

Cropland In-Field Soil Health Assessment Worksheet

Soil Health Resource Concerns

- CPT = Compaction
- SOM = Soil Organic Matter Depletion
- AGG = Aggregate Instability
- HAB = Soil Organism Habitat Loss or Degradation

Location
Field/CMU
Tract#
Client/Customer
Planner
Date
Soil Map Units
Soil Moisture
Topsoil Texture

Indicator Timing and Use	Meets Assessment Criteria (Yes/No)
Anytime ☀️ After Rain or Irrigation ☁️ With Adequate Moisture 💧 Before a Tillage Event 🚜 Primarily No-till Systems ⚙️ Before Growing Season 🌱 During Growing Season 🍃 Interview 🗣️	<input type="checkbox"/> Y <input type="checkbox"/> N
Soil Cover ☀️ SOM, HAB • Surface cover from plants, residue or mulch; cover greater than 75%	<input type="checkbox"/> Y <input type="checkbox"/> N
Residue Breakdown ☀️ ⚙️ 🗣️ SOM, HAB • Natural decomposition of crop residues or organic mulch is as expected with crop and conditions	<input type="checkbox"/> Y <input type="checkbox"/> N
Surface Crusts 🚜 🌱 🍃 AGG • Crusting on no more than 5% of the field	<input type="checkbox"/> Y <input type="checkbox"/> N
Ponding ☁️ 🗣️ CPT, AGG • No ponding on non-hydric soils within 24h following typical rainfall or surface irrigation event	<input type="checkbox"/> Y <input type="checkbox"/> N
Penetration Resistance 💧 🚜 🌱 🍃 CPT • Penetrometer rating <150 psi within top 6” depth and <300 psi in the 6-18” depth; • OR Slight or no resistance with wire flag inserted to 12”	<input type="checkbox"/> Y <input type="checkbox"/> N
Water Stable Aggregates ☀️ HAB, AGG • Cylinder: At least 80% remains intact after 5 minutes with little cloudy water; • OR Strainer: soil remains intact with aggregates apparent; • OR Soil Quality Test Kit (SQTK): meets stability class 6	<input type="checkbox"/> Y <input type="checkbox"/> N
Soil Structure ☀️ CPT, SOM, AGG, HAB • Granular soil structure in A horizon and no platy structure in A or B horizons	<input type="checkbox"/> Y <input type="checkbox"/> N
Soil Color 💧 SOM • No color difference between field and fencerow sample in the same landscape position; • OR, Value is on the darker range using color chart and soil survey pedon description	<input type="checkbox"/> Y <input type="checkbox"/> N
Plant Roots 🍃 CPT, SOM, HAB • Roots covered in a soil film (rhizosheaths) or are part of soil aggregates; • OR Living roots, if present, are healthy, fully branched and extend into subsoil	<input type="checkbox"/> Y <input type="checkbox"/> N
Biological Diversity 💧 🚜 SOM, HAB • Clearly evident; more than 3 different types of organisms observed without magnification	<input type="checkbox"/> Y <input type="checkbox"/> N
Biopores ☀️ ⚙️ SOM, AGG, HAB • Presence of root or earthworm channels that extend vertically through the soil with some connecting to the surface	<input type="checkbox"/> Y <input type="checkbox"/> N

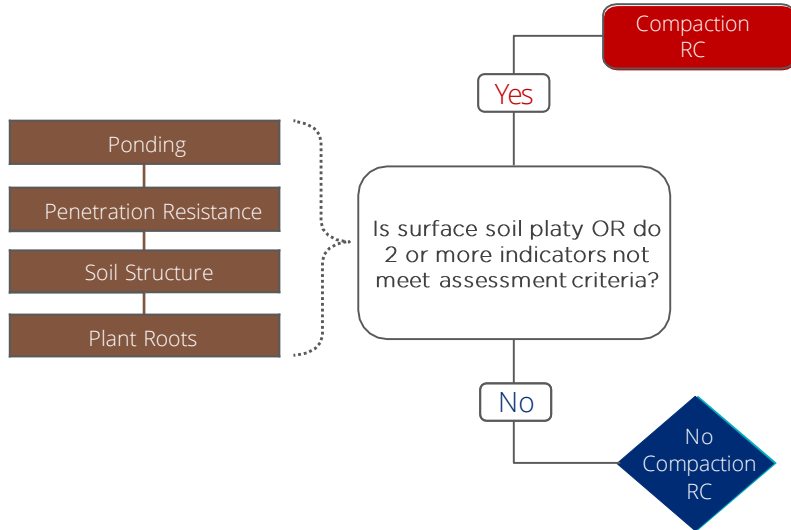
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Legend (for all RCs)

