EXPERTS FOR GROWTH

Improving crop performance under saline conditions with the biostimulant ESSR-1



Mauricio Hunsche¹, Roger Plana², Thomas Leppin¹, Javier Vazquez²

¹ COMPO EXPERT GmbH, Krögerweg 10, 48155 Münster, Germany.

² COMPO EXPERT Spain S.L., C/ Llull 321-329, 5^ª planta, 08019 Barcelona, Spain.

Introduction

Salinity is one of the most important abiotic stresses in agricultural systems affecting about 8% of the agricultural areas worldwide. Irrespective of its origin - either because of the naturally high salt concentrations in the soils or because of the irrigation water of high electrical conductivity – it strongly reduces commercial yield and crop profitability.

The accumulation of sodium chloride in the rootzone induces both osmotic and ionic stresses. In this way, salinity impairs uptake and transport of water and minerals, worsening water household and nutrition of the crops.

COMPO EXPERT Technologies: combating salinity outside and inside the plants!

- \mathbb{V} NovaTec[®] Presal: combination with the nitrification inhibitor DMPP. Stabilized ammonium in the soil solution, with all related advantages for plant nutrition: more secondary roots and root tips, higher internal concentrations of cytokinins as anti-stress hormones.
- Solution With calcium acetate, displacing sodium from the humic-clay complex; acetate binds to sodium, and can be washed out

Further, the accumulation of Na and Cl ions in the aerial tissues causes ionic, osmotic and oxidative stresses, thereby reducing the integrity of cellular membranes, and influencing metabolic and physiological processes. In consequence, high salinity negatively impacts plant performance, resulting in lower photosynthesis, lower biomass and lower commercial yield.

ESSR-1 (*Elicitor Salt Stress Relief - 1*), formulated as Presal

ESSR-1 is a natural biostimulant that is present in many living organisms, including agricultural crops. ESSR-1 is an elicitor: it activates natural defence mechanisms of the plants before the stress severity reaches harmful levels.

In the cells, ESSR-1 induces the synthesis of protective compounds and allows a better and faster adjustment of the osmotic potential, limiting the negative effects of salinity on multiple enzymatic, metabolic and physiological processes.





- through watering.
- Section Basfoliar® Presal Amino: combining the effect of ESSR-1 with the advantage of high-performance aminoacids in foliar applications.



Overview: Basic and applied experiments with ESSR-1

- Solution More than 15 fruit and vegetable crops (e.g., Tomato, Sweet Pepper, Cucumber, Eggplant, Lettuce, Onions, Cabbage, Strawberries, Table Grapes, Apricots, Durian, Citrus, Peaches, Avocados), Ornamental Plants and Turf.
- Solution Section Secti Lebanon, Mexico, Chile, China, Vietnam, Thailand, Korea.
- Solution by Low, medium and/or high salinity levels, according to the susceptibility of the crop and cultivation system.
- Solution Development of the Presal product line, optimization of product formulations (water soluble salts and liquid formulations), application methods and application timing.
- Stechnical and agronomic R&D at **own research facilities**.
- Separation Centers and Service Providers worldwide.
- Solution under field conditions / practical experiments with growers.



Section Experiment-specific evaluations include:

- metabolic parameters such as accumulation pattern of osmolites, antioxidative potential, amount and composition of pigments.
- physiological parameters such as transpiration and photosynthesis. - morphological parameters including root and aerial development.
- yield and product quality.



COMPO EXPERT Center

Conclusions

ESSR-1 induces cellular adjustments and supports the crops to overcome salinity stress. Section ESSR-1 is co-formulated with other sophisticated COMPO EXPERT technologies, and is offered in the Presal product line (Kamasol[®] Presal, NovaTec[®] Solub Presal, NovaTec[®] Fluid Presal, Basfoliar[®] Presal Amino SL) for convenient application. It is the bio-stimulating effects of ESSR-1, combined with the balanced COMPO EXPERT nutrition, ensure optimum agronomic performance of high-value crops even under adverse growth conditions.