Resistance to blast in Core Collection of Foxtail millet Germplasm

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Abstract

Foxtail millet is valued as a crop of short growth duration, which is fairly resistant to insect pests and diseases, and the grains make a nutritious and healthy food. However, blast disease, caused by *Magnaporthe grisea* is the only yield limiting biotic constraint to this crop. For identification of sources of leaf, neck and head blast resistance, foxtail millet core collection comprising 155 accessions was evaluated at ICRISAT, Patancheru, India in a RCBD with 2 replications, 1 row of 2 m long/replication during 2009 and 2010. High humidity was provided by perfo-irrigation twice a day on rain-free days, 30 min each during morning and evening hours to facilitate the disease development. Leaf, neck and head blast was recorded at dough stage. One hundred fifty accessions were found free from leaf blast compared to 4 accessions (ISe 1129, ISe 1299, ISe 1037 and ISe 1118) that had >7 score on 1-9 scale. Twenty accessions from the core collection (ISe 375, -748, -751, -769, -771, -785, -846, -1067, -1137, -1204,-1286, -1320, -1335, -1387, -1419, -1547, -1563, -1593, -1685 and -1704,) and two check lines (ISe 376 and -1541) were resistant (≤10% incidence) to neck and head blast in both the years. For confirmation of field resistance, core collection was evaluated at seedling stage (12-days old) under artificial inoculation in a greenhouse using local (Patancheru) isolate of *M. grisea*. Only twelve accessions were found resistant (≤ 3 score on 1-9 scale) in the greenhouse screen indicating disease escape for leaf blast in the field. Thirty one accessions (resistant to neck and head blast under field conditions during 2009 and 2010, and leaf blast in the greenhouse screen) including germplasm checks (ISe 376 and -1541) and susceptible checks (ISe 302, -480 and -1118) were selected for further screening against four isolates collected from different foxtail millet growing areas in India. For leaf blast resistance, 12-days old seedlings were evaluated following artificial inoculation; whereas for neck and head blast reaction, accessions were spray inoculated at anthesis stage. Two accessions ISe 1547 and ISe 1181 found resistant to leaf, neck and head blast against all the four isolates could be used as potential sources of blast resistance in the foxtail millet improvement program in India.