

## Soil Quality Evaluation Site Description

<b>Site Description</b>		DATE:
Map Location	State:	County:
Geographic Location	Longitude:	Latitude:
Field or site location		
Landowner		
<b>Soil Information</b>		
Soil Series		
Slope %		
Erosion		
Mean Annual Temp.		
Mean Annual Precip.		
<b>Present Management</b>		
Cropping System (Rotations, cover crops, etc)		
Fertilizers/Pesticides (N inputs, pesticide use, etc)		
Tillage/Residue Cover (Type, depth, frequency, timing, % cover, etc)		
Irrigation (Pivot, gravity, amount and timing, etc)		
Other		
<b>Past Management History</b>		
Cropping System (Rotation/fallow history, etc)		
Fertilizers/Pesticides (N inputs, pesticide use, etc)		
Tillage/Residue Cover (Past tillage, frequency and type)		
Irrigation (past irrigation, how long?)		
Unusual Events (Floods, fires, land-leveling)		



Soil Respiration (at Initial Field Water Content)								DATE:	
	Sample site	(H) Ring height (cm)	Start time	End time	(A) Soil temp. (Celsius)	(B) Draeger tube %CO <sub>2</sub> (n=1)	* Soil Respiration lbs CO <sub>2</sub> -C/acre/day	(B) Draeger tube %CO <sub>2</sub> (n=5)	* Soil Respiration lbs CO <sub>2</sub> -C/acre/day
1									
2									
3									
4									
Soil Respiration (at least 6 hours after irrigation or soil wetting)									
1									
2									
3									
4									
* Soil respiration = PF x ((A + 273)/273) x (B - 0.035) x 22.91 x H = lbs CO <sub>2</sub> -C/acre/day								H = 5.08 cm (if not measured)	
<b>PF</b> = Pressure Factor = 'raw' barometric pressure in inches Hg/29.9 inches. Note: This adjustment is necessary at elevations > 3,000 ft.; otherwise PF = 1									
Conversion: Degrees Celsius = 5/9 x (Degrees Fahrenheit - 32)									
<b>NOTES:</b>									

Infiltration (for 1 inch of water)								DATE:	
	Sample site	1st inch of water		(W) 1st Infiltration time (minutes)	* 1st Infiltration (in/hr)	2nd inch of water		(W) 2nd Infiltration time (minutes)	* 2nd Infiltration (in/hr)
		Start time	End time			Start time	End time		
1									
2									
3									
4									

\* Conversion of infiltration time to inches per hour (in/hr);  $\text{in/hr} = (1/W) \times 60$

**NOTES:**

Bulk Density and Soil Water Status (core method)								DATE:			
	Sample site	(h) Height of ring above soil (cm)	(E) Weight of field moist soil + bag (grams)	(F) Weight of bag (grams)	Subsample for determining soil water content				**(M) Soil H <sub>2</sub> O content (g/g)	*** Soil bulk density (g/cm <sup>3</sup> )	
					(G) Weight of paper cup (grams)	(I) Weight of paper cup + soil (g)	(K) Dry weight of soil + cup	* (L) Dry weight of soil (grams)			
1											
2											
3											
4											
*Dry wt. of soil subsample = (K - G)				**Soil H <sub>2</sub> O content = (I - K)/L							
***Soil bulk density = [(E - F)/(1 + M)]/[(12.7 - h) x 42.52]    h = 5.08 cm (2 inches) if not measured;    volume of soil = 324 cm <sup>3</sup>											
Bulk Density and Soil Water Status for Gravelly Soils (excavation method)											
	Sample site	(n) Volume of water (cm <sup>3</sup> )	(E) Weight of field moist soil + bag (grams)	(F) Weight of bag (grams)	Subsample for determining soil water content				**(M) Soil H <sub>2</sub> O content (g/g)	*** Soil bulk density (g/cm <sup>3</sup> )	
					(G) Weight of paper cup (grams)	(I) Weight of paper cup + soil (g)	(K) Dry weight of soil + cup	* (L) Dry weight of soil (grams)			
1											
2											
3											
4											
*Dry wt. of soil subsample = (K - G)				**Soil H <sub>2</sub> O content = (I - K)/L							
***Soil bulk density = [(E - F)/(1 + M)]/(n)    n = volume of soil in cm <sup>3</sup>											

