SOIL AND WATER SALINITY TOLERANCE OF PEARMILLET HYBRIDS AND GENOTYPES IN SALT AFFECTED SOILS AND IRRIGATION WATER IN FIELD CONDITION


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ABSTRACT

Six bajra hybrids and eight parental lines were tested during summer 2002 to know their response against problematic soils and saline irrigation water. The hybrid GHB-526 was recorded significantly superior in grain yield whereas GHB-316 was found significantly better for fodder yield, but both the hybrids were observed at par with GHB-559 in both cases. In case of growth and yield attributing parameters, the GHB-559 recorded significantly higher plant height and plant stand whereas 94555A recorded higher number of tillers and 81A recorded more ear head length. The difference in test weight was found to be non-significant.

Pearl millet is an important cereal crop of Gujarat state as it covers maximum acreage as compared to any other food crops in the state. It is being grown in an area of 13 lakh hectare of the total area under cultivation.

The ingress of sea water in the ground water is a matter of great concern, in several parts of Gujarat, since it leads to poor quality of well water (Anonymous, 1986). The quality of soils and productivity of the crops have been declining with the continuous use of the such poor quality water from well. Salinity is one of the important constraints limiting the crop production particularly in the coastal belts of Saurashtra region. However, some crops and their hybrids have ability to tolerate the salinity and perform well in this condition. Hence, relative salt tolerance of crops and their hybrids/genotypes assume significant importance to increase the productivity on this problematic soils as well as irrigation water. Pearl millet is a short duration crop grows extensively in the North Saurashtra agro-climatic zone which is characterized by poor quality of ground water.

A field experiment was conducted to screen out the different varieties/genotypes of pearl millet in salt affected soils as well as in the fields with saline irrigation water at Main Millet Research Station, Gujarat Agricultural University, Jamnagar during summer 2002. The pH and electric conductivity were estimated in 1:2.5 soil water suspension using systronics pH meter (Expand Type) and conductivity of the soil by soil conductivity meter (Jackson, 1973). Pearl millet hybrids and genotypes show variation in their salinity tolerance, which may be attributed to the differences in variation of yield and yield attributing characters. Therefore, the present investigation was aimed to diagnose the growth, yield attributes and yield parameters which may have bearing on salinity tolerance.

The chemical properties of soil and water of Jamnagar center is as per under.

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<th>EC</th>
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<tr>
<td>SOIL</td>
<td>5.4</td>
<td>7.3</td>
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<td>WATER</td>
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The experiment was conducted with 14 different bajra hybrids and genotypes (GHB-526, 255, 183, 316, 558 & 559 and 81A, 405A, 95222A, 94555A, J-2372, J-2296, J-998 and J-2290) during the summer 2002 in randomized block design with three replications. The field was prepared after presowing irrigation. The crop was manually sown in rows which were 45 cm apart. The crop was adequately fertilized with 120 kg nitrogen...
and 60 kg P₂O₅ per hectare through Urea and DAP. Half dose of nitrogen and full dose of phosphorus were applied at the time of sowing and remaining half dose of nitrogen was top dressed at 30 DAS. Other cultivation practices were followed as per the recommendations of the crop.

The observations were recorded on plant height, number of tillers, ear head length, plant stand, grain yield, fodder yield and test weight of each treatment from the net plot (2.4 m x 5.0 m) on five randomly selected plants.

The growth parameters like plant height, number of tillers and ear head length were significantly affected by various hybrids and genotypes. Maximum plant height (127.5 cm) was recorded with hybrids GHB-559, which was found at par with hybrid GHB-526, 558, 235 and 183. The genotypes 94555A was observed significantly superior in number of tillers whereas genotypes 81A was significantly superior in ear head length (24.7 cm). The plant stand was recorded significantly different whereas test weight (1000 grain weight in gram) was found to be non-significant. The highest plant population (129167 plants/ha) was noted in hybrids GHB-559, which were however, at par with hybrid GHB-526 (126667 plants/ha). Genotypes 94555A performed very poorly with minimum plant population (20833 plants/ha). The grain and fodder yields were significantly different in different hybrids and genotypes. The grain yield of hybrid GHB-526 was the highest, which was statistically at par with hybrid GHB-559. The lowest grain yield was observed in genotypes 81A. The fodder yield was noted highest in hybrid GHB-316, which was found at par with GHB-559.

From the data, it is concluded that the hybrid GHB-526 was recorded significantly superior in grain yield whereas GHB-316 was found significantly better for fodder yield, but both the hybrids were observed at par with GHB-559 in both cases.
REFERENCES