Louisiana FFA

Soils Evaluation

Career Development Event

Revised 2025

Soil Judging Career Development Event

Purpose: Land and soils may be judged much like animals, farm or horticultural crops. In judging crops, we look at the size, shape, and quality and determine which the best is. Similarly, when judging land, we look for clues that tell us how well the land can produce crops or be used for other purposes. Soil characteristics, climate, and topography are good clues to the soil's capabilities, but close examination of the soil texture, structure, depth, permeability, reaction, degree of erosion, slope, drainage, and flooding are necessary to classify land into capability classes. In land judging, the major factors affecting how the land can be used must be determined. These factors are used to correctly recommend conservation practices and fertilizers for conserving the soil. Soil judging helps students to develop an appreciation for soils. The purpose of this contest is to encourage the in-depth study of soils and to provide students a practical, hands-on environment for judging and evaluating soils.

Objectives:

1. To develop students' understanding of basic soil differences.
2. To develop students' knowledge of the effects of soil properties on crop growth.
3. To develop students' knowledge of why soils respond differently to various management practices.
4. To help students realize the influence of land features on production and land protection.
5. To develop students' skills in selecting suitable soil and water conservation practices.
6. To develop students' abilities in determining land capability classes.
7. To develop students' skills in determining the proper use and treatment for specific soils.

Contest Format:

Four sites are judged using the LAND JUDGING SCORE CARD. The sites are judged based on the factors listed in this publication.

Rules and Regulations:

1. All general rules apply except as indicated in the specific rules of this contest.
2. A team consists of three or four contestants with the three high scores tabulated as the official team score. The fourth score will be used to break ties.
3. Contestants will be allowed 15 minutes to judge each site. Cards are collected before leaving each site.
4. Contestants are allowed to **only** bring the following pieces of equipment out to the land plots:
    a. A clipboard with no stray markings and/or printed/stamped/drawn rulers on them.
    b. A pencil
    c. Their scantron (Ziplock bag or other clear plastic coverings are allowed to protect the scantron on rainy days. No stray marks or rulers can be marked on them)
    d. A knife or nail (With no stray marks or printed/stamped/drawn rulers)
    e. A rag for cleaning hands (They may have a clip for attaching it to a belt loops; cannot have measurement markings printed on them) *(Revised 9/25)*
5. No water bottles, bubble vials, tape measures, other measuring devices (obtained, purchased, or fabricated), and "Slope Shooters" are allowed to be carried and used by contestants. (Water bottles will be provided on site.) ***"Slope Shooters are devices such as clinometers, transits, tilt meters, etc. or fabricated equipment (outside of equipment allotment list) with the intention of determining slope more precisely are not allowed into the event." (Revised 9/25)*
6. No talking or comparing of cards.
7. The land judging handbook shall be used to resolve contest differences and should be used in setting up and conducting all contests.

8. Specific information concerning the contest is presented on the following pages.
9. Tie Breakers - Team score: (apply in the order listed)
    a. Score of the 4th team member, if one team has only three members, then use the next tie breaker. (*Revised 2010*)
    b. Team scores from each site beginning with Site 1, then compare Site 2 scores, Site 3 scores, and Site 4 scores.
    c. Team scores from Part I, then use Part II for Site 1, Site 2, Site 3, and Site 4 until one team has a larger score.
    d. Names of tied teams are placed in a hat; the one drawn wins that placing.
10. Tie breakers - Individual scores:
    a. Use the same procedure used to break the team tied scores.
11. Teams attending the National Contests will have the opportunity to judge home-site evaluations if they wish. Rules and information for home site evaluation may be obtained from the Oklahoma soils contest bulletin.
12. This rule establishes a set of Area contests and allows only the top 15 teams from each Area to compete at the State Soils CDE. *(Adopted August 2010)*
13. Schools will be allowed to bring only one team to the National Land Judging competition in Oklahoma. The school will still be able to place two teams and receive all recognition for that placing at the state competition however; only one team from a school will be permitted to compete at the National Land Judging competition. The next eligible team will be selected as their replacement. (*Adopted August 2013)*
14. The most current scoring system used by the Oklahoma National Land Judging officials will be used when scoring the Louisiana event. *(Adopted August 2013)*
15. Scantron score cards may be used for this event. *(Adopted 2018)*
16. The five teams from the state CDE that qualify to compete at the national land judging competition must declare their intention to compete with the state FFA office by February 1. If the school chooses not to attend the next eligible team will be contacted until a replacement has been found. *(Adopted August 2019)*
17. Students will be provided at least 2 boxes each of the subsoil and topsoil for evaluation. *(Adopted 2019)*

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Introduction

Land is a basic natural resource used by humans to meet one or more of their needs. It provides raw materials, enables them to produce food and fiber and stores water and nutrients for future use. It also provides space for cities, highways, recreation, etc. Nothing surrounds us more in our daily lives. But, like so many things important to life, land goes unnoticed until we learn to appreciate it.

The land resource or the soil resource is limited in quantity and its quality varies from place to place. Soils are a result of the interactions of climate and vegetation on geological materials as conditioned by topography over a period of time. It is no wonder that so many kinds of soils exist with different profile features and properties. Soils vary in the kind, number, and degree of development of major horizons and sub-horizons that may form. Few soils have all horizons, but all soils exhibit some of them.

Soil Profile

The term "soil profile" is an important concept to learn. It is a side view or vertical cross-section of the soil as seen in a ditch bank or dug pit that allows the topsoil and subsoil to be examined. When we look beneath the surface of the soil, we see that the soil is divided into layers or "horizons." These layers differ in color, physical properties, chemical composition, and biological characteristics. This is the soil profile. It has 3 major parts or horizons: (1) the topsoil or "A" horizon, (2) the subsoil or "B" horizon, (3) the parent material or "C" horizon. A hypothetical soil profile is shown in **Figure 1**. Most land judging decisions are based on a soil profile that is at least 40" deep.

