CORN MARKETING PROGRAM
CMPM
OF MICHIGAN

Vertical Tillage impacts on residue management and stand establishment

2013 - 2014 Research Report

Project Lead:

Dr. Tim Harrigan, Biosystems & Agricultural Engineering

Michigan State University

Despite technological and agronomic advances, corn and soybean growers are concerned that excessive corn residue is increasingly slow to break down and decompose. The objective of this project funded by the Corn Marketing Program of Michigan was to evaluate the role of vertical tillage on corn residue breakdown, soybean emergence and final stand, soybean yield and other key measures of crop progress.

A summary of the results concluded:

- Based on the results of ten field trials with a variety of vertical tillage tools, vertical tillage of corn residue in the spring or fall did not improve soybean emergence, final stand or soybean yield.
- Fall vertical tillage sized and knocked down corn residue, but it did not lead to a reduction in the volume of surface residue at planting time the following spring.
- Spring vertical tillage reduced corn residue 25% to 33% compared to untilled corn residue.
- There was little benefit from two passes with a vertical tillage tool in the fall or spring compared to a single pass in the spring.
- A single pass with a vertical tillage tool can improve a cereal rye cover crop emergence and uniformity in dry conditions, or in firm or trafficked soil with little residue cover.
- Vertical tillage tools vary in their ability to till and loosen the soil, and to cut and size corn residue. On fine-textured soils that respond favorably to tillage, aggressive, fluted coulters or tillage implements with gang angles greater than zero will size crop residue and increase soil loosening and lateral movement.
- If shattering and sizing corn residue is the primary goal, less aggressive coulters and toolbars with a reduced gang angle and an attachment such as a rolling spike harrow can distribute residue evenly while reducing tillage intensity.

On-farm trials were conducted in six locations:

1. Thelen Farms in Clinton Co., using a Salford RTS and a Summers Supercoulter
2. Faivor Farms in Clinton Co., using a Great Plains Turbo-Till
3. Sandborn Farms in Eaton Co., using a Case-IH 330 Turbo
4. Voisinet Farms in Clinton Co., using a Case-IH 330 Turbo
5. Crumbaugh Farms in Gratiot Co., Ferguson Farms in Sanilac Co. using a Landoll 7431

Five short videos document the tools and techniques, soil and residue conditions at each location. The videos and links to the videos are:

1. Fall Vertical Tillage with Landoll 7450 http://youtu.be/ZGLLrzznK0M
2. Vertical Tillage Managing Hi-Yielding Corn Residue http://youtu.be/WYHJNORcmIY
3. Vertical Tillage with Great Plains Turbo-Till http://youtu.be/T9k6cwHs24A
4. Vertical Tillage Case IH 330 Turbo http://youtu.be/9E7hASWEhx4
5. Vertical Tillage Salford RTS, Summers Supercoulter Plus http://youtu.be/by0QAq7ru-s

Click here to access the full research report for this project.

Corn Marketing Program of Michigan
13750 S. Sedona Parkway, Suite 5
Lansing, MI 48906
888.323.6601
corninfo@micorn.org