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研究论文

玉米自交系耐铝性评价及根系形态解剖特征

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摘要 采用营养液培养方法，对9个玉米自交系的耐铝性进行了评价，并对其中两个耐铝性不同的典型自交系的根系形态和解剖特征进行了比较。结果表明，玉米自交系在含铝营养液中的耐铝性评价结果与酸性土壤上的耐酸性筛选结果基本一致。耐铝基因型具有苏木精着色程度较低、种子根相对伸长率和植株相对生物量较高的共同特点。种子根相对伸长率、苏木精染色指数与植株的耐铝性具有显著的相关性。种子根相对伸长率是一快速简便、准确可靠的耐铝性鉴定指标。铝胁迫下，两个耐铝性不同的典型玉米自交系根系形态和解剖特征具有明显差异，耐铝基因型明显优于铝敏感基因型。

关键词 玉米 耐铝性评价 根系形态解剖特征

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The Al-Tolerance Evaluation and Anatomical Characteristics of Roots in Inbred Lines of Maize

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Abstract The Al-tolerance of 9 inbred lines of maize and part of their F1 generations that had different reactions to acid soil were evaluated, and their morphological and anatomical characteristics were contrasted with those of Al-sensitive typical inbred line, by means of hydroponics. The results indicated that the evaluation of Al-tolerant inbred lines grown in nutrient solution with aluminum kept basically consistent with the screening results in acid soil. The Al-tolerant lines had lower hematoxylin dye index, higher RSRL and higher relative biomass in comparison with Al-sensitive lines. There were significant correlations between the relative seminal root length (RSRL), hematoxylin dye index, and the Al-tolerance of the plant. That means RSRL can be used as a simple, convenient and accurate index for Al-tolerance evaluation. There were significant difference of morphological and anatomical characteristics between two typical inbred lines, Al-tolerant genotypes were distinctly better than Al-sensitive ones.

Key words Maize Al-tolerance estimation Root morphological and anatomical characters

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