

# Zinc Fertilizer Source in Rice Production

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## Relevance

Rice is grown on approximately 40,000 acres on average in Monroe County every year. Zinc is the most critical micronutrient in rice production, particularly in soils with high pH and low soil test zinc levels. Yield reductions range from 10% to 100% in severe Zn deficient cases. In this scenario the University of Arkansas soil test report recommends 10lbs/acre of actual zinc. It was determined that producers were only applying 1-2 lbs./acre of zinc resulting in inconsistent yields with no deficiency symptoms.

## Response

Fields were located matching the criteria for zinc applications. Six plots were established in three fields (2 plots/field) with various zinc fertilizer sources at different rates. Tissue samples and soil samples were collected throughout the growing season to track zinc levels in the plant and soil in response to various zinc fertilizer sources.

## Results

Awareness was brought to producers about the importance of applying adequate amounts of zinc to prevent “hidden hunger”. Differences were observed in plant tissue and soil concentrations of zinc in relation to various zinc products. Education was gained by insuring producers are aware of what products work best in certain situations. Long term financial profits will result from producers using correct products and yield gains by supplying adequate zinc for the crop.

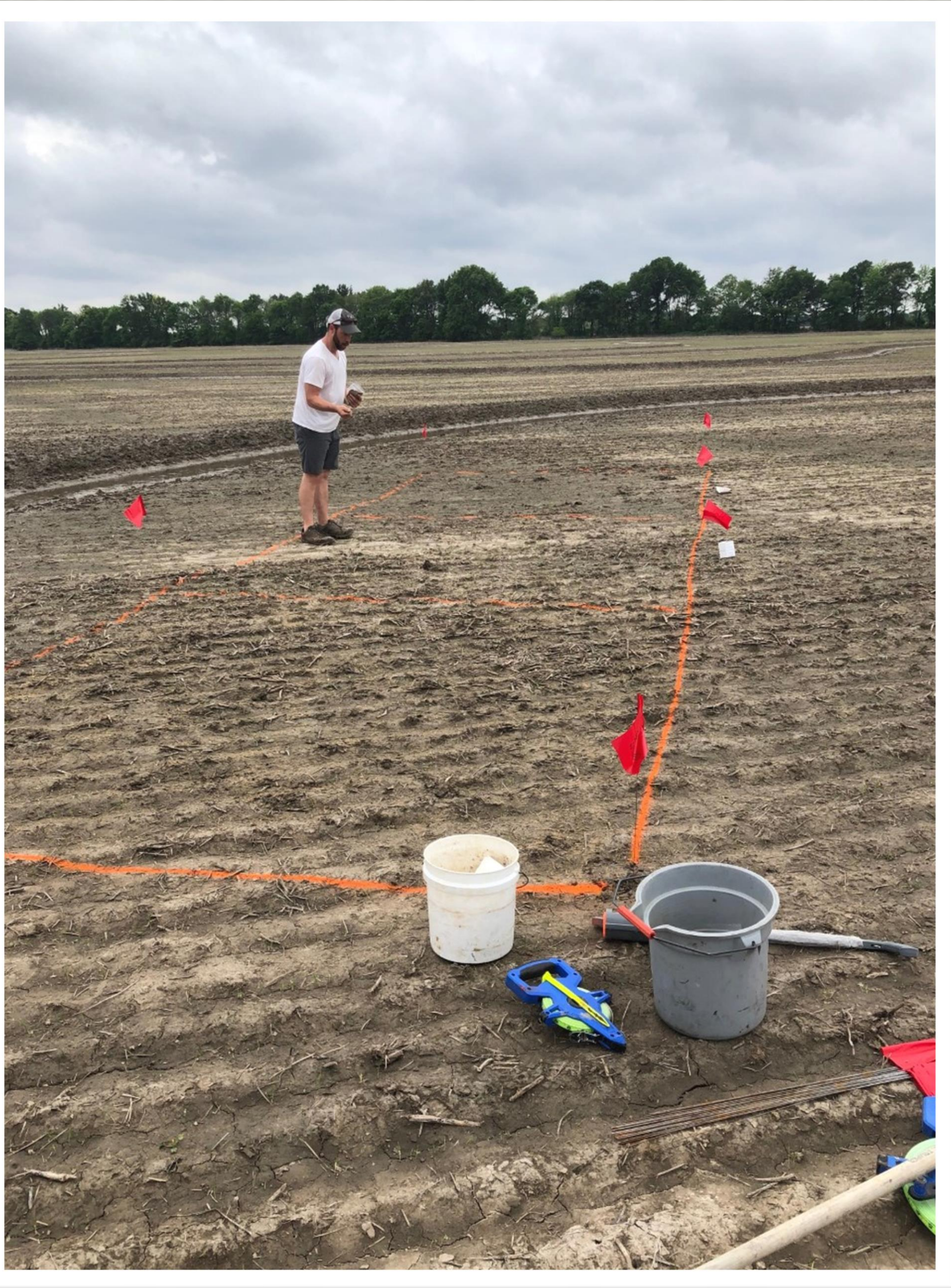


Table 1. Product rates, zinc supplied, and costs.

Product	Product Rate	Actual Zn Supplied	Cost
-	----- lb /acre -----		\$/acre
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Control	<u>0</u>	<u>0</u>	<u>\$0</u>
Zinc Sulfate	<u>28</u>	<u>10</u>	<u>\$26.50</u>
MicroMerge Zinc	<u>100</u>	<u>10</u>	<u>\$90.00</u>
MicroMerge Zinc	<u>20</u>	<u>2</u>	<u>\$18.00</u>

Table 2. Midseason plant tissue Zn concentrations.

Product	Actual Zn supplied	Cost	Tissue Zn Concentration
-	(lb/acre)	\$/acre	(ppm)
Control	<u>0</u>	<u>\$0</u>	<u>28.3</u>
Zinc Sulfate	<u>10</u>	<u>\$26.50</u>	<u>35.0</u>
MicroMerge Zinc	<u>10</u>	<u>\$90.00</u>	<u>28.7</u>
MicroMerge Zinc	<u>2</u>	<u>\$18.00</u>	<u>27.4</u>

\*Although all treatments including the control contained optimal tissue Zn levels (>22ppm)for rice at the tillering growth stage (Table 2), the zinc sulfate treatment showed the highest zinc level in the plant. Our results show that zinc sulfate is the most cost-effective zinc fertilizer source, in terms of plant uptake and building soil test zinc levels."

Table 3. Spring to fall differences in soil test zinc.

Product	Actual Zn supplied	Sp. to Fall diff in soil test Zn (AVG)
-	(lb/acre)	(ppm)
Control	<u>0</u>	<u>+0.03</u>
Zinc Sulfate	<u>10</u>	<u>+2.5</u>
MicroMerge Zinc	<u>10</u>	<u>+3.6</u>
MicroMerge Zinc	<u>2</u>	<u>+0.75</u>

\*The soil test Zn increases shown are an average across 4 plots comparing spring sampled soils before zinc was applied to fall sampled soils after zinc was applied.

