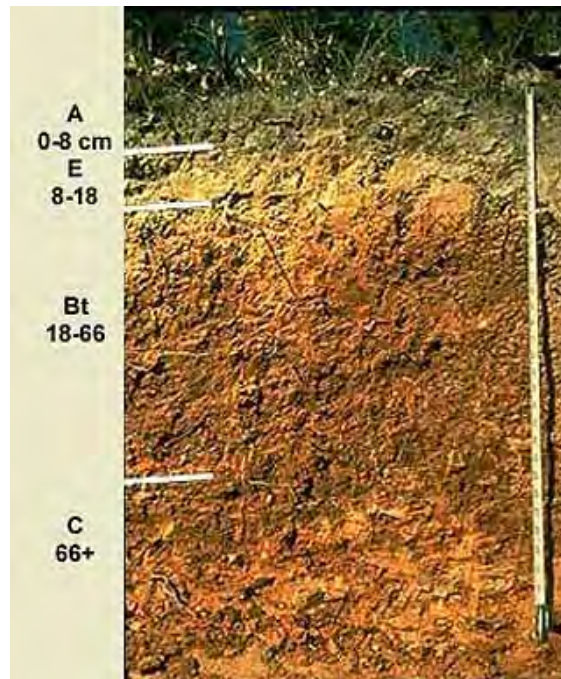


**American Society of Agronomy
Region IV Soils Contest
Oct. 20-24, 2008
University of Arkansas at Monticello
Monticello, Arkansas
*Home of The Boll Weevils!***



CONTEST RULES

Team Composition

A team is composed of three or four undergraduate students who are enrolled in a full-time, four-year curriculum in the institution they are representing. Each institution may enter only one team in the contest. Additionally, up to four alternate competitors from each team are allowed to compete in the contest activities, but their scores will not count towards the team total in the individually judged pits. However, alternate competitors are eligible for individual awards. All students must be eligible to represent their institution according to the rules and regulations governing eligibility at their institution. Team and alternate students should be designated prior to the individual contest on Friday, Oct. 24, 2008, preferably by Thurs., Oct. 23, 2008.

Contest format

The contest will combine the scores of two, team-judged pits and the team score from three, individually-judged pits. The team scores from the individually-judged pits will be the sum of the top three individual scores for each pit. Therefore, the sum of 11 scorecards will determine the overall scoring per team. Students from institutions having less than three team members are allowed to compete, but they are only eligible for individual awards. Trophies will be awarded to the top three teams and plaques to the top five high individuals.

At each site a pit will be excavated and an area will be designated on one of the pit walls for the measurement of horizon depth and boundary distinctness. A restricted area of the pit wall will be outlined with flagging and a nail will be placed 'somewhere in the third horizon'. A tape measure will also be attached to the restricted area. **THE FLAGGED AREA IS TO BE UNDISTURBED!** Picking, taking samples, or other disturbances is not permitted. The pit ID, depth to be considered, the number of horizons to describe, pertinent chemical data, and other relevant information will be displayed on a sign at each pit (Fig. 1). Contestants should expect to critique between four and six horizons per pit. Slope stakes will be placed along the grade for determination of % slope and Site Position designation (Part II.A. of scorecard).

PIT 1		
Describe five mineral horizons between the surface and a depth of 112 cm.		
Horizon	% B.S.	% O.C.
1	65	0.5
2	56	0.3
3	44	0.1
4	38	0.1
5	41	0.1

The nail is 36 cm from the surface.
Original depth of topsoil 18 cm.

Figure 1. Example of information provided at each pit.

Fifty minutes will be allowed for the judging of each site. During registration, each contestant will be assigned a number-letter combination corresponding to team-group designations. This will uniquely identify each contestant and be used to facilitate rotations at the pit (Table 1):

Table 1. Contestant rotations.

Time	Pits 1 and 3		Pits 2 and 4	
	Odd team no.	Even team no.	Odd team no.	Even team no.
First 5 min.	In*	Out	Out	In
Next 5 min.	Out	In	In	Out
Next 10 min.	In	Out	In	Out
Next 10 min.	Out	In	In	Out
Next 20 min.	Free**	Free	Free	Free

*In designates authorization to be inside the pit trench.

