

Phenotype Screening

C O R P O R A T I O N

enabling discovery

Service Description Comparative Evaluations

Phenotype Screening Corporation offers a detailed plant development characterization service for the evaluation of the effects of chemical and biological seed treatments, foliar sprays, fertigation agents, and other plant treatments on whole plant growth and development.

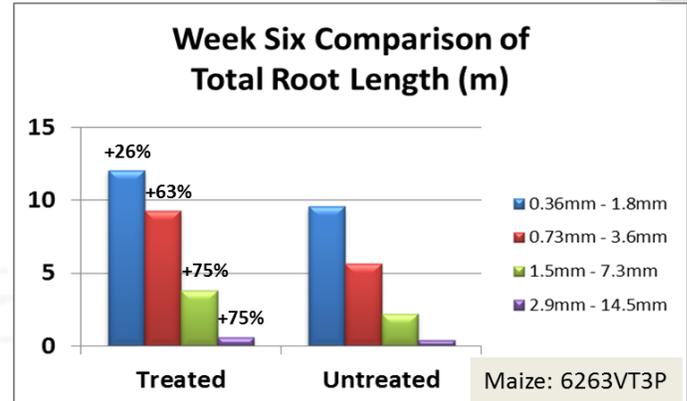
Phenotype Screening Corporation's service provides answers in a quick and effective manner. Our artificial growth substrate and our uniform, controlled Root Lab conditions provide the perfect environment for treatment difference to manifest without random weather, pest, and soil condition effects. Because of the nondestructive nature of our root imaging technology, differences in both the above ground and the below ground development of individual plants can be followed over the life of the experiment.

Treatment Evaluations

The purpose of any treatment is to improve the input cost vs. yield proposition. In order to properly market and apply a treatment a certain level of understanding of the effects of how the treatment works is necessary. Furthermore, notwithstanding the efficacy of a crop protection treatment, it must not have a deleterious effect on the overall integrated development of the plant under pest free conditions.

We can assist by comparing treated vs. untreated plant development in our artificial substrate and controlled environment.

The bar chart below shows a Root System Architecture Signature (RSAS) for the total root length of maize plants under treated and untreated experimental conditions. Each bar



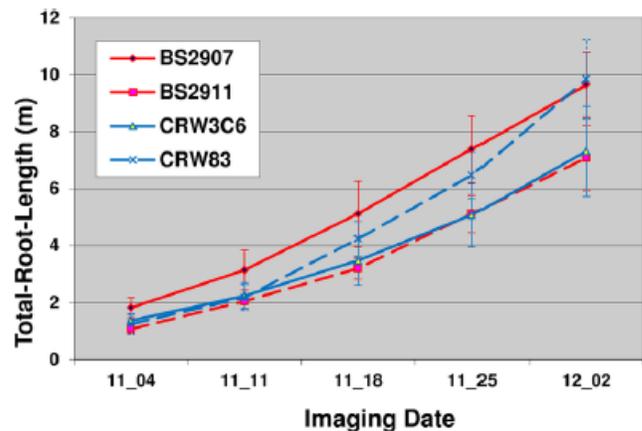
Total Root Length of Maize by Root Diameter Range Under Treated and Untreated Conditions.

represents a root diameter range; note that the diameter ranges overlap as shown in the key on right.

Variety Evaluations

Even with the best above ground phenotyping, a detailed evaluation of root system architecture is important.

We grow your varieties in our Root Lab and show you the differences in above ground vegetative development and in root architecture development over time. The below



Temporal Signature for Total Root Length

Service Description

Comparative Evaluations

(continued)

trajectories for total root length of several varieties of maize illustrate that different varieties can have different growth trajectories.

We provide measures of plant maturity rate, plant height, stalk thickness, leaf area, chlorophyll content index, above and below ground dry biomass, total root length, projected root area and total number of root/ transect crossings. Each root trait is provided for several select root diameter ranges.

Stress Evaluations

Both abiotic and biotic stress can be introduced to the plants grown our Root Lab. Soil and air temperature, watering rates, light intensity levels, light photoperiods, nutrient balance, micro-organism population densities, etc. can be precisely varied in both the presence and the absence of specific treatments.

For instance seed treatments must often function well under cool, wet soil and cool air temperature conditions. Specific conditions such as 55°F soil temperature and 68°F air temperature can be attained in the Root lab.



Soybean Droop Test for Drought Resistance Screening

Example Pricing

For planning purposes example pricing is given below. The Table assumes four comparison sets with eight plants in each set. Three levels of experimental effort and analysis work are priced. These prices are for corn, soybean, or cotton in one meter deep containers. Other plants, container sizes, and experimental procedures are available. In addition quantity discounts are available.

Experiment Activities	Level One	Level Two	Level Three
Provide Research Plan	YES	YES	YES
Germinate Seeds and Select Equi-vigor Seedlings	YES	YES	YES
Tend Plants For Six Weeks In Root Lab	YES	YES	YES
X-Ray Image Plant Root Systems	4	4	4
Provide Digital Files of Root System X-Ray Images	YES	YES	YES
Extract Root Traits From X-ray Images	NO	YES	YES
Record Vegetative Development Stage	NO	NO	YES
Measure Plant Heights at Each Stage	NO	NO	YES
Measure Chlorophyll Content Index at Each Stage	NO	NO	YES
End Of Experiment Root and Shoot Biomass	NO	NO	YES
End of Experiment Stalk Thickness	NO	NO	YES
End Of Experiment Leaf Area	NO	NO	YES
Provide All Measured Data in Spreadsheet Format	NO	YES	YES
Provide PowerPoint Summary Report	NO	YES	YES
Total Estimated Price	\$20,500	\$25,750	\$29,500