

Appendix 2: Invasive Species Fact Sheets

1. European Buckthorn
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FACT SHEET #1

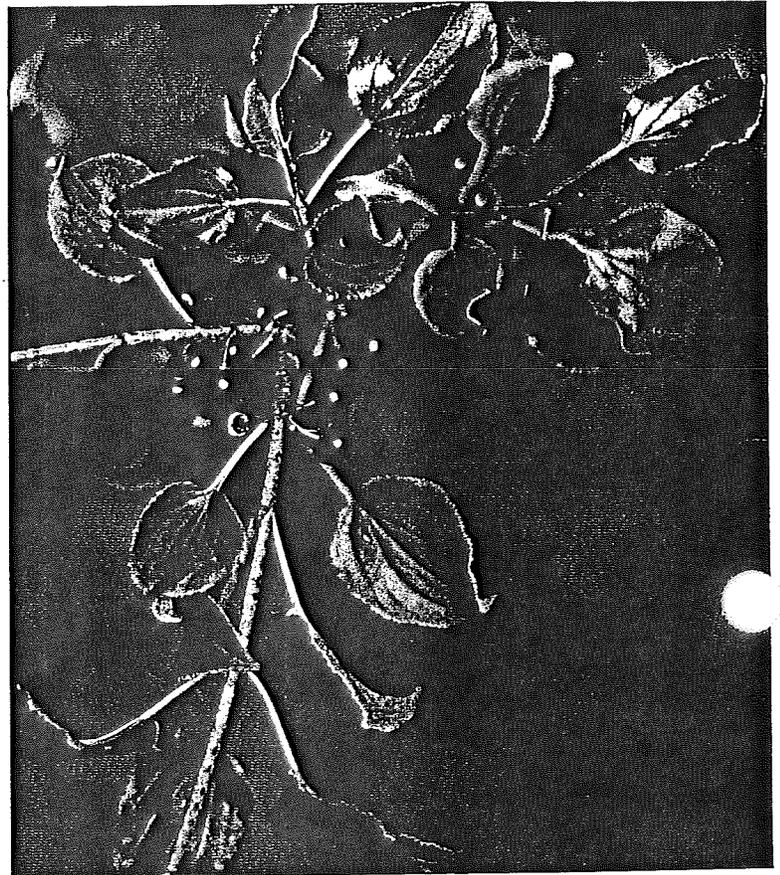
European (Common) Buckthorn *Rhamnus cathartica*

Description:

Shrub or small tree reaching height of 25' (7.6m); trunk diameter up to 10" (25cm); crown spreading and irregular; bark gray to brown, rough textured when mature and often confused with *Prunus sp.* Inner bark yellow. Twigs often tipped with a spine. Small black fruits up to 1/4" (0.6cm) diameter containing 3-4 seeds typical. Leaves broadly elliptic, rounded to pointed at the tip, and toothed. Upper and lower leaf surfaces smooth. Upper leaf surface dark glossy green. Leaves stay green late into fall, after all other leaves have fallen.

Concern:

Endemic to Eurasia, *R. cathartica* was introduced to North America as an ornamental shrub. It is native to Eurasia. The fruit causes a severe laxative effect, readily distributing its seeds when eaten by birds. Common buckthorn invades mainly woodlands and savannahs, although it may also be found in prairies and open fields. Once established, it crowds or shades out native shrubs and herbs, often completely obliterating them. MN Interagency Exotic Species Task Force 1991 future threat ranking of SEVERE, current threat SEVERE.



K. E. B. O. L. I. N.

European Buckthorn, *Rhamnus cathartica* leaves and mature berries

Controls:

Late March to Early May: Prescribed fire is one method proposed for controlling buckthorn in natural areas. In the upper Midwest, burns conducted as soon as leaf litter is dry should lower resprouting vigor, due to low carbohydrate levels. Burning every year or every other year in established stands may be required for 5-6 years or more. Unfortunately buckthorn seedlings often occur in areas with little litter to carry a fire more often than once every 3-4 years. Fire will top kill a mature plant, but resprouting does occur. Buckthorn seedlings appear to be very vulnerable to fire, perhaps due to their poorly established root structure. Uprooting of smaller seedlings with a weed wrench is another non-chemical control.

