

**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.

Erosion and/or runoff will be controlled.

PURPOSE

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

Soil compaction and soil displacement will be minimized.

Comply with applicable federal, state, and local laws, regulations and permit needs.

CONDITIONS WHERE PRACTICE APPLIES

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

Measures, including the use of equipment, will be implemented to control or protect against locally invasive and noxious species that may arise from site preparation activities. If pesticides are used, refer to the standard PEST MANAGEMENT (595).

CRITERIA

General Criteria Applicable to all Purposes

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

All chemicals will be used in accordance with label guidelines. Chemical containers should be disposed in a safe, approved manner. Follow criteria in PEST MANAGEMENT (595).

Livestock will be fenced out to prevent damage to site preparation areas and woody plants.

An appropriate site preparation method (mechanical, chemical, prescribed burning) will be chosen based on existing vegetation, site and soil conditions and establishment method. Use Table 1 as a guide in determining appropriate site preparation methods.

Additional Criteria to Encourage Natural Regeneration of Desirable Woody Plants

Time site preparation activities to coincide with the natural seed fall.

Maintain necessary filter strips and/or riparian forest buffer areas. Follow criteria in FILTER STRIP (393) and RIPARIAN FOREST BUFFER (391).

Existing desirable tree species must be present with the potential for successful natural regeneration and seed production. Refer to TREE/SHRUB ESTABLISHMENT.

Slash and debris shall be removed, treated or eliminated as appropriate. Remaining slash and debris shall not create habitat for or harbor harmful levels of pests, or hinder needed equipment operations, or create undue fire hazard.

CONSIDERATIONS

The site preparation method should be cost effective and protect cultural resources, wildlife habitat, springs, seeps, wetlands and other unique areas.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resource Conservation Service or download the standard from the electronic Field Office Technical Guide for Missouri.

**NRCS MOFOTG
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Climate, soil properties, topography, existing vegetation, planting methods, and the species selected for planting govern the type of site preparation needed.

Visual quality objectives should be considered when selecting site preparation methods.

Anticipate possible off-site effects and modify the site preparation design accordingly.

Consider personnel safety during site preparation activities.

For complex sites, consult a professional forester for assistance.

When choosing the desirable method of site preparation, consider the growth habits of selected trees/shrubs and the purpose for which the trees/shrubs are planted.

If chemical site preparation is used to control vegetation, the potential for surface and/or ground water contamination exists.

When preparing sites in cropland fields, consider the affect that carry-over herbicide residue will have on the planted tree/shrub species.

Forest site preparation activities can impact water quality by causing a temporary increase in erosion rates and sediment yield.

Consider selection of plants that have higher carbon sequestration rates.

Impacts on wildlife species, habitat and aesthetics should be considered when selecting site preparation methods.

Particulates, smoke, and other air pollutants generated by site preparation may have on-site and off-site effects on air quality.

PLANS AND SPECIFICATIONS

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

OPERATION AND MAINTENANCE

Access by vehicles during site preparation or after (i.e., before adequate tree and shrub establishment occurs) should be controlled to minimize erosion, compaction and other site impacts. Refer to USE EXCLUSION (472).

Maintain erosion control measures as necessary.

Control locally invasive and noxious plants as necessary. If pesticides are used, refer to PEST MANAGEMENT (595).

PRACTICE SPECIFICATIONS

Proper site preparation methods are needed to reduce competition from existing vegetation so newly planted trees have the best chance for survival. Use Table 1 as a guide in determining appropriate site preparation methods.

Cropland

Areas with residue cover < 50% may not require site preparation. Residue cover > 50% will require site preparation. (See Table 1 for guidance).

If site preparation is needed, follow one or both of these methods:

Mechanical: Expose bare mineral soil (no more than 30% residual residue) in the planting/seeding area. Limit tillage to no more than 2 months prior to planting or seeding. Till earlier if flooding is a possibility. Fall tillage is permissible for early spring planting. Use contour strip tilling on slopes greater than 3 percent. Tilled strips should be at least 3 feet in width.

Chemical: Where erosion may be a problem, apply appropriate chemical(s) in 3 to 4 feet bands over projected planting rows. If slopes exceed 3 percent, apply on contour. In fields with aggressive plant cover, spray the entire field. Use WIN-PST to evaluate leaching and runoff potentials. Pesticide/soil hazard risk ratings of "extra high" or "high" shall be accompanied by mitigating practices and/or substitution of pesticides will lower risk ratings. Use low volatile formulations. Some chemicals need extended time to work. Consider applying

chemicals in the fall or early spring prior to establishment.

If a permanent cover crop is needed or desired after site preparation, use one of the following species at the specified rates to control potential erosion or weed competition between woody planting zones:

Species	Rate - PLS/Ac
<i>Ladino clover</i>	2.25 lbs
<i>Annual lespedza</i>	5.6 lbs
<i>Orchardgrass</i>	3.2 lbs
<i>Kentucky bluegrass</i>	1.6 lbs
<i>Timothy</i>	2.3 lbs
<i>Redtop</i>	1.3 lbs
<i>Virginia wild rye</i>	7.0 lbs

Note: Above rates are for good planting conditions. Increase rates by 50% for fair planting conditions.

