

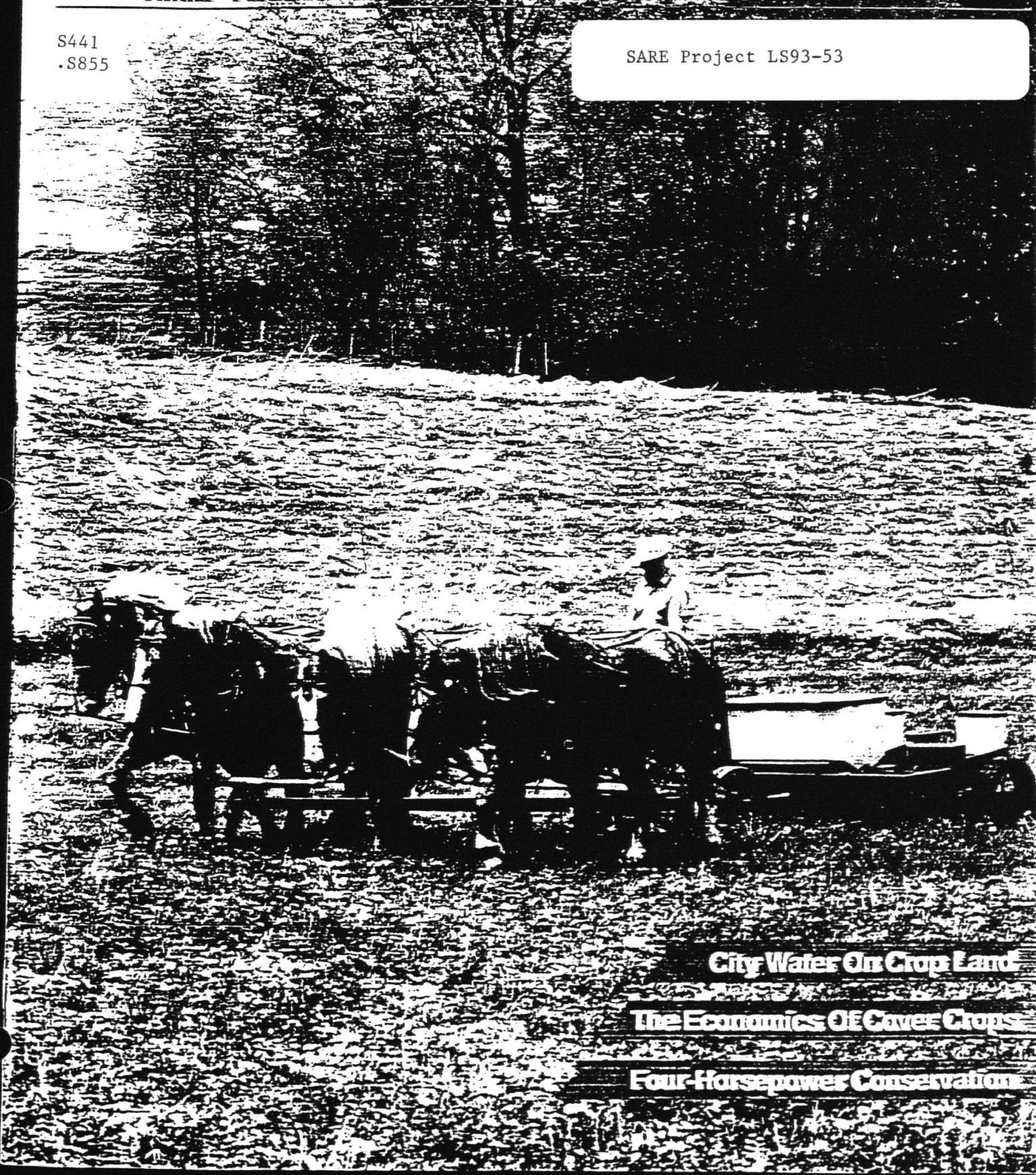
NATIONAL Conservation Tillage

AUGUST/SEPTEMBER 1994

Official Publication of the National Conservation Tillage Association

S441
.S855

SARE Project LS93-53



City Water On Crop Land

The Economics Of Cover Crops

Four-Horsepower Conservation

Existing And New Cover Crops

Potential New Cover Crops for the South



Wayne Reeves

Winter cover crops complement the use of conservation-tillage techniques, especially in crops like cotton or in silage production systems that do not leave significant amounts of residue following harvest.