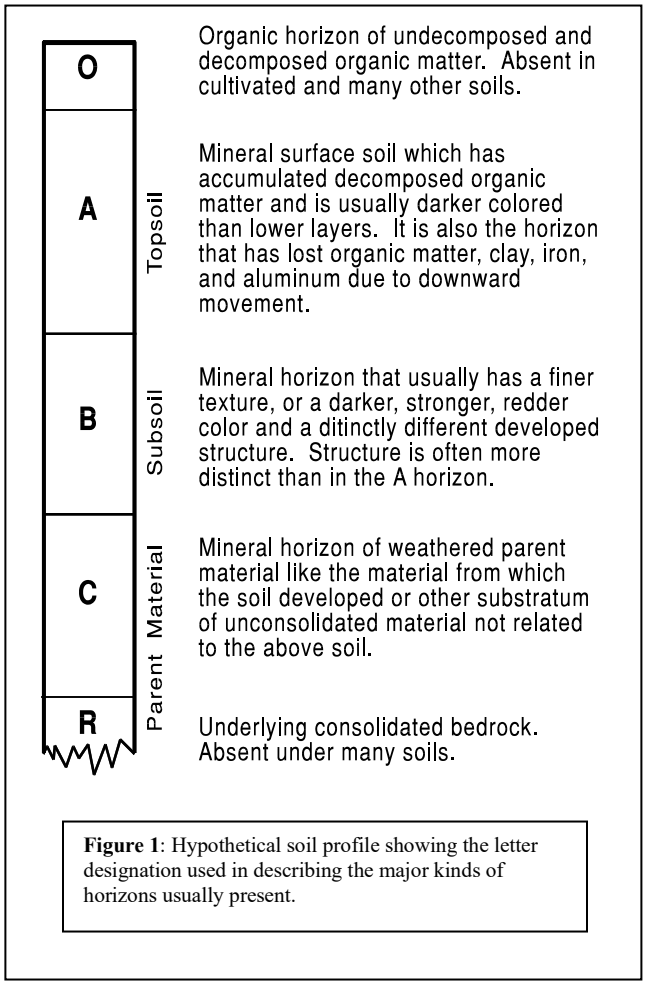


Figure 1: Hypothetical soil profile showing the letter designation used in describing the major kinds of horizons usually present.

Soil Factors

Texture

Soil texture refers to the relative proportion of sand, silt, and clay particles in a specific soil mass. It is easiest to determine when the soil is moist. Sand feels gritty when rubbed by the finger. Silt feels floury or velvety. Clay is usually sticky and plastic when wet and when pinched between the thumb and finger forms a flexible "ribbon."

The *surface texture* is normally determined from at least plow depth or 7 inches; however, erosion may have removed the surface to such an extent that only 1 or 2 inches may remain. For contests, a boxed sample of surface soil and subsoil will be provided to judge texture.

In soils, several subdivisions of texture are recognized and are illustrated in **Figure 2**. For land judging we will recognize 5 texture categories* represented by the middle column. For teaching purposes the 14 texture breakdown may be used.

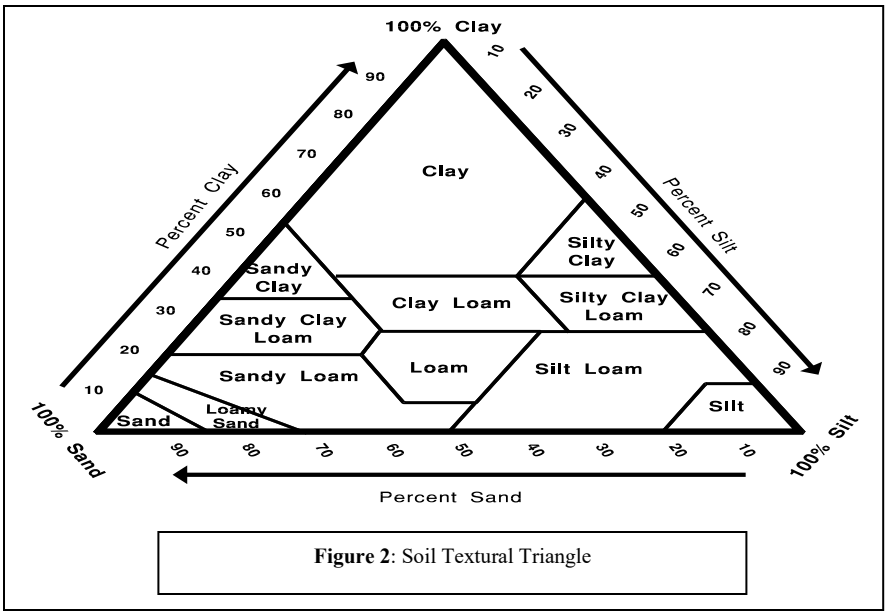


Figure 2: Soil Textural Triangle

Coarse-textured soils are loose, very friable, and the individual grains can be readily seen or felt. When squeezed between thumb and forefinger, it feels gritty and will not ribbon or stain fingers. Squeezed when dry, it will fall apart as pressure is released. When moist, a mold may be formed which is unstable and crumbles as the soil is handled.

Moderately coarse-textured soils feel gritty but contain enough silt and clay to make moist soil hold together. The individual sand grains can readily be seen and felt. Squeezed when dry, it will form a mold which breaks readily upon handling. If squeezed when moist, a mold can be formed which can be carefully handled without breaking. It forms no ribbon or very poor ribbon.

Medium textured soils have a slightly, smooth or velvety feel when moist. Squeezed when dry, it forms a mold that will bear careful handling. The mold formed by squeezing when moist can be handled freely, without breaking. When the moistened soil is squeezed out between thumb and forefinger, it will form a poor ribbon with dull surface.

Moderately fine-textured soils usually break into clods or lumps when dry. When the moist soil is squeezed out between thumb and forefinger, it will form a short well formed ribbon with a shiny surface which will tend to break or the ribbon will bend downward. The sandy clay loam texture has a slightly gritty or velvety feel when moist.

Fine-textured soils form very hard lumps or clods when dry and are quite plastic and sticky when wet. When the moist soil is squeezed out between thumb and forefinger, it will form a long ribbon which will support itself. The soil may also have a slightly gritty or velvety feel when moist.

Soil Depth

Depth refers to the total thickness of the surface and subsoil plus any underlying material that is favorable for root development. Depth is an important factor of soils. It determines the total amount of water held in the soil, the volume of soil available for plan root growth, and the supply of nutrients available to plants. Generally this material is underlain by bedrock, clay or shale beds, or alluvial material.

Deep soils have over 40 inches of soil that can be penetrated by plant roots.

Moderately deep soils have over 20 inches of soil but less than 40 inches of soil that can be penetrated by plant roots.

Shallow soils have over 10 inches but less than 20 inches of soil that can be penetrated by plant roots.

Very shallow soils have less than 10 inches of soil that can be penetrated by plant roots.

Soil Slope

Slope has a tremendous effect on water runoff, erosion and use of farm machinery. It is expressed as a percent, and is defined as the number of feet that the land rises or falls in a 100-foot horizontal distance. For example, a slope between two points which are 100 feet apart with a difference in elevation of 5 feet would have a 5% slope (**Figure 3**).

