Developing Country Studies
ISSN 2224-607X (Paper) ISSN 2225-0565 (Online)
Vol.7, No.12, 2017

Pre-Scaling up of Improved Faba Bean Technologies in the Highland Districts of Guji Zone, Oromia Regional State, Ethiopia

Basha Kebede Dembi Korji
Oromia Agricultural Research Institute, Bore Agricultural Research Center, P.O. box 21, Bore, Ethiopia

Abstract
Pre scaling up of faba bean was conducted in the highland districts of Guji Zone to increase farmers' capacity in production and management practices. Ana Sora and Ana Sora districts and four sites were selected purposively based on convenience of the crop for faba bean production. From each peasant Association nine farmers were selected, for the two years 72 farmers were selected. The two improved varieties of faba bean distributed for farmers were Gebelcho and Walki. Depending on the capacity of farmers 50kg-100kg of faba bean was given for the selected farmers. Around 24.5ha was covered by the faba bean during the production years. Training was given farmers and others on production and packages of faba bean. Exchange and mini field day was arranged for further promotion of faba bean in the highland area. From 0.25ha the productivity of improved faba bean Gebelcho was around eight quintals while Walki was about seven quintals which was higher than locally disseminated faba bean. Faba bean is potential crop in the highlands of Bore and Ana Sora districts. The crop is used for household consumption as well as cash crop in generating income for farmers. Gebelcho and Walki were acceptable during field day by farmers due to their disease tolerant and productivity per hectare. Thus, highland farmers should use Gebelcho and Walki variety of faba bean in order to increase their faba bean production and generate more income for their livelihood. Further dissemination faba bean is expected from seed multipliers in producing quality seed and addressing potential area.
Keywords: Faba bean, Gebelcho, Walki, farmers

Introduction

Faba bean (vicia faba L.) is one of the major pulse crops grown in the highlands (1800 – 3000 masl) of Ethiopia (Temesgen and Aemiro, 2012). Faba bean is a valuable protein-rich leguminous crop cultivated and consumed as human food in the specified areas. In addition, its straw is used as animal feed. With a cheap protein source, it partly compensates for the large deficiency in animal protein sources. Faba bean plays a significant role in improving the productivity of soil by fixing atmospheric nitrogen and is a suitable rotation crop for cereals. A major benefit of rotating pulse crops, such as faba bean with cereal crops is in compensation or response to low soil fertility as well as in the interruption of diseases and insect pest cycles (Barri and Shtaya, 2013). Among pulses, faba bean accounted for 31.4% (0.84 million mt) (CSA, 2015). However, the productivity of the crops under smallholder farmers is not more than 1.89 t ha-1 (CSA, 2015).

Despite the immense economic and ecologic merits, however, the productivity of faba bean, in Ethiopia is far below the potential due to a number of biotic and abiotic constraints, socioeconomic constraints in smallholder farms and inadequate technological interventions. Shiferaw *et al*. (2013) also mentioned the productivity of faba bean is far below expected potential due to low input usage, natural disasters like snow storm, depletion of macronutrient from cultivable land and unavailability of essential nutrients such as phosphorus.

The production of faba bean in the highlands of Guji Zone is well known. Faba bean serve as source of household food in the form of *kik wot* and *shumo* prepared during *Jigi*. Faba bean is also used as cash crop since the crop has high market price that brings high returns to the farmers. However, most highland farmers use local varieties which are not disease resistant that lead to low yield. Therefore to over-come lack of improved seed and disease resistant variety the pre scaling up of improved faba bean technologies were initiated in the highlands of Guji Zone.

Objectives

- To scale up improved faba bean varieties in the community
- To increase production of faba bean in the highlands of Guji Zone

Description of the study areas

The experiment was executed at Bore and Ana Sora districts during the main cropping season of 2013 and 2014 under rain-fed condition. Bore district is situated at a distance of 385km from Addis Ababa and 210km from the zone capital city, Negele. Bore district is situated in the Northern part of Guji Zone, Oromia regional state of geographical locations. It has elevation ranging from 1450-2900meters above sea level. The annual temperature of the district ranges from 10.1 up to $20C^0$. The major soils of Bore district are Nitosols (red basaltic soils) and Orthic Acrosols which were used for diverse crop production such as potato, wheat, barley, maize faba bean, field pea, enset and so on.

And Ana Sora district is situated at a distance of 410km from Addis Ababa and 180 km from zonal capital city, Negelle. The district is characterized by two types of climatic zone, namely temperate, Dega (locally known as Bada) which starts in early April up to October and Woina dega (locally known as Bada-dare) which starts late November up to the beginning of March). It is most humid and sub humid moisture condition, which has relatively longer growing season. The major crops grown in the district includes, faba bean, field pea, maize, wheat, barley, potato and enset. The district is also well known by honey production.

Sampling procedure

The pre -scaling up of improved Faba bean varieties were conducted at two (2) districts (Bore & Ana Sora). At each district two Peasant Associations (PAs) were selected based on potentiality of the districts for faba bean production. And the selection of pre-scaling up sites were purposive based on convenience of the area to the technologies. From each PAs nine (9) farmers were selected having 0.25 hectare of land for each variety (Gebelcho and Walki). So that a total of 72 farmers planted faba bean.

