Iowa’s natural areas are under attack by exotic plants that degrade these valuable spaces. Invasive plants displace native species, disrupt ecosystems, and interfere with recreational uses of prairies, woodlands and other areas.

A number of factors contribute to the growing problem with invasive woody plants; however, disturbance is the universal factor that plays a key role in the success of these weedy plants. Since Iowa’s few remaining natural habitats are highly fractured and often exposed to disturbances (grazing, logging, nutrient runoff, etc.), the threat of invasive plants is constant.

While a wealth of information is available to aid in identification and management of invasive woody plants, much of the information regarding control tactics is directed towards persons experienced in weed management. This bulletin will provide information appropriate for persons who have little experience handling herbicides.

**Woody invasive plants of Iowa**

**Buckthorn** – Several species of buckthorn are considered invasive in Iowa, but common buckthorn (*Rhamnus cathartica*) is most prevalent. Buckthorn is commonly found on the edges of wooded areas, and is easily spotted in the spring or fall since they leaf out earlier and retain their leaves later than native trees. It is a shrub or small tree that can reach heights of 25 ft. Leaves are oval, dark green with 3 to 4 pairs of curving veins. Twigs are usually tipped with a sharp spine, the source of the plant’s name. A useful identification trait is the yellow/orange tissue found immediately under the bark.

**Honeysuckle** – There are several invasive honeysuckle species in Iowa. Plants form a clump of arching stems that can reach heights of 10 to 15 ft, and like buckthorn they leaf out early and retain their leaves late into the fall. Leaves are arranged opposite on the stems and in the spring are light green. The bark is grey to tan in color with distinct stripes.

**Multiflora rose** - This plant was introduced both as rootstock for cultivated varieties and also was planted for numerous purposes (many that it was poorly suited). It grows best in open areas such as pastures and prairies, but can survive in wooded areas. Individual plants can reach heights greater than 10 ft. Multiflora rose can be differentiated from native roses by the fringed stipules present at the base of leaf petioles. Native roses have stipules, but they have smooth margins.

**Control strategies**

Several control tactics are effective against woody plants. The most appropriate method varies depending on plant size, density, type of habitat, and time of year. Smaller plants often can be pulled from the soil by hand or with specially designed tools. Mechanical removal of the brush or tree is an effective tactic, although many weedy species will resprout following removal of the stem. Repeated mowing can be effective against brushy species such as multiflora rose, or herbicides can be used to control resprouting.

Three distinct types of herbicide treatments are commonly used to control woody plants.

**Cut surface** applications are used to prevent resprouting after mechanical removal of the woody plant. The herbicide should be applied shortly after cutting while the wound is still fresh. For larger trees, the herbicide only needs to be applied to the cambium, the tissue directly underneath the bark. Herbicides can be painted onto the surface or applied with a squirt bottle or small sprayer. Roundup (glyphosate) at a 50% dilution (one part Roundup to one part water) is effective against most species. Only use concentrated formulations with at least 40% active ingredient for cut surface applications. Tordon RTU (picloram) is a premixed formulation for cut surface treatments. Caution is required with picloram since over-application can result in absorption of the herbicide by roots of adjacent trees and plants, resulting in significant injury.
Basal bark applications involve applying herbicide to the lower 12 inches of stems and trunks. The herbicide is applied using an oil based carrier (diesel fuel, kerosene, bark oil) to increase movement of the herbicide through the bark. Dyes formulated for basal applications allow the applicator to easily see coverage of the target and if excessive off-target spray is occurring. Basal applications are most effective on trees with a diameter less than 4 to 6" since the bark on larger trees may reduce herbicide absorption. Trees can be treated anytime of the year, but the stems must be dry at the time of application. The bark should be thoroughly wetted with the spray, but applying until runoff is not necessary.

Several herbicides are labeled for basal bark application, their effectiveness varies with target species. Triclopyr is effective against most invasive woody species, and is sold under the tradenames of Garlon, Remedy Ultra, Tahoe, and Tailspin. Only the ester formulation (e.g. Garlon 4) should be used for basal bark treatments because it is oil soluble, important when mixing with oil, and esters penetrate bark more effectively than amine formulations (Garlon 3A). A mix of 20 oz of herbicide to one gallon of oil based carrier is effective against most species. Garlon is available in 2.5 gal containers that may be more than required for many users. Pathfinder II is a ready-to-use formulation of triclopyr for basal applications that does not require dilution. The combination of convenience and quantity of product make this type of product suitable for many acreage owners.