For establishment methods, seeding dates, and fertilization (optional) with a permanent cover crop follow criteria in CONSERVATION COVER (327).

Grassland

Grass cover needs to be controlled for optimum tree/shrub plant growth and development. Use one or more of the following options (See Table 1 for guidance).

Mechanical: Expose bare mineral soil (no more than 30% residual residue) in the planting/seeding area. Limit tillage to no more than 2 months prior to planting or seeding. Till earlier if flooding is a possibility. Fall tillage is permissible for early spring planting. Use contour strip tilling on slopes greater than 3 percent. Tilled strips should be at least 3 feet in width.

Chemical: Where erosion may be a problem, apply appropriate chemical(s) in 3 to 4 feet bands over projected planting rows. If slopes exceed 3 percent, apply on contour. In fields with aggressive plant cover, spray the entire field. Use WIN-PST to evaluate leaching and runoff potentials. Pesticide/soil hazard risk ratings of “extra high” or “high” shall be accompanied by mitigating practices and/or substitution of pesticides will lower risk ratings.

Use low volatile formulations. Some chemicals need extended time to work. Consider applying chemicals in the fall or early spring prior to establishment.

Prescribed Burning: Conduct burning only under controlled, predetermined conditions as outlined in a prescribed burn plan. Refer to PRESCRIBED BURNING (338).

Woodland

Desirable Vegetation

Underplanting: Make a harvest cut or thinning and leave a well-spaced overstory of about 55 percent stocking. No cutting is necessary if the stand is already 55 to 65 percent stocked.

Reduce competition from woody plants less than 2 inches DBH and other herbaceous competitors by mechanical, chemical, or prescribed burning means before underplanting. For underplanting with pine, kill all competing or undesirable vegetation less than 6 inches DBH.

Conduct burning only under controlled, predetermined conditions as outlined in a prescribed burn plan. Refer to PRESCRIBED BURNING (338). To reduce surface litter, burn after leaf fall in late November or early December. To control competing vegetation, burn in late spring.

The remaining overstory may be removed during the dormant season after 3 to 6 years. For pine underplanting, remove any undesirable overstory within 1 to 3 years.

Natural regeneration: If adequate regeneration is present from existing reproduction or will be present from potential stump sprouting, remove overstory by clear-cutting the entire stand or by creating large group openings within the stand.

Undesirable Vegetation

Harvest any merchantable material. Then use one or more of the following site preparation methods:

Mechanical: Remove remaining cover to expose mineral soil. Pile debris so that it

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doesn't impact on growth of desired species. On slopes greater than 3 percent, operations should be on the contour. On land that is gullied, some additional grading may be necessary.

Chemical: Apply appropriate chemical(s) in 3 to 4 feet bands over projected planting rows. If slopes exceed 3 percent, apply on contour. Use WIN-PST to evaluate leaching and runoff potentials. Pesticide/soil hazard risk ratings of "extra high" or "high" shall be accompanied by mitigating practices and/or substitution of pesticides will lower risk ratings. Use low volatile formulations. Some chemicals need extended time to work. Consider applying chemicals in the fall or early spring prior to establishment.

Prescribed Burning: Conduct burning only under controlled, predetermined conditions as outlined in a prescribed burn plan. Refer to PRESCRIBED BURNING (338). Burn after leaf fall in late November or early December to reduce surface litter. Burn in late spring to control competing vegetation.

REFERENCES

A Guide for Prescribed Fire in Southern Forests; USDA Forest Service, Southeastern Area; 1978.

Bottomland Hardwood Reforestation in the Lower Mississippi Valley; USDA Forest Service; 1989.

Silvics of North America; Vols. 1 and 2. Handbook #654. USDA Forest Service. 1990.

Planting Northern Red Oak in the Missouri Ozarks. Paul Johnson. USDA Forest Service. 1985.

Artificial Reforestation of Shortleaf Pine. USDA Forest Service and Missouri Department of Conservation. 1984.

Table 1. Site preparation guidelines.

Site preparation methods noted for each category are suggested options based on cover and type of establishment method. (NOTE: Specific site conditions may not allow the use of indicated site preparation options. Make appropriate adjustments based on field conditions, observations, and land owner objectives.)

Cover	Establishment Methods:		
	Direct Seeding	Natural Regeneration	Seedling/Container
<i>Cropland</i>	<i>Site Preparation Options</i>		
Residue level < 50% cover	C,N	C,N	C,N
>50% cover	C,M,MC	C,M,MC	C,M,MC
<i>Grassland</i>	C,M,CB,MC	C,M,CB,MC	C,M,CB,MC
<i>Woodland</i> understocked	<i>not recommended</i>	C,B,H	C,B,H
undesirable	C,M,MC,B,MB,CMB,H	C,M,MC,B,MB,CMB,H	C,M,MC,B, MB,CMB,H

- M - Mechanical
- C - Chemical
- B - Prescribed burning
- N - Not necessary
- MB - Mechanical and prescribed burning
- MC - Mechanical and chemical
- CB - Chemical and prescribed burning
- CMB - Chemical, mechanical and prescribed burning
- H - Harvest cut, removal of existing woody material and/or thinning