

ORIGINAL ARTICLE

Performance of Pearl millet (*Pennisetum glaucum*) cultivars under late sown condition in sandy loam soils

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ABSTRACT

Pearl millet (*Pennisetum glaucum* L.) is one of the most important crops for food, feed and fiber for dry and rainfed regions of India as well as the world. Pearl millet possesses specific genetic characteristics to withstand environmental vagaries and produces good grain yield when grown on nutritionally stress soils. The productivity of crops grown in water scarce area increased by adopting advanced agronomic practices and its nutrient management during the lifecycle of the different cultivars. The experiment was conducted to identify the best cultivar with different nitrogen doses in delayed sown conditions in sandy loam soil. Three cultivars (Dev- 9999, HHB-67 Improved and HHB-197) and four nitrogen treatment (0, 75% Recommended dose (RD), 100 % RD and 5T vermicompost (VC)+RD+ Biomix) were studied to identify the cultivar, which produces the highest grain and straw yield. Data on plant height, number of tillers, head length, grain test weight and straw and grain yield were recorded. Cultivars and nitrogen rate have significant effect on the plant height, head length, number of tillers, straw and grain yield. Highest plant height was recorded in the cultivar Dev-9999 followed by HHB-197 and HHB-67 improved in T4. Ear head length of Dev-9999 was significantly higher than HHB-197 and HHB-67 improved in all the treatments under study. The ear head length ranged between 24.7 to 28.5 cm of Dev-9999 and was significantly higher among different the cultivars. Dev-9999 produced significantly higher grain yield and straw yield than the rest of cultivars in all the treatments under study. Increase in nitrogen doses produced significant differences in yield among all the cultivars. It shows that pearl millet has the potential to produce more grain and straw yield up 125% RD nitrogen application in combination with vermicompost and seed treatment under sandy loam soils of Haryana.

Keywords: Biomix, Pearlmillet cultivars, Nitrogen doses

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INTRODUCTION

Pearl millet is one of the most important crops grown in the semi-arid dry land regions in Africa and Southeast Asia [1]. It is the sixth major cereal in the world after wheat (*Triticum aestivum*), rice (*Oryza sativa*), maize (*Zea mays* L.), barley (*Hordeum vulgare*) and sorghum (*Sorghum bicolor*) [5]. It possesses the unique genetic predisposition to withstand environmental stress, By this, it has been projected as a potential food and feedstock in marginal soils [6]. Management of nutrients scheduling in developed cultivars is essential to obtain appreciable economic yields. N is considered the most important limiting nutrient for many economically important crops [7]. The objective of this study was to determine the response of three most widely grown pearl millet cultivars in and around Gurugram.

MATERIAL AND METHODS

The experiment was conducted in Kharif seasons of 2017 at Research Farm, Faculty of Agricultural Sciences, SGT University, Gurugram on sandy loam soil. Three pearl millet cultivars i.e (Dev-9999, HB- 67 improved and HHB-197) with four nutrient doses viz. (Control, 75 % RD, 100% RD and 5t Vermicompost+100%RD+Biomix) were selected for this study. The sowing was done on 13th July, 2017. The seedbed was prepared two days prior to sowing. Seed rate was 5 kg ha¹. Urea was applied for N and SSP for P was applied to plots manually. The doses were T1-NP (0:0) control, T2- N:P (93.75:46.88), T3- N:P (125:62.5), T4-N:P (156:78.12:0)+ 5t Vermicompost (VC)+Biomix 100ml/kg (Azatobactor, Azospirillum and PSB)

RESULTS AND DISCUSSION

Plant height

Data in the Table 1 revealed that Cultivar Dev-9999 recorded significantly higher plant height (213.34 cm) than HHB-67 improved (180.51 cm) and HHB-197 (163.72). The height of HHB-67 improved was higher but non significant in compared HHB-197. Similar results are also reported by Singh [5] that different cultivars have genetic impact on growth parameters in pearl millet. Increase in fertilizer dose also significantly increased height in comparison to control in 125% RD+ 5T VC+ Biomix which was (196.99 cm) and was significantly higher than rest of treatments. The height recorded at 100% RD also was significantly higher than 75 % RD and control. Plant height recorded at 75 % RD was also significantly higher than control. Mishra *et al.*, [3] also reported that the maximum height found at highest rate of 120 kg ha⁻¹ nitrogen.

