



# FactSheet

Extension

## Ohio State University Fact Sheet

### Agricultural Engineering

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## Fall Strip Tillage Systems: An Introduction

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Strip tillage is a relatively new soil conservation system useful for today's farmers. In Ohio it is most often used as part of a no-till system to increase corn yields.

No-till soybean production continues to increase, but corn grown with no-till and other conservation tillage systems peaked about 1995 and is declining. The main problem is cold, wet soil at planting which delays planting and decreases yield.

### What is STRIP TILLAGE?

Strip Tillage is a system combining the benefits of no-till and full-width tillage. Strip tillage is usually performed in the fall following soybeans or wheat to prepare the ground for corn planting. Tillage is confined to narrow strips where seeds will be planted.

The loosened soil in the strip creates a ridge 3 to 4 inches high, which improves soil drainage and warming. By spring, it usually settles down to 1 to 2 inches high, and after planting the field is flat.

Row middles are untilled and covered with undisturbed crop residue. Fertilizer can also be applied during strip tillage.



**Figure 1. Corn row with clean strip and residue between rows.**

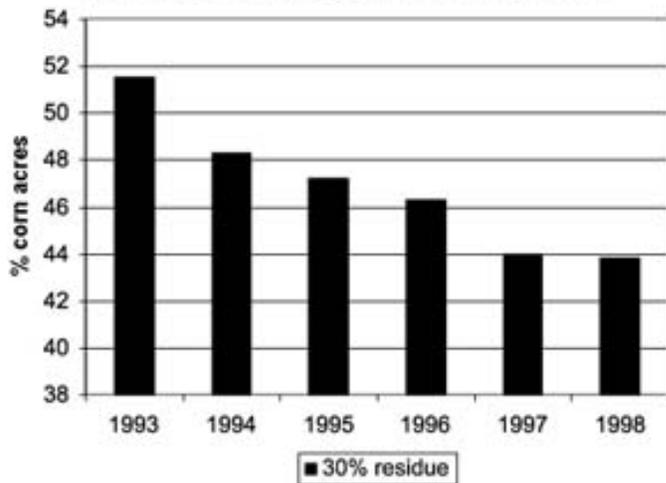
## **Why do STRIP TILLAGE?**

No-till corn production has not been successful on many flat, poorly drained soils in Ohio. Fall strip tillage is a good alternative to plowing.

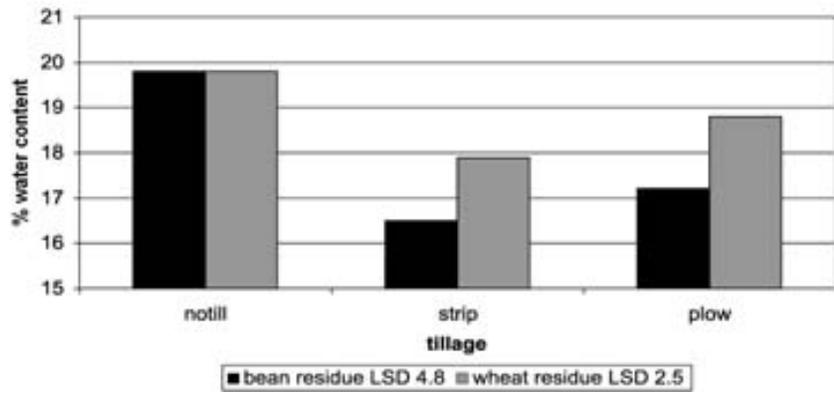
### *Benefits of strip tillage*

- **soil conservation**—undisturbed residue between corn rows (maintains long term no-till benefits)
- **improved soil conditions**—for development of corn plant in row (warmer, mellow seed bed)
- **banding of fertilizer**—placing nutrients near crop roots may allow reduced rates
- **optimized planting conditions**—earlier planting, less need for starter fertilizer

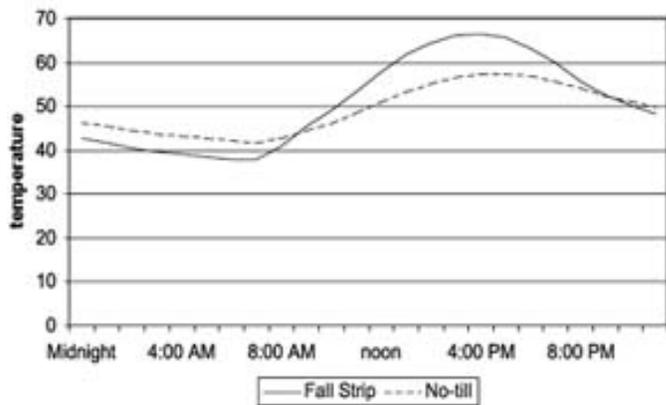
### NW Ohio - Corn Conservation Tillage % acres leaving year round residue



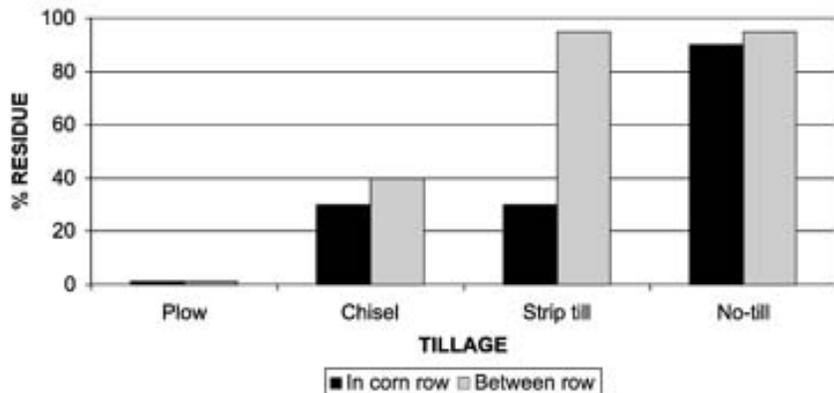
### Soil Moisture 2 in. at planting 1998 & 1999 average OARDC Branch



