Land Judging in South Dakota

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Land Judging in South Dakota

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A systematic study of the soil is the basic tool for determining the capabilities and limitations of land. Land judging is used to teach and promote a better understanding of soils through a study of the physical properties of the soil and to show how to use these properties is determining proper land use. Most of the characteristics that are used to identify soils can be determined in the field.

The ultimate objective in land judging is land classification. After classification, the use to be made of the land and a treatment in accordance with this use is recommended.

Land is judged in the field by inspecting a vertical cross-section of soil (profile) in its natural state. The features that tell you about the character of the soil are determined by sight and by touch. To make the correct decisions you must understand what characteristics are involved in good and poor quality land.

Land Appreciation Schools

Land Appreciation Schools are usually held before a judging contest. In these schools you learn that soil depth, texture, permeability, slope, and other factors determine the class of land. This classification of land is the key for properly treating and using land. The names of conservation practices, what they are, and how they are used will also be learned. The schools usually are held anytime between April and October.

Land Judging Contests

Usually four fields are used in each contest and are numbered 1, 2, 3 and 4. One or more pits or holes are dug in each field, depending on the size of the participant groups. This provides the exposure of a vertical cross section of the soil to a 4-foot depth to aid in determining soil texture, depth, permeability, and erosion evaluation. A representative sample of topsoil and subsoil may be placed in a box near the pit to allow a better chance of examination. Some means of wetting the soil should be made available at the sites. (See Figure 1.)

The participant may be informed of the total number of conservation practices applicable to each field, the lay and slope characteristics of the field, as well as original top soil depth, results of soil tests and other pertinent information relative to the field. The following form provides such information:

Field No.

1. Assume soil tests show deficiencies in a. b. c. d.
2. Barnyard manure available.
3. Use management practices.
4. Pay no attention to practices on the field.
5. Thickness of original topsoil was ......... acres.
6. Size of field to consider is ......... acres.
7. Consider most intensive use of the land.
8. Other conditions are limiting factors.

The official placing for each field is done before the contest by soil scientists. Their decisions are recorded and given to the tabulation committee as the official placings for the scoring of the participants score cards.

Each participant is given a score card for each field to be judged. The name or contestant number, field number, and other information according to the instructions of the contest leader should be filled in by the participant.

Figure 1. Within each field a selected uniform sample area not less than 100 x 100 feet will represent the field. Sample areas do not have to be square. Flags or stakes will be set to indicate the boundaries and slope determination.

Use of the Score Card

In filling out the score card (see Figure 2) the participant will evaluate the seven soil factors necessary for determining the land capability class. These soil factors are surface texture, permeability, depth, slope, surface drainage, erosion, and surface stoniness.

After studying the facts given, feeling the soil, measuring it, and looking at it carefully, the decision as to the capability class in which the land belongs will be made.

Part I

The estimates of these factors are recorded on Part I of the score card. For example, under “Surface Texture,” if the contestant’s estimate is “Medium Texture,” the number 2 preceding the word “Medium” is checked. A soil factor must be regarded as being limiting if it cannot meet the Class I Land Capability standards. Consequently, any factor which limits the use of land is regarded as a “limiting factor” and should be marked by appropriate identity under the Limiting Factor heading on the score card. Once the number of limiting factors has been determined, the severity of any one or a combination, determine the “Land Capability Class.”

A guide for determining Land Capability Classes according to the severity of the limiting factors or combinations is presented in Table 1. Examples of combination factors that lower the capability class are found in Table II. Climate is considered a limiting factor in South Dakota with exception of lands in the eastern counties. (See Figure 3.) After the land capability class has been determined, the participant marks the land class number on the score card.

Acknowledgement: The authors wish to express appreciation for the helpful suggestions offered by members of the Plant Science staff, Vocational Agriculture and the Soil Conservation Service.
Part II is divided into three soil management practice sections—Vegetative, Mechanical and Supporting Practices for Erosion Control, and Fertilizer and Soil Amendments. It may be necessary to use practices from all three groups to properly treat the field.

