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Soil Management of Harvest Ruts

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Soil Management of Harvest Ruts

Abstract

Combines working in wet conditions to harvest crops have formed ruts in fields. About three-fourths of combine mass and virtually all of loaded grain tank weight are carried on the combine front axle. With good yields, grain tank extensions, and a 12-row head, front axle load can be 18 to 20 tons.

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Soil Management of Harvest Ruts

By Mark Hanna, Department of Agricultural and Biosystems Engineering, and Madhi Al-Kaisi, Department of Agronomy

Combines working in wet conditions to harvest crops have formed ruts in fields. About three-fourths of combine mass and virtually all of loaded grain tank weight are carried on the combine front axle. With good yields, grain tank extensions, and a 12-row head, front axle load can be 18 to 20 tons.

The consequences of such wet conditions are significant soil compaction caused by this heavy equipment and yield reductions that will be realized next season. Compacted soil created beneath the rut may interfere with subsequent crop rooting and development. Ruts deeper than about two inches can also interfere with maintaining seed depth during planter operation next spring, unless they are leveled.

Using tillage to loosen the soil and relieve compaction requires soil to be dry enough so that soil shattering is effective. Because soil moisture has refilled the top 12 to 24 inches of the soil profile, deep tillage with a chisel plow or subsoiler this fall or next spring will use fuel and time – but is unlikely to loosen soil effectively between tillage shanks. However, the full soil moisture profile in upper layers will freeze and thaw over the winter and help loosen soil, depending on air temperatures and snow cover. Entering the field this fall in wet moisture conditions for deep tilling or any type of tillage will be counter productive by creating much deeper soil compaction.

Ruts deeper than planting depth will need to be leveled before planter operation. A good strategy may be to wait until a week or two before planting next spring and use a light tillage pass, such as with a field cultivator, light disk, harrow, or soil finisher. If only a portion of the field is rutted, consider tilling only that area to avoid recompacting subsoil in other parts of the field. Waiting until warmer weather next spring allows for some potential drying of the top two or three inches of soil and avoids further compaction of wet, plastic soil on the surface – which will happen with a tillage pass this fall. If compaction effects are observed during the 2010 growing season and soil is dry after harvest, tillage next fall may be considered deep enough to break through the compacted layer.

Summary

- Rutting creates compacted soil and an irregular soil surface.
- Avoid deep tillage this fall to correct the problem as wet soil does not shatter/loosen.
- Shallow tillage next spring will level ruts for planter operation.

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