



PRODUCT KNOWLEDGE · SOIL & ORGANIC

Tornado

Amino acids · fulvic · humic · seaweed extract

A four-way foliar biostimulant for the weeks when the crop is under load — amino acids, fulvic and humic fractions and seaweed extract in one spray.

PS 5606-2023

Licence CM/L-4125/2025

500 ml · 1 L

Foliar

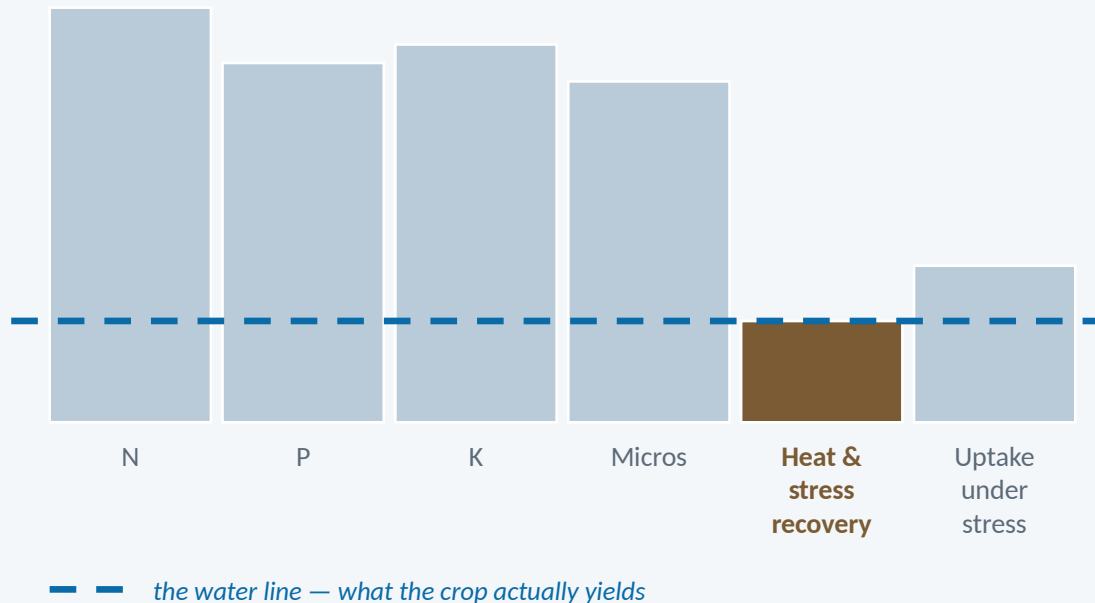


Vital Agri Nutrients (Pvt) Ltd · van.com.pk

For information only. VAN may change a product's composition at any stage for agronomic, efficiency or upgrade reasons.

A full nutrition programme still fails in the wrong week.

Carl Sprengel set the law out in 1840; Justus von Liebig made it famous. The staves are usually drawn as nutrients — but whatever is limiting is the limitation.



The stress week

A crop at 45 °C in June closes its stomata, stops assimilating and starts spending energy on making its own osmolytes and amino acids from scratch. Nothing is deficient in the soil. The staff that is short is the plant's capacity to keep working through the window — and that is what a biostimulant is for.

A biostimulant does not replace a nutrient. If a nutrient staff is the short one, fix that first — a soil test tells you which. VAN Lab publishes its prices.

THE PACK

What is actually in the bottle.

A concentrate in two pack sizes. One specification — the bottle size follows the crop, not the formulation.