Table 1: Effect of nitrogen and phosphorous scheduling on plant height, earhead length, grain yield and stover yield of pearl millet cultivars

Cultivars	Height at maturity (cm)	Earhead length (cm)	Yield (q/ha)	Stover Yield (q/ha)
Dev-9999	213.34	26.08	40.91	96.36
HHB-67 improved	180.51	22.15	31.10	72.00
HHB-197	163.72	24.95	34.13	83.18
CD at 5%	26.97	3.02	1.95	2.78
Fertilizer dose Kg/ha				
(T1) Control	175.14	22.75	29.51	79.10
(T2) 75 % RD	182.07	23.51	34.47	90.12
(T3) 100 % RD	188.73	24.72	37.43	92.72
(T4) 125 % RD+ 5T VC+ Biomix	196.99	26.6	40.14	103.45
CD at 5%	3.09	0.74	1.50	4.08

Earhead length

Maximum earhead length (26.08 cm) was recorded in Dev-9999 which was significantly higher than HHB-67 improved (22.15 cm) but statistically higher than HHB-197 (24.95cm). Spike length of HHB-197 was statistically higher than HHB-67 improved pearl millet cultivar. Fertilizer scheduling also favored the increase in spike length with increase in fertilizer dose. Spike length recorded at 125% RD+ 5T VC+ Biomix (26.6 cm) was significantly higher than rest of treatments. The spike length recorded at 100% RD was significantly higher than 75% RD (24.72 cm) and Control (22.75 cm). Similar result was also recorded by Singh [7].

Grain yield

Data in Table 1 revealed that grain yield was influenced by genetic factors of respective cultivars (Table 1). Significantly higher grain yield (40.91 q/ha) was recorded in cultivar Dev-9999 than HHB-197 (34.13 q/ha) and HHB-67 improved (31.10 q/ha). Grain yield recorded with cultivar HHB-197 was statistically higher than HHB-67 improved. Similarly significant differences in pearl millet genotypes with respect to grain yield and straw yield were also reported by Maqsood & Ali [2] and Sarr *et al.*, [4]. Data in the Table 1 also revealed that increase in fertilizer dose from control to maximum also resulted in significant increase in grain yield. Grain yield recorded at 125% RD+5T VC+ Biomix was significantly higher than the rest of treatments under study. Grain yield recorded at 100% RD was significantly higher than the 75% RD and control. Grain yield recorded at 75% RD (34.47 q/ha) was also found significantly higher than the control (29.51 q/ha). Similar result also reported by Obeng *et al.*, [1] and Singh *et al.*, [7].

Stover Yield

Stover yield of cultivar Dev-9999 (96.36 q/ha) was significantly higher than HHB-197 (83.18 q/ha) and HHB-67 improved (72.00 q/ha). Similarly significant differences in pearl millet genotypes with respect to grain yield under different conditions were also reported by Maqsood & Ali [2] and Sarr *et al.* [4]. Data in Table 1 also revealed that increase in fertilizer dose from control to maximum also resulted in significant increase in stover yield. Stover yield recorded at 125% RD+5T VC+ Biomix was significantly higher than the rest of treatments under study. Stover yield recorded at 100 RD was statistically higher than the 75% RD (90.12 q/ha) and was significantly higher than control (79.10 q/ha). Stover yield recorded at 75% RD was also found significantly than the control. Similar results were also reported by Singh *et al.*, [7].

CONCLUSION

In this study it was found Dev-9999 cultivar performed better in sandy loam soil with irrigation facilities than HHB-197 and HHB -67 improved. Increase in nitrogen and phosphorous rate up to 125% RD with 5 ton vermicompost and seed treatment with Biomix resulted in more height, spike length, grain yield and stower yield than rest of the treatments.

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