

Recommendations for

Killing Upland Hardwoods With Silvicides

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Research on the chemical control of unwanted hardwood trees has been conducted at Alexandria, Louisiana, for nearly two decades. During this time, scores of silvicides have been tested by various methods of application, and southern landowners have used the findings to improve forest productivity on millions of acres.

Silvicides are so effective and economical that they have largely outmoded cutting or girdling as a means of hardwood control. While up-to-date recommendations on various methods and chemicals have been published as the work progressed, it seems worth while to summarize them in one article. The accompanying table serves this purpose.

Rates of application suggested in the table were developed in central Louisiana on upland sites with blackjack oak, post

oak, red oak, sweetgum, blackgum, and hickory. Some adjustments in the chemical concentrations and dosages may be needed in other areas, because effectiveness varies somewhat by species and site. For this reason, it is recommended that small local tests be made before a large control program is undertaken.

Silvicides may be applied in several ways. In choosing a method, a landowner will need to consider species and size of trees to be killed, density of the hardwoods, presence of desirable species, size of entire job, location of the area, and cost of tools.

An individual-stem treatment is usually best where desirable trees are intermixed with weed species, or where weed trees are in fairly open stands. Three methods are available—trees can be injected with silvicides, the base of the

tree trunk can be sprayed, or silvicides can be applied to the soil around the tree.

Injection with 2,4,5-T ester is the cheapest of all methods in terms of labor and material combined. If under 8 inches in diameter, trees of many species can be killed by spraying the lower 8 to 12 inches of the trunk with 2,4,5-T. Basal spraying is unlikely to be effective if the bark is saturated with moisture or if it is too thick for the spray to penetrate. Application of fenuron to the soil at the base of trees is ideal for many small landowners because no outlay for tools is required. Care must be taken, however, for this chemical remains in the soil for two years or more.

Foliage sprays with 2,4,5-T ester applied by aircraft, mist blowers, or tractor-



Injecting silvicides is often the cheapest and surest method, says the author, of controlling unwanted hardwoods

Sprinkling fenuron granules around the base of cull trees is a good method for small landowners because no tools are required



RECOMMENDATIONS FOR APPLYING SILVICIDES IN SOUTHERN UPLANDS

Technique	Recommended for	Season of application	Silvicide	Dosage*	Approximate costs	Comments
Foliar Spray:						
Aerial	All major species and sizes where stocking is high. Most applicable on larger tracts	Spring and early summer	2, 4, 5-T ester	2 lbs. acid equivalent (ae) per acre in enough diesel oil to make 1.5 gals. solution, which is then emulsified in 3.5 gals. water	\$7.50 per acre	Respray may be needed after 1 year. If so, apply 1 lb. ae per acre in 5 gals. oil-water emulsion
Mist blower	Trees less than 20 feet tall. All major species	Spring and early summer	2, 4, 5-T ester	2 lbs. ae per acre in diesel oil to make 1 gal. solution, which is then emulsified in 4 gals. water	\$6.00 per acre	Drift hazard is high
Ground sprayer	Trees less than 15 feet tall. All major species	Spring and early summer	2, 4, 5-T ester	2 lbs. ae per acre in 2 gals. diesel oil plus 30-150 gals. water	\$8.00 per acre	High hazard to young pines
Injection	All sizes of major species	All seasons	2, 4, 5-T ester	40 lbs. ae per 100 gals. diesel oil; 5 ml. solution in each injection with incisions spaced 0.5 to 1 inch apart, edge to edge	0.45¢ per inch of tree diameter	Space injections 1 inch apart on trees 9 inches d. b. h. and smaller; 0.5 inch apart on larger ones
		Spring and early summer	2, 4-D amine or 2, 4, 5-T amine (both 4 lbs. ae per gal.)	Apply undiluted; 0.5 ml. 2, 4-D amine in injections spaced 3 inches apart for blackjack and post oaks; 1 ml. 2, 4, 5-T amine in injections 3 inches apart for hard-to-kill species	0.15 to 0.20¢ per inch of tree diameter	Tests in other seasons not yet made
Basal spray	All major hardwood species; most effective for stems under 6 inches d. b. h.	All seasons	2, 4, 5-T ester	8 lbs. ae per 100 gals. diesel oil applied to lower 12 inches of stem at rate of 50 ml. solution per inch of tree d. b. h.	0.7¢ per inch of tree diameter	Kills often erratic with trees 7 inches d. b. h. and larger
Stump spray	All major species	All seasons	2, 4, 5-T ester	16 lbs. ae per 100 gals. diesel oil applied to all surfaces of stumps at rate of 40 ml. per inch of diameter	0.8¢ per inch of tree diameter	Spray not later than 48 hours after tree is cut
Soil application	Individual trees of all major species	Late winter and early spring	Pelleted fenuron	0.5 to 1 gram active material per inch of tree diameter applied evenly to soil around base of tree	0.6 to 1.0¢ per inch of tree diameter	Place fenuron close to base of unwanted trees; it should not be applied in root zone of desirable plants. Works best on sandy, well-drained soils
Ax frill	Individual trees 4 inches d. b. h. and larger. All species	All seasons, but less sprouting in spring and early summer	2, 4, 5-T ester	16 lbs. ae per 100 gals. diesel oil applied at rate of 20 ml. per inch of tree diameter in continuous frill chopped around trunk	0.7¢ per inch of tree diameter	Frills should be cut as low as possible to minimize sprouting. Apply chemical immediately after frilling
Chopped notches	Individual trees 8 inches d. b. h. and less. All major species	All seasons	Ammonium sulfamate crystals	0.5 to 1 ounce per notch; notches chopped 4 inches apart edge to edge, near groundline. Can also be applied to fresh-cut stumps at rate of 0.5 ounce per inch of stump diameter	0.7 to 1.0¢ per inch of tree diameter	Notches must be cut at groundline for least sprouting; apply immediately after notches are cut. Chemical is highly corrosive to metal

*These dosages may be reduced or increased under certain conditions if field trials indicate.

mounted ground equipment are best adapted for large contiguous areas remote from farms. They are fast and effective, but there is danger to nearby crops from drift of the silvicides unless strict precautions are taken. Frequently, a second foliar spray is needed to obtain adequate release of overtopped pines. In aerial spraying, the plane should fly as close to the tree tops as is safe, and spray swaths should not exceed the width of the spray boom. Over rough terrain or in small irregular areas, helicopters are more suitable than fixed-wing airplanes.

For spraying with 2,4,5-T, the choice should be a low-volatile ester—one that vaporizes slowly. High-volatile chemicals kill hardwoods readily and are less expensive, but vapors may drift with the wind and damage crops several miles away.

Occasionally fence rows and small areas of brush near crops can be treated with garden sprayers and ammonium sulfamate, with which there is little or no hazard from drift.

Foliar sprays should not be applied immediately before or after rain.