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Bread Wheat Preliminary Variety Trial Set-I, (BWPVT-I-15)

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ABSTRACT

Wheat productivity particularly in Tigray as compared to the major wheat growing areas of Ethiopia is less. This is due to many of the previously released wheat materials were tested and released in potential areas with high rainfall that does not fit to the real condition of the region and infested by new emerging diseases. Therefore, this activity was implemented to evaluate and select bread wheat genotypes which are with better agronomic performance and resistant to diseases. The trial was conducted at Enderta (Illala on station) districts in 2016 main cropping season. From the overall analysis it is observed that there is a sig. difference among the genotypes tested for all traits except for biomass and seeds per spike. One candidate genotype ETBW 8064 was selected for future regional variety trials.

Key Words: Genotypes, Trait, Regional Varietal Trial

INTRODUCTION

Ethiopia relies on rain-fed agriculture that contributes roughly around 43 percent to overall GDP, 90 percent of export earnings, and supplies 70 percent of the country`s raw materials to the secondary activities (MOFED, 2012). Due to its size, the influence of agriculture on the economy has been extensive. The production system in Ethiopia is smallholder based and mainly under rain-fed conditions. Rain-fed agricultural production is thus the basis of all subsistence farming in most parts of the dry-land zone and accounts for most of the land area cultivated annually. The rain-fed nature of agriculture underlines the importance of the timing and amount of rainfall that occurs in the country. Heavy dependence on rainfall indicates that climate extremes such as drought or flood can cause significant health and economic threats to the entire population (Cheung et al, 2008). The major challenges threatening the dry-land communities relate to the degradation of the natural resource base, which is leading to soil and vegetation loss, fertility decline, water stress, drying of water resources, lakes and rivers. This degradation is being exacerbated by increasing climate variability and change, with profound impacts on the livelihoods of dry-land communities (Kidane, 2010).

Cereal is an important crop which covers up to 9,601,035.26 hectare of land with a production of 196,511,515.46quintals for the year 2016/17 in Ethiopia. From this wheat covers 1,709,582.24 hectare of cultivable land and its production is 44,999,798.01 quintals in Ethiopia and 103,330.37 hectare of cultivable land and its production is 1,976,380.62 Tigray (CSA, 2017) where the area under cultivation is increasing gradually attribute to its importance as human food and feed for animals. Despite the growth in wheat area and total production, Ethiopia continues to be a net wheat importer (Bekele *et al.,* 2000). Wheat productivity particularly in Tigray as compared to the major wheat growing areas of Ethiopia is less. This is due to many of the previously released wheat materials were tested in potential areas with high rainfall that does not fit to the real condition of the region. Trying to grow these varieties causes frequent crop failures and perennial food insecurity in the region. This insecurity needs different aspects of crop improvement.

The Objective of evaluate and select best lines which are resistant to diseases and adaptable to moisture stress areas.

MATERIALS AND METHODS

The experiment was carried out in 2016 main season at Illala site, Mekelle. Thirty new entries along with two standard checks (Mekelle-01 and Ogolcho) also Shehan as a local check were evaluated on-station. The trial was arranged in alpha lattice design with three replications. Each replication consisted of five blocks where six entries were randomly assigned within each block. Six rows of 2.5 meters long experimental plot were used for each variety. The spacing between rows, plots and blocks were 20cm, 50cm, and 1m, respectively. A seed rate of 125 kg/ha was used and planted in rows in drilling. DAP and Urea fertilizers were applied equally to all experimental plots as per the recommendation of the crop (100kg/ha DAP and 100kg/ha Urea). Agronomic managements were applied equally to all plots.

Finally, yield and yield component data were taken from the central four rows and subjected in to analysis of variance using GenStat 16th and SAS version 9.0 statistical softwares. The treatment means showing significant differences at 5% level of significance were compared using Fishers' protected least significance difference (LSD) comparison procedure.

