



Borregaard

# MARASPERSE AG

A sustainable plant nutrition complexing agent

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# MARASPERSE AG, A SUSTAINABLE BIOBASED COMPLEXING AGENT

Marasperse® AG is a plant derived, specialty complexing agent for micronutrients, designed to give superior performance over chemically derived agents.

## MAJOR BENEFITS IN MICRONUTRIENT FORMULATIONS

- Stable metal complexes over a wide pH range with high metal salt concentrations
- Enhanced micronutrient uptake that outlasts synthetics in foliar applications
- Customize formulation ratio for:
  - Additional humectant properties
  - Prescription micronutrient loads
- Yield increases due to micronutrient use efficiency
- Sustainable and environmentally friendly
- Lower treatment cost than synthetics

## EASY TO USE

The unique properties of Marasperse AG benefit the micronutrient formulator at many stages of his operation. In liquid form, it has low solution viscosity and is easy to transport.

Marasperse AG consistently produces stable complexes for foliar micronutrients over a wide pH range. Recipes and dosage rates available upon request.

## MICRONUTRIENT UPTAKE THAT OUTLASTS SYNTHETICS

Marasperse AG provides a stable and constant release of complexed micronutrients that lasts much longer than synthetics like EDTA.

The example below shows the Mn foliar levels are still increasing and have increased to over twice the EDTA application 50 days after (foliar) application.

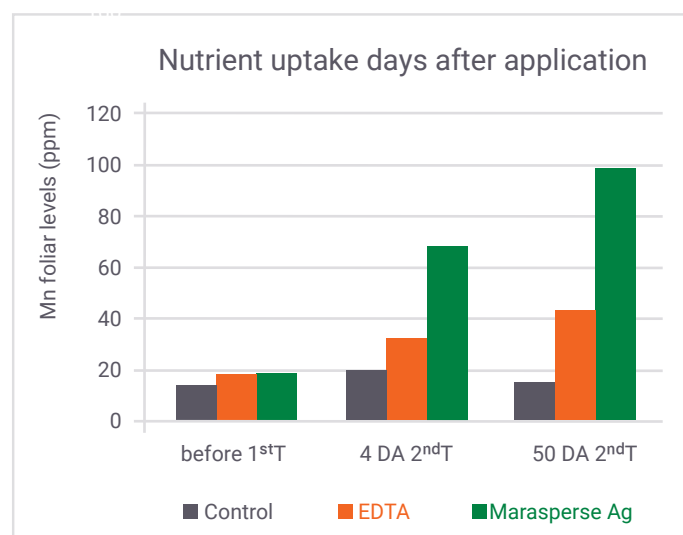


Figure 1: Marasperse AG nutrient efficiency outlasts synthetic chelating agents.



## HOW IT WORKS

Marasperse AG allows for adherence on leaf surface and is hygroscopic (water absorbing). As shown below, a dry spray solution of Zn complexed with Marasperse AG absorbs water continuously even in rather dry conditions. This allows for a longer period for nutrient uptake.