Decide how the field should be used. For example, suppose in evaluating the factors of Part I, you found the land was Class III, you would find in the Land Capability Class definitions, the most intensive use for Class III is cultivation. This class could be used for pasture, but that is a less intensive use. Remember in Land Judging always choose the most intensive use for the Class of land selected in Part I. The first step would be to select from the list of practices, those necessary to conserve soil and maintain or improve productivity. Record these by number in the squares afforded on the card.

Figure 2. Land Judging Score Card

SCORE CARD

For Land Judging

Cooperative Extension Service
South Dakota State University
Table 1. Guide for Selecting Land Capability Classes in South Dakota

<table>
<thead>
<tr>
<th>Soil Factor</th>
<th>Best Land Class Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texture, (Surface)</td>
<td></td>
</tr>
<tr>
<td>Medium (Loamy Soils)</td>
<td>I*</td>
</tr>
<tr>
<td>Fine (Clayey Soils)</td>
<td>II</td>
</tr>
<tr>
<td>Coarse (Sandy Soils)</td>
<td>III</td>
</tr>
<tr>
<td><em>(a) Incoherent sands would be placed in Class VII</em></td>
<td></td>
</tr>
</tbody>
</table>

Permeability of Underlying Material (Internal drainage)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>I*</td>
</tr>
<tr>
<td>Slow</td>
<td>II</td>
</tr>
<tr>
<td>Rapid</td>
<td>III</td>
</tr>
</tbody>
</table>

Depth Favorable for Plant Roots (Surface and Subsoil)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep (36&quot; or more)</td>
<td>I*</td>
</tr>
<tr>
<td>Moderately Deep (20&quot; to 36&quot;)</td>
<td>III</td>
</tr>
<tr>
<td>Shallow (10&quot; to 20&quot;)</td>
<td>VI</td>
</tr>
<tr>
<td>Very Shallow (Less than 10&quot;)</td>
<td>VII</td>
</tr>
</tbody>
</table>

Surface Drainage (Runoff)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td>II</td>
</tr>
<tr>
<td>Excessive</td>
<td>III</td>
</tr>
<tr>
<td>Poor</td>
<td>IV &amp; V+</td>
</tr>
</tbody>
</table>

Erosion (existing)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>None to slight</td>
<td>I*</td>
</tr>
<tr>
<td>Moderate</td>
<td>II</td>
</tr>
<tr>
<td>Severe</td>
<td>VI</td>
</tr>
</tbody>
</table>

Stoniness

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>None to slight</td>
<td>I*</td>
</tr>
<tr>
<td>Moderate</td>
<td>IV</td>
</tr>
<tr>
<td>Excessive</td>
<td>VI</td>
</tr>
</tbody>
</table>

*Due to climatic conditions in South Dakota, Class I land is found only in the eastern part of the State; elsewhere in the state, the lands are either Class II or III. See Figure 3.
†When slopes approach 10 to 16% on “Loess” soils, lands may fall in capability Class IV, when no other factors are limiting other than slope and surface drainage (excessive).
‡Class V when permanent high water table exists, otherwise Class IV.

Eastern S.D. Central and Western S.D.

| Nearly level (0-3%) | I* II or III |
| Undulating (3 to 6%) | II III     |
| Sloping (6-10%)     | III IV     |
| Rolling (10-20%)    | VI VI      |
| Steep (20% or more) | VII VII    |

Scoring Land Judging

After Parts I and II have been finished, the score cards are collected. The work is then graded and scored by the judges. Points are awarded for each entry on the score card. The total number of points make up the participant’s final score for the field. The perfect score on a field is 60. Thirty points are given on Part I and 30 points for Part II. The perfect score for 4 fields is 240 points.