May to October: McHenry County, IL Conservation District (MCICD) reports excellent results using 20% Garlon 3A (Trichlopyr) in water with dye on cut stumps during the growing season. Product label suggests avoiding the spring sap flow. Garlon 3A undiluted applied to cut stumps between first budding in May, through summer, to hard freeze in fall was 95% effective in preventing resprouting (Boudreau and Willson).

Mid-August to October: MN DNR Region V State Parks Resource Management has been using a fall cut with immediate stump application of a 5:1 water:Roundup (Glyphosate) solution using a hand sprayer. Initial checks indicate a >85% control overall. Kline, 1983 in Wisconsin, used a 5:1 water:Roundup solution on cut stumps in August/September with 100% control.

Winter: 20% Garlon 4 with an oil, such as Penevator, and dye on cut stumps was reported as effective by MCICD. Frill application is also effective. Experiments at the University of Wisconsin Arboretum report good results using a 12.5% solution on cut stumps, or a 6% solution basal bark treatment to stems < 3 inches dbh.

PROBLEM SPECIES FACT SHEET #2

Exotic Honeysuckles *Lonicera tartarica*, *L. x bella*, *L. maackii*, *L. morrowii*

Description:

Upright deciduous shrubs; reaching heights to 20'; leaves opposite, untoothed. Flowers in May or June. Tartarian honeysuckle has generally pink flowers but may vary from white to red; Amur and Morrow's flower white, yellow with age. The hybrid of Tartarian and Morrow's has characteristics of both parents. Fruits red or yellow berries in pairs in the axils of the leaves. Careful identification of honeysuckle species is necessary before attempting control measures. In the *Manual of Vascular Plants of Northeastern United States and Canada*, Gleason and Cronquist note that native bush honeysuckles have smooth flower styles (narrow area of pistil above ovary); styles hairy in exotics. In the northern half of Minnesota, native bush or shrub honeysuckles are *L. villosa*, and *L. oblongifolia* (found in swamps, wet woods and bogs), and *L. canadensis*. Native climbing or twining forms are *L. dioica* (statewide), *L. sempervirens* and *L. hirstuta* in the south, and *L. prolifera* in far southeast MN only.

Concern:

Native to Russia, Asia and Western Europe, bush honeysuckles were introduced to North America as ornamental shrubs and used as wildlife habitat. Commercial propagation continues with many cultivars of bush honeysuckles available. Abundant fruits are readily eaten by birds, seeds disperse through excretion. As a group, the bush honeysuckles tolerate a variety of moisture regimes and habitats. Seedlings establish in disturbed or sparsely vegetated areas. Honeysuckles out-compete native plants by earlier leaf expansion and later fall retention; research also suggests alleopathic effects, inhibiting the growth of other plants. MN Interagency Exotic Species Task Force 1991 current threat ranking for Tartarian honeysuckle is SEVERE, future ranking of SEVERE.

Control:

March to May: Prescribed burning in fire adapted communities will kill seedlings and top kill mature plants; repeated fire may be necessary for adequate control. (INPC guideline)

August to October: Application of a 5:1 water:Roundup (glyphosate) solution by hand sprayer to cut stumps has been used successfully by MN DNR Region 5 Resource Management. Cut stumps as low as possible for better herbicide application surface. Honeysuckle's tough wood and cutting low to the ground, where there is more grit in the bark, often require frequent sharpening of tools. A 4:1 solution, applied as above, is also noted in INPC guidelines and TNC ESA as the preferred control method. Untreated cut plants readily resprout; pulled plants propagate from broken roots.



Honeysuckle, *Lonicera* species, probably *L. tartarica*

K. E. Bolin

This information is not an endorsement of particular products or practices. Pesticide use must follow label directions and applicable state and federal laws.

