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Response of varieties and dates of sowing on growth and yield of Pearlmillet under gird zone

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Abstract

A field experiment was conducted during the monsoon season of 2016-17 at Research Farm, Department of Agronomy, College of Agriculture, RVSKVV, Gwalior (M.P.) to study the effects of crop geometry and sowing dates on growth and yield of pearlmillet. The growth characters viz. plant height (cm), number of leaves, number of tillers/plant, number of leaves/culm and dry matter production and yield and yield attributing characters tillers m⁻², ear head length (cm), ear head girth (cm), test weight (g) and grain and straw yield (kg/ha) were influenced significantly on sowing date of 20th July. The varieties of pearlmillet also produced the significant difference in the growth character and yield attributes of Pearlmillet. The significant increase in all the growth character was recorded in the cultivar crystal Dhoom while the minimum were recorded in the Boss-65. The yield attributes were also follow the same trend as / growth characters and the maximum productive tiller⁻², ear head length (cm), ear head girth (cm), test weight (g) and grain and straw yield (kg/ha) was obtained under the variety crystal Dhoom, which was followed by Big B, Ankur-045, 86M86 and the minimum was recorded in the variety Boss - 65 and sowing date of 9 august of pearlmillet.

Keywords: Pearlmillet, variety, spacing and yield

Introduction

In last few decades, there has been an increasing of the importance of millets in India, major cereals which are grown on soils supplied with large quantity of fertilizers, irrigation and pesticide inputs have attained yield plateau. Millets are one of the cereals asides the major wheat, rice, and maize. Pearlmillet (*Pennisetum glaucum* L.) Popularly known as *Bajra*, cattle millet, bulrush millet belongs to the grass family or *gramineae*. In the world, it's rank sixth followed by rice, wheat, corn, barley and sorghum (Anonymous, 2010). However, in India, it is fourth most important cereal crop after rice, wheat and sorghum. It has the greatest potential among all the millets. India is the largest producer of pearl mille in the world, both in terms of area (7.8 million ha.) and production (9.25 million tons), with an average productivity of 1270 kg/ha. (AICRP on Pearlmillet, Jodhpur). In India major producing state are Rajasthan (46%), Maharashtra (19%), Gujarat (11%), Uttar Pradesh (8%) and Haryana (6%). Sowing time is the most important non-monetary input influencing crop yield. A major problem of rain-fed agriculture in semi-arid regions with short rainy seasons is how to determine the optimum sowing date. Sowing at optimum time improves the productivity by providing suitable environment at all the growth stages. Identifying suitable time of sowing for Pearlmillet is important to have proper growth and development of plants.

Materials and Methods

An experiment was conducted at Rajmata Vijayaraje Scindia Krishi Vishwavidyalya Gwalior, Madhya Pradesh (26.13° N and 76.14° E) in Madhya Pradesh during monsoon season of 2016-17. The area has Region comes under semi-arid subtropical climate with extreme weather condition having hot and dry summer and cold winter. Generally monsoon set during the last week of June. The total rainfall received during the crop growth period was 211.52 mm during 2016 with fairly good distribution. The maximum temperature goes up to 46 °C during summer and minimum as low as 2 °C during winter. The average rainfall ranges between 80 to 90 cm, most of which is received in the month of July, August, and September with an average maximum and minimum temperature during growing period as 41.6 °C and 13.2 °C, respectively the total rainfall received during the rainy season from June to October 2016 was 573.00 mm. Occasional showers are also very common in winter season but this period is often cool and dry. The hot period of summer season generally starts somewhere in middle of April and continued till the middle of June, when the presence of monsoon in the sky becomes clearly visible. The soil was sandy loam in texture and slightly alkaline in reaction (pH 7.4)

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with electric conductivity 0.29 dsm⁻¹ and low in nitrogen (212.0 kg/ha) and medium phosphorus (14.45 kg/ha) and potassium (255.75 kg/ha). A combination of five pearl millet varieties Big B, Crystal Dhoom, Boss 65, Ankur – 045 and 86M86 and three dates of sowing (20th July, 30th July and 09th August) had been used in split plot design (SPD) with three replications with planting distance 45 cm*15 cm, plot spacing 3.6 m*4.5 cm. Pearl millet was sown with 5kg/ha seed rate, 8 row/plot, number of 30 plant/row. The use of recommended dose of fertilizer 80 N kg/ha, 40 P kg/ha and 20 K kg/ha was applied before sowing in the seed row zone. Nitrogen and phosphorus were applied through urea and single superphosphate, respectively. The initial plant stand

was counted 25 days after sowing at harvest. To calculate harvest index (HI) following formulae was used:

Harvest index= Economic yield/biological yield.

