NEWS & VIEWS

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Make Fall Fertilization a Part of Your Plan

IN INTENSIVE, high yield agriculture, planning and timing of nutrient applications can have a substantial impact on the success of the overall management plan in developing optimum yield potential and profitability. Fall application of some or all of the fertilizer requirement is an important part of crop nutrient management for many farmers. Time management, economics, soil condition, and environmental benefits are among the considerations to include in the decision to use fall application. Nothing really new here, but it is important to review these points each year and evaluate how fall fertilization fits into the overall management system for the farmer. It is equally important to evaluate the impact of fall fertilization on the operation of a crop input supply business.

Nutrient management planning is a positive approach that farmers and their suppliers and advisers should adopt to assure that they are minimizing their potential to contribute to water quality problems locally and in the major watersheds. A nutrient management plan should be carefully developed to include all available nutrient sources—fertilizer applications, manure, and other—and realistic estimates of crop removal based on expected yields. It must provide enough nutrients to meet crop needs throughout the growing season, including high demand periods, so that optimum yields and quality can be obtained. It is equally important that the plan be designed to minimize potential to degrade water supplies. Finally, the plan must be practical so that it can be readily implemented — *and steps must be taken to be sure it is implemented.*

Since phosphorus (P) and potassium (K) can and should be managed from a long-term perspective, the goals for soil test build up and yield potential should be a part of a strategic plan to reach these goals. Management of P and K resources so that soil test levels are maintained in the high range provides greatest flexibility to the farmer. If weather or soil conditions make fertilizer application difficult, fields with a high soil test may be skipped for a year without serious concern for yield loss. When soil tests are medium or lower, that is not an option.

How does fall fertilizer application fit into nutrient management planning and implementation? What should be done this fall to help maintain progress toward the strategic nutrient management plan? How does fall fertilization impact the fertilizer supplier's business and workload? The following considerations should help provide some answers for an individual farm or dealership.

Fall Is an Ideal Time to Soil Sample

A recent soil test is essential to developing a nutrient management plan. Timing of sample collection can have a big impact on soil test results. Consistency of timing from one sampling period to the next is critical if you intend to compare results to track progress in changing soil test levels. The best time to sample is usually in the fall. That is the time when soil P and K levels tend to be at the lowest level of the year, due to the greatest amount having been taken up by the crop in either harvested grain and forage or in the crop residue.

The importance of timing is illustrated in **Figure 1**, which shows a comparison of soil tests collected at monthly intervals over a period from 1994 to 1997 in southern Illinois. Unless samples are collected at the same time of year in successive sampling periods, there is no good way to compare the results. The graph also shows the effect of annual pre-plant applications of 120 lb/A of K_2O.

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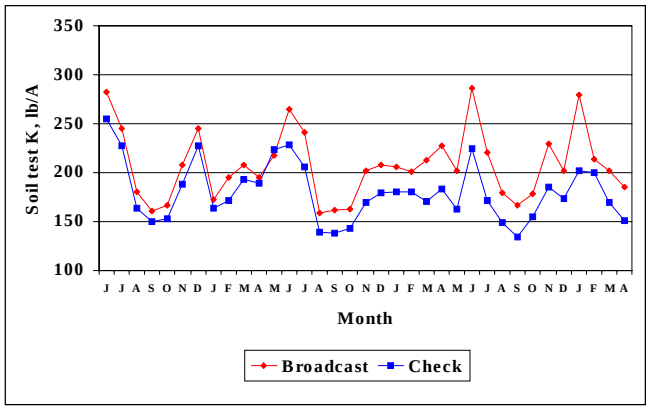

Figure 1. Monthly soil test K levels for Dixon Springs, Illinois (1994-97). The graph reflects annual pre-plant applications of 120 lb K_2O/A.

That means you get the best assessment of the minimum nutrient levels available to the crop, and you can best identify the most likely yield limiting nutrients. Most soil test response curves are calibrated for fall sampling, too, so this timing will give the best relationship to the recommendations database. In most years, getting the samples collected early in the fall…as soon after harvest as possible…means results can be used for fall application of fertilizer. Consistency in sampling depth and methodology are also critical.

Fall sampling for nitrogen (N) may also help provide information to plan for N management. If fall N application is planned, rates can be adjusted to account for residual N from the current season's crop. For spring N application, it can provide a benchmark value on which to base estimates of winter losses and adjustments for the next crop. Environmentally responsible—and economically efficient—N management requires consideration of a range of factors, with fall N soil test being one of the important ones for many fields.

