



Microbial Analysis

Sustainable Soil Management with the Mikhail Balance System

FILE NO : 06014362 DATE ISSUED : 19/12/2025
DATE RECEIVED : 9/12/2025

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SAMPLE ID : WORM JUICE ANALYSIS REQUIRED : Active Biological Indicators

| ITEM | UNIT | RESULT | % of Total Active Bacteria |
|--------------------------------|-------|--|----------------------------|
| ACTIVE LACTIC ACID BACTERIA | cfu/g | 1000 | 1.69 % |
| Active Fungi | cfu/g | 25000 | |
| Cellulose Utilisers | cfu/g | 7000 | |
| TOTAL ACTIVE FUNGI | cfu/g | <u>32000</u> | 54.24 % |
| ACTIVE YEASTS | cfu/g | 10000 | 16.95 % |
| ACTIVE ACTINOMYCETES | cfu/g | 2000 | 3.39 % |
| ACTIVE PHOTOSYNTHETIC BACTERIA | cfu/g | 14000 | 23.73 % |
| Total Active Population: | cfu/g | 59000 | |
| TOTAL NITROGEN | | cfu/g = colony forming unit per gram of material %W/V | 0.155 |

Notes: See notes on Biology Management (page 2).
No bacterial colonies were detected on the culture media, if the result is 1000 cfu/g for Lactic Acid Bacteria and Actinomycetes or 100 cfu/g for Yeast, Fungi, Cellulose and Photosynthetic Bacteria.

Notes on Biology Management

The first thing to remember is that SWEP results are for ACTIVE micro-organisms only. This means only those that will immediately grow under ideal conditions (generally about 7-10% of total soil biomass). This allows us to analyse samples year round, since the microbes that are active in spring will still be present in summer or winter, but at very reduced levels of activity. Given the ideal conditions in our cultures, they will spring back to life and grow much more quickly than others.

Active Indicator Organisms

Photosynthetic bacteria like *Rhodopseudomonas spp* and *Bradyrhizobium spp* require only sunlight, carbon dioxide and mineral nutrients to survive. They are important in recycling organic matter, particularly compounds that are difficult to break down - such as pesticide and petrochemical residues. They are also important for synthesis of bio-active compounds that are known to stimulate plant growth.

Yeasts such as *Saccharomyces spp*, *Debaryomyces spp*, *Torulopsis spp* and *Rhodotula spp* synthesise plant growth substances from amino acids and sugars that are produced by photosynthetic bacteria. These substances also promote the growth of Lactic acid bacteria and Actinomycetes.

Lactic acid bacteria such as *Lactobacillus spp*, *Leuconostoc spp*, *Lactococcus spp* and *Pediococcus spp* produce Lactic Acid from sugars and carbohydrates. Lactic acid is a strong bio-suppressive compound that helps control harmful micro-organisms. This effect, together with other trace nutrients produced by members of this group, is particularly beneficial to the growth of Photosynthetic bacteria and Yeasts.

Actinomycetes such as *Actinomyces spp* and *Streptomyces spp* produce antibiotic compounds that are effective suppressants of pathogenic organisms. They have also been shown to produce plant hormones - especially when treated with kelp extracts.

Fungi such as *Aspergillus spp*, *Penecillium spp*, *Mucor spp* and *Rhizopus spp* have many beneficial effects on plant growth. These include the production of enzymes, antibiotics and various growth regulators. They are also important in the conversion of organic matter to humic substances. Some of the less complex compounds produced from this process are also important food sources for some bacteria.

Cellulose Utilisers like *Trichoderma spp* require only minerals and cellulose for growth. These fungi break down plant remains into organic materials that are beneficial to other micro-organisms such as Protozoa.

AQIS Approved Quarantine Site.
Victorian DPI accreditation to receive samples from PIZ and PCN infested zones.

Disclaimer: All results and/or recommendations in this report are made in good faith and are based on past and ongoing research by SWEP Pty Ltd. However, limitations such as the vagaries of climatic conditions mean that we cannot guarantee production of any crop by the use of this test and associated recommendations, and cannot be held responsible for any results obtained.