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Demonstration of Improved Sesame Varieties with Improved Production Technologies on Small Scale Farms at Qola Tebmien and Tanqua Abergelle destrict, Tigray, Ethiopia

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Abstract
The demonstration was conducted to select a candidate variety in moisture stress growing area during2015croping season. A total of two improved variety plus one local cultivar were planted at two moisture stress testing environment. It executed in low land samre nebar hanet, S/samre and Dabao, Q/Tembienagbe woreda. S/samre and Q/Tembienagbe woreda is found in the S/east and central zone of Tigray regional state respectively.Ten interested farmers were selected from each location in collaboration with extension workers. Each farmers have a quarter of land(1/4ha)for the testing technology. All demonstration plots(1/4ha) was fertilized uniformly with 50 kg Urea and 100 kg Diammonium Phosphate (DAP). Full dose of P was applied at planting time and half of N was applied at first weeding(7-14) days and the remaining half was side dressed at second weeding(30-35) days. All other cultural practices were applied as per standard recommendations for the crop. During farmers' field assessment, farmers were evaluating the performance of the technology with researcher by comparing with local practice in terms of management practices, days to maturity and yield. Accordingly, the average yield of humera-1 was 5.125 qt/ha in dabano kebelle and 5qt/ha in nebar hadnet than setit-1(4qt/ha)in both locations and local 3.5qt/ha the same result in both locations. Due to that humera-1 is more interested and accepted by farmers, so this should be scaled out in to other similar agro-ecology of the area.
Keywords: demonstration, improved technology of sesame and yield

1.Introduction

Sesame (Sesamum indicum.) is an annual short-day warm season plant and mostly grown as a rain fed crop in the rainy season in the semi-arid regions of the tropics and subtropics. It is used for food. The dried seeds are eaten in soups and, mixed with sugar, are a popular sweet in Africa and Asia. It is used as a salad and cooking oil. The oil is also used in the manufacture of margarine and compound cooking fats.

In general, average productivity of sesame continues to be lower (144 to 234 kg/ha) than expected from agricultural technology for the last 20 years, mainly due to its cultivation on marginal lands, under poor management and without inputs except seed. The major constraint responsible for lower yield are inappropriate production technologies viz; broadcast method of sowing, no use of fertilizer and untimely weed management (45DAS), (Khaleque and Begum, 1991). The yield of sesame can be increased by 21 to 53% with adoption of improved technologies such as improved variety, recommended dose of fertilizer, weed management and plant protection. Keeping this in view, frontline demonstrations on sesame were conducted to demonstrate the production potential and economic benefits of latest improved technologies on farmer's fields. The yield increase is due both to development and use of improved varieties and improved agronomy practices and crop protection. The potential yield of sesame still is much higher than actual yield, as still much damage occurs by pests and diseases, insufficient weed control, to high levels of mono-cropping, lack of mechanization (amongst others causing seed shattering when not enough labour is available during harvest) and unrealised genetic potential. Potential yields are probably as high as 2000 kg/ha (Mkamilo and Bedigian, 2007).

Sesame is an important agribusiness sector in Ethiopia and therefore one of the six priority crops in the Agricultural Growth Programme (AGP) of the Ethiopian Government. It is one of the important export crops in the country. Ethiopia is the fourth producer and second largest exporter of sesame in the world. Sesame accounts for 90% of the value of exported oilseeds, estimated at 379 million USD (FAOSTAT 2012).

The total land coverage/ acreage of sesame crop in Ethiopia is increasing (around 500,000 hectares in 2012-13), the total production is growing (150-200.000 tons in 2012-13).The country's main sesame production areas are located in the semi-arid lowlands of North-West Ethiopia, which accounts more than 70 % of the national sesame production. Setit Humera area in Tigray is one of the major production regions in the country.

Although the sesame sector in Ethiopia has a significant turnover , the sector has much potential for further growth, product and market development and higher net profits for farmers and other sesame stakeholders. Abergelle agricultural research mandate areas are potential for sesame production. However they haven't improved varieties and management system. Due to this reason the main objective of the work is to demonstrate improved sesame technology to the mandate and to asses' farmers' reaction regarding to the improved Varieties and management practices.

2. Materials and Methods

2.1. Area Description

The demonstration was conducted in low land samre, nebar hanet s/samre and Dabano, Q/Tembien woreda. s/samre and Tanqua Abergelle woreda is found in the s/east and central zone of Tigray regional state respectively.

Map of Tigray, Ethioia Showing where they found the distrects

2.2. Methods

Demonstration of improved varieties and management practices with their full recommended fertilizer application will be conducted in Abergelle agricultural research center mandate areas. Ten interested farmers from each wereda was selected in collaboration with extension workers. Farmers will be provided with improved and early maturing Humera-1 and Setit-1 varieties and local. Seeds will be planted in row. Each demonstration plots will have a quarter ha of land. A spacing of 40 cm between rows and 10cm between plants with a seed rate of 3 kg/ha and 3-4cm seeding depth will be maintained. All plots will be fertilized uniformly with 100 kg Diammonium Phosphate (DAP). Full dose of DAP will be applied at the time of planting and 50kg of urea 50% at first weeding and the remain 50% was applied the second weeding. All other cultural practices will be applied as per standard recommendations for the crop.

