



# ***INGRAINED***



***AMINO ACID CHELATED MICRONUTRIENT FERTILIZER***

# Wheat Farm in Southwest Kansas

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CONTROL



TREATED

All wheat was treated with standard fertilizer and chemical program. This was a dryland farm in Southwest Kansas. Test portion of the field received Tracer's InGrained liquid foliar at a rate of 16 oz/acre.

*Product was applied via self-propelled sprayer.*



Major freeze event occurred during the growth period of the wheat (-20°F). InGrained was applied and this photo was taken 2 weeks after that application. The wheat that was treated with InGrained was able to recover from the severe cold stress and began to thrive. The control wheat continued to fight the "frostbite" setback and was never able to catch up to the performance level of the treated wheat.

The sprayer boom line can be seen by the sudden height seen in this photo.

INGRAINED

CONTROL



# Leaf Mineral Uses InGrained

## Guaranteed Analysis

Total Nitrogen (N).....	3.00%
Calcium (Ca).....	0.05%
Magnesium (Mg).....	1.50%
Boron (B).....	0.20%
Copper (Cu).....	1.00%
Iron (Fe).....	0.50%
Manganese (Mn).....	0.50%
Zinc (Zn).....	0.50%

Mineral Uses	
<b>Calcium</b>	Nitrogen Metabolism, Detox Agent, Growth Points, Grain Quality
<b>Magnesium</b>	Chloroplast Stability, Energy Production, Enzymes, Protein Synthesis
<b>Zinc</b>	Cell Division, Protein Synthesis, Nitrogen Metabolism, Grain Quantity
<b>Iron</b>	Nitrogen Utilization, Protein Metabolism, Enzyme Function, Photosynthesis
<b>Manganese</b>	Lignin Synthesis, Membrane Maintenance, Heat Tolerance, Vertical Growth
<b>Copper</b>	Seed Formation, Yield, Immunity, Protein Synthesis
<b>Boron</b>	Energy Utilization, Nutrient Transfer, Pollination

### FOLIAR FEEDING MECHANISM

The waxy cuticle of the plant carries a negative charge so when a positive ion (like an inorganic mineral) comes in contact, the two attract. This holds the positive ions on the surface of the leaf. Amino Acid Chelated Minerals are small in size and neutral, therefore are able to pass into the leaf to be utilized.

### AMINO ACID CHELATED MINERAL FERTILIZER

- Small Molecular size and weight
- Electroneutral
- Avoids antagonisms
- Can be applied at time of other chemical applications (with Jar Test Check)
- Freely pass through cuticle
- Recognized by the plant as proteinaceous/nitrogen containing
- Moved by the plant via the phloem

# Harvest Results



**Head Height**  
Control: 22-31"  
InGrained: 27-35"

**Control** 52 bu/acre  
**InGrained** 70 bu/acre

**34.6%**  
**Yield Increase**



## Comparing Results

When comparing the results of the stems and leaves to that of the entire plant, it is seen that there are certain metals that are more heavily distributed to the head of the plant, instead of being contained within just the structural components of the plant. Leaves and Stems have higher quantities of Potassium, Calcium, Manganese, Copper, and Boron. Elements like Magnesium, Sulfur, Zinc, and Iron were more concentrated in the heads. InGrained increased uptake and utilization in every nutrient reviewed. All these different and often overlooked micronutrients worked to increase overall health of the plant, thereby increasing yield.

		InGrained		Control	
		Whole Plant	Leaves/Stems	Whole Plant	Leaves/Stems
Total Nitrogen	%	1.24	0.73	1.14	0.51
Phosphorus	%	0.18	0.11	0.1	<0.05
Potassium	%	1.16	1.59	1.08	1.25
Calcium	%	0.12	0.19	0.11	0.19
Magnesium	%	0.1	0.08	0.08	0.1
Sulfur	%	0.1	0.07	0.07	0.07
Zinc	mg/kg	14	11	7	4
Iron	mg/kg	201	105	137	114
Manganese	mg/kg	92	112	62	96
Copper	mg/kg	4	11	3	3
Boron	mg/kg	3	5	3	3

*Just like how looking at one or two elements is not enough to get a full understanding of what is needed in a nutrient plan, only looking at one component of the plant is not enough to determine nutrient uptake and utilization*



Control heads developed dark spots on the tips of the florets. This issue was seen across all control samples. This may indicate micronutrient application assists with crop disease suppression.

It was noted during sample collection that it was much easier to pull control samples for the roots were weaker, plants had dried down more, and the soil seemed to have less moisture. InGrained plants were still green enough to continue increasing grain weights and were utilizing soil moisture more efficiently.



## Comparing Results

Wheat that was treated with InGrained continued to grow for a longer period than the Control plants. Not only did they continue to put on grain weight but they also had more berries per head to enlarge.

InGrained is best utilized with foliar application. By utilizing this alternative application method the plant is able to increase its nutrient uptake capacity and more effectively utilize what is available.

# Micronutrients prove their worth time and time again through heat, cold, and drought stress.



*Tracer's foliar fertilizers are liquid insurance in a jug. Feed your plants directly.*



The synergistic effects of proper mineral balance ensures genetic potential is reached.

## GET IN TOUCH



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