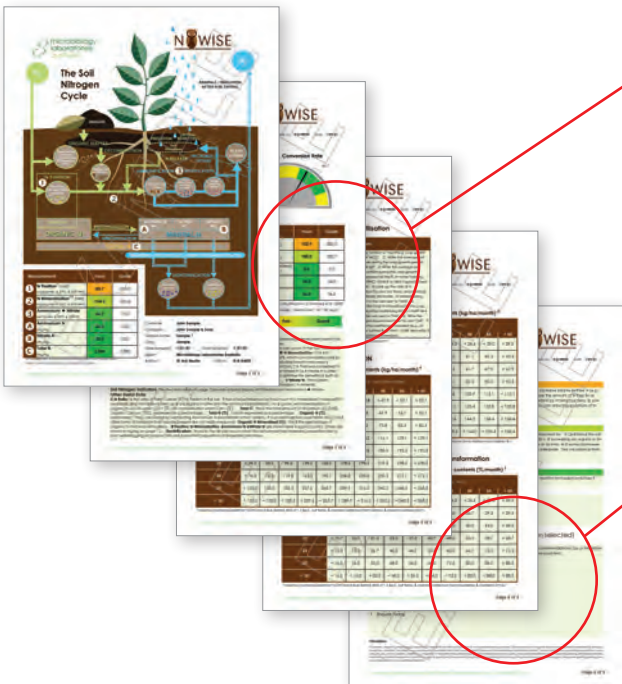




N WISE



N Wise measures the effect of soil microbes on the nitrogen levels in your soil. It uses hybrid microbiology-nutrient test technology to give you the full picture of all the nitrogen pools in your soil and shows the rate at which that nitrogen is likely to be available to plants under your field conditions. Nitrogen is a major input to agricultural soils and a major cost to growers. However, too much nitrogen results in poor nitrogen use efficiency and damages the soil by reducing its inherent abilities to fix, release and transform nitrogen for plant use, and depleting N reserves over time. The comprehensive, 5 page report pulls together the best research in the field, and gives you insight into these normally unseen workings in your soil. A must-have test for those serious about soil management, N Wise gives you the confidence to make better informed decisions about soil nitrogen.



Key features

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

Ideal for:

- Optimal soil nitrogen management
- Matching nitrogen fertiliser requirements with soil needs
- Improving nitrogen use efficiency
- Avoiding depletion of soil N reserves over time

Info level*



SEE OUR ONLINE PRODUCT SELECTOR

- Our **online product selector** will help you identify which tests you need
- Visit www.microbelabs.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.

ALSO AVAILABLE IN THESE GREAT VALUE TEST PACKAGES

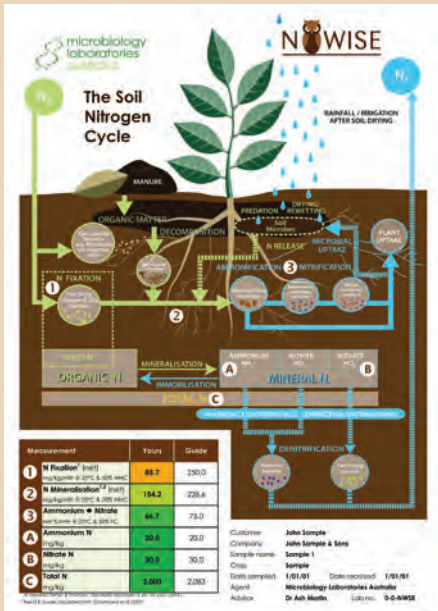
- Soil Audit
- Soil Professional
- Nutrient Wise

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!



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INFO SHEET



THE SOIL MICROBIAL NITROGEN CYCLE

The availability of soil nitrogen to plants is largely controlled by a number of important microbial processes that link to form the soil microbial nitrogen cycle. Microbes interact with every pool and every form of nitrogen in the soil, and control the rate at which nitrogen is fixed into the soil from atmospheric nitrogen (nitrogen fixation), the rate at which organic nitrogen from fixation, plant residues and fertilisers such as urea is released for plant uptake (mineralisation) and the rate at which released nitrogen is transformed in the various plant-available forms (transformation, including ammonification and nitrification). Nitrogen loss under adverse soil conditions such as waterlogging and compaction is also often the result of microbial processes (denitrification). Knowing the levels of nitrogen being handled by soil microbes at each of these important steps is key to optimal soil nitrogen management.

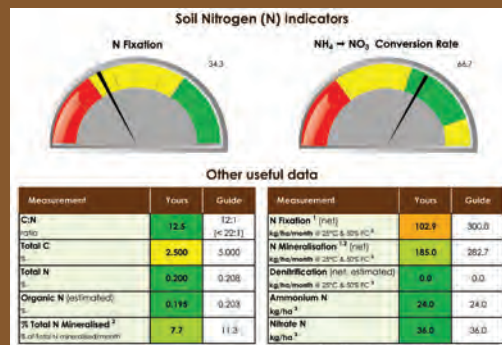
For the technically-minded

The soil microbial nitrogen cycle is perhaps one of the most well-studied biological cycles. However, technical challenges to measurement and research scope have until now limited the availability of data for practical use by soil managers. A key part of successful practical use of such 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. N 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 technical information see: Schomberg *et al.* (2009), *Soil Sci. Soc. Am. J.*, 73:1575-1586; Gilmore & Maoumoustakos (2011), *Soil Sci. Soc. Am. J.*, 75:317-323; Wang *et al.* (2003), *Biol. Fertil. Soils*, 37:362-374; Paul (Ed.) (2014), *Soil Microbiology, Ecology and Biochemistry* (4th ed.).

KEY MICROBIAL PROCESSES IN THE SOIL NITROGEN CYCLE

N Wise helps you to manage four key parts of the soil microbial nitrogen (N) cycle.

- 1. N Fixation** - N fixed from air in the soil by Free Living Nitrogen Fixing Bacteria (FLNFB). This can occur in the root zone of all plants, not just legumes. It can make a substantial contribution to building soil N in all crops.
- 2. N Mineralisation** - N released from soil organic matter (including the microbial biomass) and converted into mineral N, which can be readily used by plants. It is a critical process in the soil N cycle because it determines how much organic N (including fixed N and urea) is converted to plant-available N.
- 3. N Transformation** (Ammonium > Nitrate) - the percentage of ammonium (NH₄⁺) N that was converted to nitrate (NO₃⁻) N. Ammonium N is more resistant to loss through leaching and denitrification than nitrate N, but nitrate N is often more readily absorbed by plants. Ideally, there should be a moderate amount of conversion to optimise the benefits of both of these forms of N.
- 4. Denitrification** - N lost from the soil due to anaerobic soil conditions caused by e.g. waterlogging or compaction.



For the technically-minded

For further technical information see: soilquality.org.au, Soil Nitrogen Supply; Vadakattu *et al.* (2014), *Crop Pasture Sci.*, 10:1044-1056; Phillips *et al.* (2015), *Soil Biol. Biochem.*, 86:201-211; Battle-Aguilar *et al.* (2011), *Agron. Sustain. Agric.*, 312:251-274; Mulvaney *et al.* (2009), *J Environ. Qual.* 38:2295-2314; Paul (Ed.) (2014), *Soil Microbiology, Ecology and Biochemistry* (4th ed.).



NEED HELP?

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