

Seed Strong: Using Nutrition to Maximize Seed Potential

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What are Seed Nutritionals?

- Liquid or Dry formulations developed specifically to deliver key macro and micronutrients immediately upon seed germination.
- Specific formulations developed for planter box use, seed treatment slurry use and/or as a seed finisher and shiner.
- Compatible with most popular seed treatment packages.



Why Add Nutrition to the Seed?

- Consistent yield increase
- Boost to early season vigor
- Better root development to help mitigate stress all season long
- Dry seed nutritionals provide an advantage over traditional finishers and fluency agents
- Seed nutritional products are available to fit any operation in both dry and liquid applications



Nutritional Planter Box Treatments Replace Talc/Graphite and Aid in Fluency

Rate of seed flow

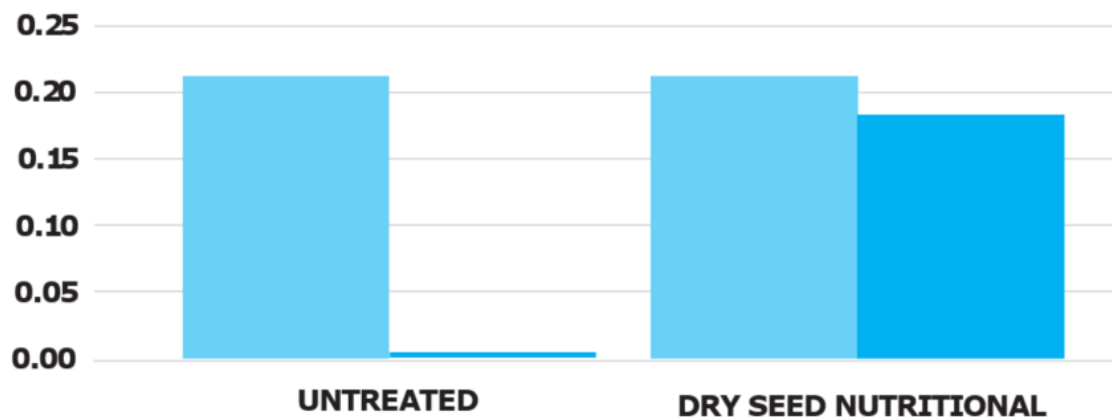


FIGURE 1. Rate of seed flow (kg/s)

