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PRE-SCALING UP OF GROUND NUT VARIETIES IN SELECTED DISTRICTS OF WEST AND KELLEW WOLLEGA ZONES, ETHIOPIA

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ABSTRACT

The study was conducted in Dale sadi, Dale wabera and Sayo districts of Kellem wollega Zone and Gimbi districts of west Wollega zone for two consecutive years of production(2016/17 and 2017/18 G.C) on farmers' field. The objective of the study was to pre-scale up and popularize the best performing and preferred groundnut variety in the study area. The study addressed a total of 90 farmers in the two years of the project span. From a total of 90 farmers male represents 73 and female 17. During farmers' selection process both female and male farmers had been incorporated so as to avoid gender bias. Training was given for the selected farmers, development agents and district experts about improved groundnut technologies production and management. Full packages of the technologies were provided. Variety Manipinter was planted on plot area of 0.25ha on respective farmers' field in the study area. The recommended rate of NPS 100kg/ha and Row planting method with the spacing of 60cm between rows and 10cm between plants were used respectively. To enhance farmer's knowledge on Groundnut training was given for target community on agronomic practice of Groundnut. During training a total of 117 target communities were participated on training out of which 84 were male and 33 were female. An average production of 14.935 qt/ha and a total of 336 quintal of groundnut yield was harvested during project life span. Finally, farmers feedback concerning technology was collected and incorporated, accordingly the farmers feel as the Manipinter have relatively high yield, good seed quality (Grain size, color), disease tolerant than previously used varieties. Generally, since it is impossible to address all farmers only by the effort of the research center, district agriculture and natural resource bureau in collaboration with zonal agricultural and natural resource office and input supplying NGO's should hold the turn to scale up the technology in wider scale.

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BACKGROUND AND JUSTIFICATION

Groundnut (*Archis hypogea*) is one of the most important oil crops grown by small holder farmers. It is an excellent source of oil which thrives under hot, semi-arid conditions and as a legume; groundnuts improve soil fertility by fixing nitrogen. Groundnut is usually grown at altitudes ranging from sea level to 1600 m above sea level. It requires fewer inputs than many other crops, giving a high return per unit of land, and hence is appropriate for small-scale farmers (Okello *et al*, 2010). Groundnut is an important food and feed crop, which also serve as a significant source of cash in developing countries that contribute significantly to food security and alleviate poverty (Pande *et al.*, 2003; Upadhyaya *et al.*, 2006). Groundnuts have several uses. In many countries, groundnut cake and haulms (straw stems) are used as livestock feed. It is a high value crop that can be marketed with little processing; however, it is extremely versatile and can be used in a wide range of products. Processed groundnut is used in diversified ways including groundnut butter which is used as spread for bread or biscuits, in cookies, sandwiches, candies and frostings or icings. Moreover, it is also used as a substitute for milk in the preparation of "maciyato" during fasting days in Ethiopia. Groundnut is also used to prepare children's food ("fafa") and used daily as roasted "ocholonie" or "Kolo". It is a good source of calcium, iron and vitamins (Aldominantly cultivated cereal crop than other cereal crops by the farmers of these zones. It is a major source of food and an important cash crop for farmers of these zones. However, farmers found in these areas only grow the local varieties. Hence, this may be due to inaccessibility of the farmers to newly released improved groundnut varieties. For this reason, Haro Sabu Agricultural Research Center has evaluated and recommended top performed varieties for demonstration After that demonstration was done on farmers field and FTC 's to further verify the technology and recommended Manipinter variety of Groundnut to be popularized and disseminated on large scale.

Objectives

- To disseminate already proved and verified productive groundnut varieties
- To provide farmers with alternative improved high yielding groundnut varieties
- To increase farmers' income in the project areas

METHODOLOGY

Description of the study areas

The trial was carried out during 2016/17 and 2017/18 cropping seasons in Dale Wabera, Dale Sadi, Sayo and Gimbi districts in collaboration with District Agricultural and natural resource office's. D /sadi, D/wabera and Sayo district are among districts found in Kellam wollega zone, whereas Gimbi district is one of districts found in west wollega zone. The map of the study area is stated as a figure 1 below.

