

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

TREE/SHRUB SITE PREPARATION

(Acre)

CODE 490

DEFINITION

Treatment of areas to improve site conditions for establishing trees and/or shrubs.

PURPOSE

- Encourage natural regeneration of desirable woody plants.
- Permit artificial establishment of woody plants.

CONDITIONS WHERE PRACTICE APPLIES

On all lands needing treatment to establish trees and/or shrubs.

CRITERIA

GENERAL CRITERIA APPLICABLE TO ALL PURPOSES

The method, intensity, and timing of site preparation will match the limitations of the site, equipment, and the requirements of the desired woody species.

An appropriate site preparation method will be chosen to achieve the intended purpose and to protect desirable vegetation, site and soil conditions. Other complementary practices and measures will be used as necessary to control erosion, runoff, compaction and displacement to acceptable levels. Comply with Oklahoma's Forestry Best Management Practices.

Remaining slash and debris shall not create a habitat for harmful levels of pests. Measures will be implemented to control locally invasive and noxious species that may arise due to site

preparation activities. If pesticides are used, refer to the Oklahoma NRCS Pest Management (595) standard.

Remaining slash and debris shall not hinder needed equipment operations or create an undue fire hazard. It shall be removed or eliminated as appropriate. Refer to the Oklahoma NRCS Slash Treatment (384) standard.

Comply with applicable federal, state, and local laws and regulations during the installation, operation and maintenance of this practice.

Mechanical Treatment

Mechanical site preparation involves the use of machinery such as dozers, tractors, and skidders to remove or reduce logging debris and competing vegetation for regeneration purposes. Initial costs of treatment should be weighed against future returns. Too intensive a treatment may not be economical, even though the result is an increase in volume.

On droughty soils with limited organic material, intensive site preparation may increase survival at the cost of later growth.

Ideally, proper site preparation reduces competition without removing or destroying topsoil and organic matter.

Site factors that could restrict the use of equipment are steep slopes, rocks, heavy debris, soil texture, and excessive soil moisture. Protect streamside management zones and intermittent stream channels from all unnecessary soil disturbances with all mechanical treatment. Do not plan site

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [electronic Field Office Technical Guide](#).

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preparation within 50 feet of a perennial or intermittent stream.

Disking and Furrowing. This method is most successful where a heavy sod is present. It can be used on cleared lands, pastures, and areas with small widely scattered brush. In light sod, disking and furrowing usually are not needed. A scalper on the tree planter can remove the grass competition and clear trash from its path in one operation. Disk only area where planting is to be done or vegetative competition needs to be controlled. Do not disk on slopes of 10 percent or more.

Disking or plowing should be done on the contour.

Root raking and bulldozing. Much of the topsoil and organic matter that is supposed to sift between the tines of a root rake is swept along with the woody material and deposited in or near the windrows. These windrows should preferably be on the contour.

Where soils are highly erodible, low in nutrients, or on slopes greater than 10 percent, the adverse effects of dozing may outweigh any advantages.

Shearing Blade Mounted on Dozer. Shearing involves cutting of trees and vegetation at the ground line using tractors equipped with angled or V-shaped shearing blades. This is often the best means of removing large numbers of stems too large for disking or drum chopping. It is best suited on fairly rock-free soils with a gentle slope and relatively large amounts of unmerchantable material to be removed.

This practice can be applied on relatively stable soils on steeper slopes if applied with care to avoid soil damaging situations. A root rake or dozer blade is used in conjunction with this practice in order to pile or windrow debris. These large piles of debris are slow to deteriorate. They also occupy more planting site area and result in more loss of topsoil through pushing of material farther across the ground. Minimizing size of windrows should be considered. Windrows should be placed on the contour when possible. They should be as narrow as possible and leave openings to facilitate planting and fire-fighting equipment.

Windrows may be burned prior to planting or seeding.

Areas that have been repeatedly passed over with heavy equipment to the extent that the surface soil has become too compacted for normal plant growth should be loosened with a deep tillage implement.

Chopping. A chopper is a large rolling drum with sharp blades attached that is pulled by a dozer. The drum can be filled with water to add weight for crushing the brush as it rolls over it and chops it up. Two passes may be needed in heavy brush.

This method is best suited on level or gently rolling areas where the timber present is <5 inches DBH. It works best with species that don't resprout easily. Prescribed burning normally should follow the final chopping operation in order to be most effective in controlling resprouts, refer to the Oklahoma NRCS Prescribed Burning (338) standard.

Mowing. Late in the growing season vegetation can be mowed closely to prepare sites for tree planting. This is beneficial on weedy, idle cropland or areas of tall grass that are to be planted in trees.

