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USING PHOSPHORUS AND POTASSIUM SOIL TEST RESULTS

What can you do with soil test information? Once you have spent the time collecting samples and getting them analyzed, it's important to make full use of the results. Soil testing can be used for:

- Identifying yield-limiting factors
- Determining nutrient recommendation
- Estimating the probability of getting a crop response to added nutrients
- Evaluating how well a nutrient management program is performing
- Estimating how much potassium or phosphorus must be added to increase soil test levels by a certain amount

Soil tests drastically improve nutrient management. They can show where situations exist that limit crop yield and quality. It is important to look at more than one result at a time. Too often, the requirements of each nutrient are examined in isolation. This ignores interactions. For instance, soils that are too acid or too basic can limit the availability of phosphorus and potassium. Lighter textured soils are not able to hold as much phosphorus or potassium as heavier soils. Get to know such relationships and consider each result in the context of the others. Combine this approach with good records of management practices to get the most from soil test results.

Soil tests can help you manage risk. Crops grown on low testing soils have a greater chance of responding to fertilization in the year of application. They also run the risk of not yielding as much as crops grown on higher testing soils. In some situations soil tests are not as good at determining when a crop response will occur. For instance, banding potassium in ridge-till and no-till soils may produce responses even under higher testing soils. Starter fertilizers can also provide benefits at higher soil tests. Know the research in your area to identify such situations.

Testing soil regularly provides critical information. Tracking how soil test levels have changed over time is one of the best ways of evaluating your fertility program. If your objective was to build soil test levels, you can see if you have accomplished it and how long it took you. You can also get a sense for the variability in soil test levels over time. Can you find some trends or is there just too much scatter in the data? If there is a lot of variability, are you managing nutrients in a way to address this uncertainty? Remember, that for any analysis of data over time, more frequent sampling provides a much clearer picture of what has been happening. If you sample once every four years, at the end of 12 years you only have three points to look at – barely enough to see any trend at all. If you're worried about how much more frequent sampling will cost, think of the costs of not knowing how your nutrient management program is performing.

Historical soil test data can refine your nutrient management program. Knowing how soil test levels have been changing can be combined with knowledge of nutrient use and the quantity of nutrients removed by harvested crop portions. The total amount of phosphorus or potassium removed by crops can be subtracted from the total amount applied. This gives you net additions or subtractions for each interval between soil sampling. Dividing this net by the change in soil test level provides an estimate of how much phosphorus or potassium must be applied or removed to change the soil test by 1 part per million or pound per acre, whatever the case may be.

Soil testing is an essential part of nutrient management planning. Be sure to make full use of the information it provides.

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