About the Booklet

Improved sustainability and economic return of cropland will result from an upward trend in soil health. The upward trend in soil health will be an outcome of land management decisions based on improving the soil resource. To increase awareness and evaluate soil health, this field soil health guide was developed through a collaborative effort by a group of eastern North Dakota producers, agricultural consultants, and the Natural Resources Conservation Service. The local producers and consultants selected and described soil indicators that qualitatively measure the health of soil. NRCS assembled this booklet with guidance from the group. The soil health scorecard booklet is useful for comparative analysis of different fields or tracking changes within a field as affected by land management decisions. The booklet is designed by producers for producers but can be used by other agricultural professionals who deal with land management concerns.

How to Use the Booklet

Tools Required

- A shovel and field marker.

Soil Quality Assessment

- Select a field for assessment, and record a field identifier (I.D.) on a Scorecard Sheet. Use the Field Notes/Inputs Sheet and map to enter any other significant information such as inputs, crops and rotations, weather, soil moisture, field conditions, tillage operations, and location.

- Excavate a soil sample to a depth of 12" from a representative site or sites within a field. On the Scorecard Sheet, rank each indicator on a 1 to 9 scale by marking an X by the representative numerical value. The Indicator Table gives specific information on what to observe and how to rank each indicator. Preferable times to measure each indicator are listed in the Timetable Guide.

Notes

- Evaluations are qualitative; therefore, assessment scores are not an absolute value.

- Assessments are most meaningful when completed by the same evaluator over time and under similar soil moisture conditions.

- The more observations in an assessment area the greater the reliability of the results.

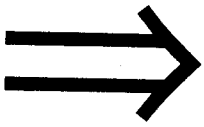
Indicator Table

Indicator	Poor (1)	Fair (5)	Good (9)
Water Infiltration	High runoff with very slow infiltration after moderate rainfall causing crop drownout	Moderate runoff and slow infiltration after moderate rainfall, ponding of short duration	Little or no runoff of water after moderate to heavy rainfall, infiltration rapid
Compaction	Hardpan and/or soil occurs in large compressed pieces requiring large shear force, roots absent below 8"	Soil occurs in medium pieces sheared with moderate force, root penetration 12 to 16" deep with difficulty	Soil occurs in 1" or smaller pieces sheared with small amount of force, roots penetrate without difficulty
Organic Matter Residue	No visible roots or residue	Some residue, few roots	Moderate amounts of residue and intact roots
Soil Tilth and Structure	Hard or very firm soil that breaks with difficulty, large chunks of soil when tilled	Firm soil that breaks apart with some difficulty into 1 to 2 inch size clumps	Mellow, soft soil which crumbles easily into small particles
Existing Crop	Poor uneven stand and yields poor, crop color light green to yellow	Wheel tracks visible in stand, some crop lodging, uneven emergence	Healthy looking crop with dark green color and even stand
Salinity	Areas of no crop growth with Kochia infestations and/or bare saline spots	Areas of stunted crop growth and saline spots confined to headlands or around potholes or ditches	Growth of crops adjacent to potholes or ditches not stunted
Soil Color	Gray surface layer is 0 to 5" thick or light gray or white subsoil is exposed by tillage	Surface color is gray and 5 to 10" over subsoil	Surface to subsoil is uniform dark black 10" or greater in thickness
Root Structure	Vertical roots stop at plow layer, root system appears stunted, many main roots growing horizontally	Root growth through plow layer, but rooting activity appears stunted, some main roots growing horizontally	Large vertical root growth to a deep depth with many small lateral roots
Earthworms and Other Visible Life	No visible soil life or evidence of activity, i.e. worm casts or tunnels		Visible soil life and evidence of activity

Assessment Timetable

Indicator	Best Time Assessed
Water Infiltration	After 1" to 2.5" rainfall from May through October
Compaction	Anytime ground is not frozen
Organic Matter Residue	During growing season
Soil Tilth and Structure	During growing season
Existing Crop	During growing season >30 days after emergence
Salinity	During growing season >30 days after emergence
Soil Color	Anytime
Root Structure	After crop establishes a mature root system
Earthworms and Other Visible Life	When soil conditions are moist during growing season

Scorecard Sheets



Field Notes/Inputs

Farm I.D._____

Field I.D._____ Date_____

Crop _____ Acres_____

Inputs

	Type	*Quantity*	*Price*
Fertilizer			
Manure			
Cover			
Crops			
Pesticides			
Other			
Equipment			
Used			

Problems, Comments, Weather Conditions

_____

_____

_____

Yields

Amount _____

Units _____

Moisture_____

Price _____

Scorecard Sheet

Date_____ Crop_____

Farm/Field ID _____

Soil Quality	**Poor**			**Fair**			**Good**		
Indicators	1	2	3	4	5	6	7	8	9
Water Infiltration									
Compaction									
Organic Matter Residue									
Soil Tilth and Structure									
Existing Crop									
Salinity									
Soil Color									
Root Structure									
Earthworms									
Other (Write in)									
Other (Write in)									