

Soil test to save big

By JOSH FLINT

FOLLOW along with Fabian Fernandez, a University of Illinois Extension assistant professor of soil fertility, as he explains how you can implement a soil testing program for potassium.

To begin with, let's assume you're

thinking of using soil testing on a 50-acre field, with high cation exchange capacity soil and a goal of 300 pounds of potassium per acre.

Also, let's assume you'll be setting up a four-year soil testing program, with a normal crop rotation of corn (180 bushels per acre) and soybeans (50 bushels per acre).

Pencil it out

Assume the following:

- a) 50-acre field
- b) Four-year soil testing program
- c) High cation exchange capacity soil
- d) Critical level is 300 pounds of potassium per acre
- e) Corn yield of 180 bushels per acre
- f) Soybean yield of 50 bushels per acre
- g) \$800 per ton of potash (62% K₂O) or 40 cents per pound

Test is low, at 250 pounds K per acre

$(50 \times 4) + (0.28 \times 180 \times 2) + (1.30 \times 50 \times 2) = 431$ pounds K₂O is needed (or 695 pounds of fertilizer, which is 62% K₂O)

695 pounds of fertilizer per acre needed over four years, or 174 pounds per acre per year

695 pounds fertilizer at 40 cents per pound = \$278 per acre, or \$13,900 for the 50-acre field

First off, how varied is the field's topography, soil type, soil K levels, etc.?

Fernandez recommends collecting one sample every 2.5 acres for uniform fields and every 1.1 acres for fields with more variation. At \$4.75 per sample, the cost of soil testing is \$95 if you test every 2.5 acres on a 50-acre field or \$214 if you test every 1.1 acres on a 50-acre field.

After receiving the results, let's say the soil tested low, at 250 pounds of K per acre. Therefore, you need to apply enough to bring the soil to the critical level of 300 pounds per acre, plus what the crop will remove each year.

■ First, you are short 50 pounds of potash per acre from the critical level of 300 pounds per acre. To increase the K₂O level to 300 pounds per acre, you need to apply 4 pounds of K₂O to raise the soil test by 1 pound. Therefore, multiply 50 pounds of K₂O by four to achieve a value of 200 pounds per acre.

■ Next, calculate how much K your corn crop will remove. On average, corn removes 0.28 pounds of K₂O per bushel. Remember to multiply the result by two years.

■ Finally, add in the amount of K removed by two years of soybeans, which is 1.30 pounds of K₂O per bushel.

When you add the three values together, you come up with 431 pounds of K₂O per acre, over the course of four years (see graphic).

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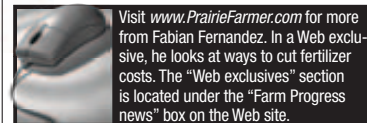
Cost benefit analysis

Using white potash (0-0-62), you will actually need to apply 695 pounds of fertilizer over the course of four years, or 174 pounds per acre per year to meet your goal of 431 pounds of K. Using a cost of 40 cents per pound (or \$800 per ton), you'll need to spend \$278 per acre over four years, or \$13,900 for the entire field over the course of the four-year program.

Per year, you'd need to spend \$3,475 on the 50-acre field to meet your K goals. Compared to how much the fertilizer application will cost, Fernandez says the cost of soil testing is minimal. In fact, the initial cost of the test was only 0.7% (every 2.5 acres) of the entire cost.

To really drive the point home, Fernandez asks: What if the K test was very high and there was no need to apply fertilizer? Without the soil test information, most people would have applied a typical rate. At 40 cents per pound, it pays to know where your soil nutrient levels are.

While this example is for a one-rate application, intensive sampling can provide information to guide variable-rate technology fertilization, which could reduce total fertilizer costs at the whole-field level.



Visit www.PrairieFarmer.com for more from Fabian Fernandez. In a Web exclusive, he looks at ways to cut fertilizer costs. The "Web exclusives" section is located under the "Farm Progress news" box on the Web site.