**Free time designates authorization for any competitor to enter the pit trench.

The restricted area on the pit wall will be outlined with flagging and a tape measure mounted that is NOT to be disturbed, and a nail will be inserted somewhere in the third horizon of each pedon (Fig. 2). Contestants should provide the following for their personal use: tape measure, clinometers (or Abney level), water bottle or sprayer, acid bottle, knife, pencils, Munsell color charts (10R to 5Y), hand towel, hand lens, and containers for soil samples. Calculators, 2 mm diameter sieves, and clipboards may also be used. No other materials other than those supplied by the host will be permitted during the contest. Cell phones, pagers, or other communication devices are prohibited during the contest. Talking is NOT permitted between contestants during the 50 minutes of pit judging. Contestants should show respect for each other and avoid creating distractions during the competition.

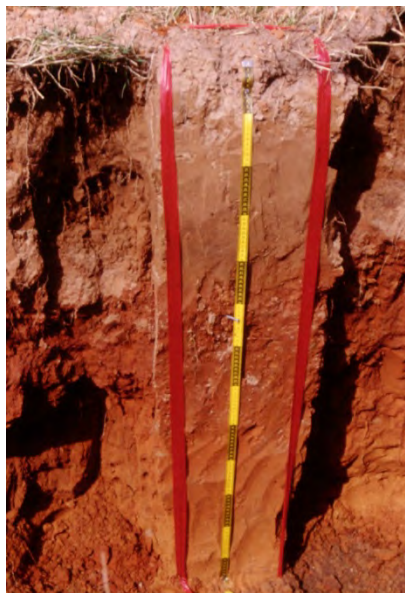


Figure 2. Example of restricted area of pit wall.

Scoring, Abbreviation, and Tie Breakers.

Grading will be done by individuals competent in soil morphology and classification. Each grader will grade only one pit and scores will be re-counted by another grader for accuracy. Variable credit may be given at the discretion of the judges. For horizons, two points will be given for the correct master horizon designation even if other components are in error. Where an answer is not needed or is inappropriate, a dash (-) **must** be recorded for credit.

Contestants may use the official abbreviations (preferred, see Attachment 1) or write out answers. Use of abbreviations other than official abbreviations is strongly discouraged, but graders may use their discretion if the meaning of an unofficial abbreviation is obvious.

A team is composed of three or four undergraduate students. The team score will be the sum of the top three individual scores at each pit (Table 2). This method maximizes the opportunity for all four team members to contribute to the final team score.

Table 2. Score tabulation example.

Contestant	Team Pit	Site 1	Site 2	Site 3	Total
A		132	130	110	262
B		146	116	141	403
C		130	112	160	290
D		125	114	129	243
Team score:	150	408	360	430	1198

If there are ties for team and individual awards, the summation of estimated clay percentage in the third horizon of each team and/or individual site will be compared to the absolute values. The individual or team with the smallest deviation will be the winner. If necessary, the clay % of the second horizon will be summed likewise until a clear winner emerges. The scores from the two team-judged pits will be added to the individual scores for the overall team total.

SCORECARD INTERPRETATIONS

The scorecard consists of four parts: I. Soil Morphology; II. Site Characteristics; III. Soil Taxonomy; and IV. Interpretations (refer to the attached example). The Soil Survey Manual (Chpt. 3, 1993), and Field Book for Describing and Sampling Soils, Ver. 2.0 (Schoeneberger, P. J. et al., 2002) and Keys to Soil Taxonomy (10th e., 2006) will be used as guides. These publications are available on the Internet for downloading at the USDA-NRCS website:

<http://soils.usda.gov/technical/>.

Part I. Soil Morphology

A. Horizon Designations (Chpt. 18, pp. 311-316, Keys to Soil Taxonomy, 2006).
Horizon designation will follow standard procedures, including a master, transitional or combination horizon symbol in the “Master” column, and when needed, a lower case symbol in

the suffix column, and an Arabic numeral in the “No.” column. All B horizons **must** have a suffix. Arabic numerals indicating lithologic discontinuities and prime symbols to distinguish otherwise identical designations should be placed in the “Master” column. If no designation is necessary, contestants must place a dash in that position to receive credit.

B. Depth.

The depth of the lower boundary as measured from the soil surface should be recorded (cm). Alternately, the depth of both the upper and lower boundary may be given, but only the depth to the lower boundary will be graded. For example, a Bt1 horizon occurring from 30-45 cm may be recorded as “45 cm” (preferred) or “30-45 cm”. The last horizon boundary should be the specified judging depth with a “+” added. Thus, if the Pit sign states “Describe 5 horizons from the surface to a depth of 140 cm”, the fifth depth designation should be “140+”. However, when the specified depth is at a lithic or paralithic contact, the “+” is dropped from the depth.