Method of data collection

Regular interaction with farmers, key informant and focus group discussion were used to collect the data.

Data analysis Method

Simple descriptive Statistics was used to analysis the data.

Result and Discussion

The pre -scaling up of improved Faba bean varieties was conducted at two (2) districts (Bore & Ana Sora), Guji zone Oromia Regional State. At each district two (2) PAs were selected based on potentiality of the districts. 49 quintals of two improved faba bean varieties namely Gebelcho and Walki (29 quintals of Gebelcho and 20 quintals of Walki) were distributed for selected farmers owning 0.25ha-1ha of land. 50-100 kg was delivered. So that 24.5 hectare of land was covered by two varieties. Training was given for 144 farmers on the productivity of improved varieties of this crop with its all packages for both farmers who got seeds and who not got seeds in order to share information on the technologies. Mini field day was arranged at Bore district of Ano Kerensa Peasant Association and Ana Sora at Irba Buliyo Peasant Association to share experience among farmers and PAs participating on the activity. During the occasion farmers, DAs, experts were satisfied by observing the technologies delivered. On self-initiation, farmers, DAs and others encouraged to work together in similar activities. Around 140 farmers, 11 DAs,18 experts, two administrators (from two districts) and researchers were attended and observed the yield advantage of the improved varieties over the local varieties and the field visit created a pressure of interest among farmers, DAs and other participants.

Yield obtained from pre scaling up of faba bean

Table 3. Yield of improved faba bean scaled up in quintals

Variety	Bore from 0.25ha					Ana Sora from 0.25ha					Ave
	2014/15		2015/16		Ave	2014/15		2015/16		Ave	
	Ano Kerensa	Abay Kuture	Ano Kerensa	Ano Kuture		Irba Buliyo	Bube Korsa	Irba Buliyo	Bube Korsa		
Gebelcho	10	11.5	5.5	6	8.25	12	11	6.5	5	8.62	8.44
Walki	8.5	9	4.5	5	6.75	9.5	8	5.5	4	6.75	6.75

The above table revealed that during 2014/15 production season the production of faba bean was higher than that of 2015/16 due to occurrence of frost and disease (chocolate spot) attacking the crop in 2015/16. Being affected by frost and disease the productivity of improved faba bean was higher than locally disseminated faba bean as farmers were interested to produce improved faba bean varieties. Ana Sora district was higher faba bean productivity than Bore district. Gebelcho has higher than Walki variety.

Conclusion

The pre scaling of faba bean in Guji Zone was conducted in the highlands of Ana Sora and Bore districts to increase the production of faba bean in the community. Faba bean is potential crop in the highlands of Bore and Ana Sora districts. The crop is used for household consumption as well as cash crop in generating income for farmers. Not only used for consumption and generate income for household faba bean is also used to keep the fertility of land and thus contribute to increase productivity of subsequent other crops. Training, exchange visit and mini field days capacitated farmers on production of faba bean. Gebelcho and Walki were acceptable by farmers due to their disease tolerant and productivity per hectare. Gebelcho and Walki variety has got acceptance by participants during mini field days. Both Gebelcho and Walki have higher productivity than locally disseminated. However, the productivity of faba bean was influenced by severe frost and disease occurred during 2015/16 production.

Recommendations

- Highland farmers should use Gebelcho and Walki variety of faba bean in order to increase their faba bean production and generate more income for their livelihood.
- Further dissemination faba bean is expected from seed multipliers in producing quality seed and addressing potential area
- New adapted and disease resistant variety of faba bean should be adapted by research center
- Farmers should use chemicals to reduce *chocolate spot* disease.

Acknowledgements

Authors would like to acknowledge OARI (Oromia Agricultural Research Institute) the then IQQO (*Inistitiyuutii Qorannoo Qonnaa Oromiyaa*) for their financial assistance. Farmers and development agents directly involved for the completion of pre scaling up improved faba bean research activity also heartily acknowledged.

References

Barri, T. & Shtaya, M.(2013). Phenotypic Characterization of Faba Bean (Vicia faba L.) Landraces Grown in Palestine. Journal of Agricultural Science; Vol. 5, No. 2

CSA (Central Statistical Agency). 2015. Federal Democratic Republic Of Ethiopia, Agricultural Sample Survey, Volume I Report on Area and Production of Major Crops. Statistical Bulletin 532, Addis Ababa, Ethiopia 12 p.

Shiferaw Demissie, Diriba Muleta & Gezahegn Berecha. 2013. Effect of Phosphate solubilizing Bacteria on Seed Germination and Seedling Growth of Faba bean (*Vicia faba* L.). *International Journal of Agricultural Research*, 8(3): 123-136.

Temesgen Alene & Aemiro Bezabih (2012). Genotype X Environment Interaction and Stability Analysis of Faba Bean (*Vicia faba* L.) Varieties in North Ethiopia. Libyan Journal International, ISSN 2219-4304, 3 (4): 195-200.© IDOSI