



**DEMONSTRATION OF COMMON BEAN VARIETIES (DURSITU AND
CHERCHER) IN THE GURAWA AND KURFA CHELE DISTRICTS, EAST
HARARGHE ZONE, OROMIA REGION, ETHIOPIA**

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Abstract

Common bean is becoming increasingly important in eastern Ethiopia because of the recurrent late onset and early termination of rainfall. It is an important crop under various intercropping systems and used for soil fertility management, and as emergency and security crop. However, its productivity is below 13.2 qts/ha, especially in eastern Ethiopia due to soil depletion, low technology intervention and farmers' lack of awareness of improved common bean varieties that have a yield potential of 17-40 qts/ha on research stations and 13-21qts/ha on-farmers' field. The major emphasis of this project was to demonstrate the two released common bean varieties (dursitu, food type and Chercher, canning type) in Gurawa and Kurfa Chele districts of East Hararghe Zone during Belg and Meher seasons. Its specific objectives were to demonstrate the two improved common bean varieties with the local checks; to evaluate their performances and identify a variety that meets farmers' choice in Belg and Meher seasons. Four kebeles were identified from the two districts based on their common bean production potential from which 12 target farmers were selected based on their willingness to demonstrate the technology. Training was given to the target farmers including the district and kebele extension agents on the modern common bean production. Farmers' days were organized at the maturity and harvesting time during the two seasons. Chercher variety was selected first, Dursity second and the local common bean third based on their maturity dates, colour and market demand. Farmers preferred Chercher variety for use during Belg season and Dursitu variety during rainy season to fully fetch its yield potential. The data shows that an average yield for Chercher, dursitu and the local varieties across the two districts during Belg to be 17.9, 13.5, and 7.9 qts/ha, respectively. The corresponding yield during the Meher seasons was 20.1, 21.2, and 10.2 qts/ha, respectively. This result shows that target farmers were able to increase common bean yield from the previous 13.2 qts/ha to around 21.2 qts/ha because of the interventions conducted through demonstration of the technologies together with associated trainings.

Keywords: Demonstration, Improved Common beans, Training

1. INTRODUCTION

Common bean is becoming increasingly important in eastern Ethiopia because of the recurrent late onset and early termination of rainfall, which force the farmers to use short duration corps. It is an important component of crop production in Hararghe under various intercropping systems. It is used as soil fertility management, as emergency and security crop and as a supplemental animal feed (Chemed and Bulti, 2006; Tana and Chemed, 2006). The major problems of common bean production in Eastern Ethiopia are: inaccessibility to improved common bean varieties, low extension intervention, and inferior performance of local varieties.

To address these constraints, Haramaya University (HU) developed six improved common bean varieties along with its improved practices during the last 10-15 years, of which eleven are food beans (Gofta, Ayenew, Haramaya, Dursitu and Kufanzik, Tinike, Hirna, Babile, Fedis, Hundane and one navy (white) variety (Chercher). The merits of the new varieties include high yield (17-40 qts/ha on research stations and 13-21qts/ha on-farmers' field), tolerant to major diseases, excellent growth habit, early maturing (82-114 days) and adaptive to wider agro ecology of 1300-2000 m.a.s.l. (Chemed and Bulti, 2004).

Most of the technologies developed were not demonstrated and transferred to the end users through appropriate extension methods to complement the work conducted on research stations, and to provide more realistic evaluation of the new technology under farmers' condition. The process also provides an excellent opportunity for farmers to learn, evaluate, and participate in the recommendations drawn on the specific technology. Furthermore, it can encourage and strengthen researchers-extension-farmers- stakeholders and policy makers' dialogue and provide opportunity to jointly identify research thematic area, participatory technology generation, transfer and utilization. Hence, the objective of this project was to demonstrate the two recently released common bean varieties (Dursitu and Chercher) with the local one in Gurawa and Kurfa Chele districts during Belg and Maher to select the variety (ies) that meet farmers' criteria and thereby increase target farmers common bean production from 10.5- 21 qts/ha.

