

NOCULATE[®]

MICROBIAL TURF ENHANCEMENT

BRANDT[®]

globe
GROWING SOLUTIONS

NOCULATE®

BIOLOGICALLY ENHANCED FERTILISERS

KEY FEATURES

- **High quality NPK nutrient delivery**
- **Freeze-dried technology for microbial population**
- **Solubilise locked soil nutrients**
- **Improved nitrogen cycling**
- **Improved root systems: root hairs and branching**
- **Improve soil health**
- **Rejuvenate soils which have been treated with pesticides**
- **Reduce disease activity**
- **Improved soil nutrient availability and nutrient uptake**
- **Contains Humic Acid and Wetting agent**
- **Small granule under 100 SGN allows year-round use on greens**

Globe Growing Solutions

biologically enhanced fertilisers (Noculate Range) are manufactured utilising a unique, technology-driven production process. Each individual formulation benefits from the addition of a select consortium of highly beneficial soil microorganisms. These microscopic wonders have the ability to fix atmospheric nitrogen and solubilise minerals in the soil profile, both of which facilitate the never-ending quest by plants to sequester nutrition.

The soil matrix contains many naturally occurring inorganic substrates such as calcium phosphate, which are not plant available. Many of the microbial species in Noculate fertilisers have the capacity to produce organic acids, these acids solubilise a portion of the calcium phosphate. The end result is more calcium and

phosphorus is made available to the plant, essentially tapping a nutrient reserve not available under normal circumstances. Globe also incorporated nitrogen-fixing bacteria into their fertiliser blends, which serves to satiate the nitrogen requirements of plants.

Free-living, nitrogen-fixing bacteria have the capacity to convert di-nitrogen (N₂) from the atmosphere into a plant available form of nitrogen (NH₃).

To put nitrogen fixation into perspective, roughly 2/3 of the global input of fixed nitrogen arises from biological processes. Independent studies have shown that soils rich in nitrogen-fixing bacteria can sequester upwards of 100 Kg of N per hectare per year, thus supporting the importance and benefit of incorporating nitrogen-fixing bacteria into fertiliser blends.

The addition of microorganisms also enhances a plants ability to absorb nutrients. A complex series of biochemical reactions increases the permeability of the plants cellular membrane, which in turn facilitates nutrient uptake. Tissue analysis trials at Auburn University in the USA have consistently shown that plants fed biologically enhanced fertilisers contain more nitrogen, phosphorus and potassium than plants fed non-biologically enhanced fertilisers with the same N, P, K analysis.

Healthier soils make for a healthier turf plant

Humic Acid adds essential organic material to soil which aids water and nutrient retention and improves soil structure. It promotes micro rhizal fungi and stabilises nitrogen aiding in the plants ability to uptake nutrients.



The addition of microorganisms also serves to prolong the fertilisers ability to stimulate growth by reducing the incidence of nutrient leaching.

Soil bacteria incorporate free nitrogen into their metabolic functions. Much of this nitrogen would have been lost forever to the plant through the leaching process, had the bacteria not incorporated it into their cell mass and temporarily stored it. This storehouse of nitrogen is then given back to the plant through a complex process known as nutrient mineralisation. In short, the addition of beneficial soil microorganisms to Noculate fertiliser blends serves to satiate the short term and long term nutritional requirements of the plant. They have the capacity to expedite nutrient availability, facilitate nutrient absorption and to continue providing these nutrients to the plant over an extended period of time.

Noculate fertiliser blends will also improve the structure of the soil matrix over time by way of its biological component (bacteria & fungi). Many soil bacteria have the capacity to produce a glue-like substance (polysaccharides), which serves to create micro-aggregates in the soil profile. These micro-aggregates are then wound together by fungal hyphae to create macro-aggregates. This biologically induced process improves the soil structure over time, enhancing percolation as well as the oxygen holding capacity of the soil matrix. Aside from their ability to positively affect plant nutrition and soil structure, the microbial systems utilised to augment Noculate fertilisers afford the plant and soil a number of other quantifiable benefits. They serve to stabilise soil pH, increase humus levels, improve CEC of soil, increase the photosynthetic capacity of the plant, enhance root architecture, stimulate plant growth via production of PGR's and provide plants with increased resistance to environmental stress such as disease, heat, cold, drought and foot traffic.

MICROBIAL COMPONENTS IN NOCULATE® FERTILISER BLENDS

Bacillus subtilis

- Prolific enzyme producer, catalyses countless bio-chemical reactions in the soil.
- Produces organic acids to solubilise mineral for plant availability (mineralisation).
- Produces polysaccharides to improve soil structure (micro-aggregates).
- Stimulates plant growth through the production of plant growth compounds (PGR).
- Provides plants with increased resistance to environmental stress.

Bacillus licheniformis

- Prolific enzyme producer, catalyses countless bio-chemical reactions in the soil.
- Produces organic acids to solubilise mineral for plant availability (mineralisation).
- Produces polysaccharides to improve soil structure (micro-aggregates).
- Stimulates plant growth through the production of plant growth compounds (PGR).
- Provides plants with increased resistance to environmental stress.

Bacillus megaterium

- Prolific enzyme producer, catalyses countless bio-chemical reactions in the soil.
- Produces organic acids to solubilise mineral for plant availability (mineralisation).
- Produces polysaccharides to improve soil structure (micro-aggregates).

Bacillus coagulans

- Prolific enzyme producer, catalyses countless bio-chemical reactions in the soil.
- Produces organic acids to solubilise mineral for plant availability (mineralisation).
- Produces polysaccharides to improve soil structure (micro-aggregates).

Bacillus pumilis

- Prolific enzyme producer, catalyses countless bio-chemical reactions in the soil.
- Produces organic acids to solubilise mineral for plant availability (mineralisation).
- Produces polysaccharides to improve soil structure (micro-aggregates).

Bacillus stearothermophilis

- Prolific enzyme producer, catalyses countless bio-chemical reactions in the soil.
- Produces organic acids to solubilise mineral for plant availability (mineralisation).
- Produces polysaccharides to improve soil structure (micro-aggregates).
- Performs well in extremely warm soils (thermophilic).

Bacillus stearothermophilis

- Produces polysaccharides to improve soil structure (micro-aggregates).
- Fixes atmospheric nitrogen into plant available form.
- Stimulates plant growth through the production of plant growth regulatory compounds (PGR).

Trichoderma viride

- Stimulates plant growth through the production of plant growth regulatory compounds (PGR).
- Provides plants with increased resistance to environmental stress.
- Improves soil structure through the formation of macro-aggregates.

Globe Noculate fertilisers contain multiple strains of each genus/species outlined above.



NOCULATE®

MICROBIAL TURF ENHANCEMENT

NOCULATE® GRANULAR FERTILISER RANGE FOR RENOVATION AND MAINTENANCE OF HEALTHIER TURF

PRODUCT	ANALYSIS	RATE 100m ²
NOCULATE® XN	24-0.5-5 plus 1% Fe, 6% Humic Acid	1.5-4.0kg
NOCULATE® COMPLETE	17-1-14 plus 2% Fe, 1% Humic Acid	1.5-4.0kg
NOCULATE® STARTER	7-9-4 plus 8% Humic Acid	1.5-4.0kg

BETWEEN NOCULATE® GRANULAR APPLICATIONS

NOCULATE® LIQUID

LIQUID MICROBIAL INOCULANT

CAN BE INCORPORATED WITH MOST OTHER LIQUID PRODUCTS

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