



**Cationic Ligands
for Crop Health and Increased Yield:**
“Space-Tech”* Efficiency,
Here on Earth

***Originally designed and developed to grow food in Space, these formulations have flown on the Space Shuttle and to the ISS, multiple times.**

OrbitalAg Inc., is jointly owned by Space Technology Holdings LLC. and CMFI Inc.

OrbitalAg's Value Proposition for Sustainable Agriculture

We can deliver crucial
micronutrients, into cash crops,
efficiently at the cellular level:

**A groundbreaking new
technology!**



Solving Global Problems:

Space Technology Applied to Terrestrial Agriculture



- **Global Problem #1 - Soil depletion:**

- Necessitates potentially damaging growth medium additives

- **Global Problem #2 - Nutrient runoff:**

- Contaminates waterways (inefficient application and overuse)

- **Global Problem #3 – Lack of micronutrients:**

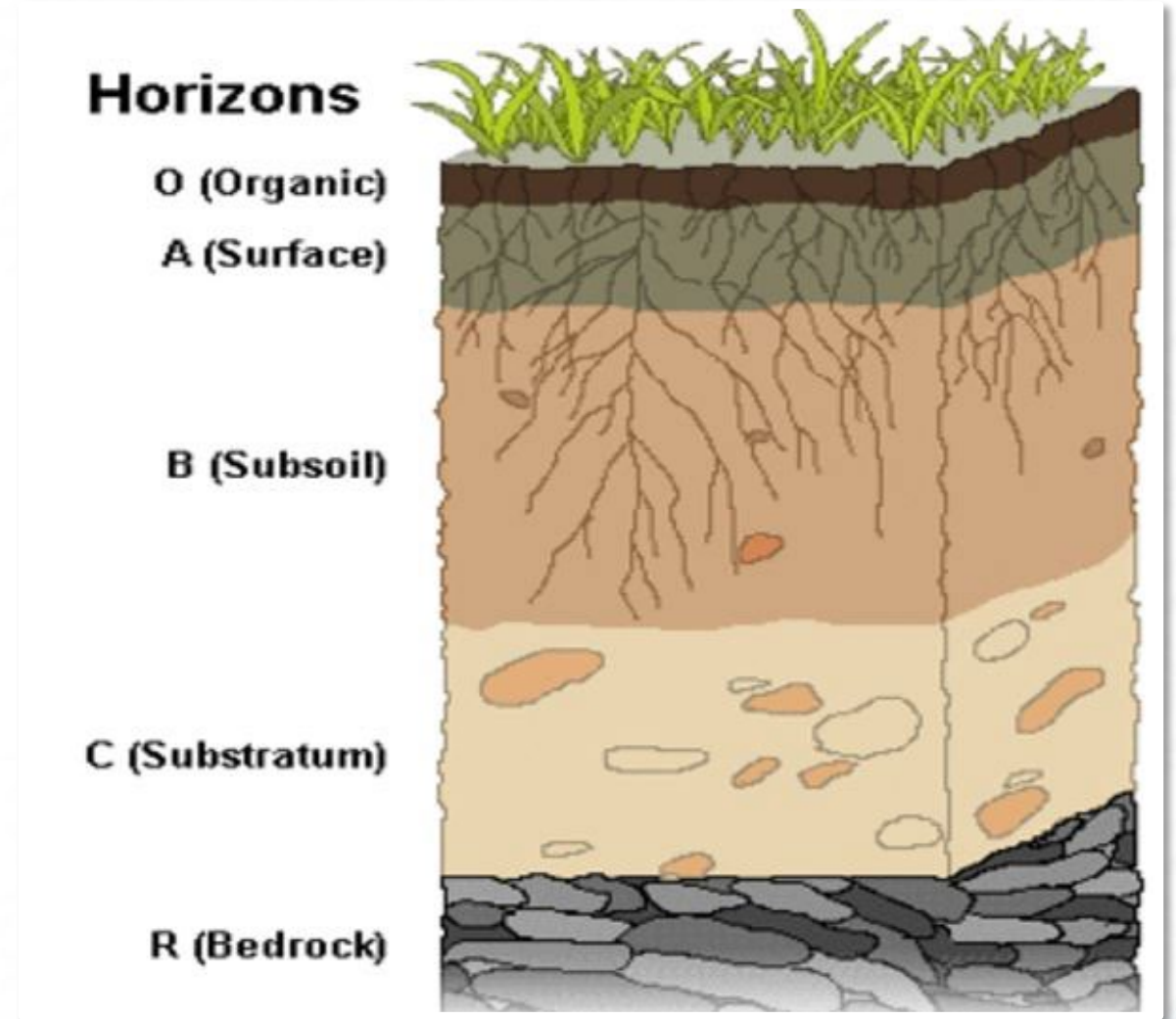
- Crucial to the health of ALL crops yet below optimal levels in depleted soils.



