

# Cut-Stump Herbicide

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## Combined Approach – Cut Stump Treatment

A cut-stump treatment (also sometimes referred to as cut-surface treatment) is a woody invasive plant control method that combines physical removal of the above-ground portions of the target plants with chemical control of the roots. Though often effective and highly targeted, it is a relatively labor-intensive control method and also requires a slash/debris management plan. It is usually most practicable for small sites or low-density infestations.

### How it works

The first step of a cut-stump treatment is cutting down the above-ground portions of the target plants. For multi-stemmed plants, all stems should be cut. Removing the above-ground portions immediately prevents plants from photosynthesizing and producing fruit in

the short-term. However, almost all woody invasive species regrow from the root system following cutting. Herbicide is applied to the cut-surface of the stump in order to kill the root system, preventing regrowth.

## Methodology in Detail

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### Cutting and Slash Management

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Please see our summaries for cutting methods and invasive plant disposal. Cuts should be made as low to the ground as feasible to minimize trip hazards. Cuts should be parallel to the ground to provide a flat surface for herbicide application.

### Timing Considerations

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#### Seasonality

Cut-stump treatment can be practiced during most of the year. It should not be conducted during heavy sap flow (typically during early spring). If stems are cut during sap flow, they may leak water or sap, preventing herbicide applied to the stump from being properly absorbed (Enloe et al. 2011). Mid-to-late fall is generally the best time for cut-stump treatment. Woody plants transport carbohydrate reserves down to the root system in the fall, which aids herbicide translocation (Schalau 2006).

#### Weather

Application shortly before rainfall may cause treatment to be less effective. Knowledge of the herbicide product rainfastness (time after application that is needed to guarantee control) is critical to avoid losses in effectiveness.

Herbicides mixed in water may have limited effectiveness in winter when temperatures are consistently below freezing as the product may freeze on the stump surface. Oil-based mixtures can often be used at temperatures below freezing.

#### Timing of Herbicide Application Relative to Cutting

Herbicide should be applied to cut-surfaces as soon as possible following cutting because many woody invasive species seal off their vascular tissues following injury. Herbicides mixed with water generally have less penetrative power than those mixed with oil, and it is more critical to apply them while the cut is still fresh; within 5 minutes if possible (Enloe et al. 2013). The window for application may be longer if herbicide mixed with oil is used (Jackson 2018, Ferrell et al. 2015). Delays between cutting and application may impact effectiveness (Ballard and Nowak 2006).

## Species Considerations

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Some woody invasive species sprout from the root system in response to damage – sometimes called suckering. Suckering species include tree-of-heaven, black locust, white poplar, Oriental bittersweet, and Russian olive. Managers have reported variable success conducting cut-stump treatments on tree-of-heaven and black locust, and in some cases, extensive root suckering has resulted (Gover et al. 2004, Duncan 2019, Illinois Nature Preserve Commission 2017). A method that does not sever the main stem such as foliar herbicide application, basal bark application, or stem injection is recommended for these species.

## Choosing Herbicide

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Herbicides that are suitable for cut-stump treatments are systemic meaning that they are absorbed into the target's tissues and transported throughout the plant. When choosing a systemic herbicide, a site manager should consider the site characteristics (particularly any presence of surface water or saturated soils), the species being treated, and the environmental behavior of the chemical relative to long-term goals for the site.

Certain herbicides in certain formulations are known to have adverse impacts on surface water, doing significant harm to aquatic life. If the site where cut-surface application is being considered has a high water table (saturated or near-saturated soils) or surface water present, herbicide labeled/approved for this type of setting should be selected (read environmental hazards section on the label). Two of the most common herbicide active ingredients for use on woody invasives – glyphosate and triclopyr – come in both aquatic safe and unsafe formulations.

