

CHARACTERISTICS OF EARLY COTTON YIELD MONITOR ADOPTERS

B.C. English, J.A. Larson, R.K. Roberts, and A. Fitchpatrick

Department of Agricultural Economics

The University of Tennessee

Knoxville, TN

Abstract

Using information from a 2001 survey of cotton farmers, a comparison is conducted between farmers who have adopted cotton yield monitors and those who have not. The analysis indicates that on average farmers who have adopted cotton yield monitors are younger, have more college education, and farm more acres. They also have higher average yields and perceive greater within-field yield variability than those who have not adopted this technology.

Problem Statement and Relevance

Cotton is an important high value southern crop that requires extensive use of fertilizers, insecticides, herbicides, growth regulators, and defoliant (Brooks, 2002). More than twice as many inputs are used for cotton than for corn, soybeans, or wheat. The estimated total cost of production for cotton in Tennessee is \$547/acre compared with \$364/acre for corn, \$249/acre for soybeans, and \$213/acre for wheat (Tennessee Agricultural Statistics Service, 2002). Precision farming uses a set of agricultural production technologies that has the potential to improve farm profitability by increasing crop yields, reducing input usage, and lowering production costs for farmers and providing environmental benefits to society (National Research Council, 1997). These benefits are potentially very important in input intensive cotton production.

Reliable cotton yield monitors, recently available in the market, along with yield maps, soil maps, and maps from remote sensing are used in identifying within-field yield variation, potential soil limitations, and other growth impediments including nutrient availability, water availability, and pest infestations. This identification process is important in determining whether the use of variable rate input application technologies will result in increased profits.

This paper compares the attributes of early adopting individuals with those who have not adopted cotton yield monitors. The attributes examined can be grouped into four categories including:

1. Technology identification and use
2. Importance of the technologies
3. Farm characteristics
4. Selected demographics

Methods

A survey of Southeastern cotton farmers was conducted in January and February 2001. On January 16th, surveys were mailed to 6,423 cotton farmers in Alabama, Florida, Georgia, Mississippi, North Carolina, and Tennessee (Figure 1). A follow-up postcard was sent on January 23, reminding potential respondents to fill out and return the survey. On February 15, a second survey was sent to those farmers who did not respond (Roberts, 2002).

Of the surveys mailed, 447 were returned by the postoffice or the respondents indicated that they were not cotton farmers. The response rate to the survey varied by state:

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| 1. Alabama | 24 % |
| 2. Florida | 26 % |
| 3. Georgia | 10 % |
| 4. Mississippi | 20 % |
| 5. North Carolina | 22 % |
| 6. Tennessee | 18 % |
| 7. Overall | 17 % |

These data were recorded in a SAS data set and two subsets were formed; those who had used a cotton yield monitors and those who had not used one. Several survey questions were analyzed to determine differences between these two subsets of producers including:

1. Other precision farming technologies used
2. Farm characteristics such as yields and planted acres

3. Farmers' perceptions about within-field yield variability
4. Age, education, and source of income differ
5. Computer use

Results

Significant differences exist between adopter and non-adopter of precision farming technologies. Of the nearly 1350 surveys returned, only 21 producers had adopted cotton yield monitor technology. These 21 farmers reported significantly higher yields and higher spatial yield variability than non-adopters. They were more likely to have used other information technologies such as precision soil sampling and variable rate application technologies such as variable rate fertilizer application. On average, these 21 farmers were younger; had larger farms, farmed 500 more cotton acres; had computers in the home and used them for farm management; and attended more college. Both groups believed that precision farming would be profitable in the future and extremely important to cotton production.

References

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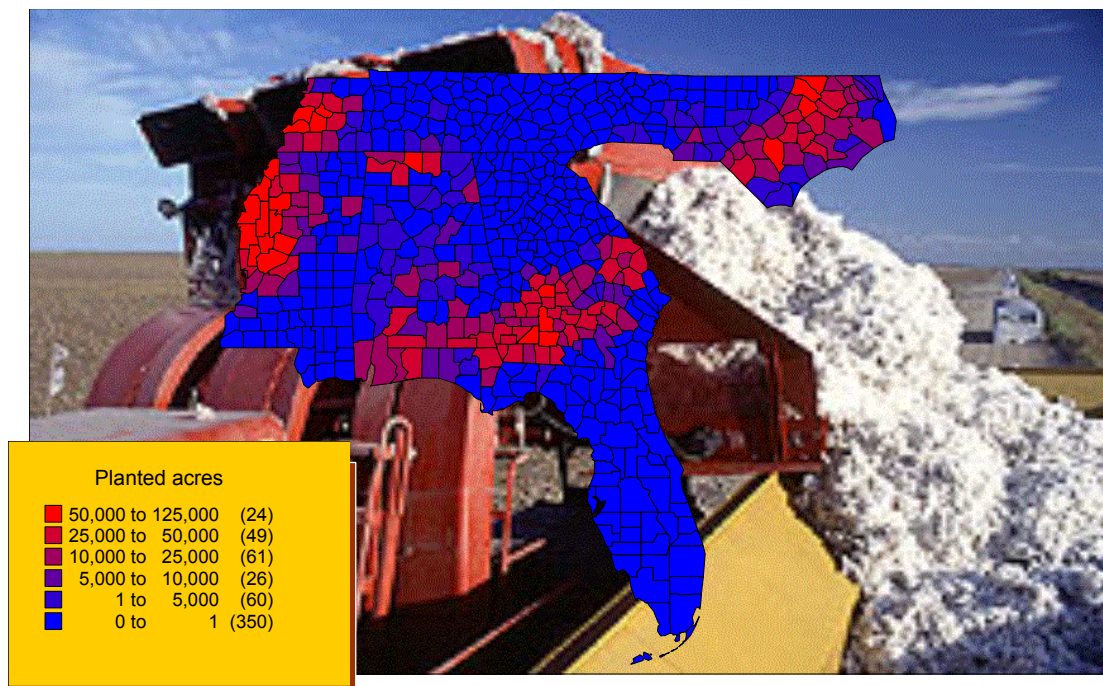


Figure 1. Cotton acres planted in the states included in the study, 2000.