2.3. Demonstrated sesame technology packges

- Land preparation (2x tilling)
- Variety (setit 1, Humera 1 + local variety)
- Seed rate 3 kg/ha,
- Row planting 40 x 10cm b/n rows & plants, respectively,
- Fertilizer (100kg DAP + 50kg Urea
- Thinning (during first weeding),
- Weeding 3x (7-14 days first, 30-35 second & 65-75 days third),
- Pest scouting (emergence to harvest every week or fortnight),
- Webworm (Malathion 50% @2/Ethiosulfan 35% EC @ 1.5 l/ha)
- Harvesting (when 2/3 of plants assume lemon yellow color)

• Harvesting (when 2/3 of plants assume lemon yellow colour)
• Drying (plant hilla on levelled high spots close to each other (10 hilla), dry not more than 2 weeks),
• Threshing (near each hila, don't carry dry plants away)
• Bagging (in pesticide free, new, clean & airtight sacks)

2.4. Data collection and analysis

Days to maturity and yield and perception data(farmers' reaction to the new varieties compere with local and disease reaction) parameters was collected and analyzed.

3. Results and Discussion

3.1.Maturity data and Grain yield:-

In this demonstration setit-1 and humera-1 early mature than local just it shows at both location. even though, between the improved variety also displayed variation around 12days. From the time when setit-1 is earlier mature than humera-1 and local as shown the data just it takes(101,93) ,(111,107) and (129,126)days to mature in nebar hadnet and dabano kebbelle respectively. However the heights yield was obtained from humera-1 (5, 5.125qt/ha) dabano and nebar hadnet respectively followed by setit-1 (4qt/ha) in both testing site. While the lowest yield was revealed that in local cultivar(3.5qt/ha) yield in both testing site was obtained (figure-1). In general the yield obtained are not satisfactory, this is due to the shortage of rainfall during the cropping season but it shows good vegetative growth in both location, we were anticipated to give more than hare. Farmers observed in the field, they said that regard to the disease and insects 'humera-1 is highly resistant than setit-1 and local cultivar'. Some diseases like rest was found in setit-1 and local cultivar, due to this reason farmers were not much interested even if for setit-1 variety as it shows short plant height and low number of capsule as a measure determinant of yield.

Accordingly, the average yield of improved variety humera-1 with improved practice was higher yield than setite-1 and local cultivar, use of improved technologies and good agricultural practices improved sesame productivity at least by 30.9% was verified.

