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TILLAGE AND ROTATION EFFECTS ON COTTON YIELD AND QUALITY ON TWO SOILS

Philip J. Bauer
Florence, SC
James R. Frederick and Bruce A. Fortnum
Clemson University
Florence, SC
Charles E. Curtis
Clemson University
Clemson, SC

Abstract

Many cotton (*Gossypium hirsutum* L.) fields in the coastal plain contain several different soil map units. Optimizing yield on the different soil map units may require soil-specific residue management practices. The objectives of this research were to determine the effect of tillage and rotation on cotton yield and fiber properties on two coastal plain soils. Because cotton pest levels can be affected by cropping history, a second objective was to assess the effect of rotation on rootknot nematodes (*Meloidogyne incognita*) and thrips (*Frankliniella* sp.) when conservation tillage is used. Treatments in the study were soils (Bonneau sand and Norfolk loamy sand), rotation (continuous cotton, cotton rotated with corn (*Zea mays* L.), and continuous cotton with a rye (*Secale cereale* L.) cover crop, tillage (conservation and conventional), and aldicarb level (0 and 7 lbs Temik® 15G per acre). Early season thrips damage, rootknot nematode levels in cotton roots, lint yield, and HVI fiber quality data were collected in 1998, 2000, and 2002. No interactions occurred between soils and rotation or soils and tillage for yield in any year, suggesting that similar residue management strategies can be used for cotton production on these two soils. Cotton grown with conservation tillage had higher yield than cotton grown with conventional tillage in all three years. Fiber properties did not differ enough among treatments to affect the value of the cotton lint. Cotton grown with aldicarb had higher lint yield than cotton grown without aldicarb in 1998 and 2002, but not in 2000. Rotation influenced pest levels in the cotton grown with conservation tillage when aldicarb was not applied. Thrips damage was lower on those plants grown following the rye winter cover crop than on plants in the other two rotations. Midseason root nematode infection levels were lower in cotton grown in rotation with corn than in plants in the other two rotations only in 1992. Further research is needed to determine how to use these residue management systems more effectively against these pests in cotton grown with conservation tillage.