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### **COVER CROPS IN NO-TILL PROVIDE EXTRA BENEFITS**

*Jackson County, Kansas*—The sight of a farmer in his corn field with a backhoe would make most heads turn... and likely shake in disbelief. But that is exactly what Henry Hill did to prepare for last week's No-Till on the Plains' "Whirlwind Expo" on his Jackson County farm northeast of Holton. He dug a four foot deep trench about 15 feet into his corn field so that those attending the tour could have a clear view of one of his most important assets—the soil. Henry and his father, William, have been no-till farming for about 30 years and the soil in his crop field shows the signs that Dr. Ray Ward, of Kearney, Neb., likes to see. And as a certified soil scientist with over 48 years of experience working in soil laboratories, Ward knows what he's looking at.

As Ward dug in the corn field soil, he looked for worms and corn plant roots. He said the idea that roots will find or grow toward the nutrients and moisture in the soil is unfounded. In actuality, he said the "roots grow where the soil is soft and wet" and where the nutrients actually are.

Ward explained that you can tell a lot from the soil and its structure. "You need to understand your soil so you know how to manage that soil," he said. As the owner of Ward Laboratories in Kearney, Ward also explained the method to gather an accurate soil sample from a pasture or crop field during the Whirlwind Expo's afternoon session.

Paul Jasa, an extension engineer with the University of Nebraska-Lincoln Extension, illustrated the differences in soil property using three soil sources—one from a tilled field; another sample from a no-till field, and a third from a no-tilled, cover-cropped field. He poured equal amounts of water on each sample and let it drain completely. Turning each of the samples out onto a board, he showed how the soil from the cover cropped, no-till field held together due to the microbes in the soil, while the no-tilled soil loosely held together and the tilled soil fell apart.

Jasa said this biological life—the "livestock"—holds the soil particles together and keep the moisture from passing through. Soil structure and residue have to work together, he said. That soil structure, Jasa explained, is what allowed the sample from the cover cropped field to actually hold the water and let the moisture soak in.

Lyle Frees, Natural Resource and Conservation Service, allowed an up-close view of what happens during a rain event using the rain simulator. He said the simulator illustrates "what happens when rain impacts with the soil's surface". The simulator provides a rain storm event on three different types of soil coverage. The first is bare ground; the second with some residue on the surface, and a third, in this case, sod from the Hill's waterway.

The amount of run-off from the bare soil sample was four times greater than the run-off from the both samples of covered ground and quite muddy compared to the fairly clear run-off of the waterway sod. "Water quality and soil quality go hand-in-hand," he said.

Jasa said the key to no-till is to have uniform residue which results in uniform soil temperature as well as uniform (and increased) soil moisture. One way to accomplish this is by planting cover crops in between regular crops.

Keith Berns, a farmer and no-till cover crop seed dealer from Bladen, Neb., discussed the Hill's planting of cover crops. According to Berns, a cover crop is a crop planted between periods of regular crop production to positively benefit the soil, soil fertility, control weeds and diseases.

Berns said he likes the mixes of cover crops because they provide diversity from one planting. The mixtures that Berns uses include grasses, brassicas and legumes with plants such as: lentils, common vetch, sorghum sudan, milo, pearl millet, canola, dwarf essex rape or oilseed radish.

"We want to increase biological activity of soil (by planting cover crops)," he said. Berns said the amount of benefits from organisms living in soil is tremendous.

Berns said the cover crops also serve specific purposes for improving soil quality. For example: he explained as radishes decay, they leave holes in the soil which in turn helps break up soil compaction.

Another no-till farmer featured during the expo was Gail Fuller. Fuller uses cover crops and a double rotation to maximize his benefits from no-till. He incorporates plants like lentils, sunflowers, oats and yellow peas into his rotation of wheat, beans and corn.

Fuller, who farms 1800 acres near Emporia, advises other farmers to start small and ask "what do I want to do?" He said a farmer should ask himself these questions: "Do I want to control erosion? Graze? Build nutrients?" Then he suggested planning your cover crops to help you accomplish those goals.

Fuller suggests a farmer experiment when first starting out with cover crops and work with what you already have on hand. "Keep it cheap. Clean out the shop. Throw it in there. It all works," he said, referring to some two-year-old wheat seed he sowed as a cover crop.

Fuller also recommends utilizing resources such as Sustainable Agriculture Research and Education "Managing Cover Crops Profitably" which is available online or for purchase from [www.sare.org](http://www.sare.org) This publication details information about a wide variety of cover crops. Additional information on cover crops is available from the National Sustainable Agriculture Information Service at [www.attra.org](http://www.attra.org) and from the Kansas Rural Center's Sustainable Agriculture Management Guides which are available online at [www.kansasruralcenter.org/publications.html](http://www.kansasruralcenter.org/publications.html)

The Whirlwind Expo was coordinated by No-Till on the Plains and funded by the following Watershed Restoration and Protection Strategy (WRAPS) groups: Delaware WRAPS; Missouri River WRAPS; Lower Kansas WRAPS; Middle Kansas WRAPS, and Upper Wakarusa WRAPS.

Marlene Bosworth, Delaware WRAPS coordinator said the WRAPS groups wanted to co-sponsor the event to bring a no-till event to the area. "Working together, you can get a lot more done," she said.

She said it was important for area farmers to actually see the physical make-up of the soil once no-till practices are utilized. "Once you see the cohesiveness of the soil that has been improved by practices such as cover crops, it is a no-brainer...it is very convincing once you see the physical changes," she said.