Modern Farming Produces Substantial “Waste”

#1 - Soil Depletion

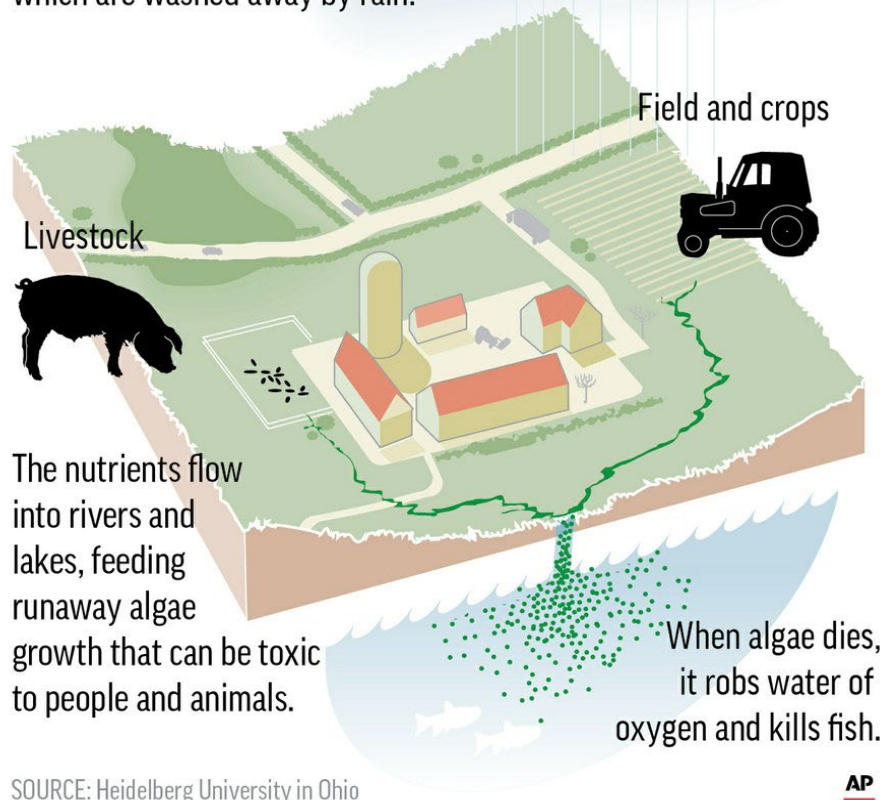
- Modern agriculture is extremely **intensive**. Valuable nutrients, already in the soil, are heavily consumed by the crops being grown.
- So much so that artificial additives are **crucial** to maintaining crop yield.
- Overuse of NPK and other nutrients, leads us to Problem #2.



Modern Farming Methods Produce Much Waste

Farm runoff is a leading cause of algae blooms

Fertilizers and manure contain phosphorus and nitrogen, which are washed away by rain.



