Planning Tools for Soil Quality Degradation - Compaction

Resource Assessment

Traffic on wet soil is avoided
AND
Traffic patterns on fields are controlled
AND
Equipment loads are reduced to minimize weights
AND
Tillage and crop rotation are selected to manage compaction.

Three out of four are part of the current management practices?

NO

Compaction is a potential resource concern – evaluate further

YES

Soil compaction is being managed

Refer to Wisconsin Conservation Practice Standard, Controlled Traffic Farming (Code 334)

RECORD COMPACTION FINDINGS (as applicable)

<table>
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<tr>
<th>Tract</th>
<th>Field</th>
<th>Penetrometer Reading</th>
<th>STIR Value</th>
<th>Visual Assessment</th>
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Document and attach other reports, photos, and maps as documentation.

Complete a visual OM assessment to confirm results:

- Evidence of Root Restriction
- Evidence of surface crusting
- Evidence of Plow Pan
- Soil profile shows evidence of compaction (poor structure)
- Poor infiltration rates

**Options For Measuring And Determining Compaction**

Complete and document penetrometer results as listed below (attach results and documentation)

This link is an excellent source that explains how to use the penetrometer to measure soil compaction. This publication comes from PennState Extension. Below is a summary:


**Additional Guidance**

» Compaction continues to increase with modern farming practices. Sub surface compaction is a concern crop production. The penetrometer is designed to help measure potential restriction caused by compaction below the surface.

» At 300 PSI, root penetration of the soil will be stopped (with the exception of cracks, and other pore spaces.

» Take readings in moist soil conditions (field capacity is ideal). Too dry can cause higher readings and too wet you can miss plow pans.

» Push the rod into the ground 1 inch per second observing any layers of resistance. Most likely layers will be directly below the tillage zone.

» Take measurements in varied portions of the field—compare the traffic areas to in row. Keep those readings separated to assess the results.

» Document the depth of the restriction layer and its thickness.

» This tool was originally designed to measure the need to subsoil. Many publications indicate subsoil pushes that plow pan deeper into the profile but that it will remain a restriction layer. The value of long term (six + years) No Tillage on systems has been known to eliminate this concern.

» If 50% of the readings indicate plow pans are forming and restriction of root growth is at 200 PSI, then the resource concern is confirmed.

» The link below is a power point with information from Cornell University that covers some good information regarding Soil Compaction. This publication provides a great list of consequences to soil compaction & High Soil Bulk Density.


» Field soil test pit procedure (must follow proper procedure-Diggers hotline, CR, T&E)