










MAS-AS is a liquid combination of bioactive molecules identified by scientists at Engage Crop Solutions. These proprietary molecules contain many active sites stimulating the synthesis of enzymes and hormones by plants to develop stronger and healthier crops.

Over the past ten years Engage and its partners in nutrition around the world have been working to find the key technologies that help nutritional absorption of roots or penetration through the leaf surface.

The research has focused on the distribution of nutrients through the vascular system and assimilation by the plant to get the best response for each individual nutrient.

In-depth global research involving more than 2,000 compounds has become MAS technology, adapted to match nutrients to enhance the optimal delivery and uptake by the growing crop and also help to strengthen the defences of plants against abiotic stress.

CROPS

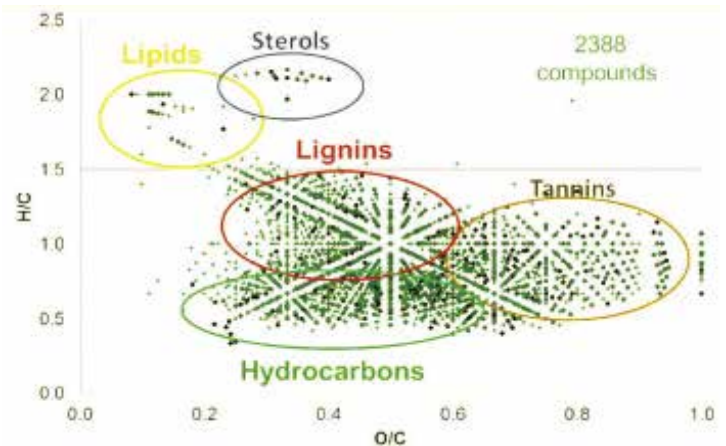
-  Cereals
-  Leafy Salads
-  Potatoes
-  Citrus
-  Soft Fruit
-  Fruiting Vegetables
-  Ornamentals

Components of MAS™

MAS technological research found that certain molecules repeatedly aided penetration of nutrients through the leaves or roots and other molecules aided the distribution through the vascular bundle and beyond. The following compounds (below) were the most active and most consistent:

- › **Tannins** – Polyphenols from plants
- › **Lignins** – Plant fibres modified by fungi
- › **Lipids and Sterols** – Enzyme driven response compounds
- › **Condensed Hydrocarbons** - plant derived compounds that have been modified by microbial action

Engage has taken these naturally occurring substances and through a proprietary process, refined and manipulated the molecules to create MAS-AS.





Benefits of the MAS-AS package are:

- Better root growth
- Bio-active molecules in MAS-AS stimulate the indole butyric (IBA) pathway generating higher levels of IBA in tissues which results in better root growth and development.
- MAS-AS stimulates the synthesis of zeatin, a cytokinin which promotes the growth of shoots.
- MAS-AS treated plants are therefore able to maintain better growth under drought conditions.

Technical Sheet

➤ Reduced transpiration

MAS-AS helps maintain positive xylem pressure potential and improves xylem modulus elasticity. MAS-AS also regulates stomatal closure and will aid the transpiration process while under stress.

➤ Increased efficiency of water use

MAS-AS inhibits ethylene synthesis under stress. Ethylene increases membrane fluidity causing leaks in plant tissue which may result in wilting. Thus, plants treated with MAS-AS use water more efficiently. Stressed plants produce more free radicals which induce lipid peroxidation and may further lead to destabilisation of cell membranes. MAS-AS acts as an antioxidant to prevent the accumulation of free radicals in tissues.

➤ Increased availability and absorption of nutrients

MAS-AS increases the secretion of root exudates in the rhizosphere to improve nutrient availability and root nutrient interception. MAS-AS treated plants also show an increase in nutrient uptake by the xylem.

➤ Slowdown of the processes of ion binding within the plant

MAS-AS interacts with genes to increase specific signalling. MAS-AS works to up-regulate enzymes that act as transporters of nutrients in the plant, however, it down-regulates ethylene, ABA (stress hormones) and receptors and proteins that bind to nutrients. This results in increased mobility of nutrients in the plant.

Other benefits of MAS-AS

- Nutrient distribution properties and increased penetration of the leaf and roots enhanced uptake of foliar nutrients tested up to 30%.
- Synergistic effects with other applied nutrients and agrochemicals.
- Proven to increase chlorophyll content (research CFIA).
- Increased resistance to both abiotic and biotic stresses.
- Reduction of stress caused by pesticide applications.

Application

MAS-AS is intended for use with pesticides and foliar nutrition. Mixing rate is 0.5-1.0 litres per Ha in 200-800 litres of water, depending on the rate and frequency of application. Ideal application period is every two weeks. For more information on specific mixing rates please contact your Engage advisor. It is advisable to maintain the pH between 3 and 10, as solutions of high alkali and low acids are detrimental to the benefits of MAS-AS.

MAS-AS allows the plant to focus its energy on core functions such as rooting, increase chlorophyll, nutrient movement and response to stress for a limited period or for a sustained period, if used regularly.

Compatibility

MAS-AS is compatible with pesticide and nutrient products. For more information please read the label before use.

For more detailed application rates per crop, please visit engagecropsolutions.com or speak to an Engage advisor.

Always read the label before use.