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C WISE

C Wise helps you to manage the key soil factors responsible for building soil carbon. It measures the effect of soil microbes on the carbon levels in your soil, indicates your soil's humus building potential and gives you the full picture of the major carbon pools in your soil. Soil carbon, along with other nutrients, is a key driver of soil microbial activity and the important microbial processes that produce soil health. Soil microbes degrade organic residues into labile (readily available) carbon, using some as food and building the rest into more resistant organic molecules, such as humus. However, a number of soil characteristics need to be in place for humus to be built. There needs to be adequate labile carbon to convert into humus, adequate nutrients in the right ratios, and good soil structure to provide the right physical conditions for humus construction. A must-have test for those serious about soil management, C Wise gives you the confidence to make better informed decisions about soil carbon, building humus and sequestering carbon.

Key features
- Excellent value
- Practical indicators
- Makes high grade info easy

Ideal for:
- Building soil carbon
- Optimising soil carbon management requirements with soil needs
- Managing crop residue breakdown
- Combined overview of some key soil nutrient, biology and structure attributes

Info level

★★★☆

SEE OUR ONLINE PRODUCT SELECTOR

- Our **online product selector** will help you identify which tests you need
- Visit **www.microlabs.com.au/selector**

COLOUR CODED RESULTS FOR EASY UNDERSTANDING

All results are colour coded based on guide values for easy recognition.

Key

Poor | Fair | Good

COMMENTS AND EXPLANATIONS

Each report comes with comments and explanations designed to help you understand your results.

MORE INFO?

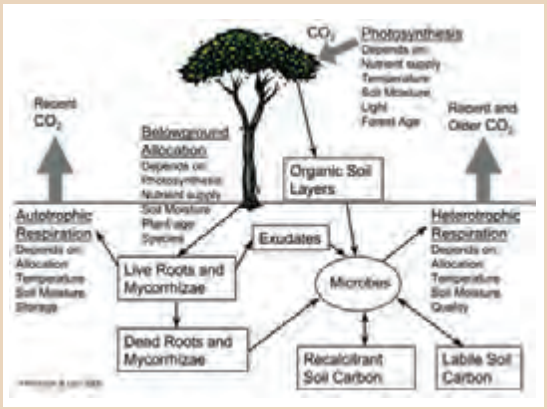
Customised reports with detailed comments and recommendations are also available as an optional extra. See price list for more info.

INFO SHEET

ALSO AVAILABLE IN THESE GREAT VALUE TEST PACKAGES

- Soil Audit
- Soil Professional
- Nutrient Wise

All packages include a free Fill 'n' Go sampling kit with complimentary delivery and return express shipping to the lab. Visit www.microbelabs.com.au/soils today!



THE SOIL MICROBIAL CARBON CYCLE

The source of all carbon in the soil microbial carbon cycle is ultimately carbon dioxide (CO_2) in the air. These days we're used to hearing about CO_2 as a pollutant, but in the soil carbon cycle CO_2 is actually a nutrient, and, moreover, with correct soil management it can be converted into stable forms and stored in the soil - a process called 'carbon sequestration'. Carbon is one of the bases of life for the living part of the soil (biology). It is an essential nutrient for plant growth through photosynthesis, and is passed into the soil in the form of plant residues and exudates, which are used by soil microbes as sources of food and building blocks for resistant forms of soil carbon, such as humus. Soil microbes convert some of their food into CO_2 through respiration. This CO_2 can be recaptured by plants and used for growth through photosynthesis, thus completing the cycle.