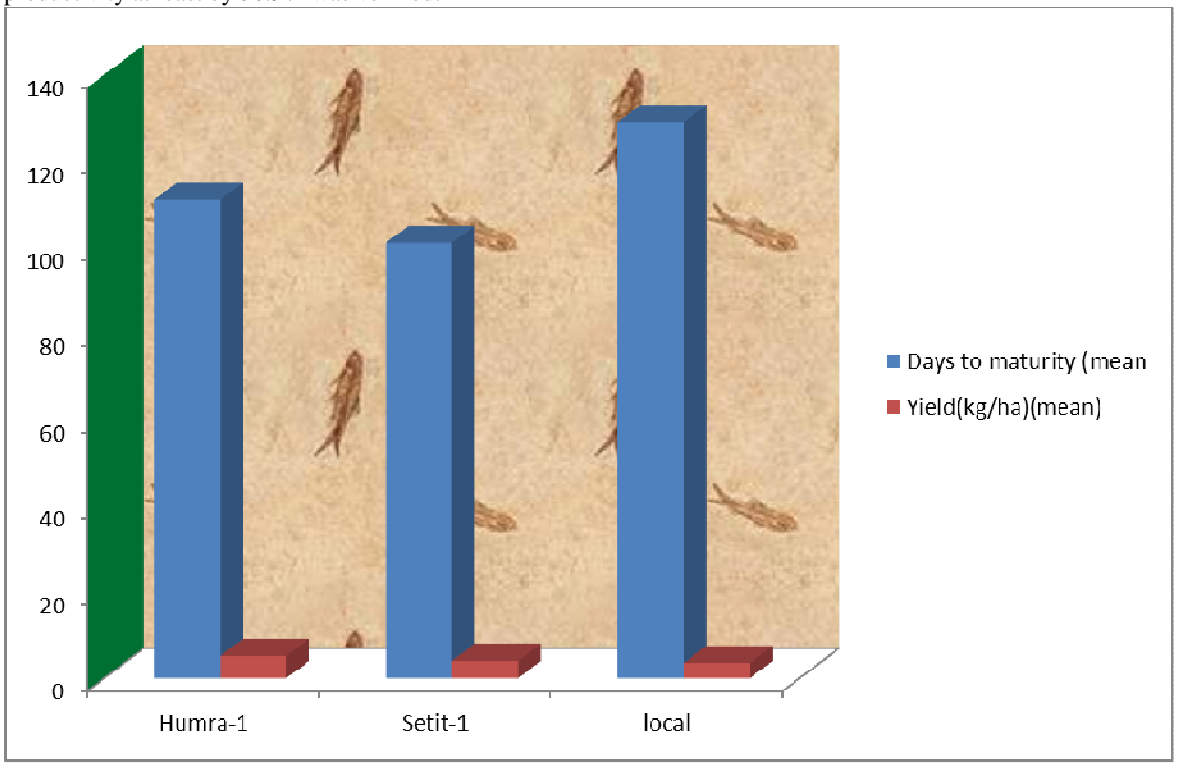

Figure a. Maturity date and yield of improved varieties of sesame Vs local cultivar at Dabano,Qolla Tembien

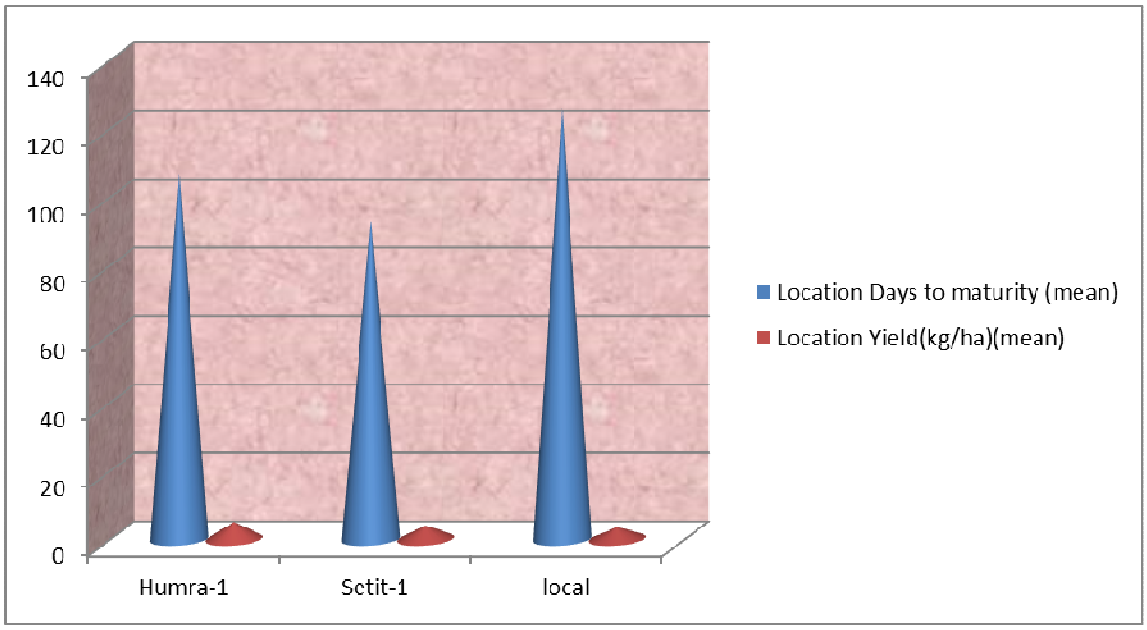

Figure b. Maturity date and yield of improved varieties of sesame Vs local cultivar at nebar hadnet,S/samre

4 . Conclusion and Recommendations

Generally from farmers opinion /during field judgment / and results obtain from the demonstration it was revealed that, humera-1 technology is the best option to high yield and disease resistant in both locations. Therefore, different stake holders, OoARD and extension research system mainly, shall take over the role and responsibility in extending and reaching to the beneficiaries. And participatory research approach should also be continued for technology generation and dissemination so as to enhance the livelihood of farmers.

5 . References

Central Agricultural Census Commission (CACC), 2006. Agricultural sample enumeration report on area, production and yield of crops (private peasant holdings meher season) for 2012/13. Part I. Addis Ababa, Ethiopia.

Khaleque MA, Begum D (1991). Area and production of Oilseed crops, 1988-90. In fifteen years of oilseed research and development in Bangladesh. AST/CIDA 28:190.

Mkamilo GS, Bedigian D (2007). In PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. < http://database.prota.org/search.htm>. Accessed 30 November, 2008. (Van der Vossen, H. A. M. & Mkamilo, G. S., eds.).

MOA(Ministry of Agriculture and rural development). 2010. Animal and Plant Health Regulatory Directorate. Crop Variety Register. Issue No.13. Addis Ababa, Ethiopia

Appendix:

Table. 1 yield and maturity date of improved sesame variety Vs local

Location: dabano, Q/Tembien

Location		
Variety	**Days to maturity (mean**	**Yield(kg/ha)(mean)**
Humra-1	111	5.125
Setit-1	101	4
local	129	3.5

Location: nebar hadnet, S/samre

Location		
Variety	**Days to maturity (mean)**	**Yield(kg/ha)(mean)**
Humra-1	107	5
Setit-1	93	4
local	126	3.5