Save Valuable Time Next Spring

We can't predict the weather patterns for next spring, but if field conditions are good, applying fertilizer, especially P, K and aglime, in the fall can help avoid the rush if conditions are not favorable in the spring. Too often, spring applications are skipped due to tight scheduling to get the crop planted. This can seriously impact yield potential if the soil test levels are not in the high range. Or planting may be delayed, also resulting in decreased yield potential. **Figure 2** shows the days suitable for field work for different months of the year for the central Midwest. Work that can be completed in the fall helps avoid time constraints that commonly occur in the spring.

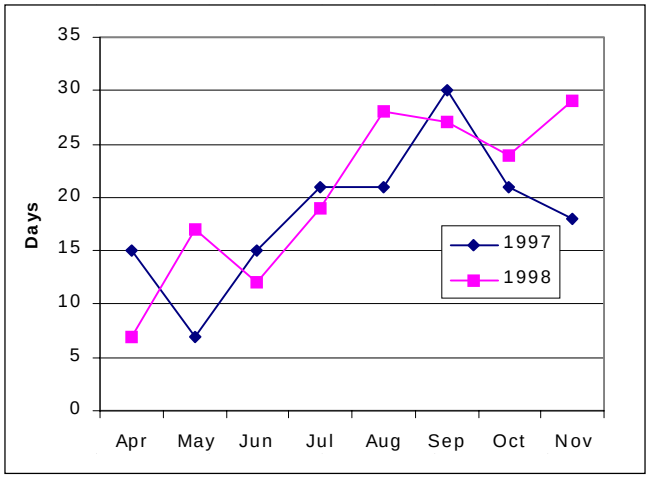

Figure 2. Number of days suitable for field work can be limited in critical spring planting season, as illustrated by data from two recent years in Indiana.

Spread the Workload for the Farmer and the Fertilizer Supplier

Agriculture is a business of peaks and valleys in workloads. Fall fertilizer application can help smooth out some of these high and low points to make more uniform distribution of workload for everyone involved and more efficient use of equipment. We can't avoid seasonal variation and some of the weather problems that upset scheduling plans. But fall fertilizer application can help to get up to twice as many work days to complete the job before the next crop. That means the farmer can handle more acres and the dealer can handle more customers with the same amount of labor and equipment. Fall fertilizer application also helps increase the "throughput" for storage and transportation, allowing more flexibility in ordering and scheduling shipments.

Fall Fertilization Reduces Damage to Soil Structure

Fields tend to be drier in the fall than in the spring, so traffic from heavy fertilizer and aglime application equipment has less potential to cause compaction or ruts in the field. If damage does occur from fall application, there is opportunity for winter freezing and thawing to help reduce the effects before the next crop season.

More Reaction Time

Fall application allows more time for P and K to penetrate into the root zone and more time for aglime to react with the soil to neutralize acidity. Better availability of nutrients and higher yield potential can result. In no-till production systems, fall application of P, K and aglime are especially helpful in providing more time for nutrients to be moved into the root zone. Crop residue helps avoid loss of nutrients from surface runoff, but that still may limit fall application in fields with steep slopes.

Why Doesn't Everyone Apply Fertilizer in the Fall?

Fall fertilizer application has many advantages, but there are situations where it is not the best practice. On sandy soils, for example, fall application is usually not recommended for spring seeded crops, due to the potential for leaching losses before the crop can take advantage of the nutrients.

Fall application of P is usually a good choice, especially if it can be incorporated. On sloping soils, without adequate groundcover and where erosion is a potential problem, P fertilizer application should be made closer to planting time to minimize potential for loss of the nutrients from the field and for contamination of water supplies.

Potash can generally be applied in the fall on soils with a cation exchange capacity (CEC) of at least 6, without concern for losses, especially if it is incorporated.

Application of ammonia N in the fall should be delayed until soil temperatures remain below 50° F, unless an N stabilizer is used. Urease inhibitors can help control N losses with urea N. Nitrate forms of N should not be applied in the fall. Splitting applications between fall and spring may also be a useful alternative. Some innovative producers are using a uniform fall application of a base rate, followed by site-specific variable-rate applications in the spring using variable-rate systems to adjust for differences in anticipated N requirement. This approach allows for getting the bulk of the N applied in the fall, yet provides an opportunity to fine-tune rates in the spring after expected needs can be more specifically assessed. Doing so may help make more efficient use of fertilizer dollars and help to reduce potential losses to the environment.

Summary

For most farmers, there are opportunities to use fall nutrient assessment and application to help maintain progress toward long-term strategies for soil nutrient levels and crop yield goals. This fall is an excellent time to reassess those strategies and begin the process of implementation. The dealer who works with his farmer customers in developing and implementing these strategies can also benefit by planning his operations and scheduling of personnel, equipment and storage for improved efficiency. The tools for site-specific management…GIS data management, variable-rate application systems, yield monitors…all add new possibilities for incorporating old agronomic and management concepts into a 21st century crop nutrient management system. ■

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