



United States
Department of
Agriculture

Agricultural
Research
Service

National Soil
Dynamics
Laboratory

Conservation
Systems
Research

Research
Project
Description
No. 54

August 2005

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Conservation Systems Research

Winter Rye Residue Effects on Weed Control in Cotton

RESEARCH PROJECT DESCRIPTION NO. 54



Cotton in winter rye residue.

Researchers

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The Challenge

Winter cereals are known to be an excellent cover crop for southeastern farmers, protecting the soil surface and increasing soil organic matter content. Many cotton growers in Alabama have included winter cereal cover crops as part of their conservation tillage systems.

When rye is utilized as a winter cover crop and allowed to grow several feet in height, then mechanically rolled into a dense mat on the soil surface, weed growth is suppressed. The residue mat physically impedes weed growth and also reduces sunlight to the growing weeds. Chemical weed suppression (allelopathy) also occurs from chemicals released from the rye residue. A substantial mat of rye residue on a cotton field might provide enough weed control early in the season to eliminate the need for preemergence herbicide applications.

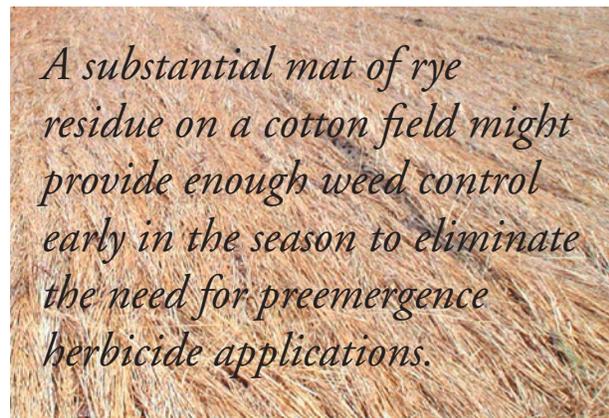
The Experiment

Field experiments at Alabama Agricultural Experiment Station facilities will:

1. Evaluate the effect of winter rye residue on weed control in conservation tillage cotton systems.
2. Determine if weed control from winter rye residue can eliminate preemergence herbicide applications in conservation tillage cotton systems.

At the Wiregrass Research and Extension Center in Headland, and the Prattville Agricultural Research Unit in Prattville, weed control in systems including rye residue and/or herbicide applications (early residual and postemergence) will be evaluated.

In the autumn of 2004 cereal rye was established no-till in one-half of the experimental plots (the other half will have no cover crop) and allowed to grow until spring. In the spring, the rye and weeds in the fallow plots will be terminated with glyphosate, and the rye rolled with a mechanical roller-crimper. Cotton will be established no-till.



Rolling a rye cover crop in springtime.

Early residual herbicide treatments include:

- Valor® in the rye burndown.
- Prowl® at cotton planting.
- none.

Postemergence herbicide treatments include:

- glyphosate at 4-leaf stage.
- Caparol® plus MSMS at layby (providing residual control to the end of season).
- both of the above.
- none.

At the E.V. Smith Research Center, near Miltstead, a similar field experiment will include rye residue and postemergence herbicides, but will not include any preemergence herbicides. Herbicide treatments include early postemergence or sequential applications of Roundup®, Ignite®, or Envoke®, with or without a layby application.

Related Publications

Winter cover crop residue effects on weed control and cotton yield. Conservation Systems Research Project Report No. 2. USDA-ARS National Soil Dynamics Laboratory, Auburn, AL. 2005.

Winter rye residue effects on weed control in soybeans. Conservation Systems Research Project Description No. 53. USDA-ARS National Soil Dynamics Laboratory, Auburn, AL. 2005.