

NO-TILLAGE CROPPING SYSTEMS IN SOUTH CAROLINA

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INTRODUCTION

No-tillage (no-till) is defined as a planting method in which a narrow seedbed (1 to 3 inches) is prepared by a coultter or similar tool. The idea is to disturb the soil very little as an aid in reducing erosion and possibly lowering the costs of establishing a crop.

In South Carolina, no-till has met with limited success. In 1983, an estimated 150,000 out of 2.3 million row crop acres have been planted no-till. However, there were 500,000+ additional acres planted with minimum tillage in which crop residues were either disced lightly or otherwise treated (e.g., burning) before planting. The potential by 1990 is for 1 million no-till acres of row crops in South Carolina.

NO-TILL CROPPING SYSTEMS

The major no-till cropping system in South Carolina involves soybeans planted in small grain stubble. In 1983, there were over 600,000 acres of soybeans planted in small grain stubble (primarily wheat), of which approximately 120,000 acres were no-till. Much of the remaining 480,000 acres were planted with minimum tillage following the burning of the grain stubble. Burning remains the most widely accepted type of residue management in reduced-tillage systems involving double cropping with small grain.

For growers who wish to utilize them for livestock feed, etc., cover crops offer much potential. However, the establishment of cover crops exclusively for erosion control has not gained wide acceptance. Legume cover crops grown for their contribution of nitrogen to succeeding crops such as corn or grain sorghum, appears to be gaining favor among certain innovative growers.

Due to heavy crop concentrations in the lighter Coastal Plain soils, most no-till planting systems in South Carolina involve planters with a double disc opener following a row subsoiler. This, of course, increases the energy requirement per row by about 50%, compared to coultter-planter systems. Many new no-till planters are now commercially available for use in sandy soils which form hardpans, but virtually all involve some type of chisel for deep tillage (usually 8 to 15 inches).

Row spacings for over 95% of the no-till row crops in South Carolina remain 30 to 40 inches. The primary reasons for this include: 1) some row treatment of insecticide-nematicides is practiced, particularly for corn and grain sorghum; 2) most planters equipped with chisels for deep tillage have difficulty with row spacings closer than 30 inches; 3) a conventional row width of 30 to 40

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inches is necessary for many row-oriented directed or shielded sprayers for weed control: and 4) research does not show a yield advantage for corn or soybean rows closer than 30 inches in South Carolina.

NEW PRACTICES IN NO-TILL

The major deterrents to increased no-till plantings are weed pests, particularly perennial grasses (e.g., johnsongrass) and large-seeded broadleaf weeds (e.g., sicklepod and morningglory). New grass herbicides, such as POAST and FUSILADE, and new herbicide application technology (e.g., shielded sprayers) give growers additional weed management options. Management is the key factor for success with no-till, regardless of the crop(s) involved.

RESEARCH EMPHASIS

A new IPM (Integrated Pest Management) project involving various tillage and crop rotation schemes and their influence on pest populations has been initiated in South Carolina. Several disciplines are involved, but emphasis is given to weed management. Several commercial companies are supporting a phase of the work involving postemergence weed management. Other research by USDA scientists involves planting grass crops such as corn into various legume cover crops. This effort is a part of a new southern regional research project.