EFFECT OF TILLAGE UPON LINT YIELD AND FIBER QUALITY

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Abstract

No-till, and reduced till with and without paratilling and conventional tillage were compared. Paratilling increased lint yield, but lint percent was reduced. Lint percent was lower in the conventional tilled cotton as compared to no-till. Fiber length was generally shorter in the no-till. Trash content was much lower in the conventional tilled cotton.

Introduction

Producers are faced with the continuing problem of reducing production costs while increasing or maintaining yield. They are either attempting to reduce tillage or to eliminate it entirely. There is a continuing question of how much tillage is necessary. Some are attempting to control weeds chemically and not till the soil. Others are trying to maintain the old seed bed but clean the furrows.

Discussion

In the previous fall, stalks were cut in the conventional tilled plots and in the spring , the plots were disked twice and bedded. Then the beds were loosened with a do-all and cottonseeds were planted. In the fall, stalks were cut in the reduced till beds. Winter weeds were killed chemically, and the beds were rebuilt leaving the stalks in place. After planting, the weeds were controlled with cultivation, barring off disks and a hooded sprayer. Another treatment was the same as the reduced tillage; except, the plots were paratilled a few days ahead of planting. In the no-till plots, the stalks were cut in the fall and weeds were controlled chemically. The planter was modified by adding a coulter in front of the disk openers to plant the no-till plots.

The trial was set up as a randomized complete block containing four replications. Plots were eight rows wide and 223 feet long. Two rows were harvested and ginned on a twenty saw Continental with an incline seedcotton cleaner, a feeder-extractor and a one stage lint cleaner. Samples were classed on high volume classing instruments at the USDA Cotton Classing Office in Haiti, Missouri.

This years' weather consisted of two extended dry periods followed by very large amounts of rainfall. As a result, there were two long periods of moisture stress which affected the plants during early flowering and after cutout. The plots were furrow irrigated as needed. In 1997, the no-till plots did not emerge as well as the others. In 1998, emergence was good in the no-till plots, but crop development was poor. Weed control was certainly more difficult in the no-till plots. The plants in the paratilled plots did not water stress as much as the other treatments.

Summary

No statistically significant differences were shown for yield; however, the data indicates paratilling helps increase yield (Table 1). The conventional plots yielded more cotton than either the no-till or reduce till treatments. Lint percent was reduced with the use of the paratill. The lint percent of conventional tillage was lower than no-till. Lint percent of reduced tillage was inconsistent when compared to conventional or no-till. Micronaire was inconsistent (Table 2). Length was generally shorter in the no-till plots. Fiber strength was erratic between treatments. Trash content was very high in the no-till in 1997 but good in 1998 (Table 3). The no-till appeared to be trashy in 1998 judging from the weeds in the plots. The conventional tilled cotton consistently produced cleaner lint than the other treatments.

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Table 1. Lint Yield and Lint Percent

Treatment	Lint Yield (lb/A)	Lint Percent (%)
Reduced with Paratill	787.0 a	38.25 b
Reduced without Paratill	729.5 a-b	38.25 b
Conventional Till	617.0 b-c	38.25 b
No-Till	525.0 c	38.75 a
Mean	664.6	38.38
LSD .05	140.0	0.470
C. V. (%)	13.86	0.75

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Table 2. Fiber Properties

Treatment	Fiber Properties Mic.	Len. (in.)	Str. (g/tex)
Reduced with Paratill	5.025 a	1.108 a	27.80 c
Reduced without Paratill	5.150 a	1.105 a	29.27 b
Conventional Till	4.925 a	1.098 a	30.77 a
No-Till	5.250 a	1.090 a	28.15 c
Mean	5.088	1.100	29.00
LSD .05	0.327	0.019	0.981
C. V. (%)	4.08	1.07	2.22

Table 3. Fiber Properties

Treatment	Fiber Properties Unif. (%)	Trash (%)
Reduced with Paratill	83.25 a	4.25 a
Reduced without Paratill	82.50 a	5.00 a
Conventional Till	83.50 a	3.25 a
No-Till	82.75 a	3.75 a
Mean	83.00	4.06
LSD .05	1.716	2.597
C. V. (%)	1.20	37.66