

CONSERVATION TILLAGE IN COFFEE COUNTY COTTON

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Abstract

This report reviews the history of conservation tillage and cotton production in Coffee County, Georgia, since 1900, with emphasis on the last six years. A major increase in cotton acreage, and in the use of cover crops and conservation tillage, has occurred in the county since completion of the boll weevil eradication program in 1990.

Introduction

Coffee County is located 45 miles east of Tifton in south central Georgia. It is bounded on the north by the Ocmulgee River, and by the Satilla River in the extreme southeast corner. A majority of the county's cultivated land is located within the Coastal Plain Region, with about 65,000 acres of sandy loam type soil. The remaining cultivated land lies within the Atlantic Coastal Region, with about 15,000 acres of sandy textured 'flatwood' soils. The county has a high water table during the winter months.

Materials and Methods

Historical Background

Georgia cotton growers have historically tended to single out a particular pest problem or cultural practice and attempted to find a solution through a single, non-integrated approach. In many cases, this method resulted in new problems that were just as serious as the original one. For example, early season boll weevil treatments decimate beneficial insect populations, leading to outbreaks of secondary pests such as armyworms, plant bugs and aphids. For 70 years Coffee County and Georgia growers tried to control the boll weevil with a succession of insecticides, beginning with calcium arsenate, then DDT, toxaphene and BHC, and finally organophosphates and synthetic pyrethrins, but production continued to decline until cotton became uneconomical to grow (Haney *et al.*, 1996; Figure 1). Meanwhile, widespread adoption of frequent cultivation for weed control led to accelerated soil erosion and degradation of the surrounding riparian environment.

Three major factors have provided incentive for Coffee County growers to adopt conservation tillage practices. First, crop production inputs are steadily increasing, and generally erratic market prices result in variable (usually shrinking) profit margins for growers. Growers need to find ways to reduce their overall inputs. At the same time, growers are faced with ever-increasing government regulations (e.g., HEL Requirements and the 1985 Farm Bill) intended to reduce the amount of soil erosion from highly erodible cultivated farmland. Finally, completion of the Southeast Boll Weevil Eradication Program (SEBWEP) in 1990 has presented growers with the opportunity to develop an entirely new approach to producing cotton in Georgia.

In the early 1980's Coffee County growers attempted to begin a conservation tillage program, but it failed thru lack of suitable equipment and sufficient management knowledge (Figure 2). Our current conservation tillage project began anew in 1990 with a small core group of six cooperating growers. We started with small-scale on-farm demonstration plots using winter cover crops (wheat, rye and crimson clover) to provide erosion control and alternate habitats for beneficial insects. We also began holding county-wide grower meetings and local community 'shade tree' workshops that focused on topics such as and cover crop management, beneficial insects, and integrated pest management. Finally, we also organized a series of farm tours and field days that were open to the general public.

Results and Discussion

Interest in conservation tillage has increased dramatically in Coffee County since 1990, and an alliance of cooperating growers, banks, farm supply companies and state and federal agencies has been formed to promote adoption of conservation tillage in Coffee County (Table 1). Land under conservation tillage has increased from just 15 acres of vegetables in 1991 to 25,000 acres of vegetables, soybean, peanut and cotton in 1996. (Figure 2).

Benefits vs. Disadvantages

In 1996 the scope of our program increased dramatically when the Georgia Cotton Commission provided research funds to compare conventional tillage to conservation tillage systems in a multidiscipline approach (soil quality, natural enemies/pests, diseases, nematodes, yield, inputs and returns). First year findings indicate that yields in the conservation tillage fields surpassed yields in the conventional fields and that overall returns were \$60 per acre higher in the conservation fields (Lewis *et al.*, 1997; Table 2). A summary of the benefits Coffee County growers have realized from the use of conservation tillage systems is presented in Table 3.

The major disadvantage reported by growers was the necessity for management of a cover crop and/or grain crop residue to get good soil contact with the seed.

Summary

The project leaders and Coffee County growers are excited about the future of the conservation tillage program. We believe this approach is a biologically and ecologically and friendly system that provides a potential for greater profit margins while helping farmers meet government regulations to reduce soil erosion on their farms. expect a continued increase in total conservation tilled acreage in 1997 and beyond.

