



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



## Forage Seed Producer Capacity Building on Quantified Forage Early Generation Seed in Ethiopia



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**Feed the Future Consortium Partners** in the Feed the Future Global Supporting Seed Systems for Development activity:



## Introduction

Despite Ethiopia maintaining the highest cattle population in Africa, inadequate and low quality feeds continue to negatively affect increased livestock productivity. Cultivated forages can play a key role in increasing livestock productivity as the country has arable land, labor, adequate precipitation in most places, and adapted diversity of forage varieties. However, poor access to sufficient and quality forage seeds and planting materials, lack of improved agronomic practices and postharvest management continue to contribute to low forage cultivation. Empowering forage seed producers and inputs supply value-chain improvement, therefore, is key to improve availability of quality forage seeds, and therefore increased forage productivity in the country. In line with this endeavor, we assessed impact following training forage seed producers and quantified amount of forage early generation seeds they would be interested to acquire in order to bolster forage seed production in their entities.

## Efforts made and progress status

### Forage Seed value-chain development

Forage seed value-chain actors were mapped and the key roles they play including vertical and horizontal linkages in the end of 2022. Among the key actors mapped include national and regional agricultural research institutes with responsibility for crop variety development and supply of early generation seed – key for productivity improvement. To contribute to forage early generation seed development and supply in sufficient and good quality, a memorandum of understanding was prepared developed and signed between ABC/CIAT and Ethiopian Institute of Agricultural Research (EIAR). Other key forage value-chain actors identified were private seed enterprises, out-grower farmers, non-governmental organizations (NGOs), government bureau of agriculture, feedlots and dairy farms and smallholder farmers. Private seed enterprises play a key role in forage seed production activities. With the engagement of smallholder farmers, these enterprises support extension worker by providing start up seed and technical backstopping, collecting raw seed from out-grower farmers and conducting seed processing and quality management and supply to buyers. The major buyers are NGO projects, government bureau of agriculture and private feed lots and dairy farms.

. In addition to poor access to Forage Early Generation Seeds, seed enterprises, out-grower farmers and extension workers were deemed necessary to boost on agronomic practices and postharvest seed management aspects. As such, capacity building workshops were organized for these key role players for forage and forage seed production.



## Forage and Forage Seed Production Frontline Key Role Players Capacity Building

Forage and forage seed development capacity building training was provided to forage seed producers and woreda development agents in Ethiopia in March 2023. The training focused on site selection, land preparation, planting and sowing rates and spacing, seed crop management, seed harvesting and processing and storage. Forage species included Panicum, Lablab, forage oat and Brachiaria.

A survey was conducted six months post training to determine changes incorporated by the forage seed producers and woreda experts, with the expectation that one key outcome would be an increase in forage seed production.

### Survey Findings on Understanding/Knowledge Changes After the Training

A total of 15 people who attended the capacity building training were involved in this survey assessment. Most of them provided their responses by completing the survey questionnaires while some responded via mobile phone interviewing since they did not have email access. They were asked to use the scale of **very low, low, average, high** or **very high** concerning their understanding/knowledge before, and changes after the training period. Based on the trainees' responses, *understanding/knowledge* level of the trainees varied both before and after the training period for all trainees. The range of trainees in percentage were; 13 – 33 %, 47 - 80 %, and 6-26 % responded had **low, average** and **high** understanding/knowledge level on all the six training topics, respectively, while 13 % of them replied had even **very low** level of understanding on seed processing and storage topics before the training period. After the training period, their knowledge changed on all the six training topics to level of **average** and **high** for 6 -20 % and 53.3 -73.3 % trainees, respectively, while 13 - 27 % of them raised to **very high** level of understanding on all training topic (Table 1).

