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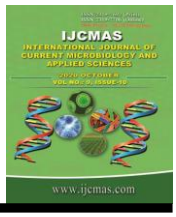

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# Performances of Pearl Millet Hybrids under Arid Zone of western Rajasthan

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**A B S T R A C T**

A field experiment was conducted during *kharif* of 2018 on sandy loam soil of very low organic carbon (0.07%), low phosphorus ( 10.1 kg/ha) and medium potassium content (202.5 kg/ha) at research farm of Agricultural Research Sub Station, Samdari, Barmer to study the pearl millet hybrids Performances under arid zone of western Rajasthan. The experiment was laid out randomized block design with 3 replications. Five pearl millet hybrids viz., MH 2192, RHB 177, MH 2455, HHB 67 and MH 2456, and recommended dose of fertilizers (RDF); 40 : 20 : 0 :: N : $P_2O_5$ : $K_2O$ are applied. The results revealed that RHB 177 significantly increased test weight and MH 2456 hybrid recorded non-significantly maximum plant height and MH 2192 hybrid observed highest plant stands. Among the tested hybrids the maximum panicle length and panicle diameter were recorded by RHB 177. While the maximum seed and fodder yield was recorded by MH 2192 hybrids.

## Introduction

Pearl millet [*Pennisetum glaucum* (L.) R. Br.] is the most widely grown staple food of majority of poor and small land holders in Asia and Africa. It is also consumed as feed and fodder for livestock. It accounts for almost half of global millet production. It is the sixth most important cereal crop in the world next to maize, rice, wheat, barley and sorghum. In India, pearl millet is the fourth most widely cultivated food crop after rice, wheat and maize. It occupies an area of 6.93 million ha with an average production of 8.61 million tonnes and productivity of 1243 kg/ha (Directorate of Millets Development, 2020). The major pearl millet growing states are Rajasthan, Maharashtra, Uttar Pradesh, Gujrat and Haryana contributing 90% of total national production.

Pearl millet is grown mostly on poor in organic matter, low in available nitrogen and phosphorus. Poor soil fertility and erratic

rains are the most important constraints to crop production in arid and semi arid region. Soil fertility management i.e., nutrient management particularly nitrogen (N) and Phosphorus (P) plays a major role in increasing production and productivity of pearl millet. Nitrogen is an essential nutrient and key limiting factor in crop production of different agro ecosystems. It is considered as one of the most important plant nutrients for growth and development of crop plant. It also plays an important role in synthesis of chlorophyll and amino acids that contribute to the building unit of protein and thus, growth of plants. It helps in early establishment of leaf area capable of photosynthesis. Pearl millet is an exhausting crop and heavy consumer of plant nutrients. It promotes leaf and stem growth rapidly which consequently increase the yield and its quality. Nitrogen to some extent enhances the utilization of phosphorus and potassium. Nitrogen is most commonly deficient nutrient in Indian soil and gives considerable response in pearl millet crop Jadav *et al.*, (2011). It is the major nutrient required by pearl millet which positively increases the growth attributes, length and width of panicle, test weight, number of grain/panicle, grain weight/panicle and finally improve the yield Prasad *et al.*, (2014). Phosphorus is the key element in the process of conversion of solar energy into chemical energy. It influences the vigour of plants, root growth and improves quality of the produce. It is backbone of balanced fertilizer use and it occupies a key place in intensive agriculture. Information on recommended dose of nitrogen and phosphorus for higher grain yield is lacking in rain fed Pearl millet under arid zone of western Rajasthan.

## Materials and Methods

The field experiment was conducted at Agricultural Research Sub Station (Agriculture University, Jodhpur), Samdari, Barmer during *Kharif* season of 2018-19. Five advance hybrids MH 2192, RHB 177, MH 2455, HHB 67 and MH 2456, was tested for their performance. The recommended dose of fertilizers (RDF); 40: 20: 0 :: N : $P_2O_5$ : $K_2O$ are applied. The soil of the experimental site was sandy in texture, low in organic carbon and medium in phosphorus and high in potash. The crop was sown on 28$^{th}$ June, 2018 with 60 cm row spacing and 15 cm plant spacing. Five randomly selected plants from each plot were taken for recording growth and yield parameters. The observations recorded on growth, yield and its attributes are presented in Table 1.

## Results and Discussion

Among all the tested hybrids, the test weight was significantly higher in the hybrid RHB 177 (8.5 g) which was followed by MH 2192 (7.1 g). The plant stand was non- significantly higher of hybrid MH 2192 (0.66 lakh/ha) as compared to all other hybrids. While the maximum plant height recorded by MH 2456 (125 cm) it was followed by RHB 177 (123 cm). Early days to 50% flowering was recorded by MH 2455 (51 DAS) it was followed by MH 2192 (52DAS), the maximum panicle length and panicle diameter was recorded by RHB 177 (20 cm and 2.2 cm).

Among tested hybrids MH 2192 produced non-significantly higher seed and fodder yield than other tested varieties under dry land condition. Better seed and fodder yield in MH 2192 may be due to more active photosynthetic area (leaf area) that causes more expansion of shoot area. This indicates that these varieties thrive well under moisture stress condition. Such effect may be due to the genetic variability between the varieties. MH 2192 has favourable gene action under stress condition. The significance of genetic variability among pearl millet genotypes was also reported by Damame *et al.*, (2013) and

Yadav *et al.*, (2014). The Similarly significant differences in pearl millet varieties with respect to grain yield were also reported by Maqsood and Ali (2007) and Kumar *et al.*, (2016).

**Table.1** Performance of growth and yield attributes of Peral millet hybrids under arid zone of Western Rajasthan

| S. No. | Hybrids | Plant stand (lakh/ha) | Plant Height (cm) | Days to 50% flowering | Panicle length (cm) | Panicle Diameter (cm) | Test weight (g) | Seed yield (kg/ha) | Fodder yield (kg/ha) |
|---|---|---|---|---|---|---|---|---|---|
| **1** | MH 2192 | 0.66 | 120 | 52 | 16 | 1.9 | 7.1 | 854 | 1875 |
| **2** | RHB 177 | 0.43 | 123 | 54 | 20 | 2.2 | 8.5 | 701 | 1088 |
| **3** | MH 2455 | 0.52 | 121 | 51 | 17 | 1.9 | 6.2 | 630 | 1482 |
| **4** | HHB 67 | 0.40 | 118 | 54 | 18 | 1.9 | 6.4 | 505 | 1019 |
| **5** | MH 2456 | 0.58 | 125 | 53 | 18 | 1.8 | 6.3 | 792 | 1736 |
| | $SE_{m\pm}$ | 0.07 | 6.3 | 1.5 | 1.5 | 0.12 | 0.2 | 86.8 | 245.0 |
| | CD at 5% | N/A | N/A | N/A | N/A | N/A | 0.6 | N/A | N/A |
| | CV% | 22.14 | 9.0 | 4.8 | 14.3 | 10.90 | 0.3 | 21.6 | 29.5 |

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