FACT SHEET #3

Staghorn and Smooth Sumac *Rhus typhina* and *R. glabra*

Description:

Staghorn sumac is a shrub or occasionally a small tree, height to 32' (10m), bark smooth and gray, twigs velvety-hairy; leaves odd-pinnate; leaflets oblong lanceolate and serrate; flower in terminal panicles appearing in June; fruit drupe more or less spherical, thickly covered with crimson hairs. Wood soft and greenish yellow. Smooth sumac is similar to the above species except that twigs are glabrous (without hairs) and somewhat glaucous (covered with a fine, waxy, removable powder imparting a whitish cast to surface).

Concern:

Staghorn and smooth sumac are native to North America. Sumacs generally grow in dry, rocky or gravelly soil. Sumac is also tolerant of other well drained conditions and well adapted to conditions on bluff prairies and dry prairie sites, growing in the open and in transition areas between woods

and prairie. Plants spread profusely by suckering, forming dense, low islands of cover. Sumac clusters readily cover other prairie vegetation, especially in the absence of periodic fire. Although fire or repeated cutting stimulate new growth, nutrient stores are eventually depleted. Considering the small acreage of native prairie remaining, uncontrolled sumac spread imperils the community.

Control:

March to May: Prescribed burning in fire adapted communities will kill seedlings and top kill mature plants; periodic fire combined with cutting (described below) should control spread of sumac species. Some research (TNC; INPC) guidelines showed more vigorous growth with spring burns; August burns were suggested for areas not in a cutting regime.

Late May to Early July: Sumac should be cut with loppers, or swede saws for large plants, as low to the ground as possible to avoid resprouting and safety hazards. In areas of heavy sumac cover, where underlying vegetation would be damaged by dropped cuttings, remove and stack in a less sensitive area for later burning.

Late July through August: Return to early summer site to cut resprouts, further depleting the energy stores of the plants and deterring growth in the next season.

MN DNR Region V State Parks Resource Management has found that after 3-5 years of cutting twice a year, an occasional prescribed fire and/or cutting controls sumac cover on bluff prairies.



Smooth sumac, *Rhus glabra*, leaves and fruit

Siberian Elm

Ulmus pumilla

Description:

Siberian elm is distinguished by small, elliptic, smooth above, toothed leaves, nearly even at the base, 0.8-2.6" (2-7cm) long. Alternate simple leaves short pointed at the tip and tapering or rounded at asymmetrical base; dark green above, paler and nearly hairless beneath. Mature height 50-70', round crown of slender, spreading branches; rough bark gray or brown and shallowly furrowed at maturity; nearly hairless twigs and small, blunt buds. Flowers greenish, lack petals, occurring in small drooping clusters of 2-5. Fruit one-seeded, smooth, circular, 0.4-0.6" (10-15mm) wide, in clusters.

Concern:

A native of northern China, eastern Siberia, Manchuria and Korea, Siberian elm was introduced to the U.S. in the 1860's for its hardiness and fast growth in a variety of moisture regimes and habitats, including droughts and cold winters. Seeds are produced early in spring and spread by the wind. Germination rate is high and seedlings soon establish in the bare ground found early in the growing season. Near a seed source seedling thickets quickly crowd out and dominate native vegetation, especially in disturbed or sparsely vegetated areas. MN Interagency Exotic Species Task Force 1991 current threat ranking of MODERATE, future threat ranking of SEVERE.



K. E. Bolin

Siberian elm *Ulmus pumilla*

Control:

March-May: A regular regime of **prescribed burning** in fire adapted communities will kill seedlings. Removal of on site seed sources by other methods is necessary for adequate control.

Mid-May to July: Trees girdled in mid-May to early July will die over 1-2 years without sprouting if cut properly. Cut through the bark slightly deeper than the cambium in two parallel cuts 3-4 inches apart, then knock bark off with a blunt object such as the back of an axe head or dull end of a girdling bar. The xylem must remain intact; if girdled too deeply the tree will respond as if cut down, i.e. it will resprout.

April to September: During the growing season, seedlings can be hand pulled and small trees carefully removed by a grub hoe or weed wrench. Although labor intensive, large trees can be cut down and resprouts trimmed as needed.

