

# Assure Engineered Problem Solving Fertilizers

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## 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 amyloliquefaceans 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 aureofaceans**  
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.

**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	<u>Feather meal</u> , <u>Methylene urea</u> , <u>ammonium sulfate</u> , <u>urea</u> , <u>monammonium phosphate</u> , <u>meat and bone meal</u> , <u>kelp</u>
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