

Herbicides to Kill Invasive Trees in Home Landscapes ¹

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A number of plant species that are invasive in natural areas of public lands also occur on private property. These may have been planted intentionally, introduced as seeds from other areas, or they may have spread vegetatively across lot lines. Because invasive plants on private property can serve as a source of infestation to natural areas, property owners are encouraged to remove invasive plant species (county ordinances sometimes require their removal). Homeowners can play an important role in the fight against invasive plant species.

Control methods that can be used by homeowners are similar to those used in natural areas by professional land managers. However, the scale can be very different, ranging from the removal of a single tree on a small lot to many trees contained in several acres. Homeowners with several acres of invasive plants may use similar methods and herbicides as professional land managers, while those with small areas or a small number of trees can use simpler methods. The principle difference in herbicides used by professional land managers is packaging, where herbicides can be purchased, and, sometimes, concentration. This publication discusses methods and herbicides that can be readily used by homeowners for removal of invasive plants and is intended for general information. Additional information and training can be obtained from your County Extension office. **Always follow the directions for use on the manufacturer's label for specific herbicides.**

Check with your local government to determine if a permit is required before removing unwanted trees.

Herbicides

Herbicide products contain an active ingredient, a diluent (to dilute or dissolve the active ingredient), and sometimes other additives that enhance the performance of the herbicide (e.g., surfactants and emulsifiers). The active ingredient may be either oil soluble (diluted in oil) or water soluble (diluted in water). Active ingredients contained in the majority of herbicide products used by professional land managers are triclopyr amine (water soluble), triclopyr ester (oil soluble), glyphosate (water soluble), and imazapyr (water and oil soluble) (Table 1). The amount of active ingredient contained in an herbicide product varies and is expressed on the herbicide label as pounds of active ingredient per gallon of product or as a percent.

Triclopyr Amine

Triclopyr amine is a growth regulator-type herbicide, which means that it causes abnormal and/or suppressed plant growth that may result in plant death. Triclopyr amine-containing herbicide products used by commercial applicators usually contain 31.8% (acid) triclopyr; they are sold in 2.5 gal or larger containers and are available only from agricultural supply stores. Triclopyr is available for homeowner use in more dilute (0.8%–8.8%) products

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The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication do not signify our approval to the exclusion of other products of suitable composition. Use herbicides safely. Read and follow directions on the manufacturer's label.

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and smaller containers (8 oz–1.3 gal) from garden supply stores. While commercial product labels recommend up to full strength for some applications, diluted or undiluted product that contains 8.8% is usually effective for most landscape applications. Care should be taken not to allow triclopyr amine to come into contact with foliage or roots of plants that are not intended to be harmed.

Triclopyr Ester

Like triclopyr amine, triclopyr ester is a growth regulator-type herbicide. Triclopyr ester-containing herbicide products used by commercial applicators usually contain 43.6% or 9.81% (acid) triclopyr, and they are sold in 2.5 gal or larger containers. These products are available only from agricultural supply stores. The concentrated product (43.6%) can be diluted in water for foliar applications or in oil for basal bark applications. The more dilute product (9.81%) is used undiluted. Care should be taken not to allow triclopyr ester to contact foliage or roots of plants that are not intended to be harmed. Triclopyr ester is volatile and, therefore, can be absorbed by plants as a vapor, which can cause unwanted damage. The potential for vaporization increases at temperatures above 80°F and is likely above 90°F.

Glyphosate

Glyphosate kills plants by interfering with the synthesis of proteins produced only by plants. Glyphosate-containing products used by commercial applicators contain 30.8%–39.9% glyphosate (acid) and are available in 1 gal and larger containers from agricultural supply stores. Glyphosate-containing products with these same concentrations or more dilute, ready-to-use products are available to homeowners in garden supply stores. Glyphosate is not volatile and has little potential for absorption by plant roots.

Imazapyr

Imazapyr is not recommended in home landscapes because it is readily absorbed by plant roots, active at very low concentrations in the soil, and can be active in the soil for more than one year.