Here is an example of how judges award points on answers given by a contestant. Suppose Field 1 is cultivated cropland, is classified as Land Capability Class III, has a surface texture of silty clay, has a subsoil which is moderately permeable, is a deep soil, sloping, with none to slight wind and water erosion, and has excessive surface drainage. The following is an example of how judges may assign points to Field 1 for the official placing:

- Fine texture ........................................ 2 points
- Moderate Permeability .............................. 3 points
- Deep Soil ........................................... 3 points
- Sloping Slope ...................................... 4 points
- Slight Erosion ..................................... 4 points
- Excessive Surface Drainage ....................... 2 points
- Texture, Slope, Drainage—2 points............. 6 points

Each entry is evaluated under the specific heading for each practice.

Suppose you mark practices 1, 7, 18, and 25 from the soil management practices on the back of the score card. The judges may grade as follows:

- Practice Nos.: 1 7 18 25
- Points awarded by judges for each practice: 1 3 1 6

The total number of points bracketed under the squares totals 30, which is a perfect score in this particular example. Had you marked some practice or practices other than ones designated by the judging committee, fewer points would have been received, perhaps a zero. Judges emphasize the conservation practices having the most important bearing on each specific field problem. In certain localities, the judging committee may consider this practice worthy of more points. The judging committee is authorized to determine how many points should be awarded to the participants for each of their answers. Participants will have different ideas about conservation practices on a field. There may be occasions when the judging committee will consider optional practices for a field. It is suggested that points for the optional practice be less than the figure for the practice having the least number of points assigned.

Definition of Soil Factors

The important characteristics that can be learned from the study of a vertical cross section of a soil include physical properties such as the amount of moisture that the soil will hold for plants, the rate at which air and water move through the surface and subsoil, and the amount of soil that has been lost by erosion. From these factors then, it is possible to determine a best management system to be used on this particular kind of soil.
Table 2. Some Examples of Land Capabilities Classes with Combination Factors.

<table>
<thead>
<tr>
<th>Texture</th>
<th>Soil Depth</th>
<th>Permeability</th>
<th>Slope</th>
<th>Erosion</th>
<th>Runoff</th>
<th>Factors that keep land out of Class I</th>
<th>Land Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>sandy deep</td>
<td>rapid</td>
<td>nearly level</td>
<td>none-slight</td>
<td>sand</td>
<td>1,3,6</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>sandy deep</td>
<td>rapid</td>
<td>slumping</td>
<td>none-slight</td>
<td>good</td>
<td>1,3,4,5,6</td>
<td>IV (VI)</td>
<td></td>
</tr>
<tr>
<td>clayey deep</td>
<td>slow</td>
<td>nearly level</td>
<td>moderate</td>
<td>good</td>
<td>1,3,5</td>
<td>IV</td>
<td></td>
</tr>
<tr>
<td>clayey shallow</td>
<td>slow</td>
<td>rolling</td>
<td>moderate</td>
<td>excessive</td>
<td>2,4,5,6</td>
<td>VII</td>
<td></td>
</tr>
<tr>
<td>clayey shallow</td>
<td>slow</td>
<td>rolling</td>
<td>severe</td>
<td>excessive</td>
<td>1,2,3,4,5,6</td>
<td>VII</td>
<td></td>
</tr>
</tbody>
</table>

Factors in bold type indicate the combinations contributing to Land Class designations.

Figure 3. Land Capability Class as Affected by Climate

Surface Texture

The term "texture" normally refers to the topsoil. However, the texture of the subsoil should also be examined to assist in the evaluation of permeability. The texture of a soil influences its water holding capacity, the ease with which it may be tilled, and its ability to furnish nutrients to plants. Texture is the proportion of sand, silt and clay particles that make up the soil mass.

