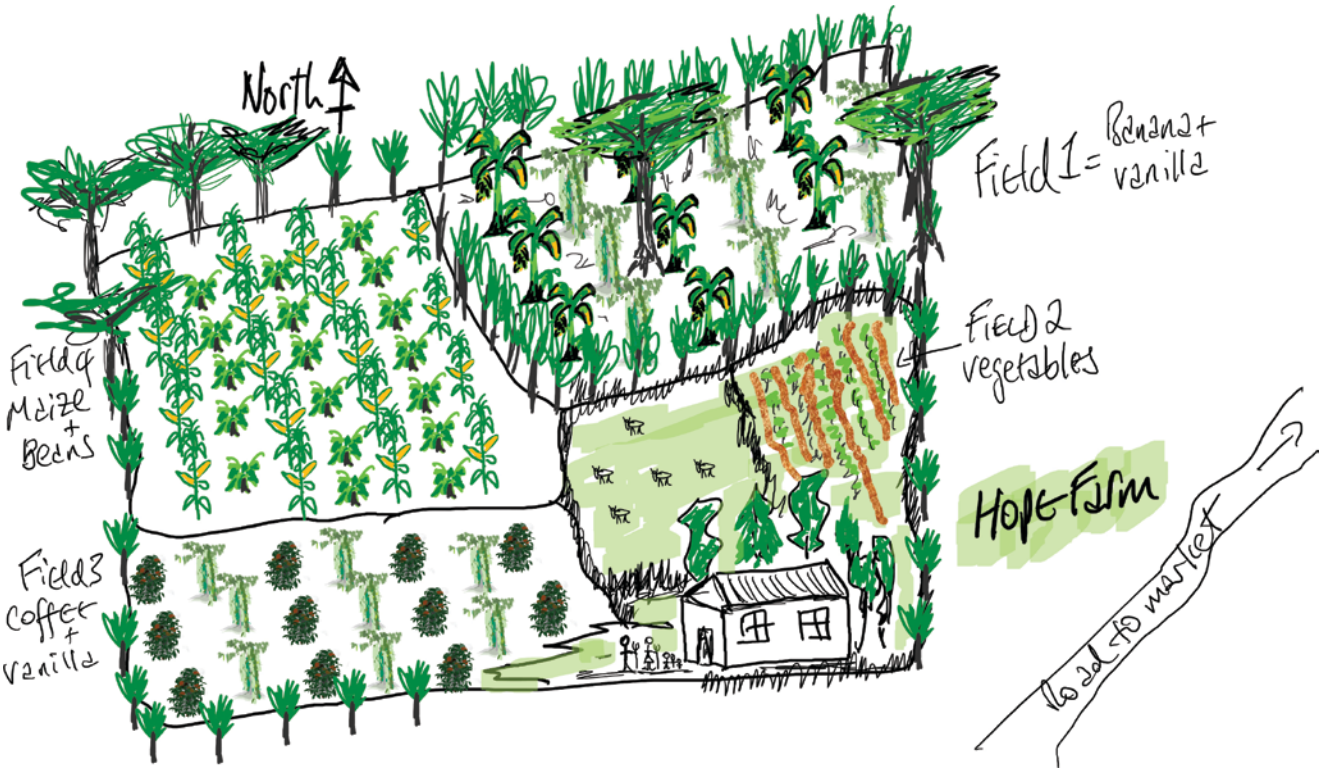


Figure T16.3. A farm map showing fields with different crops

Figure T16.3 shows a map of a farm where the farmer is growing a range of crops, including coffee, vanilla, bananas as intercrops and in agroforestry systems. In other plots, the farmer grows crops important for food security, such as maize, beans and vegetables. The farmer also grows trees for shade, timber and fruit and has some goats for consumption and sales.

Most crops have specific harvest times, so the farmer must wait until the harvest to earn money. In Uganda, two important products—banana and goats—can provide cash flow at almost any time of year. The farmer can sell these in the local market for ready cash when needed.

Uganda has two rainy seasons, allowing many crops to be harvested twice a year. Planning cropping to take advantage of the two seasons makes it possible to earn money throughout the year and provide a large quantity of nutritious food to feed the family.

Cash flow

Income from the crops can also be put into a crop calendar (Table T16.2). This shows when a farmer can expect to earn money from which crop (normally at harvest time), and when they will have their highest expenses. Farmers can use such a calendar to record their cash flow.

