

# NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE GENERAL SPECIFICATIONS

## TREE/SHRUB SITE PREPARATION (Acre) CODE 490

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### GENERAL CRITERIA

The chosen site preparation method will achieve:

- The landowner's goals and objectives
- Improved survival of the regeneration by controlling competition for moisture and sunlight by other vegetation
- Facilitated tree planting or seeding
- Retention of as much litter on the site as possible
- Creation of a favorable micro-site into which seedlings can be planted
- Improvement or maintaining wildlife food and cover
- Protection of the site from excessive erosion and wildfire

### METHODS

- **Mechanical Site Preparation.**

Land that has been harvested for forest products, land presently in unmerchantable trees with woody understory, or pastureland and other openland may be site prepared using mechanical site preparation methods. Mechanical site preparation includes mowing, disking or plowing, subsoiling, chopping, shearing, lopping, mulching, and bedding.

The forest management plan will focus on the outcome desired in mechanical site preparation rather than available equipment.

Generally skidders, crawler tractors or excavators are used, but farm tractors and flex track equipment may be modified for use. Site factors that could be restrictive for machinery include soil texture, slope, soil wetness, ground roughness, soil strength, and the amount of vegetative matter on top of the soil. Consult applicable soils information sources such as Web Soil Survey, Soil Data Mart, etc. for detailed information for the site.

Use of mechanical site preparation can potentially impact water quality on areas that have steep slopes, erodible soils, or where the prepared site is near a water body. In these situations, use the site preparation method that has the least disturbance to the soil surface and still meets the landowner's objectives.

See the table below for descriptions, applicability, and limitations of commonly used mechanical site preparation methods.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.
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<b>MECHANICAL SITE PREPARATION METHODS</b>		
<b>METHOD</b>	<b>DESCRIPTION / USE</b>	<b>COMMENTS</b>
Mowing	Suited for grass, weeds and small brush & trees (up to 2" diameter). Mow as short as possible late in the growing season prior to planting.	Mowing is best suited on abandoned cropland, pastureland or where follow-up mowing is planned such as in Christmas tree operations. It sets back vegetation to make planting easier. If perennial vegetation is present, herbicides may also be needed. Allow for re-growth before spraying. Mowing only may create cover for rats and other rodents destructive to hardwood seedlings.
Roller Chopping	Large bladed cylinder, usually filled with water for extra weight, and pulled by a dozer. Suited for brush and small trees (<5 inches DBH) on upland sites.	Two passes are usually required. Pull the chopper up and down slopes where possible to reduce the potential for excessive erosion. Prescribed burning usually follows chopping. Hand or wildland machine planting methods usually follow chopping. There is minimal soil loss with this site preparation method, but only works well where the brush species present do not readily resprout.
Shearing only	A shearing blade that is either angled or V-shaped, including the KG blade, mounted on a dozer that cuts, shears or shatters trees and stumps at the ground line. Blades with serrated edges have the best cutting action. Best suited when the vegetation is generally large (>8 inches DBH).	When standing timber is sheared, the trees are left on the site. Piling may or may not be needed depending on the volume of debris, method of tree planting that is planned, or if regeneration is to be by direct or natural seeding. Follow-up usually includes, prescribed burning, herbicide application, or both.
Shearing and Piling	Following shearing, a second dozer or pass using a mounted root rake, piles the debris. If windrowed, pile on the contour and leave periodic gaps.	Debris from shearing is either piled or windrowed. The cost of windrowing or piling may be avoided if the site is to be planted by hand or using direct or natural seeding. The disadvantages of this method include the fact that topsoil is often pushed into the windrows/piles or excessively disturbed. Other concerns are soil compaction and loss of area for tree/shrub establishment if the windrows or piles are not burned.
Root Raking only	Toothed dozer blade rips roots and stumps from the ground.	Effective if the site was totally harvested. Like Shearing and Piling above.
Mulching	A spinning drum with flailing hammers mounted horizontally to the front of a large machine. Suited for all sizes of brush and trees.	Mulch is left in place. Effective when aesthetics are important. Herbicide follow-up may be needed.
Combination Plowing	A three-in-one plow, pulled by a dozer or other large machine rips, disks, and beds a site. Best suited for shallow (see Sub-soiling below), clayey or wet sites.	On harvested sites, usually used with a "V" or "KG" blade. Herbicide follow-up may be needed.
Sub-soiling (Ripping)	A ripping shank is pulled behind a large machine to break up the soil profile. Effective when compacted or dense layers occur within 15" of the surface.	Ripping shatters this layer to improve root placement and development. Subsoiling is done to a depth of 18 to 24 inches and conforms to the planned row spacing. It should be done when the soils are dry.
Bedding	A bedding harrow is pulled to create raised beds for planting. Most effective on wet and poorly drained soils and flatwood sites to improve seedling survival.	Bedding is only advised in deep soils of medium textures (loam or sandy loam) where it is essential for tree/shrub survival. Site generally needs to be free of debris. Locate beds to prevent obstructing drainage patterns. Herbicide follow-up may be needed.

