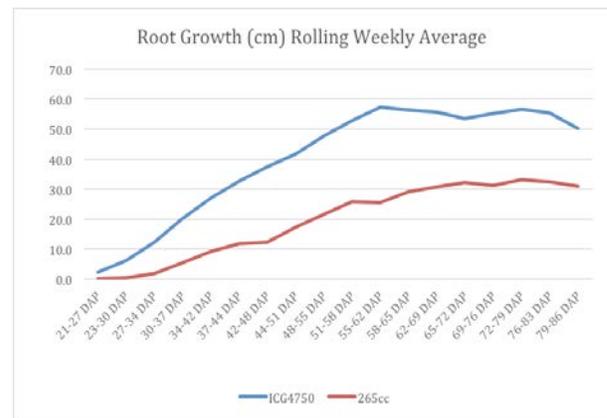
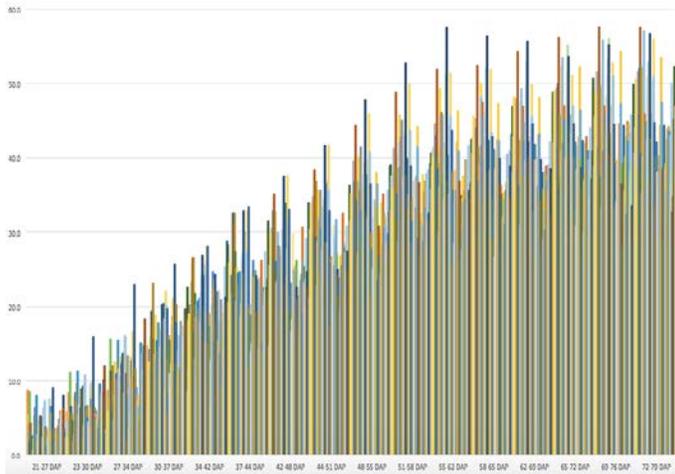


Identification of Peanut Lines with Superior Root Growth

By: Craig Kvien, UGA, Tifton, (ckvien@uga.edu) 229.392.3507, and Cooperating Scientists: Corley Holbrook and Peggy Ozias Akins

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 & Results: In 2016 we used 100 peanut lines, measuring each for the time it took for lateral roots to begin extracting water 20 inches below the surface and at different distances out from the row (6" to 60 inches). The graph below shows root growth over time for all the lines and a second graph with just two of the lines – to better show that the differences seemed to be consistent over time.



At the end of the season we set the digger blades as low as possible, and collected 6 representative root systems from each plot, weighed and rated them for root development.

An example of one peanut line with a particularly good root system is shown in the picture to the left.

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. Like many plants, peanuts use their stored seed energy to rapidly establish a root system, and large mature seed help the plant get off to a great start. For the first month, over half of the weight of the peanut is in the root system. Roots will continue to grow throughout the season, yet a higher proportion of the plant's weight shifts to the leaves and then to the pod.

Many studies have documented genetic differences in peanut root growth. Yet, the number and control of the genes responsible for these root characteristics is not well understood. Our goal with this project is to study root growth characteristics using a portion of selected peanut lines along with peanut lines known for superior root development and poor root development. We believe the information coming from 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