Table T16.2. Income from the major crops and periods of highest expenses

Activity / List of crops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beans	Harvest $				Harvest $	Harvest $						
Maize	Harvest $				Harvest $	Harvest $						
Vegetables		Harvest $	Harvest $	Harvest $	Harvest $	Harvest $	Harvest $	Harvest $	Harvest $	Harvest $	Harvest $	Harvest $
Banana		Harvest $	Harvest $	Harvest $	Harvest $	Harvest $			Harvest $	Harvest $	Harvest $	Harvest $
Coffee				Harvest $	Harvest $	Harvest $			Harvest $	Harvest $	Harvest $	
Vanilla	Harvest $					Harvest $	Harvest $				Harvest $	Harvest $
Fruits						Harvest $	Harvest $					
Goats			Harvest $					Harvest $				Harvest $
Expenses												
Inputs		Inputs	Inputs	Inputs		Inputs	Inputs	Inputs		Inputs	Inputs	
Labor		Hire labor	Hire labor	Hire labor		Hire labor	Hire labor	Hire labor		Hire labor	Hire labor	
School	Fees					Fees				Fees		
Holidays				Easter	Eid							Christmas

Developing new markets with buyers

Generally, buyers purchase only one crop, such as vanilla. Farmers also sell different crops to each buyer. These one-to-one relationships have led to farmers and traders selling and buying from different people every season. However, a recent trend is for buyers (especially those who deal in cash crops) to buy more than one product from the same farmers.

For example, buyers of coffee and cocoa in the Rwenzori area found that most of their farmer suppliers also grew vanilla. So they started buying vanilla from them too. Some buyers have started asking farmers to supply other crops, such as chilli and pyrethrum. This approach has several advantages:

- The buyer can save on transport and time by buying two or more crops from the same farmer.
- Buying several crops makes it possible to build a stronger business relationship and build more loyalty between the farmers and buyers.
- It strengthens the farmers' loyalty to the buyer, and the buyers' loyalty to the farmers who supply them. This can create long-term relationships.
- Success with one farmer can lead to a cluster of farmers doing the same thing. If they all sell to the same buyer, that saves further on transport and time.
- Working with organized and clustered farmers makes it possible to invest in other systems to trace particular products back along the value chain. That lets a processing company know which farm a batch of vanilla came from. That means the company can pay extra for good quality.

Some buying companies are developing new types of private extension systems. They employ extension agents who advise farmers who want to diversify their production and supply the company with one or more crops. This system promises to provide farmers with better services, improve their production methods, and boost their product quality and output.

The multi-crop procurement approach is currently focused on traditional cash crops—coffee, cocoa and vanilla. But some companies are also looking at novel products:

- Black solder fly: the larvae are used in animal feed.
- Bamboo: for fencing, furniture and flooring.
- Elephant grass: for fodder.
- Spices such as ginger, cinnamon, pepper and cloves.

All offer opportunities for farmers and companies alike.

Environmental services

The trees in an agroforestry system have many advantages for farmers and the environment.

- They produce fuelwood, timber, fruit, nuts and fodder.
- They protect the soil and reduce erosion. They can restore degraded land and make it productive again.
- They enrich the soil by bringing nutrients up from deep in the soil.
- They shade the ground, cool the air, and act as windbreaks.
- They reduce evaporation, keeping the soil moist.
- They take carbon dioxide out of the air, protecting the climate.
- They shelter wildlife and increase biodiversity.

Intercropping

Farms in Uganda typically have several fields. Some of these are for a single crop: a field for maize, one for beans, a vegetable garden, a banana plantation, etc. Others have a mix of crops, like in a vanilla garden that has a mix of vanilla, coffee or banana, and shade trees.

It may be more productive to grow several crops in a field rather than just one. For food crops, for example, farmers can grow beans and maize in separate rows in the same field. In agroforestry, they can combine trees with crops for cash, food or fodder.

Advantages

Intercropping has several advantages over two separate fields with individual monocrops. The major advantages include:

- Farmers can grow more different types of crops in the same area of land in the same season. This contributes to food security, nutrition and cash income. It reduces the risk if one crop is attacked by pests and diseases, or is damaged by drought or bad weather.
- Farmers can get a higher total production from the field (though the yields of the individual crops may be lower than in monocrops).

- The crops can use space, light, nutrients and moisture more effectively. In agroforestry, crops grow at different heights, thus reduce competition with each other for space.
- Pest and disease attacks are less likely, and tend to be less serious.
- The crops cover the soil more completely, protect it from erosion and suppress weeds. Some crops improve the soil fertility and structure.

Disadvantages

- The crops may grow at different times, making it difficult to plant and harvest them.
- The yields per hectare of the individual crops may be lower than in a monoculture.
- Intercropping is labor-intensive and it is difficult to use machinery.
- Crops may compete with each other, or may host pests and diseases that harm other crops.

It is important to choose the right combinations of crops to grow together. Vanilla does not grow well with maize or potatoes, for example, because it is important not to disturb the shallow roots of the vanilla vines. It grows better with perennial crops such as coffee or banana, where it is not necessary to dig up the soil.

Farmers' interest in intercropping will depend on many factors: the crops they already grow; the size and configuration of their farm; the soil, climate and slope; their skills, capital and opportunities to market the various crops and available labor time. Each farm will be different, and each farming household will have to discuss as a household and make decisions about what to grow, which arrangement will benefit the household and how to address the potential increase in labor in order to help the family achieve its vision.

Let's talk about money

Calculating profitability

Calculating the revenue from an intercrop is easy: just add together the income from the various crops in the field. It is more difficult to calculate the costs, because each crop has its own set of costs. Once you have both the revenue and the costs, you can calculate the profit.