Methods for Removing Invasive Plants

Hand-Pulling

Herbaceous plants can be hand-pulled, but using an herbicide or a combination of hand-pulling and herbicide can make the job easier for large numbers of plants. Newly emerged seedlings of woody plants frequently appear in

home landscapes. Homeowners should be vigilant for these; when discovered early enough, they can be removed by hand-pulling. Tools such as the “Extractigator” and the “Weed Wrench” are available for purchase on the Internet, and these tools aid in pulling larger seedlings and saplings.

Stump Grinding

When trees are cut down, the stumps are often ground below the soil surface with a stump-grinding machine. This method removes the stump for aesthetic purposes but adds additional cost to the tree removal. Invasive tree species vary in their ability to sprout following stump grinding, and certain species may regrow from the ground stump or remaining roots. If sprouts occur, they can be controlled using one of the herbicide application methods listed below.

Foliar Herbicide Applications

Foliar application refers to applying herbicide to the leaves (foliage) of unwanted plants. Seedling trees and shrubs and herbaceous plants can be controlled by foliar application of triclopyr- (amine or ester) or glyphosate-containing products, but triclopyr-containing products are more reliable for killing woody plants. The herbicide solution should be applied so that it contacts only the unwanted plants because it will kill most plants that it contacts.

Cut Stump Herbicide Application

Stumps of invasive woody plants will sprout after cutting if not treated with an herbicide. Sprouts can be continually cut off as they appear, but applying herbicide to the stump will kill it and prevent sprouting. Stumps should be cut as close to the ground and as level as possible (Figure 1) so that applied herbicide does not run off. On large stumps, the herbicide should be applied just inside the bark (Figure 1). This is where the living tissue is located, and that tissue will carry the herbicide into the roots. Remove sawdust from the stump because it can absorb herbicide and prevent it from moving into the stump. Apply the herbicide to the stump as quickly as possible after cutting. Products containing triclopyr (amine or ester) or glyphosate are effective for controlling regrowth of stumps of many invasive plant species, but triclopyr is more reliable. Triclopyr ester-containing products should be applied to the bark of the stump, and exposed roots, as well as to the top of the stump, for more reliable control.

Basal Bark Herbicide Application

Many woody plants can be killed without cutting the tree down by applying oil-soluble herbicides to the bark (Figure 2). This method is only recommended for trees or shrubs with stem diameters of six inches or less. Applying oil-soluble herbicides is faster than cutting vegetation down and treating the stumps. It is useful for homeowners who have larger numbers of woody plants to kill in an area where it is acceptable to leave dying and dead vegetation standing. An oil-soluble herbicide, triclopyr ester, must be used for basal bark applications to facilitate movement of the herbicide through waxy substances in the bark.

Frill or Girdle Herbicide Application

Basal bark application will not be effective on trees with bark that is too thick for herbicide to penetrate. In this case, some bark must be removed before herbicide application. A sharp implement such as a machete or hatchet is used to make cuts through the bark and herbicide is applied into these cuts. Cuts 3–4 inches apart (frill) are sufficient for some species, while a continuous cut completely around the trunk (girdle) is necessary for hard-to-control species such as melaleuca (*Melaleuca quinquenervia*) (Figure 3). Either a water-soluble or oil-soluble herbicide may be used.



Figure 1. Cut stumps as close to the ground and as level as possible. Concentrate the herbicide just inside the bark.

Licenses and Training

Anyone who performs pest control on Florida lawns and ornamentals as a business, anyone who applies pesticides to their own business property or employees who apply pesticides to their employer's business property, or any government employee who applies pesticides to lawns and ornamental plants of formal plantings adjacent to public buildings, must be licensed



Figure 2. Oil-soluble herbicide, diluted in penetrating oil, can be applied directly to the bark to kill some trees.

