

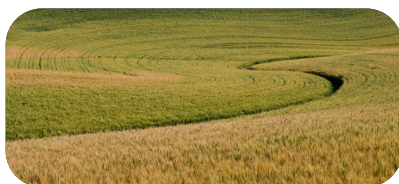


March 30, 2023

Sugar-Based, Decarbonized Complexing Agent Unlocks Crop Yield Potential

Experimental Field Trial with Sugar-Based Magnesium
Complex on Squash Crops **Increases Yield by 17%**
Over Un-Complexed Salt

The agriculture industry is critical to global sustainability goals as the sector faces the immense test of feeding a growing population while reducing environmental impact. As the world's supply of fresh water and fertile land continues to shrink, efficiencies in farming are key to addressing this challenge. Achieving the balance between sustainability and increased efficiencies has been a struggle given the global supply chain impacts since the COVID-19 pandemic as well as the rise of inflation and reduced spending on agriculture research and innovation.



A More Environmentally Friendly Complexing Agent to Aid Plant Nutrition

Nutrient deficiency can have a significant impact on agriculture, resulting in reduced crop yield or plant quality as well as a decline in overall biodiversity. One efficient way to deliver metal nutrients to a plant is by forming a chelated complex of the metal ion with a synthetic chelate or complexing agents. The complex maintains the metal ion in a soluble form for ease of application, reduces metal adsorption and fixation in soil, and increases solubility of the metal ion so it can be effectively delivered in a variety of different methods. Unfortunately, many synthetic chelating agents, such as EDTA, have unfavorable environmental impact in terms of biodegradability and toxicity.

Solugen's novel, sugar-based complexing agent can deliver micronutrients and certain macronutrients more effectively via foliar applications, unlocking crop yield potential to enable more profitable farming, healthier plant growth and production of quality fruits and vegetables while reducing carbon footprint. Our unique complexing agent is synthesized via a proprietary chemienzymatic pathway that uses sugar as a feedstock and does not generate greenhouse gas or wastewater in the process.

Complexing this unique chemistry with plant nutrients such as Ca, Mg, Zn, and B can provide a distinct advantage over incumbent technologies in terms of nutrient load, performance, biodegradability, and toxicity. Furthermore, this chemistry exhibits formulation flexibility with different ratios of Boron, enabling delivery of multiple nutrients to the plant in a single dose. Moreover, these complexed products can benefit from the natural humectancy of Solugen's base chemistry, allowing a longer residence time for nutrients to be delivered to the plant when applied through foliar applications.

Enabling High, Multi-Nutrient Loading in a Single Formulation

Relative to other commercial sources evaluated, Solugen's unique chemistry enables higher nutrition content as well as multi-nutrient loading with B (Figure 1).

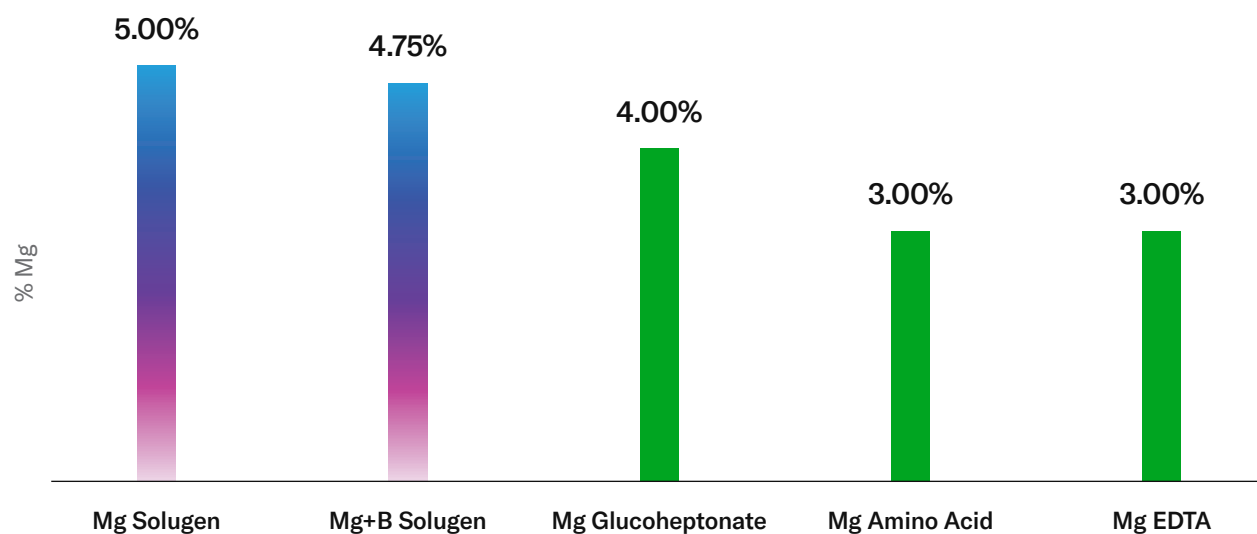
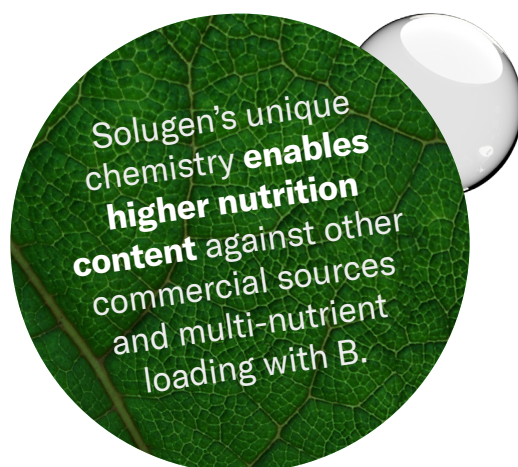


Figure 1. % Mg Content of Plant Nutrition Formulated with Solugen's Complexing Agent vs. Other Commercial Sources

Mg+B Solugen complex contains 0.1% B for 2-in-1 nutrient delivery.