Due to differences in species biology, certain chemicals or chemical mixtures work better on some species than others. Herbicide product labels include a list of weed species controlled. If a species does not appear on a product label's control list, it does not necessarily mean that the herbicide will not work but that the manufacturer has not tested it and does not guarantee efficacy. University programs and state agencies engaged in forestry and invasive species control are often great sources of species-specific herbicide recommendations. The Midwest Invasive Plant Network consolidated these recommendations for many species in its Invasive Plant Control Database.

## Chemical Adjuvants and additives

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Adjuvants are chemicals added to herbicide to improve performance in some way. Oil can act both as a carrier/diluting agent for herbicides used for cut-stump treatment and also as an adjuvant because oil improves the mixture's ability to penetrate the vascular tissue of the

plant. Some herbicide products are pre-mixed with an oil (often labeled ready to use/RTU), while others may recommend addition of oil as an adjuvant. Read the label carefully and consider only adjuvants specifically recommended for cut-surface application.

Herbicide dye is a recommended addition to any product being used for cut-stump. Use of a dye allows applicators to track which stumps have been treated, and can also alert other site users that herbicide was recently applied.

### **Equipment for Application**

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Herbicide or herbicide mixture can be applied to a stump surface using either a paint brush (sponge or bristle-tipped), a squeeze bottle with a specialized sponge tip (e.g., Buckthorn Blaster™), a spray bottle, or a low-volume backpack sprayer outfitted with a brass wand with a shut-off valve.

### **Personal Protective Equipment**

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Always follow personal protective equipment recommendations on the herbicide product label.

### **Regulations, Training, and Applicator Certification**

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Each Great Lakes jurisdiction has regulations regarding the registration and labeling of pesticide products and the training and certification of pesticide users. Note that not all herbicides are registered for use in all jurisdictions and it is illegal to use a product in a jurisdiction where it is not registered. In Ontario, Canada the use of most synthetic herbicides on non-agricultural and non-forestry land is prohibited by law. Persons seeking to use herbicide to control invasive plants for the benefit natural resources in Ontario are required to seek an exemption under the Pesticide Act.

U.S. state governments generally require that any anybody applying herbicides on non-residential or non-farm properties or applying herbicide in exchange for payment undergo training and pass a certification or licensing exam (see program links below). Certain pesticides are labeled as restricted use at the federal and state levels that require certification for purchase and use in all cases. Ontario requires licensing of all persons seeking to purchase and apply pesticides. It is usually necessary to renew certification or licensing periodically. Managers should be certain that all staff and volunteers using herbicide have adequate training and current certification. Any hired applicators should be asked for proof of current jurisdictional certification.

Pesticide Training and Certification  
Programs:

IL IN MI MN NY OH ON PA WI

## Application Method

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Sawdust or other debris on the stump surface should be removed. For small stumps up to 3" diameter, the whole stump surface can be treated with herbicide. The goal should be full surface coverage without dripping or run-off. Read the label instructions carefully for best practices; some labels recommend that the product be applied to the sides of the stump and to any visible surface roots in addition to the cut-surface. For larger stumps over 3" in diameter the outer portion of the stump can be coated without applying herbicide to the center. This puts the herbicide in contact with the vascular tissue that absorbs the chemical while minimizing the amount of chemical used (Ferrell et al. 2015).

## Stop the Spread

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If invasive plant seeds are likely present on site (e.g., the plants being treated are fruiting or have fruited previously), all equipment, clothing and footwear should be brushed off before leaving the site to prevent spreading invasive plant seeds to new locations.

## Monitoring and Follow-up

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Any woody invasive species treatment needs to be monitored for effectiveness and regrowth in the years following treatment. Regrowth from treated stumps is most easily addressed with foliar application of herbicide. Because woody plants seal wounds, re-application of herbicide to a previously cut and treated stump will not be effective unless a fresh cut is made.

## References and Further Reading

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- Gover, A, Kuhns, L, and J Johnson. 2004. Managing tree-of-heaven (*Ailanthus altissima*) on roadsides. Penn State University, Department of Plant Science. Roadside Vegetation Management Factsheet 3.
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*Header Photo: Laura Van Riper, Minnesota Department of Natural Resources*