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PRECISION TECHNOLOGY FOR RIGHT NUTRIENT MANAGEMENT

Managing nutrients right – right source, right rate, right place, and right time – may be best accomplished with the right tools. Various technologies are available to aid farmers and their advisers in decisions related to nutrient management, from soil sampling to fertilizer application to yield measurement. These technology tools can enhance their ability to fine-tune nutrient management decisions and develop the right site-specific nutrient management plan for each field. The farmer and the farmer's employees, management and agronomic advisers, and input suppliers all are part of a team, each contributing to the decision process in different ways.

Right management means site-specific management. Making decisions on source, rate, timing, and placement with information collected on the specific field is the best way to be assured those decisions will produce the most efficient, most economical, and most environmentally appropriate nutrient management plan. Costs of being wrong are much greater under today's prices for inputs and today's crop prices. That means the price paid for technology to fine-tune those decisions is easier to justify.

The price for the technology need not be great. Costs have gone down for many of the tools as more people have adopted them. Many of the components of site-specific management do not require a lot of investment. Better records are a major step for many farmers. Just using better accounting of inputs and yields for each field is an important starting point. Employing GPS to geo-reference input and yield data may be the next step. Most fertilizer and chemical dealers now have GPS-guided application equipment. Most harvesting equipment now comes with GPS as a standard...or easily added...feature. The same system can usually be transferred to planting equipment for collecting geo-referenced the planting data, starter fertilizer application, and other inputs. With addition of proper controllers, variable-rate application of inputs can be added to the management plan. Each of these steps can be added over time, so that the initial investment can be built upon. In recent years GPS guidance has been the hot-seller, helping avoid costly skips and overlaps, saving on input costs for seed, fertilizer, and pesticides. Most farmers say reduced operator stress and fatigue are a major added benefit.

Again, records are a key element. With GPS guidance and tracking technologies, and on-board sensors, monitors, and controllers, huge amounts of data are available for the farmer and advisers to use in further refining the management system. To best utilize the information collected on the farm, a GIS record system is important. That 3-letter term need not scare anyone. It is a powerful tool for managing large amounts of geo-referenced data... the kind of data generated by modern agriculture's tools and practices. There is a need for decision-support services for farmers, consultants, and input suppliers...support services that focus on data management and analysis for these management team members. Implementing a system of GIS-based records that enables all members of the team to have access to the details for each field.

Early efforts to assemble such a comprehensive, shared data management system have had limited success, but there is a resurgence of interest. The software and communication systems have improved. Excellent outside sources of data, such as digitized soil surveys and weather information, are now available to complement the farmer's data for use in decision-support tools. Most important, more farmers are collecting data, leading toward the "critical mass" of customers needed to sustain a support service offering, either as an independent operation or as an add-on service from an input supplier. Most have learned that properly managing and interpreting those data require outside help, and that they can glean much more benefit by sharing the data with their adviser partners. Various programs are being implemented by seed, fertilizer, and chemical companies, or by technology data service providers. These programs will help address the growing information management needs of 21st century farmers who are seriously attempting to put the right nutrient source on at the right rate at the right time in the right place.

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Abbreviations: GPS = Global Positioning System; GIS = Geographic Information Systems.

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