Unlocking Squash Yield and Marketable Product with Solugen's Sugar-Based Mg Complex

A recent field trial was conducted with squash, using Solugen's unique, sugar-based chemistry as a delivery platform to evaluate the nutrient delivery efficiency of magnesium via foliar application. Solugen's magnesium complex was formulated and tested against the following treatments:

- A. Mg Solugen complex (5% Mg)
- B. Un-complexed magnesium salt: Mg Nitrate (9.5% Mg)
- C. Mg amino acid complex (3% Mg)
- D. Grower standard fertility program

As a result, Solugen's Mg complex enabled an increase of highly marketable grade (extra fancy) squash by 12% in count and by 17% in yield (lb) compared to the un-complexed salt at initial harvest (Figure 2).

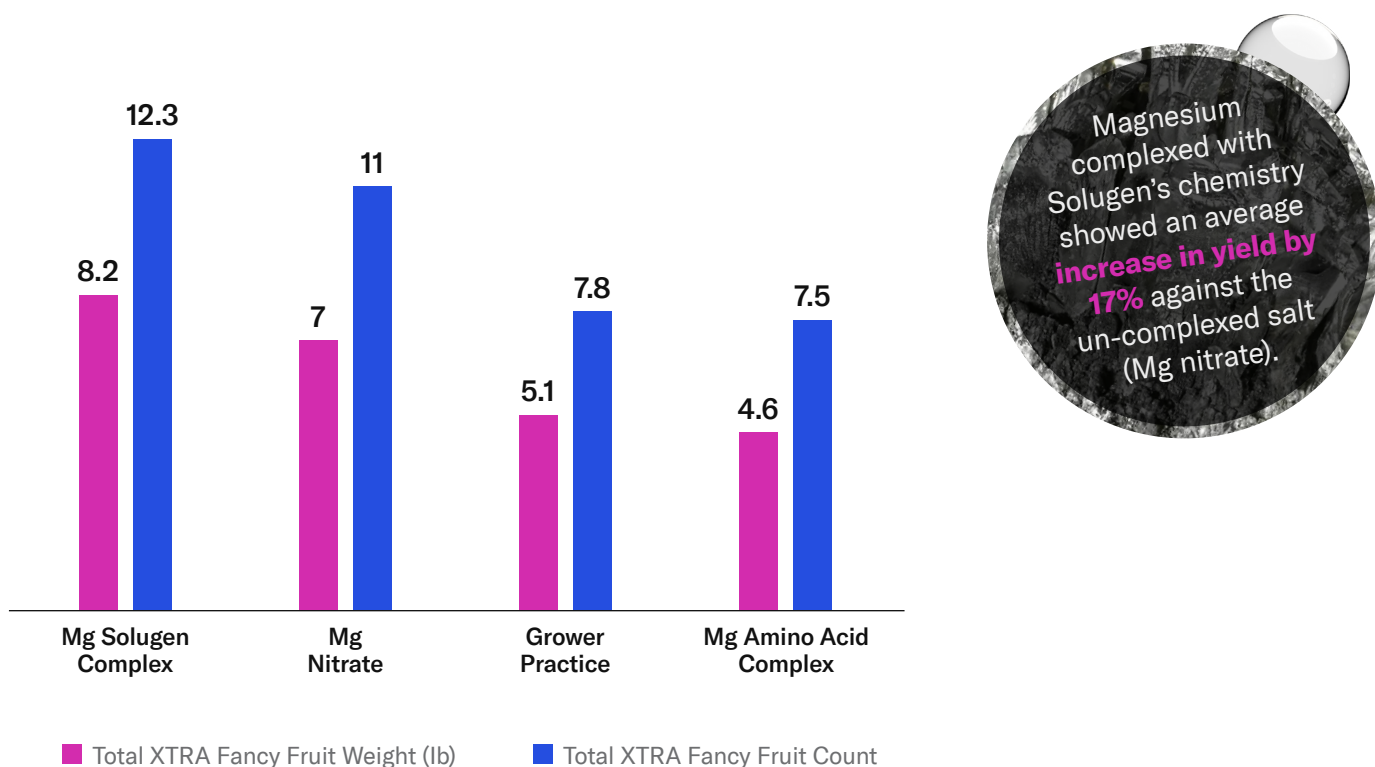


Figure 2. Total Extra Fancy Fruit Count and Weight at Initial Harvest of Squash

As evident from this trial, Solugen's unique, sugar-based complexing agent demonstrated its use as an efficient plant nutrient delivery platform, enabling high, multi-nutrient loading in formulation and efficient absorption of magnesium by the squash. By creating metal nutrition complexes from Solugen's plant-based chemistry, growers can benefit from increased yield and production of highly marketable squash.

Proudly manufacturing in Houston, TX, Solugen can be your partner for providing high performing, cost competitive, biodegradable, and climate friendly products with sugar-based chemistries. To learn more, visit [**solugen.com/agriculture**](https://solugen.com/agriculture) or e-mail us at [**ag@solugen.com**](mailto:ag@solugen.com).