Harvesting Nature's Science



Efficiency Test of HUMA GRO® SUPER PHOS® in Spring Wheat

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Research Report

Introduction

Proper phosphorus (P) nutrition is important for wheat root growth and tiller development. Furthermore, P is an essential component of energy-carrying phosphate compounds (adenosine triphosphate [ATP] and adenosine diphosphate [ADP]), nucleic acids, essential coenzymes, and phospholipids.

Phosphorus deficiency can cause wheat to grow slowly and mature late. Phosphate is the only form of P that plants are able to take up, yet only 1% of all P in most Montana agricultural soils is present in a phosphate form. Although typical Montana fields contain between 1 or 2 parts per million (ppm) to 20 or more ppm of P, its availability is directly affected by soil pH. In Montana's predominantly alkaline (high-pH) calcareous soils, the phosphate ions tend to fix P by reacting with calcium (Ca) and magnesium (Mg) to form compounds of very low solubility.

SUPER PHOS® (SP; 0-50-0) is a Micro Carbon Technology® – based P fertilizer specifically formulated to resist "tie-up" with Ca and Mg so P can remain water-soluble and available to plant roots. This product has been proven to aid P uptake in cold, wet, alkaline, and calcareous soils.

Objective

The objective of the field trial was to evaluate the relative efficiency of topdress and foliar application of SP and traditional P fertilizers – ammonium polyphosphate (APP), diammonium phosphate (DAP), and triple superphosphate (TSP) in spring wheat.

Materials and Methods

The experimental site was at Montana State University's Western Triangle Agricultural Research Center (WTARC), near Conrad, MT. The Choteau spring wheat variety was used. Eleven treatments were replicated four times. Nitrogen (N) was applied to SP at seeding to compensate for the N level in APP and DAP. Treatment 1 was established as a check plot unfertilized with P. For treatments 2 through 7, liquid APP and two granular P fertilizers - DAP, and TSP - were applied with the seed at planting. For Treatments 8 and 9, SP, diluted with water at a concentration of no greater than 5% (v/v) was applied at seeding by dribbling it over the top of the seed. Seed and P fertilizer were covered with approximately 1 inch of soil after application. For treatments 10 and 11, a foliar application of SP at tillering (Feekes 5) was done using an all-terrain-vehicle (ATV)-mounted stream-bar sprayer.

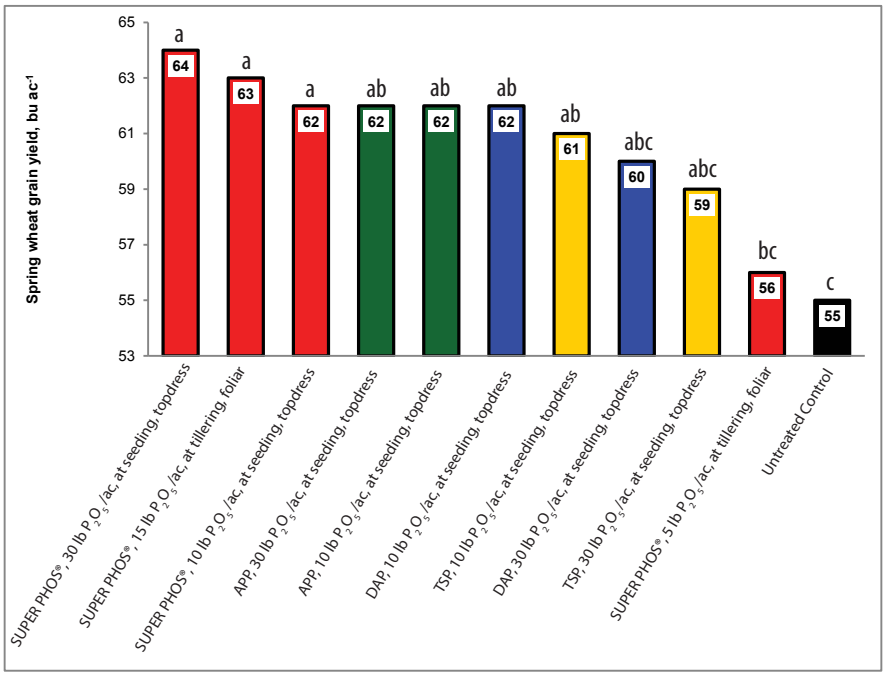

Figure 1. Spring wheat grain yield as a function of P fertilizer source, rate, time, and placement, Conrad, MT, 2013.

Results (2013 Growing Season)

The highest yields of 64 bu/ac and 63 bu/ac were obtained, respectively, with SP applied at a rate of 30 lb P_2O_5 per acre as a topdress at seeding and a rate of 15 lb P_2O_5 per acre as a foliar spray at tillering (Fig. 1). Comparable grain yields of 62 bu/ac were obtained with both SP and DAP applied at 10 lb P_2O_5 per acre as topdress at seeding.

SUPER PHOS® has performed very well in terms of spring wheat grain yield. Application of SP at seeding at both 10 and 30 lb P_2O_5 bu/ac rate resulted in significantly higher grain yields compared to the untreated control. Tripling the rate of SP from 10 to 30 lb P_2O_5 increased yield by 2 bu/ac. Foliar application of SP at 15 lb P_2O_5/ac rate at tillering also produced significantly higher grain yields compared to the untreated control.

This study confirmed that SP is much less corrosive and less likely to cause damage to the seeds as a dribble, and suggests that SP could be applied with the seed at a higher rate compared to other P sources.

Preliminary Conclusion

Results indicated that application of SUPER PHOS® at seeding at the rate of 30 lb P_2O_5 bu/ac could be a good option for P fertilization in spring wheat cropping systems. More data from replicated studies conducted at multiple locations is

Full research report available upon request.

SUPER PHOS® can be applied by foliar application, according to label directions, without the risk of phytotoxicity and keeps phosphate available and soluble in the soil solution for rapid and controlled uptake by plant roots without being blocked by clays or organic matter. Phosphate encourages the production of amino acids, proteins and carbohydrates necessary for cellular division.

Our HUMA GRO® Products Are Highly Efficient and Effective Due to Our Unique Delivery System

MICRO CARBON TECHNOLOGY® Delivering Nature's Science™

If you would like to learn more about this top quality product, contact us directly at 800-961-1220 or visit our website at www.humagro.com.

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