■ Dry ■ Wet


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Seed singulation

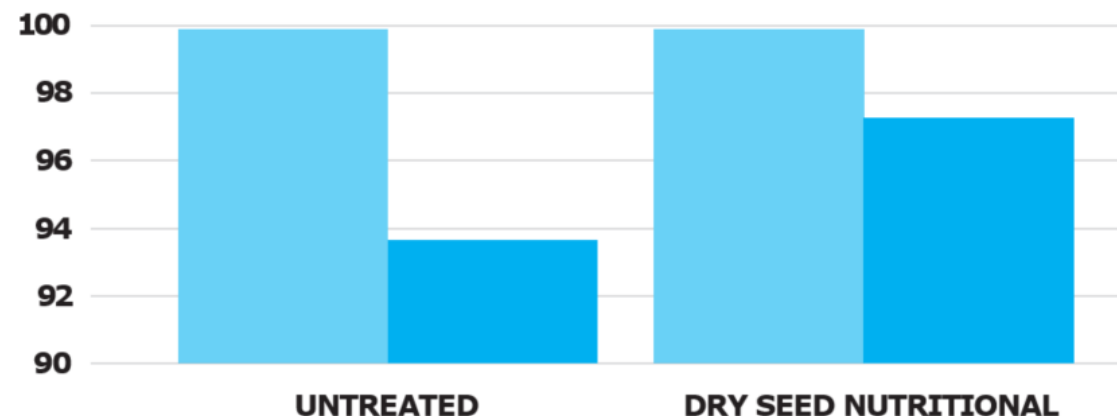


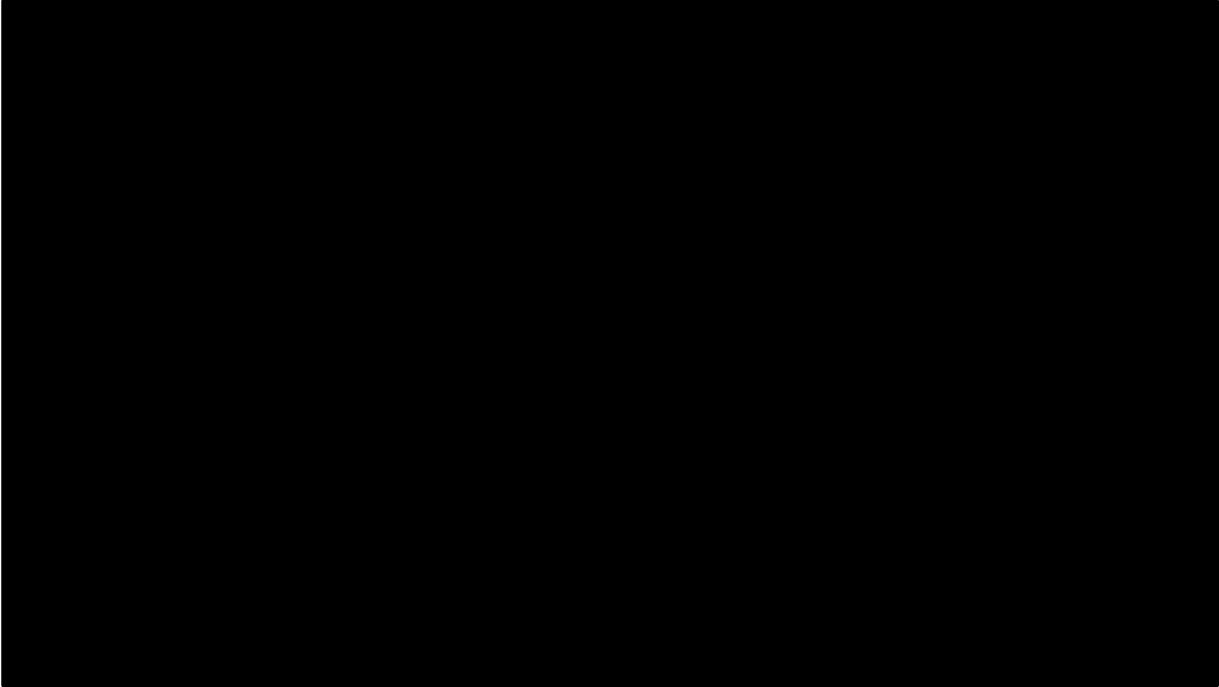
FIGURE 2. Seed singulation (%)

■ Dry ■ Wet

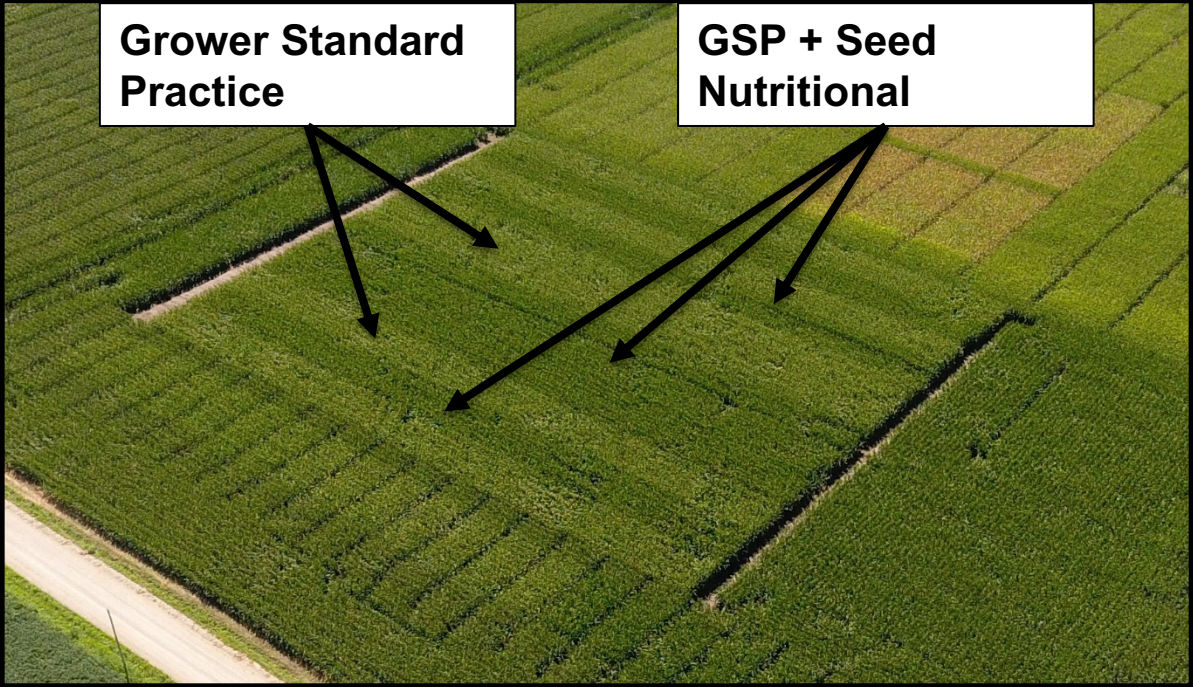

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- Seed flow experiments conducted with corn using flow meter and digital row unit compared to untreated seed.
- **Nutritional fluency agent provides significant improvement in both seed flow and singulation in wet conditions.**

