

Participatory Promotion of Improved Chickpea Varieties in Habro and Oda Bultum Districts of West Hararghe Zone

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Abstract

This activity was conducted during the 2013 main cropping season at Habro and Oda Bultum districts of West Hararghe Zone to evaluate the performance of improved chickpea variety on farmer's field and strengthen stakeholder's linkage in the study area. A total of seventy (70) farmers from both district were participated for the activity. Three improved variety of chickpea (Minjar, Natoli and Habru) were evaluated with local checked to create awareness for farmers. 0.125 of land were used for each variety on each farmer's field. The result of the study showed that Minjar variety performed well than other improved varieties and local check in terms of yield from the same area on farmer's field. In addition, farmers also prefer Minjar variety in terms of its seed quality, seed size, early maturity and disease resistance over other improved varieties and local check. So, concerning body should scale up further for similar agro ecology to improve chickpea production and productivity of farming community.

DOI: 10.7176/JNSR/11-17-06

Publication date: September 30th 2020

INTRODUCTION

Agriculture is the fundamental driver for Ethiopia's economy and long-term food security as it offers about 80-85% of employment, more than 61% of the total export and 38.5% of gross domestic product of the country (Jima & Birhan 2017). Ethiopia has diverse agro-ecology that permits different agricultural systems and production of different crops. diverse agro-ecology together with diverse farming systems, socio-economic, cultures and climate zones provided Ethiopia with various biological wealth of plants, animals, and microbial species, especially crop diversity (Atnaf *et al.*, 2015).

Legumes constitute a critical component of the agricultural system in Ethiopia; about 12 legume crops are grown in the country. Of these, faba bean (*Vicia faba* L.), field pea (*Pisum sativum* L.), chickpea (*Cicer arietinum* L.), lentil (*Lens culinaris* Medik.), grass pea (*Lathyrus sativus* L.), fenugreek (*Trigonella foenum-graecum* L.) and lupine (*Lupinus albus* L.) are categorized as highland legume crops and grown in the cooler highlands. On the other hand, haricot bean (*Phaseolus vulgaris* L.), soya bean (*Glycine max* L.), cowpea (*Vigna unguiculata* L.), pigeon pea (*Cajanus cajan* L.) and mung beans (*Vigna radiata* L.) are categorized as lowland legume crops and predominantly grown in the warmer and low land parts of Ethiopia (CSA, 2018 & Getachew, 2019).

Chickpea is one of the major pulses grown in Ethiopia, mainly by subsistence farmers usually under rain fed conditions. It is one of the main annual crops in Ethiopia both in terms of its share of the total cropped pulse area and its role in direct human consumption. It is grown widely across the highlands and semi-arid regions of the country (Bejiga *et al.* 1996). Chickpea is the most important pulse crop in Ethiopia, where the whole seeds are eaten fresh, cooked or boiled or in the form of dhal which is prepared by splitting the seed in a mill and separating the husk. Floor made by grinding the seed is one of the chief ingredients of everyday diet for those suffering from Uric Acid problem. The dry stems and leaves and husk after threshing are feed to livestock.

Two types of chickpea, Kabuli and Desi, are currently produced in Ethiopia. Kabuli or garbanzo type is usually large seeded with seed size ranging from 6–8 mm and smooth cream white seed coat colour. The production of Kabuli types is currently limited to few pockets, primarily in Eastern Shewa region where access to improved varieties has been promoted through better linkages with the research and extension system. Desi type chickpea, traditionally widely grown in the country, is small seeded with seed size ranging from 3–6 mm, and hard and reddish-brown colored seed coat (Bekele Sh. & Hailemariam T., 2007).

Yields of chickpeas in the majority of traditional smallholding farms very low due to lack of improved technology concerning the crop.. However, many improved varieties of chickpea like Minjar, Natoli, Habru & others) were developed by Ethiopian Agricultural Research Institute (EARI) which improves its productivity and production. Therefore, this activity was developed to evaluate those improved varieties of chickpea on farmer's field to improve their productivity and create awareness among different stockholders.

METHODS AND MATERIALS

Description of the Area

The activity was conducted in Habro and Oda Bultum districts of west Hararghe zone. Habro and Oda Bultum districts were located at 404 km and 362 km from Addis Abeba, respectively. Those two districts were known for chickpea production relative to other districts of west Hararghe zone. Specifically the activity was undertaken in

four Peasant Associations of which Bareda, Abdi Guddina & Haro Chercher from Habro district and Kara from Oda Bultum district. Generally, agro ecologies of the two districts were summarized as follows.

