

The Effects of Root Zone Supply of Aluminium on Vegetative Growth of 15 Groundnut Cultivars Grown in Solution Culture

Authors : Mosima M. Mabitsela

Abstract : Groundnut is preferably grown on light textured soils. Most of these light textured soils tend to be highly weathered and characterized by high soil acidity and low nutrient status. One major soil factor associated with infertility of acidic soils that can negatively depress groundnut yield is aluminium (Al) toxicity. In plants Al toxicity damages root cells, leading to inhibition of root growth as a result of the suppression of cell division, cell elongation and cell expansion in the apical meristem cells of the root. The end result is that roots become stunted and brittle, root hair development is poor, and the root apices become swollen. This study was conducted to determine the effects of aluminium (Al) toxicity on a range of groundnut varieties. Fifteen cultivars were tested in incremental aluminium (Al) supply in an ebb and flow solution culture laid out in a randomized complete block design. There were six aluminium (Al) treatments viz. 0 μM , 1 μM , 5.7 μM , 14.14 μM , 53.18 μM , and 200 μM . At 1 μM there was no inhibitory effect on the growth of groundnut. The inhibition of groundnut growth was noticeable from 5.7 μM to 200 μM , where the severe effect of aluminium (Al) stress was observed at 200 μM . The cultivars varied in their response to aluminium (Al) supply in solution culture. Groundnuts are one of the most important food crops in the world, and its supply is on a decline due to the light-textured soils that they thrive under as these soils are acidic and can easily solubilize aluminium (Al) to its toxic form. Consequently, there is a need to develop groundnut cultivars with high tolerance to soil acidity.

Keywords : aluminium toxicity, cultivars, reduction, root growth

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