#2 - Nutrient Runoff

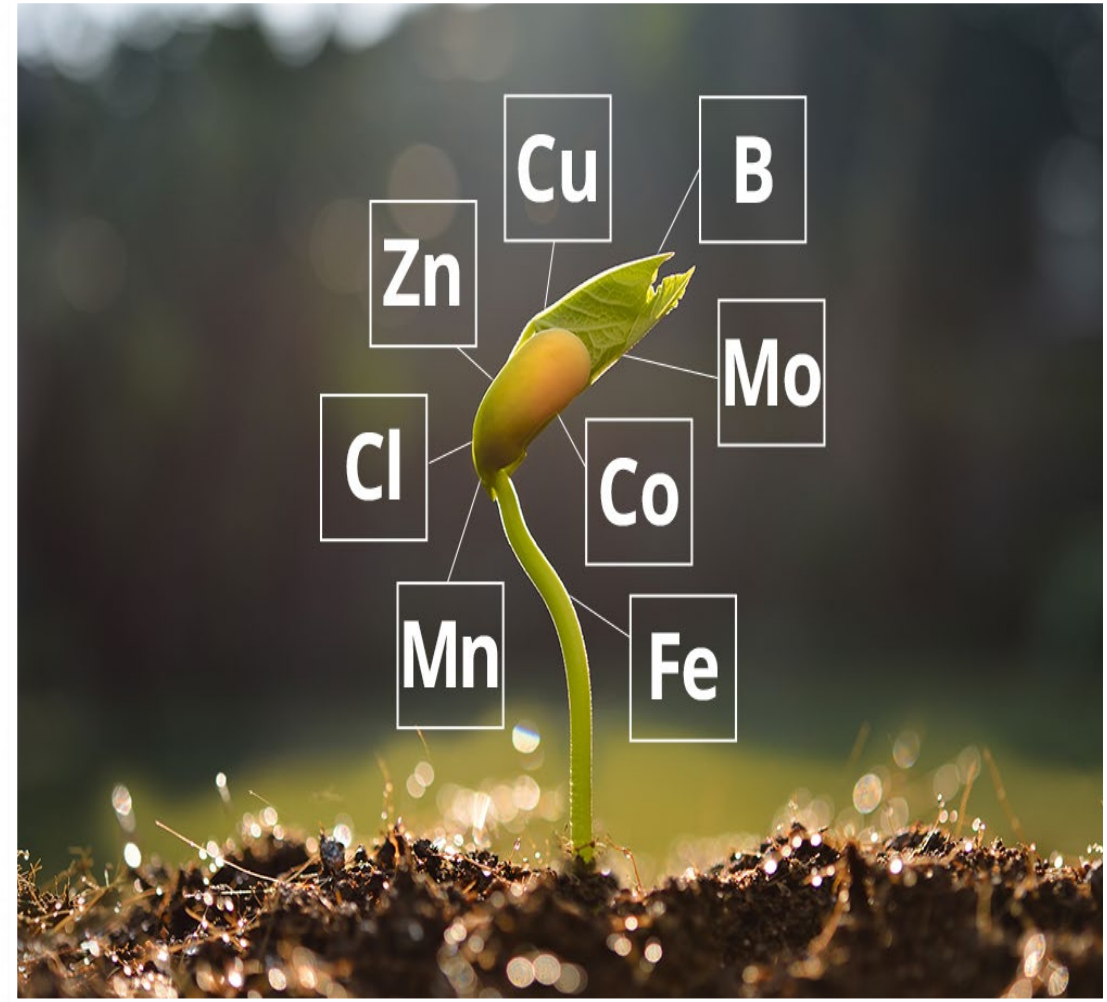
- Modern farming incorporates additives to soil.
- Often these additives are applied neither sparingly or in a bioavailable format.
- The result? Overuse, damaging runoff, not just of additives but crucial nutrients, lost into waterways causing more damage, downstream.
- This resulting runoff can be and is, in some states, a **taxable** event to growers.