Disking	Disking to an 8" to 10" depth. Can be effective on open land, small brush, compacted soils, or after chopping and burning	Allow time for settling before planting. Consideration must be given to erosion control. Herbicide follow-up may be needed.
Tilling	Strip or spot tillers cultivate the planting site.	Primarily for specialty uses.
Lopping	Chainsaws and hand tools used to clear a site. Limited to sparse vegetation.	Debris may be left in place or piled.

- **Prescribed Burning.**

Land that has been laying fallow for several years, pasture or recently harvested forestland may be site prepared using prescribed burning. Site preparation burning may be used in conjunction with certain mechanical and/or chemical site preparation methods, as well. See standard for Code 338, *Prescribed Burning*. The landowner must have a burn plan and notify proper authorities prior to conducting the burn.

- **Chemical Site Preparation.**

In general, herbicides are effective in suppressing most undesirable vegetation and are well suited for use on many sites. Things to consider when selecting an herbicide include the crop species, planting method and date, soil type, target species ("weeds") and their growth stage, terrain, cost and environmental restrictions. Application methods may include broadcasting, banding, stem treatment (Individual Plant Treatment) or soil treatment. Ground or aerial applications may be used.

When properly applied, herbicides also have little site impact. However, the use of herbicides may not address all the critical site factors limiting regeneration success. Soil type influences the performance of soil active herbicides. Consult applicable soils information sources such as Web Soil Survey, Soil Data Mart, etc. for detailed information for the site. Other factors such as high water table or the urban/ wildland interface may make mechanical treatments more suitable. Effective timing varies with the herbicide and the target species. Further, in some areas, application of herbicides is of particular concern to other resource users and members of the public. In many cases it may be necessary to create a buffer around areas receiving chemical site preparation to protect adjacent lands.

All herbicides must be applied according to label instruction and never used outside of their labeled restrictions.

<b>CHEMICAL SITE PREPARATION METHODS</b>			
<b>Method</b>	<b>Where Applicable</b>	<b>Equipment</b>	<b>Notes</b>
Broadcast			
Aerial	Brush and vegetation that can be covered by the air	Helicopter	Select herbicide for target species to be controlled.
Ground – Mist Blower	Trees and brush < 30' tall	ATV or tractor mounted mist blower	Select herbicide for target species to be controlled.
Ground - Spray	Low brush and herbaceous vegetation	ATV or tractor mounted sprayer May be broadcast or banded	Determine the need for a general, directed spray, or "over-the-top" chemical. Uniform coverage is important
Hand Spraying	Up to 6' tall Low density	Backpack sprayer	Determine the need for a general, directed spray, or "over-the-top" chemical. Usually applied "Spray-to-Wet"
Basal Spray	Full – Up to 6" dbh Streamline – Up to 3"	Backpack sprayer	Herbicide is sprayed on lower portion of tree. Chemical is mixed with additive to aid penetration through bark.
Injection	All >1" DBH Usually best suited when trees are > 3-4" dbh and fewer than 250 – 300 trees per acre	Injectors or Hack-n-Squirt	Spacing of injections is chemical dependent but usually 2-3" apart. "Hard-to-control" species may require continuous cut.
Soil Spot Treatment	Brush or trees	Liquid herbicides are applied with a "spot gun".  Granules may be applied by hand or mechanically	Rates usually soil texture dependent.