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Evaluation of improved Tef (*Eragrostis tef* L.) varieties in konso area, Southern Ethiopia

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ABSTRACT

Eighteen tef varieties including local check were evaluated with the objective of selecting adaptable and best performing tef varieties for moisture stress areas. The trial was conducted during 20015 and 20016 cropping seasons at konso woreda of segen area people zone of south region. The design was randomized complete block design with three replications.The mean yields of all improved varieties were relatively higher than the local check. The combined analyis of variance over years revealed that varieties were Significantly difference for plant height, spike length, above ground bio mass and grain yield. The mean values of grain yield ranged from local check (12.88qt/ha) to Dukem (20.942 qt/ha). Gamachis(20.304) and Kuncho (19.238).Varieties Dukem,Gamachis and Kuncho had a grain yield advantage of 38.49%, 36.56%and 33.04% over the local check respectively. Farmers' selection criteria were grain yield, bio mass and seed color. Based on their selection criteria, farmers selected Dukem for grain yield and bio mass, Gamachis and Kuncho for their seed color and grain yield. while Based on quantitatively measured traits and farmers' visual observation, varieties Dukem Gamachis and Kuncho are recommended for production with their full packages in konso and similar Moisture stress agro ecologies

Keywords: *grain yield, farmers' evaluation, moisture stress area, tef varieties.*

INTRODUCTION

Tef [*Eragrostis tef (*Zucc.) Trotter] is the most important indigenous cereal of Ethiopia. Its production area is increasing at unprecedented scale due to increased market demand (both local and foreign) and many other desirable characteristics, including higher nutritional value, low incidence of damage by insects, better adaptation to drought, adaptive to poor drainage and high straw value (Seyfu, 1997).The germ plasm base of tef limits spectacular jump in its yielding ability. However, because of the facts that tef is culturally deep entrenched in the food-habit of the Ethiopian population, it is mainly a cash crop, it covers more than 2.5 million of land, and Ethiopia has long been in food deficit, the "little" tef-yield Increment contributes in the strive towards food security (Hailu and Getachew, 2006). It is adaptable to a wide range of ecological conditions and can be grown in conditions where the environment is unfavorable for most cereal in Ethiopia. It can be grown in altitudes ranging from near sea level to 3000ms, but the best performance occurs between 1100 and 2950 m a.s.l (Hailu and Seyfu, 2000). Even though some varieties of tef have been released in Ethiopia, most of them were not evaluated. Around drought prone areas of southern Ethiopia and farmers were not participated in varietal development and evaluation process. Farmers' participation in varietal selection has significant value in technology evaluation and dissemination. According to Getachew et al.(2008) and Chianu et al. (2006), the two way feedback between farmers and researchers is indeed vital component of highly client-oriented breeding programs in locally important and traditionally cultivated crop. Therefore, the objective of this study was to evaluate the performance of improved tef varieties under drought prone areas of southern Ethiopia with the full participation of farmers.

MATERIALS AND METHODS

The experiment was conducted during 20015 and 20016 cropping seasons at Addis gebere kebele of konso woreda. The experimental site has an altitude of 1680 m.a.s.l. and annual rainfall of 597 mm and 823 mm during 20015 and 20016 cropping seasons, respectively.The dominant soil type is light vertisol; the temperature was ranged from 13.07-26.75^{o}C. Eighteen improved varieties of tef namely, Quncho, Magna, Tseday, enatit, Kaytana, Koye, Yilmane, Dukem, Chafe, Gerado, Gimbichu, Gamechis, Lakech, Simada, Amarech, Ajora, Dima and one local check were tested for their adaptability with full packages of agronomic practice in the study areas.

The trial was laid out in randomized complete block design with three replications. The spacing between plots and blocks were 0.5 m and 1 m respectively. Each experimental plot had 2 x 2 m with a gross area of 4 m^2. Planting was done by row drilling at seed rate of 5 kg ha^{-1}. Fertilizer was applied at the rate of 50/100 kg/ha N and P_2O_5 respectively. Half of the total nitrogen and total phosphorus were applied at the time of planting while the remaining nitrogen was applied at the time of tillering. Twice hand weeding and plowing and other management practices were done as required. Above ground biomass and grain yield (kg/ha) on plot basis while plant height (cm) and spike length(cm) on plant basis were collected and subject to statistical analysis using SAS statistical software (SAS,2002).

RESULTS AND DISCUSSION

The combined analysis of variance over years among varieties (Table1) revealed that there were significant difference for plant height, spike length, above ground bio mass and grain yield. Also, Varieties by year interaction indicated that there was significant difference for all tested parameters like; plant height, panicle length, biomass and grain yield. Varieties Dukem, Gamachis and Kuncho gave the highest grain yield (2.0942 t/ha), (2.0304t/ha) and (1.9238t/ha) respectively (Table 1). Dukem gave the highest grain yield in both years and performed consistently over years. The high yielding and consistence performance of Dukem was reported by (Yifru and Hailu, 2005). They also further argued that the high grain yielding potential of Dukem may be due its tallest plant height and panicle length compared to other improved varieties. Local variety had the shortest plant height, panicle length and lowest grain yield among all improved varieties and relatively weak performance over years. Dukem,Gamachis and Kuncho gave yield advantage of 38.49%, 36.56% and 33.04 % over the local check respectively. Therefore, based on quantitatively measured agronomic traits and farmers' visual observation at field, Dukem and Gamachis and Kuncho are recommended for production in konso woreda of southern Ethiopia and similar agro ecologies

Table1. *Interaction means of tef yield and yield component at Addis gebere 2015&2016*.