Depth measurements should be made between the tapes in the flagged area on the pit wall. A range for the depth considered correct will be based on the distinctness and topography of the boundary. **NO HORIZON LESS THAN 8 cm WILL BE DESCRIBED.** If a horizon less than 8 cm thick occurs, it should be combined with the adjacent horizon that is most similar for the depth measurement purposes. When two horizons combine to a total thickness of 8 cm or more, the properties of the thicker horizon should be described.

If a lithic or paralithic contact occurs at or above the specified depth on the site card, the contact should be considered in evaluating the water retention difference, effective soil depth, and hydraulic conductivity. Otherwise, the last horizon should be assumed to extend to 150 cm for making all relevant evaluations. If a lithic or paralithic contact occurs within the specified depth, the contact should be considered as one of the horizons to be included in the description, and the appropriate horizon nomenclature should be applied (i.e. R or Cr). However, morphological features need not be provided and **dashes** should be used on the scorecard. If the contestant gives morphological information, it will be ignored by the graders and it will not count against their total score. If in doubt concerning the nature of the horizon, the contestant would be advised to provide all of the normal data.

C. Boundary Distinctness (Chpt. 3, pp. 133-134, Soil Survey Manual).

Distinctness refers to the thickness of the zone within which the boundary can be located. The distinctness of a boundary depends partly on the degree of contrast between the adjacent layers and partly on the thickness of the transitional zone between them. The topography of the boundary will not be required for this contest. The boundary distinctness of the lowest horizon will not be determined and will not be graded, therefore a dash (-) should be recorded.

Distinctness classes are:

- Abrupt (A): < 2.0 cm thick
- Clear (C): 2.1-5.0 cm thick
- Gradual (G): 5.1-15.0 cm thick
- Diffuse (D): > 15 cm thick

D. Clay Percentage and Texture (Chpt. 3, pp. 136-143, Soil Survey Manual).

Estimates of the clay percent should be placed in the space provided. A scaled range for correct answers compared to the lab-determined values will be used according to:

<u>actual %</u>	<u>allowed deviation</u>
<20	+/- 1
20-40	+/- 2
>40	+/- 5

The textural class and % clay for each horizon will be determined from laboratory data. Soil texture classes as defined in Chapter 3 and their official abbreviations (supplied to contestants) will be used. Deviation from standard nomenclature will be incorrect (i.e., silty loam, clayey sand). Credit for sand, loamy sand, and sandy loam textures will NOT be given if sand modifiers are needed (i.e. very fine, fine, or coarse).

Modification of the textural class will be required if the horizon contains more than 15% by volume coarse fragments (>2mm), which includes carbonate nodules. Sieves will be allowed during the contest. For the purpose of this contest, only the following terms will be used to describe coarse fragments:

Gravelly – fragments 2-75 mm diameter of any lithology and shape.

Cobbly – fragments of any shape and lithology that are > 75 mm diameter by their long axis.

If gravel and cobbles occur in the same horizon, the dominant condition should be described.

Coarse fragment modifiers are required as follows:

<u>Coarse fragment</u> (vol/vol)	<u>Modifier</u>
0-15%	none needed
16-35%	gravelly or cobbly
36-60%	very gravelly or cobbly
>60%	extremely gravelly or cobbly

For example, if the horizon has a texture of clay loam with 40% by volume gravel-size fragments, the correct texture designation should be VGR CL (very gravelly clay loam).

E. Color (Chpt. 3, pp. 146-157, Soil Survey Manual)

The Munsell color notation to include hue, value, and chroma will be used to describe the moist soil color of each horizon. For surface horizons, the moist color will be determined on briefly rubbed samples as directed in the discussions of mollic epipedon in Soil Taxonomy (p. 15). For all other horizons, the color recorded should be the dominant color of the matrix (the color that occupies the greatest volume of the horizon). Often the most noticeable color may be that of the ped surface, *but* the ped surface color may not constitute sufficient volume to be designated as

the dominant color. The 2000 revised edition of Munsell color charts will be used for the contest.