April to September- After spring sap flow and through the growing season, a cut stump application of water : **Roundup** (glyphosate) solution between 9:1(10%) and 4:1(20%) concentration by hand sprayer is effective. MN DNR State Parks Resource V Resource Management used a 4:1 Roundup solution with good results.

This information is not an endorsement of particular products or practices. Pesticide use must follow label directions and applicable state and federal laws



Biological Control of Purple Loosestrife in Minnesota

What is "biological control"?

Biological control is the use of naturally occurring pest or predators to control a harmful exotic, such as purple loosestrife. In natural communities, predation and competition among species helps control the abundance of populations. For example, in Europe, herbivorous insects feed on purple loosestrife and prevent it from dominating wetland communities. However, when loosestrife was introduced into North America, its natural predators were left behind. Without normal pest or predators, loosestrife has become the dominant species in many Minnesota wetlands where it displaces native vegetation and wildlife.

Why is Minnesota using biological control for purple loosestrife?

Herbicides are used to selectively control small loosestrife infestations. However, herbicides are not effective on large loosestrife infestations and herbicides do not kill the loosestrife seed that is stored in the soil. Herbicide must often be applied yearly to a site to control loosestrife. Advantage of biological control include:

- long-term reduction of loosestrife
- cost-effective management (annual control is not necessary)
- environmentally sound method (reduce herbicide use; non-target plants are not harmed)
- self-sustaining control

Will these biological controls cause other problems in Minnesota?

No, purple loosestrife biological control insects, native to Europe, were thoroughly tested and were shown not to be harmful to native plant species or agricultural crops. The loosestrife beetles are selective for purple loosestrife and cannot survive without purple loosestrife. The U.S. Dept of Agriculture and the Minnesota Department of Agriculture have approved the release of 5 insect species for purple loosestrife control in Minnesota. Over the last 100 years, no insect that was screened and tested as a biological control agent on plants has caused a negative impact.

So what has been done so far?

Minnesota initiated its biological control program for loosestrife in 1988 when potential release sites were identified. Three insect species; one root-boring weevil, *Hylobius transversovittatus*, and two leaf-feeding beetles, *Galerucella californiensis* and *G. pusilla*, were first released in Minnesota in 1992 and have overwintered and successfully reproduced. They have fed on and caused minimal damage to loosestrife plants within the immediate release area. The next step is to allow the insects to build up their population so they can sufficiently reduce loosestrife abundance within a site. A fourth insect species, a flower-feeding weevil, *Nanophyes marmoratus*, was released in small numbers in 1994. This flower-feeder has become established in several sites in the Twin Cities metro area. By 1995, over 100,000 leaf-feeding beetles had been released in Minnesota at 45 sites in 13 counties. Our ultimate goal is to establish self-sustaining populations of insects throughout Minnesota.

Will biological control eliminate loosestrife in Minnesota?

No, purple loosestrife is here to stay. The goal of biological control is to significantly reduce the abundance of loosestrife and thereby minimize the damage it causes to wetland ecosystems. Once sufficient numbers of the insects are present, researchers believe the insects will reduce loosestrife abundance up to 90%

How long will it take to work?

It will take at least 5-7 years before there are enough loosestrife beetles present in a site to cause a significant reduction. The time required to achieve this control will depend on the size of the loosestrife infestation, the site characteristics, and the numbers of insects originally released. On a statewide scale, it may take more than 20 years before loosestrife is reduced as much as possible by the insects.

How do you decide where to release the insects? (or Can I get insects for my favorite wetland?)

Currently the demand for insects is far greater than the supply. The DNR must carefully select release sites to improve the chance of successful insect establishment. Each site that is selected for insect release must be carefully monitored to track the changes in vegetation and insect populations. Once abundant local populations have been established in every major watershed, the DNR plans to use the public's help in distributing insects to other areas. The insects will eventually spread to new sites on their own.