2. METHODOLOGY

2.1 Description of the Study area

Eastern Hararghe Districts (kurfa chele and Gurawa) are situated at altitude of 1357-3200 m.a.s.l. Their annual rainfall ranges from 500 to 1200 mm. They have bimodal rainfall distribution, the small rainy season which occurs in February and the main rainy season that occur between June and September. The major crops grown in the districts are sorghum, maize, teff and haricot beans, groundnut, coffee and chat. Eastern Hararghe farmers grow common bean twice per year (during Belg and Maher especially in Gurawa). The Belg production is sol and larger, whereas Maher is mostly intercropping with various major crops. They usually sow teff after the harvest of Belg on the common bean fields in Gurawa.

2.2 Sampling technique

Gurawa and Kurfa Chele districts were identified from Eastern Hararghe Zone using purposive sampling technique based on common bean production potential. Two kebeles were identified from each district. Three model farmers were selected from each kebele depending on common bean production potential, full interest to participate in the project during the two seasons (Belg & or Maher), ability to allocate the required land for the three common bean varieties (two improved and one local varieties). The name of the target farmers, their respective districts and peasant associations (PAs) is indicted in Tables 6.3 and 6.4.

2.3 Training

Training is one of the important extension methods to enhance and integrate the farmers' indigenous knowledge and skill with improved practices. Accordingly, training need assessment before and after technology demonstration was made. Six development agents (4 in Gurawa and 2 in kurfa chele districts), 2 district extension experts one from each district, and 12 target farmers (6 from Gurawa and 6 from kurfa chele districts) attended the trainings on the common beans agronomic practices before sowing (Tables 6.1 and 6.2). Each target farmer provided 10mx20m of land for the two improved common beans and one local common bean varieties demonstration in Belg and Maher. Necessary packages were distributed together with the varieties. The varieties were sown in April for Belg and in late July for Maher because of the late onset of rainfall in both seasons. Field days were organized in June for Belg and September for the Maher seasons. The performance of each improved common bean varieties were evaluated against the local check in each kebele in terms of their yield performances, diseases tolerance, maturity dates and market demand (Tables 6.3, 6.4, 6.5 and 6.6).

3. RESULTS AND DISCUSSION

Table 1 showed that target farmers' knowledge and skill on improved common bean agronomic practices was very low but increased after training.

Table 1. Training needs assessments before and after training on the target farmers

No.	Questions	Before Training				Assessment After Training			
		Farmer' No.		Total	%	Farmer' No.		Total	%
M	F	M	F						
1	Land preparation	3	-	12	25	11	-	12	91.6
2	Row planting	-	-	12	0	10	-	12	83.4
3	Spacing	-	-	12	0	10	-	12	83.4
4	Weed control	6	-	12	50	12	-	12	100
5	Disease control	-	-	12	0	11	-	12	83.4
6	Harvesting	4	-	12	33.3	12	-	12	100
7	Post Harvesting Mgt.	-	-	12	0	9	-	12	75
8	Crop rotation	6	-	12	50	12	-	12	100
9	Soil fertility	6	-	12	50	12	-	12	100

Table 2 showed that development agents' knowledge and skill on improved common bean agronomic practices to be quite low before the training, which was greatly improved after undertaking the training.

Table 2 Training needs assessments before and after training for development agent

No.	Questions	Assessment Before Training				Assessment After Training			
		Number of DAs				Number of DAs			
		M	F	Total	%	M	F	Total	%
1	Land preparation	3	-	6	50	6	-	6	100
2	Row planting	2	-	6	33.3	6	-	6	100
3	Spacing	3	-	6	50	6	-	6	100
4	Weed control	4	-	6	66.7	6	-	6	100
5	Disease control	3	-	6	50	6	-	6	100
6	Harvesting	1	-	6	16.7	6	-	6	100
7	Post Harvesting Mgt.	1	-	6	16.7	6	-	6	100
8	Crop rotation	4	-	6	66.7	6	-	6	100
9	Soil fertility	4	-	6	66.7	6	-	6	100

Farmers' Days

Farmers' days were conducted at flowering stage and at harvesting stage. At flowering stage, crops resistances to different diseases and drought tolerance ability were evaluated. At harvesting stage, the yield performances were evaluated (Figure 6.1.). During the Belg season, a total of twelve target farmers, 4 development agents, 2 district extension experts and 55 follower farmers were participated in Gurawa and Kurfa chele districts.



