



Making informed decisions on fertilizer application is good for crops and farmers' budgets.

by **Candace Pollock**

With fertilizer prices continuing their upward trend, a soil test is the best tool available to farmers to help them manage their crops while leaving more money in their pockets.

According to the most recent U.S. Department of Agriculture (USDA) Economic Research Service (ERS) data available, less than 40% of corn acreage in the United States was soil-tested in 2000 to make fertilizer management decisions. Robert Mullen, an Ohio State University (OSU) Extension soil fertility specialist, speculates that number has increased, but those growers not utilizing soil testing are missing out on a huge money-saving opportunity.

"In the past, when fertilizers were cheap, there wasn't much of an economic penalty in overapplication, so some producers were supplying more than necessary," says Mullen, who also has an Ohio Agricultural Research and Development Center (OARDC) appointment. "But today, when commercial fertilizer prices are reaching unprecedented costs, that is no longer the mentality to take. Those growers who do use soil tests recognize their value."

That value is the ability to measure the level of nutrients in the soil, such as soil pH, nitrogen (N), potassium (K) and phosphorus (P), and from those numbers

make a more informed decision in fertilizer application that's good for the crops, as well as a farmer's budget.

Mullen was to be on hand at the Conservation Tillage and Technology Conference in late February to walk participants through the soil-testing process, how to evaluate the results, and follow recommendations based on specific crop-production systems.

"You start by putting yourself in their shoes. I'm a producer. I get the soil analysis, and I have this piece of paper. What matters on that sheet of paper, and how do I use that information to make a decision?" Mullen asks. "There is no cookie-cutter recipe for fertility management because everyone has different soils and different cropping systems. The idea is more of a case-study approach. It's to get them to think about the information in a different way and what they should go through when they start making decisions."

Mullen says soil tests are an effective resource tool for fertility management, because the analysis lets farmers identify which nutrients to invest in and which ones they can do without for a certain period of time.

"Why sink more money into your crop-production system when you don't have to?" Mullen asks.

Take phosphorus and potassium as an example, Mullen says. With both nutrients skyrocketing in price, a soil test would reveal how much potassium and phosphorus are currently available in the soil. Unlike nitrogen, phosphorus and potassium are not directly related to yield, so once they are present at adequate concentrations, adding more would not result in additional productivity.

"Once you reach a certain concentration of potassium or phosphorus in the field, you don't need to add any more fertilizer, and a soil test would be able to tell you that," Mullen says. "Without it, you may be paying for something you do not need."

Other things growers can determine from a soil test include soil pH, which reveals whether lime is needed; buffer pH, which indicates how much lime should be applied; and the amount of fertilizer necessary based on specific cropping systems.

In addition to giving a presentation on soil testing, Mullen was to provide information on the new OSU nitrogen rate calculator and demonstrate how farmers can introduce manure into fertility management recommendations.

Nitrogen calculator

The nitrogen rate calculator, a free program developed by OSU Extension, calculates optimum nitrogen rate recommendations through average corn yields using only two inputs — the price of corn at harvest and the cost of nitrogen at application.

The goal is to apply the minimum nitrogen needed for maximum yield results, thereby saving farmers money on fertilizer applications, Mullen says.

"The tool is part of a new nitrogen application program that is slowly replacing old recommendations that based fertilizer inputs on yield potential. That is, if a grower wanted 150 bushels per acre, he would apply the maximum nitrogen needed to get those 150 bushels," Mullen explains. "However, through years of research we found no correlation between nitrogen applications and yield."

Under the new recommendations, nitrogen application is based on average yield responses, much of it already calculated by Mullen through nitrogen rate studies at 70 locations. So, for example, if nitrogen is 40¢ per pound and the price of corn is \$4 a bushel, the best nitrogen rate would be 156 pounds (lb.) for corn following soybeans, with an application range of 150 lb. to 180 lb.