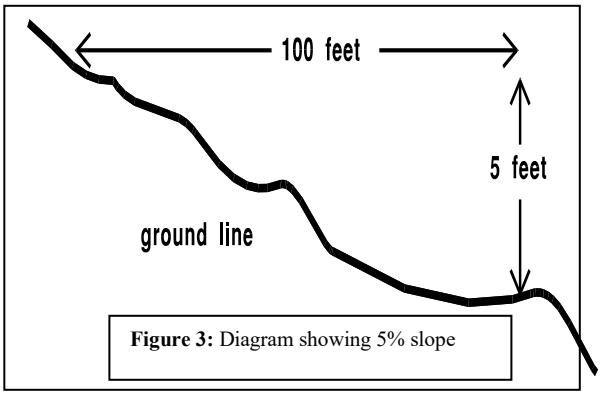


Figure 3: Diagram showing 5% slope

Nearly level - Land with less than 1 foot elevation change in 100 feet.

Gently sloping - Land with 1-3 feet elevation change in 100 feet.

Moderately sloping - Land with 3-5 feet elevation change in 100 feet.

Strongly sloping - Land with 5-8 feet elevation change in 100 feet.

Steep - Land with 8-15 feet elevation change in 100 feet.

Very steep - Land with over 15 feet elevation change in 100 feet

Erosion

Soil erosion is the detachment and movement of soil materials by wind or water. Erosion consists of two distinct processes--detachment and transportation. Rain drops falling on unprotected soil, wind striking unprotected soil particles and the bombarding action of moving particles are detachment forces. Flowing water and air currents are the transportation forces.

None to slight: Soils of this class show any obvious effect of erosion. The plow layer exhibits characteristics of the A horizon. Less than 25 percent of the surface soil has been removed and no gullies are present.

Moderate: Soils of this class have 25 to 75 percent of the original surface layer present. The plow layer may consist of a mixture of the surface A horizon and underlying B horizon. Some small, occasional crossable gullies may be present. It may or may not change the land capability class but it is always considered a factor to keep an area out of Class I.

Severe: Soils of this class have been eroded to the extent that over 75 percent of the original surface layer is removed. The plow layer exhibits characteristics predominately of B horizon. Frequent crossable gullies or occasional un-crossable gullies or occasional blow-out area may be present.

Very severe: Soils of this class have over 75 percent of surface soil removed with frequent un-crossable gullies and/or severe accumulations by wind. The plow layer exhibits characteristics similar to severely eroded soils. If wind is the main erosion force, blow-outs are numerous and deep. In either case areas are mostly unfit for crop production without extensive reclamation.

<u>The term "gullies" includes both crossable and un-crossable, unless otherwise specified. A crossable gully is one that can be crossed with the usual farm machinery in operation. Frequent gullies are less than 100 feet apart. Occasional gullies are more than 100 feet apart</u>.

Structure

Soil structure is not judged, however, it is very important in its effect upon permeability and soil use. It also relates to how well crops can grow. It is necessary to know about this soil property. Structure means the shape and arrangement of soil particles into clusters or aggregates. Each aggregate has a particular shape or size and determines the type of soil structure. It is best to observe this property in the soil profile rather than in the sample box because of the disturbance. The various types are shown in **Figure 4**.

Single grained: Each soil particle functions as an individual unit due to the lack of binding material. This structure-less condition is usually found in coarse-textured soils and is usually erodible.

Granular and/or sub angular blocky: Granular is sphere-like or rounded aggregate with no flat surfaces due to contact pressure from the faces of surrounding aggregates. Sub angular blocky is block-like or tending toward six-faced aggregates having mixed, rounded and flat surfaces with many rounded vertices or corners.

Blocky: Block-like or tending toward six-faced aggregates having flat surfaces with mostly sharp, angular vertices or edges that are mold casts formed by surrounding aggregates.

Prismatic: Prism-like or vertically-oriented aggregates with the vertical axis much greater in length that the horizontal axis. Flat surfaces or faces are well defined.

Columnar: Structure is modified type of prismatic aggregate but with rounded surfaces. It usually suggests salty conditions.

Platy: Plate-like or relatively thin horizontal plates or leaflets.

Massive: Medium to fine-textured soils with indistinct aggregates or no apparent aggregation. This type is characteristic of clayey, very slowly permeable soils.

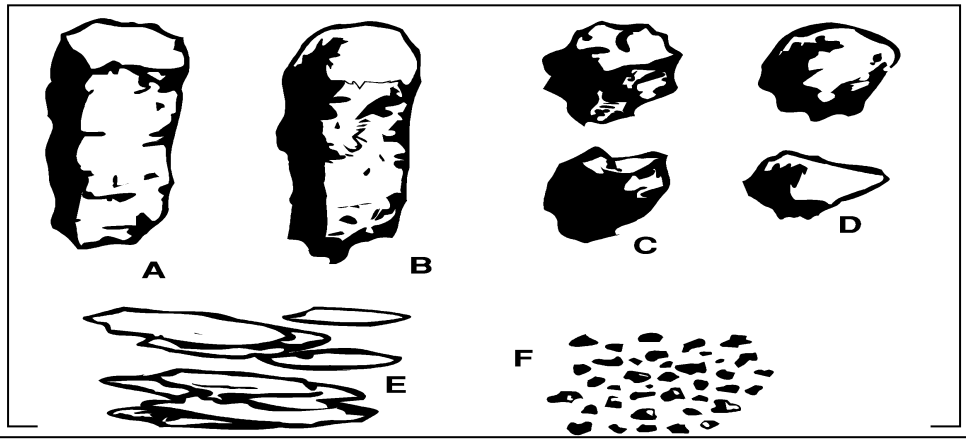


Figure 4: Drawings illustrate some of the types of structure: A-prismatic; B-columnar; C-angular block; D-sub angular block; E-platy; and F-granular.

Interpretation of Soil Factors

Permeability

Permeability refers to the movement of air and water through the soil. Permeability is affected by many soil characteristics. It is extremely important because it affects the supply of air, moisture and soil nutrients available to the plant in the root zone. A soil's permeability is determined by permanent characteristics such as texture, structure and consistence. It may be increased or decreased and still remain within the range of each permeability rating.

Each soil layer has a permeability rating but the soil's permeability is determined by the relative rate of moisture and air movement through the most restricting layer within the upper 40 inches of the effective root zone. *For contests, the subsoil sample in the box will be used to determine the permeability*. Subsoil texture and structure are of primary importance in determining permeability.

Rapidly permeable - Soils with moderately coarse and coarse-textured sub-soils that are granular or single-grained are rapidly permeable. Sub-soils tend to be very friable or loose when moist, and exhibit little restriction of water or air.

Moderately permeable - Medium textured sub-soils are moderately permeable regardless of structure. They are friable to very friable with large pores. Roots are abundant. Some soils, with moderately fine textured, granular sub-soils, are also moderately permeable.

