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Pre-scaling up of Bread Wheat Technology at Jarso and Metta Districts of East Hararghe Zone, Oromia Region, Ethiopia

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ABSTRACT

Pre scaling up of Senate was conducted at the Jarso and Metta districts to increase farmers' production and management practices of bread wheat. A total of 40 farmers was involved in the pre-scaling up of bread wheat variety was used on plot size of 0.125ha of land.One kebele from each district was selected. Afgug and Dursitu Bilisuma were selected purposively based on their potential for bread wheat production from Jarso and Metta respectively. From each kebele 20 farmers were selected for the two years. Depending on the capacity of farmers 20kg of bread wheat was given for the selected farmers. Training and field day were organized. 168 participants participated in the field day organized.5ha were covered by the crop during the production years. The yield performance of the variety was 33.64 and 32.70 qt/ha at Jarso and Meta respectively. Further dissemination of bread wheat is expected from seed multipliers and district agriculture in the study area and similar agro-ecologies.

KEYWORDS: *Bread Wheat, Senate, Pre-scaling up, Jarso and Metta district*

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1. INTRODUCTION

Wheat (*Triticumaestivum* L.) is one of the globally produced. It is an important industrial and food grain which ranks second among the most important cereal crops in the world after rice (Asadallah, 2014; Falola *et al*., 2017). In sub-Saharan African countries, wheat is also a strategic commodity which generates farm income and improves food security status (Amentae *et al*., 2017; Minot *et al*., 2015; Negassa *et al*., 2013). In Ethiopia, wheat ranks fourth after teff, maize and sorghum in area coverage and third after maize and teff in total production (CSA, 2014; Minot *et al*., 2015). The highlands of the central, south-eastern and northwest parts of the country are the main wheat-growing areas of Ethiopia. Regionally, the national production of wheat comes from Oromia (57.4%), Amhara (27%), SNNP (8.7%) and Tigray (6.2%) (CSA, 2014). The major wheat producing areas in Ethiopia are located in Arsi, Bale, Shewa, Ilubabor, Western Hararghe, Sidamo, Tigray, Northern Gonder and Gojam zones (Bekeke et al., 2000). Over the past two decades, both wheat production and consumption have shown increasing trends in Ethiopia. Yet, this substantial increase in domestic production and import has not reversed the increasing trend in wheat product prices, implying an even increased growth in wheat demand. Wheat yield in Ethiopia needs to improve further to level-up with Africa and world average yields, which were 13 and 32% higher than the average wheat yield in Ethiopia, respectively (FAO, 2015a).

Improved technology could play a more dominant role in productivity, enable Ethiopia to enhance its yields and achieve self-sufficiency which in turn can improve the living standard of its growing population (FAO, 2014).Besides the use of its grain for food, wheat residue and other by-products are also commonly used to overcome the shortage of livestock feed which is the biggest constraint to the sector in the country. The other constraint of wheat production in Ethiopia is yellow and stem rust disease which is roughly expected to occur each 7 years. All these wheat production challenges made wheat productivity

in Ethiopia lower than other wheat producing countries in the world (Yami *et al*., 2013). To curb the problem related with improved variety pre-scaling up of the technology was conducted in the Jarso and Metta area. This technology created an opportunity for the farmers to efficiently utilize their farmland and increase production and productivity. The aim of this study is to popularize the wheat technologies in the study area.

Objectives

- To increase production and productivity of improved Bread Wheat variety in selected districts.
- To improve income of the farmers in selected districts
- To strengthen stakeholders linkages and collaboration in selected districts

2. Materials and Methods

2.1. Description of the Study Area

Jarso is bordered on the South by the Harari Region, on the West by Kombolcha, on the North by the city of Dire Dawa, on the East by the Somali Region, and on the Southeast by Gursum. The administrative center of this District is Ejersa Goro. The altitude of this District ranges from 1050 to 3030 meters above sea level. Mountain Gara Sirirta, Aybera, Kilisa and Bekekalu are among the highest peaks. Rivers include the Gideya. Khat, fruits and vegetables are important cash crops. Meta District is located in East Hararghe zone of Oromia region. Meta is bordered to the Southwest by Deder district, to the Northwest by Goro Gutu district, to the North by the Somali regional state, to the Northeast by Kersa district, and to the Southeast by Bedeno district. The administrative capital of the district is Chelanko. The district is characterized by valleys in pocket areas, and rugged topography with many hills. Mixed crop production and livestock rearing characterize the farming system of the district. The major crops produced in the district include sorghum, maize, wheat, and haricot bean, vegetables of different kinds and fruit trees.

