NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
GRAZING LAND MECHANICAL TREATMENT
(Acre)
code 548

DEFINITION

Modifying physical soil and/or plant conditions with mechanical tools by treatments such as; pitting, contour furrowing, and ripping or sub-soiling.

PURPOSES

This practice should be applied as part of a conservation management system to support one or more of the following purposes:

- Fracture compacted soil layers and improve soil permeability.
- Reduce water runoff and increase infiltration.
- Break up sod bound conditions and thatch to increase plant vigor.
- Renovate and stimulate plant community for greater productivity and yield.
- Reduce nutrient runoff and increase infiltration of animal wastes.

CONDITIONS WHERE THIS PRACTICE APPLIES

This standard may be applied on pastureland, rangeland, hayland, grazed forest, and native pastures.

CRITERIA

General Criteria Applicable For All The Purposes Stated Above.

Mechanical treatments such as chiseling, ripping, aerating, or plugging will be designed and applied in a manner to accomplish the desired objectives and address the natural resource concerns. These treatments will be limited to soils and slopes where surface disturbances will not result in unacceptable levels of soil erosion and/or sedimentation.

Areas to be treated will be relatively free of undesirable or noxious plants that are likely to increase because of surface disturbance. Soil mineralogy and soil conditions will be taken into account to ensure that the desired effects will result from application of this practice. Fine textured soils will clod excessively if conditions are too dry and compact if too wet. Stoney soils will damage equipment and leave very rough surface conditions.

Chiseling and ripping operations should be done in such a manner as to shatter restrictive layers with a minimum of surface disturbance. To minimize disturbance in sod pasture it may be desirable to run a coulter ahead of each chisel. Application of this practice should not destroy the turf or disturb more that 50 percent of the existing plants. Sod forming grasses can generally be chiseled on a closer spacing than bunch grasses.

Aeration and plugging should be done when soil moisture is adequate to allow opening of the sod but limited enough to prevent compaction. On implements that allow pitch on the knife gangs, care should be taken to limit disturbance to less than 50 percent of the existing cover.

Desirable forage species will be of sufficient quantity and have a distribution pattern that allows the plants to take advantage of the improved moisture and to spread into disturbed areas. Where the density of desirable grasses is not adequate, seeding is required.

When seeding is performed, seed the effected area at a 100% seeding rate. *(i.e. 2 foot disturbed area every 20 feet. The 2-foot area is seeded at 100% but the pasture will only receive a 10% seeding rate.)* Refer to the Range Planting Standard for seeding rates of accepted species.

Adequate rest from grazing will be applied to ensure desired plant responses from this treatment

NRCS, TX
September, 2008

Generally, the treated area should be deferred from grazing from the date of application until November 1 in the application year and from March 15 to November 1 the following year. If treated areas are included within a prescribed grazing system, which ensures adequate periods of rest and moderate utilization rates to improve plant vigor, then no season-long deferment is required.

Criteria for Contour Furrowing

1. Best suited to sites where the soil surface characteristics prevent or retard water infiltration.

2. Applicable on moderately fine, medium and moderately coarse textured soils with less than 20% slopes.

3. Furrows will be constructed on the approximate contour.

4. Minimum depth of furrows will be three inches.

5. Minimum width of furrows will be six inches.

6. The horizontal interval should not exceed 10 feet on slopes of 10% or less. On slopes greater than 10%, restrict spacing to no more than 1.0 foot of vertical interval.

7. Horizontal interval should be decreased as average rainfall increases.

Criteria for Renovation by Ripping, Chiseling, Disking or Other Means

1. Most applicable where soil compaction and/or restrictive layers prevent infiltration and deep percolation.

2. Limited to fine, medium and coarse textured soils with no more than a 20% slope.

3. Operation will be done on the approximate contour.

4. Depth of the ripping operation should be determined by finding the depth of the most restrictive soil layer. The minimum depth of any operation should be 4 to 6 inches for disking and 6 to 10 inches for ripping. On shallower soils, the majority of the A and B horizons should be fractured. Extremely rocky soils should not be ripped.