Table 1: Summary of Habro and Oda Bultum Agro-ecologies

Name of the district	Agro-ecology						Soil Type
	Altitude(m.a.s.l)		Temperature(⁰ c)		Rainfall(mm)		
	Min.	Max.	Min.	Max.	Min.	Max.	
Habro	1600	2400	16	20	650	1000	Black sandy & loam soil
Oda Bultum	1040	2500	25	28	900	1100	Dominant in loam & clay soil

Source: Farming System Study of Habro (Aman T. & Anteneh T., 2001) & Oda Bultum (Aman T. Anteneh T. & Fekede G., 2001)

Site and Experimental Farmers Selection Criteria

Communication with district Agricultural Office (AO) and expert has been conducted to make the activity more participatory and select appropriate Kebele for Chickpea production in the study area.



Accordingly, Bareda, Abdi Guddina, Haro Chercher and Kara Kebeles were selected based their potential production of chickpea in relation to other kebeles. Additionally, discussions were held with respective kebele officials and DAs to select farmers on which the activity conducted. These criteria includes: Farmers interest to the crop, model farmers, accessible of site, ability to risk taker, farmers who afford two timed of land for this experiment, farmers who manage their field on time(land preparation, sowing, weeding, harvesting, threshing) and others. Accordingly, a total of seventy (70) farmers were selected to conduct the activity.

Table 2: Summary of selected Kebele, farmers and area covered by improved crop

No.	district	Kebele/PAs	No. of Fs participated	Area of land covered by improved varieties in Hec
1	Habro	Haro Chercher	19	2.4
		Bareda	17	2.2
		Abdi Guddina	18	2.3
2	Oda Bultum	Kara	16	2
Total			70	8.9

Methods of Data Collection and Analysis

Different data like yield data and farmers selection criteria were collect through supervision on prepared data collection sheet by researchers and DA of the PA. Organizing field day was also another way to collect farmer's attitude toward provided technology in relation to their agro ecology. The collected data (quantitative data) was analyzed by using average and frequency distribution while qualitative data were analyzed through qualitative interpretation.

RESULT AND DISCUSSION

Performances of improved chickpea varieties under Farmer's Condition

Habro and Oda Bultum districts were potential chickpea producing from west Hararghe Zone. Because of this

three improved varieties of chickpea was compared with local variety on selected farmers to improve its production and productivity. Therefore, the performances of each variety were evaluated based on different parameter like yield data, farmers selection criteria by comparing each variety with local check. Table 4 showed that yield summery of each variety (Minjar, Natoli, Habru and local check) on farmers' circumstance and total field harvested from activity. The result indicated that the average yield of Minjar, Natoli, Habru and local check variety is 38.7, 43.2, 37.4 and 25.2 kuntal per hectare, respectively. From this we concluded that Natoli have yield advantage over other improved variety and local check.

Table 3: Summery of yield performance of the varieties per hectare

No.	Variety Name	Total area planted in hectare	Average yield per hectare	No. Fs participated	Total yield harvested
1	Minjar	3.4	38.7	27	131.6
2	Natoli	1.4	43.2	11	60.5
3	Habru	4	37.4	32	149.6
4	Local	8.8	25.2	70	221.76

Source: Our Computation, 2014.

The above table indicated that a total of 341.7 kuntal yield were harvested from three improved varieties of chickpea provided for seventy farmers in the study area. This indicates that improved varieties of these three improved variety of chickpea were disseminated in the study area.

Photo: Performance of chickpea varieties on farmer's field



Awareness Creation & Capacity Building on Chickpea Production in the study area

Additionally, farmer's field day was organized to facilitate experience sharing among farmers to get feedback and promote the technology to other stakeholders. Accordingly, participant of field day compared each variety with local and preferred Minjar variety due to its seed quality, seed size, early maturity and disease resistance over other improved varieties and local check. However, Natoli variety have yield advantage over other improved varieties and local check.

Photo: Farmers field day



Training was provided for farmers and expert of agricultural offices to enhance their skill & knowledge on chickpea production and management.

Table 4: Training participant on chickpea production and management

No.	Type of participant	No. of participant		Total participants
		Male	Female	
1	Farmers	29	3	32
2	Developmental agents	6	2	8
3	Experts	1	1	2
Over all total		36	6	42

Photo: Training provided to farmers



CONCLUSION AND RECOMMENDATION

Chickpea is legume crop grown for food and market purpose in West Hararghe Zone. Chickpea production play greater role in ensuring household food security in the study area. Due to this the activity was conducted in order to evaluate improved chickpea varieties on farmer's field. Accordingly, Minjar variety was selected by farmers for further dissemination due to its seed quality, seed size, early maturity and disease resistance over other improved varieties and local check.. Therefore, concerning body should give attention for further popularization in similar agro ecology with package of recommendation.

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