

Immediate Release

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Strip-Till Advantages

Tilling the soil has become a farming tradition, especially with growing corn. Spring tillage warms the soil because each tillage pass reduces soil moisture by 0.5 to 1.0-acre inch. It takes 10X more energy to warm up cold wet soil than air, so a tilled warmer, moist, well aerated corn seed may germinate faster. Tillage create good seed-to-soil contact for even and consistent corn stands and also kills early weeds which may reduce yields 10%. Tillage also burns up carbon and mineralizes soluble nutrients (50 PPM nitrates) for faster early corn growth. These early tillage benefits are the main reason why farmers do annual tillage.

The downside risks though are also a problem. Tillage causes higher soil erosion, soils start to seal as the soil organic matter is mineralized (40-60% loss in SOM in last 75 years), soils become tighter, harder to farm, less water infiltration, ponding water, and higher water and nutrient runoff. Weeds and other pests (insects and diseases) thrive on tilled soils, and generally more inputs (fertilizer, fuel, equipment, pesticides) are needed to get good yields. Is there an alternative, or a tillage practice that can bridge the benefits of conventional full-width tillage with no-till practices? The answer may be strip-till.

For conservation purposes, strip tillage is considered a minimum tillage system that leaves residue on the soil surface. Only a small portion of the soil is tilled or disturbed (8-10 inches) which helps to aerate, warm up, dry out and prepare a good seedbed. Strip tillage improves seed to soil contact compared to no-till (Mike Petersen, 2011). The remaining undisturbed soil (20-22 inches) improves water infiltration and reduces soil erosion by slowing down water runoff. The American Society of Agronomy describes strip till as “Strip-till is in between the two systems (No-till and Conventional Till) where you combine the benefits of each” and a compromise between strict no-till and conventional tillage.

An advantage to strip till is the ability to band fertilizer 7 inches deep in a 10-inch tilled strip. In the spring, farmers would plant on the tilled strips in what is considered a stale seed bed. The fertilizer is injected into the root zone and temporarily tied up until next spring when corn is planted in the row, preventing nutrient losses and improving nutrient efficiency. Placing fertilizer in the same pass as tillage saves the extra cost of fuel and labor by making less passes in the field

(Jensen, 2018). Overall, more organic residue is left in the field due to less tillage and the fertilizer being placed in bands (NRCS, 2008) which improves soil health.

Some studies have shown a temperature difference of 6 degrees higher in the strips in the month of June. Strip-till farmers report planting fields earlier due to faster spring soil warm up and dry down. (Jensen, 2018). Yield advantages may occur if soil properties reach an optimal level to allow corn plants to grow faster and focus its energy on yield.” (Korzekwa, 2015).

Two issues with strip till are the high horsepower requirements and timely field applications. Pulling a 6 or 8 row shank through the soil requires a minimum of 25 to 30 horsepower per shank to as much as 40 horsepower depending upon soil conditions (Mike Petersen, 2011). A typical strip till machine is 20 feet wide with 8 shanks and uses a 365 hp tractor to perform the tillage.

Most farmers prefer to do strip tilling in the fall when soil conditions tend to be drier, but in wet years or during a late harvest, strip tilling may have to be delayed until winter or early spring. Trying to strip till under wet soil conditions promotes soil compaction. Strip tilling on frozen soils may be difficult and spring strip tillage may interfere with planting. On fields with 4-6% slopes, soil erosion on the strips may become an issue. Contour farming or farming around the hill rather than up and down the slope will minimize soil erosion. After a wet winter or a winter with excessive variable temperatures (freeze/thaw cycles), fall strip till can sometimes be a mess. GPS and auto-steer may help keep the planter on the strips, but sometimes even that can be difficult. With any tillage system, there are always challenges to making the system work every single year. Sometimes though, a compromise is much better than government regulation!