5. Soil moisture should be sufficient to allow for adequate penetration and disturbance by the ripper or chisel points, yet dry enough to promote thorough fracturing of impervious soil layers.

6. Chisels or ripper shanks should be spaced 5 to 30 feet apart based on slope, average rainfall, and objectives of the landowner. Economic resources of landowner will affect spacing. Spacing of ripped trenches should not exceed 1 foot of vertical slope interval. For renovating deteriorated improved pastures where there is little vegetative cover, excessive soil capping and signs of excessive runoff, it may be desirable to chisel with chisel shanks spaced 2 to 4 feet apart to create seedbeds for new plant establishment and to enhance rainfall infiltration.

7. On sod forming grasses, such as bermudagrass, chisels should be spaced between 30 to 40 inches apart and run between 5 to 10 inches deep depending upon the soil and depth of compacted layer.

8. This practice is not applicable where excessive density of trees and shrub roots will impede equipment.

Criteria for Pitting

1. Can be considered as an alternative to contour furrowing.

2. Limited to fine textured soils with few stones in the upper part of the profile and where slopes are less than 20 percent.

For maximum benefits, there should be mid to tall climax species present that have the potential of increasing in the community. Otherwise reseeding should be applied concurrently with the pitting operation.

CONSIDERATIONS

Range Planting, Pasture and Hay Planting, Prescribed Grazing, Pest Management, and Nutrient Management may be used in conjunction with Grazing Land Mechanical Treatment.

Mechanical treatment may not be desirable on areas to be used for recreation due to enhanced surface roughness of the site.

Time of the year, depth of ripping, and spacing of shanks will be considered when planning this practice on wet surface soils with traffic pans.

Implements will be of a design that will limit sod inversion and/or soil heaving such as, but not limited to, rippers, paraplows, aerators, or pluggers.

When this practice is applied to enhance infiltration of liquid slurry or dry animal waste the practice will be applied immediately prior to the waste application. This will increase infiltration while decreasing dust from dry manure where mechanical treatment is applied after manure spreading.

Addition of fertilizer and soil amendments may be done in conjunction with grazing land mechanical treatment.

Consult the Nutrient Management Standard code 590 when applications of animal waste or fertilizer and mechanical treatments are planned for or near riparian areas.

Aeration with spike or blade type aerators may be applied to pasture land as needed but not more than two times a year. Aeration is usually limited to sod forming grasses and may be planned to coincide with fertilizer and/or irrigation.

Timing of treatments will vary depending on soil type, soil moisture, and vegetation conditions. Treatments should be done when damage to plants will be minimal and plant response will be quickest.

All treatments should be planned on the contour when conditions warrant.

PLANS AND SPECIFICATIONS

Specifications for installation of Grazing Land Mechanical Treatment will be prepared for each site or planning unit according to the criteria and operation and maintenance of this standard. Specifications shall be recorded using state developed specification sheets, job sheets, narrative statements in conservation plans, or other acceptable documents.

OPERATION AND MAINTENANCE

Implementation of a good prescribed grazing plan is essential for the long term operation and maintenance of this practice. If the desired effects of this practice are lost over time, the practice should be reapplied.

Surface disturbance may cause undesirable weeds to germinate. This may require pest management by timely application of herbicides, mowing, or flash grazing (in special situations).

APPROVAL AND CERTIFICATION

GRAZING LAND MECHANICAL TREATMENT

(ACRE)

CODE 548

PRACTICE STANDARD

PRACTICE STANDARD APPROVED

/s Kent Ferguson — September,22, 2008

State Range Management Specialist — Date

This practice standard is needed in _____Field Office.

_____ — _____

Natural Resource Manager — Date

CERTIFICATION:

Reviewed and determined adequate without need of revision.

_____ — _____

Zone Range Management Specialist — Date

_____ — _____

Zone Range Management Specialist — Date

_____ — _____

Zone Range Management Specialist — Date

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