LUMINA™

AMINO ACIDS

Lumina™ is a unique plant fertilizer produced via microbial fermentation that contains a bioavailable source of plant nutrients, amino acids, and polypeptides that can promote plant vigor and nutrition in all conditions. The amino acids in Lumina may improve nutrient availability, especially when added to tank mixes containing additional nutrients. Lumina will improve crop tolerance to abiotic stress and improve overall crop nutrition while enhancing the function of beneficial microbes.

LUMINA™ FEATURES & BENEFITS

- Bioavailable nutrients elicit and increase photosynthesis / stimulate plant growth
- Source of bioavailable nitrogen compliments inorganic nitrogen
- Boosts plant metabolism
- Enhances crop quality and yield under both favorable and stressful growth conditions
- Increases plant tolerance to abiotic stress

LUMINA™ pH

Lumina has a naturally low pH of 4.3 ± 0.8, so it may lower the pH of nutrient solutions when mixed. However, it is generally not necessary to adjust the nutrient solution pH after adding Lumina even if the pH value is lower than expected. Because Lumina contains relatively low levels of mineral nutrients but significant amounts of organic compounds like amino acids, polypeptides, and carbohydrates, the resulting nutrient solution pH is therefore easily manipulated once introduced to the soil system and plant's rhizosphere.

If you notice a pH drop after adding Lumina to your nutrient solution, don't worry--it's natural. If you want to closely monitor how the plant and rhizosphere are changing your nutrient solution pH, take irrigation run-off pH readings after watering. Keep an eye on plant response following nutrient applications, but don't worry too much about perfecting the pH before watering.

GUARANTEED ANALYSIS

Total Nitrogen (N)	0.5%
0.5% Water Solube Nitrogen	
Soluble Potash (K_2O)	0.5%

Derived from: molasses and shrimp protein hydrolysate*

Shrimp protein hydrolysate is the material obtained by the hydrolysis of proteins to their constituent amino acids and short polypeptides. They are a source of nitrogen.

APPLICATION RATES

CROP	Container (mL/Gal)	Field (L/Acre)
Cannabis	10-20 mL	1-2 L
Vegetables	0.5 - 1 mL	1-2 L
Fruit	0.5 - 1 mL	1-2 L
Row Crops	-	1-2 L
Nut Trees	-	1-2 L
Ornamental / House Plant	0.5 - 1 mL	-

APPLICATION GUIDELINES

• Applying Lumina **via root drench** will help complex nutrients in your usual feed program, making them easier for the plant to uptake which is the primary benefit of root drenches.

• Applying Lumina **via foliar spray** may quickly fix nutrient deficiencies and boost leafy growth

• Lumina can be applied via drip irrigation, overhead irrigation, backpack sprayers, or tank- mixed with traditional fertilizers for direct injection

• Lumina can be mixed with most fertilizers, pesticides, herbicides, and fungicides--always test compatibility

• Mix well before use!

USING LUMINA WITH TRIBUS ORIGINAL

Tribus Original and Lumina are compatible and can be used together for a 'compound' effect. The bacteria in Tribus are responsible for producing extracellular enzymes such as protease, lipase, tannasse which breakdown the lipids, proteins, and carbohydrates found in Lumina for plant uptake. In turn, the carbon content found in Lumina can act as a food source for the bacteria found in Tribus which may help with colony formation in areas outside of the rhizosphere. Together, Tribus and Lumina will substantially enhance root mass, yield, and flower quality by providing the plant with superior nutrition and microorganisms.

STORAGE CONDITIONS

• Protect from frost; Protect from heat and direct sunlight.

• Store in a cool dry place between the temperatures of 2°C / 35.6°F and 48°C / 118.4°F away from direct sunlight. The product will freeze at -10°C / 14°F

Lumina™ by Impello®

Lumina™ is a unique nutrient solution derived by microbial fermentation that increases the activity of multiple critical metabolic pathways in the crop. **Lumina™** contains carbon, nitrogen, true protein, amino acids, and essential metabolic micro-nutrients, which enhance crop tolerance to environmental and physiological stresses and provide a source of nitrogen to complement the applied nitrogen.

COMPONENT	RANGE**	CAS #	ANALYSIS METHOD
Protein*	5.4 ± 1.4 % w/v (Crude)	NA	AOAC 990.03
Nitrogen	0.9 ± 0.2 % w/v	7727-37-9	AOAC 993.13
Potassium	0.7 ± 0.2 % w/v	7440-09-7	AOAC 985.01
Carbon	7.2 ± 2.0 % w/v	7440-44-0	ASTM D5373
Manganese	6.0 ± 1.5 ppm	7439-96-5	AOAC 985.01
Copper	6.0 ± 4.0 ppm	7440-50-8	AOAC 985.01
Iron	46.0 ± 21.0 ppm	7439-89-6	AOAC 985.01
Amino Acid*	2.5 ± 0.6 % w/v	See Annex	AOAC 994.12 (Alt I & Alt III) AOAC 988.15 AOAC 985.28
pH	4.3 ± 0.8	NA	Electrometric
Density	9.01 ± 0.25 lb/gal	NA	Hydrometer

* This is a natural product and thus seasonal variation in raw materials contributes to the reported component ranges.

** Each component range represents average and standard deviation of the middle 80% of all the available data set

NA: Not apply

ANNEX

Amino Acids	Num. CAS	% w/v
Alanine	56-41-7	0.47%
Arginine	74-79-3	0.03%
Aspartic Acid	56-84-8	0.11%
Cystine	52-90-4	0.01%
Glutamic Acid	56-86-9	0.06%
Glycine	56-40-6	0.22%
Histidine	71-00-1	0.02%
Isoleucine	73-32-5	0.21%
Leucine	61-90-5	0.24%
Lysine	70-54-2	0.07%
Methionine	63-68-3	0.08%
Phenylalanine	63-91-2	0.14%
Proline	147-85-3	0.34%
Serine	302-84-1	0.03%
Threonine	72-19-5	0.10%
Tryptophan	73-22-3	0.01%
Tyrosine	60-18-4	0.05%
Valine	72-18-4	0.21%