

ENHANCING STRESS TOLERANCE OF PLANTS IRRIGATED WITH SALINE WATER



BLOCSAL®

With PSI® 475 Precision Technology



BLOCSAL[®] WITH PSI[®]475 PRECISION TECHNOLOGY

WHAT IS THE CHALLENGE?

Salinity is one of the most significant abiotic stresses impacting crop production in arid and semi-arid regions. When salt levels are excessive, they raise the electrical conductivity of irrigation water and cause toxic ions like sodium (Na⁺) and chloride (Cl⁻) to accumulate in the soil. This buildup leads to ion toxicity in plants and disrupts their osmotic balance, making it harder for crops to absorb water and essential nutrients resulting in stunted growth and limited yield.

WHAT IS BLOCSAL[®]?

BLOCSAL[®] with PSI[®]475 Precision Technology is a precision engineered *Ascophyllum nodosum* & protein hydrolysate based biostimulant that reduces ion toxicity and stimulates osmotic stress tolerance in high value fruit and vegetables that are irrigated with high conductivity water (>1.5 dS/m).

BLOCSAL[®] improves salinity stress tolerance in plants by accumulating osmolytes like proline and sucrose, which actively help plants to retain water. **BLOCSAL[®]** also upregulates the expression of sodium (Na⁺) transporters genes, restricting Na⁺ translocation from roots to leaves, and promotes potassium (K⁺) accumulation in roots. It allows the maintenance of higher K⁺/Na⁺ ratios in both leaf and root tissue, which is known as a key predictor of salinity stress tolerance. These specific tolerance responses to salinity stress are complemented with additional benefits at the biochemical level. This helps plants to retain crop growth, productivity, and quality under salinity stress conditions.

THE BENEFITS

- **Well defined Mode of Action (MOA)**
Increased saline tolerance
- **23% yield increase in stressed conditions**
Increased flower production & relative water content
- **Improved important quality parameters**
Improves quality parameters such as Brix & Titratable acidity (TTA)
- **Low dose rate**
1-1.5L/Ha dose rate throughout crop lifecycle
- **Peace of mind**
Your crop is protected and primed for stress. Works in stressed and unstressed conditions

PSI[®] PRECISION TECHNOLOGY

Plant Signal Induction (PSI[®]) Precision Technology finetunes the bioactivity of biostimulant extracts to create and guide the plants natural response system to target well defined responses in the plant. Through precision biostimulation, plant signalling biomolecules are engineered to target specific crop issues and growing obstacles that farmers face. **PSI[®]475 Precision Technology** promotes healthy growth in salinised soils.

Brandon Bioscience understands what makes a high performing biostimulant. Our Plant Signal Induction (PSI[®]) platform means that we validate **PSI[®]475** chemically, biologically and functionally to understand not only what it is but what it does and how it does it.



Sourcing naturally occurring biostimulants in nature



Careful extraction and characterisation via PSI[®] Technology



PSI[®] Precision Technology finetunes bioactivity to target a specific response in a plant



PSI[®] Precision Technology guides the plant's natural system creating specific traits



Reduces ion toxicity and stimulates osmotic stress tolerance

MODE OF ACTION



Stimulation of osmotic adjustment mechanisms. Higher relative water content (RWC), accumulation of osmolytes (proline and sucrose), upregulation of aquaporins in leaf and root.



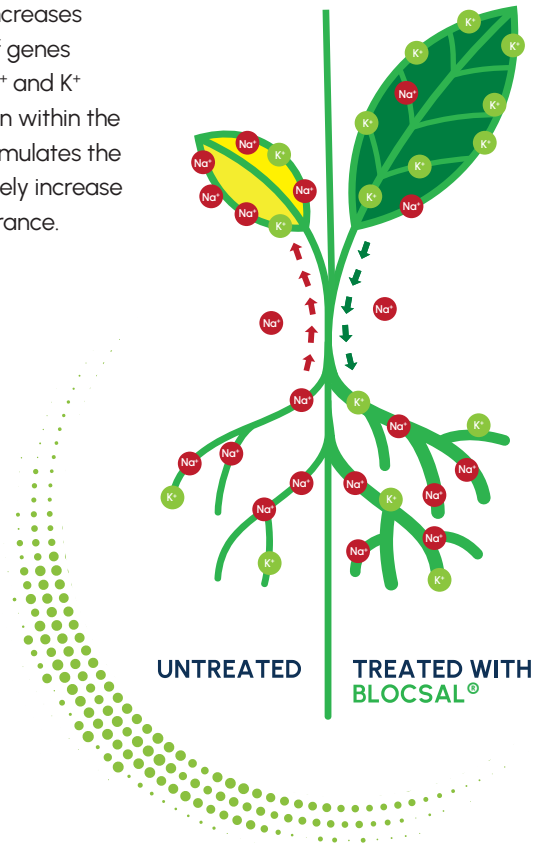
Improved C and N metabolic pathways, and improved photosynthesis. Improvement in yield and quality parameters (°Brix). Increased plant and root biomass.



