Soil crusting across Iowa

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Soil crusting across Iowa

Abstract
Soybean planted during the last week of April has now emerged across most of Iowa. The sunny and windy conditions last weekend led to stressful conditions for the soybean seedlings. However, soybean planted during the second week of May just before the last rain now show a tendency toward soil crusting that has delayed, and in some areas prevented, seedling emergence. Crusting is usually most noticeable in fields with high silt content, low organic matter, and little surface residue, especially where excessive tillage occurred.

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Combating soil crust quickly is a real challenge, but one way to prevent a poor stand. The cooler the weather, the longer the seedling can survive, unless a seedling disease infects it. The warmer the weather, the faster the seedling grows and the sooner it runs out of energy. It is therefore important to deal with crust soon after it forms. Using a rotary hoe is one of the best ways to break the soil crust and enhance soybean emergence. If done properly (do not damage the cotyledons), rotary hoeing causes very little damage to the young soybean plant and little disturbance of crop residue, thereby enhancing infiltration and preventing erosion. If cotyledons are damaged or ripped off, the plant will die because during the cotyledon stage it can’t use photosynthesis and gets all its energy from the cotyledon.

A miracle technique. A general rule is to drive as fast as you can and then don't look back. It often looks bad after it's rotary hoed, and many believe that all the plants are lost. However, it seems worse than it really is. Stay away from the field and then go back and look at your stand a week later. It really is a miracle technique if it's done right. We rotary hoed 10 acres of research plots this afternoon in Nevada; my graduate students will probably lose sleep this week until they see the results.
Soybeans are struggling to emerge in some areas of Iowa. (Palle Pedersen)

Use a rotary hoe to break up soil crust. (Palle Pedersen)

The stress of emerging through crusted soil also increases the risk of soybean seedlings being infected by plant pathogenic fungi. Poor-quality seed is always at great risk of seedling diseases, but even high-quality seed is at risk under severe stress. Although seedlings have emerged, the wet weather and cool temperatures have inhibited their growth. Several species of fungi that cause seedling health problems thrive in wet soils. The combination of stress on seedlings created by saturated soils and soil crusting and the greater activity of fungi in these wet soils means that seedling diseases may show up in many fields.