



Kick-Off the Fall Season with Fertilization Management / Fall 2005

Nourishing the 2006 Crop...Will We Get It Done?

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Sticker shock! Some folks appear to be experiencing this condition as 2006 crop management strategies are considered. Will it motivate growers and their advisers to rigorous evaluation of nutrient management options based on sound economics and agronomics...or will it create an emotional obstacle to rational decisions?

Which of these reactions dominates will largely determine whether the 2006 crop is well nourished or forced to redirect a larger share of the energy it captures from the sun to scavenging for nutrients...energy that gets subtracted from yield development.

Let's guide our thinking on this topic with some recent quotes from six different sources.

- "We are a science-based industry."—*A captain of the fertilizer industry*
- "Soil test K information is essential for prioritizing K applications to those fields most likely to respond to added K."—*Extension Soil Scientist*
- "Farmers could start mining the potash retained in the soil and lighten up on potash applications."—*Market Analyst*
- "This year (2005) we have seen a higher number of corn and soybean fields exhibiting potassium deficiency symptoms."—*Extension Soil Scientist*
- "Weather continues to be the farm economy's biggest enemy."—*Fertilizer Manager*
- "Fertilizer management strategies should be balanced with regard to achieving high short-term efficiency as well as maximizing the cumulative crop yield response over time."—*University Research Agronomist*

Science-based—

What does that mean? One interpretation is that we guide use of input products and services with science...we encourage use of best management practices (BMPs), such as appropriate soil testing. The relevancy of these practices does not diminish with market fluctuations.



At the same time higher costs may be causing growers to consider cutting back on fertilizers, deficiencies of K and other nutrients are being detected in more corn and soybean fields. For most situations, the best advice is "stay the course" and continue to follow management practices that include balanced fertilization.

Soil test information is essential—

Soil testing is the best indicator we have for the economic and agronomic impact of nutrient additions. It clearly has its weaknesses and interpretation can be challenging, but in general soil testing serves us well.

Start mining potash?—

The analyst who suggests this makes an interesting observation. The industry figured out that we do indeed need to mine more potash...but perhaps, unless soil tests are sufficiently high, it would be better to do so from mines rather than from the fields that support farm families and provide society with needed food, fiber, and bioenergy. The facts indicate that in many critical production areas of North America, "mining" has been going on for many years.

Let's go a little deeper into this issue. PPI, in cooperation with North American soil testing laboratories, is in the process of conducting another intensive survey of the fertility of our soils. One of the first states to be completed is Kentucky, with over 70,000 soil samples collected for the 2005 crop year. It shows a median soil test potassium (K) level of 128 parts per million (ppm), a 6 ppm decline from the

2001 summary. Was it a surprise? No, because the K budget for Kentucky shows an average deficit of about 15 lb K_2O/A and we typically expect soil K to change 1 ppm for every 8 to 12 lb of K_2O in the net nutrient budget (15/1.5 ppm/yr = 10 lb K_2O/ppm). Soil testing worked, nutrient budgets worked as predicted, and...there is no free lunch. If fertile soils are desired, then their fertility must be maintained. Knowing field-specific nutrient budgets and tracking soil test levels over time are fundamentals of modern nutrient management.

More K deficiency symptoms—

This has been a recurring theme now for several years. It's not just soil tests and nutrient budgets that indicate many fields are on the edge of rather serious growth limitations, the plants themselves tell us this is so.

Weather... the farm economy's biggest enemy—

Few would disagree, especially those who suffered big-time this year from the drought in the heart of the Midwest Corn Belt. Let's remember the tools we have to buffer the negative effects of weather: crop selection, intelligent soil management, and optimum P and K levels. For several years, data have indicated how drought effects can be substantially reduced by improving water use efficiency with optimization of these nutrients.

Balance short-term efficiency with cumulative yield response—

Nutrient use efficiency has become a hot topic. The fertilizer industry has paid attention by developing and delivering products and practices focused on improving efficiency. These are positive contributions, especially with today's higher nutrient costs and intensified concern about environmental impacts. As management strategies are planned with efficiency in mind, it is critical to be cognizant of impacts on future productivity...the agronomic foot-print left behind.

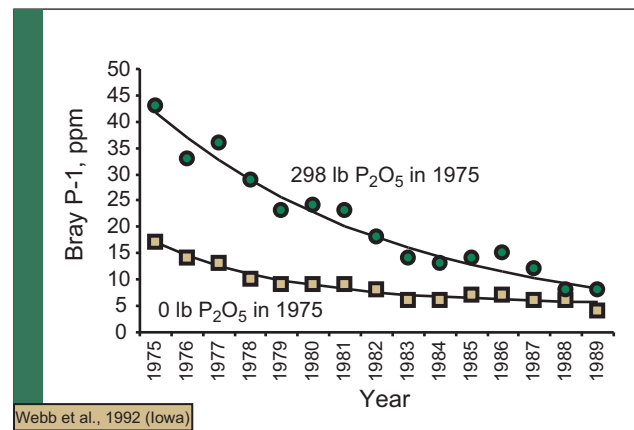


Figure 1. The residual effect of a single P application to this Iowa soil persisted for more than 15 years.

A multitude of studies from around the world show us that cumulative responses to residual P or K remaining after the year of application are nearly always greater than the initial response. **Figure 1** shows an example residual effect of P application in Iowa. Recent research shows that due to interactions with soil organic N, residual effects of N may also be important.

The challenge is to avoid situations where apparent gains in short-term efficiency are just loans taken out against future productivity. The goal is to design strategies that use improved products and practices to reap benefits sooner rather than later, while also maintaining system sustainability. ■

For more on these issues, see:

>www.ppi-ppic.org/fertilizer/economics<

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