

Measuring Soil Health in Florida Citrus Groves

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Effort Statement: Sample collection for this project was recently completed, and we are currently analyzing the data for different indicators for these trials. For example, different components of soil carbon are more responsive to changes in soil health, with mineralizable carbon and permanganate oxidizable carbon (POXC) being more responsive than the traditional methods of measuring soil organic matter. We are starting to do comparisons of methods and measurements for soil enzymes, which might also be a good short-term indicator of changes in soil health.

Summary: Soil health, similar to soil quality, is not a new concept, but it is receiving increased attention because of its impact on crop production. Healthy soils have greater water-holding capacity, nutrient availability, and microbial activity, all of which can impact root growth and nutrient uptake. Several management practices are associated with soil

health improvements, including cover cropping and compost inputs. To assess changes in soil health, growers and researchers can measure different indicators. However, over 20 different indicators can be used to measure soil health, ranging from relatively simple measurements of soil pH to more complicated measurements of soil microbes. Most of the research on soil health indicators has been conducted in annual crops and soils that are very different from Florida citrus systems, and not all soil health indicators may be appropriate for the sandy sub-tropical soils of Florida. For example, soil organic matter is a common soil health indicator, but increases can occur slowly. Other indicators of soil carbon might provide a faster assessment of changes for that aspect of soil health. Therefore, we are conducting a farm-scale study to identify indicators that will provide short- (months) and long-term (years) assessments of changes to soil health in Florida citrus groves. In addition

to making our own measurements of these indicators, we are comparing our results with those of soil health testing services provided by commercial labs. We plan to provide growers and researchers with a list of indicators that are appropriate for assessing and monitoring soil health in Florida citrus.

Take Home Message:

- The sandy sub-tropical soil of Florida requires calibration and assessment of soil health indicators, as most previous soil health indicator work has been conducted in other parts and different agricultural systems of the United States.
- There is a wide range of indicators that can be used to measure soil health, but variations in methodology can make comparisons difficult.
- We hope to provide growers with a short list of indicators that can be easily used to monitor soil health in their citrus groves.

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