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Spring rain: The good and the ugly

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Abstract
The current wet conditions are a mixed bag providing moisture to recharge the soil profile and potentially mitigating the residual effect of last season's drought. The amount of moisture we received over the past two weeks can significantly improve soil moisture conditions for early-season growth and for the rest of the season. According to Iowa Environmental Mesonet, since April 17 the daily estimated precipitation statewide average was 1.93 inches, the highest on any individual day since September 13, 1961.

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Spring rain: The good and the ugly

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The current wet conditions are a mixed bag providing moisture to recharge the soil profile and potentially mitigating the residual effect of last season’s drought. The amount of moisture we received over the past two weeks can significantly improve soil moisture conditions for early-season growth and for the rest of the season. According to Iowa Environmental Mesonet, since April 17 the daily estimated precipitation statewide average was 1.93 inches, the highest on any individual day since September 13, 1961.

Immediate impacts on soil

Soil erosion: Fields with intensive fall tillage are experiencing significant amounts of soil erosion. The destruction of soil structure during tillage operations reduced water infiltration causing the surface soil to seal and resulting in great amounts of surface runoff and sediment losses to rivers and streams. The lack of residue cover on the soil surface is a main factor in accelerating soil erosion. The reduction in water infiltration of intensively tilled soils means that they may not benefit greatly in terms of subsoil recharge because the majority of the water runs off the soil surface into streams and ditches. In contrast, no-till fields with good residue cover or fields with cover crop will experience much better water penetration and recharge to the soil profile. This, of course, is needed in many areas to mitigate last season’s drought conditions. The efficiency of a tillage system in capturing rain and storing it in subsoil is highly affected by residue cover level, how residues were managed (shredded or intact) and the existence of water ways and buffer strips that slow water movement and provide more opportunity for water to penetrate into the soil profile.

Soil compaction: The other concern we need to think about this spring is the potential for soil compaction. Wet soil condition presents a challenge with field operations such as applying fertilizers, planting and other daily farm management operations. Avoid entering fields when soil moisture is at or above field capacity, when greatest soil surface compaction or side wall compaction can occur. Soil compactions occurring during planting causes root deformation and subsequently yield reduction. It is worth waiting until field condition is dry enough by monitoring the top 6 inches of soil moisture by performing field moisture tests. Other problems associated with soil compaction are the potential of early nutrient deficiencies such as potassium (K) during early growth stages when compaction affects root growth.

In summary, the recent rains may help to bring soil moisture to appropriate levels in the top soil that may ensure a good planting season. But it may also create challenges we need to factor in to minimize some potential impacts on crop performance. Tillage intensity and residue management dramatically affects rain harvest and subsoil recharge and the degree of soil erosion we experience. Practice caution when entering the field this spring to avoid potential soil compaction.
Soil erosion in central Iowa. (Source: Drake Larson)

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