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THE RIGHT TIME TO TEST

The right time to take soil samples is in rhythm with the crop rotation. Normally it's best to sample following the same crop, giving a consistent basis for comparing fields and picking out trends over time. Most samples are taken in late summer and fall, to allow ample time for planning a crop nutrition program based on the 4Rs—right source, rate, time, and place. But, with this year's drought, is fall sampling still a good idea? There are several reasons why it is.

Severe drought reduces the crop's uptake and removal of nutrients. The effect on the soil test is not likely to be large. Leftover nutrients from a typical corn crop might increase soil test levels by 3 to 5 parts per million for P and K, assuming the worst-case scenario with nothing harvested from the field. If the drought cuts yield in half, the increase is likely to be smaller. And leftover nutrients that show up in the soil test are likely to be available to the next year's crops.

Of course, nutrients can also change chemical forms when the soil dries out. But it can be hard to predict whether their availability will increase or decrease. Generally, soil test K increases as a soil dries, so we expect to see higher levels in samples taken during a drought. Most laboratories dry all their samples before testing, but some use a field-moist sample for K analysis. The drought difference is likely to be larger for the latter. In general, however, a recent sample affected by drought is a better basis for next year's crop nutrition program than a sample that is older than the typically recommended sampling interval of 3 or 4 years.

Are soils being sampled often enough? It seems—on average—that most cropland is sampled about as often as is recommended. In the Northeast USA, including states from the watersheds of the Chesapeake Bay and the Great Lakes, the number of samples represented in the 2010 IPNI Soil Test Summary (<http://info.ipni.net/IPNI-3186>) amounted to one for every 45 acres of census cropland. That's more intensive than what is generally recommended—one sample from every 25 acres every three years translates into one sample from every 75 acres each year. But included in this average are the more intensive sampling schemes of many practitioners of precision agriculture (with each sample representing as little as an acre). So while most of the cropland gets sampled often enough, there still may be a portion that could be sampled more often.

What's more important is what the soil test shows. While the distribution of soils testing below, in, and above the optimum range varies by region, most states in the Northeast and most provinces in Eastern Canada still show a substantial portion of soils testing below and above the optimum range, for both P and K. Obviously, this is not because the soils aren't being sampled. Non-optimal soil test levels persist partly because recommendations are not being followed. Sampling more frequently than once every three years will not change these soil test levels. Following the soil test-based recommendation moves most soils into the optimum ranges for both P and K, and keeps them there.

Sampling soils more often than once every three years won't reduce losses of P in runoff either. Soils testing above the optimum range may increase risk of P loss to some degree. Fertilized at rates below crop removal, such soils will decline in soil test P. Sampling once every three years will suffice to track and prevent a decline below the optimum range.

4R Nutrient Stewardship also encourages the tracking of crop nutrient balances. Recommendations from a soil test often relate to crop removal: the basic recommendation is to apply more or less than crop removal for soils testing below or above, respectively, the optimum or maintenance range. Also, there is always some uncertainty with both soil testing and with nutrient removal information. Doing both increases confidence because the uncertainties in each tend to cancel each other out.

Soil testing should proceed as usual this fall. The opportunities in a dry year will probably be better than in a wet year. Considering current prices for fertilizers and crops, you can't afford to miss this one!

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Abbreviations: P = phosphorus; K = potassium.

Note: *Plant Nutrition TODAY* articles are available online at the IPNI website: www.ipni.net/pnt