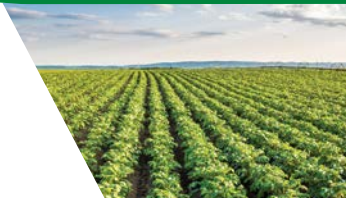




Biostimulant Solutions

PRODUCT RANGE OVERVIEW



Andermatt
Madumbi

Biostimulant definition

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

– Dr Brendon Neumann,
Andermatt Global Product Portfolio Manager



Biostimulant solutions

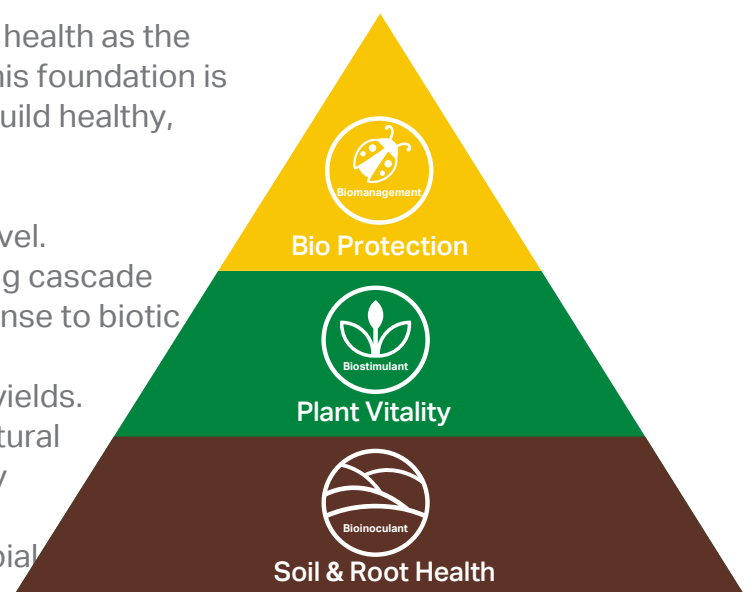
On a global level, the biostimulant sector is one of the fastest-growing agricultural sectors as growers look for new ways to 'grow more with less'. The demand for food production is increasing with a growing global population. At the same time, resources in the form of arable land, quality water supply, etc. are limited.

On a local level, the South African authorities have recognised the importance of this sector through the establishment of the Group 3 (biostimulant) fertiliser registrations. The requirements of the Group 3 registrations are more stringent, costly and time-consuming than conventional synthetic fertilisers. As a result of these requirements, future products entering the South African market will be adequately backed by science.

Biostimulant Plant Health

At Andermatt Madumbi, we view soil and root health as the foundation of sustainable agriculture. Once this foundation is laid, crop care and plant health is needed to build healthy, nutrient-dense, high quality yields.

Biostimulants impact plants on a molecular level. They interact with the plant's internal signalling cascade reactions, reducing the plants negative response to biotic and abiotic stress. Biostimulants act in low concentrations, optimising plant growth and yields. Indirectly, biostimulants also stimulate the natural microbial food web to benefit the plant. Highly productive plants produce exudates into the environment. In soil, this increases the microbial diversity which will drive further release of minerals from the soil for uptake by the plant.



Andermatt Madumbi Sustainability Pyramid

Therefore, biostimulants drive the whole ecosystem that supports plant health, and does not just supply an individual nutrient or component to fill a single specific need.

Andermatt Madumbi Biostimulant solutions

Mineral Biostimulant Range



AgriSil K50[®]

Strengthens plant cells and improves tolerance to biotic and abiotic stress.

B3756	Available in: 450 ml, 1 L, 5 L, 20 L and 1000 L	Fully soluble, liquid formulation of Potassium silicate designed for agricultural use. The ultimate silica supplement to aid in building plant stress and disease tolerance.
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BioCarb-K

Efficient, plant available potassium for chloride-free nutritional support.

K9558	Available in: 1 kg, 5 kg, and 25 kg	Potassium supplement in a chloride free formulation to support potassium fertilisation of all crops, but especially crops sensitive to chloride in the form of potassium bicarbonate.
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Fulvic Acid Powder

A natural chelator, plant growth promotor and microbial stimulant.

