

## Considerations for Adopting & Implementing Precision Ag Technologies

### Introduction

Precision agriculture (PA) technologies, once thought to be only for large-scale producers focused on intensive management, are readily available and affordable for a wide variety of agricultural operations. Interest in adoption of PA technology has rapidly increased with current PA trends across the United States which have included demand for high-level GPS/GNSS (real-time kinematic or RTK) accuracy, improved management through precise applications of inputs and solutions for information management. Based on a 2009-2010 survey of Alabama producers, 60-70% of Alabama farmers either currently use or intend to implement precision ag technologies within the next two years.

#### INSIDE THIS PUBLICATION

- ❖ Advantages and potential savings in using precision agriculture
- ❖ Purchase and adoption considerations for precision ag technologies

### What Can Precision Ag Do For You?

Precision ag technologies can provide multiple benefits to producers through input savings, improved time, labor and equipment management, and environmental benefits. Automatic-section control (ASC) technology, available for use on sprayers, planters, spreaders, and other application equipment, works by turning sections of application equipment on and off in areas where application has already occurred or off in un-wanted areas (e.g. environmentally sensitive areas such as grassed waterways). Research at Auburn University found that ASC can provide a 4.3% average savings on inputs with a payback period of less than 2 years for most application equipment. These savings are a result of reduced overlap at headlands and within point rows. In return, farmers can expect savings between \$1.50/ac/yr up to \$25.00/ac/yr for this technology depending upon crop, management, and field shape and size.

Guidance systems, which reduce overlap and input usage, can on average save approximately 10% on input savings with farmers seeing a possible 15% to 30% overall savings when using both ASC and guidance systems together. Additional benefits of auto-guidance systems include reducing the concentration time needed during driving, leading to less fatigue and an increased ability to focus on other tasks. Yield maps can be used not only to evaluate current and new management practices, but also as a data source for development of site-specific management strategies (e.g. management zones, variable-rate seeding and nutrient prescription maps, etc.). Further, the adoption of variable-rate technology to vary inputs can provide additional savings and yield benefits to producers.

### Considerations for Getting Started

With the increasing interest in PA adoption, "How do I get started using precision ag technology?" is one of the most often asked questions from producers. Consider the following guidelines when adopting PA technology:

- 1) Have a clear objective in mind with adopting either PA technology and/or practices. Determine the needs – current and future – for your farming operation and how PA can fit into your current operation. Develop long-term PA implementation plans to help with purchasing decisions.
- 2) Identify the training, support and service tools that are available for your product when shopping around. Service for your PA equipment is one of the most important aspects to consider when making your purchase.

- 3) Buy products that are compatible with multiple operations. Utilizing components such as monitors, receivers, antennas and controllers across various applications and equipment can help to spread the cost of PA technology. For example, a PA display can be purchased for guidance; it can be moved to harvest equipment for yield monitoring, then returned to the tractor for variable-rate fertilizer applications.
- 4) Consider future plans and ensure equipment can be upgraded to perform additional applications or work with additional equipment; also determine the ease and cost of the upgrades. For example, many entry-level guidance systems can be upgraded from utilizing WAAS GPS correction (sub-meter accuracy) to a paid subscription (decimeter-level accuracy) or RTK correction (centimeter-level accuracy); or additional features such as automatic swath control or auto-guidance can be added on. Is the technology compatible with your current and/or future equipment? Precision farming equipment can be proprietary to farm equipment. If you plan to upgrade or trade farm equipment in the future, make sure your PA equipment will be compatible.
- 5) Is the technology easy to move between farm equipment? For example, if you are using a guidance system in a spreader truck to apply fertilizer and you want move it to your sprayer, will you need additional specific wiring harnesses or cables for each piece of farm equipment?
- 6) Will you have the ability to record and easily transfer data? While most systems currently on the market have the ability to record and download data, not all do. If this is a feature you want, make sure before you purchase that it is available. The format your data is recorded and exported in also varies by PA equipment so it is also important to ensure that the data can be downloaded in a format that you will be able to access. For example, if you do not have an Agricultural Geographic Information System (AgGIS) program, then a PA system which can export data as a Portable Document Format (.pdf) or Rich Text Format (.rtf) file would be important to allow you the option of viewing your data.
- 7) Keep all data even if you are not currently utilizing it in your farm management program. Elevation data collected with your RTK system and yield data are examples of data that can be collected and then used in the future to create management zones or prescription maps for variable-rate applications.
- 8) Understand the time requirement of learning and installing new PA systems and determine a timeline for implementation. There is a learning curve associated with PA technology and installations can often take longer than anticipated.
- 9) Determine the level of GPS/GNSS accuracy and repeatability required for your operation. Different levels of GPS/GNSS correction are more appropriately suited to specific farming practices. For example, strip-tilling and planting peanuts would require centimeter-level accuracy and year-to-year repeatability to plant and harvest directly on the row year after year; however sub-meter accuracy is sufficient for yield monitoring.

**Overall there is no right or wrong approach to PA technology.** Farmers need to conduct on-farm studies to evaluate the PA practices which will provide the best return for their operation. While PA technologies and practices can appear overwhelming at first, we encourage newcomers to take it slow and in steps. Guidance systems and ASC provide quick, tangible benefits to farmers while other technologies and site-specific management approaches can provide benefits but should be evaluated over several years. It can take time for farmers to fully start to experience savings or increased profit from precision agriculture. For more information on precision ag technologies, visit the ACES Precision Ag website at [www.AlabamaPrecisionAgOnline.com](http://www.AlabamaPrecisionAgOnline.com).

## Disclaimer

The mention of trade names and commercial products is for informational purposes and does not necessarily imply endorsement by the Alabama Cooperative Extension System.

## Prepared by

[Amy Winstead](#), *Regional Extension Agent*, Alabama Cooperative Extension System; [John Fulton](#), *Associate Professor and Extension Specialist*, and [Daniel Mullenix](#), *Research Engineer*, Biosystems Engineering Department, Auburn University.

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