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Compaction Influence on Drought Stress in 2012

Field compaction has aggravated drought stress this year.

- Soils that are poorly drained with high water holding capacity normally yield better than lighter soils under drought.
- In 2012, zones of compaction are limiting yields on these soils in some fields.
- Farmers are urged to assess compaction in their fields this fall.
- Deep tillage could be profitable in some situations.

Drought stress is more prevalent in fields with layers of compaction. Deep rooting is very important for high yields.

Drought stress magnifies compaction issues

- Compaction introduced in fall 2009 and 2010
  - Fall ripping wet soils
  - Heavy axle loads
- Restricted root development in compaction zone
  - Reduced root mass to depth
  - Reduced capillary action transporting water from subsoil

Snow cover and warm winters since fall 2009 prevented freeze / thaw reaching adequate depths

- Freeze / thaw heaving action limited to surface 12" in winters of 2009/2010 and 2010/2011.
- Dry soils show reduced benefit from freeze / thaw action.

Notice the compacted layer beginning 8 to 10 inches below the soil surface.

Drought conditions will help alleviate compaction issues

- Soil constriction from extreme drought will fracture soil layers deep into the soil surface.
- If fall rainfall is enough to fill the soil profile, the "blocky" soil structure will fracture and pore space will return.

Deep cracks in soil profile will help alleviate compaction for 2013 (Iowa, late July, 2012 – Reuters / Karl Plume).

With rainfall, soil structure should loosen and more normal pore space should return.

Tips to Reduce Compaction

- Avoid tilling fields when soil is wet.
  - Heavy disk or disk rippers pack wet soil.
  - Ripper shanks "smear" rather than fracture.
- Manage traffic patterns.
  - Confine grain cart traffic to reduce affected surface area.
  - Manage axle loads by unloading combine more often.
  - Confine truck traffic to smaller "loading area".

Growers are urged to assess compaction in their fields this fall

- Evaluate all fields for compaction issues.
- Address issues on a field by field basis as compaction depth may change.
- Dig behind the ripper to ensure the compaction layer has been removed.
- Resist "lifting" the tillage tool to reduce shank wear.