FLORIDA FINDINGS FROM A 2013 PRECISION FARMING SURVEY OF COTTON FARMERS
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Abstract

This paper summarizes the results of Florida respondents to a 2013 precision farming survey that was sent to all cotton farmers in 14 Southeastern U.S. States. A total of 28 Florida farmers responded from seven counties in central and northern Florida (primarily the Panhandle region). Information from these farmers and their farms was summarized and compared to similar studies conducted in 2001, 2005 and 2009, including the identification of any trends related to the adoption and use of specific precision farming technologies.

Introduction

The objective of this study was to evaluate the use of precision farming by cotton farmers in Florida in 2013 and, where possible, compare these results to data derived from similar studies that were sponsored by Cotton Incorporated in 2001, 2005, and 2009.

Materials and Methods

The Cotton Board (Memphis, Tennessee) provided a list of cotton producers in fourteen southern U.S. states for the 2011 marketing year. The list included 13,838 names and addresses, however, only 13,566 were considered cotton producers (e.g., 272 were experiment stations operated by university research and education centers). The questionnaire was mailed to all 13,566 cotton farmers such that we attempted to conduct a Census of the population in these fourteen states. The survey approach began with an initial postcard mailing to producers to that they would be receiving a questionnaire in approximately two weeks. The questionnaire was then sent with a postage-paid return envelope and a cover letter. A reminder postcard was sent approximately one week later and a follow-up questionnaire (with new cover letter and postage paid return envelope) was sent to non-respondents three weeks after that. Collaborators at the University of Tennessee administered the survey.

From the 13,566 cotton producers that were included on the mailing list, 1,811 completed responses were received for a response rate of 13.8%. Of those 1,811, only 28 were located in Florida.

Results and Discussion

In the 2013 survey the Florida farmers averaged 55 years old and had nearly 30 years of experienced making farming decisions. Nearly 75% of their household income was from farming. A total of 52% reported using precision farming for cotton production where precision farming was defined as follows: "Precision farming involves collecting information about within-field variability in yields and crop needs, and using that information to manage inputs." Following adoption, 38% reported increases in cotton lint, quality and 43% reported observing improvements in environmental quality as compared to 23% and 21%, respectively, which reported no changes (the remainder indicated that they did not know). When asked whether they thought precision farming would be profitable in the future, only 70% believed so with 48% citing that it is too expensive. With respect to using variable rate technology to apply inputs to cotton acreage, 44% did and 62% of those used maps generated by consultants. Of those reporting increases in cotton yields as a result of applying inputs at variable rates, the average yield increase was 139 lbs./acre (ranging from 5 to 400). Finally, respondents were asked whether they were aware of programs that provide partial reimbursement for adoption of variable rate technologies; only 46% were aware of such programs and, of those, only 21% received some reimbursements. In the subsections that follow, more detailed results on the farmers, their use of precision farming, and their use of variable rate technologies in particular are summarized for Florida farmers.

Farmer Information
- Average age: 55 years (range: 31-77 years)
- Education: 21% with Bachelor's degree
- Computer use for farm management: 50% (in the field: 43%)

- Average farm experience: 29 years (range: 10-55 years)
- Share of income from farming: 77% (range: 20-100%)
- Average dryland cotton area – owned (29%): 75 (range: 35-120 ac)
- Average dryland cotton area – leased (50%): 254 (range: 15-679 ac)
- Average dryland cotton yield: 1,028 lbs lint/ac (range: 760-1,250 lbs lint/ac)

When compared to previous surveys in 2001, 2005, and 2009, the most notable difference was that the farmers reported a higher share of income from farming and a slightly younger and more educated groups.

Precision Farming for Cotton in Florida
Precision farming involves collecting information about within-field variability in yields and crop needs, and using that information to manage inputs.

Using this definition, 52% of Florida cotton farmers had used precision farming for cotton production; of those adopters, 63% reported improvements in cotton lint quality and 67% reported improvements in environmental quality following the use of precision farming. With respect to the technologies, other notable findings include:

- 72% reported using GPS guidance systems
- 42% reported obtaining geo-referenced soil sampling by grid
- 48% believe the primary barrier to using PF is that it is too expensive, while 17% believe the benefits are uncertain
- Other farmers were cited as the most important source of precision farming information (54%), followed by farm dealers (42%, with 20% by internet); University extension materials were used by only 29%