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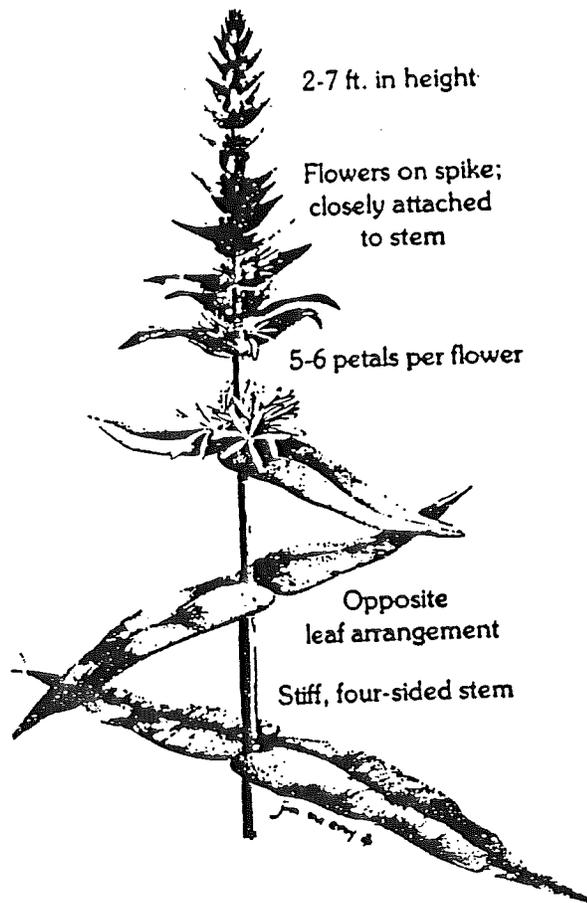
HOW TO CONTROL PURPLE LOOSESTRIFE

In 1987, purple loosestrife was designated a noxious weed in Minnesota. This has created much demand for information about the most effective purple loosestrife control methods. This summary sheet is intended to provide private land owners, agricultural inspectors and resource managers and others with the most current approved control techniques, as well as, guidelines for obtaining the necessary permits.

Presently, only about two percent of the suitable habitat for loosestrife in Minnesota is infested. However, once loosestrife invades an area, it can spread and become unmanageable very quickly. Loosestrife is currently found in most of the state's 87 counties with 1,470 separate populations reported, yet some loosestrife colonies are still small and can be managed with known control measures.

IDENTIFYING PURPLE LOOSESTRIFE

Purple loosestrife is a hardy perennial that can grow up to seven feet tall. Its stems are usually four sided with opposite leaf arrangement. The flowers are on a long spike closely attached to the stem. The flowers are purple-magenta in color with 5 to 6 petals per flower. Purple loosestrife blooms from mid-July to early September. This is the best time to recognize its bright flowers which can be seen on lakeshores, wetlands, streambanks and even in gardens. For more information on identifying purple loosestrife, a color brochure is available (see reference section in handbook).



REPORTING PURPLE LOOSESTRIFE SITES

If you find purple loosestrife in your area, it should be reported to the DNR's Purple loosestrife Program. New, small infestations should be reported since these are of highest priority for control. A standardized report form is available and should be used when reporting loosestrife. A sample of this postcard size report form can be found in the reference section of this Exotic Species Handbook. Reporting loosestrife infestations helps monitor the spread of loosestrife and efficiently control loosestrife statewide.

CONTROL STRATEGY

control strategy for small loosestrife populations should consist of aggressive eradication of existing plants. In addition, wetlands that do not currently have loosestrife need to be monitored, to ensure that any invasion is detected early. In areas where loosestrife has invaded wetlands or lakeshores having multiple owners, coordinated control efforts should be initiated on a bay-wide, lake-wide, or watershed-wide basis. Such coordinated control efforts should result in more efficient control, fewer applications for aquatic nuisance control permits, and savings in total treatment costs.

Early methods for eliminating large, dense populations of loosestrife were ineffective. Mechanical methods, such as cutting, are ineffective. Broadcast spraying of non-selective herbicides kills all the vegetation which allows loosestrife to come back even thicker from the seed bank. Long-term control of large populations may require biological controls and more selective herbicides, but the development of these techniques is at least several years away.