**Table 1. Understanding/knowledge level before and changes after training on key training topics in present as responded by the trainees**

Training attributes	Understanding/knowledge level and change by respondents in present (%)									
	Before training					After training				
	Very Low	Low	Average	High	Very high	Very Low	Low	Average	High	Very high
<i>Site selection</i>		33	47	20			6	67	27	
<i>Land preparation</i>		27	47	26			13	60	27	
<i>Planting/ sowing rates and spacing</i>		33	47	20			13	60	27	
<i>Seed crop management</i>		20	80				13.3	73.3	13.4	
<i>Seed harvesting</i>		27	67	6			20	67	13	
<i>Processing and storage</i>	13	13	54	20			20	53	27	

### **Survey Findings on Trends of Trainees Practicing Level Before and After the Training Period**

Information was gathered on how the trainees rated their approach to each attribute before and after the training. They were asked to use the scale of very low, low, average, high or very high. According to the respondent's information, majority of the trainees (46-67 %) practicing each attribute fall under **average** level before and changed to **high** level for 60 -73 % of them and even raised to very high level for 7-20% of them after the training period. Although this survey was conducted prior to the seed harvesting and processing period, the survey result indicated positive changes on the respondent's response (Table 2). This might be because of their readiness to apply knowledge they have acquired from the training at the upcoming seed harvesting and processing calendar in the period from October to December.

**Table 2. The rate of trainees practicing the training attributes before and after the training as responded by the 15 trainees**

Training attributes	Rates of trainees practicing level and change by respondents in present (%)									
		Before training				After training				
	Very Low	Low	Average	High	Very high	Very Low	Low	Average	High	Very high
<i>Site selection</i>		27	53	20				13	67	20
<i>Land preparation</i>		20	53	26.7				13	67	20
<i>Planting/ sowing rates and spacing</i>		27	53	20				20	73	7
<i>Seed crop management</i>	7	20	46	27				13	67	20.0
<i>Seed harvesting</i>	7	13	60	20		7		13	60	20
<i>Processing and storage</i>	7	13	67	13		7		13	67	13

### Survey Finding on Knowledge Sharing After the Training

Based on the information gathered from respondent trainees, the knowledge gained, and experiences shared from the training program is transferred to different categories of users. These included trainees' neighbors, friends, farmers' unions, groups of out-grower farmers, individual farmers and development agents. In further analysis of the information gathered, trained woreda experts transferred the knowledge to farmers' cooperative unions, individual farmers and kebele-based development agents; enterprise owners and their representatives transferred the knowledge to their neighbors and friends; experts from the seed enterprises transferred the knowledge to out-grower farmers.

### Survey Finding on Importance of the Training Attributes Based on the Respondent Trainees' Information

They were also asked to categorize the training attributes into the most and least helpful based on their personal perspectives. Accordingly, site selection and planting/sowing rates and spacing/ are selected as the first two most helpful attributes by 67 % and 60% respondents' perspectives, respectively, while seed crops management and seed harvesting are equally selected as the third most helpful attributes by 53 % respondents. On the other hand, seed processing & storage and land preparation were selected as the least helpful attributes by 60 % and 53 % respondents, respectively.

### Survey Findings on Expected Changes in Forage Seed Productivity

Although it is in the middle rainy season and forage seeds are not yet ready for harvesting at the moment of this data gathering, respondents were asked for their perspective on their expectation of changes in their field productivity (increase or decrease in present). Based on their feedback, there is incremental change in seed yield for most forages being grown both at seed enterprises and individual household levels who are receiving extension services from the respondents. At the enterprise level, the highest increment of 36-40 % is expected for Rhodes and Alfalfa at the Bulto Farm and oat at Anatoli seed. The change in increment for forage seeds of Panicum, Sudan grass, Rhodes, and lablab expected at Eden farm is 21- 25%. At the woreda level, the highest increment seed yield at 41-50 % is expecting for oat at Tiyo woreda of Oromia region followed by 26-30 % increment for Sudan grass at Erfatana Gidim woreda of Amhara region (annex 1).

### Forage early generation seed (EGS) demand by Forage Enterprise

Another quick survey of forage early generation seed (EGS) demand by private seed enterprises was made in Ethiopia in the month of September 2023. A total of six private seed enterprises namely Eden, Anatoli, Kifle, Mengistu, Muluaem and Tadesse private forage seed enterprises were involved and their separate and aggregated quantified demands by forage types was recorded along with their willingness to pay for EGS seeds. The survey report shows that a total of aggregated quantified demand of 1783 Kg EGS seeds of different forage species is required for the coming planting time by these enterprises (Table 3), Through this quick survey assessment, only accessible seed enterprises from Around Addis Ababa, Oromia, Sidama and SNNP regions were addressed. Enterprises from Tigray and Amhara regions were not included because of connection problems for reaching at them electronically. Hence, more demand is expected for forage early generation seed in the coming planting time (May –June 2024).