Dale sadi district

Dale sadi is situated at about 550 km West of Addis Ababa. It is bordered by: Illubabor to the South, Dale wabera to the West, Aira to the North and Lalo kile to the East. The area lies between 08°N 25 56 to 08°N 58 05 and 034°E 33 41 to 035°E 28 48 and has average altitude of 1150 meters above sea level. The area has temperature range of 33-35°C with more agricultural crops and people in rural of the country. The climatic condition alternates seasons from March to April. The winter dry seasons (November to February) with mean annual rain fall of 1200mm.

Dale wabera district

Dale Wabera district is situated at about 570km west of Addis Ababa, Western Ethiopia, and The altitude of the area ranges from 1100 to 1800 m.a.s.l. The mean minimum and maximum temperature of district are 11.0–15.5°C and 26.1–34°C, respectively. The Agro ecology of woreda varies between long summer rain fall (June to September) and winter dry season (December to March) with annual rainfall ranging from 1300 to 1600 mm. The livelihood of the society largely depends on mixed livestock and crop production. The total land cover of the district is about 1132.02 km

Sayo

Sayo district is located in the south western part of Kellam Wollega Zone & the zonal capital was found in it (Sayo district). Astronomically the district is located between $8^{\circ}12'-8^{\circ}44'$ north latitude and $34^{\circ}41'-35^{\circ}00'$ east longitude. The district has a total area of 127,800 km². The district generally lies within an altitudinal range of 1300-2000 m.a.s.l. The major rainy seasons in the district include spring (April-May), summer (June-August) and autumn (September-November).

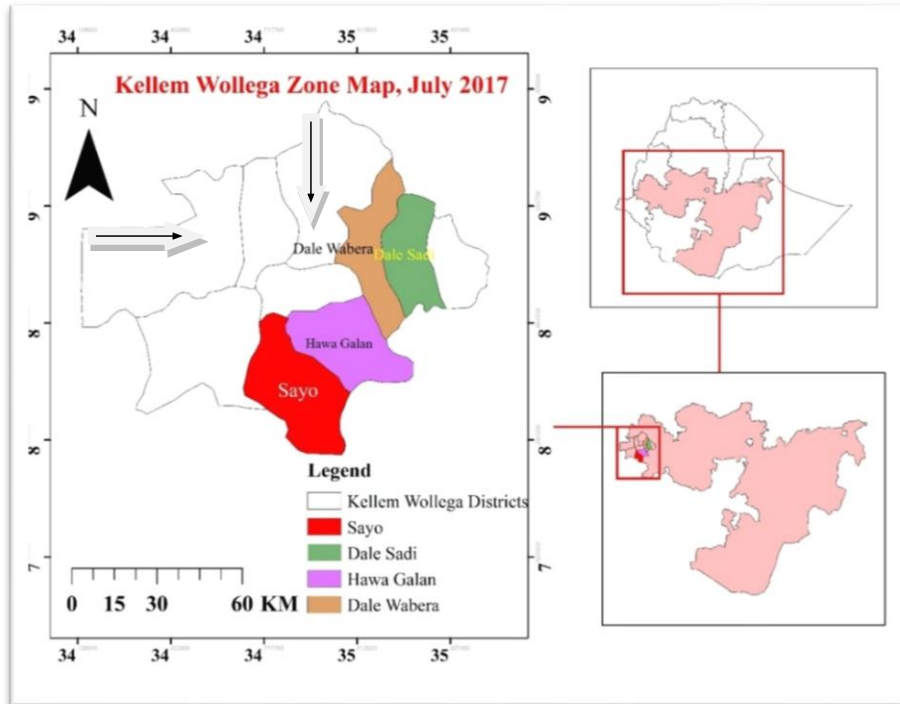


Figure 1. Map of Kellam Wollega zone

Gimbi

Located in the West Wollega Zone of the Oromia Region, it has a latitude and longitude of $9^{\circ}10'N$ $35^{\circ}50'E$ with an elevation between 1845 and 1930 meters above sea level. It is the administrative center of Gimbi woreda. The 2007 national census reported a total population for Gimbi of 30,981, of whom 15,716 were men and 15,265 were women.

