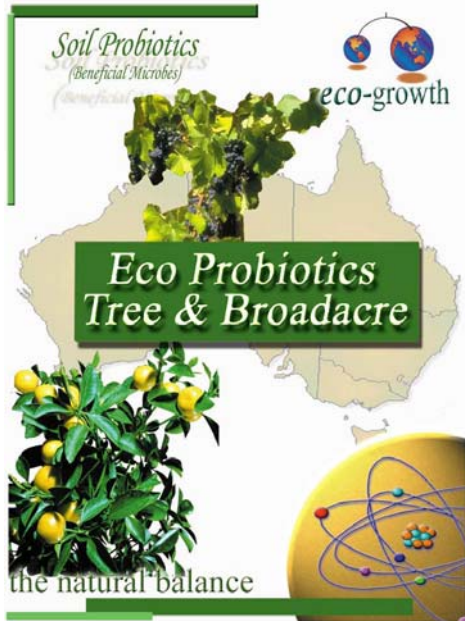


eco-growth
the natural balance



Eco-Probiotics

Soil Restorer



BFA CERTIFIED
ORGANIC INPUT A16004

Beneficial Microbial Soil Inoculum
Creating Living Soils

*- for Broad Acre, Turf, Vegetables, Olives,
Viticulture & Gardens*

Eco-Probiotics Soil Restorer contains a scientifically balanced blend of beneficial bacterial & fungal organisms for:

- Improved plant growth and development
- Reducing transplant losses / planting shock
- Increase soil nutrient availability and water retention
- Reduced need for fertilizers, fungicides and pesticides
- Increased tolerance to drought, soil salinity & polluted soil conditions
- Helping plant resistance to disease
- Encouraging earthworm activity

Available sizes: 200g, 1Kg, 5Kg, 20Kg, or Bulk Loads

PRODUCT DESCRIPTION

Eco-Probiotics Soil Restorer is a combination of cultured BENEFICIAL soil bacteria and fungi micro-organisms. There are three blends available, "Garden", "Lawn & Turf" and "Tree & Broadacre" - specially selected for their use in soil restoration and better nutrient release while helping with pathogen control.

90% of the living mass on earth is in the top 25cm of soil! The soil should be alive!

All nutrient transactions within the soil require bacteria and fungi (85% of these are beneficial and vital for nutrient exchange and subsequent availability to our plants, crops and pasture.)

Eco-Probiotics Soil Restorer inoculates the soil with beneficial microbes (soil structure builders, decomposers, nutrient builders, nitrogen fixers, protectors, and plant growth hormone producers). Micro-organisms select what they need to make the compounds of life (and in a form that are BIO-AVAILABLE), and reject the waste that is not needed, (eg aluminium, iron, etc) – which are generally in excess in our soils. Micro-organisms also control what goes into the plant roots.

Note: These natural controls are TURNED OFF when the soil is made more acid or excessive acidic chemicals are added.

GENERAL ANALYSIS

MAIN STRAINS

- Azotobacter:** Produce plant growth hormones.
- Azospirillum:** Free living nitrogen fixers-converting atmosphere nitrogen in the soil.
- Bacilli:** Lactic acid bacteria, helps with soil condition structure.
- Cellulosic Fungi:** One of the few decomposers of organic matter (cellulose) turning stubble into organic carbon.
- Mycorrhiza:** Nutrient converters and actively source phosphorus from the soil.
- Phoshobacter:** Converts phosphorus into plant available "P"
- Pseudomonas:** Soldier bacteria – helps protect plants against fungal attack in the root zone.
- Rhizobium:** Legume nitrogen fixers.
- Streptomyces:** Bacteria that helps control pathogenic bacteria.
- Saccharomyces:** Yeasts that convert carbon dioxide into sugars within the soil.
- Trichoderma:** Potential to control soil diseases including; Rhizoctonia, Fusarium, Armillaria, Pythium & Phytophthora

MODES OF ACTION

Why the need for balanced populations of soil microbes?

- Fact A: The soil, when healthy, has a living community of soil micro-organisms.
- Fact B: These micro-organisms are responsible for the continuous breakdown of parent rock materials and the decomposition of organic matter that provide a continuous supply of nutrition for plant food. They also draw free nitrogen directly from the atmosphere and make it available for use by plants.
- Fact C: The population and activity of healthy soil bacteria are directly related to the efficiency of fertilizers, chemicals and soil nutrients.
- Fact D: Most soils in Australia have become biologically depleted in the past 20 years due to ever increasing chemical use.