2.2. Site and Farmers' Selection

Two Kebeles(Afgug from Jarso and Dursitu Bilisuma from Metta) were selected purposively based on the potentiality, appropriateness of the area by considering lodging, slop's land scape, access to road, suit for (clustering, repeatable monitoring and evaluation in progress of sowing to harvesting) . Farmers were selected based on their interest, innovation he/she has, land provision for this pre-scaling up, interest in cost-sharing, willingness to share experiences for other farmers. Farmers' selection were under taken in collaboration with DA's, district experts (SME) and multidisciplinary Researchers.

2.3. Research Design

Senate improved variety was used for pre-scaling up. The plot size per farmer was .125 ha. Totally 5 ha of land were covered with this technology (40* 0.125). 20 farmers from Afgug and 20 Farmers from Dursitu Bilisuma were addressed with the technology. Seeding rate of 150 kg/ha, spacing 25cm between rows, and fertilizer rate of NPS/Urea 100kg/ha was applied.

2.4. Information sharing and ways of communication

Training, exchange visits and field day, preparing leaflet, manuals, and posters, proceedings, and publications on international journals.

2.5. Methods of data collection and Data Collected

Both quantitative and qualitative data were collected through personal field observation, individual interview, Focus Group Discussion by using checklist. Types of collected quantitative data were number of farmers participated in FRG, yield performance, and number of stakeholders participated in the training. Qualitative data were farmers' perceptions towards the new technology.

2.6. Data analysis

Quantitative data was summarized using descriptive statistics (percent, minimum, maximum and mean), while the qualitative data analyzed using narrative explanation and argument. Finally data from different sources were triangulated to get reliable information.

3. Result and Discussion

3.1. Training provided for stakeholders

Multidisciplinary Fedis agricultural research center researchers were participated in mini-field day organized. The team members involved on mini-field day was research-extension, socio-economic and crop agronomist. The training was given on improved bread wheat production, market information and experience sharing and technology transfer approaches.

Table 1: Number of participants in mini-field day at Metta

No.	Participants	Metta (Dursitu Bilisuma)		
		Male	Female	Total
1	Farmers	111	42	153
2	DAs	5	-	5
3	District experts	8	2	10
	Total	124	44	168

Source: Own computation 2022

Among the training participant stakeholders, 91.07 % were farmers. This showed that most of the mini-field day participants were farmers. From those farmers, 27.45 % are female farmers'. Yield performance of bread wheat across the Districts

Kebeles	Varieties	Mean (qt/ha)	Maximum	Minimum
Afgug	Senate	33.84	39.40	28
Dursitu Bilisuma	Senate	32.70	36.20	27
Total		33.27	39.40	27

The grain yield of the improved bread wheat variety (Senate) was 33.64 qt/ha and 32.70 qt/ha at Jarso and Metta districts respectively.

4. Exit strategy

The mandate of Fedis Agricultural Research Center is starting from technology generation or adaptation to demonstration and up to pre-scaling up stage in which the target participants limited in scope. It is important to see an alternate option in which a mass of farmers can involve in the technology promotion through strategic mechanism like incorporating this technology in bread wheat government initiative. With aim of keeping the extension system linkage among those organizations and to enhance the continuity of technology for wider coverage until the better new technology option developed. The agreement was reached by Fadis agricultural research center and the respective district of Offices of Agriculture and Natural Resource on how to keep the continuity of the technology and wider scaling up to study area and similar agro-ecologies.

5. Conclusion and Recommendation

The pre-scaling up of senate bread wheat technologies was conducted in Jarso and Metta districts on five hectare of land resulted with total average productivity of 33.27 qt/ha across location. The improved technology was fully accepted by farmers. Wider demand for the improved technology was created for stakeholders during the field day to promote and disseminate in the potential areas. Detailed training should be given to farmers and local experts on seed management and improved bread wheat technology to create sustainable seed sources and technology multiplication for future users. Agricultural office and seed multiplying enterprise should cooperate for the sustainability of the technology for further scaling out.

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