These calculations will be different for each farm. Here is one way to do the calculations.

1. Identify 4–5 farmers who grow vanilla in different types of intercropping: with banana, with coffee, and with both banana and coffee. Include other important crops that contribute substantially to income or food security. For simplicity, choose farmers who already have a vanilla plantation, not someone who is just starting one.
2. Interview each farmer separately. Ask them to draw a plan of their farm showing their fields. Ask them the size of each field and to list the major crops grown in each field. Write these crops in the form (Table T16.3).

3. For the **plot with vanilla**, ask them to estimate the **size of the plot** in square meters (measure this if necessary). Write this and the following information in the next form (Table T16.3).
4. Ask them to estimate the **number of plants** of each type (count them if necessary, or estimate from the field area and the planting distances):

$$\textit{Number of plants} = \frac{\textit{Field area in square meters}}{\textit{Distance between plants in a row} \text{ (m)} \times \textit{Distance between rows} \text{ (m)}}$$

Example for 0.4 hectare (1 acre) plot

$$\textit{Number of vanilla plants} = \frac{4{,}000\ m^2}{3\ m \times 3\ m} = 444 \text{ plants}$$

Note:

1 hectare = 10,000 square meters

1 acre = 4,096 square meters (or about 4,000 square meters).

1. Do the same for the other crops in the vanilla field (coffee, banana, etc.).
2. Calculate the numbers of each type of plant **per hectare**.
3. Ask the farmer to estimate the **income** from each crop in the field.
4. Ask the farmer to estimate the **costs** for each crop in the field. Note that some activities will be specific to the crop (pollination of vanilla, pruning coffee), while others will be joint for all crops (weeding). Calculate the **total costs** for the field.
5. Calculate the overall **profit** from the field.
6. Calculate the income, total costs and profit **per hectare**.

Table T16.3. Form for collecting information on intercropping

Name of farmer					
Village					
Total area of farm (hectares)					
Start of cropping season (month)					
	Area of field (hectares)	**Crops grown**			
Field 1					
Field 2					
Field 3					
Field 4					
Field 5					

Table T16.4. Example of calculating profit for all crops in an agroforestry plot

Name of farmer							
Village							
Start of cropping season (month)							
Area of vanilla plot	**hectares A**			**square meters**			**B = A × 10,000**
Vanilla plot	**Vanilla**	**Coffee**	**Banana**	**Crop _____**	**Crop _____**		
No. of plants in plot							**C**
No. of plants per hectare							**D**
Income	**UGX**	**UGX**	**UGX**	**UGX**	**UGX**	**Total UGX**	
Income from crop							**E**
Costs	**UGX**	**UGX**	**UGX**	**UGX**	**UGX**	**Total UGX**	
Cultivation							**F**
Weeding							**G**
Pruning							**H**
Pollination							**I**
...							**J**
							K
							L
Total costs							**M = sum F to L**
Profit (income minus costs)							**N = E – M**
Profit per hectare							**O = N / A**

Once you have collected this data from several farmers, you can fill in the form (Table T16.5) to summarize the information.

Table T16.5. Form for summarizing the cropping mix and profitability of different cropping systems

Copy the **highlighted** items from Table T16.4 into this table.

	Number of plants per hectare (row D from Table T16.4)					Total profit per hectare (row O from Table 16.4)
	Vanilla	Coffee	Banana	Crop_____	Crop_____	
Farmer 1	1000	1000	750			40,000,000
Farmer 2						
Farmer 3						
Farmer 4						
Farmer 5						

Changing the crop mix

This exercise will give you an idea of the types of cropping systems that farmers have, both on their farms as a whole, and in their vanilla gardens. It will also give you an idea of the income, costs and profitability of the different cropping systems. You can gain insights on what systems are profitable, where improvements can be made, and whether it is worth making these improvements. Adjusting a cropping pattern with perennial crops, for example, can involve a considerable amount of investment. It may, or may not, be profitable to do so.

You can use this information to advise the farmers on the crop mix they wish to grow.

Farmers also need to consider the changing marketability and prices for the products that they grow. The prices of some commodities vary widely from year to year, and even within a year. What seems the best choice this year may not be advisable the next. And perennial crops (like vanilla) take time to grow and start producing. Farmers need to look at the long-term price trends before deciding to invest in particular crops.

Increasing production of individual crops

Farmers can think whether they are getting enough yield from their current crops. If they see that others are getting higher production per plant or per tree, they can put more effort and money in boosting yields. If labor is a bottleneck, they can consider hiring more labor at critical times of the year. For example, they could hire someone to help with the pollination of vanilla. They could invest in better crop maintenance or find ways to apply more organic matter to their plots.

Next steps

This is probably the first time many farmers will have scrutinized their farming system. They will now have a better idea about their farms and their farming systems. They can use this information to think about next steps. They should consider how to increase the area devoted to each crop, its yield and production level, the mix of crops, the need for labor and other inputs, and the food and nutritional needs of the family throughout the year.

There are many possible options. The least-risky option is to maintain the current crop mix and to focus first on improving the productivity. As they gather more information, they can consider changing their crop mix.