F. Redoximorphic Features (RMF) (Keys to Soil Taxonomy, 10th ed., pp. 23-24).

Redoximorphic features are soil morphological features caused by alternating reduction/oxidation processes. The reduction/oxidation of iron (Fe) and, to a lesser extent, manganese (Mn), minerals result in most RMF features. Iron is a major pigment that influences soil color. The loss, accrual, and valence/mineral state of Fe are a major determinate of color patterns within or across entire soil horizons. Iron or Mn reduction occurs when free oxygen is limited or excluded from a soil volume or horizon by water saturation for extended time. Reduced iron (Fe²⁺) is comparatively much more soluble and mobile than oxidized iron (Fe³⁺), and moves with water flow and by diffusion gradients. When soil is reduced, Fe and Mn in local zones can be removed, leaving uncoated mineral grains (depletions) of lighter color. Reduced Fe is oxidized and precipitates when water drains from soil (reentry of free oxygen), or where oxygen is present in, or along, soil pores, including root channels, or along roots. The re-oxidized Fe or Mn may form crystals, soft masses, or hard concretions or nodules (concentrations). Oxidized Fe will generally have a redder or yellower color than adjacent soil particles, while Mn often will have a darker color than adjacent soil particles.

Therefore, redox concentrations are defined as zones of Fe-Mn accumulation from:

1. Nodules and concentrations. Concentrations have internal rings and nodules do not.
2. Masses. Masses are non-cemented concentrations.
3. Pore linings. Pore linings may be either coatings on pore surfaces or impregnations from the matrix adjacent to pores.

Redox *depletions* are defined as zones with chromas less than, or values higher than those in the matrix where either Fe, Mn, or both Fe, Mn, and clay have been removed through reduction and transport processes. They may be identified as:

1. Iron depletions. Zones that contain lesser amounts of Fe and Mn oxides but have clay content similar to that of the adjacent matrix.
2. Clay depletions. Zones that contain lesser amounts of Fe, Mn, and clay compared to the adjacent matrix.

An important RMF is the “reduced matrix” where soil is saturated and/or reduced at the time of observation. A reduced matrix may occur in soils with no other visible RMF’s. A reduced matrix will **not** be on this contest due to the required identification time of the need for alpha, alpha, dipyrindyl solution to determine the presence of reduced Fe.

Report the moist abundance as few, common, many (<2%, 2-20%, >20% respectively) of the *most dominant* RMF. Indicate if it is a concentration or depletion (Con/Dep). If no RMF features are present, mark both “Abundance” and “Con/Dep” with a dash (-).

G. Structure.

Both grade (weak, moderate, or strong) and type (shape) of structure should be recorded. Acceptable types of structure are restricted to the following: granular, platy, sub-angular blocky, angular blocky, prismatic, and columnar. If either two structure types or compound structures

are present, describe the one with the larger peds. If there is no structure, indicate “structureless” (SL) in the grade column and “massive” (MA) or “single grain” (SG) in the shape column.

Part II. Site Characteristics

A. Site position.

The following are the designations for site positions that will be used in this contest with a brief description.

1. Summit. The topographically highest position of a hillslope profile with a nearly level (planar or only slightly convex) surface. Ridge tops are included under summit since they are topographic highs and are usually planar in one direction.
2. Shoulder. The hillslope profile position that forms the convex, erosional surface near the top of a hillslope. If present, it comprises the transition zone from summit to backslope.
3. Backslope. This position includes all landscape positions between the shoulder and toeslope.
4. Footslope. The hillslope profile position that forms the concave surface at the base of a hillslope. It is a transition zone between upslope sites of erosion and transport (shoulder, backslope) and downslope sites of deposition (toeslope).
5. Toeslope. The hillslope position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear, and are constructional surface forming the lower part of a hillslope continuum.
6. Floodplain. The lowest geomorphic surface which is adjacent to the stream bed and which floods *first* when the stream goes into flood stage. It is formed by the deposition of alluvium. Each stream has only one floodplain.
7. Stream terrace. These are geomorphic surfaces formed by the deposition of alluvium and are higher in elevation than the flood plain. A stream may have more one or more terraces. For the purpose of this contest, a landform will NOT be designated as a stream terrace unless it's association with a present-day stream is reasonably apparent.
8. Depression. For the purpose of this contest, a depression is considered to be shallow depressions less than 0.5 ha in area showing no visible signs of developed surface outlets for runoff.
9. Mound. A low, rounded natural hill of unspecified origin. Found on flat lying geomorphic surfaces older than late Holocene, usually old fluvial terraces and normally between 0.5 – 2.0 m in height and 10 and 30 m in diameter. The origin of these ‘pimple’ mounds is uncertain. Hypotheses suggested include erosion, gophers, coppice dunes formed in past droughts, seismic, and others. For the purpose of this contest, mound/intermound areas will contain many obvious mounds. If the soil is silty, loess

should be marked as the parent material, and if the soil is loamy or sandy, eolian should be marked as the parent material.