Beneficial micro-organisms form a vital part in the world's cyclic food chain. When organic matter dies and decomposes, bacteria and molds metabolize the highly complex organic molecules into simple inorganic bio-available wastes. Elements of inorganic wastes are then excreted back into the soil to be absorbed and utilized once again as food by earthworms and plants. Some bacterial species release nitrogen, sulfur, phosphorus, and trace elements from organic matter. Others break down soil minerals and release potassium, phosphorus, magnesium, calcium and iron. Still other species make and release natural plant growth hormones, which stimulate root growth. A few species of bacteria fix nitrogen in the roots of legumes while others fix nitrogen independently of plant association. Bacteria are responsible for converting nitrogen from ammonium to nitrate and back again depending on certain soil conditions. Other benefits to plants provided by various species of bacteria include increasing the solubility of nutrients, improving soil structure, fighting root diseases, and detoxifying soil.

Synthetic chemical fertilizers do little to build soil fertility. They simply provide plants with an instant fix of growth elements, then drain into and accumulate in the ground water and rivers – leading to over-nutrition and subsequent algal blooms etc. In fact, many chemical fertilizers kill the micro-organisms and earthworms that keep soil productive and healthy. Most beneficial microbes and earthworms are also very susceptible to concentrated toxic chemicals (most pesticides, insecticides, fungicides and herbicides) (**Morgan AJ, Sturzenbaum SR, Winters C, Kille P.** *Cellular and molecular aspects of metal sequestration and toxicity in earthworms.* Invertebr Reprod Dev 1999, 36(1-3), 17-24).

Although plants essentially require nitrogen, potassium, and phosphorous (NPK), they also require many other trace nutrients, minerals, hormones etc available only in healthy soils full of beneficial microbes. The goal is to restore and / or maintain healthy soil - to provide plants with all the nutrients and growth factors required to be healthy. Many believe that by adding inorganic fertilizers (NPK) to their soils they are “feeding their plants”. In reality, if there are quantities of organic matter in the soil, approximately 80-90% of the inorganic fertilizers are taken up into the life cycles of certain opportunistic microbes – this can lead to an overgrowth of these microbes; to the detriment of other beneficial soil micro-organisms. Eventually, these opportunistic microbes die and then the inorganic nutrients are released into the soil in a bio-available form to be taken up by plant roots.

Soil Probiotics and Restorers

Recent developments in microbiology have identified a range of **highly advanced beneficial soil microbes**, which appear to have **enormous problem-solving potential for agriculture**. The bacteria and fungi involved are sourced from the same "master species" which comprise part of a new **Soil Probiotic** that has produced dramatic results. The product has the greatest impact where the living soil has been heavily worked, mechanically over-tilled and has become unbalanced, and organic carbon levels have plummeted. To date, toxic chemicals have provided dubious results; whereas the promise of this hardy breed of Probiotic "pro-life" bugs is exciting: (Antibiotics = anti-life).

The **Eco-Probiotics Soil Restorer** is a microbial soil inoculum that contains a scientifically balanced blend of beneficial bacterial and fungal organisms totaling **24 types** and strains (including *Azotobacter*, *Azospirillum*, *Bacilli*, *Cellulosic fungi*, *Phosphobacter*, *Pseudomonas*, *Rhizobium*, *Streptomyces* and *Saccharomyces*). Its use greatly increases and stimulates the natural beneficial microorganisms, resulting in **massive population increases in the soil**. It is 100% organic and 100% non-toxic, and works to reintroduce & create a healthier living environment for the normal functions of the desirable microorganisms and earthworms, thus **enhancing biological and sustainable life in the soil**.

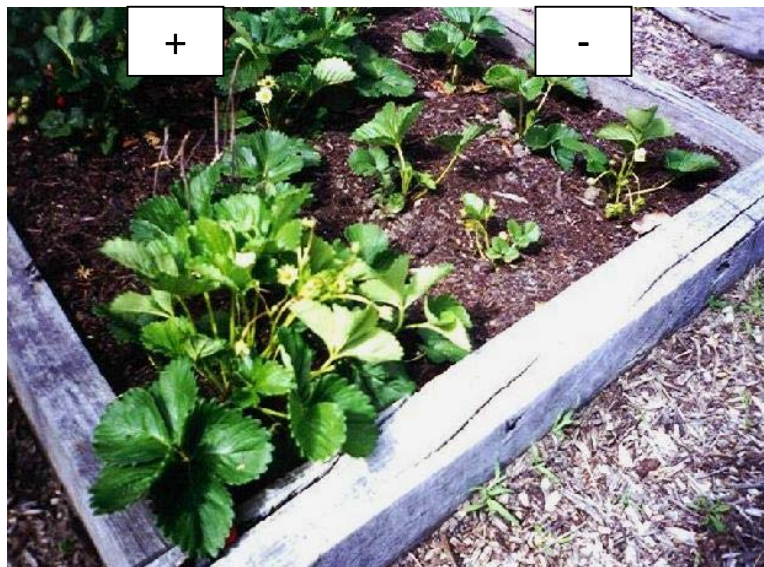


Figure 1: 3 week old strawberries, same water, minerals & soil conditions – those on the left were treated (Plus Probiotics), those on the right were (Minus Probiotics)

Whilst the primary purpose of Probiotics are to balance microbial activity, many important side benefits have been noted. The product is not a fertiliser, fungicide, insecticide, herbicide or nematode control agent, however users have consistently reported the following benefits: -

- a. Regulation of the pH level.
- b. Assists in the control of aggressive nematodes.
- c. Assists in the control of pathogenic fungi.
- d. Plant strength increases natural insect resistance.
- e. Some insect pests are destroyed in the soil, notably lawn grub (bacteria can break down the waxy coating of their eggs).