Tornado — 500 ml and 1 L

AMINO ACIDS

10% w/v (100 g/L) — per label

FULVIC ACID

Included — proprietary bio-stimulant blend

HUMIC ACID

Included — proprietary bio-stimulant blend

SEAWEED EXTRACT

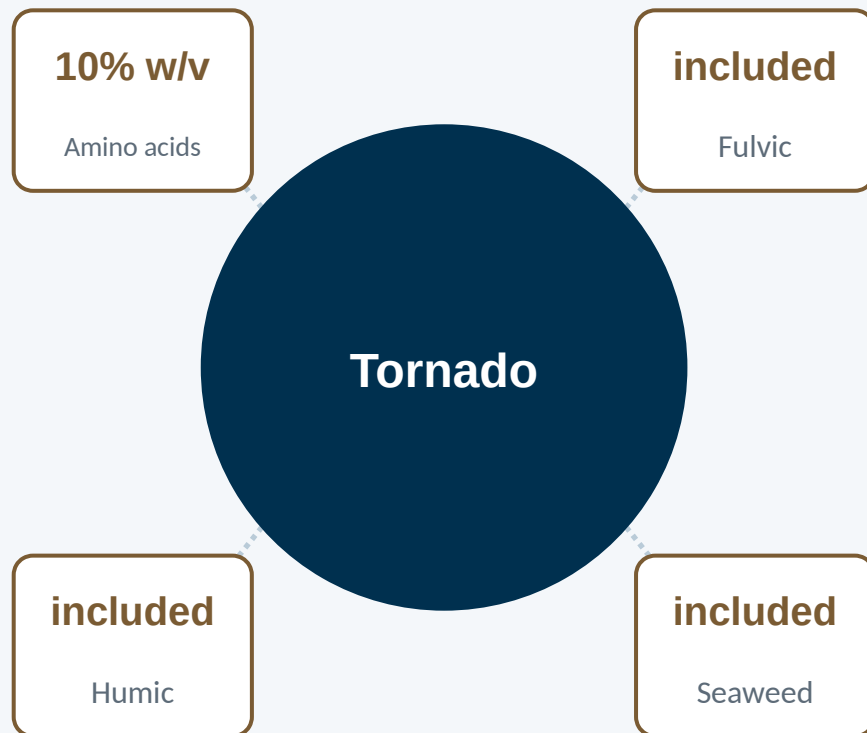
Included — proprietary bio-stimulant blend

ROUTE

Foliar spray, at the stress window and the quality push — 500 ml or 1 L per acre depending on the crop

What the label declares.

As registered under PS 5606-2023 and as published on van.com.pk. One component carries a declared figure; the other three are named as part of a proprietary blend.



ROUTE

Foliar

sprayed on the leaf, not applied to the soil

WINDOW

**Mid-life /
maturity**

grand growth and the quality push

STANDARD

PS 5606-2023

biostimulant product class

Four fractions, four different jobs.

This is not a blend of four versions of the same thing.

1 Amino acids — the energy shortcut

A plant builds its own amino acids from nitrate, and the reduction step is expensive in energy. Supplying them ready-made lets a stressed crop skip that cost and spend what it has on growth and recovery instead. Declared at 10% w/v.

2 Fulvic — the carrier

The smallest of the humic fractions, and the one that moves. Fulvic acid chelates cations and carries them across the leaf surface, which is why it belongs in a foliar rather than a soil product.

3 Humic — the conditioner

The larger fraction. Improves wetting and retention on the leaf and supports the same chelation chemistry that makes humates useful in the soil.

4 Seaweed extract — the signal

Seaweed extracts are used agronomically for their effect on the plant's own hormone and stress-response signalling rather than for nutrient content. It is the fraction that acts on how the crop behaves, not on what it is fed.

Read Tornado as four mechanisms in one pass, applied when the crop is under load — not as a fertilizer with extras.

What the crop does with it.

Six effects, none of them a nutrient being supplied.

1 Skips the reduction cost

Ready-made amino acids save the energy a plant spends reducing nitrate to build them

2 Holds the spray on the leaf

Humic and fulvic fractions improve wetting and retention, so more of what is sprayed stays put

3 Carries cations to the leaf

Fulvic chelates and carries — which is why it improves a tank-mixed micronutrient too

4 Supports stress signalling

Seaweed extracts act on the plant's own hormone and stress responses

5 Recovery after a shock

Heat, salinity, transplant and chemical stress all cost the crop growing days; recovery is where the return is

6 Quality at the end

Applied at grand growth and maturity, the target is fill and finish — not more vegetative growth

This is a mid-life and maturity product.

Where Tornado sits in VAN's published crop programmes.



Grand growth is the anchor — watermelon, citrus and wheat all carry it there. Strawberry and basmati rice take it at early growth instead, which is the window where those two crops are most exposed.

Stage weights show where the published programmes place the product, not a measured uptake curve. A biostimulant has no uptake curve in the sense a nutrient does.

A carrier is only worth having if something is being carried.

Established interactions between soil nutrients — after Mulder. These describe how nutrients behave with one another, not how Tornado performs.