Soil Electrical Conductivity, pH, and Nitrate (NO <sub>3</sub> <sup>-</sup> )						DATE:	
	Sample site	(X) Weight of field moist soil (grams)	Readings for 1:1 soil:water mix.			* Estimated Soil NO <sub>3</sub> -N (1b NO <sub>3</sub> -N/acre)	** Exact Soil NO <sub>3</sub> -N (1b NO <sub>3</sub> -N/acre)
			EC (dS/m)	pH	(Y) Soil NO <sub>3</sub> -N ppm (est.)		
1							
2							
3							
4							

\*Estimated: 1b NO<sub>3</sub>-N/acre = Y x [depth of soil in cm /10] x soil bulk density x 0.89  
Depth of soil = depth of soil sampled in centimeters; for kit it is 0 to 3 inches = 7.6 cm

\*\*Exact: 1b NO<sub>3</sub>-N/acre = Y x C.F. x [depth of soil in cm /10] x soil bulk density x 0.89  
C.F. = [30 mL + ((X/(1 + M)) x M)]/[X/(1 + M)]    M = decimal soil water content (g/g)  
Depth of soil = depth of soil sampled in centimeters; for kit it is 0 to 3 inches = 7.6 cm

Water Quality Measurements			DATE:	
	Sample site	Salinity (dS/m)	Water Nitrite (ppm)	Water Nitrate (ppm)
1				
2				
3				
4				

NOTES:

Aggregate Stability						DATE:
	Sample site	(A) Weight of sieve (grams)	(B) Weight of sieve + aggregates (grams)	(C) Weight of sieve + dry aggregates (grams)	(D) Weight of sieve + dry sand (grams)	* Percent water stable aggregates (% of soil > 0.25mm)
1						
2						
3						
4						

\* % Water stable aggregates =  $(C - D)/(B - D) \times 100$

Slake Test										DATE:
	Sample site	Individual Soil Slake Ratings								* Average Soil Slake Rating
1										
2										
3										
4										

\* Soil Slake Rating = (add all of the individual ratings and divide by the total number)

Earthworms					DATE:	NOTES:
	Sample site	Surface dwelling earthworms	Deep dwelling earthworms	Total Earthworms (no. per square foot)		
1						
2						
3						
4						

Soil Observations and Estimations		DATE:	Classes for Structure Index			
	Description	Structure			Class <sup>a</sup>	
		Type	Size	Grade		
Top soil depth (inches)		Granular	Fine, Medium, Coarse	Weak	2	
Plant roots		Granular	Fine, Medium, Coarse	Moderate	4	
		Granular	Fine, Medium, Coarse	Strong	5	
		Blocky	Very fine, Fine, Med.	Weak	1	
Compaction layer		Blocky	Very fine, Fine	Moderate	4	
		Blocky	Very fine, Fine, Med.	Strong	5	
		Blocky	Medium	Moderate	3	
Soil texture		Platy	Thin, Medium, Thick	Very friable <sup>b</sup>	3	
		Platy	Thin, Medium, Thick	Friable <sup>b</sup>	2	
		Platy	Thin, Medium, Thick	Firm or Stronger <sup>b</sup>	1	
Other		Massive			1	
		Single Grain			1	
Note: <sup>a</sup> Class 5 is the best. <sup>b</sup> Substitute horizontal moist rupture resistance.						

Soil Structure						DATE:	NOTES:	
Depth (inches)	Type	Size	Grade	(A) Class	(B)	(A) x (B)		Structure index*
0 - 4					3			
4 - 8					2			
8 - 12					1			
*Structure index = ((Total - 6)/24) x 100				Total =				