

# **How to Use Chemicals to Kill Brush & Trees**

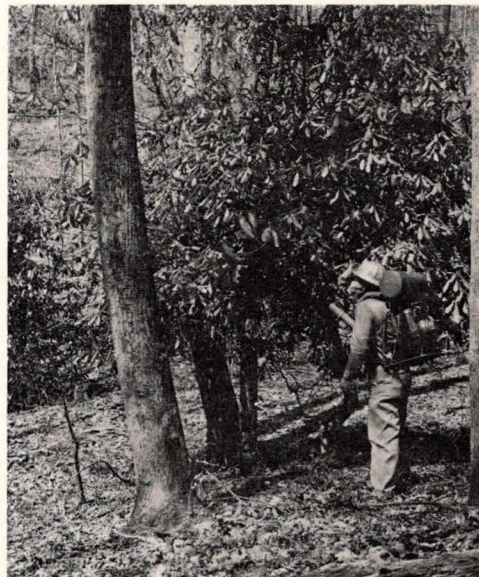
**by Robert M. Romancier**  
*Forest Service*

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# How to Use



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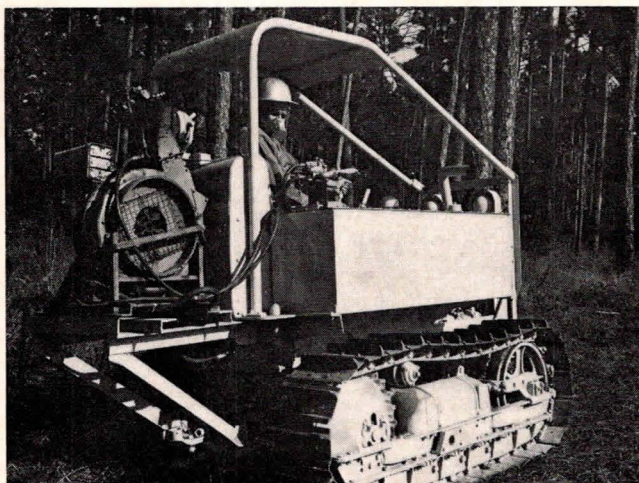
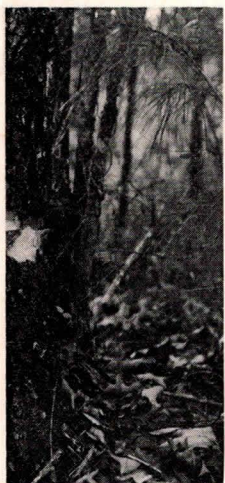
U.S. FOREST SVC.

Chemicals can be applied in many ways to kill woody plants. Far left, aerial application permits rapid, economical treatments of large areas. Below left, high volumes of herbicides in water are used to clear roadsides, fence rows, and rights-of-way. Left, basal sprays are the most effective way to treat small stems. The spray should be applied until the bark and root collar are drenched. Above left, the one-man mist blower is fast and effective; the operator can easily spray vegetation 20 feet high. Above, frilling is easy to do and very effective. Above right, tractor-mounted mist blowers can travel almost anywhere and do a good job of understory tree and brush control. Right, the injector gives excellent control when wounds are made close enough together and low on the tree.



U.S. FOREST SVC.

# Chemicals to Kill Brush & Trees



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by Robert M. Romancier

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**F**ARMERS OFTEN WANT to eliminate trees or brush that have invaded fields or are competing with desirable trees. Chemicals work well, but few farmers are sure of which ones to use and how to apply them. Here are some general guidelines:

Of the chemicals available, 2,4-D and 2,4,5-T are the best known and the most reliable. But newer silvicides, some still in the experimental stage, are also effective for the control of many woody plants.

How you choose and apply a silvicide depends on the proximity of valuable plants that could be hurt by the chemical, the area to be treated, the kind and size of the trees or brush, and on the degree of control you want. The money and manpower available are also important. The table on the next page describes some of the more important methods of controlling woody plants.

Several things affect the success of a silvicide treatment.

The species of the plant is the most important. Some silvicides are much more effective on one plant than another. Generally, the chemical label indicates what species the chemical is effective against.

Time of the year is important, too. While it's obvious that foliar sprays are for spring and summer application, it's not so well known that 2,4-D or 2,4,5-T or many other chemicals should not be used on or injected into a tree during early spring when the sap is moving rapidly upwards. If you apply chemicals at this time, they are carried upwards in the sap stream. A few leaves may be killed, but the chemical doesn't get to the roots to kill the entire plant.

Many chemicals work best when they are applied to healthy, rapidly growing plants. Periods of drouth are poor times to apply chemicals. Most soil-applied silvicides require enough rainfall to wash the chemicals into the root zone, but too much water may move the chemical below the roots.

*(continued on next page)*

# 7 Ways to Apply

Percent organic matter, texture, and pH also influence the performance of soil chemicals. While the effects of pH vary, fine-textured or heavy soils and soils high in organic matter usually require considerably higher dosages of silvicides for satisfactory control of woody plants.

Many chemicals, especially 2,4-D and 2,4,5-T, are slow acting, and may take 2 years or more to kill a tree. Don't consider a treatment a failure

**SOME CONFUSING TERMINOLOGY:** Strictly speaking, an **herbicide** kills herbs—plants that annually die back to the ground and have no woody stem. **Silvicides** and **arboricides** kill tree species, and **phytociides** kill all plant species. However, because the terms "herbicide" and "silvicide" are used interchangeably by foresters and land managers, both terms appear in the article.—RMR

if the tree is still alive a year later. But by then the injury should be apparent. Often higher concentrations of silvicides speed up the killing process, but they may not give any better final kill and they cost more.