RESULT AND DISCUSSION

There was a significant difference among the genotypes for traits days to heading, days to maturity, plant height, spike length, thousand kernel weight and grain yield whereas, biological yield and seeds per spike resulted in non-significance difference (Table 2). Seven genotypes (ETBW 8078, ETBW 8079, ETBW 8082, ETBW 8083, ETBW 8108, ETBW 8279 and ETBW 8312) whose maturity was below 100 days were recorded. One genotype (ETBW 8064) revealed a yield advantage over the standard checks that is a grain yield of 4489kg/ha was obtained while Mekelle-01 and Ogolcho gives 4396kg/ha and 3580kg/ha respectively. The local check Shehan produces a yield of 2711Kg/ha.

Table 2: Mean Values of Days to heading, days to 90% maturity, plant height (cm), Spike length, seeds per spike, biomass yield, thousand kernel weight, grain yield and harvest index

Genotype	DTH	DTM	PH (cm)	SL (cm)	SP	BY (kg/ha)	TKW (g)	GY (kg/ha)	HI (%)
ETBW 8064	55	100	86.67	6.9	32	11083	29.37	4489	40.48
ETBW 8065	60	107	84.27	6.4	31	11583	28.87	3511	30.14
ETBW 8066	66	109	83.87	8.3	34	10250	24.67	3118	30.34
ETBW 8067	63	109	85.2	7.3	33	10583	24.57	2936	27.75
ETBW 8068	65	109	85.6	7.6	34	12083	23.97	3519	28.05
ETBW 8070	56	100	86	6.3	25	12000	29.3	3999	33.37
ETBW 8071	58	101	88.67	6.3	29	11250	25.23	3410	30.18
ETBW 8073	62	105	86.8	6.5	31	13417	23.07	3890	28.86
ETBW 8078	56	97	80.8	5.6	27	10417	26.7	3228	30.84
ETBW 8079	54	97	78.33	47	32	12000	30.7	4323	36.28
ETBW 8082	54	98	86.27	6.7	34	11500	26	4235	36.33

Table 2: continued…

Genotype	DTH	DTM	PH (cm)	SL (cm)	SP	BY (kg/ha)	TKW (g)	GY (kg/ha)	HI (%)
ETBW 8083	51	97	84.27	5.8	30	10667	33.07	3814	35.7
ETBW 8084	59	102	82.47	5.8	27	11417	27.1	3713	32.16
ETBW 8086	73	118	79.93	6.7	37	12167	27.9	3556	29.41
ETBW 8087	53	100	94.53	5.9	25	11083	35.27	3295	29.83
ETBW 8093	65	107	89.2	7.5	31	9667	21.37	2386	24.68
ETBW 8094	61	102	104.8	7.9	31	11250	25.87	3317	29.7
ETBW 8097	55	104	94.07	6.5	27	12167	33.57	3816	31.51
ETBW 8098	56	103	92.47	5.8	28	11750	33.77	3781	32.26
ETBW 8108	55	97	79.53	5.2	33	10167	24.5	3593	35.23
ETBW 8138	62	106	78.8	6.7	29	10333	23.57	3352	32.49
ETBW 8145	65	104	91.67	6.3	30	11667	24.3	3246	27.47
ETBW 8157	58	106	85.4	6.5	32	10583	30.23	3489	32.86
ETBW 8278	52	104	93.47	6.4	31	11500	26.53	4041	35.26
ETBW 8279	60	99	94.87	6.9	29	12750	25.43	3799	29.84
ETBW 8311	64	107	87.6	7.5	31	11667	25.97	4044	34.36
ETBW 8312	51	95	85.93	6.9	28	11500	35.63	4186	36.37
Mekelle-01	52	97	84.87	7.1	30	11500	31.87	4396	38.16
Ogolcho	64	108	93.47	6.9	31	11833	25.2	3580	30.11
Shehan	59	101	101	8.5	31	11833	24.63	2711	22.94
CV%	1.82	2.62	3.92	7.92	18.75	12.31	8.05	15.67	8.75
P-value	0.0001	0.0001	0.0001	0.0001	0.94	0.466	0.0001	0.017	0.0001

CONCLUSIONS AND RECOMMENDATIONS

According to their earliness these seven genotypes (ETBW 8078, ETBW 8079, ETBW 8082, ETBW 8083, ETBW 8108, ETBW 8279 and ETBW 8312) will be used future crossing programs for earliness. But high yielding genotype as compared to the standard checks (ETBW 8064) will be promoted to Regional Varietal Trial.

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