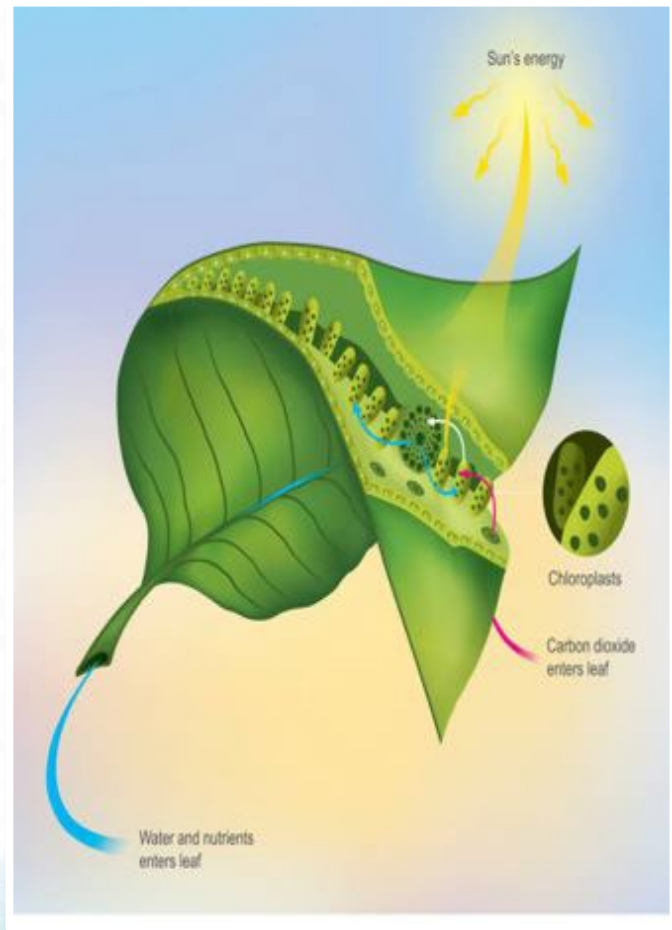
Modern Food Crops are Lacking in Crucial Micronutrients

#3 – Micronutrient Uptake

- Today, people take “supplements”; minerals in pill form, why?
- Because our crops no longer provide many crucial micronutrients.
- **OrbitalAg** can efficiently introduce crucial micronutrients into crop tissue, creating more nutritious food for the consumer.
- The way things were before our soils became so depleted.
- ***THIS aspect, is what makes our formulation, so valuable!***