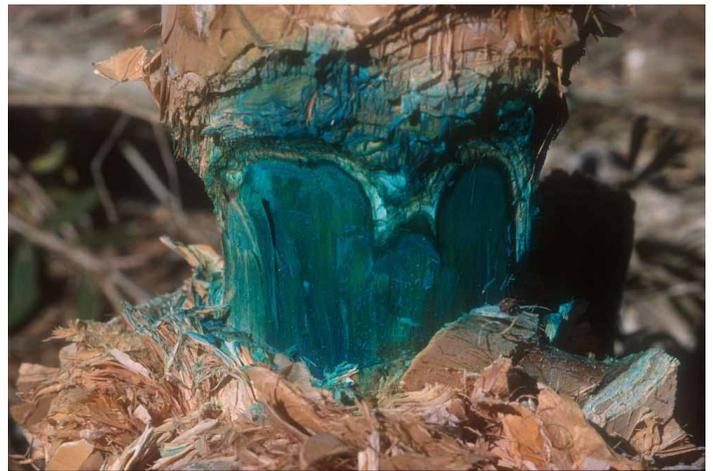


Figure 3. For species with thick bark (such as melaleuca), herbicide must be applied after girdling the tree.

according to provisions in Chapter 482 of the Florida Statutes. Additional information on pesticide licensing and training can be obtained from Extension offices or from the UF/IFAS EDIS website at http://edis.ifas.ufl.edu/topic_pesticide_applicator_certification.

A license is not required to purchase or apply any of the herbicides discussed in this article on your own property (non-business). A yard maintenance person who applies a pesticide to the lawn or ornamental plants of an individual residential property is exempted from licensing and certification requirements if the pesticides are owned and supplied by the individual property owner. However, unlicensed yard maintenance people cannot advertise for, or solicit, pest control business and cannot represent themselves to the public as being engaged in pest control. Unlicensed yard maintenance people cannot supply their own pesticide application equipment, use pesticide application power equipment, or use any equipment other than a handheld container when applying pesticide.

It is essential and required by law for anyone using an herbicide (or any pesticide) to follow the “Directions for Use” on the manufacturer’s label. Training in pesticide application is recommended for anyone who applies their own pesticides and is provided at Extension offices in each county (<http://solutionsforyourlife.ufl.edu/map/>). Training manuals for self-study of pesticide application are available through the UF/IFAS Extension Book Store (352-392-1764 or <http://ifasbooks.ufl.edu>.)

Control of Specific Invasive Plants

On the label, the manufacturer will recommend the herbicide be used to control those species for which it has sufficient control data. Herbicide products with the active ingredients triclopyr and glyphosate are effective for controlling invasive plant species that are not always listed on the labels, using the methods described in this

publication. It is legal to apply an herbicide to control a plant species that is not listed on the manufacturer’s label as long as the herbicide is applied to a site approved by the label. Although the herbicides more readily available to homeowners have not been tested on all invasive species in Florida, products with the same active ingredients have been tested and used by professional land managers in Florida. Triclopyr- and glyphosate-containing products have been found effective for controlling Brazilian pepper, carrotwood, Chinese tallow, and melaleuca (results may vary in response to various factors). Methods for controlling invasive plant species can also be found in UF/IFAS EDIS publication SP242, *Integrated Management of Nonnative Plants in Natural Areas of Florida* (<http://edis.ifas.ufl.edu/wg209>). Additional information specific to these and other invasive plant species can be obtained from the EDIS website (<http://edis.ifas.ufl.edu>) or by calling the Extension office in your county.

Table 1. Herbicide active ingredients and product concentration available for control of invasive plant species.

Active ingredient/concentration ¹	Container size	Availability	Comments
Glyphosate/30.8%–39.9%	1 gal and larger	Agriculture supply stores	Not absorbed by plant roots
Glyphosate/30.8% or less	1 gal or smaller	Garden supply stores	
Triclopyr amine/31.8%	2.5 gal and larger	Agriculture supply stores	Can be absorbed by plant roots
Triclopyr amine/0.8%–8.8%	1 gal or smaller	Garden supply stores	
Triclopyr ester/43.6% or 9.81%	2.5 gal and larger	Agriculture supply stores	Can be absorbed by plant roots and as a vapor
Imazapyr/23.4%	1 gal or larger	Agriculture supply stores	Not recommended for landscape use

¹Expressed as acid