Sand, silt, and clay particles have been defined as having the following diameters: above 2 mm. (millimeters) is considered gravel and above 3 inches is considered stones; sand, between 2 mm. and 0.05 mm.; silt, between 0.05 mm. and 0.002 mm.; clay, less than 0.002 mm. An estimate of the texture of a soil in the field is made from feeling by pressing and rubbing moistened soil between the thumb and finger. Sand grains feel gritty and can for the most part be seen with the unaided eye. Silt produces a floury feeling when moistened and clay forms very hard lumps or clods when dry and is sticky when wet and can be "ribboned" or "leafed" when pressed. The soils take in water rapidly but lose it rather quickly and for this reason they are often quite dry. They are usually low in essential plant nutrients. Sandy soils generally are very susceptible to erosion if left unprotected. A limiting factor.

Medium Textured Soils (Loamy)

These soils contain a favorable mixture of sand, silt, and clay particles which makes it neither too coarse or too fine. It has a floury and somewhat gritty feeling when moistened and rubbed between the thumb and finger. It can be "leafed" or "ribboned" into short lengths of usually no more than one-half inch and may take a slight polish when pressed between the fingers. These soils are able to take in water at a moderate rate and are able to hold considerable water along with adequate air. They are quite easily worked and have a good capacity to supply nutrients to plants. Soil plant relationships are generally good on these soils when drainage is no problem. Not a limiting factor.

Fine Textured Soils (Clayey)

These soils contain a large proportion of clay particles which may impart some unfavorable characteristics. The soils tend to be sticky and plastic when wet and should be worked only when moisture conditions are just right. They can be "ribboned" into lengths longer than one-half inch easily and when pressed between the thumb and finger, will "leaf" readily and take on a high polish. These soils have a slow rate of water intake and proper aeration is a problem. Fine textured
soils do have advantages however, in that they have a much higher water holding capacity, and are able to hold and furnish more plant nutrients than moderate or coarse textured soils. A limiting factor.

Movement of Air and Water in Subsoil (Permeability)

Permeability refers to the capacity of the soil to permit air and water movement through the surface and the subsoil. Proper water-air relationships are necessary for favorable root development and normal plant growth. The physical properties of texture and structure largely influence the rate of movement of air and water through the soil. Soil structure refers to the arrangement of the soil particles. The individual grains are held together in aggregates of different sizes and shapes although soils do occur in which there is no apparent structure. The size, shape, and stability of these aggregates have a marked influence on the productivity of the soil, and offer clues to the permeability of the soil. It is important to remember however, that the structure of the soil can be modified by tillage whereas texture cannot. Listed in Figure 6 are the principle types of structure and soil conditions commonly found in South Dakota soils.

In addition to structure and texture, the color of the subsoil is a very important characteristic of permeability. Bright tan and brown colors are indications that the soil is well drained. If the subsoil contains a mottling of orange, red or gray spots of irregular pattern the soil may be somewhat poorly drained. If the subsoil is almost entirely gray it indicates slow drainage.

Slow Permeability

The rate of water and air movement in these soils is extremely slow, and they may remain wet for long periods of time. Generally fine textured or compact subsoils are present. Usually, they are very sticky and plastic when wet. Evidence of a massive soil condition or columnar and platy structures may be present. The colors of the subsoil may be dull gray or gray along with flecks of orange and red. A limiting factor.

Moderate Permeability

This represents a favorable condition for air and water movement in the soil. The colors of the surface and subsoils are bright and uniform with no evidence of mottling or irregular spotting. The texture of the subsoil is usually in the medium range although a somewhat finer textured condition may exist. The structure of the subsoil is generally prismatic. Not a limiting factor.

Rapid Permeability

Water and air move through these soils at a faster rate than desirable. As a result these soils tend to be droughty even under conditions of average rainfall. The colors of the subsoil are generally bright, uniform, and brownish. Usually the subsoils are coarse textured and a single grain soil structure exists. A limiting factor.

