Identification of Peanut Lines with Superior Root Growth

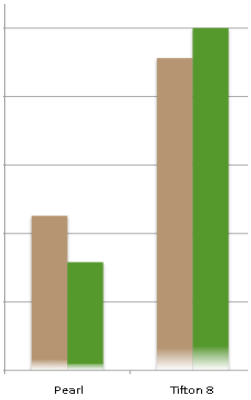
Progress report to the Georgia Peanut Commission on 2/12/2014

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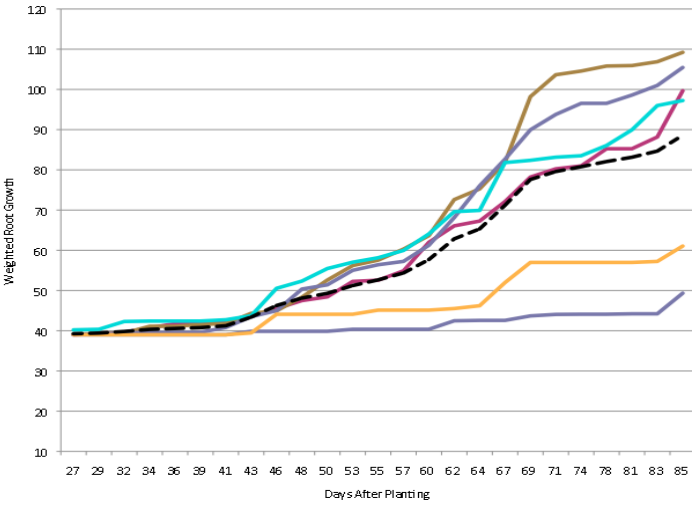
Objective: To identify peanut lines with superior root growth for use in peanut variety development and to aid development of molecular markers for this trait.

Rational & economic significance of project

Root growth is closely linked to shoot growth, and varieties with superior root growth are better able to explore the soil for water and nutrients and yield more. Superior root growth benefits irrigated and non-irrigated growers as it improves both nutrient and water use efficiencies.



Many studies have documented genetic differences in peanut root growth. For example, the chart to the right (from our 2013 studies of 22 lines) highlights a 2 to 3 fold difference in the root growth of peanut varieties Pearl (left bars) and Tifton 8 (right bars) in two soil types (brown & green bars). Yet, the number and control of the genes responsible for these root characteristics is not well understood.



The chart on the left shows the results from six of the 22 lines, 2 with poor root growth (Pearl and 435F) and four with better than average root growth (C431-1-1, 431-1-7, 232d and Tifton 8.

While some of these differences can be attributed to large mature seed, a substantial part of root development is due to other plant traits under genetic control. In 2014, we plan to increase the genetic population of peanut lines in this test.

The additional lines will be those used in the Ozias-Akins led "High Resolution Phenotyping of Diverse Peanut Lines" project along with other lines known for superior root development and poor root development. We believe these lines will help breeders and molecular biologists better define the number and location of the genes that control root characteristics, and expedite variety development with improved rooting characteristics.