Information sources

As farmers collect more information about their farm, they can compare its performance over time. They also need to monitor crop prices over time, as these will have a big effect on the income they earn.

They should get information from extension agents, commodity buyers, other farmers, and other reliable sources of information on how to improve their farming system.

Making decisions as a family

In making decisions, farmers should always discuss with their spouse and other family members and make decisions jointly. They need to consider the implications of the proposed changes on the workload of particular family members, the amount of food and its nutritional quality, and the use of additional income.

Lesson plan

Duration

2-3 hours

Training periods

After the vanilla crop has been sold.

Objectives

During this session the participants will:

- Draw a map of their farm.
- Consider upgrading options for the farming system. Increasing production for each crop or changing the area of specific crops.
- Determine how they can stabilize and increase their revenues by growing and selling a range of crops, while ensuring appropriate production for home consumption.
- Learn how to think about their farm as a full business.

Materials required

Training guide, flip chart, markers, charts, calculator, dried beans or pebbles, circles of paper of different colors: 8 cm, 4 cm and 2 cm in diameter. Sheets of paper and scissors to make more circles if necessary. Small pots of glue (if possible).

To do the exercises in this lesson, you will need to collect some information beforehand from male and female farmers on their production and costs. This will give you the information on prices and production levels that you can use in the lesson. See the *Technical information* handbook for the types of information to collect.

Introduction

Greet the participants and tell them what the session is about: diversifying their farms.

If this is the last time you will meet the group, say this to the participants.

Cropping mix

1. Before this exercise, prepare a number of flip charts with an empty form like in Table L16.1.
2. Divide the participants into groups of 4 or 5. Give each group a flip chart and a marker pen. Ask one person in each group to act as the scribe. Give each group 25 dried beans or pebbles.
3. Ask the groups to make a list of the main crops and livestock they have for income and consumption. They should list up to 10 crops or animal types in the left column of the table. Remind them not to forget to include trees.
4. In the second column, invite them to write:
   - **F** for the crops or livestock they use for **food.**
   - **C** for those they sell for **cash.**
   - **O** for those with **other** uses (such as trees used for fuelwood or shade).
   - Some crops (such as maize or bananas) may be used for both food and cash. They should mark these with **FC**.
5. Ask them to divide up the beans or pebbles among the crops or animals depending on the income earned or contribution to home food consumption of each one. A crop with the highest contribution to income or food consumption should get more beans; a crop with a low contribution to income or food consumption should get just one or two. Once the group has agreed on the number of beans for each crop or animal, the scribe should write these numbers into column 5, "importance" of the table.
6. Ask each group to write which month (or months) in the year they can harvest and sell each item. For some, this will be once or twice a year; for others (such as eggs or milk) it may be all year round. Get the scribe to write these months in column 4.
7. Finally, ask them to say who they sell the item to. Possibilities include the name of the buying company, the word "buyer," "market," "neighbors," or (for items they consume themselves, "eat."
8. Ask if anyone sells more than one crop to the same buyer. Show this on the flipchart.
9. Ask the groups to report back to the plenary on what they have written.

Table L16.1. Form to gather information on the crop and livestock mix

Crop, livestock or tree	Food	Cash	Other	Totals	Buyer

* Score of 1-4 with 4 being highest, in terms of value to food security, contribution to income and other services, such as fibre, feed, fuel and construction. .

Mapping the farm

1. Explain that the groups will draw a map of a farm. Ask each group to choose one volunteer whose farm they will map. Give each group another flip chart sheet.
2. Invite each group to draw a map of the volunteer's farm. This does not have to be accurate, but it should show the rough size and location of the fields and the house.
3. Ask the groups to write the names of the crops that are grown in each field. They can draw little pictures of the plants or animals. If two or more crops are grown in the same field, they should show this.
4. **Important:** Ask the groups to show the areas of the farm allocated to agroforestry crops such as coffee, cocoa, bananas and vanilla.
5. When completed, ask each group to present their map.

Ask farmers to map their own farms with their spouse / partner after the meeting.

Figure L16.1. Map of a mixed agroforestry farm

Crop calendars

1. If you still have the crop calendar from session 1 use that to show the group what they had done previously Or draw a blank calendar on a flip chart like Table L16.2
2. **Tip to save time**: Use the calendar from Session 1 or prepare a new table before the session.
3. Show the names of the months at the rainy seasons along the top of the calendar. Write the names of the main crops down the first column.
4. In plenary, ask the participants to say when each crop is planted and when it is harvested. Show this period in the appropriate row in the calendar.
5. Ask when they get the income from each of the main crops (normally this is when the crop is harvested). Mark these in the appropriate column and row in the calendar.
6. Ask the farmers what the main expenses are for the farm and household throughout the year. Ask about items such as school fees, festivals, and farm inputs such as seed, fertilizer and labor. Write each type of expense in the bottom half of the calendar, in the left-hand column.
7. For each type of expense, ask what month they have to pay for it. Show these in the appropriate column and row in the calendar.
8. When the calendar is complete, ask:
    - Are there times of the year when there is much less income?
    - Are there crops that can be introduced to their farming mix to fill the revenue gap?
    - Are there some crops or livestock that can be sold at any time in the year?
    - What types of changes can farmers make to improve the production and revenue from their farms? Ask them for examples.
    - Discuss these options. Are they practical? Are they affordable?

