Wolf Trax DDP® Nutrients Improve Rice Yield In Nicaragua

Part 1: Micronutrients and Tropical Soils

FIELDINSIGHTS
Your Connection to the Field
ISSUE 2: 2015

A study was conducted in Chontales, Nicaragua in 2015 to evaluate the performance of Wolf Trax Innovative Nutrients on rice. This study showed that micronutrients gave significantly better yields over an NPK blend with no micros and that DDPs outperformed traditional granular micronutrients. Mg, Zn and Fe DDP s coated onto the NPK blend dramatically improved yields by 14%, 25% and 36%, respectively over a traditional NPK blend, thus optimizing rice yield and return on investment.

BACKGROUND

Tropical soils are characterized with being highly weathered, acidic, low CEC, and low in available nutrients. This can present many challenges for growers to optimize crop production. The objectives of this series of research were to examine which micronutrients tropical soils are responsive to and how Wolf Trax DDPs can play a role in correcting deficiencies. Nicaragua is one of Central America's countries where agriculture represents a significant percentage of Gross Domestic Product[1] and is an ideal place to study tropical soils.

1 http://www.fao.org/wairdocs/tac/x5789e/x5789e02.htm

METHODS

A field study was conducted by Freedom Ag Research during spring 2015 in a grower's farm in Chontales, Nicaragua. The soil at the experimental site was a fine sandy loam, with pH=6.4 and 2% organic matter content. Soil analysis determined that Mg, Fe and Zn were limiting nutrients, in addition to N, P and K. A base NPK blend was then set and consisted of 575 lb/acre (46-0-0), 748 lb/acre (18-46-0), and 376 lb/acre (0-0-60).

Pre-germinated rice seed and fertilizer treatments were broadcast at the same time and incorporated into the soil at 1-inch deep.

Wolf Trax DDP Nutrients feature three proprietary technologies that ensure effective delivery of nutrition:

EvenCoat™ Technology

Fertilizer coating technology that allows for blanket-like distribution and more points of interception for young roots.

***PlantActiv*™ Formulation**

Physically and chemically designed – the Wolf Trax DDP particle size is optimum for plant uptake.

FlexUse™ Application

In fields with severe deficiencies or crops with high demand, many DDP Nutrients can be applied multiple times in a season.

Plant density was about 15 - 20 seeds/ft^2. Treatments were set in a randomized complete block design with four replications. Data was analyzed using general linear models (P≤0.10) and treatment values were separated using Fisher's-protected least significant difference tests.

Treatments

1. GP (Grower practice with N, P, and K)
2. GP+Mg STD (12.5 lb/acre Magnesium Sulfate)
3. GP+Mg WT (3.8 lb/acre Magnesium DDP)
4. GP+Fe STD (28.8 lb/acre Ferric Oxide)
5. GP+Fe WT (1.53 lb/acre Iron DDP)
6. GP+Zn STD (18 lb/acre Zinc Sulfate)
7. GP+Zn WT (0.6 lb/acre Zinc DDP)

RESULTS

Micronutrient treatments significantly improved grain density and total yield of rice. The highest seed weight was observed in the NPK + Zn WT and NPK + Fe WT treatments, with about 88.5 g/1000 grains, which represented a 36% increase in weight compared to plots treated with the general practice of just NPK (Figure 1). Number of inflorescence and seeds per head were minimally influenced by the treatments (data not shown). Consequently, because of the difference in grain weight density, total yield was significantly improved as well. Rice total yield increased with the application of Mg, Fe and Zn, regardless of the fertilizer sources (Figure 2). However, plots treated with Mg, Zn or Fe using Wolf Trax DDPs as the source had dramatically improved yields - 14%, 25% and 36% respectively - over the general practice. Also, DDP-coated fertilizers showed positive effects over the standard granular micronutrient treatments on increasing total grain weight and total yield.

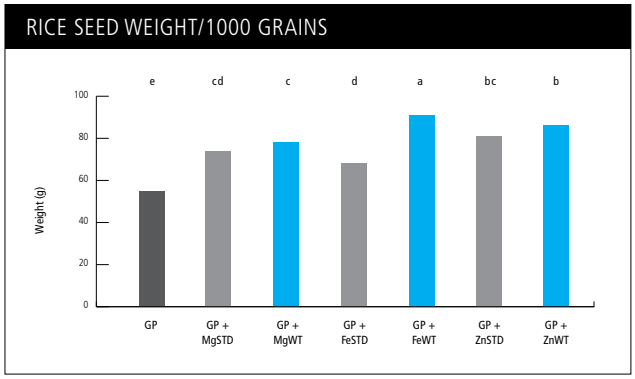

Figure 1 - Effects of Wolf Trax DDP fertilizers on rice seed weight/1000 seeds at harvest. Values followed by the same letters do not differ at P<0.10.

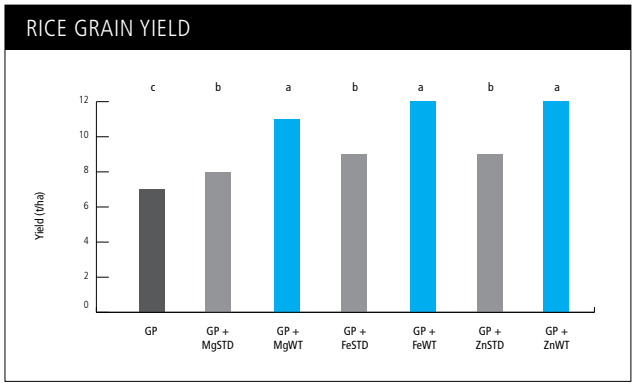

Figure 2 - Effects of Wolf Trax DDP fertilizers on rice grain yield at harvest. Values followed by the same letters do not differ at P<0.10.

Photo of rice research plots located in Chontales, Nicaragua.

SUMMARY

Additions of micronutrients significantly increased rice yield, with Mg, Zn and Fe DDPs giving the greatest yield improvements over traditional granular micronutrients. The superior formulation and distribution of Wolf Trax DDP Nutrients not only deliver better agronomic performance, but they also allow for several operational efficiencies which reduce the sheer volume of fertilizer needed to be stored, blended and spread across the field. This combination of benefits add up to the greatest return on investment for the grower.