Slowly permeable - Soils that have moderately fine textured sub-soils with angular and sub-angular blocky structure are slowly permeable. The sub-soils are firm when moist and hard when dry. Roots are common. Length differences of vertical and horizontal cracks are negligible. Soil peds tend to break more easily along the vertical axis than in the very slowly permeable soils. Soils frequently have thick surface and transitional horizons from the surface to the most clayey horizon in the profile.

Very slowly permeable - Soils that have dense, fine textured sub-soils and clay pan soils are very slowly permeable. Their structure is coarse, angular blocky or massive with very few visible pores. Roots are few and generally follow ped faces and cracks. These sub-soils are very firm when moist and very hard when dry. Horizontal cracks are longer than vertical ones.

Surface Runoff

Surface runoff is the relative rate water is removed by flowing over the soil surface. This includes rainfall, as well as water from adjacent slopes. It is a combination of soil slope, position in the landscape, permeability and infiltration rate.

Rapid: Water is removed from the surface at a rapid rate. A large amount of rainfall is lost and only a small portion moves into the soil which increases the erosion hazard. This is a result of compaction, clayey textures and/or slopes greater than 3% (except rapidly permeable soils).

Moderate: Water drains away readily, yet slow enough that a large amount of the water enters the soil. This condition causes little erosion hazard and is desirable and normal runoff. This condition occurs on slopes of 1-3% (except when the soils are rapidly permeable).

Slow: Water flows away so slowly that free water covers the soil for moderate periods. This increases the moisture supply but may interfere with farming operation. This condition occurs on slopes of 0-1% and includes nearly level, loamy and clayey soils with moderately permeable sub-soils and nearly level, sandy soils with slowly permeable sub-soils.

Very Slow: Water is removed so slowly or stands so long that the soil remains wet for long periods. Most of the water either passes through the soil or evaporates. Generally this condition occurs on level to slightly

concave landscapes. However, deep sandy soils with rapidly permeable sub-soils on slopes also have very slow runoff because the infiltration is so high that most rainfalls produce no runoff.

Major Factors That Affect Land Capability

These factors are conditions that keep land out of Class I. There may be one or more. The number to identify is not given and is not on the site card, check the appropriate practice.

Surface Texture: Surface soil texture is not a major factor except for sandy soils. Sandy soils can be no better than Class III because of erosion hazards of both wind and water that are very difficult to control.

Soil Depth: Only shallow or very shallow soils will be a major factor.

Slope: Any slope greater than nearly level will be considered a major factor.

Erosion: All conditions except none to slight will be considered a major factor.

Permeability: Only two conditions rapid or very slow will be a major factor.

Surface Runoff: Only very slow (rapidly permeable sandy soils excepted) and rapid runoff conditions will be considered as major factors.

General Guide for Selecting Land Capability Classes

FACTOR	DESCRIPTION	BEST LAND CLASS
Texture		
	Coarse	III
	Moderately coarse, medium, moderately fine, fine	I
Depth		
	Deep, moderately deep	I
	Shallow	III
	Very Shallow	VII
Slope		
	Nearly level (0-<1%)	I
	Gently sloping (1%-3%)	II
	Moderately sloping (3.1%-5%)	III
	Strongly sloping (5.1%-8%)	IV
	Steep and Very Steep (8.1% & <)	VI
Erosion		
	None to slight	I
	Moderate	II
	Severe or Very Severe	VI
Permeability		
	Raipd	III
	Moderate and Slow	I
	Very Slow	II
Surface Runoff		
	Rapid	III
	Moderate and Slow	I
	Very Slow	II

Land Capability Classes

Land is classified by USDA on the basis of permanent limitations or hazards in its use from the standpoint of keeping the soil permanently productive. The soil features of a particular area are all considered when determining the land capability class.

There are eight recognized classes of land. They are divided into cultivatable and non-cultivatable.

Cultivatable

Class I - Soils in Class I have few limitations that restrict their use. Overhead water does not change the land class- treatment because it is usually on adjacent soils.

Class II - Soils in Class II have some limitations that reduce the choice of what plants or require moderation conservation practices.

Class III - Soils in Class III have severe limitations that reduce the choice of plants or require special conservation practices or both.

Class IV - Soils in Class IV have very severe limitations that restrict the choice of plants, require very careful management, special conservation or both.

Non- Cultivatable

Class V - Soils in Class V have little or no erosion hazards, but have other limitations that are impractical to remove that limits their use largely to pasture, range, woodland or wild life food and cover. These may include very poor drainage with wet poorly drained profiles or frequently flood areas. (Frequent flooding will be shown with "other factors" when it occurs.)

Class VI - Soils in Class VI have severe limitations that make them generally unsuited for cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.

Class VII - Soils in Class VII have many severe limitations that make them unsuited for cultivation and limits restrict their use largely to grazing, woodland, or wildlife.

Class VIII - Soils and land forms in Class VIII have limitations that preclude their use for commercial plant production and restrict their use to wildlife, recreation, water supply or aesthetic purposes.

Interpretations of Land Treatments

Vegetative

For cropland use on Class I through IV.

1. Row crop with occasional soil conserving crop - applicable to Class I land.
2. Row crop with frequent soil conserving crop - applicable to Class II land.
3. Row crops not more than 2 of 4 years - applicable to Class III land.
4. Row crops not more than 1 of 5 years - applicable to Class IV land.
5. Return crop residue to the soil.

6. Practice Conservation Tillage - provides for a protective cover by leaving crop residue of any previous crop as mulch on or mixed in the surface (first few inches) of the soil. At least 30% residue should remain on the soil surface after planting.

For Pasture, range, Wildlife or Commercial Woodland

7. Establish recommended grasses and legumes. This practice is used when permanent vegetation is needed. Because of differences in interpretation this practice will be used on all Class V, VI, and VII except where tree plantings are made.

8. Proper pasture or range management. The application of practices to keep plants actively growing; to encourage the growth of desirable grasses and legumes while crowding out weeds and brush, and minimize soil erosion.

9. Protect from burning.

10. Control grazing. Carry out a system of deferred or rotational grazing and proper stocking that will maintain or improve desirable vegetation on pasture or range. The practice should not be used where tree plantings are made.

11. Plant recommended trees. For farmstead and field windbreaks, and commercial woodland plantings.

12. Harvest trees selectively. A system of cutting in which single trees, usually the largest, or small groups of such trees are removed and reproduction secured under the remaining stand.

13. Use only for wildlife or recreation area. This means protection or the development of areas that cannot be used for grazing, forestry, cultivation, or urban

Mechanical

14. Control brush or trees. This may be accomplished by spraying with chemicals and/or use of machinery. The purpose is to improve the desirable vegetative cover by removing or killing undesirable brush and trees, or removing timber so land could be farmed in the case of Class I to IV. This practice should not be used when bushy plants can be controlled by normal farm plowing. (Less than 2" diameter @ 5 feet above ground.)