10. Intermound. The concave to relatively flat-bottomed, irregularly shaped depressions that separate pimple mounds in mounded landscapes.

B. Parent Material.

Parent material kind is a term describing the general physical, chemical and mineralogical composition of the material, mineral or organic, from which the soil develops. Mode of deposition and/or weathering may be implied or implicit. The following parent materials will be used in this contest:

1. Alluvium. Unconsolidated, clastic material subaerially deposited by running water, including gravel, sand, silt, clay, and various mixtures of these.
2. Colluvium. Unconsolidated, unsorted sediments detached from the hillslopes and deposited at a toeslope or within a stream bottom by gravity and water.
3. Eolian. Wind-blown materials comprised primarily of sand with some silt and clay. Usually associated with edges of deflated depressions and mound if the mounds are loamy or sandy.
4. Estuarine deposit. Fine-grained sediments (very fine sand, silt and clay) of marine and fluvial origin with a high proportion of decomposed terrestrial organic matter, laid down in the brackish waters of an estuary; characteristically finer sediments than deltaic deposits.
5. Lacustrine deposit. Clastic sediments and chemical precipitates deposited in lakes.
6. Loess. Wind-blown materials comprised primarily of silt with some fine sand and clay.
7. Marine deposit. Sediments (predominantly sands, silts, and clays) of marine origin; laid down in the salty waters of an ocean.

Sometimes two parent materials will be evident in a profile, for example loess over marine. If evident, indicate the transition with an Arabic numeral in the Master horizon column beginning with the number 2 for the first transition. It is implied that the overlying parent material is number 1. For example, the following sequence may be found in a profile with two parent materials: A – E – Bt1 – 2Bt1 – 2Bt2 etc.

C. Slope classes.

Slope classes to be used in the contest are listed on the scorecard. If a site falls on the boundary of two slope classes, mark the steeper class. The slope is to be determined between the two stakes at each site. The student is responsible for checking the heights of the stakes.

D. Erosion classes.

The degree to which accelerated erosion has modified the soil may be estimated during soil examinations. The conditions of eroded soil are based on a comparison of the suitability for use

and the management needs of the eroded soil with those of the uneroded soil. The eroded soil is identified and classified on the basis of the properties of the soil that remains. The original thickness of the A and E horizons (if present) will be supplied at each pit. The following classes will be used based upon the thickness of the original surface.

Deposition. The soil is in a position that could receive additional sediments and there is evidence that the soil regularly receives additional sediments. The thickness of the A and E horizon (if present) currently at the site is greater than the original thickness of the A and E horizons.

Class 1. The class consists of soils that have lost some, but on the average less than 25 percent, of the original A and/or E horizons or of the uppermost 20 cm if the original A and/or E horizons were less than 20 cm thick.

Class 2. This class consists of soil that have lost, on the average, 25 to 75 percent of the original A and/or E horizons or of the uppermost 20 cm if the original A and/or E horizons were less than 20 cm thick.

Class 3. This class consists of soils that have lost, on the average, 76 percent or more of the original A and/or E horizons or of the uppermost 20 cm if the original A and/or E horizons were less than 20 cm thick.

Class 4. This class consists of soils that have lost all of the original A and/or E horizons or the uppermost 20 cm if the original A and/or E horizons were less than 20 cm thick.

Part III. Soil Taxonomy

Keys to Soil Taxonomy (2006) should be used for details on soil classification. Only the diagnostic horizons, features, and orders possible for mineral soils in the area, along with pertinent data displayed on the pit sign, are listed on the scorecard.

Part IV. Interpretations

A and B. Hydraulic conductivity (Classes simplified from p. 2-70, Field Book, V. 2.0, 2002). Saturated hydraulic conductivity of the surface horizon and the *most limiting* horizon (Hydraulic Conductivity/Soil) within the depth specified for judging will be estimated. Should a lithic or paralithic contact occur at the specified judging depth, it should not be considered in evaluating hydraulic conductivity. Fragipans and duripans will NOT be considered as paralithic.

High. Greater than 3.6 cm/hr. This class includes sands and loamy sands. Horizons containing large quantities of coarse fragments with insufficient fines to fill many voids between the fragments are also included in this class.

Moderate. Between 0.036 and 3.6 cm/hr. This class includes materials excluded from the "Low" and "High" classes.

