

## Herbicides to Kill Invasive Trees in Home Landscapes <sup>1</sup>

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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 they can be purchased, and sometimes, concentration. This article 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 Cooperative Extension Service office.

**Directions for use on the manufacturer's label of specific herbicides must be followed.** Always check with your local government to determine if a permit is required before removing unwanted trees.

### Herbicides

Herbicide products contain an active ingredient (a.i.), a diluent (to dilute the product), 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 a herbicide product varies and is expressed on the herbicide label as pounds of active ingredient per gallon of product or as a percent.

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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 does 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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### **Triclopyr amine**

Commonly used herbicide products that contain triclopyr amine are Garlon 3A, Renovate, Brush-B-Gon, and Brush Killer (Table 1). Garlon 3A is a concentrated product (3 lb triclopyr per gal), packaged in large volume (2.5 gal or larger) containers, and available only at farm supply stores. Renovate is similar to Garlon 3A and is registered for application to aquatic sites. Brush-B-Gon and Brush Killer are more dilute than Garlon 3A, are packaged in small quantities (quart containers), and can be purchased at retail garden supplies. They are readily available and convenient for the small property owner to use.

### **Triclopyr ester**

Commonly used herbicide products that contain triclopyr ester are Garlon 4 and Pathfinder II. Garlon 4 is a concentrated product that is diluted in water or oil before use. Pathfinder II is pre-diluted in oil and ready to use. Both Garlon 4 and Pathfinder II are packaged in 2.5 gal containers and available from farm supply stores. Vine-x contains triclopyr ester ready-mixed in oil and is sold on the Internet (<http://www.vine-x.com>) in small applicator containers.

### **Glyphosate**

There are many glyphosate-containing products used by professional land managers. Roundup Weed and Grass Killer Super Concentrate is similar to products used by professional land managers and can be purchased in small containers from retail garden supply stores. Products that are more dilute than Roundup Super Concentrate also are available (not discussed in this fact sheet).

### **Imazapyr**

Arsenal and Habitat (labeled for aquatic sites) are imazapyr-containing herbicide products that are commonly used by professional land managers. These products are not recommended for use in home landscapes because imazapyr can be taken up by the roots of desirable plants and cause injury or mortality.

## **Methods for Removing Invasive Plants**

### **Hand-pulling**

Herbaceous plants, such as tuberous sword fern, can be hand-pulled, but use of some foliar applied herbicide can make the job easier for large numbers of plants. Newly emerged seedlings of woody plants, such as Chinese tallow and carrotwood, frequently appear in home landscapes. Homeowners should be vigilant for these; when discovered early enough, they can be removed by hand pulling.

### **Stump grinding**

When trees are cut down, the stumps are often ground below the soil surface with a stump-grinding machine. This serves to remove the stump from view for aesthetic purposes but adds additional cost to the tree removal. Sprouting ability of invasive tree species following stump grinding has not been thoroughly tested, and certain species may regrow from the ground stump or from 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 in this way with Brush-B-Gon, Brush Killer, or Roundup Super Concentrate. All are diluted in water before application. The herbicide solution should be applied so that it contacts only the unwanted plants because it will kill most plants that it comes in contact with.

### **Cut stump herbicide application**

Stumps of invasive woody plants will resprout after cutting if not treated with a herbicide. Re-sprouts can be continually cut off as they appear, but applying herbicide to the stump will kill it and prevent resprouting. 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 concentrated just inside the bark (Figure 1). This is where the living tissue is

located that will carry herbicide into the roots. Sawdust, which can absorb herbicide and prevent it from moving into the stump, should be removed. Apply the herbicide to the stump as quickly as possible after cutting. Products that contain triclopyr amine, triclopyr ester, or glyphosate are effective for controlling regrowth of stumps of many invasive plant species. Homeowners with only one or a few stumps to treat can use Brush-B-Gon, Brush Killer, or Roundup Super Concentrate. All three products can be applied undiluted.