Table L16.2. Form for crop calendar showing contribution to household income from the major crops and periods of highest expenses

Activity List of crops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beans												
Maize												
Banana												
Coffee												
Vanilla												
Fruits												
Goats												
Expenses												
Farm												
School												
Holidays												

Let's talk about money

Income, costs and profitability of various cropping mixes

1. Explain that you want to explore what the best crop mix is for an agroforestry plot.
2. Present the information on the cropping mix and profitability that you have gathered from the male and female farmers you have interviewed (see the *Technical information* manual).
3. Discuss with the participants whether these figures are realistic.

Designing a crop mix

For this exercise, you will need flip charts, marker pens, and circles of different colored paper to represent different crops:

- 8 cm diameter, yellow (banana)
- 8 cm diameter, green (coffee)
- 4 cm diameter, blue (vanilla).

You will need a few of the larger circles, and more of the smaller ones.

Bring some white paper and scissors to make different sized circles for other crops.

You will also need some glue so the participants can glue their crops to the flipchart paper.

1. Divide the participants into groups of 4 or 5. Give each group a flip chart and a marker pen.
2. Ask each group to draw the outline of an agroforestry, or where there is a mix of crops in a field on the flip chart. The field outline should cover most of the flip chart sheet. It does not have to be a rectangle: it can be any shape. (It is more entertaining if each group has a differently shaped field.)
3. Tell each group to put the circles representing bananas into the field. Rules: the bananas may not overlap, and they must be in rows. Ask them to count how many bananas they have fitted into their field.
4. Tell them that the price of bananas is high at the moment: each banana plant will bring in UGX 20,000 a year (base this number on the information on prices and profitability you have collected from the farmers previously). Ask each group to count the number of banana plants and to calculate how much field is worth.
5. Now ask them to repeat the exercise with the circles representing coffee. When they have completed placing the circles, tell them that each coffee bush will bring in UGX 5,000 a year (again, based on the information you have gathered previously). Ask them to count the number of coffee bushes and calculate the total worth.
6. Then tell the participants to add vanilla to the crop mix. Tell them that each vanilla plant will bring in UGX 25,000 a year (again, give a figure based on the current prices). Tell them that they cannot plant vanilla alone: it must go with either coffee or bananas, or both. All the crops must go in rows, and the vanilla must be at the same spacing as the coffee or banana. The vanilla may overlap slightly with the other crops (vanilla needs shade!). Get the groups to experiment until they find the best combination of crops for their field. Get the groups to count the number of each type of crop, and to report how much their field is worth.

Next steps

Discuss the following questions with the participants:

- Is the production of the crops in the agroforestry field about right? Or is there a yield gap which they can close with better farming management?
- Is the plant population in the agroforestry field for the different crops right? Or should they think about making changes, such as thinning out some crops and increasing the number of other crops?
- Is the crop mix right? Or should they think about changing their crop mix? This would mean shifting the types of crops, and or changing the density of some crops.
  - For example, a farmer with a banana and coffee farm might want to add vanilla.
  - A farmer with coffee and vanilla may want to add in banana.
- Does the farmer need to hire more labour?
- At the farm level, does the farmer want to expand the area of certain crops? For cash crops, food crops? Or both?

Stress that all the household members—especially the spouse or partner—need to be involved in decisions. Each farm family should make decisions jointly.

- How would changes in the crop mix change the workload of particular family members?
- What support might be needed to lighten a heavy workload?
- How would changes in the crop mix alter the amount of food that the family has available, and nutritional quality of that food?
- How will any additional income be used? How will it benefit each family member?
- What could be done to ensure the whole household benefits fairly from additional income?

Final thoughts

Thank the participants for coming, and say you hope they will be able to use what they have learned to improve their vanilla production and help them to make more money from vanilla.

If it is possible for you to continue your work with the farmers, ask them if they would like to meet again in the next season. If yes, set a date for the meeting, and start planning what it will cover.

If you are not able to continue your work, or if they do not wish to meet again, say that it has been a pleasure for you to work with them and wish them the best for the future.