Root Plow. The subsurface method of attacking the roots is a good one. Oak sprouts originate at or above the root collar so the root plow severing roots below this point is effective. Efficiency of the operation improves when cut roots are turned up at the soil surface then chopped by disking.

Soil Ripping. It can be used on areas where seedlings are to be planted to increase moisture infiltration and improve seedling survival. This is provided that the soil type will permit this operation without creating additional harvesting problems such as turning up large rocks.

Soil ripping should be done on the contour with a 10 ft. spacing between rip lines (ripper should have at least 2 shanks approximately 10 ft. apart). Rips should be a minimum of 18 inches deep. This practice usually requires the equivalent of a D-8 dozer or larger.

The equipment operator must be able to move over stumps without pulling the ripper teeth up more than the minimum allowable ripping depth

of 18". Ripping teeth will be less than 6 inches in width and will not have a sweep point or disc attachment that would turn the soil.

Ripping will be done when the soil is well drained and not wet. The site should be ripped at least 2 months prior to planting the seedlings.

Sites will be burned prior to ripping, refer to the Oklahoma NRCS Prescribed Burning standard and specification (338).

Tractors will not be operated over or in a stream course with a defined channel except at designated crossings.

Chemical Treatment

Site preparation with herbicides will cause the least amount of soil erosion. Things to consider when selecting an herbicide include checking for environmental restrictions, cost, soil type, terrain, crop species, and target species and their growth rate.

Herbicide can be applied by broadcasting, banding, or single stem treatment.

Broadcast applications can be done by aerial spraying or by equipment on the ground if the site is properly cleared. The chemical can be sprayed in a banded strip at least 3' wide where the tree row will be located with a sprayer on the ground. Treatment should be considered when the hardwood stem count is greater than 100 trees per acre or when the ground cover of competing vegetation is greater than 60%.

Avoid direct entry of chemicals into water bodies or flowing waters. Apply all chemicals in accordance with the label instructions.

Herbicides can be used to kill individual undesirable species of trees by injecting them with a basal injector, a hypo-hatchet, or by using a basal bark spray. The chemical injected should be applied during the active growing season by chopping cuts through the bark into the cambium layer. The cuts can be 2-3 inches apart on most species, however, hard to kill species like hickory or maple need slightly overlapping cuts that girdle the stem.

Basal bark herbicides work well on smooth barked species when the chemical is applied

completely around the base of the tree on the bark.

Prescribed Fire. This is a valuable supplement to mechanical or chemical control of competing vegetation. It is the least expensive and most widely used method of site preparation. Some benefits include improved access and visibility which increase the efficiency and safety of planting operations. It also removes debris and leaf litter so that tree seeds can come into contact with the soil and increase regeneration. Refer to the Oklahoma NRCS Prescribed Burning (338) standard for guidance.

Where it is determined that wildfire may be a hazard to stand regeneration or where prescribed burning is utilized, firebreaks will need to be constructed. Refer to the Oklahoma NRCS Firebreak (394) standard.

CONSIDERATIONS

The chosen method should be cost effective and protect cultural resources, wildlife habitat, springs, seeps, wetlands and other unique areas. Refer to the Oklahoma NRCS Wildlife Upland Habitat Management (645) and Riparian Forest Buffer (391) standards.

Anticipate possible off-site effects and modify the site preparation design accordingly. Particulates, smoke, and other air pollutants generated by site preparation may have an on-site and off-site effects on air quality.

Consider personnel safety during site preparation activities.

Natural Regeneration

A low cost method to establish an area to trees involves leaving high quality seed trees to populate the area where the site has been prepared. An adequate seed supply must be present. Seed trees should be spaced approximately 120 feet apart with a minimum of three trees left per acre.

Seed trees should be vigorous, well-formed trees 12 inches DBH (diameter at breast height) or larger.

PLANS AND SPECIFICATIONS

Plans will address method of site preparation, species, and protection required for desirable woody plants.

Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, and narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Repair erosion control measures as necessary to ensure proper function.

Control locally invasive and noxious plants as necessary. If pesticides are used, refer to the

Oklahoma NRCS Pest Management (595) standard.

Access by vehicles or equipment during or after site preparation shall be controlled to minimize erosion, compaction, and other site impacts. Refer to the Oklahoma NRCS Use Exclusion (472) standard.

REFERENCES

Oklahoma Department of Agriculture - Forestry Division, "Forest Manager's Guide for Water Quality Management in Oklahoma".

OSU Extension Agents' Handbook of Insect, Plant Disease and Weed Control.