Stimulation of endogenous mechanisms of ionic homeostasis. Higher K^+/Na^+ ratio in both leaf and root tissue, upregulation of ion transporter stimulation.

ADVANCED PLANT RESPONSE

BLOCSAL[®] increases expression of genes related to Na^+ and K^+ transportation within the plant. This stimulates the plant to actively increase its saline tolerance.



UNTREATED

TREATED WITH
BLOCSAL[®]

BEYOND SOIL CORRECTION

BLOCSAL[®] with **PSI**[®]475 Precision Technology offers a leap from physical sodium displacement to long term protective effects in plant tissues. Research proves **BLOCSAL**[®]'s ability to reduce ion toxicity and stimulate osmotic stress tolerance inside the plant across several layers of biological data.

Before being released for commercial use, **BLOCSAL**[®] undergoes quality assurance testing in our labs and is trialled in controlled environments and open field trials to validate its agronomic efficacy.

EASY TO MEASURE, POUR & STORE

BLOCSAL[®]'s high concentration means a lower application rate. This means less packaging, less transportation costs, and less storage space utilised.

AVAILABLE IN



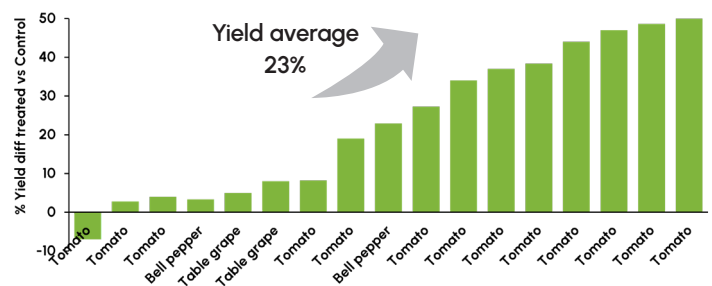
5L









10L

PROVEN IN FIELD

The induction of salinity stress tolerance by **BLOCSAL**[®] with **PSI**[®]475 Precision Technology is characterised by the activation of well-established plant responses at phenotypical, physiological, biochemical, and molecular levels (see Ikuyinminu et al., 2022). Our data shows that **BLOCSAL**[®] with **PSI**[®] 475 Precision Technology increased crop marketable yield in a trial series with tomato, pepper and table grape. These crops were subjected to a saline irrigation water programme with high EC water (≥ 1.5 dS/m) throughout the crop growth cycle. The observed marketable yield benefits (+23% on average, 94% win rate) also closed the fruit yield gap in salinity stressed plants.



DIRECTIONS FOR USE

Method of Application	Crop	Dosage Foliar (L/ha)	Application Time
 Foliar	 Tree Fruits	1.0 - 2.0	Applied as a low dose application throughout all crop life cycle (minimum 2 applications)
	 Tree Nuts	1.0 - 2.0	Applied as a low dose application throughout all crop life cycle (minimum 2 applications)
	 Soft Fruits	1.0 - 2.0	Applied as a low dose application throughout all crop life cycle (minimum 2 applications)
	 Vegetables	1.0 - 2.0	Applied as a low dose application throughout all crop life cycle (minimum 2 applications)
	 Grapes	1.0 - 2.0	Applied as a low dose application throughout all crop life cycle (minimum 2 applications)

VALIDATED IN SCIENTIFIC LITERATURE

There are 2 published peer-reviewed papers on **BLOCSAL®** for tomato cv. micro tom. Working with key institutions & universities ensures our precision biostimulants are backed by credible sources and our customers can trust PSI® Technology backed solutions.



Ikuyinminu et al. (2022)
Journal of Agronomy

Enhancing Irrigation Salinity Stress Tolerance and Increasing Yield in Tomato Using a Precision Engineered Protein Hydrolysate and *Ascophyllum nodosum*-Derived Biostimulant



Ikuyinminu et al. (2023)
Journal of Molecular Sciences

Transcriptome, Biochemical and Phenotypic Analysis of the Effects of a Precision Engineered Biostimulant for Inducing Salinity Stress Tolerance in Tomato



UNRIVALLED TECHNICAL SUPPORT

With our unrivalled technical support, we help in transferring our agronomic expertise and knowledge to customers & growers so that they can get the most out of **BLOCSAL®**. We employ the right people with the skills and knowledge in the right places to deliver smart & efficient solutions.



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