15. Terrace and farm on contour. Terrace is an embankment or ridge of earth constructed across the slope to control runoff and minimize erosion. Conduct farming operations on the contour or at right angles to slope direction. For contest purposes all cultivatable soils, except coarse textured, with slopes over 1% will be considered as needing terraces.

16. Maintain terraces. Implement practices that keep terraces working effective. (Applies only to practice 15.)

17. Construct diversion terrace. A diversion terrace is a channel with a supporting ridge on the lower side usually has greater horizontal and vertical spacing and constructed to handle a larger flow of water than normal field terraces ***used when overhead water is a factor***. This is always given information.

18. Install drainage system. To remove excess surface or ground water from land by means of surface or subsurface drains. Used when wetness is given as a factor.

19. Control gullies. Implement one or more conservation practices that will adequately control runoff and erosion. Used any time ***active*** gullies are within the field area. They should be at least 6 inches deep and 12 inches wide. Irregularities in a field that are grassed over with no signs of erosion are not considered as needing control.

20. No mechanical treatment needed - use when brush and trees, erosion, gullies, drainage or overhead water are not problems

Fertilizer and Soil Amendments

Fertilizers and soil amendments are essential to the production of crops. No set of limits with regard to lime or fertilizer requirements will fit all areas of the country and all crops. The intent of this section is to familiarize contestants with soil fertility requirements and terminology and identify deficiencies from given soil test values.

pH

Soils with pH of 5 or less are usually the soils requiring lime. However, lime is recommended on soils with pH's up to and including 6.3. Above this pH, no lime is recommended. Soils with pH's above 8.0 are alkaline and may indicate a salinity problem. The use of sulfur or similar amendment should be applied to reduce the pH to a more favorable level, therefore, when any pH value given for a field is 6.3 or less or above 8.0 practice No. 21 is checked.

Phosphorous (P_2O_5)

Low levels of phosphorus in Oklahoma soils are 25 lbs./acre or less. However, soils with phosphorus levels up to 60 lbs./acre do require the addition of phosphate for maximum production. When any value is given less than 60lbs./acre, you check No. 22 on the score card.

Potassium (K_2O)

Soils with potassium levels of 125 lbs./acre or less are considered deficient and require the addition of potassium. Potassium is recommended to some extent on soils with as much as 300 lbs./acre for certain crops but above that level no potassium is added. When any value is given that is less than 300 lbs/acre you check No. 23 Potassium on the scorecard.

Nitrogen (N)

No established level of nitrogen in the soil adequately indicates sufficiency or deficiency for all crops. Any value that would be deficient for corn, cotton, or small grains may be adequate for clovers or alfalfa. On the other hand, an adequate level of nitrogen for small grains or corn may be deficient for maximum production of Bermuda grass. The adequate level of nitrogen in the soil is dependent on the yield goals.

Nitrogen will be given as adequate or deficient without a numerical value. The scorecard is checked when deficiency is indicated.

Example: Soil test information shows:

pH - 5.5

Phosphorus - 30 lbs./acre

Potassium - 325 lbs./acre

Nitrogen - Deficient

On the scorecard Numbers 21, 22, & 24 will be checked.

General Instructions and Interpretations

Many contestants from distant areas will tend to interpret what they see in light of their own conditions. For that reason it is necessary to explain in detail those items that may have local variations.

Present Practices or Cover on the Land

Disregard practices and/or cover on the land at the time of the contest except for brush and trees which can occur on Class I to VII. Should this condition occur, it would be necessary to remove brush, trees and timber to reach the most intensive use. In other words, use practice 14. Other examples, if terraces are needed and terraces are already on the area you would use practice 15, terrace and farm on the contour. Should a cover of grass be on an area of Class V, VI, or VII land, you would still use practice 7, establish recommended grass or grass and legumes. The reason is that what is considered a good stand of grass to a Western contestant could be considered a poor stand of grass to a contestant from the Eastern USA.

"Other Factors" - when factors not observable by contestant (which require extended study, or information is not available from a single observation) affect the treatment of capability they will be shown for each field under "other factors." Contestants will then prescribe the correct treatment. Factors that will be given when they influence treatment are:

Wetness - Would be a factor to keep land out of Class I. Only moderately wet land can effectively benefit from the use of practice No. 18 under treatments. Install drainage system is not used on wet Class V soils. (Moderately wet for Class II or wet for Class V will be given.)

Flooding - Frequently flooded would place the area in Class V land. Occasional flooding is Class II land. Flooding is not considered on slopes over 3%. Practices 14 and 20 would apply under treatment.

Overhead Water - This condition does not take the area out of Class I but would require a diversion terrace (practice 17). Practice 16 is not checked when using division terraces. These are constructed much larger than conventional terraces, and are usually not farmed. These could be constructed on adjoining property where maintenance was not possible.

Needs Wind Break - Where this is indicated, Practices 9 and 11 would be needed.

Desires Post Lot or Wood Lot - Where this factor is indicated, Practices 9, 11, and 12 would be needed.

Timber Production - Operator desires to go into timber production in adapted areas. This would also require Practices 9, 11, and 12.

Guide to Capabilities and Treatment Practices

In order to insure uniformity in teaching, tables I to V have been specially prepared. These tables are designed to show various combinations of soil, texture, permeability, depth, slope, erosion, runoff, wetness, and flooding that could occur and the resulting capability class. Applicable treatments are also shown. ***Please study the special notes at the beginning and end of each table***.

General Notes

Coarse Textured Soils -<u>Deep and Moderately Deep</u>

1. Coarse surface soil texture is a major factor keeping the soil out of Class I.

2. The best land capability class for coarse textured soils is III.
3. Slopes from 1 to 3 percent will be checked as a major factor, but will not lower the land capability class.
4. Moderate erosion will be checked as a major factor, but will not lower the land capability class.
5. Either very slow or rapid surface runoff will be checked as a major factor, except where soils are rapidly permeable. These checked factors will not lower the land capability class.
6. Rapid permeability will be checked as a major factor, but it will not lower the land capability class. In actual practice they would require a subclass separation for treatment differences but subclasses are not considered in this contest.
7. In combination with texture, slopes over 3 percent and severe or very severe erosion are major factors that lower the land capability class from II or IV to VI.
8. The best land capability class for coarse textured soils on slopes of less than 3 percent with severe or very severe erosion is class VI.
9. The best land capability class for coarse textured soils on moderately sloping or strongly sloping soils is Class IV.
10. The best land capability class for coarse textured soils on moderately sloping or strongly sloping soils with severe or very severe erosion is Class VI.
11. The best land capability class for coarse textured soils on steep or very steep slopes is Class VI.
12. The best land capability class for coarse textured soils that are rarely flooded is Class III. This condition will be given and the flooding will be checked as a major factor, but it will not lower the land class.
13. Shallow or very shallow, coarse textured soils will not be used in contests.

