Tillage: Think Seedbed And Rooting Zone

URBANA, ILL.

The large amount of tillage done last fall, and the good soil conditions even where no fall tillage was done, raise questions of how much tillage is needed this spring. While many producers are doing spring tillage as usual, others are thinking that this may be the year to do less, said Emerson Nafziger, University of Illinois Extension agronomist.

Nafziger said there are two fundamental reasons to do (or not do) tillage.

"First, we need to be able to place seed well, at uniform depth and with good seed-to-soil contact," he said. "We may not need tillage to accomplish this. Where we do need tillage, we should create good conditions for the seed while keeping moist soil formed around the seed."

The other reason to consider tillage is to create a favorable place for roots to grow.

"This means having no distinctive physical barrier, such as soil compacted by previous operations," he said. "It also means having good soil-to-soil connections with the deeper soil in order to keep water moving to the surface as the plant starts to take up water."

Deep ripping when soils are dry enough, and not driving on soils when they're still wet, can do a great deal to help create these conditions. But no-till can also help to preserve these conditions when they exist, he added.

Some producers might want to consider "stale seedbed" planting this spring – planting into soil tilled last fall without any additional tillage. This can help preserve soil moisture while eliminating the time and cost to do more tillage in the spring.

"Fall tillage tends to reduce the number and size of winter annual weeds, so burndown plus residual herbicides should be effective in stale-seedbed plantings," he said. "Planters may need to be adjusted to keep from planting seeds too deep. While we haven't done or seen enough stale seedbed planting to recommend it, the unusually good seedbed conditions this spring may make it worth trying, at least in a field or in some strips."

Though there aren't many fields going to corn that weren't tilled last fall, current soil conditions should also make no-till easier to do well this spring, Nafziger added. One tillage option that may allow fields – especially corn following corn – to be counted as no-till is vertical tillage.

Vertical tillage uses a wide variety of equipment types and brands, with the common theme being fast, shallow disturbance of the soil with little residue incorporation. Many of these implements also have attachments that help break corn residue into smaller pieces, but leave most of it on top, helping seed placement while preserving cover.

"Because these implements do not till to a uniform depth, they tend to produce less of a distinct break, with loose soil on top and untilled soil underneath," he said. "If it gets dry, such a break can be tough for roots to break through, in which case vertical tillage may provide some benefit. But if soils stay moist until roots have reached deeper than this, there will be little benefit."

For example, in a six-year study conducted by Eric Adee at the Monmouth Research Center, vertical tillage produced the same yield as no-till in corn following soybean.

"Because rooting conditions following this past fall and winter should already be in good shape, the emphasis this spring should be on doing as little compaction damage to the soil of the rooting zone as possible," Nafziger said. "This means driving on fields as little as possible, staying out until soils are dry enough, and doing what we can to reduce compaction when we till or plant." Δ