

Guide for Applying Conservation Treatments for Land Evaluation

(Last updated 8-14-2018 by Erika Hill, NARD)

LAND TREATMENT

After examining and determining the physical features of the soil profile, one can determine the land capability class. The land capability class indicates the most intensive agricultural use for which it is suited. Part 2 of your scorecard contains some of the land treatments commonly used in Nebraska.

Nebraska has a wide variation in climate and soils. Therefore, recommendations for land treatment may vary across the state. The practices and their application have been generalized to fit as broad an area as possible, some counties may apply these practices differently. Some areas may have their own set of rules for applying a treatment practice, and these are noted by county or land evaluation area. For contest scoring purposes, this document will be the final say in settling any disputes.

From the listed land treatments, choose the proper conservation practices that should be used or considered for use to conserve both the soil and water and to maintain or improve the productivity of the land.

Land Treatments

Land Capability Class

- 1. Row crop/occasional soil conserving crop.** Cultivation including row crops three-quarters of the time (nine out of 12 years): Use a cropping system of row crop in rotation with stubble (left standing) Use conservation over winter until seedbed preparation. Use this practice on all Class I land and on Class II land with 0 to 1 percent slopes in Hall, Adams, Webster, Buffalo, Kearney, Franklin, Dawson, Phelps, Harlan, Gosper, and Furnas counties. Not used in the West area.
- 2. Row crop not more than 2 out of 4 years.** Cultivation including row crops half the time (six out of 12 years): Use a conservation cropping system of row crop rotation. With stubble left standing over winter, use a conservation tillage system of 20 percent ground cover after crops are planted. Use on Class II land in all areas, except counties noted in No. 1 & 5.
- 3. Row crop not more than 2 out of 6 years.** Cultivation including row crops one-third of the time (four out of 12 years): Use a conservation system of row crop rotation. With stubble left standing over winter, use a conservation tillage system of 50 percent ground cover after crops are planted. Use on Class III land in all areas, except counties noted in No. 5.
- 4. Row crop not more than 1 out of 4 years.** Occasional cultivation, including row crops one-quarter of the time (three out of 12 years): Use a conservation cropping system of row crops, close growing crops and meadow crops in a rotation. Maintain a conservation tillage system of 75 percent ground cover after crops are planted. Use on all Class IV land in all areas.
- 5. Continuous cultivation, wheat fallow and/or chemical fallow:** Use on Class II and III land in the West area and in Keith, Perkins, Chase, Dundy, Lincoln, Hayes, Hitchcock, Frontier, and Red Willow counties.

6. **Permanent vegetation.** Use on all Class V, VI, and VII land in all areas

7. **Use only for wildlife and recreation.** Use on all Class VIII land in all areas.

Cropland

8. **Practice conservation tillage.** Use on all Class I, II, III, and IV in all areas.

9. **Do not burn crop residue;** Practice crop residue management. Use on Class I, II, III, and IV land in all areas.

10. **Return Crop residue to the soil.** Use of a stubble mulch or similar farming system and leaving crop residue on the surface provides a protective cover for the soil. Use on all cropland in all areas

11. **Practice field/contour strip cropping:** Use on all Class I, II, III, and IV land in the West area. Use on Class III and IV land in all other areas where terracing is not feasible due to coarse and very coarse soil textures (control section).

12. **Plant a field windbreak for wind erosion control:** Use on coarse and very coarse textures on land classes II, III, and IV where field strip cropping for wind erosion control is used. Use on all land classes and all textures in the West area.

13. **Terrace and farm on contour:** Terrace land classes II, III, and IV in all areas with slopes over 2%, except coarse and very coarse soils where terracing is not feasible due to the coarse and very coarse soil texture (control section). Do not use on gravity irrigated soils in the West area. A terrace is an embankment or ridge of earth constructed across the slope to control runoff and minimize erosion. Do not use where overhead water is stated as a problem.

