

SOIL EVALUATION

PURPOSE

To develop proficiency in the accurate recognition, comparison and evaluation of soil characteristics as they apply to land use and management.

OBJECTIVES

Participants in this career development event will become proficient in the following areas:

1. Be able to accurately identify soil characteristics
2. Understand how soil plays a role in land use and management
3. Understand how soil plays a role in the environment
4. Develop analytical skills in the comparison of different soil samples
5. Develop reasoning skills for effective and accurate evaluation

RULES AND REGULATIONS

1. A chartered FFA chapter may enter 2 teams. Team competition is limited to one four (4) member team with top three (3) scores from each pit used to determine team score. Alternates are permitted and will judge separate from the teams.
2. District competition has no bearing on eligibility for state competition.
3. Three soil pits will be evaluated using the Oregon Soil Judging Scorecard.
4. A fourth soil pit will be used by the official judges for orientation and interpretation to local soil conditions only. Practice scorecard will be collected before the CDE begins.
5. No advisors will be allowed in the pits until after all cards have been turned in at the end of the contest, and there would be absolutely no talking between advisors & students until every card has been turned in.
6. Students may bring the following materials:
 - a. Clipboard
 - b. Water bottle
 - c. Cutting tool for selecting soil
 - d. Writing utensil

NATIONAL EVENT

1. National rules allow a state to enter up to five (5) teams in the International Land Pasture and Range Judging Event held each spring.
2. Team members who have previously participated in a national CDE are ineligible to participate at state and national levels as team members.

Scorecard: Oregon State Soil Judging

Contestant _____ Site _____

School _____

First Horizon
(__ to __ inches)

_____ Color
 _____ Mottles
 _____ Texture
 _____ Coarse
 _____ Fragments
 _____ Structure
 _____ Type
 _____ Structure
 _____ Grade
 _____ Special
 _____ Features
 _____ Horizon
 _____ Name

Second Horizon
(__ to __ inches)

_____ Color
 _____ Mottles
 _____ Texture
 _____ Coarse
 _____ Fragments
 _____ Structure
 _____ Type
 _____ Structure
 _____ Grade
 _____ Special
 _____ Features
 _____ Horizon
 _____ Name

<p>Color 1 = Dark brown, Very dark brown, Black 2 = Light brown, Brown, Yellowish brown 3 = Red, Reddish brown 4 = Dark gray, Light gray, White</p>	<p>Mottles 1 = None 2 = Few to common 3 = Many</p>
<p>Texture 1 = Sand, Loamy sand 2 = Sandy loam 3 = Loam, Silt loam 4 = Sandy clay loam, Clay loam, Silty clay loam 5 = Clay, Silty clay, Sandy clay 6 = NA—Duripan, Cr, R, O</p>	<p>Coarse Fragments 1 = <15% 2 = 15 to 35% 3 = 35 to 60% 4 = >60%</p>
<p>Structure type 1 = Granular 2 = Platy 3 = Blocky 4 = Prismatic 5 = Massive, Single grain</p>	<p>Structure grade 1 = Structureless 2 = Weak 3 = Moderate 4 = Strong</p>
<p>Special features 1 = None 2 = Tillage pan 3 = Fragipan 4 = Duripan 5 = Cr 6 = Slickensides</p>	<p>Horizon name 1 = O 5 = C 2 = A 6 = R 3 = E 7 = AB, 4 = B BA, BC</p>

Third Horizon
(__ to __ inches)

_____ Color
 _____ Mottles
 _____ Texture
 _____ Coarse
 _____ Fragments
 _____ Structure
 _____ Type
 _____ Structure
 _____ Grade
 _____ Special
 _____ Features
 _____ Horizon
 _____ Name

Fourth Horizon
(__ to __ inches)

_____ Color
 _____ Mottles
 _____ Texture
 _____ Coarse
 _____ Fragments
 _____ Structure
 _____ Type
 _____ Structure
 _____ Grade
 _____ Special
 _____ Features
 _____ Horizon
 _____ Name

Total Front	Total Back	Grand Total
<input type="text"/>	<input type="text"/>	<input type="text"/>

Properties of the Whole Soil

Effective Depth

- 1 = Deep (>40 inches)
- 2 = Moderately deep (20–40 inches)
- 3 = Shallow (10–20 inches)
- 4 = Very shallow (<10 inches)