For the technically-minded

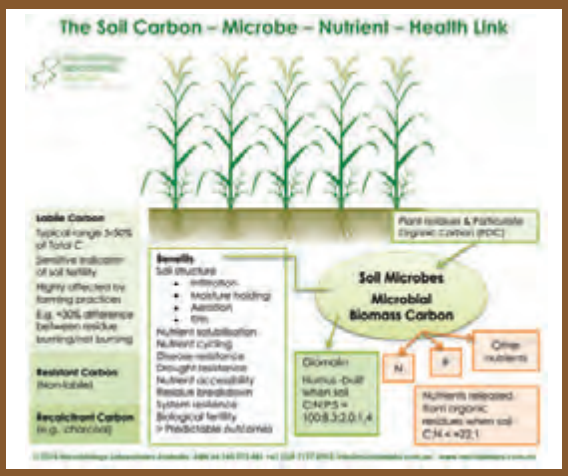
The soil microbial carbon cycle involves many different types of organisms. Recent advances in research have helped to fill gaps in scientific knowledge, particularly in relation to soil carbon pools and mineralisation pathways. However, technical challenges to measurement and research scope have until now limited the availability of data for practical use by soil managers. A part of the successful practical use of some data is the ability to adjust laboratory results to soil temperature and moisture in the field, as these exert a large influence on the rate of microbial processes. C Wise has pulled together the best local and international research to overcome these challenges. Guide values have been estimated from results published in scientific journals and Microbe Labs' own extensive experience over more than a decade.

For further reading and technical information see: soilquality.org.au Fact Sheets - Labile Organic Carbon, Organic Carbon Pools, Organic Carbon Storage, How Much Carbon Can Soil Store?; Ryan & Law (2005), Biogeochem., 73:3-27; Battle-Aguilar et al. (2011), Agron. Sustain. Dev, 31:251–274; Rey et al. (2005), Eur. J. Soil Sci., 56:589-599; Howarth (2014) in Paul (Ed.), Soil Microbiology, Ecology and Biochemistry (4th ed.), pp. 339-382.

SOIL CARBON POOLS

C Wise helps you to manage key soil carbon pools.

1. **Labile Carbon** - Carbon that is 'active' or 'easily available'. Labile Carbon consists of:
   a. **Plant Residues** - distinguishable shoot and root residues on the soil surface and in the soil
   b. **Particulate Organic Carbon** - plant debris 0.053 to 2.000 mm in size
   c. **Carbon Molecules** - starches, sugars and other relatively simple carbon compounds readily available as a microbe food source
2. **Resistant Carbon** - Carbon compounds built by microbes that are relatively resistant to further degradation. Resistant Carbon consists of:
   a. **Glomalin** - a carbon-rich soil protein made by arbuscular mycorrhizal fungi (VAM)
   b. **Humus** - complex organic compounds consisting of carbon and other elements, such as nitrogen (N), phosphorus (P) and sulphur (S)
3. **Recalcitrant Carbon** - Carbon in forms that are highly resistant to degradation, for example, charcoal.



For the technically-minded

Further reading: soilquality.org.au Fact Sheet - Soil Biological Fertility; Kirkby et al. (2016), PLOS ONE, DOI:10.1371/journal.pone.0153698; Post & Kwon (2000), Global Change Biol., 6:317-328; Rillig et al. (2001), Plant & Soil, 233:167-177.

NEED HELP?

We have expert advisors available to help you understand and interpret your report, and provide advice and recommendations if you need them. Book a time on our website today!
www.microbelabs.com.au/advice

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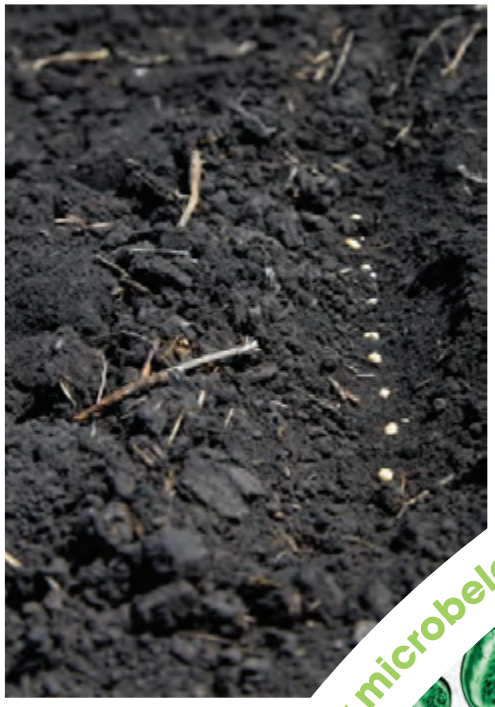

INFO SHEET