

Fall 2008, No 6

THE INCREASING DEPTH OF CROP NUTRITION

Traditional soil sampling may not be providing a complete picture of the soil nutrients available to crops. The standard sample for Midwestern states has been taken at 6 to 7 in. deep. For example, 6-2/3 in. is the official recommended sampling depth in the Illinois Agronomy Handbook. This sampling depth represents the plow layer, which is estimated at approximately 2 million lb of soil for a silty clay loam. This makes conversion of units easy, since 1 ppm would be equivalent to 2 lb/A, so that conversion from ppm to pounds per acre is done by simply multiplying ppm by 2. It is also important to remember that the calibration data for soil tests is based on this same sampling depth. Some laboratories base recommendations on a 10-in. sampling depth. So it is important to sample at the correct depth for the laboratory you are using.

This sampling plan also represents the zone from which most of the nutrients are taken up by a growing corn crop. But changes in tillage systems, crop rotations, and fertilizer placement in recent years may mean this sampling plan needs to be revised. Reduced tillage has meant that nutrients have a tendency to become stratified, with accumulations near the surface due to reduced mixing by tillage. Many years of cropping, and increasingly aggressive root systems, have had a tendency to take up more nutrients from deeper in the profile where they are not readily replenished by fertilizer applications. All of these factors mean that we may be mining nutrients from lower in the soil profile, but not recognizing the depletion with traditional soil tests.

To test whether general practices are maintaining nutrient profiles, or depleting them, we have done some preliminary sampling of selected soils from throughout Illinois, and comparing the results with data from deep sampling done statewide in the late 1960s. These tests showed that current soil test P and K levels at the 18 in. to 2 ft. depth tend to be lower than they were 40 years ago, especially for K. Based on these results, a new study is looking at a similar comparison with archived soil samples taken in the 1908 to 1911 time period to be compared with new samples collected from the same sites. This rare opportunity to compare historic soil samples with current ones from the exact sampling sites will be a guide for future nutrient management and research into better practices. We can thank the scientists who catalogued and saved the archived samples for making this comparison possible.

Today's farmers and researchers can prepare for tracking nutrients supplied in the soil profile by taking benchmark samples now for comparison to future samples to track trends in nutrients over time. We need to plan ahead so that we can protect the valuable soil nutrient profile resource.

—HFR—

For more information, contact Dr. Harold F. Reetz, Jr., Director of External Support and FAR, 107 S. State Street, Suite 300, Monticello, IL 61856-1968. Phone 217-762-2074. Fax: 217-762-8655. E-mail: hreetz@ipni.net.

Abbreviations in this article: ppm = parts per million; P = phosphorus; K = potassium.