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# Strip-tillage Concept and Management

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## **Abstract**

Where does strip-tillage fit? Where does no-till work best? Will strip-tillage out yield no-till on my farm? Those are several of the questions that I have received from farmers at meetings this winter. Here are some thoughts about strip-tillage in answer to these questions.

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### Strip-tillage Concept and Management

By Mahdi Al-Kaisi, Department of Agronomy

Where does strip-tillage fit? Where does no-till work best? Will strip-tillage out yield no-till on my farm? Those are several of the questions that I have received from farmers at meetings this winter. Here are some thoughts about strip-tillage in answer to these questions.

Strip-tillage, which creates a soil environment that enhances seed germination, is an alternative to no-till in areas where poorly drained soils are dominant. Where soil moisture conditions are suitable, strip-tillage – traditionally in the fall – creates narrow-width tilled strips to increase early spring soil evaporation and soil temperature in the top two inches.

This is particularly effective in poorly drained wet soils, where slightly raised soil strips are created by farm equipment such as anhydrous knives, disks, coulters, tool bars or manure injection equipment. Both fertilizer application and strip-tillage can be performed in one operation.

The basic requirements for strip-tillage to be effective are accuracy in matching tillage equipment on the tool bar with the planter and placement of seeds in the tilled zone.



#### Improving plant emergence

Faster and more uniform emergence of corn plants are two of the key goals of strip-tillage. In the fall, anhydrous ammonia injection knives, fluted coulters or other tool attachments are used to create residue-free strips and tilled zones that are approximately 6 to 8 inches wide and 6 to 8 inches deep. In the spring, seeds are planted directly in the same strips. Fertilizers may be incorporated while tilling these strips.

This concept is similar to another system, zone-tillage, with one exception. In zone-tillage, multiple fluted coulters create a zone that is approximately 1 to 2 inches deep and 8 inches wide and free of residue. These coulters operate at shallow depths to avoid creating void pockets below the seed. Another variation involves making a deep vertical slit with a thin profile knife centered in the middle of an 8-inch tilled zone.

Zone tillage can be achieved by using a planter equipped with fluted coulters as well. Coulters may be operated 2 or 3 inches to 6 inches deep if the soil is

dry.

Farmers in southeastern states with particularly compacted soils have used in-row subsoiling with planter-mounted shanks in each row to create a tilled zone 12 inches deep. Seeds are then planted in the disturbed zone directly behind the shanks. This system is different from the two systems previously mentioned (zone tillage and strip-tillage) in that it is often used with a full width conventional tillage system.

#### **Effect on soil temperature**

Studies have shown corn is more susceptible to delayed germination or disease in cool soil temperatures when soil is poorly drained and there is high no-till residue cover. Other studies show that by removing residue over the row or disturbing a narrow zone (6 to 8 inches wide) the seedbed warms up more rapidly. This can help corn in the early part of the growing season; in some cases corn grain yield improved over no-till simply due to improved soil temperature.

Recently it was found that removing residue or strip-tilling to create a residue free zone improves corn germination due to increased soil temperature at the top two inches. You can use planter attachments that move no-till residue away from the row during planting. This assists in more rapid warming of the soil and combats slow germination caused by cold and residue-covered soils.

Topography is important to consider before using strip-tillage. In areas where the soil slope is steep or on highly erodible land (HEL), strip-tillage may not be the best choice. The disturbance of soil and removal of crop residue can create a significant water erosion problem in the row on steep slopes. It is recommended that after soybeans, at least 70 percent residue cover should be on the surface before strip-tilling. Strip-tillage is recommended on relatively flat land with poorly drained soils, where soil temperatures tend to be cold.

#### **Key Points**

- Strip-tillage leads to warm up of soil temperature and improvement of plant emergence.
- Strip-tillage has a yield advantage over no-till in wet, poorly drained soils.
- Strip-tillage minimizes soil disturbance and keeps 75 percent of residue on soil surface.

For more information, read the publication [Consider the strip tillage alternative](#).

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