OrbitalAg's platform technology solves many problems

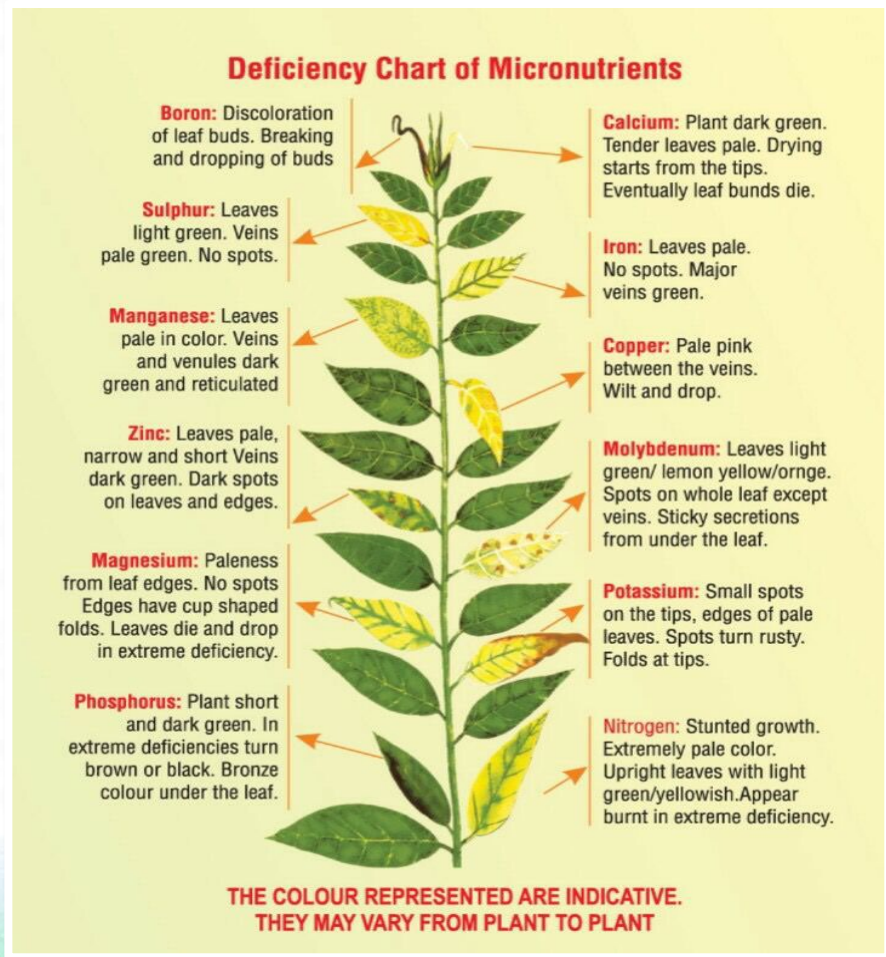


- We can enhance each crop, simply by making them more robust, through increased photosynthetic effect via patented and trade secret manufacturing and formulative methods.
- We can produce stronger, healthier plants, which enjoy increased yield and other positive effects.
- We can reduce or sometimes eliminate the need for expensive, often ecologically unsound additives -- including some pesticides.
- **(Note that we are NOT a pesticide)**



Considered “Deficiencies”? Not just in humans, but in Plants

“We are, what we eat!”



- Between plants, and the people and animals who consume them, lies a very distinct and quite direct correlation – to general health.
- Healthier plants, not lacking in key micronutrients like the minerals necessary for good health, contribute directly, to healthier humans. Produce treated with our products might be marketed as such.



From Technical Facts, to Figures & Market Trend ...

There are a wide variety of micronutrients, each of them essential for optimum plant growth.

Ex: In 2013 alone, nearly 50% of all cultivated land area, worldwide, contained an insufficient concentration of zinc.

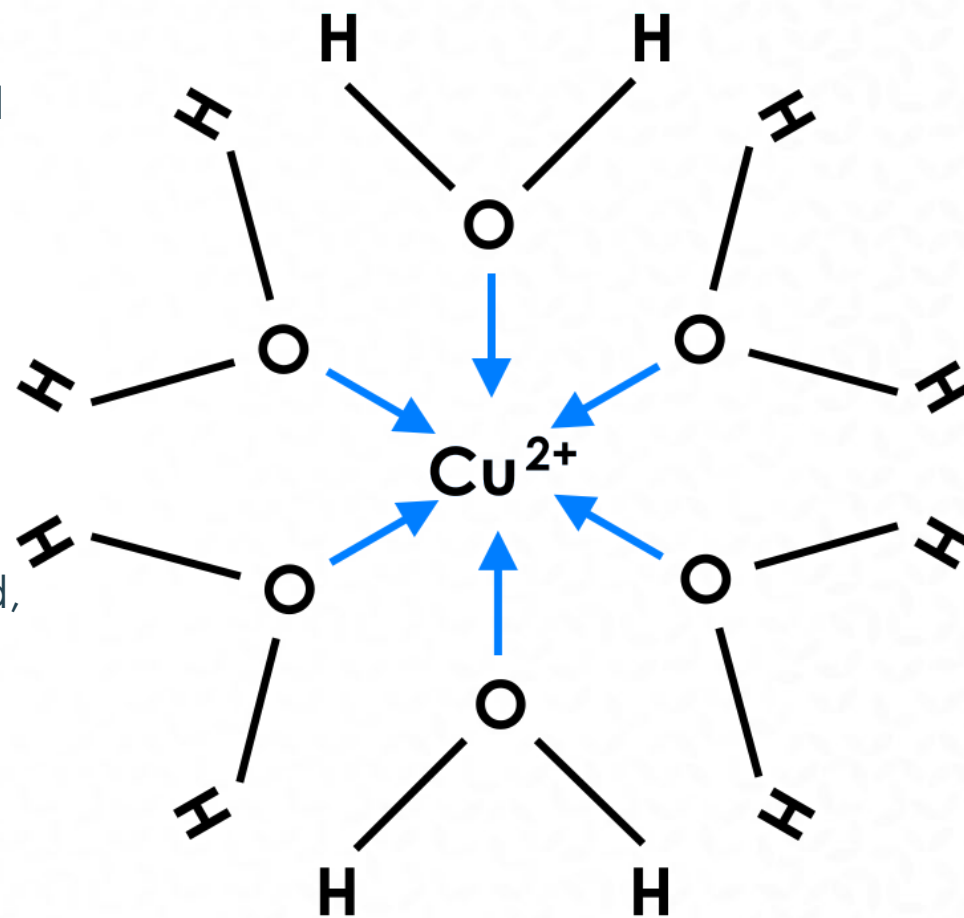
There is an ever-increasing demand for micronutrients, bioavailable minerals and fertilizers -- to address deficiencies.



