Wet soils vulnerable to compaction

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Abstract
Soils in Iowa remain generally wet because of the nearly daily rainfall since early May. The wet weather presents several challenges to accomplishing fieldwork. Whether it is planting beans (or replanting corn), cultivating, or rotary hoeing, there have been few opportunities to date. But before rushing out to the field on the first few days of dry weather, you need to do a risk assessment of working the ground. When soil moisture is at or exceeds field capacity, there is an increased potential for soil compaction, particularly at topsoil depths.

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**Wet soils vulnerable to compaction**

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Weed control, crusting, and planting (or replanting) are all valid reasons to be in the field. But some of these operations will not achieve their objectives if the soil moisture conditions are not suitable. The decision to perform any field operation this season should be justified and weighed against disadvantages or damage to the soil. Soil compaction is a particular concern because the impact is significant when the soil's physical and chemical properties, such as infiltration rate, bulk density, and nutrient availability, are altered.

**The link between soil moisture and changes in soil physical properties is essential.** The degree of soil wetness changes with proportional relationships of air (void spaces in the soil system) to water. The increase of one portion over another affects the rest of the soil's physical properties, such as bulk density, infiltration rate, and soil elasticity. The continual rainfall has the affect of filling voids with additional water.

The impact of wet conditions on soil physical and chemical properties is also a function of soil texture. Well-drained, medium-textured (loams, clay loams, silt loams, and silty clay loam) soils are much less affected than fine-textured (silty clay and clay) soils, where saturated conditions are likely to exist due to poor drainage.

Cultivation helps break up crusted soils and speeds warming and drying of the soil surface. However, the potential for soil compaction is at its highest when the soil is just dry enough to work without getting stuck. In other words, a half-day's wait can pay off in the long run.

**Check soil moisture**

It is important to check for proper soil moisture conditions prior to implementing any field operation. Most of Iowa's soils have medium textures. For these soils, a simple method of checking soil moisture is the feel method. Probing the top 3-4 feet with a hand soil probe to assess the field's soil moisture conditions is time well spent.

Check the soil moisture status by pushing a ribbon of soil from between the thumb and index
finger. If it breaks off within 1 or 2 inches, the potential for creating compaction is less. However, if the ribbon stretches out to 4 or 5 inches, it's still too wet and plastic. The chances are good that being in the field under these conditions may cause more problems than it will solve.

Another method is to make a ball of soil 2 inches in diameter and toss it through the air. If it hangs together until impact, it has a lot of cohesiveness, is still fairly plastic, and probably is too wet to work.

**A couple notes about replanting**

Planting in wet soils is a risk. If conditions are too wet, you could smear the seed furrow sidewall, which is a form of soil compaction. With the seed furrow sidewalls smooth and compacted, root systems have trouble moving laterally. Also check the press wheels on the planter. Don't hammer seeds into wet soil with too much down-pressure on the press wheels. Keep the pressure light by relaxing the tension on the down spring mechanism.

**What does a wet June mean in terms of tillage?**

By June, most producers are generally beyond tillage operations that require a lot of horsepower. Whether for planting operations, rotary hoeing, or cultivation, the lighter axle the weights, the less likely the potential for soil compaction. Because these field operations require less horsepower, if a choice in tractor size exists, now is the time to use the smallest tractor.

Wait it out if possible. Watch the calendar, watch the weather, and know the soil conditions. Every day that passes makes it more tempting to get in the field and work at the first opportunity, but you should consider the implications for soil compaction as opposed to delayed field operations.

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Wet conditions and potential soil compaction.

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