### 2 inch Soil Temperature, 4-25-99 sunny sky, Napoleon, OH



### RESIDUE ON SOIL SURFACE AFTER CORN PLANTING (previous crop = soybeans)



## Equipment Needed

There are many variations of strip-till equipment, but the following is typical: row cleaner, coulters, tillage shank, and 'covering' disks. All components are mounted on a tool bar equipped with row markers. It must be the same width as the corn planter, or multiple thereof, because the planter will run precisely where the strips are placed.



## Figure 2. Strip till rig.

Fertilizer is often applied during strip tillage in liquid or dry form. Anhydrous ammonia nitrogen with stabilizer can also be injected during strip tillage. Approximately 15 to 20 horsepower per row is needed for tractor power requirements.

- A row cleaner is important in heavy residue to create a bare soil zone.
- A coulter cuts through any remaining residue.
- The tillage shank, often with a mole knife, is narrow with a small wing near the bottom to enhance soil loosening and deep fertilizer placement with minimal topsoil disturbance. Tillage depth can vary from 4 to 8 inches depending on horsepower available and desired fertilizer placement.
- A pair of disk blades is positioned to catch any soil thrown up by the shank to keep all soil within the narrow strip. The loosened soil forms a small ridge. The disk blades should not run into the soil because a valley may be created on each edge of the strip, which could collect runoff and lead to erosion.
- Fertilizer delivery systems may include:
  - Dry P & K air caddy
  - Liquid fertilizer tanks
  - Anhydrous Ammonia pull-behind wagon



Figure 3. Mole knife.

## When to Strip Till?

Fall is the best time to perform strip tillage. The ridges will "mellow" during the winter and should be just an inch or two high in spring. After planting, the field should be flat.

It is important not to apply nitrogen in the fall to soils above 50°F as major losses may occur. This creates a timing conflict because strip till should be scheduled immediately after soybean harvest to reduce the risk of the soil getting too wet for the tillage operation. (Nitrogen stabilizer should be added to any fall-applied nitrogen.) A better option is to apply most of the nitrogen after the corn emerges as sidedress.

Strip tillage is not recommended for continuous corn because of the large volume of residue. Following wheat, the straw should be chopped short, and a row cleaner used. Soybean residue is ideal for strip tillage. The combine should chop and

evenly spread the residue.

## Precautions and Concerns

- Cost of strip tillage equipment
- Power requirement (takes more power than a no-till planter or drill)
- Less advantage, if any, in warm springs when no-till is successful
- Nitrogen application (soil must be below 50°F to reduce losses in fall; early spring anhydrous application destroys or hides the strips)
- Time crunch in fall (must be completed before soil is saturated)
- Finding the rows in spring
- May cause erosion in the row on slopes
- Banding fertilizer effects on the following soybean crop

### *Web sites for more information on strip tillage*

<a href="http://www.yetterco.com">www.yetterco.com</a>	Yetter equipment
<a href="http://www.progressivefarm.com">www.progressivefarm.com</a>	Progressive Farm Products
<a href="http://www.unverferth.com">www.unverferth.com</a>	Unverferth equipment
<a href="http://www.remlingermg.com">www.remlingermg.com</a>	Remlinger equipment
<a href="http://www.blu-jet.com">www.blu-jet.com</a>	Blu-jet equipment
<a href="http://www.gandy.net">www.gandy.net</a>	Gandy Co. fertilizer equipment
<a href="http://www.no-tillfarmer.com">www.no-tillfarmer.com</a>	No-till Farmer publication
<a href="http://www.agcom.purdue.edu/AgCom/Pubs/CT/CT-4.html">www.agcom.purdue.edu/AgCom/Pubs/CT/CT-4.html</a>	Purdue Extension, Conservation Tillage–Strip Tillage Series
<a href="http://www.ag.ohio-state.edu/~corn/library/restrial">www.ag.ohio-state.edu/~corn/library/restrial</a>	Ohio On-Farm Research results

### *E-mail contacts for more information on strip tillage*

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<a href="mailto:reeder.1@osu.edu">reeder.1@osu.edu</a>	Randall Reeder, Ohio State University

## References

Randall, Gyles, and Peter Hill. 2000. *Conservation Tillage Systems and Management*. MWPS-45. (Chapter 23: "Fall

Strip-tillage Systems"). MidWest Plan Service, Ames, Iowa.

Lessiter, Frank. 1999. *Strip Tilling Away Cold Soil Concerns!* Special No-Till Management Report No.15. Lessiter Publications, Brookfield, Wisconsin

Vyn, Tony. 1998. *Residue Management and Minimum Tillage Systems for Soybeans following Wheat.* Agronomy Journal 90:131-138.

Griffith, D.R.. 1994, *Strip Preparation for No-Till Corn and Soybeans*, CT-4 Conservation Tillage Series, Purdue University.

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