Variable Rate Technology
- 44% have applied cotton inputs with variable rate technology (VRT); of those, 62% used information and maps generated by consultants
- Average cotton yields increased by 139 lbs. lint/acre (approximately 14%) as a result of using VRT input application
- Six inputs have been applied to cotton crops in Florida using VRT, beginning with seed in 1996

Figure 1 shows that the earliest adoption of VRT for inputs were to apply seed in 1996 (on average). The most recent use of VRT for inputs was to apply phosphorous with an average adoption in 2007. In total, Florida cotton farmers that responded to the survey used VRT to apply six inputs.
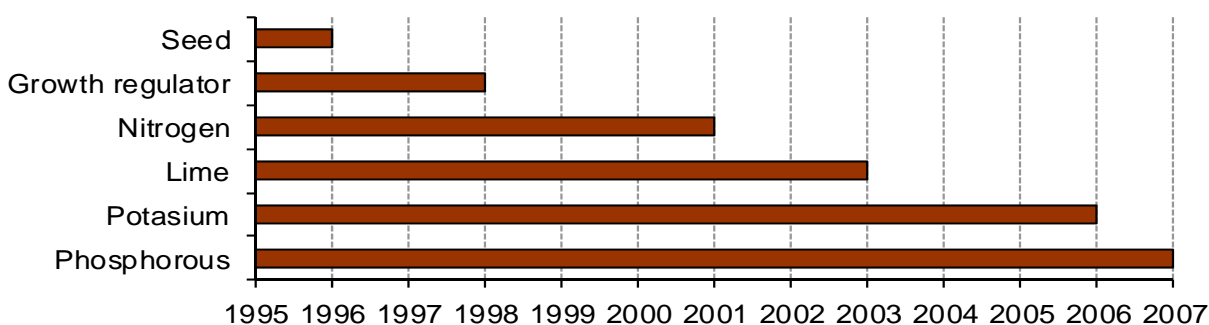

Figure 1. Average year of adoption for VRT application

Figure 2 summarizes the change in input use as a result of using VRT application. Decreases in input use were reported by most farmers for lime and seed, but also for nitrogen, potassium, and phosphorus. Increases were found for growth regulator (reported by everyone) and for all other five inputs. No change was reported when switching to VRT for application of nitrogen, lime, potassium and phosphorous for some of the respondents.
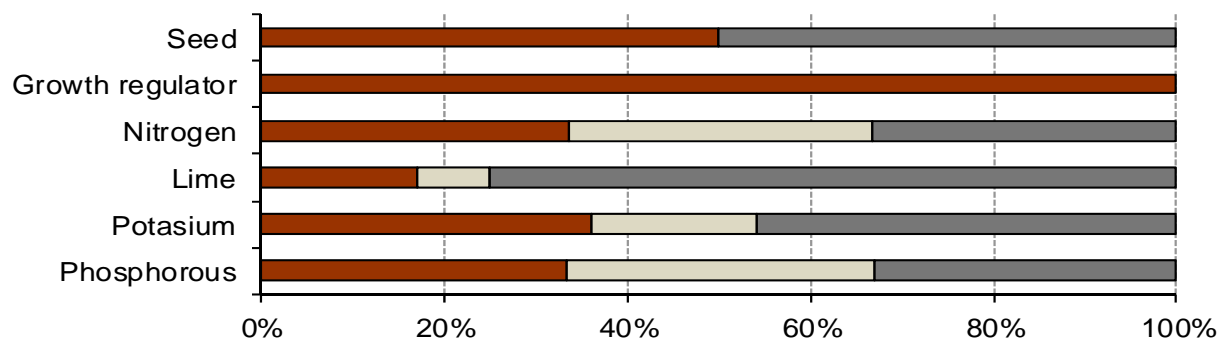
Figure 2. Change in input use with VRT application

Summary

The objective of this study was to evaluate the use of precision farming by cotton farmers in Florida in 2013. A mail survey was conducted in early 2013 to achieve the objective; of 1,811 completed responses, 28 were from Florida (1.5% of the total and 14.1% of the 199 active farmers in Florida.

Compared to similar studies conducted in 2005 and 2009, the most notable difference was that farmers' households are more dependent on income from farming and the farmers are slightly younger and more educated than previously reported. In addition, the 2013 recorded cotton farming further south (on the Florida peninsula). While 52% reported adopting precision farming for cotton, and costs were reported as a primary barrier to adoption by 48%, only 46% were aware of cost-share programs. This may be hindering adoption as some inputs (e.g., growth regulators) may be used more intensively with VRT.