Variety	Parameters			
	PH/Cm	PL/Cm	BM/Tone	GY/Tone
Enatit	88.267efdc	35.200ecd	5104.2ebdc	1.3296ef
Yilmana	84.600ef	34.550ed	5125.0ebdc	1.3875edf
Lakech	94.700bac	35.967cd	5625.0ebdac	1.7408ebdac
Keytana	87.833efdc	35.350ecd	5708.3bdac	1.6496ebdfc
Dima	86.000efd	32.300ef	5625.0ebdac	1.6208ebdfc
Gimbichu	92.867bdc	37.933bc	4958.3ebdc	1.4558edf
Dukem	101.267a	41.917a	6458.3a	2.0942a
Tseday	74.967g	30.483f	4583.3e	1.6488ebdfc
Simada	76.217g	30.367f	4750.0ed	1.6475ebdfc
Amarach	81.633fg	30.667f	4916.7edc	1.7921bdac
Chafe	97.250ba	39.667ba	5916.7bac	1.6300ebdfc
Manga	92.600bdc	36.683bcd	5583.3ebdac	1.5121edfc
Kuncho	97.317ba	39.383ba	6333.3a	1.9238bac
Gamachis	88.383efdc	35.250ecd	6000.0ba	2.0304ba
Ajora	90.050edc	35.617cd	5125.0ebdc	1.4638edf
Koye	86.433efd	35.550cd	5208.3ebdc	1.5446edfc
Grado	88.183efdc	35.850cd	5166.7ebdc	1.4700edf
local	76.150g	24.133g	5166.7ebdc	1.2888f
LSD	7.1158	3.2022	1069.5	4.2958

year				
2015	90.633a	36.7778a	5280.1	1.66269
2016	85.446b	32.8741b	5537.0	1.58509
LSD	2.3719	1.0674	NS	NS
CV	7.019199	7.985236	17.17301	22.97328
Year*variety	ns	ns	ns	ns

Means followed by the same letters in the same column are not significantly different at p ≤0.05 probability.

CONCLUSIONS AND RECOMMENDATION

Using improved varieties of tef could make an important contribution to increase agricultural production and productivity in areas like konso where there is low practice of using improved technologies such as improved crop varieties. To this end, use of improved tef technologies such as improved varieties could be one of the alternatives to improve productivity by small farmers. However, the use of improved tef varieties is not yet studied in the area. Thus, this research work is initiated to investigate the impact of including improved tef varieties on the existing production system is of paramount important.

The combined analysis of variance over year revealed that varieties are significant for panicle length, plant height, bio mass and grain yield. The mean values of varieties for grain yield ranged from local check (1.288t/ha) to Dukem (2.0942t/ha), Kuncho (1.923t/ha) Gamachis (2.0304t/ha). Varieties Dukem, Gamachis and Kuncho had a grain yield advantage of 38.49%, 36.56% and 33.04% over the local check respectively. Dukem was found to be the longest plant height (101.267cm), panicle length (41.917cm) variety with higher grain yield. The farmers' main selection criteria were grain yield, bio mass and seed color. Dukem, Gamachis and Kuncho for grain yield, biomass and seed color, Therefore, based on quantitatively measured traits and farmers' preference, varieties Dukem, Gamachis and Kuncho are recommended for production in konso woreda and similar agro-ecologies.eventhough further testing is required to put strong recommendation.

REFERENCE

[1] Chianu J, Vanlauwe B, Mukalama J, Adesina A, Sanginga, N (2006). Farmer evaluation of improved soybean varieties being screened in five locations in Kenya: Implications for research and development.*African J. Agric Res.* 1: 143-150.

[2] Getachew B, Hailu T, Anteneh G, Kebebew A, Gizaw M (2008). Highly client-oriented breeding with farmer participation in the Ethiopian cereal tef [*Eragrostis tef* (Zucc.) Trotter]. *African J. Agric Res* Vol. 3(1), pp. 022-028.

[3] Hailu T, Seyfu K (2000). Production and importance of tef in Ethiopia Agriculture. In: Hailu Tefera, Getachew Belay and Mark Sorrels (Ends) Narrowing the Rift: Tef research and development- Proceedings of the international Tef Genetics and improvement, 16- 19 October2000, Addis Ababa Ethiopia.

[4] Hailu T, Getachew B (2006). *Eragrostis tef* (Zuccagni) Trotter. In Plant Resources of Tropical Africa 1. Cereals and pulses.. (Eds M. Brink and G. Belay). Prota Foundation, Wageningen/ Backhuys Publishers, Leiden/ CTA, Wageningen, Netherlands. pp. 68-72.

[5] SAS Institute (2002). SAS System for Windows Release 9.2. Inc, Cary, NC, USA.

[6] Seyfu K (1997). Tef, Eragrostis tef (Zucc), Trotter: Promoting the Conservation and Use of under Utilized and Neglected Crops. p.12. Institute of Plant Genetics and Crop Plant Research; Gater Sleben/Int. Plant Genetic Research Institute (IPRRI), Rome, Italy.

[7] Yifru T, Hailu T (2005). Genetic improvement in grain yield potential and associated agronomic traits of tef (*Eragrostis tef*). *Euphytica* 141: 247–254.

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