Depth Favorable for Plant Roots

The thickness of the soil available for plant root growth is important in planning a management system. The roots of most plants will penetrate 3 feet or more under normal conditions if no obstructions exist. Soils of less thickness than this restrict root growth since they may lack storage capacity for water and plant nutrients. Examples of materials of soil layers not penetrated by plant roots are very loose coarse sand, gravel, cobble, clay or silt pans, sandstone, shale bedrock, and bedrock. Classification as to depth favorable for plant root growth is determined by measurement of the distance from the surface of the soil to the limiting layer as follows:

- **Deep**—Soil 36 inches or more deep
- **Moderate**—Soil 20 to less than 36 inches deep
- **Shallow**—Soil 10 to less than 20 inches deep
- **Very Shallow**—Soil less than 10 inches deep

Any depth less than 36 inches deep becomes a limiting factor.

Slope

Slope refers to the number of feet fall in each 100 feet of horizontal distance. Slope is important because of its effect on water runoff and hence the potential ero-
Figure 6. Types of Soil Structure and Effects on Permeability.

Permeability Rating:  

**Single Grain**  
This represents a soil condition consisting of primarily sand sized particles which tend to remain separated. This type of condition is common in the more coarse textured soils, both surface and subsurface depths.

**Crumb or Granular**  
This type of structure consists of small, porous aggregates which tend to be somewhat rounded in shape. Granular aggregates form very desirable seed beds for crops and allow rapid entry of water in the soil. This type of structure is common for many surface soils in South Dakota.

**Blocky**  
This type of structure consists of aggregates clinging together in nearly square or angular blocks having sharp edges. Large blocks normally do not allow rapid entry of water in the soil. This condition is mainly found in the subsoil.

**Prismatic**  
This type of structure consists of aggregates in which the vertical faces or axes are longer than the horizontal faces or axes. The tops of the units are flat. This type of structure is common under conditions of moderate permeability and associated with the subsoil.

**Columnar**  
This type of structure is similar to prismatic. The main difference is that the columnar units have rounded biscuit like tops. This type of structure indicates conditions of slow permeability; in fact it is an indication of a soil layer in the subsoil that is not readily penetrated by plant roots.

**Platy**  
This type of structure consists of aggregates that have longer horizontal faces or axes than vertical faces or axes. The fragments are flat and thin. This type of structure is usually associated with an underlying impermeable layer of the subsoil.

**Massive**  
This represents a soil condition where there is no evidence of aggregation. The soil particles tend to stick together in no definite pattern or arrangement. This condition is usually found in the lower part of the subsoil and in wet spots of the surface soil.

**Nearly Level (0-3%)**  
This is land that is level or nearly level on which water runoff is fair to poor. The slope alone offers no difficulty in the use of farm machinery.

**Undulating (3-6%)**  
This is land that slopes gently and has no sharp breaks in steepness or direction of slope. Water runoff is good for most soils. All types of farm machinery may be used without difficulty as far as the slope is concerned. There is from 3 to less than 6 feet of fall per 100 feet of horizontal distance. A limiting factor.

**Sloping (6-10%)**  
This represents considerable slope and there may be some sharp changes in steepness or direction of slope. Water runoff is excessive for most soils. Practically all types of farm machinery can be used without too much difficulty in so far as slope is concerned. There is from 6 to less than 10 feet of fall per 100 feet of horizontal distance. A limiting factor.

**Rolling (10-20%)**  
This is strongly sloping or hilly land on which water runoff is excessive. Unless the slopes are very short and irregular, most farm machinery can be used, but with difficulty, especially for the heavier types. The slope ranges from 10 to less than 20 feet of drop per 100 feet of horizontal distance. A limiting factor.

**Steep (20% or more)**  
This represents a steeply sloping or very hilly soil area on which water runoff is excessive. Only the lightest types of farm machinery can be used; in most cases however, this becomes impractical altogether. There is 20 feet of more drop per 100 feet of horizontal distance. A limiting factor.

**Surface Drainage (Runoff)**  
Surface drainage refers to the relative rate of water removal from the soil. It is the relative rate of water removal that is in excess of the amount that can be absorbed by the soil. Hence, surface drainage is affected by permeability and slope.

