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Choosing cultivation in a conservation plan

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Choosing cultivation in a conservation plan

Abstract

With all the recent rainfall, many producers are concerned about the level of weed control that their preemergence and postemergence herbicides will achieve this season. Even with the best management, occasionally something can interfere with a sound weed management or conservation tillage program. Whether it's weed and crop management histories, weather conditions, or what seems like just bad luck, you may feel that you'll have to head to the field with the cultivator this year. More than half of Iowa's producers make that choice every year.

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INTEGRATED CROP MANAGEMENT

Choosing cultivation in a conservation plan

With all the recent rainfall, many producers are concerned about the level of weed control that their preemergence and postemergence herbicides will achieve this season. Even with the best management, occasionally something can interfere with a sound weed management or conservation tillage program.

Whether it's weed and crop management histories, weather conditions, or what seems like just bad luck, you may feel that you'll have to head to the field with the cultivator this year. More than half of Iowa's producers make that choice every year. And although conservation plans generally seek to minimize tillage and soil disturbance, no producer should be expected to endure serious yield- and income losses due to weed infestations.

For any field operation, you need a reason to cultivate. If a field is reasonably clean or weed-free, don't cultivate. However, if you have a lot of weeds or if the soil is sealed or puddled due to the recent rains we've had, then the soil could benefit from a little aeration.

Post-planting cultivation results in a wide range of weed control effectiveness--from poor to excellent--depending on the number and type of weeds present and soil conditions. Generally, under good conditions, you can get from 50 to 60 percent weed control (70 to 90 percent right after cultivation).

Cultivating corn or soybeans requires favorable soil conditions--soil that is dry enough to till and shatter large aggregates. If you cultivate in wet soil the weeds simply re-root and keep growing. Grasses are also difficult to manage with cultivation because of their fibrous root systems.

Proper timing is also important. Small weeds that lack extensive or deep roots are easier to manage with the cultivator than larger, established weeds. Cultivating is most effective when done early in the season, when other farm activities demand attention, so it is often difficult to find the time. But when properly done, cultivation offers many benefits, especially for corn. If fields are pounded by heavy rains after planting--especially light-colored soils or soils low in organic content--cultivation enhances root development by easing compaction and breaking up dense soil layers. Cultivating also aerates the soil, closes any cracks that may have formed as the soil's surface dried, and reduces puddling and runoff from subsequent rainfall.

There are also disadvantages of cultivation, including the potential for increasing soil erosion as a result of burying crop residue and loosening the soil. Typically, cultivation decreases residue cover from 5 to 10 percent. It is an issue, but often comes at a time of the year when the crop canopy is starting to expand and protect the soil. Other disadvantages include higher fuel bills, more time spent in the fields, and the risk of ineffective weed management.

Deep cultivation could actually increase weed problems by pulling deeply buried weed seed to the surface where it may germinate. And the more you cultivate, the more you risk exposing and destroying organic-matter content in your soil.

When using a sweep or shovel cultivator, keep your sweeps shallow, and focus on scraping small weeds up and out of the soil without disturbing the soil too deeply or turning residues under. You spend a lot of time setting up your sprayers. You should spend just as much time setting up your cultivator. Get off the tractor, get behind the machine, and do some checking. You want uniformity--see how deep the sweeps are going and check to see if you are really uprooting small weeds. Also, check the sweeps or shovels behind the rear wheels. Sometimes they need to be set a little deeper to get the same penetration.

Finally, keep soil disturbance to a minimum. You'll need to maintain your residue cover while the crop firmly establishes a canopy. Once the crop has shaded the soil, weed seed germination stops, and your crop has gained the edge on weeds and is less vulnerable to competition for nutrients, sunlight, and water.

For weed management in soybeans, especially narrow-row soybeans, a rotary hoe can be an effective tool. Rotary hoeing should be done while weeds are still in the white root stage. Wait until daytime air temperatures are warm and soybean plants are not brittle, then drive perpendicular or diagonally to the rows. Avoid hoeing during the first week after soybean emergence when cotyledons may be shattered from plant stems.

Rotary hoes are subject to greater variability in effectiveness compared with sweep cultivators. Speed is an issue when hoeing. Don't drive too slow. The best results while hoeing are obtained at 7 to 9 miles per hour.

Many producers could face a weed-control problem this year, whether from wind affecting spray coverage, rain, or for other reasons. If you have had a chemical application strategy that has not worked as well as you wanted, change your strategy a little bit. Instead of spraying again, consider cultivation.

Good soil conservation plans minimize tillage and manage crop residue, but post-planting cultivation is sometimes needed and when properly implemented, can be an effective part of an overall plan.

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