B4796	Available in: 5 kg, 25 kg	Concentrated, high quality extracts of Fulvic Acid, improves the availability of nutrients 'locked up' in the soil. For use as an additive to foliar applications as a natural chelator, growth promotor and detoxifying agent.
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Humate Crystals and Liquid

Carbon based soil conditioner, 'feeds' the soil and the microbes it contains.

B4797 B4946	Available in: 600 g, 5 kg, 25 kg, 20 L and 1000 L	Concentrated, high quality extracts of Humic Acid sourced from ancient Leonardite deposits. An essential soil conditioner and nutrient stabiliser for use with synthetic fertilisers. Available in a highly concentrated potassium humate crystal and liquid formation.
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Microbial Biostimulant Range



Activate N[®]

A biological fertiliser for biological nitrogen supply.

B4417	Available in: 1 ha and 5 ha packs	A combination of natural plant growth promoting bacteria formulated to enhance nutrient utilisation, especially nitrogen. Contains <i>Herbaspirillum seropedicae</i> & <i>Bacillus subtilis</i>
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MycoUp Activ[®]

A biological fertiliser containing active mycorrhizal fungi to support enhanced root growth.

M0010	Available in: 200 g and 1 kg	Highly concentrated powder formulation of <i>Glomus iranicum</i> var. <i>tenuihypharum</i> var. <i>nova</i> .
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RhizoVital[®] 42

Liquid formulation of beneficial bacteria to colonise the root and enhance root development.

B4201	Available in: 40 ml, 500 ml, 1 L, 5 L and 20 L	Highly concentrated liquid formulation of the beneficial bacteria <i>Bacillus amyloliquefaciens</i> . Designed for inoculation into the root zone, aiding with mobilisation of nutrients and supporting healthy root growth.
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Andermatt Madumbi V¹² Range



V¹² Initiate

Supports and optimises the initial plant growth phases, germination or bud burst.

B4513	Available in: 450 ml, 1 kg, 5 kg, 30 kg and 1300 kg	Specially formulated nutritional support for early growth phases and maintenance of healthy plants
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V¹² Shoot

Supports and optimises the vegetative growth phase.

B4510	Available in: 1 L, 5 L and 20 L	A unique blend of minerals, amino acids, vitamins and natural plant growth stimulants (e.g. kelp and Triaccontanol)
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V¹² Fruit

Supports and optimises flowering and fruiting.

B4511	Available in: 1 L, 5 L and 20 L	A unique formulation of Boron, amino acids, vitamins and natural plant growth stimulants (e.g. kelp and brassinolide).
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V¹² Finish[®]

Supports the crop during the final stages of reproductive growth fruit fill and ripening.

K9557	Available in: 1 L, 5 L and 20 L	Plant nutrition containing a unique blend of specific minerals and amino acids.
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V¹² Multi[®]

The all-in-one vitality package and excellent stress tonic for plants under high nutritional demand.

B4512	Available in: 450 ml, 1 L, 5 L, 20 L and 1000 L	Incorporates a full spectrum of amino acid chelated nutritional elements, from A - Zinc.
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V¹² Micro[®]

Supports fast and effective handling of potential micro nutrient deficiencies.

B4514	Available in: 1 L, 5 L, 20 L	Plant nutrition loaded with amino acid chelated micronutrients.
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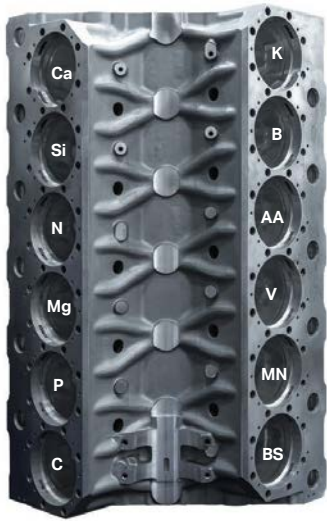
V¹² Maxi K

Supports crops and growth stages with high potassium demand.

