Site-specific tillage choices management

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Abstract
Before making tillage choices in the field, producers should consider their overall approach to tillage management. If the goal is a conservation tillage program with at least 30 percent of the previous year's crop residue cover after planting, then options of no-till, strip-till, ridge-till, and minimum tillage are effective. However, every choice requires considerations well in advance of going to the field. Once a producer has made a management commitment to implement a new tillage system, several steps should be taken to achieve maximum results, including those related to equipment and attachments needed, weather and soil conditions, and tillage timing.

Keywords
Agronomy, Agricultural and Biosystems Engineering

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences | Bioresource and Agricultural Engineering
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Why conservation tillage systems?

Before making tillage choices in the field, producers should consider their overall approach to tillage management. If the goal is a conservation tillage program with at least 30 percent of the previous year's crop residue cover after planting, then options of no-till, strip-till, ridge-till, and minimum tillage are effective.

However, every choice requires considerations well in advance of going to the field. Once a producer has made a management commitment to implement a new tillage system, several steps should be taken to achieve maximum results, including those related to equipment and attachments needed, weather and soil conditions, and tillage timing.

Equipment choice

One of the first things most producers can do is to take an inventory of their current equipment, especially the planter. It is important to know what attachments may be needed, such as row cleaners and stronger down-pressure springs. Equipment operators should be able to operate the equipment conveniently, including setting the height of new attachments such as row cleaners.

It is always wise to compare the cost of replacing or factoring in the wear and tear on existing equipment, and the cost of adding attachments. Take into account that simply adding a row
cleaner or coulter attachment - or both - to most existing planters may cost $200 to $400 per row.

**Weather and soil conditions**

Because cold, wet soils can be challenging for producers looking to move to no-till or reduced tillage systems, the key to success often lies in monitoring soil conditions. Success also depends on monitoring Iowa's capricious spring weather conditions, which can change abruptly.

Field internal drainage is an important factor in making site-specific decisions. In approximately half of Iowa cropland, producers use subsurface drainage to lower the water table and improve growing conditions. Now is a good time to identify and check drainage systems for potential problems, such as misaligned, collapsed, or broken tiles. Make sure every terrace drains completely in approximately two days after a normal rainfall. If the water stands too long, check for a plugged inlet or outlet.

Soil temperature is also critical in tillage management systems that leave residue on the soil surface. As a rule, the farther north, the slower the soil will warm up to planting soil temperature. Producers who have made a commitment to conservation tillage have looked at strip-tillage to address the issue of cold and wet soils.

**Why give the 'go-ahead' for tillage?**

Remember: studies suggest that soybean shows low response to tillage. Resist any tillage impulses ahead of soybean planting.

Some of the more common reasons for going ahead with tillage include breaking up soil compaction with rippers in the fall. But no matter what the reason, when the decision is made to go ahead with tillage, make sure that there is a valid reason with specific and measurable benefits. In every field, each tillage pass should be justifiable.
Why measure crop residue?

Now is also a good time to do a quick check on residue cover on the soil surface. A good read on existing residue indicates how well the soil is protected against erosion. Measuring residue before planting can help ensure compliance with the objectives of a conservation plan. For more information on measuring soil residue and soil erosion, please visit the Soil Management and Conservation Practices website [1].

One of the keys to the success of conservation tillage is a good cover of crop residues on the soil surface. When it comes to planting, fragile soybean crop residue will be less challenging to handle than cornstalks and rarely requires tillage in preparation for planting.

Conclusion

Conservation tillage is a key solution to reduce soil erosion and improve water quality by reducing sediment in surface waters. As Iowa producers go through the decision-making process in 2004, site-specific conservation plans and tillage management that prevent soil erosion should be major considerations in any field.

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