RESEARCH ARTICLE

SCREENING OF FOXTAIL MILLET UNDER RAINFED CONDITION IN CHAR LAND

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ARTICLE DETAILS

ABSTRACT

The experiment was conducted at the charland area of Jamalpur during rabi 2019 to know the suitable foxtail millet line/verity for water stress and increase production area of char land. Treatments included in the experiment were: ten different lines and one variety (BARI Kaon-1). T1 = RC-170, T2 = BD-869, T3= BD-954, T4= BD-972, T5= BD-998, T6= BD-1062, T7= BD-1075, T8= BD-1083, T9= BD-1086, T10= BD-1108 and T11= BARI Kaon-1. Considering some plant physiological and yield contributing characters such as effective tiller per hill, panicle length, days to harvest, root length, 1000 seed weight and yield all the foxtail millet lines/ varieties may be grown in rainfed condition especially in char land area.

KEYWORDS

1. INTRODUCTION

Foxtail millet (*Setaria italica* L.) is one of the world's most important ancient crops with its domestication in China dating back to 8700 years (Liu et al., 2009). It is widely cultivated in Asia, Europe, North America, Australia and North Africa for grain or forage (Austin, 2006). Foxtail millet has attracted international research attention due to its high salinity stress tolerance, low incidence of pest and diseases, high photosynthetic efficiency and nutritional values (Liu et al., 2011; Vetriventhan et al., 2012). Millets are small-seeded annual cereals grown for food, feed, forage, and fuel (Kothari et al., 2005). Commonly cultivated millet species include proso millet *(Panicum miliaceum L.)*, pearl millet *(Pennisetum glaucum* L.R. Br.), finger millet *(Eleusine coracana)*, kodo millet *(Paspalum setaceum)*, foxtail millet *(Setaria italica* L. Beauv.), little millet *(Panicum sumatrense)*, and barnyard millet *(Echinochloa utilis)* . In Bangladesh, there are about 0.82 million hectares of char land (Ahmed et al., 1987). "Charland" is the Bengali term, its English meaning is "Riverine Island" for mid-channel island that emerges periodically from riverbed as a consequence of accretion (Elahi, 1991). In Bangladesh the *char* lands can be divided into five sub areas which has highly potential for groundnut production (The Jamuna, the Ganges, The Padma, The upper Meghna and the lower Meghna River) where Tista and old Brahmaputra also constitute some *char* land areas and also different foxtail millet varieties /cultivar were produced well (Rahman et al., 2020; Islam et al., 2012). The area under Cheena & Kaon production in Bangladesh is about 1541 acres with a production of 617 m tons (BBS, 2019). Foxtail millet is grown in cooler, droughtier regions than other millets (Koch, 2002). It will grow rapidly in warm weather and can grow in semi-arid conditions; however, it has a shallow root system that does not easily recover from drought (Hancock Seed, 2014). Millet crops are grown on marginal lands and under low-input agricultural conditions situations in which major cereal crops often produce low yields (Amadou et al., 2013). In this case the programme will be done in char land area.

2. METHODS AND MATERIALS

The experiment was conducted at Nawvanger char, sadar, Jamalpur 24°57´ north latitudes and 89°55´ east longitudes. The annual average temperature of this district varies from maximum 36.63°C to minimum 9.4°C. Annual average rainfall is 1549.45mm (Regional Research Report 2019-2020). The experimental site was of medium high land belonging to the agro-ecological zone Old Brahmaputra Floodplain under Agro-Ecological Zone 9 (UNDP and FAO, 1988). The experiment was conducted at the charland area of Jamalpur during rabi 2019 to know the suitable foxtail millet line/verity for water stress and increase production area of char land. Design of the experiment was RCB with 3 replications. Each treatment was sown in unit plot having 2m × 2m with the spacing of 30 cm × continuous sowing. Spacing between two plots and replications were 1m and 1m respectively. T1 = RC-170, T2 = BD-869, T3= BD-954, T4= BD-972, T5= BD-998, T6= BD-1062, T7= BD-1075, T8= BD-1083, T9= BD-1086, T10= BD-1108 and T11= BARI Kaon-1 were used as lines / variety in the experiment. Which were supplied by PGRC, RARS, Jamalpur. Fertilizers were applied at the rate of 42-15-32-7-1 kg ha^{-1} NPKSZn as urea, triple super phosphate (TSP), muriate of potash (MOP), gypsum, Boron; ½ N and all other fertilizers as basal (FRG, 2018). Rest N will be applied at 30-35 DAS. Seeds were sown on November 26, 2019 in rows. Weeding was done at 25-30 days after emergence of the crop. Crops were harvest on 08 April, 2020 to 18 April, 2020. Grain yield was calculated from the whole plot. Yield contributing characters were taken from 05 randomly selected plants from the middle rows of each plot. Data were analyzed with the help of a computer package program STAR and means were separated following LSD test at 5% level of significance.