K9877	Available in: 20 L	Liquid formulation containing high levels of potassium balanced with a range of micronutrients. Contains P, K, Zn, Cu, Mn, Fe, B and Mo.
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V¹² Biostimulant range

The V¹² Biostimulant range is based on the 12 essential components of plant vitality, ie. the engine that drives plant growth.



8 KEY ELEMENTS

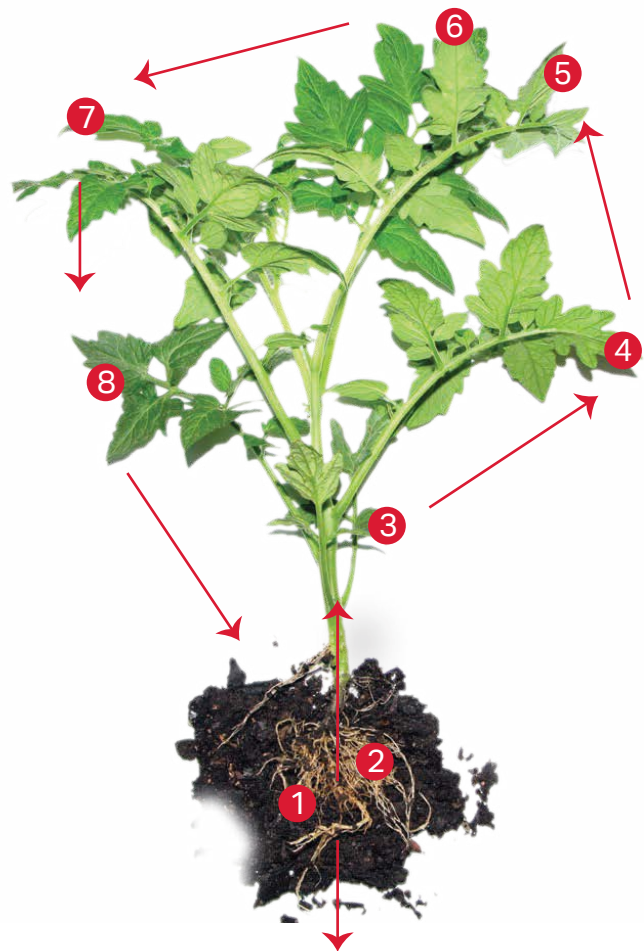
1. Calcium
2. Silica
3. Nitrogen
4. Magnesium
5. Phosphorus
6. Carbon
7. Potassium
8. Boron

4 KEY DRIVERS

9. Amino Acids
10. Vitamins
11. Micronutrients
12. Biostimulants

8 KEY ELEMENTS

1. **CALCIUM** drives uptake of other elements & is essential for cell division
2. **SILICA** creates a well-functioning transport system for improved water & nutrient uptake
3. Which requires **NITROGEN** for formation of new DNA, amino acids, etc.
4. Amino acids form chlorophyll which is activated by **MAGNESIUM** to for capturing light and photosynthesis
5. Light energy is transformed with into ATP using **PHOSPHORUS**, the plant's energy carrier
6. ATP drives production of sugars from **CARBON** based building blocks captured from the air (CO₂)
7. **POTASSIUM** is the electrolyte that drives the transport of sugars through the plant and creates the mechanism by which all nutrients enter plant cells
8. **BORON** creates the sap pressure that drives uptake and movement of all nutrients



4 KEY DRIVERS

AMINO ACIDS are involved in plant stress physiology and can help plants to better tolerate/recover from stress conditions.

VITAMINS: Vitamin C contains antioxidant properties which reduce damage from free radicles and play a role in regulating cell division. Vitamin B1 improves photosynthetic efficiency, root growth and stimulates Induced Systemic Resistance (ISR).

MICRONUTRIENTS perform unique and key functions in plant metabolism (Zn, Mn, Co, Fe, etc.).

BIOSTIMULANTS play a role in stimulating a range of plant processes and improving plant efficiency.

