Evaluation of maize inbred lines for resistance to maydis leaf blight

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Maydis leaf blight (MLB) incited by Bipolaris maydis (Nisikado and Miyake) Shoem. [Cochliobolus heterostrophus (Drechs.) Drechs.] is a major and economically important disease of maize (Zea mays L.) in several countries where crop is grown in tropical to sub-tropical environmental conditions. In India, the disease is present in almost in all the major maize growing states. Globally, three races of the pathogen designated as race ‘O’, race ‘T’ and race ‘C’ are known to occur. In India the race ‘O’ is the predominant race though presence of race ‘T’ has been detected. This disease has a potential to reduce grain yield upto the extent of 41% in susceptible cultivar (4). In this paper, results of a field evaluation screening to Maydis leaf blight are presented.

Seventeen elite inbred lines including two resistant checks, CM 104 and CM 105 (3) and one susceptible check CM 119, received from Maize Breeding Unit of Division of Genetics and Directorate of Maize Research, were evaluated to Maydis leaf blight under artificial field inoculations during 1999, 2000 and 2001 crop seasons at I.A.R.I, New Delhi. The evaluations were carried out in randomized block design with three replications having five meter row length with a spacing of 25 (plant-to-plant) x 75 cm (row-to-row). The inoculum of pathogen for field inoculation was multiplied on sorghum seeds as suggested by Joshi et al., (1). Inoculations were done by placing a small quantity of ground powder into the whorl of each plant. Inoculations were carried out twice when the crop attained the age of 30 and 40 days old. The reactions were assessed on the basis of a 1-5 rating scale, where a rating of 1 denotes very slight to slight infection, one or two scattered lesions on lower leaves and 5 denotes, very heavy infection, lesions abundant on almost all lower leaves, plants prematurely dry or killed by disease (2). The average disease rating of susceptible check CM 119 ranged from 3.5 to 4.5 over a period of three years indicating the optimum level of development of disease, ensured high pathogenecity of MLB isolate and elucidated reliable classification of resistant genotypes. The entries were classified in the following four categories on the basis of mean disease reaction: highly resistant (< 1.5)- SC-24 - (92)-3-2-1-1, Suwan 1 (S) C#-f-f and SC 7-2-1-2-6-1, moderately resistant (1.6 – 2.5)- TCA24-13-f-1, SC 7-2-1-2-7- and CM116, moderately susceptible (2.6 – 3.5)-AH63-4-1, IPA 40-f-17-6-1-1, TCA 21-1-f, IPA 40-10-#-6-#-1 and IPA 2-2-f and highly susceptible (3.6 – 5.0)- IPA 34-62-f-#, IPA 3-6-10-3-1and CM 210

It is interesting to note that the disease rating of the entries classified as resistant, never exceeded the disease rating of two previously known resistant inbreds i.e. CM 104 and CM 105 over the period of three years testing. Lines CM 104 and CM 105 are known to posses durable resistance to two leaf blights including Maydis leaf blight. The inbred lines found to be highly resistant in the present evaluations can be used efficiently by national breeding programs engaged in developing resistance to MLB.

REFERENCES


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