A word of caution: Herbicides are very hard to remove from equipment. Once you use a sprayer for herbicides, don't use it for anything else. ★

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Brand names mentioned in this article are for the purpose of identification and do not constitute endorsement by the U.S. Department of Agriculture.

## Aerial Spraying

Spraying by airplane or helicopter is suitable for killing relatively large areas (40 acres or more) of brush or worthless hardwoods, or for the release of pines growing under a poor hardwood overstory. It's a fast and economical method, but it seldom gives complete control. The most effective spray is usually the low volatile esters of 2,4,5-T applied at the rate of 2 pounds acid equivalent in one-half gallon of diesel oil or kerosene and added to enough water to make 5 gallons of the mixture. Apply at 5 gallons per acre.

Don't spray near susceptible crops or other desirable plants. Drifting spray or vapors from 2,4-D or 2,4,5-T can kill valuable plants as well as weeds.

## High Volume Spraying

High volume spraying is used primarily for right-of-way and roadside maintenance with power equipment. For foliar application, usually 4 to 6 pounds acid equivalent of 2,4,5-T or 6 to 8 pounds acid equivalent of combined 2,4-D and 2,4,5-T is applied per 100 gallons of water carrier. Spray all leaves thoroughly. The low volatile esters are most popular, but you can substitute water-soluble amines for spraying near crops susceptible to the vapors given off by 2,4-D or 2,4,5-T. Picloram (Tordon 22K) could also be used. Apply it at the rate of 1 pound acid equivalent per 100 gallons of water, spraying until all foliage is wet.

## Mist Blowing

The mist blower is useful for areas too small or oddly shaped to spray from aircraft, or to control brush growing beneath a valuable tree. Depending on the area to be treated, either a back-pack (one-man) model or the larger tractor- or truck-mounted model can be used. The back-pack is more flexible, making it easy to avoid misting desirable trees. With either size mist blower, apply 5 gallons per acre of the same mixture recommended for aerial spraying.

Farmers may be able to contract for mist blowing, or perhaps several farmers could buy a mist blower collectively. The 1-man size costs under \$300.

## Soil Pellets

To clear an area of vegetation prior to tree planting, or to eliminate woody weeds along fences or beside buildings, soil pellets may be used. These are applied broadcast, in strips, or at the bases of individual trees or shrubs. If you broadcast the pellets, you must wait a year or more before planting trees. Test plant a few trees first to be sure the chemical has been naturally reduced below levels toxic to planting stock. If you apply the silvicide in strips or to individual plants, you can plant right away by avoiding treated areas.

# Silvicides to Woody Plants

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Soil type and rainfall greatly affect the period of activity of soil pellets. Fenuron (Dybar) is effective for killing scrub oaks on very sandy soils at 3 to 5 pounds of active ingredient, or 12 to 20 pounds of the pellets, per acre. Heavy soils require much higher rates. Picloram (Tordon Beads or Tordon 10K pellets) at the rate of 5 to 10 pounds acid equivalent per acre works well on trees, brush, and cut stumps.

## Frilling

All the previous methods described have been for treating areas or many plants or trees at once. Often farmers want to treat individual stems. Frilling is one method that usually requires a minimal expense for equipment. Frilling means making a continuous wound around the tree with an ax or girdling machine. The wound should be big enough to hold the liquid silvicide with little or no loss. If the frill is ax-made, pour the herbicide solution into the frill. If a machine girdler is used, a spray or brush application is more satisfactory.

The usual dosage is low volatile 2,4,5-T esters at 8 to 12 pounds acid equivalent in enough diesel oil or kerosene to make 100 gallons. Fill the frill completely. Tordon at 2 pounds acid equivalent per 100 gallons of water also gives excellent results. One word of advice: The nearer the ground the frill is made, the more effective the treatment.

## Basal Spraying

You can kill very small stemmed brush and thin-barked trees up to about 12 inches in diameter breast high with basal sprays. The equipment is inexpensive, but the method is time-consuming. Esters (low volatile) of 2,4,5-T at 8 to 20 pounds acid equivalent per 100 gallons of diesel oil are commonly used as basal sprays. They should be applied in a continuous band around the tree or stump base. Be sure to drench the root collar area. The height of spraying need not exceed 1 foot above ground. When spraying cut stumps, treat the outer 1 to 2 inches of the stump top as well as the sides of the stump. A band of soil around the stems of root-suckering species should also be drenched for maximum effectiveness.

## Injection

Tree injectors are effective tools for killing woody stems from 1 or 2 inches diameter breast high up to 12 to 15 inches. An injector costs about \$45. Like other individual stem treatments, injection is more costly and almost always more effective than broadcast spray treatments. But it must be done correctly, with enough fluid placed in low, properly spaced wounds. Using diluted herbicides, low volatile 2,4,5-T esters at 20 pounds acid equivalent per 100 gallons of diesel oil, in wounds 2 inches or less apart, is usually a sound prescription. Undiluted 2,4-D or 2,4,5-T amines at the rate of 1 milliliter in wounds no more than 3 inches apart are also generally effective. Winter treatments of resistant species may need higher concentrations or closer spacings of the diluted esters or larger amounts or closer spacings with the undiluted amine treatments.

A newer prescription, but one which seems from early reports to be quite effective, is injecting small amounts of Tordon 22K at the same spacing as for undiluted amines. Either 1/2 or 1 milliliter of Tordon is used undiluted, or at the rate of 1/2 or 1 pounds acid equivalent per gallon water. Tordon seems to kill elms and oaks more readily than maples.