



Seasol Plus Potassium

TECHNICAL GUIDE



**A UNIQUE FORMULATION OF
BIOSTIMULANT AND NUTRIENTS**



For more information,
please go to www.seasol.com.au

Seasol[®]
a better way to grow



Seasol Plus Potassium

TECHNICAL INFORMATION

OVERVIEW

Seasol Plus Potassium is formulated to protect plants from damage caused by biotic and abiotic events that could impact fertility, and overall plant yield. In frost events especially, Seasol Plus Potassium can increase accumulation of soluble sugars, which play an essential role in stabilising various biological components such as the cellular membrane and membrane-bound organelles. By stabilising these components, Seasol Plus Potassium can minimise electrolyte leakage and limit the effects of frost damage.



Seasol Liquid
Seaweed Extract



Potassium



ABOUT SEASOL PLUS POTASSIUM

Seasol Plus Potassium improves frost tolerance in plants through biochemical, molecular, and physiological changes. Seasol Plus Potassium reduces frost-induced electrolyte leakage by maintaining membrane integrity during freezing stress.

Seasol Plus Potassium helps regulate sugar and acids in plants. Sugar accumulation helps plants to reduce frost stress by playing an essential role in stabilising various biological components such as the cellular membrane and membrane-bound organelles.

FEATURES AND BENEFITS



Aids plant establishment and reduces transplant shock



Stimulates root growth and enhances flowering



Increases tolerance to adverse environmental conditions



Enhances soil microbial activity

TYPICAL ANALYSIS

W/V: Nitrogen (N) 0.1%. Phosphorus (P) 2.9%. Potassium (K) 10.8%

Soil and Fertiliser



Water / Seasol

FOR IMPROVED PLANT GROWTH AND STRESS TOLERANCE

For improved plant growth and stress tolerance

Seasol seaweed extract is rich in organic content, has a high molecular diversity and contains a range of trace elements. Seasol seaweed extract has 17% total solids content and 3.7% (w/v) Potassium (*Typical Analysis April 2017*). Seasol seaweed extract is manufactured from two types of seaweeds producing a refined liquid seaweed extract and filtered to 150micron for agricultural use.

Seaweed extracts are effective across a wide variety of plants and soils, and have many beneficial plant growth and plant health properties (*Arioli et al, 2015; Shukla et al, 2019; Islam et al, 2020*):

Increases plant productivity - Field trials have been used extensively to demonstrate that seaweed extracts improve plant growth, yield and fruit quality. The benefits have been found across a wide variety of crops such as grapes, sugarcane, almond, potatoes, tomatoes, strawberries, and garden plants.

Increase tolerance to plant stress - Seaweed extracts offer increased tolerance to a diversity of non-lethal stresses including heat, drought and cold stresses, and to pathogen stresses. Seaweed extracts increase plant tolerance to stress by earlier triggering of natural plant responses and associated gene expression networks.

POTASSIUM (K)

The insurance strategy to allow plants to survive sudden frost stress. Frost damage in plants is abiotic stress that occurs in three stages - chilling, desiccation and freezing. The three stages of frost stress events result in damaged chloroplasts as a consequence of high light energy absorbance above the capacity of chloroplasts to use it for CO₂ fixation. This excess energy absorbed by the chloroplasts is used for reactive oxygen species formation which impairs the photosynthetic electron transport chain, stomatal conductance and rubisco enzyme activity.

Three stages of frost damage - chilling, desiccation and freezing In plants, frost damage occurs in three-stages, with damage increasing for each stage.

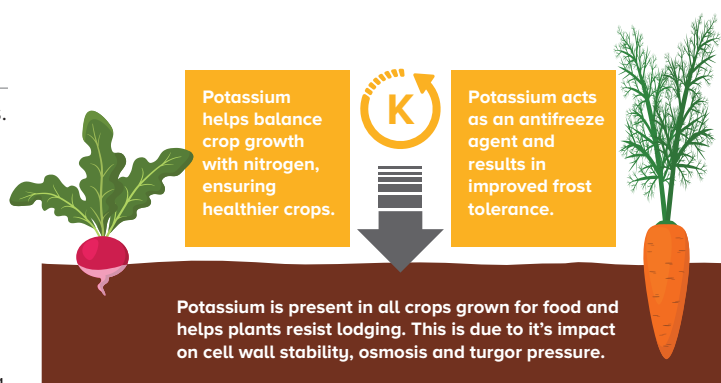
Cold - Cold damage occurs when a plant is exposed to temperatures less than 10°C and down to -2°C. At the chilling stage, there is a reduction in phospholipids, membrane permeability and adverse effect on biophysical and biochemical properties of the cell (*Hakerlerker et al., 1997*). For example, if cold stress occurs at critical stages of reproductive development, it can abort pollen development.

Desiccation - Desiccation from ice formation occurs at temperatures from 0°C to -2°C. In the desiccation stage, the dew initially freezes on the outside of the plant, but then the ice nucleation inside the leaf through cracks in the leaf cuticle and stomata. The liquid inside the leaf blade then begins to freeze. First, the liquid surrounding the cells freezes, but then it draws out the liquid from inside the cells and dehydrates them. The cells may not always freeze or have ice form inside them. This process will not necessarily kill the cells if the dehydration and desiccation do not go too far. When the ice thaws, these cells can rehydrate and recover — but can still suffer from desiccation.