Acknowledgments

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References

Haney, P.B, W.J. Lewis and W.R. Lambert. 1996. Cotton production and the boll weevil in Georgia - history, cost of control and benefits of eradication. University of Georgia- USDA Research Bulletin 428. pp. 1-48.

Lewis, W.J., P.B. Haney, R. Reed and A. Walker. 1997. A total systems approach for sustainable cotton production in Georgia and the Southeast. Proc. 1997 Beltwide Cotton Conf. (In Press).

Tables

Table 1. Agencies Cooperating in the Coffee County Conservation Tillage Project.

Coffee County Agricultural Workers Club
Coffee Conservation Tillage Alliance
Coffee County Donors (Growers, Banks, Chemical & Farm Supply Companies)
Georgia Conservation Tillage Alliance
Georgia Cotton Commission
NRCS - Georgia
NRCS - North Carolina
Seven Rivers RCD - Waycross, Georgia
UGA Cooperative Extension Service
UGA Coastal Plain Experiment Station. Tifton
USDA- ARS Coastal Plain Experiment Station, Tifton

Table 2. Overall Input Costs, Yields, and Returns per Acre in Conservation vs. Conventional Cotton Fields.

	Conservation Fields	Conventional Fields
Tillage & Planting	\$69	\$66
Fertilizer	\$38	\$37
Herbicides	\$23	\$25
Insecticides & PGR's	\$40	\$35
Combined Input Costs	\$171	\$162
Yield (Lint / Acre)	956	862
Return (@ \$0.72/lb.)	\$688	\$620
Return / Ac. Over Costs	\$518	\$458
Difference / Acre	\$60	

Table 3. Benefits Coffee County growers have realized from the use of conservation tillage systems.

1. Greater flexibility during planting and harvest
2. Higher number of beneficial insects
3. Lower soil temperatures during drought periods
4. Reduced equipment maintenance and repairs
5. Reduced horsepower requirements
6. Reduced inputs in time
7. Reduced insecticide costs
8. Reduced land preparation time
9. Reduced root pruning from cultivation
10. Reduced seedling disease
11. Reduced trips across the field
12. Reduced soil erosion

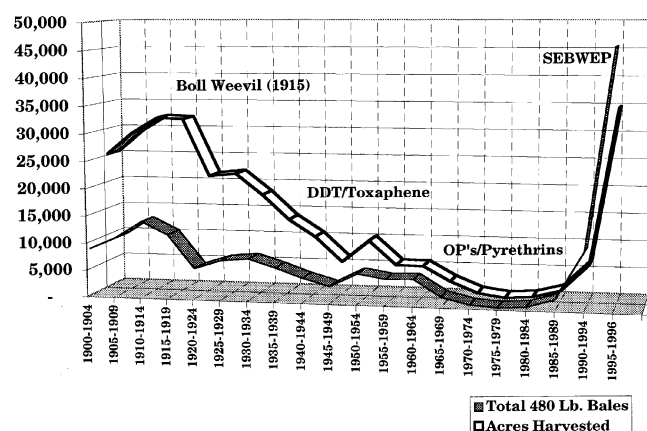


Figure 1. Acres Harvested and 480 Lb. Bales in Coffee Co: 1900-1996.

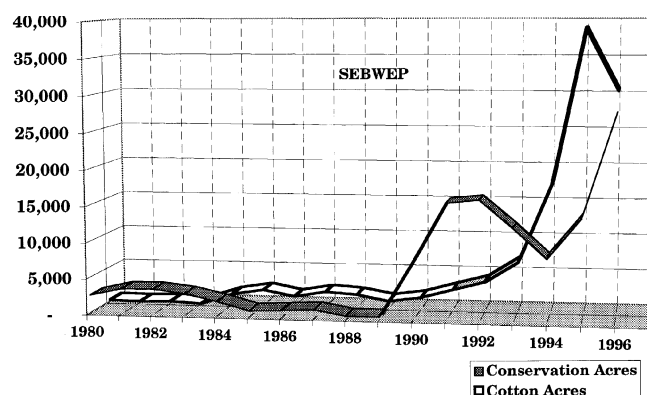


Figure 2. Conservation Acres vs. Cotton Acres in Coffee Co: 1980-1996.