Seed Nutritionals Provide a Boost to Early Season Vigor



Compass Minerals Innovation NA



Aerial view of Marshall, MO test plots summer 2018

Better Root Development Provides Benefit Throughout the Season

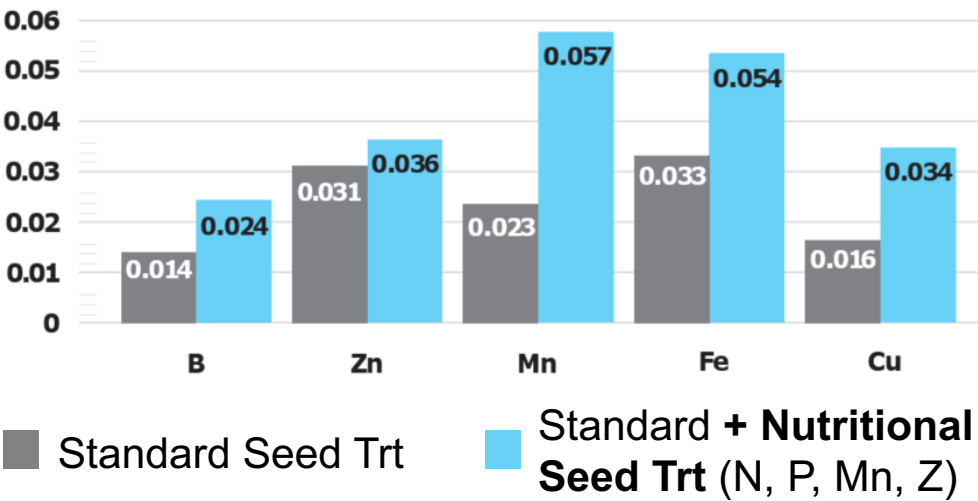


Standard Seed Treatment

Standard + Nutritional

2018 Field Trial - Hutchinson, KS

Micronutrient Uptake at V3 in Corn (mg/g of tissue)