Quiz

1. What are the food crops the farmer / household grows? What are the cash crops? What other crops are grown, and why?

2. How many crops does a typical farmer in the area grow?

3. In which months do the farmers earn their main income?

4. When do they incur their main expenses? When is money especially short?

5. What is the best crop mix for farms in this area?

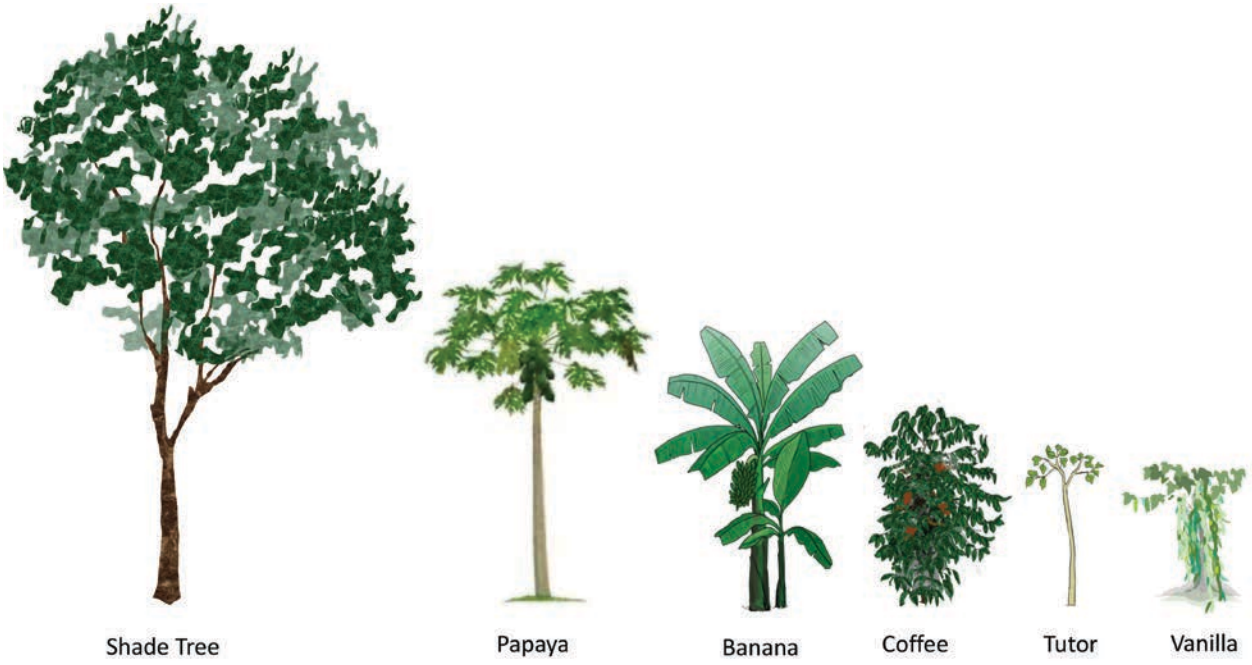
6. What are the considerations for choosing the types of crops to grow?

7. Who should be involved in the decision-making about the crop mix?

Expected answers

1. (Depends on participants' responses.)
2. (Depends on participants' responses.)
3. (Depends on participants' responses.)
4. (Depends on participants' responses.)
5. (Depends on participants' responses.)
6. Many responses possible. They include climate, soils, slope, farm size, availability of capital and labor, availability of inputs, farmer's skills and interests, marketability of products, price of inputs, price of outputs.
7. Farmers should discuss with their spouse and other family members and make decisions jointly. They need to consider the implications of the proposed changes on the different family members (workload, health, nutrition, income) and how they will benefit.

Handout 16.1: Crop mixes



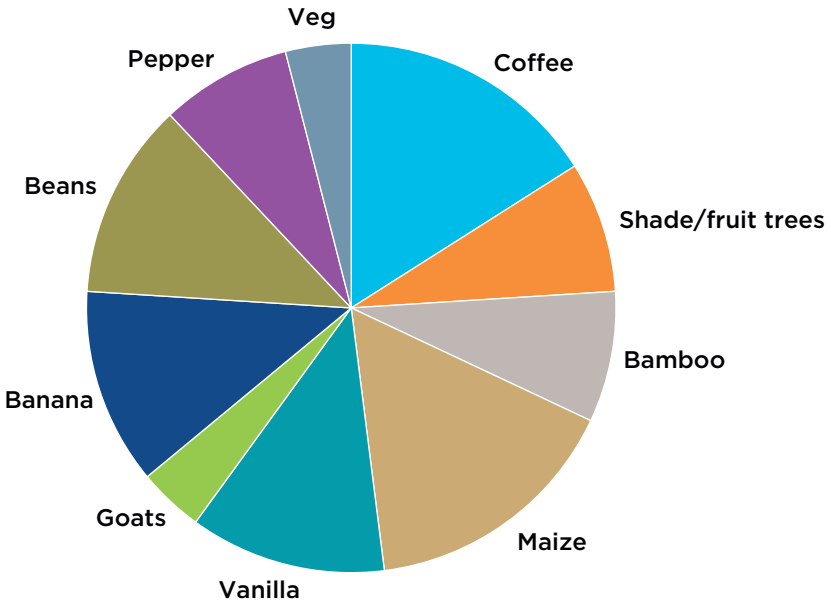
Agroforestry crops use many layers in the same field

Form to gather information on the crop and livestock mix

Crop, livestock or tree	Food	Cash	Other	Totals	Buyer

* Score of 1-4 with 4 being highest, in terms of value to food security, contribution to income and other services, such as fibre, feed, fuel and construction.