Moderately Coarse, Medium, Moderately Fine and Fine Textured Soils - <u>Deep and Moderately Deep</u>

1. Surface soil texture is not a major factor.
2. The best land capability class for moderately coarse, medium, moderately fine, and fine soils is I.
3. Any slope of less than 1 percent is not a major factor.
4. Any slope over 1 percent is a major factor and will lower the land capability class.
5. Very slow permeability is a major factor and will further lower the land capability class by 1 unit on land classes I-IV.
6. Very slow surface runoff is a major factor and it will lower the land capability by 1 unit.
7. Rapid surface runoff is a major factor, but it will not lower the land capability class.
8. “None to slight” erosion is not a major factor.
9. Moderate erosion is a major factor that will lower the land capability class on 0 - 1 and 1 to 3 percent slopes.

10. Moderate erosion will be checked as a major factor on slopes over 3 percent, but it will not lower the land capability class.

11. The best land capability class for severe and very severely eroded soils is Class VI.

12. The best land capability class for moderately coarse, medium, moderately fine, and fine soils on 0 to 1 percent slopes that is moderately wet is Class II. Wet soils can be no better than Class V. These degrees of wetness will be given and wetness will be checked as a major factor and will lower the land capability class.

13. On very slowly permeable, nearly level soils, moderate erosion occasionally does occur. However, because of the difficulty involved in explaining and defining specific treatment for such a condition it will not be used in a contest

Moderately Coarse, Medium, Fine and Fine Soils – Shallow

1. Surface soils texture is not a major factor.

2. The best land capability class for loamy and clayey soils - shallow is III.

3. Depth is a major factor and its best land class is III.

4. Any slope of less than 1 percent will be checked as a major factor.

5. Any slope of 1 to 3 percent will be checked as a major factor, but will not lower the land capability class.

6. Any slope over 3 percent is a major factor and will lower the land capability one class.

7. "None to slight" erosion is not a major factor.

8. Moderate erosion is a major factor that will lower the land capability class on 0 to 1 and 1 to 3 percent slope.

9. Moderate and severe erosion will be checked as a major factor on slopes 3 to 5 percent, but it will not lower the land capability class.

10. Very severe erosion is a major factor and will lower the capability class.

11. Very slow permeability will be checked as a major factor but it will not lower the land capability class.

12. Very slow or rapid runoff will be checked as a major factor, but neither one will lower the land capability class.

13. Mechanical practices 15 and 16 are not used on slopes of less than 1 percent, even if the land capability class is III.

Special Notes

***Possible Mechanical Treatments**

This column cannot be specific in all cases. It is the job of the contestants to pick out the treatments that apply. For example, a field can be found that would need ***no*** mechanical treatment for the most intensive use. Therefore, practice 20 would be shown. A similar field in relation to soil, slope, and erosion could be covered with undesirable brush and trees and would need practice 14. Should a field also be gullied, practices 14 and 19 would be used. Depending on soil, slope, cover, erosion, and most intensive use, practices 14, 15, 16 or 15 and 16 could be the correct answer.

Class I land in grass or cultivation would require practice 20. The same class of land but covered by brush and trees would require practice 14. In other words any field will need to have ***one*** or ***more*** of the possible mechanical practices checked that are shown under the column ***Mechanical*** on the scorecard.

Other Factors

"Other factors" shown on the condition sheet will be a key to treatment needs. These treatments are not shown under mechanical treatments, but have been discussed on page 7. When conditions warrant these will be noted on the condition sheet along with other given information. The contestant will need to check the appropriate condition on the score card.

All explanations given in this brochure are for teaching and understanding. Because of the possibility of overlooking a difference between the narratives and the tables, the tables will be the final word in contest situations.

Setting Up and Holding a Land Judging Contest

Plan

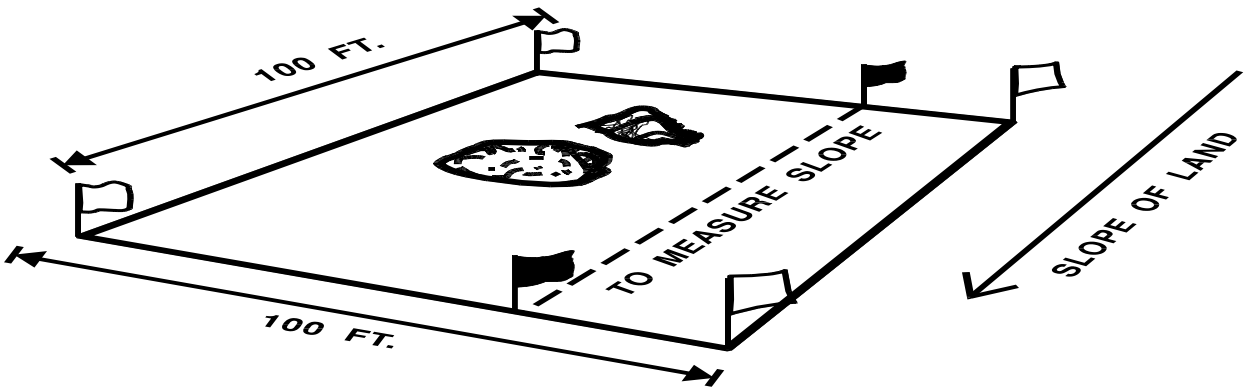
The coordinator or chairman needs to set up a meeting of interested leaders and agencies, determine who can help and make assignments. As soon as the date is set, leaders should select judges, guides and graders. In planning consider the number of teams, divisions, and number of individuals that will participate.

Site Selection

Locate a farm where different conditions can be found to study and judge. Secure permission from the owner to use the area. Select four sites, dig pits and prepare an official key for each site well before the contest. This will insure that graders can score the contest in the shortest possible time.

Preparing Field Site

Each site should have flags or stakes to indicate field boundaries of the area to be judged. The fields should be a minimum of 100 feet x 100 feet in size, but do not necessarily have to be square. Two well marked stakes should be places 100 feet apart for judges to use to estimate slopes. These should be the same distance above the ground and with the normal slope of the land as much as possible. A hole must be dug to expose the soil profile as well as the soil depth. Representative samples of topsoil and subsoil should be available and marked. If the soil is very dry a supply of water should be on hand to moisten soil samples.



Site Cards

This card provides the contestant with all necessary information. It should be prepared in advance and placed at the site before the contest. Include site number, thickness of original topsoil, soil test data and any other factors.