**Poor**  
Water moves off these soils so slowly that the soils remain wet a large part of the time. A large part of the water received passes through the soil layers or evaporates in the air. Soils with a poor rate of surface runoff usually are level to concave, or deep permeable sand. A limiting factor.
Water runoff is at such a rate that a moderate amount of the water received enters the soil and free water lies on the surface for only a short time. Only a small amount of water received is lost by surface runoff. Usually the slope is practically nil. A limiting factor.

**Good**
This represents a condition of normal drainage. Surplus water is no problem on these soils. Water lost from the surface by runoff does not reduce seriously the supply available for plant growth. A considerable proportion of the water received enters the soil. Not a limiting factor.

**Excessive**
A large proportion of the water received on these soils moves rapidly over the surface. Surface water may be removed nearly as fast as it is added. Fields with slopes of 6% and above (except rapid permeable sandy soils) would fall into this category. A limiting factor.

**Erosion—Wind and Water**
Erosion is the wearing away of soil by the forces of water and wind. The amount of top soil lost through erosion is very important in determining how the soil should be used. Man, through his methods of using the land, is largely responsible for the soil losses that have occurred. Soils vary in their susceptibility to erosion.

Factors such as slope, organic matter content of the soil, crops grown, and other forms of soil management have an important effect on the erodibility of the soil and the amount of soil that has been lost.

The classes listed below are based on the amount of soil that has been lost in the past by erosion.

**None to Slight**
Less than 25% of the original surface soil has been removed by wind or water or by both. There is no evidence of gullies. Not a limiting factor.

**Moderate**
There has been from 25 to less than 75% of the original surface soil removed by erosion. There may or may not be gullies present including some of which may be uncrossable by farm machinery. A limiting factor.

**Severe**
Seventy-five percent or more of the original surface soil has been lost. There may be occasional uncrossable gullies and/or severe blowouts and accumulation of soil by wind. A limiting factor.

**Stoniness**
Stoniness refers to the relative proportion of stones over 10 inches in diameter in or on the soil. Stones have an important bearing on soil use because of their interference with the use of agricultural machinery. Stones also have another adverse effect in that they decrease the amount of soil for a given volume since they take space which ordinarily would be occupied by soil. This may be especially important in instances of thin soils. Classes of stoniness are outlined as follows:

**None to Slight**
Varies from no stones to stones sufficient to create some tillage problems but not to make intertilled crops impractical. Less than 1.5 cubic yards of stones per acre of area. (If stones are 1 foot in diameter and more than 30 feet apart, there are less than 1.5 cubic yards per acre foot.) Not a limiting factor.

**Moderate**
Sufficient stones to make tillage of intertilled crops impracticable. About 1.5 to 50 cubic yards per acre foot. (If stones are 1 foot in diameter and about 5 to 30 feet apart there are about 1.5 to 50 cubic yards per acre foot.) A limiting factor.

**Excessive**
Sufficient stones to make all use of machinery impracticable. There are over 50 cubic yards of stones per acre foot. (If stones are 1 foot in diameter and 5 feet or less apart there are 50 or more cubic yards per acre foot.) A limiting factor.

**Definitions of Soil Management Practices**

**Vegetative Practices**

1. **Use legumes and/or grass one-half of the time in the rotation.** A rotation system of soil conserving and improving crops grown on the field one-half of the time such as 1 year in 2, 2 years in 4, etc. This practice is normally used on Class IV lands.

2. **Use legumes and/or grass one-third of the time in the rotation.** A system of soil improving and conserving crops grown on the field one-third of the time such as 1 year in 3, 2 years in 6, etc. This practice is normally used on Class III lands.

3. **Use legumes and/or grass one-fourth of the time in the rotation.** A system of soil improving and conserving crops grown one-fourth of the time such as 1 year in 4, 2 years in 8, etc. This practice is normally used in Class I and II lands.

4. **Plow under crop residue.** This practice of complete turn under of crop residues is used on nearly level land that is not subject to erosion.