14. **Maintain terraces:** Use practices that keep terraces working effectively. Mark this practice if No.13 or No. 16 are marked

15. **Establish/maintain grassed waterways or tile drains:** Use with practice 13 or 16. Use this practice whenever terraces, diversion or sediment basins are present or need to be installed to control water erosion or runoff water on 2% slope or more. Terraces, diversions and sediment basins need a suitable outlet for runoff water that is intercepted. The outlet can be either a grassed waterway or tile. In recent years tile outlets have become very popular with landowners who are building terraces, diversions or sediment basins, as the means of getting intercepted water emptied from these structures. **Do not use in the West and Southwest areas.**

16. **Construct diversion or sediment basins:** Use only if foreign (overhead) water is a problem.(This problem will be stated by the judges). A diversion or sediment basin is a channel with a supporting ridge on the lower side. It usually has greater horizontal and vertical spacing and is constructed to handle a larger flow of water than normal field terraces. Use on land classes I, II, III, and IV where applicable. Diversion or sediment basins are not used on Floodplains. Treatment 13 is not used with this practice.

17. **No mechanical treatment needed:** Used on land classes I, II, III, and IV where mechanical practices are not recommended. Will be checked if none of treatments 13, 14, 15, or 16 are used.

Rangeland – Wildlife

18. Use prescribed burning; Use on all Land classes V, VI, VII, and VIII.

19. Mow or spray for weed control: Use this practice on classes V, VI, and VII if invasive or noxious weeds are present.

The following weeds are hereby officially designated as noxious:

- Canada thistle
- Leafy spurge
- Musk thistle
- Plumeless thistle
- Knapweed
- Purple loosestrife
- Saltcedar.

The following species are considered invasive:

- Crown vetch
- Dalmatian toadflax
- Whitetop species
- Houndstongue
- Multiflora rose
- Sericea lespedeza
- Perennial pepperweed
- St. John's Wort
- Caucasian bluestem.

20. Control brush or trees: This may be accomplished with chemicals and/or use of machinery. Use with Class V, VI, VII land when undesirable brush and trees are a problem. Brush and trees are defined as woody perennials. Woody perennials are not always undesirable. Red cedars, Elm, Russian olive, Salt cedar, sand sagebrush, serviceberry, buckbrush and yucca are common woody plants across Nebraska's range and pastureland. (Salt cedars are always undesirable.) However, cedars, elm, and Russian olive are often present in windbreak plantings. These are desirable instances of these plants. Undesirable instances are where seedlings establish outside a windbreak planting and any one individual tree either gets too large to control by grazing [trunk diameter at 4 foot: greater than 1 inch] or percentage of ground cover [brush and/or trees] is in excess of 10% of the area being judged. In the drier parts of Nebraska (SW-area, West-Area, North Central area) where droughtiness is a constant threat to the range; woody species such as yucca, sand sagebrush, service berry, and even buckbrush become a desirable part of the prairie (capturing snow and reducing wind scouring—even preserving remnants of more palatable species during drought within their canopy) where the range is thin due to very steep slopes and or wind erosion.

21. Proper pasture or range management: To encourage the growth of desirable grasses and legumes to crowd out weeds and brush. Use on all Class V, VI, and VII lands

22. Establish recommended grasses or grass legume mixture: Use for land classes V, VI, and VII if reseeding is necessary. Specifically, if now in cultivation or if the field has a poor stand of grasses. Poor stand is defined as less than 25% of the ground area is covered by desirable grasses.

23. Defer grazing until cover is adequate. Use this practice on land classes V, VI, VII, if pasture or range has been overgrazed, more than 60 percent of the forage production has been removed or use on all reseeded areas, when No. 22 has been marked.

24. Graze to utilize up to 60 percent of total forage production: Use on land classes V, VI, and VII if area has had proper grazing. Not used if No. 23 is used.

25. Control gullies: Use on land classes VI and VII if erosion control structures or shaping and seeding of gullies is needed. Gullies need control if there is enough erosion that some vegetation is missing or head cuts are present. Use one or more conservation practices that will adequately control runoff and erosion

26. Enhance wildlife habitat and recreation. Use for Class VIII land.

Fertilizer and soil amendments

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

pH

27. pH-soil amendments. For the contest, when any pH value given for a field is 6.4 or less or is above 8.0, soil amendments need to be applied (**Neb-Guide G92-1096-A, Understand Your Soil Test: pH-Excess Lime-Lime Needs**).

Soils with pH's of 5.5 (NC-5) or less are usually soils requiring lime. However, lime is recommended on soils with pH's up to and including 6.4. Above this pH, no lime is recommended as profitability is reduced. Soils with a pH greater than 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. The treatment of saline/alkali conditions can be very complicated, and results are not always economically successful.