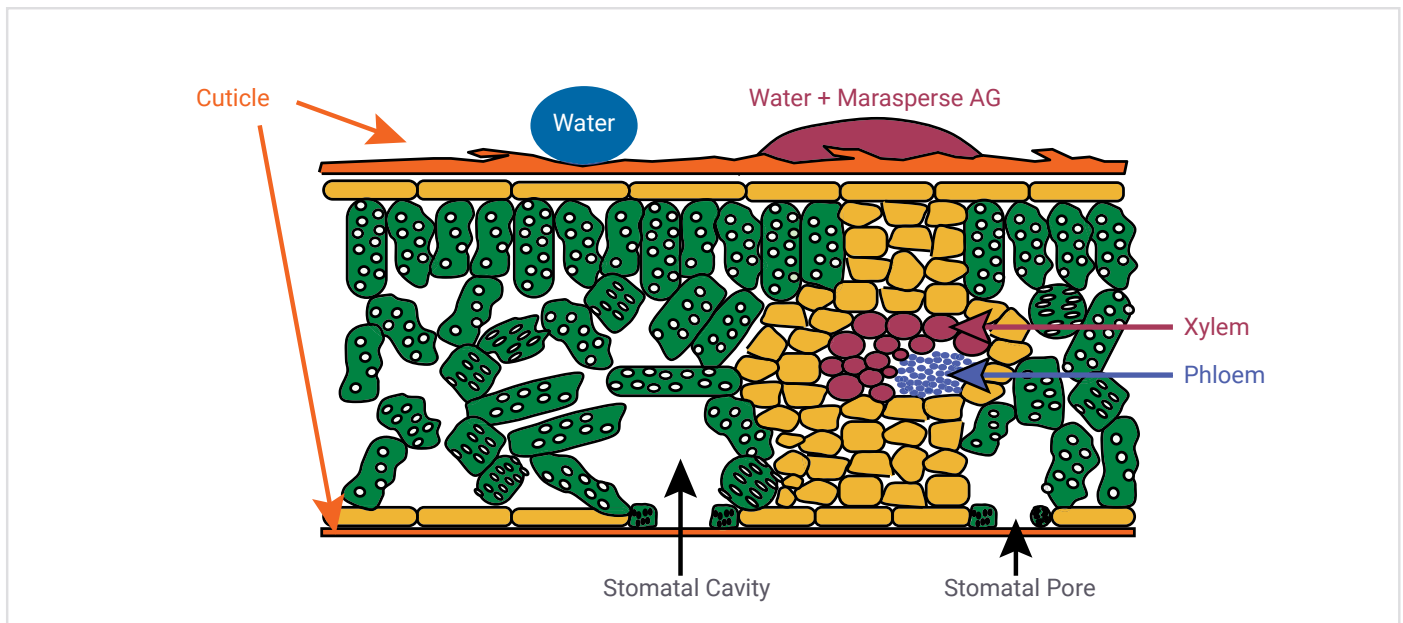


Figure 2: Diagram of leaf transversal section - better product distribution and penetration reducing the risk of leaf scorching.

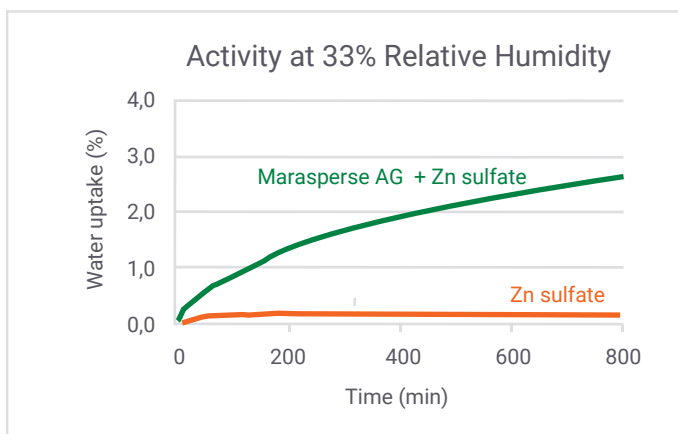


Figure 3: A Zn solution with Marasperse AG is still actively re-wetting 12 hours after application.

The Marasperse AG to micronutrients ratio can be adjusted to meet specific application needs. For example, in an arid environment increasing the concentration of Marasperse AG in the formulation allows for an increase in water uptake.

Synthetic chelates and salts dry out quickly and crystallize on leaf surface, impeding further uptake of secondary applications. Figure 4 shows Fe uptake was increased by a second Marasperse AG application but decreased for EDTA.

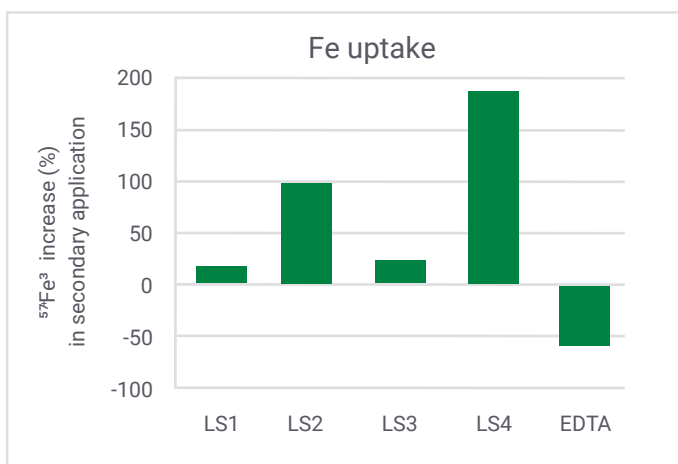


Figure 4: J. Sci. Food Agric. (2011), 91 (3), 395–404



Figure 5: The crystallization of synthetic chelates on the leaf surface also increases the potential for leaf scorching.



