

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE GENERAL SPECIFICATIONS**

**TREE/SHRUB SITE PREPARATION  
(Ac.)  
CODE 490**

**GENERAL SPECIFICATIONS**

Procedures, technical details, and other information listed below provide additional guidance for carrying out selected components of the named practice. This material is referenced from the conservation practice standard for the named practice and supplements the requirements and considerations listed therein.

The mechanical site preparation components of this practice may adversely impact significant cultural resources and should be submitted to a cultural resource specialist for a determination of impacts before the practice commences.

**METHODS**

Site preparation is generally the most expensive component of forest regeneration, and it has the potential to be the most destructive if not planned and executed well. Care must be taken to select a method or combination of methods which will adequately prepare the site for regeneration while minimizing damage to the soil and other resources.

Factors that will be considered during method selection include: soil limitations, requirements of the woody species to be planted, type and density of vegetative competition to be controlled, terrain, size of the tract, regeneration technique to be used, and economic limitations of the landowner.

The method chosen will be one that achieves the landowner's goals and objectives by:

- Improving survival by reducing vegetation which competes with the desired trees and/or shrubs for both sunlight and soil moisture
- Facilitating tree planting by

removing/reducing logging debris and standing undesirable trees

- Increasing early tree growth to reduce time required to reach the first thinning for wood production
- Optimizing financial returns for the landowner
- Improving wildlife food and cover
- Improving accessibility for equipment required for firefighting and forest management activities
- Reducing fire hazard

There are three basic methods of site preparation: mechanical, chemical, and prescribed burning.

**Mechanical Site Preparation**

Mechanical site preparation involves the use of machinery such as dozers, tractors, skidders, and similar equipment to remove or reduce logging debris as well as competing vegetation for regeneration purposes. It includes many different types of equipment and methods of use. Some of the more common methods of mechanical site preparation are drum chopping, shearing or KG blading, and raking and piling. Other methods available include disking, bedding, mowing, and lopping.

**Chopping.** A chopper is a large rolling drum with blades attached pulled by a crawler tractor. It is effective where brush competition is of small diameter (less than 8 inches). The weight of the chopper drum may be adjusted to site needs by filling with water. The chopper

crushes large logging debris and brush and cuts it into smaller pieces. Two passes of the chopper are generally required for the best long-term benefits. The chopping operation is usually done in summer followed by a prescribed burn within 4 to 6 weeks.

Chopper blades will be kept sharp for this method to be effective at reducing competing vegetation.

The drum chopper will be pulled up and down slopes where possible to reduce potential for soil erosion. The degree of slope present will determine feasibility of using this method in hilly areas.

**Shearing/Raking/Piling.** Shearing is done with a large V-blade or KG-blade mounted on a crawler tractor. This method is useful to remove large numbers of stems over 8 inches in diameter. The blade is used to cut all vegetation at soil level so that it can be piled (windrowed) and burned.

Root raking is generally done in conjunction with a shearing operation. Roots and stumps can be removed with a large rake mounted in place of the KG or V-blade. The debris is pushed into windrows.

Root raking will be done in a manner to minimize the movement of soil into the piles and allow burning without excessive smoldering and associated smoke hazards.

Shearing followed by piling should be limited to moderate slopes and stable soils to prevent excessive soil disturbance and erosion.

The windrows will be placed on the contour to reduce erosion problems.

Breaks will be planned in long windrows to facilitate wildlife movement across the regeneration area and to provide access for fire suppression equipment.

**Disking.** Disking may be used as a site Subsoiling will be done during August and

preparation method where extensive control of grass and weeds is needed in orchard establishment, Christmas tree plantings, and for open-field hardwood planting.

Disking will be done in late summer or early fall prior to tree establishment.

Consideration must be given to erosion control where disking is performed.

**Mowing.** Mowing and shredding can be effective on sites having a good plant-soil moisture relationship and where follow-up mowing is planned. Such intensive operations may include Christmas tree plantings, orchards, and hardwood tree plantings. Small brush up to two inches in diameter may be satisfactorily controlled by using a heavy duty rotary cutter.

Areas where high levels of rodent damage to hardwood seedlings are expected should be disked rather than mowed to reduce habitat for rats and other destructive rodents.

Mowing for site preparation will be planned during late summer or early fall to facilitate tree planting activities. Wildlife nesting periods (April 1 – July 15) will be avoided where practical.

**Lopping.** Lopping is cost effective where scattered large diameter residual trees are present or the tract to be site prepared is small. Lopping involves using chainsaws to fell the residuals. The cut trees are left where they fall.

Lopping is also a good choice for fragile soils or steep slopes with a high risk of erosion.

**Subsoiling/Ripping.** Soils which develop traffic pans from heavy equipment usage or long-term cattle grazing may need subsoiling prior to tree planting to ensure proper root growth. September (no later than October) prior to the

tree planting season. Subsoiling depth should be 12-15 inches. Equipment will follow contours for this practice installation to avoid excessive soil erosion. Periods of excessive soil moisture will be avoided.

