Getting Specific with Soil Test Summaries

By Bob Deutsch and John Lee

Periodically, PPI summarizes and publishes soil testing data from commercial and public laboratories in the U.S. and Canada on a state or provincial basis. During this process it has become apparent that marked variation in typical soil test levels exists among regions within states or provinces. In this article, two soil testing professionals offer their views on summaries and demonstrate a more refined summary protocol than has been used in the past.

SOIL TEST SUMMARIES have become a useful educational tool to promote soil testing in the past 10 years. Vast improvements in computer technology have made it possible and convenient to extract summaries and trends from computer data bases past and present. Getting even more specific with soil test summaries is a challenge. Soil test summaries are used by university and industry scientists, fertilizer manufacturers, fertilizer dealers, crop production consultants and many others. These summaries are generally used to:

- Inform fertilizer dealers, crop consultants and growers of significant shifts in nutrient levels such as yearly fluctuations in residual soil nitrates in the Northern Plains.
- Increase knowledge of how changing fertilizer management strategies affect soil test levels of non-mobile nutrients such as phosphorus (P) and potassium (K) across large areas over time.
- Increase knowledge of how various farming practices such as livestock production, no-till farming, banding of fertilizer and crop rotation affect soil test trends over time and across large regions.

Examples of soil test summaries for portions of Minnesota, North Dakota, South Dakota and Manitoba are shown in **Figures 1, 2 and 3.** Soil pH and P and K soil test averages were determined by zip code (i.e. 581, 582, 583) of sample origin. Summaries such as these may be used to point out factors contributing to differ-

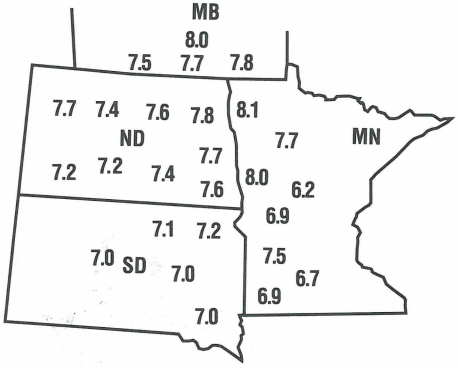

Figure 1. Soil test pH averages, 1993. Values are averages of zip code areas only. A current soil test for each field or site should be used to develop specific fertilizer rates.

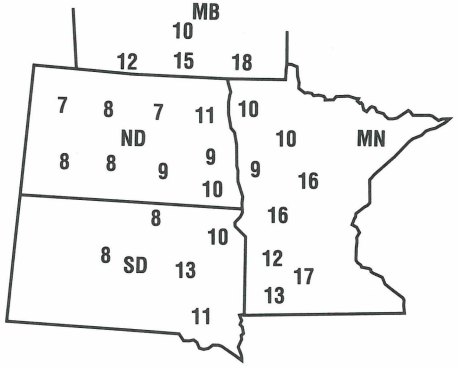

Figure 2. Olsen phosphorus soil test averages (ppm), 1993. Values are averages of zip code areas only. A current soil test for each field or site should be used to develop specific fertilizer rates.

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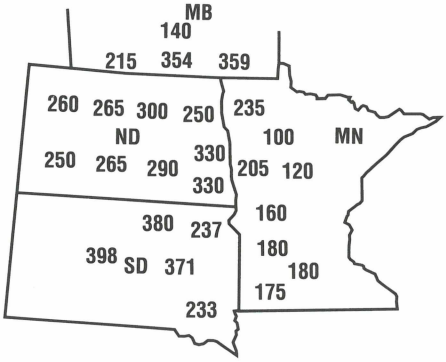

Figure 3. Potassium soil test averages (ppm), 1993. Values are averages of zip code areas only. A current soil test for each field or site should be used to develop specific fertilizer rates.

ences in soil test levels within a state, province or larger region . . . for example, soil parent material, climate, management practices and crop rotations. One weakness of these summaries, however, is that soil test data from one zip code still represent a very large area.

Soil test summaries could be made more specific if the exact location of tested areas were known, but that may never be practical. In areas where best management practices (BMPs) are being introduced, there may be a temptation to use state soil test averages as a benchmark of sorts. **Figures 1, 2 and 3** illustrate the point that there is no way to utilize areas as large as states . . . or even counties . . . as useful tools for managing individual fields.

As scientists, we must communicate with those who develop state, provincial and federal regulations concerning the proper use of soil test summaries . . . informing them that BMPs such as soil testing are best developed on a local basis.

Soil test summaries are another educational tool for stressing the importance of testing each field. Their use in publications and by the media benefits agriculture by helping increase public awareness of the good science and technology used to produce our food and protect the environment. ■

Environotes from TVA

By John E. Culp

A MAJOR NEW DIRECTION for the Tennessee Valley Authority (TVA) Environmental Research Center is conducting studies and developing strategies for watershed protection. One of the key areas of this work involves restoring abused and drastically disturbed lands.

The region has severely eroded and gullied agricultural and forested lands, abandoned mine land, industrial spoil areas, eroded reservoir shorelines, land disturbed by construction activities, and many other disturbed lands. Problems are significant. Soil erosion in the region, for example, averages almost 10 tons/A per year. Some soils are eroding at twice that rate.

TVA scientists at Muscle Shoals are conducting laboratory, greenhouse and field studies on selected environmentally abused or disturbed lands. The purpose is to mitigate nonpoint source pollution and restore the productive capacity of the lands. Some specific objectives include the following.

- Select and screen plants such as legumes, grasses and shrubs, for their use in restoring drastically disturbed lands. Emphasis is on plants that are adapted to acid, nutrient-deficient, and phytotoxic soil conditions.
- Investigate use of land-application of several kinds of inorganic and organic

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