Delaware Ag Engineers Study Tillage Systems

Since 1972 Delaware Cooperative Extension and the University of Delaware Agricultural Experiment Station have had a comprehensive program to develop, test and teach no-till crop production techniques. No-till demonstrations in the state began in 1969. With over 41 percent of its acreage in no-till, Delaware has led the nation in percentage of cropland no-tilled for the past four years.

Farmers have many tillage alternatives for producing corn and soybeans, Delaware's two major crops. But which systems are most cost-effective?

To find out, extension agricultural engineer Tom Williams and research associate Jim Kemble have begun a comparative study of crop response to 13 variations of no-till, in-row strip-till, ridge-till and minimum-till production systems for corn and soybeans. The four-year project is partially funded by a grant from the Delmarva Poultry Industry, Inc.

Delaware farmers favor no-till for a number of reasons, Williams says. It reduces both wind and water erosion, conserves soil moisture and saves time and machine energy. However, this cultural practice does have drawbacks. Growers who use no-till are increasingly concerned about delayed plantings in cold wet soils, uneven plant emergence and soil compaction. Heavy harvesting and transporting equipment contributes to soil compaction, as do heavy manure spreaders and fertilizer trucks used when the soil is wet.

Williams believes controlling field traffic by keeping all wheels off rows and reducing axle loads may alleviate compaction problems. Another solution is to use some form of limited tillage–such as ridge-till or in-row subsoiling–to break up compaction. But does it pay to use these methods on Delaware soils? That's a question Williams and Kemble hope to answer.

Ridge-tillage is becoming more popular in parts of the Midwest on fine-textured, poorly drained soils that are slow to warm up in spring. According to Williams, previous Delaware studies showed no benefit from ridge planting, but planting corn over old soybean rows did increase yields by 15.5 bushels per acre, and the ridges helped maintain cow integrity.

In-row subsoiling is used in the Southeast where hardpans impede root development, but this is an energy-intensive practice. Delaware soils have a compacted zone just below the plow layer which does not always restrict root growth. In previous Delaware studies, in-row subsoiling has given varied responses, ranging from reduced yields to 19 more bushels of corn per acre.

Ridge-tillage and in-row subsoiling have been tested on both coarse- and fine-textured North Carolina coastal plain soils. On coarse soils, ridging with in-row subsoiling produced more corn than in-row subsoiling alone. Fine-textured soils, however, showed no response to either practice. The current University of Delaware project should make it possible to define the soil conditions necessary for crop response to subsoiling in this state.

Williams and Kemble are conducting field studies at the University Agricultural Experiment Station farm in Newark, which has fine-textured, silt loam soil, and at the Research and Education Center in Georgetown, which has coarse-textured loamy sand soil.

The engineers will also look at how 10-ton axle loads affect soil compaction, and check machine energy requirements for the various tillage systems involved in the study.

"By examining the benefits of each system in relation to its cost," Williams says, "we can help Delaware farmers make sounder production decisions. This project is part of an ongoing extension and experiment station effort to show area farmers how to reduce costs and improve production efficiency."

Gehl Acquires Rights to Combine Attachments

WEST BEND, Wisc. – Gehl Company has announced the acquisition of certain assets of Keith Industries of Winnipeg, Manitoba, Canada. The products acquired include Straw Storm and Chaff Storm. Both are combine attachments that distribute crop residue as it leaves the combine.

"Bigger combines can leave bigger problems with concentrations of straw and chaff or corn cobs," states Gehl President/CEO Bernard L. Nielsen. "The problem is especially acute where crops are double-windrowed before combining. A combine without Straw Storm can leave behind heavy strips of residue that will hinder next year's crop development. Heavy doses of decomposing trash use up too much nitrogen. In fact, heavy concentrations of some chaff, such as flax, can temporarily poison the soil."

Heavy strips of crop residue can slow or stop field work. Too much residue in one strip can interfere with fertilizer, chemical and even seed incorporation. According to Nielsen, "Straw Storm helps ensure uniform seed penetration by no-till drills and other planting equipment. And it also protects valuable top soil from wind and water erosion."

Straw Storm models are made to fit large combines including Case-IH, John Deere, Deutz-Allis, Massey Ferguson and Ford-New Holland models. The unit fits underneath the normal discharge area and is powered by the combine's drive pulley.

According to Nielsen, both the Straw Storm and Chaff Storm will be manufactured at the Gehl Company plant in Madison, South Dakota. "We plan to take what is basically a very well-designed and well-accepted product, improve upon it, and market it throughout the western United States and Canada," he said.