STATUS OF COTTON PRECISION FARMING IN NORTH CAROLINA: 2013 UPDATE BASED ON NEW SURVEY DATA

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Abstract

Using survey data collected in 2013, we present descriptive statistics on the status of cotton precision technology adoption in North Carolina. Information about the utilization of precision technologies for gathering spatial information (i.e., yield monitors, soil sampling, aerial photos, etc.) and for variable rate application of inputs (i.e., fertilizers, pesticides, etc.) in North Carolina is discussed.

Introduction

Precision farming is a set of technologies with substantial promise to both individual economic gains and social environmental benefits. These information technologies, ranging from satellite imagery to grid soil sampling to soil survey mapping, are used to evaluate crop input decisions (seed, nitrogen, phosphorus, potassium, lime, growth regulators, fungicides, herbicides, insecticides, and drainage) and yield variability.

The future of precision farming in cotton depends on how producers view precision farming technologies. A thorough examination of producers' experiences with various precision farming techniques and the benefits they have received or expect will shed more light on what is driving farmers' decisions to adopt precision farming technologies.

The objectives of this study are: (1) to determine the extent of precision farming adoption by North Carolina cotton farmers in 2013; (2) to understand the reasons behind adoption (and non-adoption) of precision farming technologies by North Carolina cotton farmers in 2013; and (3) to analyze North Carolina cotton farmers' attitudes and perceptions about precision farming at the time of the survey in 2013.

Research Methods

A mail survey of cotton producers in 12 Southern states (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Texas, and Virginia) was conducted in early 2013 (February and March) to establish the current use of precision farming technologies in these states. This report represents information on the North Carolina portion of the survey. This survey is similar (although not completely identical) to previous precision agriculture survey conducted in 2001, 2005, and 2009.

In North Carolina, 1,313 cotton producers were randomly sampled based on an initial list of cotton producers provided by the Cotton Board in Memphis, TN. Questionnaires were then sent to these cotton producers on February 1, 2013. A reminder and a follow-up mailing of the questionnaire were sent on February 8, 2013 and February 22, 2013, respectively. A total of 261 cotton farmers in North Carolina responded with usable data, giving a usable response rate of 19.9%. This response rate is higher than the 2009 response rate (16.3%). Using the data from the usable survey responses in North Carolina, we use descriptive statistics to fulfill the objectives of this study.

Results

Our survey results indicate that 38% of the surveyed North Carolina cotton farmers have used some form of precision farming technology. The most common precision farming practices utilized by North Carolina farmers are automatic section control for sprayers (30%) and the use of grid soil sampling (22%). The adoption rate for yield monitors and soil survey maps are about 20% and 18%, respectively. Adoption of automatic section control on planers is about 15%. Less than 10% of the survey respondents adopted satellite imagery.

About 60% of surveyed producers in North Carolina used a GPS guidance system. Among those who adopted GPS guidance systems approximately 25% used a Lightbar system and 21% used Autosteer.

Out of the 261 usable surveys in North Carolina, 27% utilized variable rate application of inputs. However, of the North Carolina cotton producers who use variable rate application of inputs only about 40% of users believe that this technology significantly increased their yields.

Potentially having higher profits from precision technologies is the most important reason for adoption based on the responses by the sampled North Carolina cotton producers. About 77% of producers surveyed in NC adopt precision technologies for profit reasons. Only 2% and 7% of the respondents indicate that environmental benefits and being at the forefront of technology (respectively) as the main reason for adopting precision technologies. Close to half (47%) of the respondents in North Carolina think that the main barrier to adoption of precision technologies is that it is too expensive.

Lastly, about 94% of cotton precision technology adopters in North Carolina think that this technology will still be profitable in the future. But only about 39% of non-adopters believe that this technology will still be profitable in the future.

Conclusions

About 38% of the surveyed North Carolina cotton farmers have adopted some form of precision technology. The most common precision farming practices utilized by North Carolina cotton farmers are automatic section control in sprayers and precision soil sampling (grid). Only about 27% of North Carolina cotton farmers surveyed use variable rate input application and only 40% of these observe positive changes in yields. Profit is the most important reason for adopting precision technologies and costs the most common barrier to adoption. Most North Carolina cotton farmers still think the use of precision farming techniques will be profitable in the future.