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National Soil Dynamics Laboratory

Conservation Systems Research

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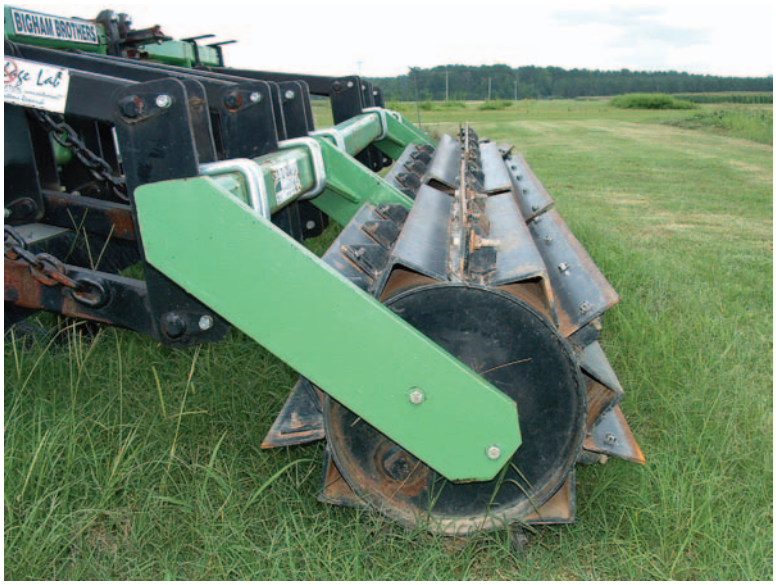
Conservation Systems Research

Improving Rollers for an Alternative Cover Crop Kill Method

RESEARCH PROJECT DESCRIPTION NO. 31



Original roller

Researchers

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The Challenge

The greatest problem associated with rollers for killing cover crops is the excessive vibration that prevents operations at typical field speeds. The original roller has equally-spaced, blunt steel crimping bars. During rolling, the contact between bars and residue is lost, causing excessive vibrations that increase with operating speed. Reports of

Reports of the excessive vibrations have caused some operators to stop using rollers.

the excessive vibrations have caused some operators to stop using rollers. An improved roller type is being designed to provide optimum crimping and minimize vibrations, maximizing the operating speed of the roller. The goal is to match or exceed the typical speed used with chemical cover crop termination and obtain comparable killing of cover crops.

The Experiment

Experiments are being conducted at the Alabama Agricultural Experiment Station's E.V. Smith Research Center in Milstead to determine:

1. Effectiveness in termination of two different cover crops using four types of roller-implements (small, 1-meter wide sections), and
2. Maximum operating speed of two types of rollers with 13.5 feet of implement width.

For the first objective, termination of winter cover crops will be performed with four different roller-implements: long bars, short, staggered rollers, curved roller, and a smooth roller with a crimping bar. Two cover crops – rye and wheat– will be used.

For the second objective, two types of rollers – a long, straight bar and a smooth roller with a crimping bar – will be used to terminate two winter cover crops (rye and wheat).

For both objectives, we will collect data on implement vibration, speed (for Objective #2), % cover crop kill, weed emergence, and soil compaction for each type of roller and cover crop.

Related Publications

Roller vs. herbicides: an alternative kill method for cover crops. Project Description #17. USDA-ARS National Soil Dynamics Unit, Conservation Systems Research. 2002. 2 pp.

The knife roller (crimper): an alternative kill method for cover crops. Agronomy Tech Note # 13. USDA-NRCS Soil Quality Institute. 2002. 4 pp.

Ashford, D.L. and D.W. Reeves. 2003. Use of a mechanical roller-crimper as an alternative kill method for cover crops. Am. J. Alt. Agric. 18(1):37-45.