

NEWS & VIEWS

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Searching for Answers in 2004 and Beyond

IT'S NOT OFTEN that you see or hear good news about agriculture in a media story...especially if major newspapers and TV are your primary sources of information. However, there are many unheralded, positive developments related to improving nutrient use to grow higher yields of healthy food, and in an environmentally-friendly way. While fertilizers are just one part of modern production systems, we are continually looking for ways to use this resource more effectively.

For many years, the Potash & Phosphate Institute (PPI) has been dedicated to discovering the most appropriate way to use plant nutrients. Partnering with the Foundation for Agronomic Research (FAR), these two institutions help support agronomic research and educational programs across North America. These efforts are all designed to answer current questions about how to help farmers be as efficient, productive, and sustainable as possible.

Both PPI and FAR have a long history of supporting research projects throughout the West Region. Following is a brief summary of the current projects supported by PPI and FAR. It must be remembered that many of these projects are still underway and final conclusions cannot be made from preliminary data. If a particular project is of interest to you, feel free to contact the individual university researcher to get the latest information.

The summaries that follow provide a brief overview of each project. For more details, please consider contacting the research project leader or Dr. Rob Mikkelsen. You can also view the full annual reports of each project (current and past), when available, at the website:



>www.ppi-far.org/research<

California



Mapping Soil Potassium Fixation in the San Joaquin Valley and Development of a Practical Soil Test for Potassium Fixation

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Potassium (K) deficiency due to K fixation is common in many cotton fields in California. Previous studies have shown that non-granitic Coast Range soils do not fix much K, while soils derived from granitic Sierra Nevada alluvium often fix large amounts of applied K. The objectives of this study are to predict K fixation based on soil texture and mineralogy as inferred from soil surveys. Improved soil testing methods for predicting K-fixation capacity on soils collected from the San Joaquin Valley are also under investigation.

Our results have shown that the silt, very fine, and fine sand fractions of soil are responsible for most of the K fixation. In soils with high clay content, silt fixes the most K. In the upper horizons of the coarser soils, K fixation occurs mostly in the silt fractions, whereas fine and very fine sands fix the most K in the lower part of the soil profile.

Maps outlining the extent of these K-fixing soils are currently being made to help growers improve K fertilization practices. CA-23F



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Idaho



Phosphorus Fertilization of Southern Idaho Sugarbeets

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Project Cooperator: Bryan Hopkins

Phosphorus (P) is an essential element for sugarbeet (*Beta vulgaris*) nutrition. Soils in the western U.S. tend to be calcareous and alkaline, resulting in low P solubility. Sugarbeets have difficulty exploiting soluble P in surface soil due to their taproot system. Research in the Northcentral U.S. supports P applied in a band in contact with the seed or below the seed for best results. However, grower concerns about germination problems and seedling vigor have prevented adaptation of these techniques in Idaho. This project evaluated the effectiveness of two fertilizer sources...ammonium polyphosphate (APP) and urea ammonium nitrate (UAN)...at three depths in comparison to a broadcast application at two Idaho locations. The UAN treatments were included in an effort to isolate the nitrogen (N) only response from the combined effect of N and P in the APP treatments. One location showed significant responses to treatments, with the APP at all three depths and the surface and 3 in. deep UAN having significant increases in sugarbeet tonnage. However, only the surface UAN and the 6 in. deep APP bands resulted in significantly increased sugar production when sugar percentage was combined with tonnage. Although some discrepancies exist between locations this year and with the results from 2002 and 2003, the APP band at the 6 in. depth resulted in the highest total sugar production for 3 of the 5 site years of data.

The result of this study, combined with evidence from other studies, indicates that deep banded (6 in. below the soil surface) APP fertilizer placed directly below the seed enhances P availability and results in increased sugar production. Shallower placement (3 in.) or surface banding also resulted in increased yields in a previous study, but the effect was neither as great nor as consistent as the deep banded treatment when evaluating the findings of this study over 3 years. In general, starter UAN bands did not enhance sugar production, although a significant increase in sugar yield was observed at one site in 2004 with surface band applied UAN. Although additional studies are planned, the results of this study, in combination with the work from previous years, show that deep banding P on sugarbeets enhances P uptake and, as a result, sugar production.
ID-06F

Oregon



Evaluating Dryland Winter Wheat Responses to Chloride Fertilization in Eastern Oregon

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Project Cooperator: Richard Smiley

This year's results confirm the earlier observations that chloride (Cl) fertilization will consistently and significantly increase leaf Cl concentration, reduce the physiological leaf spot (PLS) rating of common type soft white winter wheat when conditions are appropriate for PLS to develop, and increase grain yield. The grain yield response to Cl has been variable. Positive yield responses have been observed on soils with a wide range of Cl concentrations and across a number of wheat varieties. Club wheat varieties seem to respond differently to Cl than the common winter wheat varieties. Club wheat varieties have greater leaf Cl concentrations and tend to respond to Cl in situations where the common varieties do not. The definitive mechanism responsible for the Cl response remains elusive. Additional trials are planned that will use indirect measurements of plant water relations to assess whether Cl may be playing a role in helping plants reduce or avoid water stress. *OR-13F*

Evaluating the Effect of Phosphorus Fertilization on Hessian Fly Infestation in Wheat

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Hessian fly is a relatively new pest in northeastern Oregon, but there are increasing reports of economic loss, especially under direct seeding conditions. Hessian fly infestations caused yield reductions in the 2001, 2002, and 2003 spring wheat crops at the Columbia Basin Agricultural Research Center. Results from preliminary field trials in 2003 indicated that P fertilization reduced Hessian fly infestation of susceptible spring wheat varieties and increased leaf P concentration and grain yield. Field trials were established in the spring of 2004 at Pendleton and Moro to evaluate the effect of P fertilization on leaf P concentrations, tillering, Hessian fly infestation, grain yield, and test weight of susceptible and resistant varieties. Fertilization increased leaf P concentration at mid-tillering at both locations and in the flag leaf at Moro. The number of tillers was unaffected by P fertilization. In stark contrast to the results in 2003, P fertilization had no effect on Hessian fly infestation, grain yield, or test weight.
OR-14F ■