

Carbon Testing

Increasing Value

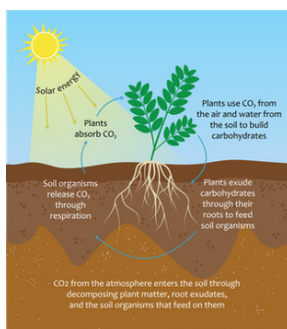
Because the soil can hold more carbon than the atmosphere and vegetation combined, and can hold it in stable forms, people are looking for agricultural opportunities to participate in the carbon credit market. These credits are based on drawing carbon dioxide down from the air into the soil by adopting soil management practices such as reduced tillage and planting cover crops that increase the soil organic matter. The best way to determine just how much carbon is being stored is through soil testing.

AgSource Laboratories provides state of the art Soil Carbon testing with a Dry Combustion analysis.

Measuring Carbon

Carbon in the soil exists in many forms, but for the purposes of measurement, there are three main forms: Total Carbon, Organic Carbon and Inorganic Carbon. The organic carbon in soil makes up about 58 percent of the soil's organic matter. Inorganic carbon includes mineral carbonates and excess or un-reacted lime. When tracking changes in the soil for carbon credits, best practice is to measure the soil's total carbon content by combustion and then subtract inorganic carbon, as needed, to determine the organic carbon content. The commonly used term 'sequestering' carbon means storing carbon by increasing the organic carbon content over time.

There are other reasons to track carbon in your soils, particularly when attempting to increase organic matter or soil health by managing the variables in the carbon cycle. Interestingly, merely measuring something has an uncanny tendency to improve it. What you measure, along with how you measure it, depends on your purpose – why are you measuring carbon? And what you are going to do with the results?



Although there has been buzz about the possibilities of remote sensing or using models to predict soil carbon changes, the gold-standard remains careful, repeated field sampling followed by laboratory analysis using the dry combustion method. This procedure is the most accurate and common test for soil carbon. AgSource continues to follow research on additional methods.

How carbon cycles into and out of soil. Jocelyn Lavallee, CC BY-ND

Quantifying Carbon Stocks

Bulk Density

A Bulk Density sample quantifies the total amount of carbon in the soil. With this measurement, the actual amount of carbon in a specific weight of soil can be calculated and represented on a per acre basis. AgSource Laboratories can determine the bulk density of intact soil cores if they are provided with the inside diameter of the probe tip and the actual length of the soil sample core at the time of sampling. The whole sample core must be submitted to the lab for analysis.

Profile Sampling

Measuring changes in soil carbon is made more complex when seasonal fluctuations and deep soil carbon are considered. Sampling at the same time of year when repeating a sampling series is more important than picking a specific season to collect the samples, as long as soil moisture is favorable for good sampling. Sample depth can be 6 or 8 inches for the surface soil. Profile sample depth ranging from one foot or as deep as three feet is also not uncommon. For both bulk density and carbon content measurements, maintaining exact sampling depth is critical for accurate and repeatable results.

Check with your carbon brokers or 3rd party carbon verifiers on how they want samples collected.

Building Soil Health to Increase Carbon

AgSource recommends pairing a Total Carbon analysis with the Soil Health assessment as an add-on test. This will provide one more measurement of the beneficial effects of improving the health of your soil. An increase in carbon is reflected in several ways including improved nutrient retention and moisture infiltration, as well as greater water holding capacity. Crops grown on healthier soil will be more resistant to seasonal fluctuations in moisture and nutrient availability. See our [Understanding a Soil Health Assessment](#) for more information.

AgSource Laboratories can report carbon results on soil health test packages or as a stand-alone carbon report.

Contact your local AgSource laboratory for sample submission forms and shipping details.