Nitrogen (N)

28. Nitrogen. Nitrogen will be given as adequate or deficient without a numerical value. No. 28 = Nitrogen on the scorecard is checked when deficiency is indicated.

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

Phosphorous (P₂O₅)

29. Phosphorous. For the contest, when the phosphorous value given is 60 lb./ac. for Bray P-1, or less, phosphorous should be applied (Neb-Guide G74-174A, Fertilizer Suggestions For Corn)

Low levels of phosphorous in Nebraska soils are 30 lb./ac. or less Bray P-1. However, soils with phosphorus levels up to 60 lb./ac. Bray P-1 do require the addition of phosphate for maximum production.

Potassium (K₂O)

30. Potassium. For the contest, when the potassium value given is 250 lb./ac., or less, potassium should be applied. (**Neb-Guide G74-174A, Fertilizer Suggestions For Corn**).

Soils with potassium levels of 250 lb/ac or less are considered deficient and require the addition of potassium. Potassium is recommended to some extent on soils with as much as 250 lb./ac. for certain crops, but above that level no potassium is added.

Example

Soil test information shows:

(If phosphorous or potassium are given in ppm, it is assumed that this applies to the top 6 in. of soil, which has a weight of about 2 million lbs./ac.; 1 lb./ac. = 2 ppm)

pH - 5.5

Nitrogen - Deficient

Phosphorus - 30 lb./ac.

Potassium - 325 lb./ac.

31. Fertilizer or soil amendments not needed. Will be checked when none of the fertilizer or soil amendments are needed. Marked only if 27-30 are not marked.

General Instructions and Interpretations

Contestants are usually familiar with conditions in their own area. However, depending on where contests are held, or in the cases of the state and national contests, some explanation is need to detail those items that may have local variations.

Present Practices or Cover on the Land

Disregard practices on the land at the time of the contest. Vegetation (ie; weeds, brush and trees) in the judging site are used to judge the practices on class I to VII. If an area is being used for a less intensive use than its potential, it is necessary to remove trees and timber to reach the most intensive use. If terraces are already in place on the field and they would be recommended, then "install terraces" would be checked, even though they already exist.

Overhead 'Runoff' water: Overhead water is water flowing across the area from a higher landscape position. Overhead water is normally only present during the storm event when excess water is flowing off the higher landscape position. Diversion terraces are usually constructed on a large scale and are not farmed. Practice no.13 is not used for diversion. Diversion terraces are not constructed on floodplains for control of flooding. This condition, overhead water, does not take the area out of Class I but would require a diversion terrace.. Flooding is overflow water from natural drainage system. Flooding may occur a significant time after the storm event and floodwater may remain for an extended amount of time.

The purpose of terraces are to control runoff while it is still sheet flow. We terrace soils, therefore, (preferably) from the top of a drainage basin first and then progressively further down. They are used to slow down the water before it becomes concentrated into rills and gullies. In contrast, a diversion structure is used after the runoff water has become concentrated and terracing can no longer prevent or control this concentration. A diversion is constructed to protect highly valuable farmland from gully erosion and or sedimentation below the steeper hill(s).

Surface layer thickness

The solum of the soil refers to the topsoil and subsoil (transitional layer if no subsoil is present). The topsoil should include all „A’ horizons. The „A’ horizon is primarily separated from the subsoil (ie, „B’), transitional layer (ie. „AC’) or underlying material (ie. ‘C’) by one or more of the following indicators;

- a. Color changes and becomes significantly lighter, ie. Dark brown to brown
- b. Structure changes from granular to subangular or angular blocky
- c. Texture shows a definite increase in clay content, may also be determined by significant increase in resistance to penetration.
- d. Distinct stratification is present from deposition by wind or water

For the land evaluation these indicators will be used for determining the present thickness of the surface soil. The field instructions may indicate that overburden has been deposited on the surface by wind, water or gravity. It will be inferred that no erosion has taken place on this field when the field instructions state overburden is present. The present surface thickness will then be determined on the profile using the four indicators. It may include the buried original surface if it is not separated from the present surface by any layer which meets the requirements of the four indicators.

Area map for Land Evaluation Contest