Works with

Fulvic and humic fractions chelate iron, zinc, manganese and copper, keeping them in a form the leaf can take up

Chelated micronutrients applied to the leaf bypass the soil chemistry that would otherwise lock them up

Foliar application places nutrition where calcareous soil cannot intercept it

A crop that recovers faster from a stress window resumes taking up everything else in the programme



Competes with

Excess calcium suppresses iron, zinc, manganese, boron, magnesium and potassium together — the reason a foliar route exists at all

Excess phosphorus suppresses zinc, iron and copper

Excess iron reduces phosphorus, manganese and zinc

High pH on the leaf surface as the droplet dries reduces what stays available — which is part of what the chelating fractions are doing

Tornado is a good tank partner for a micronutrient precisely because of the chelating fractions. Always jar-test a new mix before spraying an acre.

WHERE IT IS USED

Five crops in the published programmes, field and horticulture.

Tornado appears in VAN's locked 2025 crop nutrition plans as a foliar spray at grand growth or early growth.

Wheat

Basmati Rice

Citrus

Watermelon

Strawberry

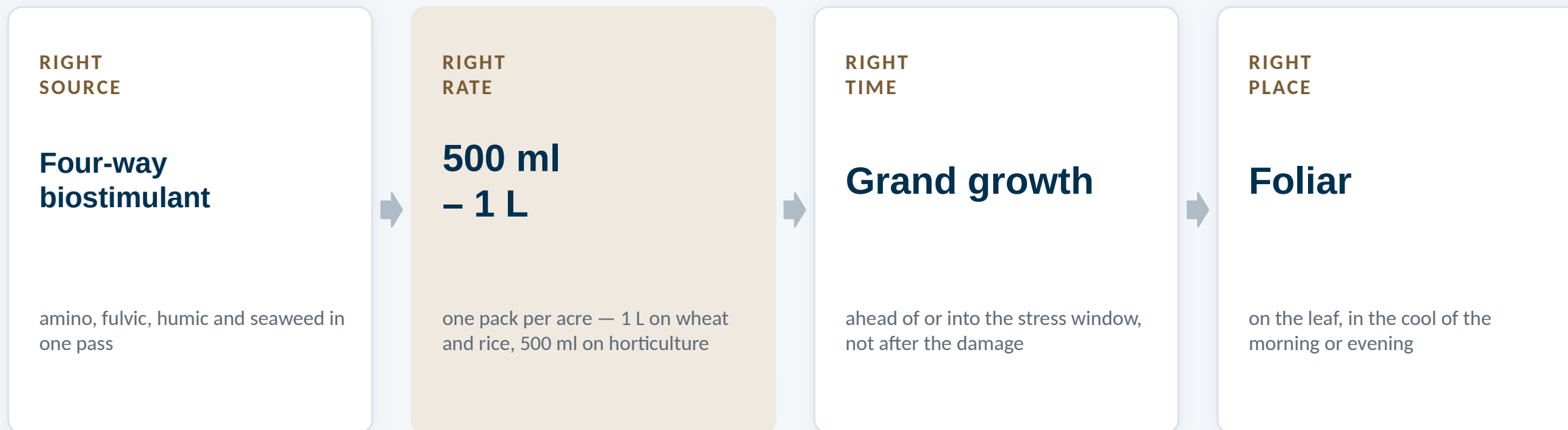
Published stage-by-stage at van.com.pk/crops/.



The pack follows the crop, not the chemistry. Broadacre — wheat and basmati rice — takes the 1 L bottle; the horticulture entries take the 500 ml. Confirm the rate per acre for crops outside these five before recommending it.

Right source, right rate, right time, right place.

The published doses. VAN publishes a rate and a stage, not a yield promise.



Spray timing within the day matters for a foliar. A droplet that dries in seconds at midday has not been absorbed — it has been wasted.

Total amino acid content is the wrong number to compare on.

Two products can declare the same percentage and behave completely differently. Three things decide which one works.

What the label percentage hides

A total figure says nothing about form, source or freeness.

- Total amino acids includes bound protein the plant cannot absorb — only FREE amino acids are taken up directly
- Harsh acid hydrolysis racemises L-amino acids into a mixture of L and D forms, and destroys some amino acids outright
- A plant's enzymes are built for the L form. The D form is not simply weaker — it is a different molecule
- Animal-derived hydrolysates carry a different amino profile and different origin questions

