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# Evaluation of Improved Bread Wheat (Triticum Aestivum L.) Varieties for Potential Bread Wheat Producing Areas of South Omo Zone of South Nation Nationality Peoples Region of Ethiopia

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**Abstract**: Twenty three improved bread wheat varieties and one local check were evaluated with the objective of selecting adaptable and best performing bread wheat varieties for bread wheat production areas of south omo zone. The trial was conducted at Senmamer kebele of Debub Ari woreda during 2012 cropping seasons using randomized complete block design under rain faid condition. Grain yield, thousand seed weight, days to heading, days to maturity and plant height ranged from 1222.8 to 2150.5, 50.9 to 34.9, 51 to 71, 114 to 132 and 57.0 to 76.7, respectively .This experiment suggests that the variety Digelo was recommended to increase production and productivity of bread wheat in South Ari district of South omo zone.

**Keywords**: Bread wheat evaluating grain yield.

## Introduction

Bread wheat (Triticum *aestivum L.*) is one of the most staple food crops in the world and is one of the most important cereal crop cultivated in Ethiopia. Ethiopia is the largest wheat producer in Sub-Saharan Africa with the cultivated land of 1.1 million ha [1]. It is also one of the most important crops in South Nation Nationality Peoples Region. Many varieties have been developed by the research centers of the nation. Its therefore imperative to introduce and test their adaptability under bread wheat production areas of South omo zone, mainly in Debub Ari woreda of Senmamer kebele with the participation of farmers. Participatory varital evaluation and selection is being conducted in many crops like Rice [2], common bean [3]. and barley [4, 5]. The rate of adoption of improved wheat varieties increased from less than 1% in 1981 to 72% in 1998 (2). Grain yield potential of bread wheat has significantly increased due to release of improved bread wheat varieties (1).The goal of increasing productivity and production of wheat will be realized if and only if the ultimate users, namely farmers, adopt the technologies that are developed by research. It is therefore imperative to introduce and test improved bread wheat varieties and scaling up of best adapted varieties to the respective area.

Debub Ari district of South omo Zone is one of the potential bread wheat growing areas in Southern Nationalities Peoples regional state of Ethiopia. However, lack of improved varieties usually constraint its production in the area. Therefore, the major objective of the present study was to identify high yielding bread wheat varieties suitable for bread wheat producing areas of South omo zone.

## Materials and methods

A field experiment was conducted at Senmamer kebele of South Ari district of South omo Zone which is located at 5°52'N, 36°38'E, and 1905 m above sea level. Twenty three improved Bread wheat varieties namely Danda, kekaba, Hawi, Tusie,pavone-76, **ET-13A2, ETBW5483, ETBW5496, Digelu, Medawalabo, Sofumar, Tay, Menze, Gasay, K6295-4A**, Kukulu ,Sirbo, Dinknesh, **Senkegna, Alidoro ,Bolo, Tosa, Hidasie and local check** were planted at recommended seeding rate of 150 kg/ha on August12, 2012. A randomized complete block design with four replications was used. Each plot consisted of six rows, 1.2 m wide and 2.5m long with spacing of 20 cm between rows and the distance between replication was 1m. The 50 kg/ha N in the form of urea and 100 kg/ha P2O5 in the form of DAP were applied at planting. Each plot was kept free from weeds with frequent hand weeding. At physiological maturity, five random plants within each plot were manually uprooted to determine plant height (cm). Grain yield (g/plot) was determined after harvesting the four central rows at ground level using sickles and oven drying the grain to constant weight at 65°C. Days to 50% heading and days to maturity were also recorded. The data were analyzed using GLM procedure of SAs software [6]

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**Results and discussion**

Results of analysis of variance of 5 characters for 23 improved bread wheat varieties and one local cheeks tested are presented in (Table 1). All the characters showed highly significant) variation ($p<0.01$) (Table 1). The significance of varieties differences indicate the presence of genetic variability for each of the characters among the tested varieties.

The highest grain yield was recorded in Digelu(2150.5 g/plot ) while the lowest was recorded in Madawalabu (1222.8g/plot). Vareities Alidoro, Dinknesh and Tusie matured early compare to the others. The heights thousand seed weight was recorded from Digelu it shows that seed weight is an essential parameter for increasing grain yield [8].Plant height ranged from 57.0(Hidasie) to 86.1(ETB-134A2).Similar result also found by [7]. Days to maturity and days to 50% heading varied from 114 to 132 and 51 to 71 (Table 2).