- = Field indicator
- = RC present
- = RC not present

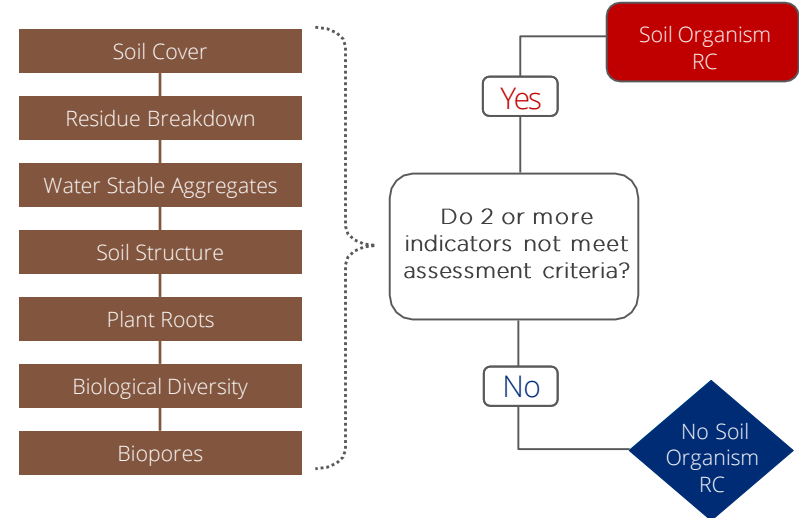
Compaction Resource Indicator Decision Tree

Circle the indicators that do not meet assessment criteria during the evaluation and follow decision tree below to determine if the given resource concern (RC) is present. Document on worksheet.



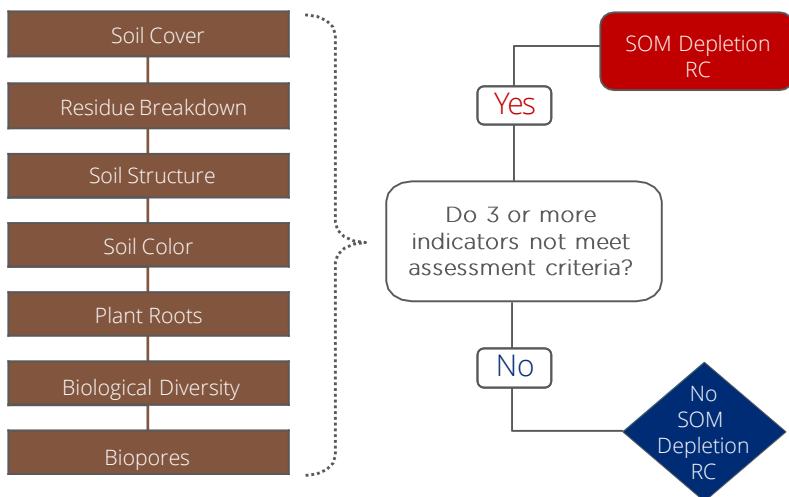
Soil Organism Habitat Loss or Degradation Resource Indicator Decision Tree

Circle the indicators that do not meet assessment criteria during the evaluation and follow decision tree below to determine if the given resource concern (RC) is present. Document on worksheet.