Available Water-holding Capacity

- 1 = High (>8 inches)
- 2 = Medium (5–8 inches)
- 3 = Low (2–5 inches)
- 4 = Very low (<2 inches)

Surface Soil Permeability

- 1 = Rapid
- 2 = Moderate
- 3 = Slow
- 4 = Very Slow

Subsoil Permeability

Water Erosion Hazard

- 1 = Low
- 2 = Moderate
- 3 = High
- 4 = Very high

Wind Erosion Hazard

- 1 = Low
- 2 = Moderate
- 3 = High

Internal Drainage

- 1 = Excessive
- 2 = Well
- 3 = Moderately well
- 4 = Somewhat poor
- 5 = Poor

Site Characteristics

Site Position

- 1 = Upland
- 2 = Foot slopes or Fans
- 3 = Floodplain
- 4 = Stream terrace or Lake plain

Parent Material

- 1 = Residuum or Colluvium
- 2 = Recent alluvium
- 3 = Old alluvium or Lacustrine
- 4 = Wind-blown sands or silts
- 5 = Volcanic ash
- 6 = Two or more classes

Stoniness/Rockiness

- 1 = None
- 2 = Stony/Rocky
- 3 = Very stony/Rocky
- 4 = Extremely stony/Rocky

Slope

- 1 = 0–3%
- 2 = 3–7%
- 3 = 7–12%
- 4 = 12–20%
- 5 = >20%

Management Interpretations

Drainage Feasibility

- 1 = Not needed
- 2 = Good
- 3 = Fair
- 4 = Poor

Irrigation Suitability

- 1 = Excellent
- 2 = Good
- 3 = Fair
- 4 = Poor
- 5 = Non-irrigable

Most Intensive Crop

- 1 = Row crop/Specialty crop
- 2 = Legume hay
- 3 = Dryland wheat
- 4 = Dryland hay
- 5 = Permanent pasture/Grass seed
- 6 = Timber grazing
- 7 = Rangeland grazing
- 8 = Forestry

Erosion Control Practice

- 1 = Water control, Cover crop, Standing stubble
- 2 = Stubble mulch, No-till
- 3 = Diversion terraces, No-till
- 4 = Strip crop, No-till
- 5 = Controlled grazing
- 6 = Watershed management

Reaction Correction

- 1 = None
- 2 = Correct acidity
- 3 = Correct alkalinity

Limitations for Septic

Tank Drainfields

- 1 = Slight
- 2 = Moderate
- 3 = Severe

Total Back

Interpretation Guide for Oregon Soil Judging

Mottles		AWHC Rates (In/In)		Stoniness/Rockiness				
Few	0-2%	Sa, Lsa	.06	None	Stny/Rcky	Very	Ext	
Common	2-20%	Sal	.12	Stones (%)	<.01	.01-1	.1-3	>3
Many	>20%	L, Cl, Sil, Sicl	.20	Rocks (%)	<.01	.01-2	2-10	>10
		C, Sic, Sac, Sacl	.15					

Wind Erosion Hazard				
	Low	Low	Mod	High
Location	W. OR	E. OR	—	—
Texture	Any	Sacl Sicl	L	Sa
		Sac Sic	Sil	Lsa
		Cl C		Sal

Permeability—Surface Soil and Subsoil								
	Rpd	Mod	Slo	Mod	Slo	Mod	Slo	V Slo
Texture	Sa	Sal		Sacl		Sac		
	Lsa	Sil	—	Sicl	—	Sic	—	—
		L		Cl		C		
Porosity	Any	Por	Not por	Por	Not por	Por	—	Not por
Structure Grade	Any	Any	Any	Any	Wk, Mass	Str	Mod, Wk	Mass, Vert

Water Erosion Hazard								
	Low		Moderate	High	Low	Moderate	High	Very high
Texture	Sa	Sac			Sacl	L		
	Lsa	Sic			Sicl	Cl		
	Sal	C	—	—	Sil		—	—
Slope / Perm. of Sfc soil	0-12/Any		12-20/Any	>20/Any	0-3/Any	3-7/Slow, V Slow	7-12/Slow, V Slow	>20/Any
					3-7/Rapid, Mod	7-12/Rpd, Mod	12-20/Any	