**Bedding.** Raised beds on excessively wet areas improve drainage around seedling roots, make planting easier, and increase seedling survival and growth. Bedding is most often used in flatwoods or other poorly drained sites. A special bedding harrow is used to produce a raised bed on which seedlings are planted. Since bedding requires a site relatively free of debris, it is usually preceded by shearing, root raking, and disking.

Avoid bedding on drier sites because it can cause moisture stress by channeling available water away from the seedlings.

Bedding may not be used in forested wetlands to convert from hardwood forests to pine forests. Such use violates the Clean Water Act provisions.

### **Chemical Site Preparation**

Chemical herbicides may be applied to regeneration areas to control hardwood brush, broadleaf weeds, or grasses. There are several advantages to using chemical methods. Chemicals can be used to control competing vegetation with little soil disturbance. They can be used on steeply sloping land where equipment limitations are severe. Landowners with small acreage can use chemical treatments when mechanical site preparation methods are impractical or are not cost-effective. Herbicides may be applied over large acreage quickly. Selectivity of the chemicals allows targeting specific types of problem vegetation.

Timing of the chemical application is often critical. There are differences in the susceptibility of the various target species to different herbicides which influence the proper timing of application. Most hardwood species are helicopter and from the ground by sprayers

more susceptible to chemical action in the spring or early summer, but they can be treated at other times.

The success of chemical site preparation depends upon correct formulation and application. Refer to Cooperative Extension Service's Recommended Chemicals for Weed and Brush Control: Arkansas MP-44 for specific herbicide recommendations.

Landowners will always be cautioned of the necessity for following label directions for proper herbicide application and safety considerations. Chemicals should be used only in accordance with all limitations of the Environmental Protection Agency, the manufacturer, and state and federal laws and regulations.

Chemical herbicides can be applied by tree injection, foliar spraying, and soil application. Chemical treatments may be followed by a prescribed fire within 6 to 8 weeks.

**Tree Injection.** Chemical injection can be used to kill individual medium to large size trees. Tree injectors are used to apply herbicide through cuts in the bark of the tree. A basal injector or a hypo-hatchet may be used. This treatment will be applied during the active growing season.

Other tools such as a hatchet and plastic squeeze bottle can be used as well. The hatchet can be used to cut into or "frill" the tree, and the squeeze bottle would then be used to immediately squirt the chemical into the frill.

Harder to kill tree species (hickory, maple, etc.) should be entirely girdled and treated. For other trees, cuts 2-3 inches apart will be sufficient.

**Foliar Spraying.** Spraying herbicides can be done aerially from fixed-wing aircraft or attached to backpacks, ATV's, tractors,

skidders, or other ground equipment. This is one of the fastest methods of brush control.

A foliar spray will be applied during late summer to fall, prior to tree planting. It is generally followed by a prescribed burn 6 to 8 weeks later. This combination is sometimes referred to as “brown and burn” because the herbicide defoliation provides fuel for the burn.

The potential for spray drift onto untargeted and/or sensitive areas should be considered during practice planning. Use of qualified and experienced applicators will help avoid this problem.

**Soil Application.** Application of herbicides as a soil treatment can be accomplished by broadcasting, treating individual stems, or using a grid pattern to treat an area. Soil-active chemicals are available for forestry use in both liquid and granular formulations. They are especially useful in treating small acreage when applied by hand with spotguns and similar equipment.

Application in late spring (mid-March to early May) is most effective due to maximum water uptake into the plant leaves during hot weather.

Soil applied herbicides will not be used near streams and other water bodies where there is potential for runoff transportation of the chemicals into the water during rain events. Soil leaching potential will be considered.

### **Prescribed Burning Site Preparation**

Prescribed fire is the least expensive and most widely used method of site preparation. It can be used alone to burn logging debris to facilitate tree planting, or it can be used in combination with

other methods of site preparation. It is commonly used to burn woody material after mechanical or chemical site preparation is complete.

Refer to the practice specification for Prescribed Burning, Code 338, for information pertinent to this practice.

Prescribed burning can be effectively used for natural regeneration systems where a seedbed of exposed mineral soil is needed for seed to germinate. Burning prior to seed tree selection reduces woody competition on the forest floor. A fall burn just before seed fall will help create suitable conditions for seed germination and growth.

Regular use of prescribed fire during pine management rotations will lessen the required intensity of site preparation needed for regeneration.

Careful attention must be paid to weather and site conditions during any prescribed burning activity. Conducting a successful burn requires knowledge of weather and fuel conditions combined with adequate qualifications and experience. The Arkansas Forestry Commission, forestry consultants, and other forestry professionals have the expertise necessary to competently conduct prescribed burns.

Arkansas law requires that the landowner will notify AFC’s fire dispatch center before burning in woodland areas. The toll free telephone number for this is 1-800-830-8015. The landowner will always be informed of this requirement when prescribed burning is planned as a site preparation method.