

INTRODUCTION AND OVERVIEW FOR SESSION ON PRECISION AGRICULTURE

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Abstract

Precision management technologies have matured to the point producers across the entire cotton belt should give these tools serious consideration. Many of the technologies can still be challenging to use; however, in this session both real-world practitioners of site-specific management and researchers will discuss how many of the challenges can be overcome. Ultimately, this management approach can provide producers another tool to stay competitive in a global marketplace.

Extended Summary

Precision crop management practices involve providing the crop with what it needs, when it needs it, and where it needs it, using a variety of technologies such as global positions systems (GPS), variable rate application systems, and yield monitors. The advantage of this management system is crop inputs are typically reduced without yield loss, decreasing input costs and lowering the potential for adverse environmental impact of agricultural operations. In some cases, by increased management of highly productive regions of a field, overall yields can actually increase. The definition of “precision farming” can encompass everything from GPS controlled tractors to spray equipment that provides extremely accurate application rates. Current media and research emphasis has been in the area of “site-specific” management, where areas of the same field are given different application rates based on what is needed in each portion of the field. Adoption of these technologies in cotton production has been limited; however, the fairly recent introduction of cotton yield monitors now provide producers with one of the most important tools needed for site-specific management. Precision farming practices have found suitable applications across the entire cotton belt; however, the benefits of site-specific application of inputs must be evaluated on a farm by farm basis. Deciding when that variability threshold is reached is difficult and research is underway to provide tools to assist producers in that decision.

Consider the theme of this year’s conference, an appropriate subtitle to this session could be “Precision Agriculture: a challenging approach for challenging times”. It is important to understand that when you start to implement site-specific management, it will not necessarily be easy. Getting started into a new management approach rarely is; however, as more cotton from the United States is bound for the export market, the control and efficiency precision management provides means it is one of the many research innovations that will keep the American producer competitive in a global marketplace. Some of the challenges you can expect if you try some of the technologies discussed in this session next season will be:

1. **Interpreting “Data”** – Making a management decision that is best for the average conditions in a field has never been simple, and subdividing that field into smaller management zones isn’t going to make it easier. Things like images of the field, yield maps, and soil maps will be needed. Having a knowledgeable extension agent, consultant or experienced friend to help you interpret all these things is a good idea.
2. **Integrating Equipment** – To reduce inputs without reducing yields, the minimum things needed are a GPS receiver, yield monitor, variable rate controller, and variable rate pumps or nozzles depending on the application. Unfortunately, at the present time there is not a turn-key system that you can take out of the box to get started. Before investing in equipment, make sure the GPS can talk to the controller and the controller can talk to the equipment.
3. **Finding Patience** – It is doubtful precision farming will make you rich overnight, and in many cases, it will take more than one season to gain a return on the investment. With the end of 2003 finally providing decent cotton prices, the 2004 season might be a good time to start trying some of the equipment.

Despite the challenges, there are cotton producers who have been successful in implementing site specific management. In this session, you will hear one example of a producer in Arkansas who has made the system work. As noted earlier, a good consultant can ease the pain of setting up equipment and management zones and a practicing consultant will share some of his experiences in implementing these technologies. Another very exciting development for cotton that will be discussed is aerial variable rate application. In addition to providing a means to keep management zones going late in the season, it also provides a chance to benefit from some of these tools without investing in your own variable rate equipment. We will also hear from some of the top researchers who are extending the benefits of precision farming to every input to the crop. New ways to determine how to reduce insecticides, herbicides, harvest aids and growth regulators will all be presented.

In 1968, Wilkes and Hobgood discussed the effects of “precision practices” on the efficiency of cotton production. Much of the discussion was on precise control of tillage implements and planting equipment. Most of the concepts they discussed

over thirty years ago are now a part of every piece of equipment we use in cotton production today. Given the success discussed in this session, it is likely the same will be true of the 2004 precision practices in the future.

References

Wilkes, L., and P. Hobgood. 1968. The Effects of Certain Precision Practices on the Efficiency of Cotton Production. Texas A&M University Publication B-1074. 15 pp.