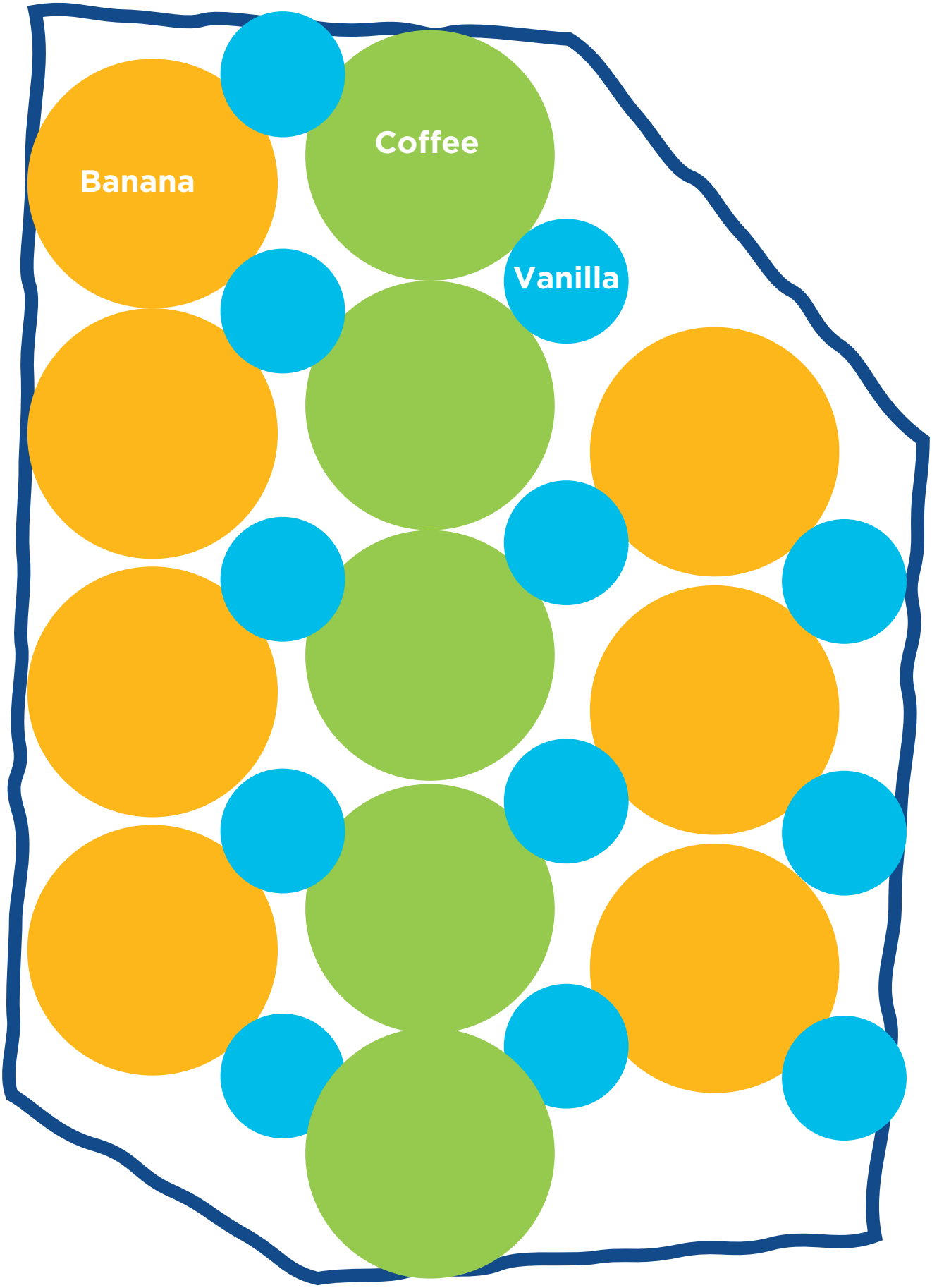
Whole farm map of mixed agroforestry crops



Example of a crop and livestock mix to meet food and cash needs, portion size based on production and value for each crop, there is a larger area of production and value for maize than for example goats or bamboo

Form for crop calendar showing contribution to household income or value for consumption for crops and livestock and key expenses

Activity List of crops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beans												
Maize												
Banana												
Coffee												
Vanilla												
Fruits												
Goats												
Expenses												
Farm												
School												
Holidays												



Example of a field with mixed cropping

Bibliography

Chambers, A, H., Moon, P., de Verlands, E, V,. and Bassil, E. 2019. Vanilla Cultivation in Southern Florida. Institute of Food and Agricultural Sciences. Extension, University of Florida, EDIS website at https://edis.ifas.ufl.edu for the currently supported version of this publication. 7 pages.

Food and Agriculture Organization (FAO). (2009). Vanilla: Post-harvest Operations. Authors:- Javier De La Cruz Medina, Guadalupe C. Rodriguez Jiménes, and Hugo S. García.. Rome, Italy. 51 pages.

Hernández, J, H., Sánchez, S. M., Díaz, E.D., Rivera, H.L, (2010). Vanilla Production in Mexico. 134 pages.