Site and farmer selection

Site selection was done with district agricultural offices and DA's purposively based on ground nut production potential and before starting field work, strengthening of FREG (Farmers Research Extension Group) were made purposively based on their representativeness of the majority of smallholder farmers, their interest and motivation in carrying out the recommended management practices (timely weeding, roughing, harvesting on time) land ownership and their commitment to deliver the technology to other farmers by considering the gender balance and other important socio economic variables. The proposed technology was scaled out on 43 representative farmers' field in the first year in three districts one district (i.e. Gimbi) from west wollega and other Two district (i.e. Dale Wabera and Dale Sadi) from Kellam wollega. In 2018 year of production it was distributed for 47 households in Sayo, Dale Sadi and Gimbi districts. Necessary management and monitoring was also performed properly.

Material used

One variety of groundnut namely Manipinter that was preferred and selected by farmers was used with their full recommended practices. In organic fertilizer NPS was used with its recommendation rate of 100kg/ha.

Seed distribution

After farmers selection had made by the researchers and DAs in respective peasant associations, each farmers were given seed which can cover 0.25 ha of land for consecutive two cropping calendar of production (i.e. 2017-2018). The study addressed a total of 90 farmers in the two years of the project span.

Stake holder Analysis (SA)

Stakeholder analysis is very important for identifying the situation and informing stakeholders their responsibility (who does what?) before starting field work SA was undertaken to identify potential stakeholders. Who are the stakeholders? How big is their stake? How much they are closer to the project? What are their roles, duties and responsibilities in implementing these activities? Finally the roles, duties and responsibilities of each actor were clearly stated in implementing the activity

Table 1. Stakeholder roles and responsibilities in implementing the activity (2016/17, 2017/18)

Stakeholders	Roles and responsibilities
HSARC	<ul style="list-style-type: none"> ▪ Coordination and facilitation ▪ Provision of Groundnut technologies ▪ Provision of training ▪ Organizing field days and ▪ Supervising, monitoring and Evaluation ▪ Helping farmers in revolving seed among them selves ▪ Collecting feedback for future technology promotion
ANR Bureau of district through Development Agent and SMS	<ul style="list-style-type: none"> ▪ Assist in site and farmers' selection ▪ Monitoring and evaluating day to day activity of project ▪ Assist in providing training ▪ Facilitate seed distribution
Farmers	<ul style="list-style-type: none"> ▪ Allocate land, Fertilizer and other inputs ▪ Conduct required management practice(Agronomic practice) ▪ participate in the training field days ▪ Share skills and experiences to neighboring farmers ▪ Transfer produced seed to surrounding farmers

Data type, method of data collection and analysis

Amount of input distributed, harvested yield, total number of farmers participated on training, and field days were recorded by gender composition. Farmers' feed-back concerning technologies was identified. The data collection method employed were field observation and focus group discussion with experts, hosting and other farmers. Descriptive statistics was used to calculate the mean yield harvested.

RESULT AND DISCUSSION

Seed Distributed

A total of 22.5qt (Manipinter variety) of Groundnut were distributed for farmers which is to be used as initial seed for farmers to farmers seed dissemination of selected Peasant association based on the size of FREG members, Accordingly the seed distribute during 2016/17 and 2017/18 G.C was summarized as follow

Table 2. Seed distribution

No.	District	PA	FREG Members	Amount of seed given	Total
1	D/Sadi	W/Wale Suchi and Awetu Birbir	29	25kg/farmer	7.25qt
2	S/Chanka	Ganda-5	13	25kg/Farmer	3.25qt
3	Sayo	Karo Baha	18	25kg/farmer	4.5qt
4	Gimbi	Tole & Aba Sena	30	25kg/farmer	7.5qt
	Grand total		90		22.5qt

Yield Performance of Variety

The yield data of Manipinter variety was taken for consecutive two years of production to evaluate the performance of the variety under full management of farmers with close supervision of development agent. The mean yield of the distributed variety over location is 14.935 qt/ha.

