

Assure Engineered Problem Solving Fertilizers

The Ingredients:

ITEMS PROVIDED BY ASSURE PRODUCTS THAT OTHER FERTILIZERS AND ORGANIC SOIL AMENDMENTS TYPICALLY DO NOT PROVIDE.

Biological Inoculums Applied To Assure Pasteurized Granular Medium:

The general strains of microorganisms and their functions are listed in a separate table:
BROAD SPECTRUM INOCULANT: 66 STRAINS

Bacillus: 46 strains to include

Bacillus subtilis Bacillus licheniformis Bacillus megaterium Bacillus pumulis Bacillus azotoformans Bacillus coagulans **Bacillus firmus** **Bacillus amyloliquefaciens** Paenibacillus polymyxa Paenibacillus durum Bacillus azotoformans Bacillus coagulans Geobacillus stearothermophilus

Endospore formers (survive in harsh environments)
 Free living nitrogen fixers Solubilize minerals & nutrients in soil profile Enhance nutrient absorption
 Enhance photosynthetic capacity Produce plant regulatory compounds (growth promotion)

Pseudomonas: 6 Strains to include

Pseudomonas putida **Pseudomonas fluorescence** Pseudomonas aureofaciens
 Provide increased resistance to abiotic stress Produce plant regulatory compounds (growth promotion)
 Enhance photosynthetic capacity Free living nitrogen fixers

Streptomyces: 7 Strains to include

Streptomyces lydicus Streptomyces griseus Streptomyces coelicolor
 Prolific enzyme producers (nutrient solubilization)
 Produce plant regulatory compounds (growth promotion) Enhance soil structure.

Trichoderma: 7 Strains

Trichoderma reesei Trichoderma hamatum Trichoderma harzianum
 Solubilize phosphorous in the soil Facilitate nutrient absorption Provide increased resistance to abiotic stress

Microbial Nutrients

Dextrose 55.00 %, 10.00% Sucrose, 3.00 % Amino Acids **Amino Acids to include Methione,**
 3.0 % Vitamin Blend (B Complex, Biotin), 2.50 % Natural Silica (Drying Agent) Bio-Stimulants

Amino Acid Profile:

Amino acids are derived from organic proteins. Approximately 50% of the content of Assure products by weight is amino acids. The amino acid distribution and the contribution of each amino acid to the total amino acid source is presented in the following table.

Yellow highlights indicate products that have been shown to suppress nematodes

| AMINO ACID SOURCE AND DISTRIBUTION TABLE | | | | | |
|--|-------|-------------------|--------------|------------|-------|
| Alanine | 4.47% | Lysine | 2.76% | Tyrosine | 1.06% |
| Arginine | 3.74% | Methionine | 1.15% | Histidine | 1.32% |
| Aspartic | 6.45% | Phenylalanine | 1.98% | Valine | 2.43% |
| Cystine | 0.53% | Proline | 4.32% | Isoleucine | 1.72% |
| Glutamic | 7.15% | Serine | 2.35% | Leucine | 3.37% |
| Glycine | 7.39% | Threonine | 2.07% | Ornithine | 0.00% |
| Hydroxyproline | 0.00% | Tryptophan | 0.30% | | |

Carbohydrate Profile

The polysaccharide and monosaccharide carbohydrates in controlled release form are derived primarily from dextrose, corn syrup solids and to a lesser degree from the other organic ingredients. Approximately carbohydrates react with amino acids to form an easily digestible metabolic energy source for microorganisms. Saccharide carbohydrates comprise about 10% of the formulation. The saccharide distribution and the contribution to the total carbohydrate source are presented in the following table.

CARBOHYDRATE PROFILE TABLE

| | | | | | |
|-----------------|-------|-----------------|------|-------------------|-------|
| Monosaccharide | 19.6% | Pentasaccharide | 7.4% | Nonasaccharid | 3.2% |
| Disaccharide | 15.1% | Heptasaccharide | 4.8% | Decasaccharide | 2.6% |
| Trisaccharide | 11.8% | Hexasaccharide | 5.9% | Higher saccharide | 16.0% |
| Tetrasaccharide | 9.2% | Octasaccharide | 3.9% | | |

Assure Products provide a gentle carrier medium.

SOLUBLE SALT PROFILE:

| | HHI 15-0-7 | HHI 12-2-18 | HHI 7-7-7; 8-0-6 | Detection Limits |
|---------------------|------------|-------------|------------------|------------------|
| Total Soluble Salts | 2.5% | 2.6% | 2.0% | 0.10% |
| Sodium (Na) | 0.27% | 0.28% | 0.20% | 0.01% |

Humic Acid and Kelp Meal Profile

Assure products applied at the rate of $\frac{3}{4}$ pounds of Nitrogen per 1,000 sq. ft. provide the following soil amendments and bio-stimulants:

HUMIC ACID AND KELP MEAL PROFILE

| | Per 1,000 sq. ft. | Per acre |
|-----------------------------|-------------------|------------|
| Humic Acid, 15% concentrate | .25 lbs. | 10.89 lbs. |
| Kelp Meal Concentrate | .25 lbs. | 10.89 lbs. |

Major and minor plant food nutrients provided by Assure products:

Assure products provide the following plant food nutrients derived from multiple sources to provide a source of available and controlled release plant food with 70-75% of nutrients released by biological activity and remainder by hydrolysis.

| NUTRIENT | DERIVED FROM |
|-----------------|---|
| Nitrogen | Feather meal, Methylene urea, ammonium sulfate, urea, monammonium phosphate, meat and bone meal, kelp |
| phosphorus | Monammonium phosphate, dicalcium phosphate, meat and bone meal |
| Potassium | Potassium Phosphate |
| Calcium 2.00% | Dicalcium phosphate, hydrated lime, meat and bone meal |
| Sulfur 1.00% | Potassium sulfate, sulfate from minor nutrients |
| Iron 2.00% | Iron oxide, Iron sulfate |
| Manganese 0.20% | Manganese sulfate |
| Magnesium 1.0% | Magnesium sulfate, magnesium oxide |
| Zinc 0.20% | Zinc oxide |
| Copper 0.20% | Copper oxide |

12-2-18 contains Potassium Nitrate in place of sulfate of potash