Freezing - Freezing damage is the final stage of frost damage and occurs when there is rapid ice nucleation and ice crystals form. During freezing stress, intracellular and extracellular ice forms, which changes the integrity of cells, causing cell death (*Burke et al., 1976; Weiser et al., 1976*). Freezing damage typically is not reversible but can be limited to specific tissues in the plants — for example, stem nodes, individual florets and individual tillers.

POTASSIUM AND DROUGHT STRESS

The major limitation for plant growth and crop production in arid and semi-arid regions is soil water availability. Plants that are continuously exposed to drought stress can form ROS, which leads to leaf damage and, ultimately, decreases crop yield. During drought stress, root growth and the rates of K⁺ diffusion in the soil towards the roots were both restricted, thus limiting K acquisition. The resulting lower K concentrations can further depress the plant resistance to drought stress, as well as K absorption. Maintaining adequate plant K is, therefore, critical for plant drought resistance. A close relationship between K nutritional status and plant drought resistance has been demonstrated. The roles of K in physiological and molecular mechanisms of plant drought resistance have been explored.



AVAILABLE IN 3 SIZES

Whatever your requirements, we now have sizes to suit your needs. **Seasol Plus Potassium** is available in 20L, 200L & 1000L.



Thinking roots?
Think Seasol.





Seasol Plus Potassium

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& AG**

INSTRUCTIONS FOR USE

1. Seasol Plus Potassium must be diluted in water. Use sufficient water to achieve adequate coverage when applying as a foliar spray. **2.** Shake or agitate before use. Maintain agitation during dilution and application if possible. **3.** Can be applied via irrigation or foliar application to mitigate crop damage and assist recovery.

APPLICATION GUIDELINES

Category	Timing	Rate	Application / Critical Comments
Plant Stress	Germination	6-12.5L/ha or 1.5ml/sqm of crop	Apply lower rate. Post emergence 3-4 leaf stage for accelerated growth. Repeat applications as required
	Transplant Shock		Apply to seedlings prior to transit at 1/400 dilution. Apply post transplant for planting shock and promote immediate root growth. Use lower rate to start, increase rate as crop matures
	Critical Growth Stages		Apply prior to each critical growth stage to encourage strong growth and increase crop development. Apply during periods of poor plant performance. Target repeat applications to support high crop loads. Seasol Plus Potassium will complement any nutrition program facilitating nutrient uptake and absorption
	Hail Damage		Apply 2 applications 7-10 days apart, repeat as required. Use a higher rate for larger crops
	Post Harvest		Combine application with post harvest program for increased uptake
Climatic Stress	High Temperatures	6-12.5L/ha or 1.5ml/sqm of crop	Apply 3-5 days prior to heat wave. 12.5L/ha or 1.5ml/sqm of crop area
	Frost		Apply 3-7 days prior to frosts. 12.5L/ha or 1.5ml/sqm of crop area
	Poor Water Quality		Apply lower rates frequently. Maintain higher soil moisture levels with frequent or pulse irrigation. Alternatively apply regular foliar applications
	Salinity EC		Reducing EC uptake. Apply lower rates frequently. Maintain higher soil moisture levels with frequent or pulse irrigation. (Combine with "Soil Wetter" to improve penetration and increased soil moisture status)
	Excess Water		Apply as foliar spray and repeat as required. Use a higher rate for larger crops
	Wind		Apply frequently. Maintain higher soil moisture levels with frequent or pulse irrigation. Use a higher rate for larger crops

GENERAL INSTRUCTIONS

Foliar Spraying: Apply the product as soon as possible after mixing in the spray tank. Maintain agitation in spray tank if possible. Seasol Plus Potassium can be used as a foliar application or applied directly to the soil and can be applied with boom sprays, air blast sprays, drip systems, travelling irrigators, centre pivots and by aerial application. **Fertigation:** Agitate the product regularly in the fertigation tank. For best results use the product on its own. Seasol Plus Potassium can be mixed with a number of agricultural chemicals

DO NOT COMBINE WITH CALCIUM NITRATE. See tank mix compatibility information at www.seasol.com.au

STORAGE AND HANDLING

Not to be kept for prolonged periods in hot conditions (>30°C) or in direct sunlight. Always use safe work practices for lifting and handling drums. Once diluted, the product should be applied within 24 hours. Agitate the product prior to using and re-agitate if the product is left standing for an extended period of time.

SAFETY DIRECTIONS

Keep out of reach of children/pets. Read carefully and follow all instructions. Wash hands, face and all exposed skin thoroughly after handling. Wear protective gloves/protective clothing including eye/face protection. Additional information is listed in the Safety Data Sheet.

CONTAINS: 0.5 - 2% Potassium hydroxide

FIRST AID

If poisoning occurs, contact a Doctor or Poisons Information Centre (Phone Australia 131 126; New Zealand 0800 764 766). If medical advice is needed, have product container or label at hand.

SWALLOWED: If swallowed, do NOT induce vomiting. Give a glass of water. Seek medical advice.

EYE: If in eyes, hold eyes open, rinse cautiously with water for at least 15 minutes and see a doctor. **SKIN:** If skin contact occurs, remove contaminated clothing and wash skin thoroughly. If irritation occurs seek medical advice. **INHALED:** Remove from contaminated area. Seek medical advice.

CONDITIONS OF SALE

This product must be used strictly in accordance to the directions. The efficacy of the product may be influenced by environmental conditions and application procedures and no warranty, express or implied is offered.



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