POTENTIAL FOR REDUCED TILLAGE TOBACCO PRODUCTION IN NORTH CAROLINA

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ABSTRACT

Flue-cured and burley tobacco were grown on approximately 154,000 and 6,000 acres, respectively, in North Carolina in 2003. Burley tobacco is grown in the Mountains of NC and some flue-cured tobacco is grown in the northwestern Piedmont where topography, available farm land for row crop agriculture, and soil conservation requirements have lead to adoption of soil conservation practices including no-till tobacco production. Research on no-till production of burley and flue-cued tobacco has been conducted for many years in NC. No-till systems have been comparable to conventional systems in burley tobacco, but several production-related issues have prevented adoption of no-till systems in flue-cured tobacco. Weed control was the primary limiting factor to successful production of no-till burley tobacco, but was only one of the limiting factors to production of no-till flue-cured tobacco. Clomazone and sulfentrazone were labeled in the late 1990's and dramatically improved weed management in tobacco allowing burley growers to adopt no-till production. However, restricted root growth, lodging, and reduced yields that are common in flue-cured tobacco have limited adoption of no-till. Problems observed in flue-cured production are likely related to restricted root growth in flue-cured soil types that is not observed in burley production areas. Recent research has shown that strip tillage and/or minimum tillage systems have been successful in over-coming many of the soil related problems associated with no-till production with similar soil conservation benefits to no-till.

SUMMARY

Flue-cured and burley tobacco were grown on approximately 154,000 and 6,000 acres, respectively, in North Carolina in 2003. Burley tobacco is grown in the Mountains of NC and some flue-cured tobacco is grown in the northwestern Piedmont where topography, available farm land for row crop agriculture, and soil conservation requirements have lead to adoption of soil conservation practices including no-till tobacco production. Tobacco soils have a high potential for soil erosion. Research in1983 showed that soil loss with a 1.3% slope was 0.05 ton/acre with no-till tobacco versus 1.1 ton/acre with conventional tillage. When the slope was 3.1%, soil losses were 0.05 ton/acre with no-till versus 4.03 tons/acre with conventional tillage.

No-till tobacco is typically grown in a rye cover crop or sod killed with either paraquat or glyphosate. It is transplanted using a modified mechanical transplanter with a fluted coulter, a double disc row opener, and more narrow press wheels with reinforced rims. Some no-till transplanters have also included a straight shank or a winged knife to provide sub-surface tillage, which in some cases improved stands and root development. Sulfentrazone and clomazone are commonly used at transplanting for preemergence weed control because they do not require soil incorporation for activation and control many of the problem weeds in tobacco production. No-till tobacco typically requires about a 25% increase in nitrogen rate. Additional production practices are the same as conventionally grown tobacco.

No-till Burley Tobacco

No-till burley tobacco has been successfully grown in most burley producing areas of NC. However, wide adoption of no-till production has not been observed. It is estimated that less than 5% of the burley acreage is no-till. Acreage of burley tobacco on individual farms is relatively small and growers are able to rotate tobacco on soils that are not highly erodible. Early research with no-till burley tobacco showed that one of the greatest limiting factor to production was weed control. Work in 1986 showed an 18% decrease in yields of no-till tobacco compared to conventional. Reduced yields were related to lack of tillage and weed interference. In later research at the Upper Mountain and Mountain Research Stations from 1989 to 1994, yields of no-till tobacco were greater than conventional five out of six years. Better weed control with new herbicides and improved mechanical transplanters improved yields compared to previous work.

No-till Flue-cured Tobacco

Production of no-till flue-cured tobacco in North Carolina has not been as successful as production of burley tobacco. In research trials in the early 1990's, quality flue-cured tobacco could be produced with no tillage, however, yields of no-till were sometimes reduced and were highly variable. Failures with no-till flue-cured tobacco were related to dry growing seasons, lack of irrigation, and low mulch density. In addition, soils in the Northern Piedmont of NC have a high percentage of clay and may not be as suitable for no-till tobacco as soils commonly found in burley producing areas. Poor root development in no-till flue-cured tobacco compared to conventional tillage was common at locations where yields were reduced, as indicated by a greater incidence of lodging after high winds. Research with strip tillage and minimum tillage has been more successful in reducing soil loss without sacrificing yields of flue-cured tobacco.