What VAN declares for Tornado

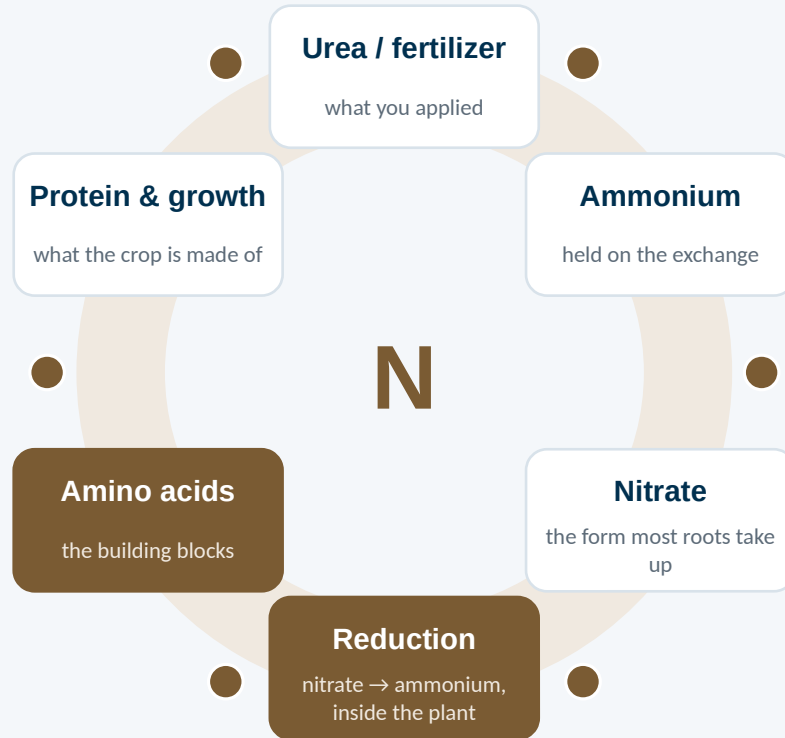
Named plainly, so a buyer can compare like with like.

- L-form amino acids — the configuration plant enzymes actually use
- Extracted from plant sources, not from animal by-product
- Free amino acids, available for uptake rather than locked in protein
- Declared at 10% w/v on the label, alongside three named biostimulant fractions

Ask any supplier three questions: is it L-form, is it free or total, and what was the source material. A product that will not answer all three is not being compared on the same basis as one that will.

Amino acids let the crop skip the most expensive step in the nitrogen cycle.

What a plant normally has to do with nitrate before it can build anything with it.



1 The reduction step is expensive

Converting nitrate back to ammonium inside the plant costs energy — reducing power the crop would otherwise spend on growth.

2 A stressed crop cannot afford it

At 45 °C the stomata close, assimilation stops, and the energy budget the reduction step draws on is exactly what has shrunk.

3 Supplying them ready-made skips it

Amino acids applied to the leaf enter the cycle after the expensive step, not before it. That is the whole mechanism, and it is why timing matters more than dose.

This is why a biostimulant is not a fertilizer. It does not add nitrogen — it changes what the crop has to spend to use the nitrogen already there.

The fractions are not four versions of the same thing.

Each one links to the rest of the programme differently — which is why they are in one bottle rather than four.

1 Amino acids ↔ nitrogen

Enter after the reduction step, so they lower the energy cost of using applied nitrogen. Declared at 10% w/v.

2 Fulvic ↔ the micronutrients

The smallest and most mobile humic fraction. It chelates iron, zinc, manganese and copper and carries them across the leaf surface — which is why Tornado is a good tank partner for a micronutrient and a poor one to spray alone on a soil problem.

3 Humic ↔ retention on the leaf

Improves wetting and how long the droplet stays workable. More of what you sprayed is still there to be absorbed.

4 Seaweed ↔ the crop's own signalling

Seaweed extracts are used agronomically for their effect on hormone and stress-response signalling, not for nutrient content. It acts on how the crop behaves, not on what it is fed.