Conducting the Contest

Register teams by using consecutive numbers and team members by using letters A, B, C, D. Have sets of land judging cards and tabulation cards prepared ahead of time if a large number of contestants are expected. When the contest begins, contestants registered with Letter A will go to site 1; those with B to site 2; C to site 3; and D to site 4. Allow 15 minutes to judge each site unless home site evaluation is also being judged. This will require additional time. Use a signal to start and stop the judging at each site. Each group moves to the next site. Cards are collected before leaving a site and someone is designated to pick up the cards and take them to the graders. Group A then goes to site 2; B to site 3; C to site 4; and D to site 1. However if the sites are not arranged to fit this sequence, they can be changed. This procedure allows groups of 20-40 people to move without confusion.

Scoring and Grading

Categories on the scorecard carry varying values depending on the judge's evaluation of its relative importance. The total points possible on each site are 75 with 45 points from Part 1 and 30 points from Part II. See example Table VI. In Part 1, items A through F and H have only one correct answer. No partial credit is awarded. Item G must have all appropriate blocks checked to get credit for the answer. In part, the applicable vegetative, mechanical, and fertilizer practices are checked according to the judgment of the contestants and other factors shown.

Use a master or tally sheet to simplify the entry of individual scores by listing team members vertically and sites horizontally on the sheet. Circle the low total score for elimination and team scores can be added quickly.

Abbreviations Used in Tables I to V

The following abbreviations will apply to the table.

V.S. = very slowly permeable or very slow surface runoff
S. = slow permeability or slow surface runoff
M. = moderately permeable, moderate erosion or moderate surface runoff
R. = rapid permeability or rapid runoff
N. = none to slight erosion
Sev. = severe erosion
V. Sev. = very severe erosion
N.L. = nearly level
G.S. = gently sloping
M.S. = moderately sloping
Str. = strongly sloping
Steep = steep slopes
V. Steep = very steep slopes

Table I. Coarse Textured Soils - Deep and Moderately Deep

Slope	Erosion	Permeability	Surface Runoff	Capability Class	Factors that keep land out of Class I	Vegetative Treatment	Possible Mechanical Treatment* use one or more
N.L.	N	S	S	III	1	3,5,6	14,20
N.L.	M	S	S	III	1,4	3,5,6	14,20
N.L.	Sev. &	S	S	VI	1,4	7,8,9,10	14,19,20
G.S.	N	S	M	III	1,3	3,5,6	14,20
G.S.	M	S	M	III	1,3,4	3,5,6	14,20
G.S.	Sev. &	S	M	VI	1,3,4	7,8,9,10	14,19,20
N.L.	N	M	V.S.	III	1,6	3,5,6	14,20
N.L.	M	M	V.S.	III	1,4,6	3,5,6	14,20
N.L.	Sev. &	M	V.S.	VI	1,4,6	7,8,9,10	14,19,20
G.S.	N	M	M	III	1,3	3,5,6	14,20
G.S.	M	M	M	III	1,3,4	3,5,6	14,20
G.S.	Sev. &	M	M	VI	1,3,4	7,8,9,10	14,19,20
M.S.	N	M	R	IV	1,3,6	4,5,6	14,20
M.S.	M	M	R	IV	1,3,4,6	4,5,6	14,20
M.S.	Sev. &	M	R	VI	1,3,4,6	7,8,9,10	14,19,20
Str.	N	M	R	IV	1,3,6	4,5,6	14,20
Str.	M	M	R	IV	1,3,4,6	4,5,6	14,19,20
Str.	Sev. &	R	R	VI	1,3,4,6	7,8,9,10	14,19,20
Steep	All		R	VI	1,3,6 also	7,8,9,10	14,19,20
N.L.	N	R	V.S.	III	1,5	3,5,6	14,20
N.L.	M	R	V.S.	III	1,4,5	3,5,6	14,20
N.L.	Sev. &	R	V.S.	VI	1,4,5	7,8,9,10	14,19,20

Table I. Coarse Textured Soils - Deep and Moderately Deep

Slope	Erosion	Permeability	Surface Runoff	Capability Class	Factors that keep land out of Class I	Vegetative Treatment	Possible Mechanical Treatment* use one or more
G.S.	N	R	V.S.	III	1,3,5	3,5,6	14,20
G.S.	M	R	V.S.	III	1,3,4,5	3,5,6	14,20
G.S.	Sev. &	R	V.S.	VI	1,3,4,5	7,8,9,10	14,19,20
M.S.	N	R	V.S.	IV	1,3,5	4,5,6	14,20
M.S.	M	R	V.S.	IV	1,3,4,5	4,4,5,6	14,20
M.S.	Sev. &	R	S.S.	VI	1,3,4,5	7,8,9,10	14,19,20
Str.	N	R	V.S.	IV	1,3,5	4,5,6	14,20
Str.	M	R	V.S.	IV	1,3,4,5	4,5,6	14,20
Str.	Sev. &	R	V.S.	VI	1,3,4,5	7,8,9,10	14,19,20
Steep	All	R	All	VI	1,3,5, also	7,8,9,10	14,19,20

Table II. Moderately Coarse, Medium, Moderately Fine and Fine Textured Soils - Deep and Moderately Deep

Slope	Erosion	Permeability	Surface Runoff	Capability Class	Factors that keep land out of Class I	Vegetative Treatment	Possible Mechanical Treatment* use one or more
N.L.	N	V.S.	S	II	5	2,5,6	14,20
N.L.	N	V.S.	V.S.	III	5,6	3,5,6	14,18,20
G.S.	N	V.S.	M	III	3,5	3,5,6	14,15,16
G.S.	M	V.S.	M	IV	3,4,5	4,5,6	14,15,16
G.S.	Sev. & V. Sev.	V.S.	M	VI	3,4,6	7,8,9,10	14,19,20
M.S.	N	V.S.	R	IV	3,5,6	4,5,6	14,15,16
M.S.	M	V.S.	R	IV	3,4,5,6	4,5,6	14,15,16
M.S.	Sev. & V. Sev.	V.S.	R	VI	3,4,5,6	7,8,9,10	14,19,20
Str.	N	V.S.	R	VI	3,5,6	7,8,9,10	14,20
Str.	M, Sev. & V. Sev.	V.S.	R	VI	3,4,5,6	7,8,9,10	14,19,20
Steep V. Steep	Very Sev. & V. Sev.	V.S.	R	VII	3,4,5,6	7,8,9,10	14,19,20
N.L.	N	S&M	S	I	9	1,5,6	14,20
N.L.	N	S&M	V.S.	II	6	2,5,6	14,20
N.L.	M	S&M	S	II	4	2,5,6	14,20

Table II. Moderately Coarse, Medium, Moderately Fine and Fine Textured Soils - Deep and Moderately Deep

