



Figure 1. Foliar application with a backpack sprayer.
Credits: Miller, James. U.S. Department of Agriculture,
Forest Service. www.forestryimages.org

is essential for control, but over-application (that leads to spray run-off) will reduce effectiveness. Therefore, foliar applications commonly require multiple follow-up treatments before control is accomplished. It is important to control spray drift when making foliar applications. Certain desirable hardwood and crop species are highly sensitive to spray drift and can be inadvertently damaged. It is also advisable to include a tracer dye with the spray solution to ensure that some individuals are not sprayed twice while others are missed entirely.

What about mowing before treatment? Mowing decreases foliage while maintaining a large root mass, making control even more difficult. If plants have been mowed, it is important to allow them to regrow to a height of 3 or 4 feet before herbicide application.

Basal application

Basal application combines the herbicide with a penetrant oil and applies the mixture directly to the bark of a standing tree. For trees that are less than 6-inches in diameter and have smooth bark, this method is frequently successful. However, it is important that the lower 12 to 18 inches of the stem be treated on all sides with the herbicide/oil mixture (Figure 2). Adequate coverage is essential, since treating only one side of the stem will result in controlling only half of the tree. Basal applications can be made any time of the year, but are most effective during the dormant season when leaves are not present.

Basal applications will not provide rapid control. Herbicide injury is often not observed for several weeks after treatment and total control may require several months. Additionally, basal treatment is not effective on older trees with thick bark. For older trees, other application techniques should be employed.



Figure 2. Basal bark application with herbicide/oil mixture.
Credits: courtesy of BASF

Hack and Squirt

The hack-and-squirt technique is ideal for control of large trees that cannot be managed with basal applications. This method requires that you use a small ax, machete, or hatchet to cut through the thick bark and into the sapwood.

When hacking, it should be done in a downward motion, leaving a “cup” to hold the herbicide solution. If the cut does not hold herbicide solution, it will leak out and become ineffective. After hacking the entire circumference of the tree, 1 squirt (approximately 1 ml) should be placed in each cut (Figure 3). The addition of a basal oil is not required for this procedure.

This method of application is advantageous because it is highly selective and injury to surrounding species is not common. It can also be done at any time during the year, but treatment of some species in the spring can be reduced due to heavy sap flow pushing the herbicide from the cut surfaces. Rainfall soon after application will also wash the herbicide away and limit uptake.



Figure 3. Hack-and-squirt application technique. Credits: Miller, James. U.S. Department of Agriculture, Forest Service. www.forestryimages.org

Cut stump

This technique is employed after cutting a tree to eliminate, or greatly reduce, resprouts from the cut surface. The herbicide should be applied to the cut surface as quickly as possible, after the sawdust has been removed. If applied immediately, a herbicide/water solution is sufficient. If herbicide treatment is delayed and the cut surface has begun to dry, a herbicide/basal oil mixture must be used and applied to the top and around the collar of the stump.

For stumps greater than 3 inches in diameter, thoroughly wet the outer edge while avoiding herbicide runoff (Figure 4). This is because the only living tissue in larger trees is around the outer edge. Covering the entire cut surface will require more herbicide, most of which will provide little effect. For smaller stems it is appropriate to cover the entire cut surface (Figure 5). For this procedure, herbicides can be applied using a backpack sprayer, squirt bottle, or paint brush. Regardless of how the herbicide is applied, a tracer dye should be included to ensure treatment of all individual stumps.



Figure 4. Application of herbicide to larger cut stumps only requires treatment of the outer edge. Credits: Miller, James. U.S. Department of Agriculture, Forest Service. www.forestryimages.org



Figure 5. Application of herbicide to smaller stumps requires complete coverage. Credits: Miller, James. U.S. Department of Agriculture, Forest Service. www.forestryimages.org

Soil Spots

This procedure is particularly useful when attempting to reclaim an area with a high density of small stems. This practice can also be used to remove individual specimens, but soil spotting is not as selective as other techniques and must be done with caution if desirables are in the vicinity of the application.

In areas with high stem density, herbicides should be applied as thin streams (not broadcast) on a grid pattern. The application rate and size of the grid depend on the soil texture and species composition. For fencerows, a single band may be applied, but larger stems should be treated individually to ensure control. See individual herbicide labels for instructions.

Soil spotting requires that the herbicide be taken up by the roots in order to be effective. Therefore, only soil active herbicides (imazapyr, hexazinone, tebithiuron) can be used for this type of application. In Florida, treatments should be made in mid-summer, when rainfall events are common, to ensure root uptake. Soil spotting is often a slow process

| Herbicide | Application Rate | Comments |
|-----------------------------|-------------------------|--|
| Tebithiuron (Spike 20P) | 2.5 to 20 lb/A (20P) | Control is rate- and species-specific. See label for control of specific species. Tebithiuron will move in water, so only apply in areas where runoff will not carry the herbicide to desirable species. Spike 20P is restricted to certain Florida counties, so consult product label before use. |
| * Diameter at breast height | | |