A good cover crop should: 1) be easy to establish, 2) grow rapidly to provide ground cover quickly, 3) provide sufficient dry matter for maintenance of residues, 4) be disease resistant and not act as a

host for diseases of the cash crop, 5) be easy to kill at the appropriate time, and 6) be economically viable.

Currently, the most common cover crops used in the South are small grains—wheat, oat or rye and winter annual legumes—either hairy vetch or crimson clover. However, researchers are continuously on the lookout for promising cover crops.

'Tropic Sun' sunn hemp is a tropical legume released jointly by the University of Hawaii and USDA-SCS. USDA's Agricultural Research Service (ARS) and Auburn University researchers planted it in late summer following corn and it produced from 4200 to 6500 lbs./acre of residue containing over 100 lbs. of nitrogen per acre by the first killing frost. This cover crop not only produced lots of residue for soil protection before winter but also showed promise as a late summer-early fall forage for livestock.

In the 1940s over 2 million acres of blue and white lupin were grown as winter cover and green manure for cotton

in the South. Today new varieties of these legumes are being investigated by researchers and farmers alike. Farmers in Georgia and South Carolina are using Tifwhite-78' white lupin and Tifblue-78' blue lupin as cover crops for cotton and corn. Both of these varieties were developed by USDA-ARS researchers at Tifton, Georgia.

Cooperative research by ARS, Auburn University and the University of Florida has shown that white lupin has great promise as a dual purpose crop, i.e., as a cover crop and as an alternative feed grain, producing on average 30 bushels/acre grain containing 34% protein which can be used on farm without any processing.

Other researchers have developed earlier maturing varieties of winter legumes, which may fit better in Southern cropping systems. Among these are 'Americus' hairy vetch, released by USDA-SCS and 'AU Robin' crimson clover, released by Auburn University.

Black oat (*Avena strigosa*) is the number one cover crop for soybean in Southern Brazil due in part to improved weed control in no-till with this cover crop. ARS, university and SCS researchers recently obtained black oat seed and are currently evaluating it as a cover crop for soybean and cotton in a number of states.

In the future, new and improved cover crops will play a vital role in the development of conservation tillage systems for the South, providing management flexibility while conserving soil and water resources. ▲

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Spring-Seeded Smother Plants For Weed Control



Douglas Buhler

Smother plants are a potential alternative weed management tactic being evaluated at the USDA-Agricultural Research Service National Soil Tillth Laboratory, the University of Minnesota and other Midwest locations.

Smother plants are specialized cover crops selected for their ability to suppress weeds. An effective smother plant could provide a new weed control option and help control soil erosion by increasing soil

cover early in the growing season.

The use of growing plants and/or plant residue to control weeds is not a new concept. For example, winter rye, vetches and clovers have been evaluated as smother plants in corn and soybean. However, these plant species have demonstrated deficiencies such as the need for herbicide for elimination, excess competition with the crop, soil moisture depletion and poor winter survival.

The use of short-term spring-seeded smother plants may avoid the problems associated with previously tested systems. The key to success will be our ability to understand and manage the biological interactions among the crop, weeds and smother plants.

Competition from short-term spring-seeded smother plants may be easier to manage than winter annual and perennial species because planting patterns and rates can be chosen at the time of crop planting in response to

environment and other factors. In addition, herbicide will not be necessary to eliminate the smother plant if its life cycle is of appropriate length.

Current research at the National Soil Tillth Laboratory is evaluating a short-term brassica (mustard family) and four varieties of annual medic (relative of alfalfa) as spring-seeded smother plants for weed control in corn and soybean. The smother plants were planted in a 10-inch band over the row at the time of crop planting with early and late planting dates for both crops. Weeds were controlled between the rows with cultivation.

Results of this experiment varied by crop and planting date. When corn was planted on April 25, cool, moist conditions resulted in excellent establishment of the smother plant and up to 90% weed suppression. Some inhibition of corn growth was observed, especially with the brassica, but corn recovered from most of the injury. Dry soil conditions following later plantings reduced smother crop establishment and weed suppression.

Future research will evaluate methods, patterns, and timing of smother plant planting to optimize weed control with minimum injury to the crop and to identify morphological characteristics of an optimum smother plant. The key to long-term success of smother plants may be breeding plants to provide the characteristics needed for various weed management situations. ▲

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