3305

P271

ASSESSMENT OF PHENOTYPIC INDEXES FOR ALUMINUM TOLERANCE IN MAIZE USING NUTRIENT SOLUTION

Geraldo Magela Almeida Cancado[1], Paulo Roberto Martins[1], Sidney Netto Parentoni[1], Aluizio Borem Oliveira[2], MAURICIO ANTONIO LOPES[1]

[1] Embrapa Maize and Sorghum, Rod. MG 424 Km 65, C.P. 151 35.701-970 - Sete Lagoas (MG), Brazil
[2] Federal University of Vicosa Av. P.H. Rolfs, S/N Campus Universitario - Vicosa (MG), Brazil

The aluminum (Al) toxicity is one of the most limiting factor for agricultural productivity in acid soils. In this work, we compared the efficiency of hematoxylin root staining relative to the phenotypic indexes of net and relative seminal root length (NSRL and RSRL, respectively), by using an incomplete diallelic cross among nine inbred lines of maize and their respective F_1 generations. The root length of maize seedlings was measured at the beginning (initial seminal root length, or ISRL) and at the end of the experiment (final seminal root length, or FSRL). The NSRL was obtained by subtracting the ISRL from the FSRL, and the RSRL by dividing the NSRL by the ISRL. The hematoxylin staining of the root apices was performed after determining the FSRL and scored by visual inspection. It was observed that the additive effects were more important than the non-additive ones and, for the general combining ability (GCA), the L13, L724, L723 and L16 lines would be the best options for hybrid production aiming an increased Al tolerance. On the other hand, the best specific combining ability (SCA) values were obtained for the crosses L13 x L16, L13 x L20, L13 x L723, L16 x L22, L16 x L723, L16 x L724, L723 x L22, L723 x L64, and L723 x L11. For the correlation among the indexes, the best result was identified for NSRL and hematoxylin staining ($r^2 = 0.76$), followed by the correlation between RSRL and NSRL ($r^2 = 0.63$). By contrast, the correlation between RSRL and hematoxylin staining appeared to be low ($r^2 = 0.27$). Supported by: CNPq, FINEP/PADCT, FAPEMIG and EMBRAPA