Result and Discussion

Effect of growth parameters

The result revealed that all the sowing dates and crop geometry significantly improved the growth parameters. Significantly recorded higher plant height at harvest, number of leaves/plant and number of tiller/plant application of sowing date of 30th July with crystal dhoom variety (Table 1).

Table 1: Effect of sowing dates and crop varieties on growth of pearl millet

Treatments	Plant height at harvest (cm)	Number of leaves/plant	Number of tiller/plant
Sowing dates			
20 th July	191.48	15.11	1.83
30 th July	192.66	15.39	1.76
9 th August	185.73	14.21	1.46
SEm±	0.94	0.19	0.03
CD (at 5%)	3.69	0.57	0.12
Varieties			
Big B	190.57	15.14	1.72
Crystal Dhoom	196.73	15.61	1.97
Boss 65	184.48	14.10	1.55
Ankur – 045	190.35	15.06	1.63
86M86	187.67	14.62	1.53
SEm±	2.20	0.25	0.08
CD (at 5%)	6.42	0.74	0.22
Interaction (D×V) I	NS	NS	NS
Interaction (V×D) II	NS	NS	NS

But Significantly recorded higher ear head girth (cm), test weight (g) and number of seed ear head application of sowing

date of 20th July with crystal dhoom variety (Table 2). While interaction is non-significant all growth parameters.

Table 2: Effect of sowing dates and crop varieties on growth of pearl millet

Treatments	Ear head girth (cm)	Test weight (g)	Number of seed ear head
Sowing dates			
20 th July	8.90	7.91	3034.93
30 th July	8.69	7.84	2714.67
9 th August	8.01	7.52	2370.67
SEm±	0.11	0.08	84.88
CD (at 5%)	0.45	0.32	333.22
Varieties			
Big B	8.66	8.03	2827.11
Crystal Dhoom	9.42	8.29	2918.00
Boss 65	7.80	7.31	2505.89
Ankur – 045	8.52	7.48	2751.78
86M86	8.27	7.68	2531.00
SEm±	0.27	0.11	103.03
CD (at 5%)	0.79	0.33	300.73
Interaction (D×V) I	NS	NS	NS
Interaction (V×D) II	NS	NS	NS

Effect of yield parameters

The result revealed that all the sowing dates and crop geometry significantly improved the yield parameters. Significantly recorded higher grain, stover yield and harvest

index application of sowing date of 20th July with crystal dhoom variety, While interaction is non-significant all yield parameters (Table 3).

Table 3: Effect of sowing dates and crop varieties on yield parameters of pearl millet

Treatments	Grain Yield (Kg/ha)	Stover Yield (kg /ha)	Harvest Index (%)
Sowing dates			
20 th July	1976.94	3757.54	34.47
30 th July	1737.82	3688.84	31.78
9 th August	1318.45	3261.68	28.76
SEm±	37.16	49.26	0.56
CD (at 5%)	145.89	193.38	2.22
Varieties			
Big B	1768.18	3670.02	32.46
Crystal Dhoom	1989.70	4006.38	33.13
Boss 65	1162.54	3277.63	26.23
Ankur – 045	1792.75	3505.26	33.58
86M86	1675.52	3387.46	32.94
SEm±	58.72	131.22	1.31
CD (at 5%)	171.40	383.02	3.83
Interaction (D×V) I	NS	NS	NS
Interaction (V×D) II	NS	NS	NS

Conclusion

Based on the experimental results, it was concluded that better crop growth can be obtained from pearl millet by sowing date of 20th July and cultivar crystal Dhoom. The higher yield attributes were obtained under the variety crystal Dhoom, which was followed by Big B, Ankur-045, 86M86 and the minimum was recorded in the variety Boss -65 and sowing date of 9 august.

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