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Demonstration of pearl millet technology at Raya kobo and Gubalafto districts, North wollo zone

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ABSTRACT

Pearl millet [Pennisetum glaucum (L.) R.Br.] locally known as "Bajra" is a nutritious course grain cereal. Globally, it is grown on an area of 34.6 million ha with annual production of 28.8 million tons. Demonstration of improved variety kola 1 was conducted in 2016/17 cropping season at Gubalafto and Raya kobo districts to create demand on the pearl millet technology to farmers and development agents and thereby to assess their reactions towards the introduced technology. It was conducted on two FTC's from kobo and Gubalafto districts. Though all agronomic practices were employed equally at both locations the performance of the variety varies significantly. The variety Kola 1 gave mean grain yield of 3.2 ton/ha and 1.8 ton/ha at Kobo and Hara respectively. The study indicated that cultivating pearl millet in moisture deficit areas can be an alternative for sustaining food security. Farmers have shown great interest and promised to adopt the technology from their neighbor farmers. Therefore technology promotions and popularization on the study and similar agro ecological areas should be carried out in collaboration with stake holders.

Keywords:
Raya kobo, Gubalafto, Kola 1, Pearl millet, Demonstration

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Introduction

Pearl millet [*Pennisetum glaucum* (L.)R.Br.], locally known as “Bajra” is a nutritious course grain cereal. Globally, it is grown on an area of 34.6 million ha with annual production of 28.8 million tons. Pearl millet is grown as food and fodder in arid and semi-arid tropical environments. It is an indispensable source of fodder in many countries of the world. Pearl millet grains are not only nutritionally comparable but are also superior to major cereals with respect to protein, energy, vitamins and minerals. Besides, they are rich source of dietary fiber, phytochemicals, micronutrients, and neutraceuticals and hence they are termed us “nutricereals” (A.Saleem etal, 2014).It has a high nutritional value as feed for poultry and livestock. Its cultivation in crop rotation has been shown to reduce nematode problems in wheat, soybean and potato, which increases its relevance in biological approaches to pest management.

Pearl millet grown for grain has similar growth habit with sorghum. It performs well on a sandy and less fertile and low moisture soil. It has similar adaptation areas with sorghum except for its better drought tolerant, earliness, and tolerant with low soil PH than sorghum.

Currently about 45% of total millet production is used for food while about 50% is used in rural poultry and cattle feeding but not in commercial poultry ration. Industrial processing and non conventional utilization of millet may increase in the near future.

Adaptation of grain type pearl millet has been done for the arid and semi-arid areas of Amhara region. In Ethiopia agriculture is highly dependent on natural rain which is also highly reluctant to change. For agriculture to continue feeding the nation research plays a pivotal role by putting options for the current climate variability.

Eastern Amhara is usually known by its late onset and early offset rainfall pattern. Especially where irrigation is not accessible and well-structured crop production is becoming unthinkable. Introducing early maturing and drought tolerant crop varieties can rescue farmers living in such areas from hunger

Objectives

- To demonstrate pearl millet technologies to farmers & extension workers
- To assess farmers’ and extension workers reactions towards the technology

Material and Methods

An experiment on the per extension demonstration of pearl millet with improved management has been conducted in 2016/17 at lowlands of North Wollo to promote pearl millet as an alternative crop for sorghum . *Kobo* and Gubalafto districts were purposively selected to conduct the demonstration.

It was conducted on two FTC’s from *kobo* and Gubalafto districts. Both sites were selected in close collaboration with the extension agents of the respective districts. Improved management practices include application of NPS and Urea at the rate of 121 and 39 kg ha^{-1} respectively. NPS fertilizer was applied once at planting where as urea was applied twice on split application. Recommendation of sorghum was used for seed rate and spacing.

Two Field days were organized for farmers, development agents and other stakeholders to evaluate the demonstration site and create demand for the technology. On these events participants had actively involved and evaluated the technology accordingly. In addition kebele extension agents have involved actively in the executing the demonstration. Agronomic data such as plant height, biomass, spike length and grain yield were recorded and analyzed using Microsoft Excel 2007.