**Table 3. Summarized quantified forage EGS demand in Ethiopia as responded by six potential seed enterprises**

S/n o.	Forage species	Quantity (kg) of forage Early Generation seed demands							Willingness to pay for
		Anatoli	Eden	Kifle	Mengistu	Mualem	Tadesse	Total	
1	Oat	35	120	35	25			215	All
2	Panicum maximum	20	50					70	All
3	Lablab	35	50		25	25		135	All
4	Cowpea	35	50			25	23	133	All
5	Rhodes grass	25	100	35	30		25	215	All
6	Sudan grass	20	500				25	545	All
7	Vetch	25	120	35	25		30	235	All
8	Phalaris	20	50				25	95	All, except Tadesse
9	Lucerne	15	50					65	Only Anatoli
10	Pigeon pea	25				25	25	75	
	Total	255	1090	105	105	75	153	1783	

### Round Table Brief Report with EIAR & Key Centers

Engaging discussions were conducted on forage early generation value-chain development among team members from Ministry of Agriculture, Ethiopia Institute of Agricultural Research, Centers such as Holeta and Melkassa Agricultural Research Centers, Regional Bureau of Agriculture, Ethiopian Agricultural Authority, Ethiopian Seed Enterprise, NGOs such as SNV, ILRI, FAO, Private seed enterprise, Feed lot and Dairy farms and individual consultants. The discussion was initiated by CIAT staff taking an advantage of the stakeholders coming together for the innovation packaging workshop organized by ILRI/CGIAR African Raising project on “Commercialization of forage seed business in mixed farming system of Ethiopia” held at ILRI campus on 21 September 2023. During that discussion, two opposing issues were raised around forage early generation seed. Researchers said “no demand” while private seed enterprise team complained of “no sufficient & good quality” of forage early generation seeds. After thorough discussion was made on these issues among participants, it was agreed to establish “Forage Early Generation Seed Platform” to connect supply and demand so that centers can obtain reliable information about types & quantified demands to multiply required forage EGS and supply to seed multipliers.

## Conclusions & recommendations

Ethiopia with its huge number of livestock, arable land suitable for crop and livestock production, released and registered forage varieties, emerging commercial livestock businesses, and existing private and public institutions for research and development could have great chance for boosting its livestock productivity to benefit from the growing national and global markets for its economic and social development. Supply of good quality and enough forage early generation seed could contribute to solving the problem of feed shortage and poor quality through production of improved forages. To make it happen, there is a need for formal coordination and collaboration among key stakeholders. Establishment of a forage early generation seed platform will create such coordination and collaboration connecting the research institutions (sources) with seed multipliers (sinks) for forage early generation seed availability in sufficiency and good quality. Presently, gathered quantified demands from the private enterprises shall be forwarded to EIAR center so that its relevant centers start production of those forage early generation seed multiplication. The suggested platform could be digitalized or conducted during a formalized meeting at least once per a year that connects supply and demand.

**Annex 1. Forage types and their expected changes in seed yield productivity in kg/ha based on the respondent trainees' estimation**

Forage types	Expected changes (increased %) in seed yield productivity in kg/ha versus respondents location/enterprise information										
	Eden seed	Degem wored	Borkosho farm	Bulto farm	Anatoli seed	Tiyo woreda	Kifle farm	Nigisti seed	Mengistu farm	Erfatana Gidm woreda	Ejere woreda
Panicum	21-25				21-25						
Sudan grass	16-20									26-30	
Rhodes	21-25			36-40	21-25	1-5		1-5	1-5		
Alfalfa				36-40	1-5	1-5	6-10			6-10	
Oat		11-15			36-40	41-50	6-10	1-5	1-5	11-15	16-20
Cow pea	16-20				1-5	1-5				11-15	
Vetch		6-10			26-30	6-10	11-15			21-25	16-20
Lablab	21-25					1-5				21-25	
Phalaris					21-25	1-5					
Desmodium			16-20		1-5	1-5					
Desho grass											
Elephant grass											
Sesbania					1-5						
Pigeon pea					1-5	1-5				1-5	