The Hexa-Aqua Ligand (HAL): (our proprietary advantage)*

A “Micronutrient Delivery System” at Pico-scale (MUCH smaller than Nano-scale)

- Explanation: Through CMFI, our technology partners, we’ve created a patented system*, wrapping crucial elements for crop growth and health, inside an ionically charged “capsule” of six water molecules -- the “ligand”.
- This unique ligand, exists at the molecular scale, enjoying a double-positive ionic charge. It remains stable because of our *trade secret manufacturing process. Its Redox value is north of 475 mV
- Though only a light application to the plant is needed, a very highly efficient “systemic transfer” of the elements is occurring and they enter directly into the plant’s circulatory and cellular structures.



*Patent US 9,266,785 B2 (exp)

*Patent US 11,648,263 B2 Issued May 2023

*Manufacturing methodology on both is a trade secret.



The HAL “Pico Scale” Micro-nutrient Delivery System:

- Ligands are absorbed efficiently by the plant.
- Ionically charged, those vital elements are transported systemically throughout the plant's circulatory system, then through each cell wall, which is expedited by the double positive ionic charge. (Redox value is 475+ mV)
- Through their normal respiratory actions, the cells disassemble the molecule, unmasking and making bioavailable the target element into the inner workings of the cell.
- *What we have, is **A VERY UNIQUE, Platform Technology, a Pico-scale Molecular Delivery System!***
- ***This can be constantly improved as we create a suite of new formulations.***





The Global Fertilizer Market to 2024 (TAM):



- Since 2012, a sustained downturn in the world “consumption of fertilizer” market and decreasing crop prices (mostly in the US and Asia-Pacific), has made it difficult to maintain consistent growth. The current conflict in Ukraine has drastically altered the situation, but not for the better.
- Major technological innovations in the industry, with growing demand for bio-based and micronutrient fertilizers, are expected to drive the market.
- 2019 alone was expected to be US \$155.8 billion, and to register CAGR of 3.8% (forecast period 2019-2024)*

**World Fertilizer Magazine*



Some Other Interesting Facts to Consider:

- The Global Bio-stimulants Market Size was valued at USD \$3.4B in 2022 and the worldwide bio-stimulants market size is expected to reach USD \$9.8B by 2032, according to a research report published by Spherical Insights & Consulting.*
- In 2022, the global agricultural micronutrients market was estimated to have global market size of US\$ 5.08B
- The zinc segment is expected to have a 43% market share in 2022 and to dominate the global market from 2022 to 2032* (Polaris Market Research)
- Development of advanced farming techniques and increased utilization of bio-fertilizers (like micronutrients), are major factors, that make **OrbitalAg**, “right timing”.



Introducing Our “Talent Team:

- [Tomas Aguayo](#) – Agronomist
- Christine Bartel – PhD - Microbiology
- [Doug Hanson](#), PhD – Chemistry
- [Don Henry](#) - Agricultural Specialist
- [Paul Simpson](#) – Key Advisor
- Dave Watson – Manufacturing Advisor
- [Mick Wiskerchen](#) – Key Advisor



Meet our Management Team:



[Marietta C. Baglieri](#)

President & Managing Director



[Richard Godwin](#)

Director and Key Advisor



[Jane Brown](#), Attorney

Director and Key Advisor