At Andermatt Madumbi, we combine niche products and proven management strategies to produce the best outcome in terms of healthy, high yielding, nutrient-dense, low residue crops.

Our regional team of biospecialists are constantly refining programs to ensure Andermatt Madumbi remains at the forefront of new developments to best assist all growers.

Biostimulants in summary

Product	Macro Biostimulants				Micro Biostimulants		Amino Acids						Vitamins				
	Kelp	Fulvic Acid	Protein Hydrolysate	K lignosulphonate	Triacantanol	Brassinolide	TRP	GLY	GLU	PRO	LYS	MET	ARG	C	E	B1	B6 +12
V ¹² Initiate	✓	✓	✓	✓													
V ¹² Shoot	✓		✓		✓			✓	✓								
V ¹² Fruit	✓		✓			✓				✓	✓	✓		✓		✓	
V ¹² Finish®	✓		✓					✓									
V ¹² Multi®	✓	✓	✓		✓										✓		
V ¹² Micro®	✓	✓	✓												✓	✓	✓

Product	Macro elements (g/kg)						Micro elements (mg/kg)						
	N	P	K	Ca	Mg	S	Si	Fe	Zn	Cu	Mo	Mn	B
V ¹² Initiate			2.86	74.8	1.76	63.83	69700	3323	23145	222	41	18357	4043
V ¹² Shoot	10				10.78	31.94		24000			4520	5742	
V ¹² Fruit	8.8					2.9							20500
V ¹² Finish®	6	90	202										
V ¹² Multi®	75.1	79.92	92.46		0.34	3.72		1712	534	175	39	348	252
V ¹² Micro®	11.66		15.12		6.86	35.6		30411	14030	4075	741	11869	6300



Healthy Food and Healthy Environment, for all



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Activate N® contains *Herbaspirillum seropedicae* & *Bacillus subtilis*. Reg. No. B4417, Act 36 of 1947. AgriSil K50® contains potassium silicate. Reg. No. B3756, Act No. 36 of 1947, skin irritant. PQ Silicas South Africa (Pty) Ltd, PO Box 14016, Wadeville, 1422. Reg. No. 2000/027189/07. BioCarb-K contains potassium. Reg. No. K9558, Act No. 36 of 1947. Fulvic Acid Powder contains fulvic acid. Reg. No. B4796, Act No. 36 of 1947. Humate Liquid contains humic acid and potassium. Reg. No. B4946, Act No. 36 of 1947. Humate Crystals contains humic acid and potassium. Reg. No. B4797, Act No. 36 of 1947. MycoUp Activ® contains *Glomus iranicum* var. *tenuihypharum* var. *nova*. Reg. No. M0010. Act No. 36 of 1947. RhizoVital® 42 contains *Bacillus amyloliquefaciens* FZB42. Reg. No. B4201, Act No. 36 of 1947. V¹² Initiate contains potassium, sulphur, calcium, magnesium, manganese, zinc, iron, silica, copper, molybdenum and boron. Reg. No. B4513, Act No. 36 of 1947. V¹² Multi® contains nitrogen, phosphorous, potassium, sulphur, magnesium, iron, copper, zinc, manganese, boron and molybdenum. Reg. No. B4512, Act No. 36 of 1947. V¹² Micro® contains nitrogen, potassium, magnesium, sulphur, iron, manganese, zinc, copper, boron and molybdenum. Reg. No. B4514, Act No. 36 of 1947. V¹² Shoot contains nitrogen, magnesium, sulphur, iron, manganese and molybdenum. Reg. No. B4510, Act No. 36 of 1947. V¹² Fruit contains nitrogen, sulphur and boron. Reg. No. B4511, Act No. 36 of 1947. V¹² Finish® contains nitrogen, phosphorus and potassium. Reg. No. K9557, Act No. 36 of 1947. V¹² Maxi K contains phosphorous, potassium, zinc, copper, manganese, iron, boron and molybdenum. Reg. No. K9877, Act No. 36 of 1947. Andermatt Madumbi (Pty) Ltd, Postnet Suite 20, Private Bag X6011, Hilton, 3245. Reg. No. 2009/020798/07.