Drainage Feasibility						
	Good	Fair	Fair	Poor	Poor	Poor
Outlets	Available	—	—	—	—	Not available
Effective depth	Deep	—	Mod deep	—	Shallow	Any
Drainage / Subsoil class / perm.	MW/Any	—	MW/Any	—	Any	Any
	SWP/Rpd, Mod	SWP/Si, V sl	SWP/Any	—	Any	Any
			PD/Rpd, Mod	PD/Si, V sl		

Irrigation Suitability					
	Excellent	Good	Fair	Poor	Non-irrigable
Slope / Permeability of surface soil	0-3/Any	3-7/Slow	7-12/Slow	3-12/V slow	>20/Any
	3-7/Rpd, Mod	7-12/Rpd, Mod		12-20/Any	
Minimum AWHC	High	Medium	Low	Very low	Very low
Internal / Drainage drainage / feasibility	WD	WD	WD	Any	Any
	MWD/Good	MWD/Good, Fair	MWD/Any		
	SWP/Good	SWP/Good, Fair	SWP/Any		
			PD/Fair		

Most Intensive Crop—Irrigated

	Row crop or Specialty crop	Legume hay	Perm pasture/ Grass seed
Location	All except— High basins in Baker, Harney, Lake, Wallowa Coastal fog belt	Any	—
pH	<8.4	<8.4	Any
Slope	0–12	0–20	0–20
Irrigation suitability	Excellent Good Fair—0–3% slope Fair—sandy soils up to 12% slope	Any	Any
AWHC	High-Low	High-Low	Any
Drain. feas.	Good-Fair	Good-Fair	Any

Septic Tank Drainfields

	Slight	Moderate	Severe
Effective depth	≥48 in	≥36 in	<36 in
Subsoil perm.	Mod	Rpd to mod	Any
Internal drainage	WD	WD, MWD	Any
Slope	0–7	0–12	Any
Landform	All except floodplains	All except floodplains of per. streams	Any

Most Intensive Dryland Crop—Western Oregon

	Wheat	PP/ GS	Wheat	PP/ GS	For	PP/ GS	For
Slope	<12	—	12–20	—	—	20–35	Any
Rainfall	<60	Any	30–45	<30 45–60	>60	30–45	Any
Drain. class / feas.	Drain. WD MW/Any SWP/Any PD/Good, Fair	Any	WD MW/Any SWP/Any PD/Good, Fair	Any	Any	Any	Any

Most Intensive Dryland Crop—Eastern Oregon <4,100 feet

	Wheat	TG	Graz	Graz	Wheat	Graz
pH	<8.4	—	—	—	—	Any
Rainfall	≥12	—	—	—	<12	Any
AWHC	Low–High	—	—	V low	Med–High	Any
Slope/Aspect	<20/Any	≥20/N	≥20/S	Any	<35/Any	Any

Erosion Control Practice—Western Oregon

	Water ctrl, Cover crop	Stbl mulch	Ctrl grazing	Wtrshd mgt
Most intensive crop	Row crop Legume Grass seed	Wheat	Pasture	Forestry

Most Intensive Dryland Crop—Eastern Oregon >4,100 feet

	Hay	Hay	Timber grazing	Forestry	Timber grazing	Grazing	Timber grazing	Grazing	Timber grazing	Grazing
pH	≤8.4	—	—	—	—	—	—	—	—	Any
Slope/Aspect	<20/Any	—	—	≥20/N	—	<20/Any ≥20/N	—	—	≥20/S	Any
AWHC	Med–High	Low	—	Low–High	—	Low–High	V low	—	Low–High	Any
Rainfall	Any	≥18	12–18	≥15	12–15	<12	≥18	<18	≥15	Any

Erosion Control Practice—Eastern Oregon

	Stubble mulch, No-till	Diversion terraces, No-till	Strip crop, No-till	Strip crop, No-till	Stubble mulch, No-till	Diversion terraces, No-till	Stubble mulch, No-till	Water ctrl, Cover crop	Controlled grazing	Watershed Mgt
Crop	Wheat	—	—	—	—	—	—	Row crop	Timber grazing, Range	Forestry
Rainfall	≤10 in.	—	—	—	>10 in.	—	—	Any	Any	Any
Wind erosion	Lo	Lo, Mod	Mod	Hi	Lo, Mod	—	Hi	Any	Any	Any
Water erosion	Lo, Mod	Hi, V hi	Lo, Mod	Any	Lo, Mod	Hi, V hi	Any	Any	Any	Any