Foliar applications require complete coverage of the plant canopy to provide consistent control. They can be made from the time leaves are fully expanded until fall color develops. Applications in mid to late summer may be less effective during periods of extended hot, dry weather. There is a greater risk of the herbicide contacting nearby sensitive vegetation with foliar sprays than with the other techniques, especially when spraying large plants. Applications should be made on relatively calm days (wind speeds less than 10 MPH) to minimize off-target movement of herbicides.

Triclopyr is available either as an amine formulation (Garlon 3A) or ester formulation (Garlon 4). For foliar applications, mix 1 to 3 oz Garlon 4 or 2 to 4 oz Garlon 3A per 3 gallons of water. An advantage of the ester formulation is that it can be used for either foliar or basal bark applications. Avoid applications of the ester formulation when temperatures exceed 85° F or in areas where the herbicide may come in contact with water (streams, ponds, etc.). The amine formulation can be used in areas where the spray will come in contact with standing water, and therefore is useful in controlling willows that may invade pond edges.

Most products sold for brush control at garden stores are a combination of two or three growth regulator herbicides intended for foliar applications. Products containing triclopyr generally are more effective on woody species than those based on 2,4-D, dicamba and other herbicides. Products available at garden stores typically contain lower concentrations of active ingredient than products sold for agricultural or commercial uses, follow the label recommendations for mixing. These products are suitable for small jobs, but for larger infestations a commercial formulation such as Garlon may be more economical.

Herbicides for brush weeds

Glyphosate – Sold as Roundup and a variety of tradenames, glyphosate is the most widely used herbicide in the world. It is non-selective and will kill or injure any plants contacted by the herbicide. When applied according to instructions, glyphosate is tightly bound to soil and will not affect adjacent plants via root absorption. Glyphosate products sold at garden centers often have a lower concentration of active ingredient than agricultural formulations, thus their use rates would be higher than published in many references. Read the label to determine specific rates to be used. Some formulations of Roundup available at garden stores (e.g Roundup Plus, Roundup Extended Control) have additional active ingredients not needed for controlling invasive plants.

Glyphosate is not as effective on woody plants as many other herbicides when applied as a foliar herbicide. However, it is effective as a cut-surface treatment on many species. The lack of soil activity reduces the risk of injury to adjacent
plants which may be a problem with other herbicides such as Tordon RTU. Products containing at least 40% (4 lbs active ingredient/gal) of active ingredient should be used for cut surface applications.

**Growth regulator herbicides** – The majority of herbicides used to control broadleaf weeds and woody plants in landscapes and natural areas belong to a group of herbicides known as growth regulators. These chemicals generally are safe on established grasses. Although most growth regulator herbicides degrade fairly rapidly in the soil, they can persist long enough to be absorbed by plant roots that extend into treated areas. Caution is required when used in areas with desirable plants to minimize the amount of herbicide reaching the soil surface.

Numerous growth regulator herbicides are available, varying in their effectiveness against specific weeds. Most are off-patent and thus sold under a variety of tradenames. They are often sold as products containing two or three active ingredients resulting in control of more weed species than a single herbicide would provide. The ingredient statement on the product label provides information on the specific herbicides used in the formulation. Products containing triclopyr generally are more effective against woody species than the other growth regulator herbicides.

Growth regulator herbicides can injure susceptible plants at very low rates, so care must be used when applying. Avoid spraying on days when wind speeds are over 10 MPH. Most growth regulators are available either as amine (water soluble) or ester formulations (oil soluble). Esters are formulated as emulsifiable concentrates that can be mixed either in water for foliar applications or oil for basal bark applications. Esters often are usually more effective than amine formulations for controlling woody species. Ester formulations are volatile and can move from treated areas if applied when temperatures exceed 85° F. The type of formulation is specified in the ingredient statement on the label.

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**Additional Online Information**

**Invasive plants of Iowa and surrounding states**


**Online sources of herbicides**

Gemplers: [www.gemplers.com](http://www.gemplers.com) 1-800-874-4755
Forestry Suppliers: [www.forestry-suppliers.com](http://www.forestry-suppliers.com) 1-800-752-8460
Ben Meadows: [www.benmeadows.com](http://www.benmeadows.com) 1-800-241-6401