Fig 1 Improved common beans evaluation

Evaluation at Harvest

During the Maher season, a total of twelve other target farmers, 2 development agents, 2 districts’ extension experts, 63 follower farmers participated at both districts. The common beans were compared and prioritized based on participants’ criteria as follows:

Dursitu improved common bean variety was selected first for its grain and biomass yield and Chercher for maturity date and drought resistances during summer in Gurawa district. But Chercher was rated first and Dursitu second in Kurfa chele district in both seasons based on yield performances and earliness in maturity. There was serious rain shortage in Kurfa chele district consequently Dursitu variety need more time to mature.

The target farmers and participants decided to share the available seed they harvested to other follower farmers and also decided to grow the two improved common bean varieties. But, they decided to grow Dursitu common bean only during the main rainy season as it need extended period of rain to fetch its full production potential.

Table 3 shows that the highest mean yield/ha was recorded in kurfa chele during the Belg season by Chercher improved common bean (19.5qt/ha) which was followed by Dursitu (14.5qt/ha) and the local variety (9.7qt/ha), respectively and the order was similar in Gurawa district, but there was yield difference between the districts.

Table 3 Name of target farmers, and grain yield of common bean varieties during Belg season in Gurawa and Kurfa chele districts

No.	Name of Farmers	District	PAs	Yield/plot (200m2)					
				in qt.			Yield qt /ha.		
				Cherche	Dursitu	Local	Cherche	Dursitu	Local
1	Ahemed Sali	Gurawa	g/gemachu	0.30	0.28	0.14	15.00	14.00	7.00
2	Abdalla Usman	“	“	0.36	0.20	0.12	18.00	10.00	6.00
3	TeshagerTeshome	“	“	0.42	0.33	0.90	21.00	16.50	4.50
4	Demisie Belachaw	“	bedu	0.22	0.18	0.13	11.00	9.00	6.50
	Toatal			1.30	0.99	0.48	0.65	49.5	24.00
	Mean			32.5	24.75	12.00	16.3	12.40	6.00
5*	*Mohamed Amin	“	“	0.00	0.00	0.00	0.00	0.00	0.00
6*	*Eshetu Kinfe	“	“	0.00	0.00	0.00	0.00	0.00	0.00
7	Abraham Amed	Kurfa	Dawe	0.55	0.45	0.24	27.5	22.5	12.00
8	Ahemed Hasen	‘	‘	0.30	0.16	0.15	15.00	8.00	7.50
9	Miftiha shekrashid	“	“	0.50	0.34	0.18	25.00	17.00	12.50
10	Miftha Haji	‘	:”	0.37	0.22	0.13	18.50	11.00	6.50
	Alemayehu								
11	Kebede	“	Kerso	0.22	0.17	0.11	11.00	8.5.00	5.50
12	Debebe Makeshe	“	“	0.75	0.40	0.28	37.50	20.00	14.00
	Total			2.34	1.74	1.09	117.0	87.00	58.00
	Mean			0.39	0.29	0.18	19.50	14.50	9.70

*Indicted that the common bean demonstrations on the two farmers’ plots were affected by drought and there were no yield.

Table4 shows that the highest mean yield/ha was recorded in Gurawa during the Maher season by Dursitu variety (29 qt/ha) which was followed by Chercher variety (21.4 qt/ha) and the local variety (12 qt/ha). But, the highest mean yield/ha was obtained from Chercher variety (19 qt/ha) in Kurfa chele district which was followed by Dursitu (13.40 qt/ha) and the local variety (8.3 qt/ha) during the same season. The mean yield differences were due to the inconsistency in rainfall in both districts during the growing seasons.

Table 4 Name of target farmers, and yield performances of bean varieties in Maher season in Gurawa and Kurfa chele districts

No.	Name of Farmers	District	PAs	Yield /plot(200m2) in					
				quantals.			Yield qts/ha.		
				Cherche	Dursit	Local	Cherche	Dursit	Local
r	u		r	u					
1	Tasfa Demeke	Gurawa	Lafto	0.30	0.35	0.17	15.00	17.50	7.50
2	Hashum Usmael	“	“	0.60	0.80	0.32	30.00	40.00	16.00
3	Mohamed Abraham	“	“	0.50	0.50	0.28	25.00	25.00	14.00
4	Worku Endrias	“	Gamachu	0.40	0.65	0.24	20.00	32.50	10.00
5	Saniyo Ahimed	“	“	0.34	0.60	0.18	17.00	30.00	8.50
6*	*Abdella Saniyo	“	Kufa Kas	0.00	0.00	0.00	0.00	0	0.00
Total				2.14	2.90	1.19	107.0	145.0	60.00
Mean				0.43	0.58	0.24	21.40	29.00	12.00
1	Megarsa Husien	kurfa	Dawe	0.25	0.25	0.13	12.50	12.50	6.50
2	Hayati Ahimed	‘	‘	0.40	0.25	0.18	20.00	12.50	9.00
3	Jafar Sirajo	“	“	0.23	0.21	0.14	11.50	10.50	7.00
4	Shifaraw tadasa	“	”	0.42	0.28	0.13	21.00	14.00	6.50
5	Amadin Yusuf	“	Kerso	0.00	0.00	0.00	0.00	0	0.00
6	Debebe Makeshe	‘	‘	0.60	0.35	0.25	30.00	17.50	12.50
Total				1.90	1.34	0.83	95.00	67.00	41.50
Mean				0.38	0.27	0.17	19.00	13.40	8.30