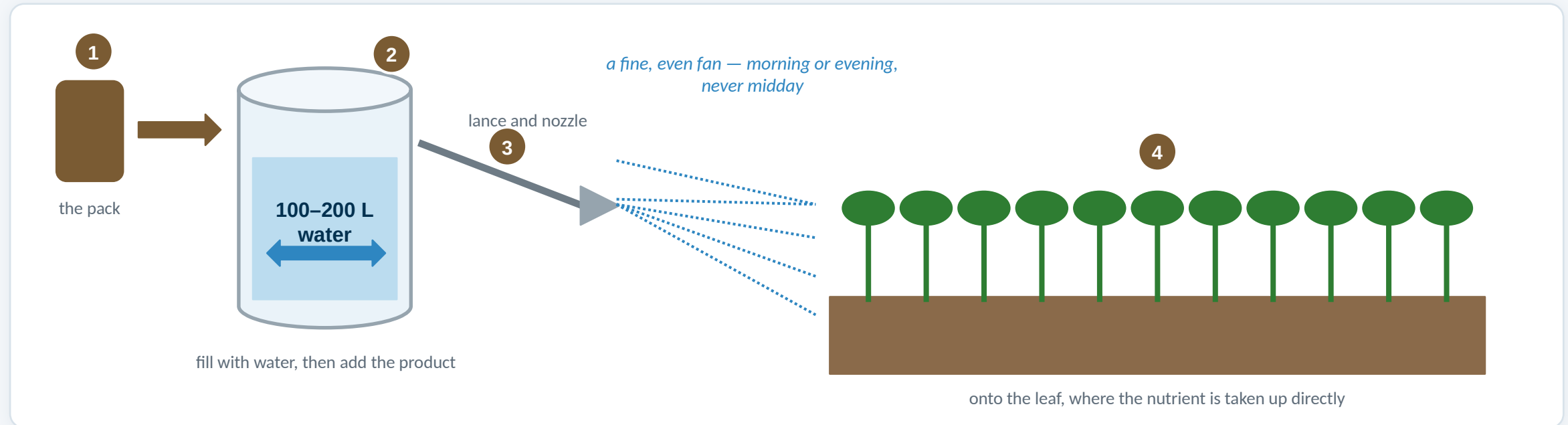
5 Named, never numbered

Fulvic, humic and seaweed are declared on the label as included in a proprietary blend. They are named here and carry no figure — that is deliberate, and it is VAN policy, not an omission.

HOW IT IS APPLIED

Water first, product second — never the other way round.

A biostimulant supports a crop through a load. Timing is the whole product.



1 Water first

100–200 L of clean water in the tank. Always water first, product second — never the other way round.

2 Add and keep agitating

500 ml per acre on horticulture; 1 L on wheat and basmati rice. A tank that settles sprays the last acre at a different rate from the first.

3 A fine, even fan

Cover the leaf without running off it. Morning or evening — midday is the wrong half of the day.

4 At the right stage

At grand growth — and into a stress window, never after it.

Doses are per acre, from VAN agronomy. The dilution is part of the rate: cutting the water to save a pass doubles the concentration on the leaf.

Four things that decide whether it works.

1

Spray ahead of the stress, not after it

A biostimulant supports a crop through a load. Applied a week after the heat wave, it is treating damage that is already done.

2

Morning or evening

Absorption happens while the droplet is still wet. Midday in a Punjab summer is the wrong half of the day.

3

It is not a substitute for nutrition

If the crop is short of nitrogen, potassium or a micronutrient, fix that. This product works on the plant's response, not on its supply.

4

Jar-test the tank mix

Tornado mixes readily, but a biostimulant plus a micronutrient plus a pesticide is three chemistries in one tank. Test a jar before you commit an acre.

What is behind the bottle.

1

PS 5606-2023

Registered against the Pakistan Standard for the product class.

2

Licence CM/L-4125/2025

PSQCA marks licence, printed on the pack.

3

Tested before it ships

Every batch is tested in VAN's own PNAC-accredited laboratory, ISO/IEC 17025:2017, LAB-336.

4

Certificate on request

Send the batch number off the bottle and VAN will send the certificate of analysis for that batch. Free, no sample, no form.

SOURCES

Where every figure in this deck came from.

⚠ VAN declarations	L-form amino acids and plant-source extraction are VAN declarations for this product, recorded 20 Aug 2026. Confirm they are supported by the specification and the certificate of analysis before external use
Amino acid form	Standard biostimulant chemistry — only free L-form amino acids are directly usable; harsh acid hydrolysis racemises L into an L/D mixture and destroys some amino acids
The nitrogen cycle argument	Nitrate reduction inside the plant is energetically costly; supplying amino acids enters the cycle after that step. Standard plant physiology, not a manufacturer-specific claim
Analysis, standard, licence	van.com.pk — amino acids 10% w/v (100 g/L) per label; fulvic, humic and seaweed declared as included in a proprietary blend; PS 5606-2023, CM/L-4125/2025
Doses and stages	VAN locked crop nutrition plans, 2025 set — watermelon, strawberry, citrus, wheat, basmati rice
Amino acid energy argument	Standard plant physiology — nitrate reduction is energetically costly; not a manufacturer-specific claim
Fulvic and humic behaviour	Established humic-substance chemistry — chelation and cation transport
Nutrient interactions	After Mulder’s chart — established relationships
Law of the minimum	Carl Sprengel (1840), popularised by Justus von Liebig

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