Low. Less than 0.036 cm/hr. Normally, low hydraulic conductivity is associated with clay, silty clay, and sand clay horizons. Massive, silt and silt loam E horizons, natric horizons, duripans, and fragipans will be included in this class.

C. Water retention difference (Chpt. 5, pp. 292-293, Soil Survey Manual).

The amount of water that a soil can hold between 33 kPa (1/3 bar) and 1500 kPa (15 bars) soil-water tension within the zone accessible to roots is the water retention difference of the soil. The water retention difference of the whole soil is calculated by estimating the amount of water each horizon can hold, determining which horizons are sufficiently accessible to plant roots to be significant sources of water, and summing the water retentions differences of the accessible layers. Water retention difference is commonly expressed in cm water/cm soil. Classes are based on the amount of water retention difference in the upper 1.5 m of soil, or above a root-limiting layer, such as a lithic or para-lithic contact. A number of factors are used to determine the water retention difference of individual horizons. These include texture, clay mineralogy, soil structure, volume of coarse fragments, organic matter content, and bulk density. For the contest, only texture and volume of coarse fragments will be used to estimate the water retention differences of individual horizons above 1.5 m. Estimated water retention in relation to texture is given in Table 3. If the instructions for a pit require judging a profile that is less than 1.5 m deep, then assume the last horizon extends to a depth of 1.5 m unless it is directly underlain by a horizon. Contestants are to assume that lithic and paralithic contacts, and petrocalcic horizons (rare in the region) have no water retention and that water retention is not to be calculated for any horizon below these contacts. Coarse fragments are considered to have negligible (assume zero) moisture retention so estimates must reflect the coarse fragment content (subtract the percentage of coarse fragment volume, see example below). NOTE: fragipan horizons and duripans are considered to have water retention as indicated by the texture of those horizons!

Five classes recognized are:

Very High	>30 cm
High	22.50-29.99 cm
Medium	15.00-22.49 cm
Low	7.50-14.99 cm
Very Low	<7.50 cm

Table 3. Estimated relationships of water retention difference to texture.

<u>Texture Class of Soil Horizon</u>	<u>cm H₂O/cm soil</u>
silt, silt loam, silty clay loam, loam, clay loam, very fine sandy loam	0.20
sandy loam, loamy very fine sand, very fine sand, fine sand, fine sandy loam, sandy clay loam, sandy clay, clay, silty clay	0.15
coarse sandy loam, loamy fine sand, loamy sand	0.10
loamy coarse sand, all sands	0.05

The following is a sample calculation of water retention difference:

<u>Horizon</u>	<u>depth</u> cm	<u>texture</u>	<u>coarse</u> <u>fragments</u> %	<u>water retention</u>
Ap	0-12	sil	0	(12cm)(0.20 cm/cm) = 2.4
AB	12-28	sil	0	(16cm)(0.20cm/cm) = 3.2
Bt1	28-54	sicl	0	(26cm)(0.20cm/cm) = 5.2
Bt2	54-105	sicl	5	(51cm)(0.20cm/cm)(0.95) = 9.69
Bt3	105-132	cl	15	(27cm)(0.20cm/cm)(0.85) = 4.59
R	132+	-	-	0 <u>0.00</u>
total water retention difference				= 25.08 cm = HIGH

D. Internal free water occurrence. (Chpt. 3, pp. 101, Soil Survey Manual).

Free-water classes are determined by the depth to specific redoximorphic features (RMF) in soil, those with chroma 2 or less and value of 4 or more, i.e., gray depletions of *any* abundance as defined by the NRCS. The soil free-water classes for this contest are:

- Very Shallow: <25 cm
- Shallow: 25-49.9 cm
- Moderately Deep: 50-99.9 cm
- Deep: 100-150 cm
- Very Deep: >150 cm

If no evidence of wetness exists within the specified depth for characterization and that depth is less than 150 cm, assume Very Deep. These classes indicate free-water and reduction occur, but do not indicate the duration of occurrence of free-water.

E. Surface runoff.

Surface runoff refers to water that flows away from the soil over the land surface. Surface runoff is controlled by a number of factors including soil properties, climate, and plant cover. Runoff can be significantly altered by management (i.e., natural cover, cultivation, minimum tillage operations, etc.). For the purpose of this contest, only the runoff classes in Table 3 will be used. If the surface has a dense vegetative or debris cover, the surface runoff class should be assigned *one lower class rate* to a minimum of 'Very Slow'. 'Ponded' class shall be used to describe surface runoff in depression site positions.