Result and discussion

Though all agronomic practices were employed equally at both locations the performance of the variety varies significantly. In all parameters the variety performed better at kobo district. This may be due to different factors such as soil fertility, temperature and others.

As shown in the table 1 above, the variety gave mean grain yield of 3.2 ton/h and 1.8 ton/ha at Kobo and Hara respectively.

As shown in table 2, When we compare with

Table1: Means of agronomic traits on demonstration plots

location	PH(cm)	SPL(cm)	BM(ton/ha)	GY(ton/ha)
Hara	157.2	16.6	10.5	1.87
Kobo	222.2	20.4	14.1	3.2

Table 2: Cost benefit analysis for the variety at both locations vs. sorghum (local)

Description	Hara (Kola 1)	Kobo(Kola 1)	Sorghum (local)
Total revenue			
Mean grain yield (ton/ha)	1.8	3.2	4.2
Adjusted yield (ton/ha)	1.62	2.88	3.78
Gross yield benefit (ETB/ha)	18630	31680	41580
Total costs (ETB/ha)			
Cost of labor ((ETB/ha)	*8000*	*8000*	*10000*
Cost of seed(ETB/ha)	*156*	*156*	*156*
Cost of fertilizer (ETB/ha)	*2560*	*2560*	*2560*
Net Benefits (ETB/ha)	7914	20964	28864

local sorghum, a farmer producing pearl millet will lose ETB 7900 and 20950 at kobo and Hara demonstration sites respectively. This is true in enough moisture conditions for producing sorghum. But at harsh climate conditions where sorghum couldn't be produced, pearl millet can compensate the deficit.

Though pearl millet can be grown in a very malnutrition soil condition, the productivity can be improved by cultivating it in fertile soil and management like other crops.

Farmers' and field days feed back towards the technology

At both districts demonstrations were conducted at FTC's where there will be most likely to be regularly visited by individual farmers. At both locations demonstrations fields were visited used as learning sites for farmers in the study areas. Field days were prepared by kebele agricultural officers and Sirinka agricultural offices. Two field days were organized at vegetative stage of the crop. SARC Researchers, journalists from different media agencies, agricultural experts, officials and farmers were invited in the field day. Therefore demand was created at the same time responsibility

In addition food test was held at Hara kebele in which 20 farmers and kebele administrators and agricultural officers were participated .participants have evaluated the Nifro quality of the crop and they were very happy with the taste. At the end of the food taste program, farmers have shown their commitment to grow pearl millet for the coming production season. They have got permission from the farmer where the demonstration was conducted.

Respective district agricultural heads have accepted the technology as an option for sorghum incase of moisture deficient seasons and promised to promote the technology by themselves

The issue of intercropping and other moisture conservation package was raised and discussed by field day participants. For compromising the yield obtained from sorghum, intercropping pearl millet with other lowland pulse crops was seen as the best option.

Farmers have also perceived that pearl millet can be easily palatable source of animal feed. But they had suspect the existence of yield gap b/n sorghum and pearl millet.

Conclusion

- The study indicated that cultivating pearl millet in moisture deficit areas can be an alternative for sustaining food security.
- Promising grain and biomass yield has been obtained from the demonstration fields at both locations
- Wider demand has been created on the technology
- During field days, Stakeholders(agricultural officers and officials have taken the responsibility to discharge in technology promotion for their districts
- Farmers have shown great interest and promised to adopt the technology from their neighbor farmers.

Recommendation

- Alternative crop technologies should be developed and introduced for areas where moisture deficit usually occurs
- intercropping technologies should be evaluated to compromise the yield gap with sorghum
- Agronomic recommendations of pearl millet such as row and plant spacing, fertilizer rate and seed rate should be developed to for promoting the crop with full packages
- Number of participant farmers in field days should be maximized as can as possible to create demand
- kebele agricultural office in coordination with administrative should be responsible to arrange field days at kebele level in order to participate massive number of farmers with the kebele and other neighbor Kebeles
- seed maintenance should be done for the improved variety
- variety development and adaptation activities on pearl millet should be continued

to release and/or recommend productive and drought resistance varieties

- technology promotions and popularization on the study and similar agro ecological areas should be carried out in collaboration with stake holders

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