



Summer 1999, No.3

PHOSPHORUS, POTASSIUM AND THINKING PAY

There's more to life than worrying about phosphorus and potassium, right? There certainly are a lot of different things that producers, consultants, dealers, and other agribusiness professionals are worrying about right now—biotechnology, weed control, crop quality, prices, insurance. The list goes on and on. We often take comfort that with all there is to think about, managing phosphorus and potassium is pretty straightforward. We take a soil test, look at a recommendation table, and apply phosphorus and potassium. That's it. No more worries. But is that really all that's involved? Is there a chance that we may be oversimplifying, and if so, what's it costing us?

University recommendations were created as suggestions. That's right, suggestions. They are not written in stone, and they may not work best everywhere. They do, however, provide a great starting point. University recommendations are based on years of research and experience and therefore provide an educated approach to managing nutrients. However, not all soils and conditions were included in the research. Local conditions can lead to best management practices different from university guidelines.

Data, expertise and experience are a winning combination. We can't modify university guidelines on gut feelings. Care was taken to create guidelines, and care should be taken to modify them. Remember, there is a lot at stake for making a change in the wrong direction—reduced profits, increased risk of environmental losses, etc. Testing approaches in replicated strips, controlling other factors, well-informed interpretations of results, and careful observations are critical to proper evaluations. Some progressive agribusiness professionals have very successfully created local best management practices that increase farmer profits and production levels.

Many factors affect how much phosphorus and potassium is appropriate. Most university recommendations are based on soil tests and yield goals. Generally, lower soil tests and higher yield goals lead to larger recommended rates. However, soil tests and yield goals do not tell the whole story. Research has shown that there are many factors that can affect how crops will respond to phosphorus and potassium. Some of these are:

- Soil temperature
- Soil moisture
- Subsoil fertility
- Free calcium carbonate
- Soil pH
- Hybrid/variety
- Tillage
- Distribution of phosphorus and potassium in the soil
- Interaction with other nutrients

We need to use all of our agronomic knowledge to come up with the best phosphorus and potassium management strategies.

The benefits of thoughtful phosphorus and potassium applications can be high. Some research from the University of Minnesota has shown that phosphorus applications based on more than yield goal and soil test levels can result in increased profits up to \$40/acre in soybeans. While these data are very preliminary, they show just how important expertise can be to farmer profitability.

There must always be flexibility in recommendations. There are just too many factors that vary from year to year and from place to place for one recommendation to be right all the time. Using knowledge to adjust phosphorus and potassium applications for different situations will always be necessary for increased productivity, profit, and environmental protection.

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Note: *Agri-Briefs* are available online at the PPI web site: ppi-far.org/agri-briefs