International Institute of Tropical Agriculture.(2019). Coffee and Vanilla Diversified Systems in Uganda: Exploring effective approaches for resilient coffee and vanilla farming systems. Commissioned by SVI and CRS.

Laws, N. 2002. Vanilla Training Manual for Colombia. Contract Number 527-C-00-01-00091-00 Colombia Alternative Development Project. Chemonics International incorporated, Washington D.C., 14 pages

NAADS, 2005. Vanilla Production Guide. Kampala, Uganda. 87 Pages

Petkoski, D and Magarinos-Ruchat, B. (2015). Sustainable Vanilla Sourcing through an Innovative Partnership: Firmenich and Danida in Uganda: Wharton University, Pennsylvania

Seville, Don: (2019) Fairtrade Living Income Vanilla Reference Price Research Summary:, Sustainable Vanilla Initiative, internal report. 5 pages

Shriver, J., Ferris, S., Barthmaier, D., (2019). Value Chain Tool Kit, Harnessing the power of markets to drive change. Catholic Relief Services. Baltimore, USA. 164 pages.

Shriver, Jefferson (2020) Revitalizing Vanilla in Uganda a case study analysis of CRS vanilla value chain programming in Uganda 2015-2020.

Shriver, Jefferson: (2014) Ben & Jerry's Producer Development Initiative Phase 1 Mapping and Opportunity Scan Report of Findings. Catholic Relief Services, Baltimore, USA.

World Bank. 2021.Guide for sustainable vanilla production and cost-benefit analysis: The case of SAVA Region. © World Bank."

VINES Project Consortium Partners

SVI
SUSTAINABLE VANILLA INITIATIVE

CRS
CATHOLIC RELIEF SERVICES

PURDUE
UNIVERSITY

FRONTIER® CO-OP
MEMBER OWNED SINCE 1976

TECHNOSERVE
BUSINESS SOLUTIONS TO POVERTY

VIRGINIA DARE™

VINES partners that deliver farmer trainings

Nillavan

Benimiro
UGANDA

MOUNTAINS OF THE MOON™

OETZEE ORGANIC
FINEST QUALITY IMPORT EXPORT

TOUTON
UGANDA

Rwenzori
Farmers' Cooperative Union Ltd.

The Making Money from Vanilla Guide

This guide aims to support a range of actors in the vanilla value chain. It provides information to help extension workers, field agents and farmers with reference materials for them to gain a better understanding of the vanilla market, best practices for production in a mixed agroforestry system and provide advice to farmers about the financial costs and returns of mixed cropping vanilla production from season to season.

Farmers in Uganda have a great opportunity to grow and sell vanilla as part of their farming system. There are large parts of the country which are suitable for vanilla production and with two growing seasons, Uganda is uniquely placed to supply the world market with high quality produce.

Given the unpredictability of vanilla supplies from Madagascar, due to regular climatic and political shocks, there has been high price volatility in global markets. To reduce the major price swings, there is increasing interest from global vanilla buyers and processors to support Uganda in becoming an alternative, or secondary market to Madagascar.

Building the vanilla business in Uganda, requires a coordinated approach that includes working with all partners in this global supply chain, including farmers, traders, processors exporters, international flavour houses and the major buyers, secondary processors and retailers in markets such as the United States, Europe and Asia.

For Uganda to become a recognized and reliable source of consistently high-quality vanilla, Uganda's farmers and processors need to develop stronger, more trusting relationships that ensure market access and give farmers the confidence to invest in expanded production, adopt best agronomic practices and quality control measures that increase production of cured vanilla to between 350 – 500 MT/Year.

To make this transition the Vines project is working with vanilla processing companies and their farmer networks, to improve production methods, assist farmers in developing diversified agroforestry systems. Considerable work also needs to be done to enable more farmers to produce high quality vanilla and sell it profitably. Processors, who compete for vanilla in a largely informal and opaque market will also need to build more transparent and traceable supply chains, if they are to be successful in maintaining demand for their products and building an international reputation and brand for Ugandan vanilla.

This manual introduces field agents, extension workers and program managers to a range of skills. The sixteen lessons cover the following topics:

- the vanilla market
- managing the vanilla farm
- cultivating vanilla
- harvesting and diversification.

Each lesson includes guidelines, exercises to do with team members or with a group of farmers, and quizzes to test your understanding. The guide is divided into three sections, for ease of use, these include (i) reference materials, (ii) lessons and quizzes and (iii) farmer handouts.

CRS has other manuals on crop production, finance and marketing for smallholder farmers in a series on SMART Skills. Other manuals in this series cover individual skills in detail. http://www.crsprogramquality.org/smart-skills-for-farmers/

CRS CATHOLIC RELIEF SERVICES faith. action. results.

Catholic Relief Services | 228 W. Lexington Street, Baltimore, MD 21201, USA | crs.org | crsespanol.org
Catholic Relief Services Uganda | Nsambya Road, Kampala, P.O. Box 30086
For more information, contact infouganda@crs.org; +256 393 265658