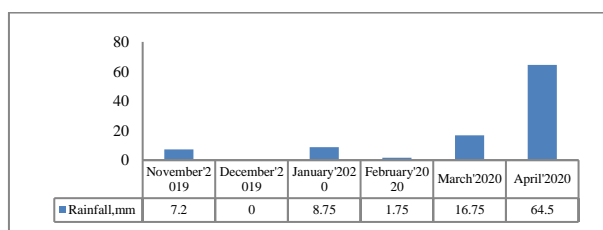|	November'2019	December'2019	January'2020	February'2020	March'2020	April'2020
Rainfall,mm	7.2	0	8.75	1.75	16.75	64.5

Figure 1: Rainfall condition of crop growing period

3. RESULTS AND DISCUSSION

Plant height were recorded at harvest are furnished in table 1. Significantly highest (136 cm) was registered under RC-170 while BD-998 was lowest (105 cm) at harvest. The data regarding effective tiller per hill are furnished in table 1, different treatments did not exhibit their significant influence. An appraisal of data table 1 indicated that un-effective tiller per hill did not showed significant appearance. The data regarding panicle length are furnished in table 1, calculated data in table 1 revealed that different treatments did not exhibit their significant influence. A perusal of data revealed that different treatments showed their significant influence on 50 % flowering. Significantly highest number of 50 % flowering (111) were recorded under BD-1086 and BD-1108 while BD-869 was lowest (95). The data regarding 1000 seed weight were recorded at harvest are arranged in table 1. Significantly highest (3.39 gm) were recorded under BD-954 and it was found statistically at par with BD-972, BD-1062 and BARI Kaon-1while BD-1086 was recorded the lowest (1.50 gm). Root length were recorded at harvest are furnished in table 1. Highest (17.21 cm) was registered under RC-170 which was similarly to BD-1083 while BD-998 was lowest (12.27 cm) at harvest. The root length mentioned tendency of water uptake in char land soil in case of water scarcity. An appraisal of data table 1 indicated that different treatments exerted their significant consequence on yield. Significantly highest yield (3.52 t/ha) was registered under treatment BD-1086 and it was found statistically at par with BD-1062, BD-972 and BD-1108 while RC-170 was recorded the lowest.

Table 1: Yield and yield component of foxtail millet rainfed condition in char land

Treatment	Plant height(cm)	No.of effective tiller/hill	No. of un-effective tiller/hill	Panicle length (cm)
RC-170	136	3	0.77	16.29
BD-869	109	2	0.33	15.36
BD-954	116	3	0.66	17.93
BD-972	107	3	0.33	16.78
BD-998	105	3	0.55	15.91
BD-1062	117	4	0.66	15.56
BD-1075	108	4	0.55	14.69
BD-1083	125	4	0.44	14.69
BD-1086	110	3	0.33	17.59
BD-1108	115	3	0.55	11.03
BARI Kaon-1	112	3	0.33	16.51
LSD$_{0.05}$	22.1	-	-	-
CV (%)	6.55	19.3	68.8	14.54

Continued table

Treatment	50 % flowering	Days to harvest	Soil PH	Root length, cm	1000 seed wt. (gm)	Yield (t/ha)
RC-170	110	144	5.80	17.21	2.12	2.41
BD-869	95	130	5.83	12.85	2.20	3.00
BD-954	110	144	6.03	15.50	3.39	3.08
BD-972	101	135	5.83	13.03	2.53	3.25
BD-998	104	136	5.83	12.27	2.12	3.04
BD-1062	107	140	5.47	14.35	2.51	3.40
BD-1075	108	140	5.93	13.79	2.37	3.17
BD-1083	109	139	5.67	16.06	2.41	3.00
BD-1086	111	143	6.03	13.92	1.50	3.45
BD-1108	111	143	5.73	13.49	2.05	3.21
BARI Kaon-1	110	144	5.50	16.11	2.51	2.80
LSD$_{0.05}$	3.05	1.04	1.15	-	0.36	0.22
CV (%)	0.97	0.25	6.85	14.98	5.29	3.3

4. CONCLUSION

Considering some plant physiological and yield contributing characters such as effective tiller per hill, panicle length, days to harvest, root length, 1000 seed weight and yield all the foxtail millet lines/ varieties may be grown in rainfed condition especially in char land area.

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