Table 1: Significance of mean square values for 5 agronomic traits for 23 improved bread wheat varieties and 1 bread wheat local landrace.

| Source of variation | Grain yield (g/plot) | Thousand seed weight (g) | Days t50% o heading | Days to maturity | Plant height(c |
|---|---|---|---|---|---|
| Replication(df=3) | 3147.7 ns | 9.6 ns | 3.3ns | 1.9ns | 63.5ns |
| Treatment (df=23) | 245280.9 | 87.6 ***_ | 93.4 * | 109.4 ** | 153.4*** |
| Error(df=9) | 4834.7 | 4.2 | 1.2 | 0.8 | 46.2 |
| CV | 4.5 | 4.7 | 1.8 | 0.7 | 3.5 |
| Lsd | 98.1 | 2.9 | 1.5 | 1.3 | 9.6 |

***,**,***=significant at p<0.05, p<0.01 and p< 0.001;ns= not significant**

**Table 2.** mean values of grain yield, thousand seed weight, days to heading , days to maturity and plant height of the tested varieties

| Variety | GY(g/plot) | TSW(g) | DTH | DTM | PH)cm) |
|---|---|---|---|---|---|
| Danda | 1888.2 | 49.2 | 65.8 | 128.7 | 71.9 |
| Kekeba | 2006.7 | 49.1 | 51.0 | 119.0 | 71.2 |
| Hawi | 1325.4 | 48.7 | 51.0 | 121.0 | 69.9 |
| Tusie | 1407.4 | 38.2 | 57.5 | 116.5 | 69.4 |
| Pavone-76 | 1266.8 | 38.7 | 57.5 | 127.5 | 58.8 |
| ETB-134A2 | 1266.8 | 34.7 | 51.0 | 132.5 | 86.1 |
| K6295-4A | 1457.4 | 37.5 | 55.0 | 123.0 | 73.9 |
| ETB5483 | 1604.8 | 45.4 | 54.0 | 123.0 | 69.9 |
| ETBW5496 | 1781.0 | 46.6 | 65.5 | 130.3 | 74.6 |
| Digelu | 2150.5 | 50.8 | 68.0 | 127.2 | 75.2 |
| Sofumar | 1447.0 | 48.2 | 51.0 | 120.3 | 67.2 |
| Madawalabu | 1222.8 | 46.0 | 51.7 | 120.0 | 72.4 |
| Tay | 1343.6 | 38.8 | 51.7 | 120.5 | 68.9 |
| Senkegna | 1432.6 | 38.7 | 61.0 | 121.0 | 69.2 |
| Gassay | 1426.3 | 39.0 | 96.0 | 120.7 | 69.9 |
| Menze | 1581.1 | 42.7 | 70.0 | 129.0 | 75.9 |
| Bolo | 1559.4 | 43.1 | 70.0 | 126.2 | 75.1 |
| Alidoro | 1660.6 | 47.1 | 61.0 | 114.0 | 76.1 |
| Dinknesh | 1444.9 | 46.6 | 61.0 | 117.0 | 68.8 |
| Tossa | 1660.8 | 41.1 | 62.0 | 120.0 | 67.8 |
| Kukulu | 1347.9 | 43.2 | 62.0 | 130.3 | 62.9 |
| Hidasie | 1789.1 | 42.7 | 52.0 | 123.0 | 57.0 |
| Sirbo | 1232.0 | 37.5 | 67.0 | 118.0 | 60.4 |
| Local | 1641.5 | 46.3 | 65.0 | 131.0 | 69.6 |
| LSD | 98.0 | 2.8 | 4.0 | 28.3 | 9.0 |

GT=grain yield, TSE= Thousand seed weight, DTH= Days to 50% heading, DTM= Days to maturity, PH= plant height and LSD= least significant difference at (p,0.05)

**Conclusion**

Adaptation and dissemination of improved agricultural technologies play a grate role in increasing production and productivity of the crops. In this experiment evaluation of 23 improved bread

wheat varieties and one local landrace was undertaken at Senmamer kebele of Debub Ari district of South omo zone. Based on the result of the experiment the variety Digelu was recommended for increasing production and productivity of bread wheat in the area**.**

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