*Indicted that the farmer' demonstration field was attacked by drought

Table 5 Summary of agronomic data of common bean varieties in the two districts during Belg season

No.	Agronomic Data	Common beans Varieties			Remark
		Chercher	Dursitu	Local	
1	Date of planting	Late April	Late April	same	rainfall delay
2	Maturity date	End June	End of June	June	End of
3	Resistance to diseases	high	average	low	
4	Resistance to drought	High	average	low	
5	Harvesting Date	End June	Early July	Early July	
6	Color	white	brown	mixed	
7	Market Demand	High	Average	low	
8	Average yield	17.9	13.5	7.9	

Table 6.6. Summary of agronomic data of common bean varieties in the two districts during Maher Season

No	Agronomic Data	Common beans varieties			Remark
		Chercher	Dursitu	Local	
1	Date of planting	Late July	Same	Same	Rainfall delay
2	Maturity date	Mid Oct.	End Oct.	Late Oct.	
3	Resistance to diseases	High	Average	Low	
4	Resistance to drought	High	Average	Low	Early
5	Harvesting Date	End Oct	Early Nov.	Nov.	
6	Color	White	Brown	Mixed	
7	Market Demand	High	Average	Low	
8	Average yield	20.2	21.2	10.2	

Table 6.7. Farmers' selection criteria and responses' to the packages

		Farmers' Selection criteria Improved common bean cultivars vs local			
No.		Dursitu	Chercher	Local	Remark
1	Yield	High	V. high	Low	
2	Date of Maturity	Late	Early	Medium	
3	Drought Résistance	Medium	High	Low	
4	Diseases Resistance	High	V. high	V.low	
5	Colors	V.good	Excellent	Mixed	
6	Market demand	High	V. high	Low	
7	Farmers' Rank	2	1	3	

Farmers' decision: target farmers have decided to grow the two improved common bean varieties and share the available seed to other follower farmers who eagerly follow the demonstration activities.

4. CONCLUSION

The two improved common bean varieties were compared with the local and both improved common bean varieties (Chercher and Dursitu) met the farmers' criteria. The variety that can be suitable for Belg and Maher seasons were also identified. Chercher variety is suitable for Belg season since it is early maturing and Dursitu variety for the Maher as it is relatively late maturing. Depending on rainfall requirement, yield potential and other quality attributes, however, Chercher variety was selected first by farmers'. This variety has high market demand, shorter maturity date and it is drought tolerant. It was learnt that demonstration of new technology using appropriate extension methods such as training and farmers' days are among the best approaches in technology transfer. Experiences were shared among target farmers, followers, researchers, agricultural development agents, and other stakeholders through group discussion on the specific improved practices during the farmers' days.

In general, participants' capability and skill on the improved common bean production technologies increased and thereby their common bean production increased from 8.0 qts/ha to 20.70 qts/ha as a result of the demonstration made on the two common beans technologies along with training and farmers days. The ground for further popularization and dissemination of the two improved common bean technologies was established.

5. RECOMMENDATION

- Optimum use of rainfall through land preparation before the arrival of rainfall and use of early maturing varieties.
- Researchers' should be involved in pre-extension demonstration activities after technology generation to facilitate the timely dissemination of the same to the wider community.
- Motivation system should be developed to encourage researchers.

- Districts and Kebele level extension agents' should give priority for the technology transfer activities.
- Enough skilled manpower, vehicles and budget should be assigned for the research and extension department so that the office can fully achieve the activities of technology transfer.

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