### 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 is only recommended for trees or shrubs with stem diameters of six inches or less. This method is faster than cutting vegetation down and treating the stumps. It is useful for homeowners with larger numbers of woody plants to kill where it is acceptable to leave dying and dead vegetation standing. An oil soluble herbicide must be used for basal bark applications to facilitate movement of the herbicide through waxy substances in the bark. Garlon 4 must be diluted in a penetrating oil that can be recommended where the herbicide is purchased. Pathfinder II is pre-diluted in oil and ready to use. Vine-x can be used for application to small stems (up to 3/4 inch in diameter).

### Frill or girdle herbicide application

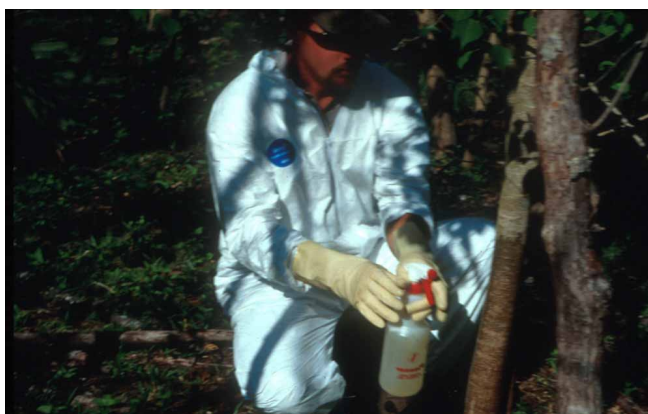
Basal bark application will not be effective on trees with bark that is too thick for herbicide to penetrate. In this case, some bark must be removed before application of herbicide. A sharp implement such as a machete or hatchet is used to make cuts through the bark and herbicide is applied into these 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 (Figure 3). Either a water soluble or oil soluble herbicide may be used.

### Licenses and Training

Anyone who performs pest control on Florida lawns and ornamentals as a business, or anyone who applies pesticides to their own business property or



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



**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.

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 according to provisions in Chapter 482 of the Florida Statutes. Additional information on

pesticide licensing and training can be obtained from Cooperative Extension offices or from the UF/IFAS EDIS web site at <http://edis.ifas.ufl.edu/> TOPIC\_Pesticide\_Applicator\_Certification.

A license is not required to purchase or apply on your own (non-business) property any of the herbicides discussed in this article. 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. Unlicensed yard maintenance people cannot advertise for, or solicit, pest control business and can not 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 a 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 Cooperative Extension offices in each county. Training manuals for self study of pesticide application are available through the IFAS Extension Book Store (352/392-1764 or <http://ifasbooks.ufl.edu>.)

## Control of Specific Invasive Plants

The manufacturer will recommend on the herbicide label 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 article. It is legal to apply a 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 on the label. Although the herbicides that are more readily available to homeowners, such as Brush-B-Gon, Brush Killer, and Roundup Super Concentrate, 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. Brush-B-Gon, Brush Killer, and Roundup Super Concentrate 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 SP 242, *Control of Non-native 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 web site (<http://edis.ifas.ufl.edu>) or by calling the Cooperative Extension office in your county.

**Table 1.** Herbicides used for control of invasive plant species.

<b>Active Ingredient<sup>1</sup></b>	<b>Products</b>	<b>Availability</b>
Glyphosate 3 lb/gal	Roundup Pro, Glyphos, Glypro Plus, Touchdown Pro, and others	Farm supply stores. 1-gal containers and larger.
Glyphosate 3.8 lb/gal	Roundup Weed an Grass Killer Super Concentrate	Retail garden supply stores. 1-qt containers and larger.
Triclopyr amine 3 lb/gal	Garlon 3A	Farm supply stores. 2-1/2 gal containers and larger.
Triclopyr amine 0.59 lb/gal	Brush Killer	Retail garden supply stores. 1-qt containers.
Triclopyr amine 0.54 lb/gal	Brush-B-Gon	Retail garden supply stores. 1-qt containers.
Triclopyr ester 4 lb/gal	Garlon 4	Farm supply stores. 2-1/2 gal containers and larger.
Triclopyr ester 0.75 lb/gal	Pathfinder II	Farm supply stores. 2-1/2 gal containers and larger.
Triclopyr ester 0.75 lb/gal	Vine-x	Internet. Pint and 12 oz brush applicator containers.

<sup>1</sup>Active ingredient is reported as acid equivalent.