UPP Biostimulants

Fertiliser Group 3




Andermatt

UPP Biostimulants

The newly developed UPP (Unlocking Plant Potential) biostimulant range offers enhanced plant growth solutions to growers in all agricultural sectors.

What are *Biostimulants*?

'Plant biostimulants contain substance(s) and/or micro-organisms whose function when applied to plants or the rhizosphere is to stimulate natural processes to enhance/benefit nutrient uptake, nutrient efficiency, tolerance to abiotic stress, and crop quality.'
- The European Biostimulants Industry Council (EBIC)

Why use *Biostimulants*?

Biostimulants can assist growers to 'produce more with less'.
Biostimulants target specific natural growth processes within plants. Increasing or decreasing these specific functions unlocks greater potential for growth, yield, quality, stress tolerance and more.

UPP Biostimulants

UPP stands for 'Unlocking Plant Potential'. The range consists of 4 products each containing a different targeted biostimulant that impacts on a different specific plant growth stage. Active ingredients include specific amino acids, vitamins, plant alcohols and organic acids.

Rhiz-UPP	***Shoot-UPP***
Rhiz-UPP is designed to improve root development and early growth in both annual and perennial crops. It can be used alone or in conjunction with beneficial rhizosphere microbes including *Trichoderma* and *Bacillus* based products. *Rhiz-UPP* contains the biostimulants tryptophan and methionine, known natural precursors of auxin and ethylene production.	*Shoot-UPP* contains the natural fatty alcohol, triacontanol (which is found in plant cuticular waxes) as well as ascorbic acid as a synergist. Triacontanol improves chlorophyll production and stimulates vegetative growth. Ascorbic acid functions as an antioxidant, protects chlorophyll from oxidative damage and reduces negative effects of stress conditions (eg. drought).
Set-UPP	***Size-UPP***
Set-UPP contains brassinolide (a steroidal lactone) that is found in almost all plants in nature and has a wide variety of benefits from inducing stress tolerance to cell elongation and expansion. Brassinolide improves pollen fertility and germination rates, germ tube elongation, pollination and fruit set.	*Size-UPP* contains the active ingredient N-ATCA (N-acetyl–thiazolidine-4-carboxylic acid) which is derived from the amino acid cysteine. N-ATCA is absorbed easily by plants and once in the plant cells it releases what are known as thiol groups, leading to improved fruit size. N-ATCA improves enzymatic processes, optimises metabolism of carbohydrates and proteins, and impacts on cell division.

Trial data:

1. Rhiz-UPP

Features	Benefits
Tryptophan as amino acid precursor to auxin production either by plants themselves or by rhizosphere microorganisms	Synergy with Plant Growth Promoting Rhizobacteria (PGPR's), many of which are known to stimulate root growth through auxin production in the rhizosphere
Methionine as precursor to ethylene production	Ethylene interacts with auxin in lateral root development as well as root and stem elongation
Kelp	Promotes early root growth

2. Shoot-UPP

Features	Benefits
Triacontanol – a fatty alcohol found in plant cuticular waxes	• Stimulates processes related to photosynthesis (chlorophyll production) and vegetative growth • Increased photosynthesis results in increased energy reserves in plants and greater yield potential
Ascorbic acid – antioxidant	• Protects chlorophyll from oxidative damage • Helps plants better cope with stress conditions
Amino acid – plant based protein hydrolysate with high levels of glycine and glutamic acid	• Natural source of nitrogen • Natural complexing agent which when applied with micronutrients can help complex the nutrients and improve their uptake by plants • The amino acids glycine and glutamic acid are key components of chlorophyll production

3: Set-UPP

Features	Benefits
Epi-brassinolide as biostimulant improves pollination and reduces stress induced physiological fruit drop	Better fruit set & retention, increases crops yield potential
Amino acids such as methionine, proline and lysine are known to play various roles in terms of improving pollen fertility and germ tube elongation	Improved pollination results in improved fruit set and increased yield potential

4: Size-UPP

Features	Benefits
N-ATCA derived from cysteine and folic acid	Improves fruit size through its effects on enzymatic processes, cell division and metabolism of carbohydrates and proteins
Folic acid	Synergist to N-ATCA and plays an important role in protein synthesis
Protein hydrolysate/Amino acid tryptophan (50g/L)	Amino acids like tryptophan have been shown to positively influence fruit size

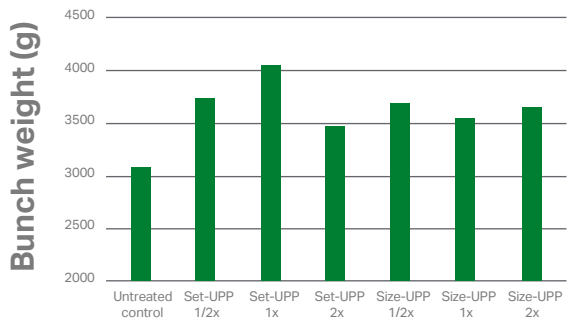

Figure A: Effect of biostimulant treatments on grape bunch weight (weight per 5 bunches). Trial conducted on Crimson Table Grapes on the Paarl region of South Africa.

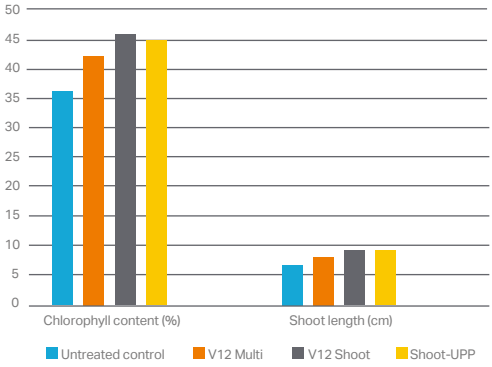

Figure B: Effect of different products (all containing triacontanol as active) on chlorophyll content and shoot length in citrus.

UPP Biostimulants

UPP biostimulant positioning in row crops (maize, wheat, soya, etc.)

	At planting (in-furrow application)	Vegetative growth (2-3 weeks after emergence)	Early reproductive stage	2 weeks later
Rhiz-UPP	1 L/ha			
Shoot-UPP		1 L/ha		
Set-UPP			0,5 L/ha	
Size-UPP				1 L/ha

UPP biostimulant positioning in leafy vegetables

	At planting	2 weeks later	2 weeks later
Rhiz-UPP	1 L/ha		
Shoot-UPP		2 L/ha	
Size-UPP			2 L/ha

UPP biostimulant positioning in tree crops (fruit or nuts)

	At transplant/ First root flush of season	Vegetative growth phase	Early flower	Fruit/nut filling
Rhiz-UPP	3 L/ha – can be applied with *Eco-T* ® and/or *RhizoVital® 42*			
Shoot-UPP		4 L/ha		
Set-UPP			1 L/ha	
Size-UPP				4 L/ha

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