Slope	Erosion	Permeability	Surface Runoff	Capability Class	Factors that keep land out of Class I	Vegetative Treatment	Possible Mechanical Treatment* use one or more
G.S.	N	S&M	M	II	3	2,5,6	14,15,16
G.S.	M	S&M	M	III	3,4	3,5,6	14,15,16
G.S.	Sev. & V. Sev.	S&M	M	VI	3,4	7,8,9,10	14,19,20
M.S.	N	S&M	R	III	3,6	3,5,6	14,15,16
M.S.	M	S&M	R	III	3,4,6	3,5,6	14,15,16
M.S.	Sev. & V. Sev.	S&M	R	VI	3,4,6	7,8,9,10	14,19,20
Str.	N	S&M	R	IV	3,6	4,5,6	14,15,16
Str.	M	S&M	R	IV	4,5,6	4,5,6	14,15,16
Str.	Sev. & V. Sev.	S&M	R	VI	3,4,6	7,8,9,10	14,19,20
Steep V. Steep	N	S&M	R	VI	3,6	7,8,9,10	14,20
Steep V. Steep	M	S&M	R	VI	3,4,6	7,8,9,10	14,19,20
Steep V. Steep	Sev. & V. Sev.	S&M	R	VI	3,4,6	7,8,9,10	14,19,20

Table III. Moderately Coarse, Medium, Fine and Fine Soils - Shallow

Slope	Erosion	Permeability	Surface Runoff	Capability Class	Factors that keep land out of Class I	Vegetative Treatment	Possible Mechanical Treatment* use one or more
N.L.	N	All Conditions	S	III	2	3,5,6	14,20
N.L.	M		S	IV	2,4	4,5,6	14,20
G.S.	N		M	III	2,3	3,5,6	14,15,16
G.S.	M		M	IV	2,3,4	4,5,6	14,15,16
M.S.	N		R	IV	2,3,6	4,5,6	14,15,16
M.S.	M		R	IV	2,3,4,6	4,5,6	14,15,16
Str. Steep & V. Steep	N.M. & Sev.		R	VI	2,3,6 also 4 if eroded	7,8,9,10	14,19,20
Str. Steep V. Steep	V. Sev		R	VII	2,3,4,6	7,8,9,10	14,19

Table IV. Moderately Coarse, Medium, Fine and Fine Soils - Very Shallow

Slope	Erosion	Permeability	Surface Runoff	Capability Class	Factors that keep land out of Class I	Vegetative Treatment	Possible Mechanical Treatment* use one or more
All	All	All Conditions	All	VII	5 if V.S. 2 in all cases 3 if sloping 4 if eroded 6 if rapid runoff	7,8,9,10	14,19,20

Table V. Special Factors (conditions) Deep Soils

Slope	Erosion	Permeability	Other Factors	Capability Class	Factors that keep land out of Class I	Vegetative Treatment	Possible Mechanical Treatment* use one or more
All	All	All	Mod. Wet	II	7	2,5,6	14,18
All	All	All	Wet	V	7	7,8,9,10	14,20
All	All		Flooding	V	8	7,8,9,10	14.20

Table VI. Example of Scoring For Land Judging

Part I of Land Judging Scorecard		Part II of Land Judging Scorecard	
Items	**Points**	**Possible Practices**	**Points**
A. Texture Surface Subsoil	 4 4	No. 3	6
B. Depth of Soil	5	No. 5	4
C. Slope	4	No. 6	5
D. Erosion	4	No. 15	6
E. Permeability	5	No. 16	4
F. Surface Runoff	3	No. 25	5
G. Major Factors	8		
H. Land Capability Class	8		
Points 45		Points 30	
Total Points 75			

LAND JUDGING SCORE CARD
LOUISIANA FFA

Contestant No. _____ Field No._____
Name _____
School _____ Organization_____

SOIL FACTORS –PART I Check Appropriate Square		RECOMMENDED LAND TREATMENTS Part 2	
SCORE		**SCORE**	
	A. Texture **Sur. Sub.** ☐ ☐ 1. Coarse ☐ ☐ 2. Moderately Coarse ☐ ☐ 3. Medium ☐ ☐ 4. Moderately Fine ☐ ☐ 5. Fine		**A. Vegetative** ☐ 1. Row crop/occasional soil conserving crop ☐ 2. Row crop/ frequent soil conserving crop ☐ 3. Row crops not more than 2 out of 4 years ☐ 4. Row crops not more than 1 out of 5 years ☐ 5. Return crop residue to the soil ☐ 6. Practice conservation tillage ☐ 7. Establish recommended grass or grasses and legumes ☐ 8. Proper pasture and range management ☐ 9. Protect from burning ☐ 10. Control grazing ☐ 11. Plant recommended trees ☐ 12. Harvest trees selectively ☐ 13. Use only for wildlife or recreation area
	B. Depth of Soil ☐ 1. Deep ☐ 2. Moderately Deep ☐ 3. Shallow ☐ 4. Very Shallow		
	C. Slope ☐ 1. Nearly Level ☐ 2. Gently Sloping ☐ 3. Moderately Sloping ☐ 4. Strongly Sloping ☐ 5. Steep ☐ 6. Very Steep		
	D. Erosion-Wind and Water ☐ 1. None to Slight ☐ 2. Moderate ☐ 3. Severe ☐ 4. Very Severe		**B. Mechanical** ☐ 14. Control brush or trees ☐ 15. Terrace and farm on contour ☐ 16. Maintain terraces ☐ 17. Construction diversion terraces ☐ 18. Install drainage system ☐ 19. Control gullies ☐ 20. No mechanical treatment needed
	Interpretations of Soil Factors		
	E. Permeability ☐ 1. Rapid ☐ 2. Moderate ☐ 3. Slow ☐ 4. Very Slow		**C. Fertilizer & Soil Amendments** ☐ 21. Soil Amendments ☐ 22. Phosphorus (P) ☐ 23. Potassium (K) ☐ 24. Nitrogen (N) ☐ 25. Fertilizer or soil amendments not needed
	F. Surface Runoff ☐ 1. Rapid ☐ 2. Moderate ☐ 3. Slow ☐ 4. Very Slow		
	G. Major Factors that keep area out of Class I ☐ 1.Texture ☐ 5.Permeability ☐ 2.Depth ☐ 6.Runoff ☐ 3.Slope ☐ 7.Wetness ☐ 4.Erosion ☐ 8.Flooding ☐ 9. None		
	H. Land Capability Class ☐ 1. Class I ☐ 5. Class V ☐ 2. Class II ☐ 6. Class VI ☐ 3. Class III ☐ 7. Class VII ☐ 4. Class IV ☐ 8. Class VIII		