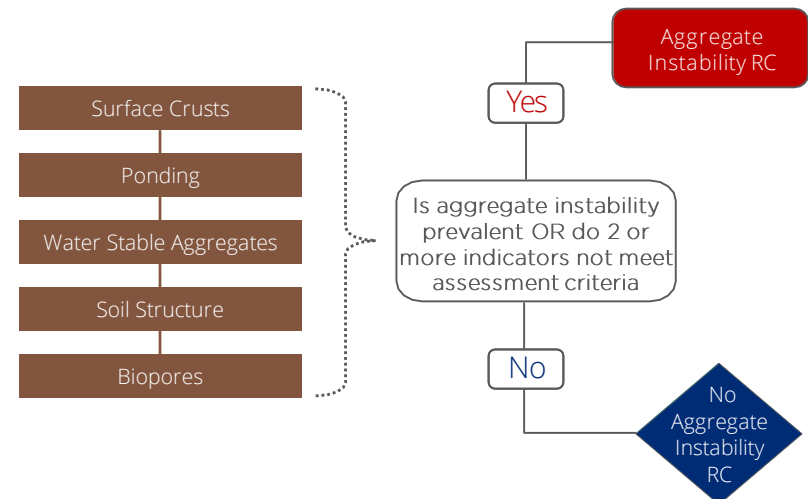
Soil Organic Matter Depletion Resource Indicator Decision Tree

Circle the indicators that do not meet assessment criteria during the evaluation and follow decision tree below to determine if the given resource concern (RC) is present. Document on worksheet.



Aggregate Instability Resource Indicator Decision Tree

Circle the indicators that do not meet assessment criteria during the evaluation and follow decision tree below to determine if the given resource concern (RC) is present. Document on worksheet.



Management History – Interview

The following questions are offered as examples to guide a conversation with the client and help the planner more thoroughly understand current conditions, the client's management and how these may contribute to existing soil health resource concerns. Answers to these and other similar questions will be helpful in assessing some of the indicators.

1. What is the crop rotation?
2. What are the types and frequency of ground disturbing operations?
3. For how many months per year is the soil surface at least 75% covered with plants, residue or mulch?
4. Are cover crops a consistent part of the cropping system?
5. If yes, for how many years has the field been continually cover cropped?
6. How are the cover crops terminated? If chemically, what herbicide is used?
7. Is the field irrigated? If yes, what type of irrigation system, and how many acre-inches are applied for each crop in the rotation described above?
8. Does water pond or run off during or immediately after typical rainfall or irrigation events? Where in the field?
9. Are there problems with crop emergence or early crop growth? Where in the field?
10. Is water management a concern (i.e., field too wet or too dry at planting)?
11. Other observations not captured in the assessment including plant condition, and recent weather and landscape characteristics that may affect assessment results.

In-Field Assessment Considerations and Instructions

Instructions

- Pages 1 and 2 (Worksheet) of the In-Field Assessment can be printed and taken to the field without the remainder of the Assessment document.
- When conducting the field evaluation, it is often helpful to compare the indicators in the managed field to an unmanaged similar soil in an adjacent fencerow or field edge.
- The following *Field Assessment Indicator Details* pages provide guidance for assessing each indicator, and list conservation practices that can be considered for inclusion in a soil health management plan to address the resource concerns associated with each indicator.
- The first four indicators (soil cover, residue breakdown, surface crusts, ponding) represent surface conditions that either affect or are indicative of soil health and should be assessed observing conditions across the field.
- The remaining indicators represent subsurface conditions and are checked by digging down to at least 8 inches and evaluating each indicator to determine if it meets the assessment criteria.
- The subsurface indicators are best confirmed by looking at more than one location in the field. Select three representative locations in the field to evaluate the subsurface indicators. If conditions are not consistent for at least two of the locations, an additional site should be evaluated.
- Penetration resistance should be assessed in several locations in the field when there is adequate soil moisture. It is often helpful to verify compaction by checking for platy or massive structure in the holes dug for the other subsurface indicators.
- Whenever possible, take photos to include in your assessment. These can be added to the customer folder along with field observations and notes.
- Soil moisture can be determined with a handheld soil moisture meter if available, or qualitatively as: *dry, moist, field capacity, or saturated*.
- Soil texture can be estimated by the “feel method.” Soil surveys can provide an estimate but should be verified in the field.

Useful assessment materials

- Shovel
- Wire flag
- Penetrometer
- Clear plastic cups or similar
- Wire sink strainers
- Water
- Small hand lens
- Texture-by-feel guide
- Camera