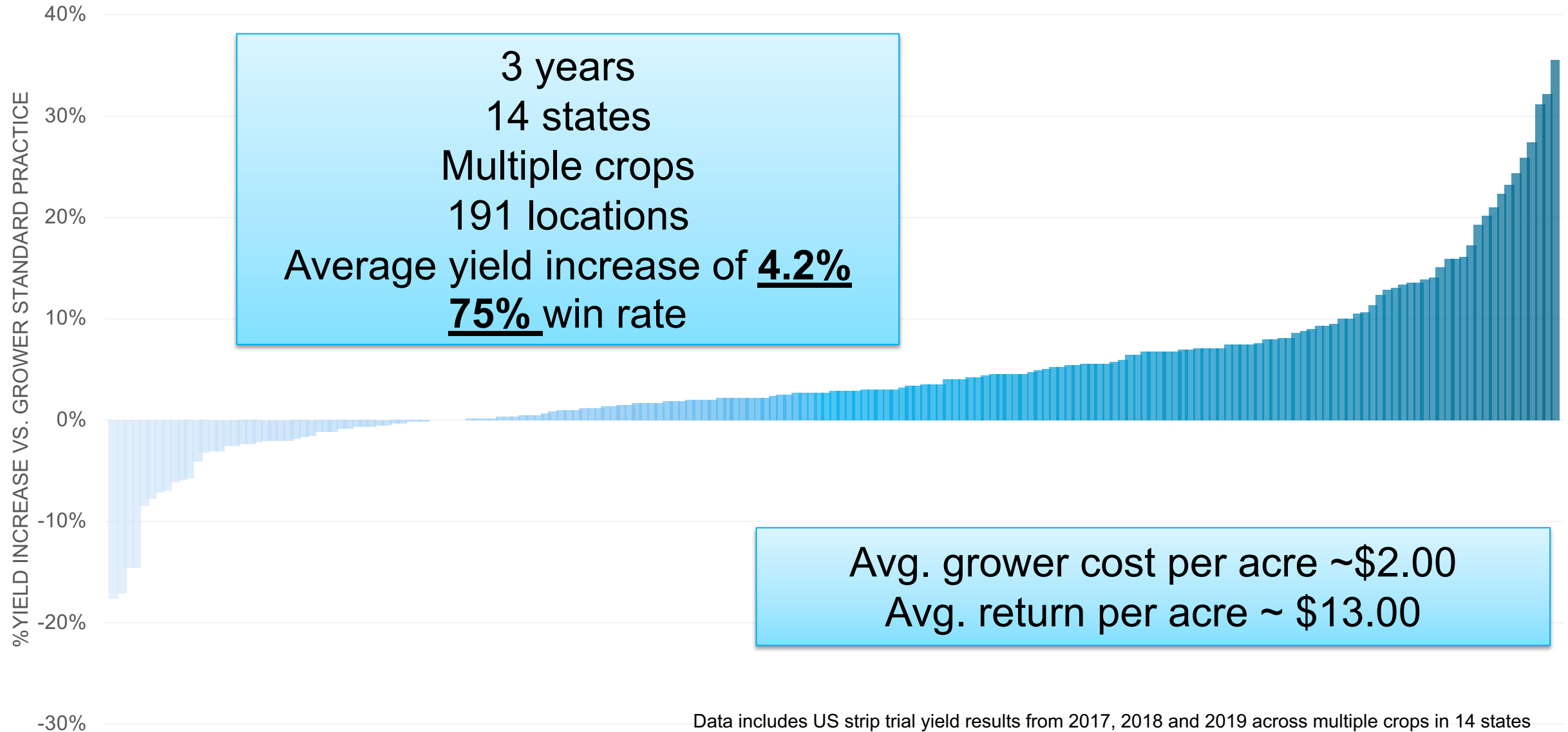


Corn at V3 with Seed Nutritional

54% Increase in tissue biomass
86% Increase in root biomass


Compass Minerals Innovation NA Greenhouse Trials

Nutritional Seed Treatments Provide Consistent Yield Across Environments and Years








Nutritional Seed Treatments are Compatible With Any Operation

- Developed specifically to work on the farm or at the retailer.
- Nutritional components to complement and optimize traditional seed treatment offerings.
- Crop specific formulations to provide key nutrients during early, and often stressful, crop growth cycles.



ROCKET SEEDS™

| | | |
|---|--|-------------------------------------|
|  | PMZ DRY 1-10-0; 8% Zn, 2% Mn | FOR CORN, WHEAT AND OTHER ROW CROPS |
| | <ul style="list-style-type: none">• Talc and graphite replacement• Creates longer, more developed root system• Excellent seed-drying source; improves lubrication and flowability• Reduces skips and seed bridging | |
|  | PMZ LIQUID 2-16-0; 3% Mn, 11% Zn | FOR CORN, WHEAT AND OTHER ROW CROPS |
| | <ul style="list-style-type: none">• Liquid suspension formulation coats seeds evenly• Creates more root surface area to take up water and nutrients• Seed safe and compatible with common seed treatment mixes• Excellent option for soils with locked up, unavailable phosphorus | |
|  | MOLY DRY 1-5-0; 1.5% Fe, 3% Mn, 3% Mo, 10.5% Zn | FOR SOYBEANS AND PULSE CROPS |
| | <ul style="list-style-type: none">• Produces larger, more vigorous seedlings• Excellent seed-drying source; improves lubrication and flowability• Talc or graphite replacement in the planter box• Highly available iron source | |
|  | MOLY LIQUID 0-0-2; 9% Mo, .45% Co, .9% Ni (Not labeled for Nickel in all states) | FOR SOYBEANS AND PULSE CROPS |
| | <ul style="list-style-type: none">• Nickel, cobalt and molybdenum to build more nodules• Ideal pH favors nitrogen-fixing bacteria establishment in root zone• Essential product of a record-breaking soybean yield program• Compatible with most pesticides, inoculants and biological products | |
|  | MOLY SHINE 1-5-0; 1.5% Fe, 3% Mn, 3% Mo, 10.5% Zn | FOR SOYBEANS AND PULSE CROPS |
| | <ul style="list-style-type: none">• Produces larger, more vigorous seedlings• Excellent seed-drying source with a polished finish• For use as a finisher in seed treatment applications• Highly available iron source | |

Conclusions

- By providing proper nutrition directly on the seed, plants can better withstand early-season stress.
 - Seed-applied nutrition is one of the most efficient ways to use fertilizer that provides yield and improves plant morphology.
 - While traditional seed treatments provide an insurance policy against pest and disease pressure, seed nutritionals provide a boost, regardless of season-to-season variability.
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Plant Nutrition

Thank You!

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