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Pay Attention to Soil Crusting After Heavy Rain Events

By Mahdi Al-Kaisi, Department of Agronomy and Mark Hanna, Department of Agriculture and Biosystems Engineering

Recent rain brings another challenge that farmers may need to deal with, especially in conventionally tilled fields that were planted recently to corn or soybean. In addition to the immediate effect on soil erosion and potential damages to newly seeded waterways, there are after effects of the rain when weather conditions improve and the soil surface starts to dry. The potential problem is soil crust.



This could occur especially in intensively tilled fields where residue cover is not adequate, as well as with fine texture soils, and soils with low organic matter content. These conditions could increase the potential for soil crust formation. Residue cover plays a significant role in reducing soil crust by absorbing the impact of rain drops that destroy soil surface structure. The destruction of soil structure impacts plant germination and seedling emergence for both corn and soybean.

Soil crusting can also result in poor growing conditions and reduced water infiltration. Soybean seedling emergence can be a problem if a dense surface crust forms. In this situation, hypocotyl is broken when pushing up against a solid crust. Monitor high-risk fields for soil crusting, especially where plant emergence has not yet occurred, in order to avoid damage to seedlings.

Rotary Hoe

The quick-relief solution to such a problem is the use of a rotary hoe. This tool is commonly used in treating soil crusting to improve seedling emergence. However, the timing is critical in order to achieve the intended results and prevent seedling damage. The rotary hoe is a potentially good tool to use to break up soil crust, but make sure you've got a crust that is actually sealing the soil surface before using it.

To minimize the damages to the seedlings and to increase success, rotary hoe at a time when the soil surface is at the right moisture conditions. This will require frequent field scouting to ensure that soil surface moisture is just above field capacity. Field capacity is the point when a handful of soil will crumple easily in your hand under minimum pressure, leaving a trace of moisture on your palm. This moisture condition will ensure less damage to emerging seedlings and less soil compaction during the hoeing process.

Rotary hoe at high field speeds (8 to 10 miles per hour) unless safety is a concern. However, if soybeans are the crop emerging, make sure both cotyledons aren't broken off by the hoe. Corn will likely be the crop emerging from rains this past weekend. Expect a minor stand loss (approximately 1 to 2 percent) from hoeing, but this should be insignificant if corn is truly having difficulty breaking through a crust. Getting off the tractor and checking for stand loss is a good idea when starting a field. If loss seems excessive (greater than 3 to 5 percent), you may want to slow your travel speed to be less aggressive with the tool.

It is very important to check early-planted fields periodically, especially those conventionally tilled with fine soil texture and low organic matter. Timing is important to manage soil crust at the proper moisture conditions.

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