COVER CROPS AND TILLAGE METHODS FOR UNR AND WIDE ROW COTTON

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Abstract

Ultra Narrow Row (UNR) Cotton acreage has been rapidly increasing in Alabama in the last 3 - 4 years. Producers have become interested in UNR Cotton as a way to save on machinery costs and possibly increase yields on marginal land. Previous research in Alabama has shown increased yields with the use of conservation tillage and lupin/legumes as winter cover crops for UNR Cotton.

A study was begun at the Wiregrass Research and Education Center in southeastern AL in 1998 to investigate the optimum combination of row spacing (Wide vs UNR), cover crops (legume vs rye), and tillage (conventional vs no-till). This experiment has been conducted for 2 years on a Lucy loamy sand, normally a drought-prone and marginal soil for wide row cotton production.

Rye was planted as a cover crop during the fall of 1997 and 1998; lupin was planted in 1997 and a lupin/crimson clover mix was planted in 1998 due to winter kill the previous year. Cover crops were killed at least one month before planting cotton and rolled down on no-till plots or incorporated on conventional. All plots were paratilled each spring.

Paymaster PM 1220 BG/RR cotton seed was planted in May of each year, but was replanted in June '98 due to extremely dry weather. UNR (8 inch rows) plots were planted at 182,000 seeds/A and Wide Row (36 inch) plots at 84,000 seeds/A each year. Best known management systems, including growth regulators, were used for each system. The 1998 growing season was characterized by an extremely dry spring, followed by a moderate summer. This is in contrast to 1999, when the spring and early summer was wet, followed by an extremely dry late summer.

Plant Populations counts showed that UNR had a higher population in 1998 than Wide row @ P=0.10 (148,000 vs 38,000 plants/A). In 1999, there was an interaction between Tillage and Row width, with populations of 37,000 plants/A for Wide row vs 139,000 for conventional UNR and 98,000 for no-till UNR.

Leaf Area Index (LAI) measurements showed a significant (P= 0.10) Row width * Cover * Tillage interaction with UNR cotton consistently having a higher LAI than Wide Row at Early Bloom. In 1999, there was a Tillage * Row Width interaction, again with UNR having a much higher LAI at this growth stage.

Lint yield measurements showed that UNR systems yielded higher (911 vs 596 lb/A) than wide row in 1998, with no interactions. In 1999, there was a Tillage * Cover interaction, but no Row Width effect. Conventional tilled plots after legumes yielded 949 lb/A vs 865 lb/A for no-till after legumes. After rye, conventional yielded 923 lb/A and no-till 669 lb/A. It appeared that early season leaching and slow breakdown of cover crops in late season may have caused nitrogen deficiency in no-till rye plots.

Based on two years of data, it appears that UNR cotton took advantage of higher early season intercepted sunlight (LAI) to yield better than Wide Row cotton in a year with a dry early summer that slowed late season growth. In a year with a wet early spring and dry late summer, Wide Row cotton continued growth through late bloom and yielded the same as UNR. In that year, no-tilling decreased yields, while cover crops had a variable effect.

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