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Screening and response of commercial cowpea [*Vigna unguiculata* (L.) Walp.] Cultivars to Low pH and Aluminum Toxic Conditions.

Aluminum toxicity tolerance in crops is an important aspect of sustainability for areas with low pH soils, for example in the Southeastern United States. Cowpea [*Vigna unguiculata* (L.) Walp.] is a leguminous pulse crop that is traditional to regional cuisine and agricultural systems in the South. Our objective was to evaluate difference in low pH and Aluminum toxicity tolerance in varieties of cowpea. Seedlings from total of 5 commercially available cowpea varieties were screened for their aluminum toxicity response under hydroponic conditions with and without low pH as an additional factor: 3 treatments included a 0.5 mM CaCl2 solution at pH 5.5-5.8, a 0.5 mM CaCl2 solution at pH 4.3, and a 0.5 mM CaCl2 solution at pH 4.3 with 50 µM AlCl3. Primary root length measurements were taken at 0, 24 and 48 hours after treatments began. Another experiment utilized 22 commercial cowpea varieties with two treatments including a 0.5 mM CaCl2 solution at pH 4.3 and a 0.5 mM CaCl2 solution at pH 4.3 with 50 µM AlCl3. Lines with the lowest reduction in primary root growth rate included Mississippi Pinkeye 2 Purple Hull, Top Pick Brown Crowder, and Mississippi Silver, while the lines with the greatest reduction in root growth rate included White Acre, Pinkeye Purple Hull, and Michels. Results show hydroponic systems are useful for screening cowpea under aluminum toxic conditions, as all cultivars showed reduced primary growth rates when treated with 50 µM AlCl3. This information can be useful for breeding of modern cultivars for low input systems especially on farms with marginal soils.