Table 3. Surface runoff classes.

% slope	<u>Hydraulic Conductivity of the Surface Horizon</u>		
	High	Moderate	Low
	-----	surface runoff class	-----
0-1	very slow	very slow	very slow
1.1-3	very slow	slow	slow
3.1-5	slow	medium	medium
5.1-8	medium	medium	rapid
8.1-12	medium	rapid	very rapid
12.1-20	rapid	very rapid	very rapid
>20	very rapid	very rapid	very rapid

ADDITIONAL NOTES.

Attachment 1

Official Abbreviations

(note: contestants will be provided with this at the contest site)

Coarse Fragments

Gravelly	-GR	Cobbly	-CB
Very Gravelly	-VGR	Very Cobbly	-VCB
Extremely Gravelly	-XGR	Extremely Cobbly	-XCB

Texture

Coarse sand	-COS	Fine sandy loam	-FSL
Sand	-S	Very fine sandy loam	-VFSL
Fine sand	-FS	Loam	-L
Very fine sand	-VFS	Clay loam	-CL
Loamy coarse sand	-LCOS	Silt	-SI
Loamy sand	-LS	Silt loam	-SIL
Loamy fine sand	-LFS	Silty clay loam	-SICL
Loamy very fine sand	-LVFS	Silty clay	-SIC
Coarse sandy loam	-COSL	Sandy clay loam	-SCL
Sandy loam	-SL	Sandy clay	-SC
Clay	-C		

RMF, Abundance/Concentration

Abundance:	Few – F	Common – C	Many – M
Concentration:	Concentration – CON	Depletion – DEP	

Structure, Grade

Weak – 1	Moderate – 2	Strong – 3	Structureless – 0
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Structure, Type

Granular	-GR	Angular Blocky	-ABK
Platy	-PL	Subangular Blocky	-SBK
Prismatic	-PR	Single grain	-SG
Columnar	-CPR	Massive	-M

Attachment 2

Texture Triangle

(note: contestants will be provided with this at the contest site)

