



Tuesday, November 6, 2007 - 2:45 PM
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Root Morphology and Mineral Nutrition of *Brachiaria brizantha* Hybrids as Affected by Levels of Toxic A

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The responses of distinct *Brachiaria brizantha* genotypes to aluminum toxicity were examined at the root level. In vitro micropropagated seedlings of 2PI9B, 3PI9A, 7PI9B, 9PI1A, 12PI1B, and 14PI9B hybrids were transferred to aerated half-strength Hoagland solution either with 4, 5 or 6 mg/L of toxic aluminum or with no toxic aluminum and pH kept free or close to 4.00. Following a 30 day continuous growth in a controlled environment, roots were collected and processed. Four identical trials were carried out as completely randomized design and data were statistically analyzed. Root length yielded the best discriminating indicator of Al toxicity, showing a decrease in the sequence 14PI9B, 9PI1A, 12PI1B, 2PI9B, 7PI9B and 3PI9A. Such an order remained for the observed changes in root morphology which consisted mostly of a drastic reduction in the overall root system volume, a decrease in the number of adventitious roots, a decrease in the averaged main adventitious root diameter, and a depletion in size and number of secondary adventitious roots. For all studied genotypes, the profiles of essential elements, as determined through ICP-AES analyses, revealed a tendency of overall reduction as the level of toxic aluminum were increased. The most marked influence was verified with Fe levels. Also, a sharp decrease in response to toxic aluminum was observed with spectrophotometrically determined P contents. The results indicate that the presence of toxic aluminum in the growth medium alters root morphological development and blocks the uptake of essential elements, with the magnitude of such responses positive or negative among contrasting genotypes.

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