## YIELD INCREASES

In this case study, tomatoes are grown under induced Mn deficiency. Remedial treatment included 2 applications of 0.31lb/acre Mn. Marasperse AG improved yield more than EDTA at the same Mn dose. Marasperse AG also provided a higher profit in comparison to EDTA.

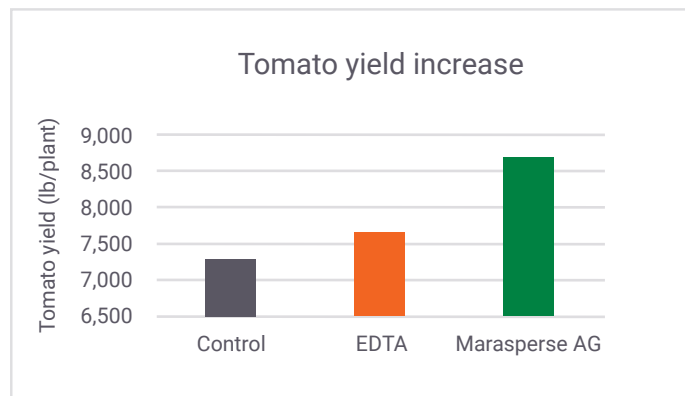


Figure 6: 2006 trial with Mn in tomatoes by IRTA

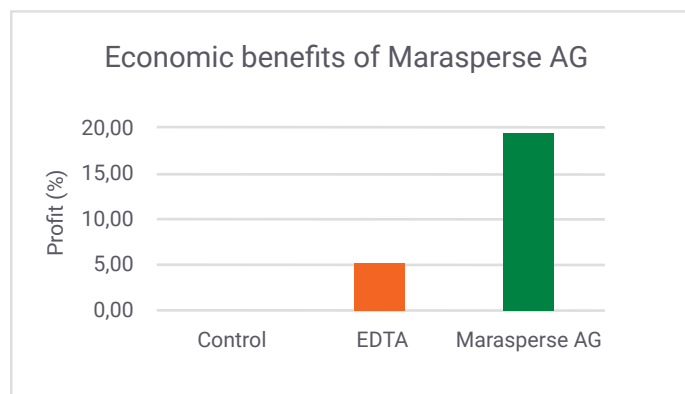


Figure 7: 2006 trial with Mn in tomatoes by IRTA

## SUSTAINABLE

Marasperse AG is derived from trees harvested from FSC certified and controlled forests. The product is bio-based and OMRI certified\*. By replacing EDTA (or other synthetic chelates) with Marasperse AG you can reduce CO<sub>2</sub> emissions by 90%.

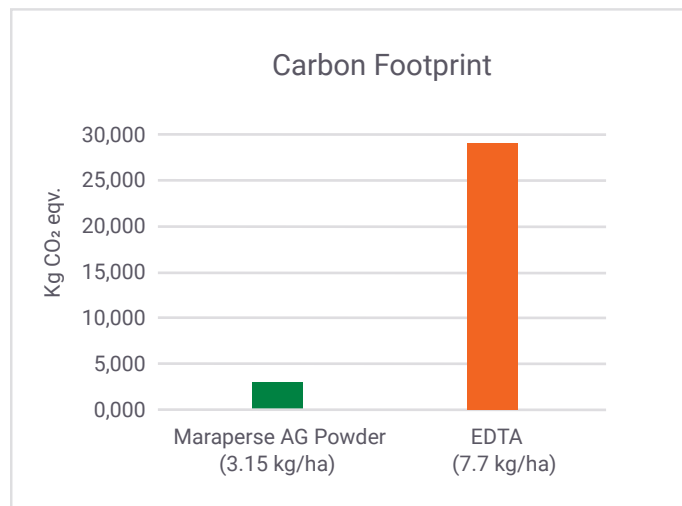


Figure 8: 2006 trial with Zn and Mn treatment in tangerines, Life Cycle Analysis (LCA) by NORSUS

## KEY MARASPERSE AG TAKE-AWAYS

- Easy to use
- Formulation stability
- Agronomic and economic benefits versus synthetic alternatives
- Long micronutrient availability
- Improved foliar quality versus synthetic alternatives
- Sustainable, environmentally friendly and OMRI certified





**SUSTAINABLE DEVELOPMENT GOALS**



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