

**WHEAT AS A COVER CROP IN A NO-TILL COTTON PRODUCTION SYSTEM:
THE YALOBUSHA COUNTY EXPERIENCE, 1999-2001**

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Introduction

Cover crops are traditionally defined as crops grown to cover the ground to protect the soil from erosion and from loss of plant nutrients through leaching and runoff [Reeves]. Researchers often limit their work on cover crops to their impacts on soil and water quality. No-till (NT) production systems which include adequate winter ground cover have the potential to reduce soil erosion by 90 to 95% of that for conventional tillage (CT), which would satisfy mandated soil loss restriction on many upland sites used for annual cotton production [Triplett, Dabney, and Siefker].

McWhorter and Jordan noted that little of the research designed to develop reduced tillage (RT) and NT systems for cotton was published because the results were negative and many experiments were abandoned due to loss of weed control and low yields. In addition, NT has progressive benefits that may not be obvious during the initial year or years of no-till practices [Boquet et al., 1977a]. Cover crops are planted by farmers concerned with economic costs and returns. Frequently their top priority is economic survival [Dabney, Delgado, and Reeves]. With limited yield data, etc., cover crops became just another BMP (best management practice) [Yuan, Dabney, and Binger] and even cost sharing government programs have had little impact [Dabney, Yuan, and Binger]. If cover crops are cost effective and growers are provided with the information, growers will utilize cover crops in their cotton production systems.

Literature Review

This section summarizes four Mid-south studies, which compare CT with voluntary native cover (CT/VNC) and NT with wheat cover (NT/WhC). A 10-year Louisiana study (1987-96) on a Macon Ridge Soil noted NT/WhC yield superior to CT/VNC. The yield improvement ranged from 22 to 99 and averaged 63 pounds of lint/acre [Boquet et al., 1977b]. Similar results were reported for a 6-year Louisiana study (1991-96). The yield improvement for NT/WhC over CT/VNC ranged from 31 to 122 and averaged 77 pounds of lint/acre [Boquet et al., 1977a].

Three-year results (1990-92) from a North Mississippi research effort on a Loess soil, also showed NT/WhC to be superior to CT/VNC. The improvement in yield ranged from 123 to 256 and averaged 191 pounds of lint per acre [Triplett, Dabney, and Siefker]. The researchers also reported NT/WhC to be 6-10 days earlier than CT/VNC. A yield increase has economic value and so does earliness [Parvin, 1991, 1997]. Dabney reported a range of 53 to 91 with an average of 72 pounds of lint per acre improvement for NT/WhC relative to CT with no planted cover based on a 2-year study at 10 locations involving several soil types. The locations were scattered from South Mississippi to North Arkansas and Tennessee.

The 4 studies (described above) indicate an average response of 101 pounds of lint per acre for NT/WhC when compared to CT/VNC. Currently cotton growers have a renewed interest in cover crops for several reasons:

1. Profits are low (or negative).
 - a. Output price and returns are down.
 - b. Input prices and costs are up.
2. Growers desire systems of production that are less costly.
3. Production systems that require fewer trips-over-the-field are less expensive.
4. No-till systems require fewer trips.
5. Monsanto's new GMS, Roundup Ready, has reduced the level of management required to successfully produce NT cotton to an acceptable level.
6. Cover crops work best in NT systems.
7. Cover crops may increase grower returns.

Yalobusha County

Mississippi's cotton acreage is traditionally described as Delta or Hill (non-Delta). Yalobusha County is in the Brown Loam area, a portion of the Hill section of the State. Currently, Yalobusha County has 10 cotton farmers that collectively produce

more than 15,000 acres of cotton. Cotton is produced on wind-formed Loess soils characteristic of the Brown Loam area of the Hill section and on alluvial or water formed sandy soils in river/creek bottoms much like the cotton soils in the Delta portion of the State. Yalobusha County cotton growers tend to use one or two planting patterns (PP). The conventional PP is 38"-solid (CP). The second PP is ultra-narrow-row (UNR).

Results

Three of Yalobusha's 10 growers have recent experience with a wheat cover crop (WhC). Grower 1 planted 50 acres of WhC in October, 1999. It was followed by 50 acres of CP cotton, which yielded 755 pounds of lint per acre in 2000. An adjacent 40-acre block of CP cotton without WhC yielded 625-a difference of 130 pounds of lint per acre.

In 2001, Grower 1 had 150 acres of UNR cotton, all following WhC and 2,250 acres of CP cotton, 1,000 acres following WhC. A 180-block of CP cotton with WhC yielded 1,190. An adjacent block of CP cotton without WhC yielded 1,030-a difference of 160 pounds of lint per acre. In 2002, Grower 1 has 550 acres of UNR cotton, 350 acres with WhC and 1,750 acres of CP cotton, all with WhC. Grower 1 is certain WhC is profitable.

Grower 2 planted his first WhC (300 acres) in the fall of 2001, all of which was planted to UNR cotton this season (2002). He had 2,350 acres of cotton in 2002 (650 acres of UNR and 1,700 acres of CP). He will have 1,000 acres of CP/WhC and 400 acres of UNR/WhC in 2003 (an increase of 367% for cotton following WhC). Like Grower 2, Grower 3 planted his first WhC in the fall of 2001. In 2002, he has 1,880 acres of cotton (450 UNR and 1,430 CP). Sixty acres of UNR cotton is following WhC and 140 acres of CP cotton is following WhC. In the fall of 2002, Grower 3 will increase his WhC from 200 to 440 acres so that in the 2003 cotton season, his cotton acreage, following a WhC, will be increased by 120%.

Implications

The two observations (130 & 160) on the yield response to WhC average 145 pounds of lint per acre or 44% above the average response reported for the 4 studies reviewed. The cost of WhC is 12¢ per pound for the seed and \$5.00 per acre for seeding. Yalobusha growers have been varying the seeding rate from 50 to 80 pounds depending on the seeding method (ground or air) and other factors. Even at the lower yield response of 101 pounds, the higher seeding rate and a low market price for cotton, the practice appears to be profitable. More observations are needed on the size of the yield response before the level of profitability can be stated with a reasonable degree of certainty.

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