GRAZING LAND MECHANICAL TREATMENT SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE

Soil that is excessively compacted is limited in its ability to function. Soil compaction occurs when moist or wet soil particles are pressed together and the pore spaces between them are reduced. Adequate pore space is essential for the movement of water, air, and soil fauna through the soil. Compaction restricts infiltration, resulting in excessive runoff, erosion, nutrient loss, and potential water-quality problems. Refer to Soil Quality Agronomy Technical Note No. 7 for more information on soil compaction.

DETECTING SOIL COMPACTION

Generally, compaction is a problem within the top 24 inches of the soil. Signs of compaction are:

Discolored or poor plant growth

Excessive runoff from sloping areas

Excessive water standing on the surface on flat or depressional areas

Soil surface saturated for long periods of time

Difficulty penetrating the soil with a firm wire (survey flag

Lateral root growth with little, if any, penetration of roots into compacted layers.

Platy, blocky, dense or massive layers

Penetration resistance with a commercially available cone penetrometer. There are potential penetration problems at 145 psi or greater.

CONDITIONS WHERE THIS PRACTICE APPLIES

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.

Areas to be treated will be relatively free of undesirable or noxious plants that are likely to increase because of surface disturbance. Should undesirable or noxious plants increase following treatment, pest management by timely application of herbicides, mowing, or flash grazing may be required. Refer to the Louisiana NRCS Practice Standard and Specification for Pest Management (595) for information and guidelines on the control of competing or undesirable vegetation.

Sufficient desirable species should be present that have a potential for increasing in the plant community as a result of the mechanical treatment and subsequent management. 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 spread into disturbed areas. Where the density of desired grasses is such that seeding or replanting is required, refer to the Louisiana NRCS Practice Standard and Specifications for Pasture and Hay Planting (512), Range Planting (550).

Implementation of a prescribed grazing plan is essential in achieving the desired effects of this practice. A prescribed grazing plan must be initiated at the time of practice installation. Refer to Louisiana NRCS Practice Standard and Specification for Prescribed Grazing (52) for further information on grazing management.

TREATMENT METHODS

Disking. Disking is most applicable on sites where vegetation composition is the concern due to soil compaction. Disking only applies to plants that will make a quick recovery following treatment such as bermudagrass and where the compacted layer is less than 6 inches deep.

Suitable equipment includes offset disk, one-way plow or similar equipment. Depth of disking will be 4-6 inches.

Subsoiling or Chiseling. Use the appropriate equipment (select a proper subsoiler shank for the desired amount of soil mixing and residue cover) and chisel or subsoil when the soil is dry enough for the equipment to properly fracture the compacted layer but moist enough for the equipment to pull the shank. Best results are usually obtained in the fall when soils are normally driest and shatter easily. Chiseling or subsoiling when the soil is too dry will disturb more surface soil, and subsoiling when it is too wet will not fracture the compacted layer, thus wasting the trip.

Subsoil or chisel to the dept of the compacted layer. Examine the soil profile to determine the dept of the compacted layer and plan to subsoil or chisel 1 inch below the zone. Use chisels for depths less than 16 inches or subsoilers for depths greater than 16 inches. The spacing between the shanks of the subsoiler or chisel should be no greater than 40 inches.

Deep Ripping. Deep ripping is most applicable on sites where soil compaction and/or restrictive layers are too deep to be mediated with disking or chiseling. Suitable equipment for deep ripping includes a construction ripper or agricultural type subsoiler.

Depth of treatment will be from 10 to 30 inches. Ripping can be conducted when the soil is dry, soil moisture content less than 30% of field capacity at the maximum ripping depth.

Aeration and Plugging. Aeration or plugging may be used only on sod forming grasses. Aeration and plugging is most applicable on sites where soil surface compaction resulting from livestock or equipment traffic is retarding water infiltration and creating accelerated runoff.

Aeration with spike or blade type aerators may be applied to pastureland as needed, but not more than two times a year. On implements that allow pitch on the knife gangs, care will be taken to limit disturbance to less than 50 percent of the existing cover.

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