5. **Incorporate crop residue with the soil surface.** This practice of handling residues so that part of the material is mixed with the soil and part left on the surface. The chisel plow or heavy duty field cultivator are examples of implements that allow part of the residue to remain on the soil surface. Used for lands in the lower rainfall areas and on lands subject to some erosion. Use on Class II, III and IV land.

6. **Leave crop residue on the surface soil.** This practice provides for a protective cover by leaving crop residues of any previous crop as a mulch on the surface. Subsurface blade equipment with either five foot blades or multiple 30 inch blades are examples of implements to be used. Use on Class III lands having a coarse or fine texture limitation.

7. **Establish tree belts.** Plant recommended trees in belts to reduce wind erosion. Use when wind break protection is indicated as needed. This practice is usually called for on the coarse textured surface soils subject to blowing.

8. **Establish recommended grasses and/or legumes.** Used on land not suitable for cropping because of erodibility, wetness, stoniness, or low fertility. This practice is used on Class V, VI, and VII lands.

9. **Control Grazing.** This is a practice of carrying out
a system of grazing that will maintain or improve desirable vegetation on pasture and range; deferred grazing, rotation grazing, and proper stocking are some of the practices included. Use on Class V, VI, VII lands.

10. Renovate and seed recommended mixtures. Implies to kill out old sod, and through cultivation and fertilizing, reseeding back with recommended mixtures. Use on Class V, VI, and VII lands when instructed to pay attention to the existing practices on the field.

**Mechanical and Supporting Practices for Erosion Control**

13. Diversion terrace. A channel with a supporting ridge on the lower side. It is built across the slope on a gentle grade. A diversion terrace intercepts water from the slope or land above and carries the water off to a safe outlet. Use with lands when overhead water or water from adjacent land is a problem.

14. Use wind strip cropping. The use of alternate strips of grain crops, row crops, and/or summer fallow approximately same width. The system should be nearly at right angles to the prevailing winds. Use on coarse and fine textured surface soils subject to wind erosion.

15. Farm on the contour. Perform field operations such as plowing, planting and cultivation on the contour or at right angles to the slope. Use on lands of 3 to 6% slope.

16. Terrace and farm on contour. A channel and ridge of earth constructed across the slope approximately on the contour to intercept runoff and reduce erosion. Terraced land should be farmed parallel to the terrace. Use on tilled lands of 6% or more slope, unless soil is coarse texture, then use practice 6.

17. Install drainage system. To remove excess surface or ground water from land by means of open ditches or tile drains.

**Fertilizer and Soil Amendments**

19-24. Use Field Condition Information and Soil Analysis as a basis for fertilizer and soil amendment recommendations. If soil tests show one or more primary plant nutrients deficient, select the appropriate.

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**Definitions of Land Capability Classes**

<table>
<thead>
<tr>
<th>Land Capability Classes</th>
<th>Suited for Cultivation</th>
<th>Land limited in use—generally is not suited for cultivation; suited for grazing, forestry or wildlife food and cover.</th>
<th>Land not suited for cultivation, grazing, or forestry.</th>
<th>Class VIII—Suited for wildlife, recreation, or watershed protection. Consists of marshlands, badlands, and saline barren lands.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I—Very good land; few or no limitations; can be cultivated safely with ordinary good farming practices. There are no serious climatic hazards.</td>
<td>Class V—Good hay or pasture land, but too wet for cultivation. Normally bottomland soils with high water tables or subject to frequent flooding.</td>
<td>Class VI—Growth or utilization of vegetation moderately limited by steep land characteristics or shallow restrictive claypan; generally good to moderately good grazing lands.</td>
<td>Class VII—Growth or utilization of vegetation severely limited by extremely steep land characteristics, excessive stoniness, incoherent sandy soils or very salty lowland; generally fair to poor grazing land.</td>
<td></td>
</tr>
</tbody>
</table>