- f. Reduction in water requirements.
- g. Increased root formation.
- h. Increased root quality.
- i. Root strength activates natural weed repulsion.
- j. Increased soil mineral availability (50 to 200%).
- k. Dramatic reduction in chemicals and fertilisers required.
- l. Rapid breakdown of added organic matter.
- m. Increased protein level of crops.
- n. Improved fibre/moisture ratio aids frost resistance.
- o. Better appearance.
- p. Improved soil and plant life quality.
- q. Improved soil workability. Better soil moisture retention.
- r. Soil improvement resists water and wind erosion.
- s. Improved frost and drought resistance.
- t. Increased nutrient level of crops.
- u. Increased earthworm activity.

STORAGE :

Store powder in Sealed container. Store contents in a dry and cool area. Do not expose dry powder to moisture, freezing temperatures or direct sunlight.

- Do not store in diluted form.
- Not to be taken.
- Remove fine strainers and filters. Use nozzles larger than 100um
- If equipment has previously been used for pesticide, neutralize with recommended neutralizing agent and triple rinse.
- Wash equipment after use.
- The user is referred to safety information contained in Material Safety Data Sheets available from Eco-Growth.

APPLICATION

FOR USE ON : Soil, Plants, shrubs, seedlings, flowers, vines, orchards, citrus trees, stone fruit, vegetables, field crops, pasture etc.

Domestic Application

- Activate microbes for 48hrs prior to application (50g/10Litres water – best at 30°C with occasional stirring).
- Apply at 100ml per square metre or 100ml per 1m high plant
- Initially drench soil around plant, & lightly water after 30mins.
- root or foliar feed every 24 - 30days (25g /10Litres)
- spray underside of leaves as well - apply late afternoon

USE PRE-INCUBATED MICROBES WITHIN 5 DAYS

Commercial Application

| METHOD | PROCEDURE |
|---|---|
| (Cereals) SEED DRESSING: Wet Seeding (Seeding into moist ground, preferred method) | 40 grams Microbes per/ha 200 mls Fish Concentrate per/ha For 1 tonne of seed mix 750g Probiotic Microbes with 2.5 litres Fish Concentrate and 7.5 litres clean water (see activating microbes below). When activated, dilute apply at 6-7 litres/tonne of grain or seed at augering. For fine seed (canola) you may need to dilute the concentrate 1:1 with water and apply at 12-15 litres/tonne. Use seed within 48 hours. |
| (Cereals) SEED DRESSING: Dry Seeding (Seeding into dry ground) | Mix 1kg Microbes with 10 litres of Fish Concentrate (DO NOT ADD WATER) make slurry and mix immediately to one tonne of seed until evenly coated, use within 48 hours. |
| FOLIAR FEEDING (Cereals & Pasture) - Boom Spraying Broad acre | 100 grams Microbes per/ha 1 litre Fish Concentrate per/ha Activate microbes and use the concentrate at 1 litre/ha with a minimum of 40 litres of clean water. Best sprayed morning, evening, night when there is moisture or even light rain. The dilution can be as high as 1 litre to 450 litres water. *Note – very important the spray equipment is clean of residual chemical before using the Microbes. |
| Horticulture (Vegetables, Turf) | Apply concentrate at 2.5 litres/ha in 400 litres water at planting and follow up 30 days later with 1 litre/ha in 400 litres/water and 4 litres fish concentrate. |
| Activating The Microbes (making Eco Pro-Biotic concentrate) | To make the Eco Pro-Biotic concentrate for folia and fertigation, use 1 kg of broad acre microbe blend and mix with 10 litres of clean water. There are 2 methods; Standard - Stir the concentrate mixture and allow to stand in a warm place for at least 48 hours stirring occasionally. Use the mixture within 48 hours of activating. Heated - Use a fish tank heater and aerator (cost \$60-\$70) and heat to 30 C. This mix can be used within 12 hours and is preferred as it ensures better microbe growth, use within 48 hours of activating. |

USE PRE-INCUBATED MICROBES WITHIN 5 DAYS

Note: The information in this document is provided to the user in good faith and represents knowledge of the product and processes at the date of printing. Every care is taken during manufacture and handling of this product and the preparation of recommendations pertaining thereto. The manufacturer or their agents accepts no responsibility for damage arising from misuse or non-adherence to current recommendations.



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