Table 3. Yield performance of the variety across location

Districts	Sayo	Dale Sadi	Gimbi	Dale Wabera
Yield Manipinter Variety across location(qt/ha)	15.44	12.77	16.77	14.76
Mean Yield(qt/ha)	14.935			

Source: own scaling up result

The yield obtained across the location for the distributed variety (manipinter) is highest in Gimbi with magnitude of 16.77 qt/ha followed by D/Wabera, Seyo and D/Sadi with magnitude of 14.75, 15.44 and 12.77 qt/ha, respectively.

Training

Training was organized to introduce the available groundnut variety with their nature and management practices to both trial farmers and DA's in the trial sites. It is given for the target community on ground nut crop production techniques & management packages, post-harvest handling and commercialization of the new technology. Manuals were prepared and distributed for farmers and Development Agents. The training given covered a total of 117 target communities out of which 84 were male and 33 were female.

Table 4. Training participants

District	Participant	Male	Female	Total
Sayo	Farmer	30	22	52
	Expert	8	1	8
	DA'S	3	1	4
	Others	8		8
Gimbi	Farmer	24	8	32
	Expert	5	1	6
	DA'S	2		2
	Others	4		4
Total		84	33	117

Field Day

Field day was among the means used to share experience among stakeholders. Accordingly field day was organized during first year of project implementation in D/Sedi district (Awetu Birbir PA) in order to share experience among agricultural stakeholders. During field day a total of 141 stakeholders out of whom 117 were male and 24 female were attended.

Table 5. Field day participants

No	PA	Participant	Male	Female	Total
	H/Birbir	Farmer	34	19	53
		SMS(DA'S +Expert)	80	5	85
		Other participants	3		
	Total		117	24	141

Farmer's Feedback Concerning Delivered Ground Nut Technology

Farmer's feedback about Manipinter variety as well as overall groundnut technology was collected and conceptually generalized. Accordingly Technology characterized by:-

- Relatively High yielder than previously used varieties
- Seed Quality (Grain size ,color)
- Disease resistance
- Seed holding capacity of its root (no more seed is lost during harvest)
- Sweetness of its bi-products(such as the so called kolo)

However the farmers criticized the Variety (Manipinter) by its demerits of

- Up right type variety while local was spreading type Variety.
- It need more Earthling than local variety(need more labor force)

Economic Return to Farmers

Ground nut is produced in west and Kellam wollega zones mostly for hose hold consumption and marketing purpose. In achieving food security and diversifying house hold income it contributed huge for the stakeholders that produce Groundnut. Farmers those participated in scaling up of the variety achieved slight progress in ensuring their food security as well as income gained. During scaling up a total of 22.5quintal of improved Ground nut was distributed for farmer's from which a mean total of 336qt was harvested.

CONCLUSION AND RECOMENDATION

Prescaling up Manipinter variety of Groundnut was conducted in D/Sedi, S/Canka and Seyo districts of Kellam and Gimbi district of west wollega zones. The Project covered a total of 22.5 ha of lands from which a total of 336qt and average productivity of 14.935qt/ha was harvested. During project life span a total of 90 house holds where adressed and Training was given for total of 117 target stake holders to capacitate farmers and other stake holders on groundnut production and managent practices, post harvest handling and comercialization of their production. Also the collected farmers feed back was mostly positive towards the distributed ground nut variety. Therefore, since it is difficult to address all farmers through the effort of center only, we recommend agricultural and natural resource bureaus of zones and district found in West and Kellam Wollega zones, agricultural unions and input supplier which are found in these zones have to supply this technology to farmers. Establishing & managing community based seed production is crucially important. Strengthening the linkages among actors and key potential stakeholders are indispensable to attain the goal.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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