FIGURE 3-16

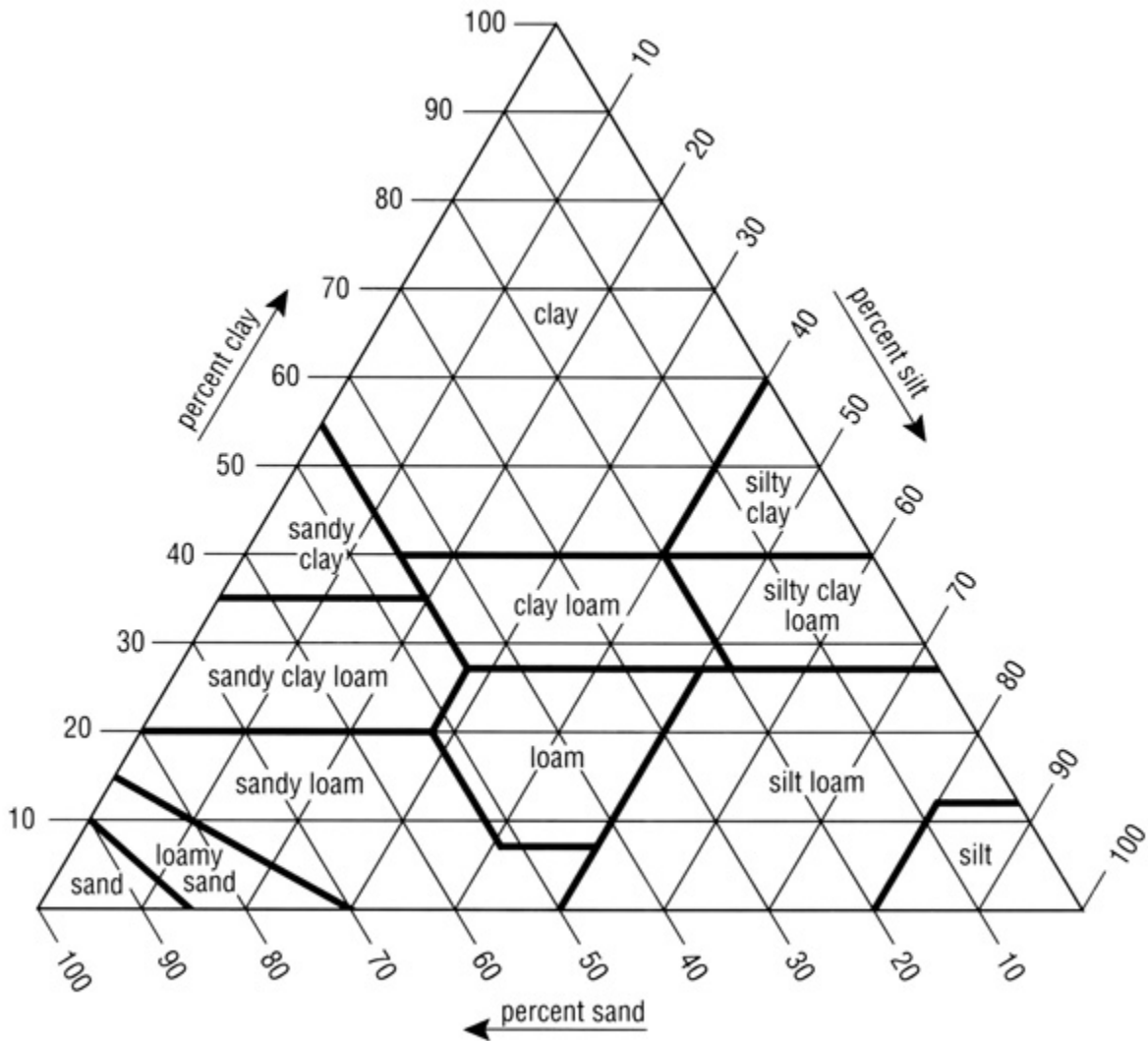


Chart showing the percentages of clay, silt, and sand in the basic textural classes.

Source: Soil Survey Manual

SCORE CARD
ASA REGION IV COLLEGIATE SOIL JUDGING
UNIVERSITY OF ARKANSAS AT MONTICELLO
Oct. 20-24, 2008

Score..	Part I	
	Part II	
	Part III	
	Part IV	
	TOTAL	

SITE NUMBER _____

CONTESTANT ID _____

Part I. SOIL MORPHOLOGY. Describe _____ mineral horizons within a depth of _____ cm.

Horizon			Lower Depth (cm) (2)	Bound Distinct. (2)	Clay % (2)	Texture (4)	Color			Redoximorphic Features		Structure	
Mas. (2)	Sub. (2)	No. (1)					Hue (2)	Value (2)	Chro. (2)	Abund. (2)	Con/Dep (2)	Grade (2)	Shape (2)

PART I. SCORE _____

PART II. SITE CHARACTERISTICS.

A. Site Position (5)				B. Parent Material (5) (Mark all that apply)				C. Slope (5) %			D. Erosion Class		
	Summit		Floodplain		Alluvium		Loess		0-1		8-12		Deposition
	Shoulder		Stream terrace		Colluvium		Marine deposit		1-3		12-20		Class 1
	Backslope		Depression		Eolian		Residium		3-5		20-45		Class 2
	Footslope		Mound		Esturine				5-8		>45		Class 3
	Toeslope		Intermound		Lacustrine								Class 4

PART II. SCORE _____

Part III. Soil Taxonomy.

A. Diagnostic Surface Horizons (10)		B. Subsurface Horizons and Features (10)			C. Order (10)	
	Mollic Epipedon		Albic		Fe/Mn concretions	Alfisol
	Ochric Epipedon		Argillic		Lithic contact	Entisol
	Umbric Epipedon		Buried		Natric	Inceptisol
	None		Calcic		Paralithic contact	Mollisol
			Cambic		Plinthite	Ultisol
			Duripan		Slickensides	Vertisol
			Fragipan		Gilgai	
			Glossic		None	

PART III. Score _____

Part IV. Interpretations.

A. Hydraulic conductivity Surface (5)		B. Hydraulic conductivity Soil (5)		C. Water retention difference (5)		
	High		High		Very High (>30 cm)	Low (7.50-14.99 cm)
	Moderate		Moderate		High (22.50-29.99 cm)	Very Low (<7.50 cm)
	Low		Low		Medium (15.00-22.49 cm)	

D. Internal free-water occurrence (5)		E. Surface Runoff (5)	
	Class 1...>150 cm		Ponded
	Class 2...100-149 cm		Very Slow
	Class 3...50-100 cm		Slow
	Class 4...25-50 cm		Medium
	Class 5...<25 cm		Rapid
			Very Rapid