CONTROL TECHNIQUES

Resource managers and researchers across the country have tried many control techniques, and have found that improper control methods can make the loosestrife problem worse. Therefore, we are providing information about both successful and unsuccessful control methods.

Hand Removal

Hand removal is not an effective way to remove older plants or large numbers of plants. However, relatively young (1- to 2-year old) and isolated plants can be pulled by hand.

Pulling is easiest when water level is at or slightly above the ground surface. Roots of older plants should be "teased" loose with a fork rather than dug out with a shovel. This will minimize the number of roots that break off and may re-sprout. Try to minimize soil disturbance, because this provides a site for seed germination. At the same time, remove the entire rootstock, since regeneration can occur from the remaining pieces of root.

Pulled plants must be removed from the wetland because they can re-root. In Minnesota, where purple loosestrife is a noxious weed, the plants must be disposed of appropriately after they have been dug up. In most instances, burning the stems and rootstocks is the best disposal method.

Note: DNR Aquatic Nuisance Control permits are not required for hand pulling (mechanical control) of purple loosestrife.

Cutting, Burning and Flooding

Cutting does reduce stem numbers in the short-term. However, many repeated cuts are needed for long-term results, and cutting may never totally eliminate the loosestrife at a site. If shoots are cut into pieces where they can float to new areas, these pieces can root. Thus, cutting can actually enhance spread. Cutting and removing the flower stalks to eliminate the season's seed production helps. However, cutting is not generally a recommended control method.

TREATING LOOSESTRIFE WITH HERBICIDES

When Plan on spraying in mid-summer through early fall (July 1 - September 1) because the herbicides are most effective at this time and loosestrife plants are easily identified. Treat as soon as possible after loosestrife begins to flower. This will minimize seed production. If plants are already well-established at the site, there is probably already a high density of viable seeds in the soil. The disadvantage of treating early in the season is that loosestrife plants are difficult to locate because they are not in flower.

Permits If purple loosestrife is located in or along a water course, lake basin or wetland, a permit is probably required for control work. An Aquatic Nuisance Control (ANC) permit is required for chemical control of purple loosestrife within the boundaries of the state's protected waters (DNR Commissioner's Order No. 2210). When treating loosestrife, there is no fee for this permit (DNR Commissioner's Order No. 2244). The mechanical control of loosestrife, such as hand pulling or cutting, does not require an ANC permit even if within the limits of protected waters.

If you aren't sure of the watercourse, lake basin, or wetland, contact one of these sources: DNR Regional offices, the county auditor at the county courthouse, the County Soil and Water Conservation District. Remember, a permit is required to work below the ordinary high water mark in a lake, stream or wetland.

The boundary of Minnesota's protected waters is delineated by the ordinary high water mark (OHW). The OHW is the "highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape." For lakes or basins, the OHW usually marks the point where the native vegetation changes from predominantly aquatic to predominantly terrestrial. For streams and rivers, the OHW is the "evaluation at the top of the bank of the channel." A permit is required for chemical control of loosestrife below the OHW. If you're not sure if a permit is required, please contact your regional fisheries office.

Applications for an Aquatic Nuisance Control permit may be made by the riparian owner on that body of water or by a representative of a group of riparian owners, such as a lake association.

Sprayers Use only a plastic or stainless steel sprayer. Use clean water, check your sprayer for leaks and adjust the nozzle to provide a spray of fine droplets. Do not adjust to a mist, since a fine mist is likely to drift and kill desirable vegetation.

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Controlling loosestrife stands is difficult because fire will not spread in most stands. Even where it is possible to manipulate water levels, flooding is generally ineffective on established plants, although repeated or prolonged flooding in turbid waters reduces loosestrife vigor. Drawdowns can have impacts on wetlands by providing new exposed mud flats for the loosestrife to germinate on and raising water levels can spread the seed to new areas.

Aquatic Herbicides

To date, the most effective, efficient and least costly method for controlling loosestrife in situations where the plants can't be pulled is with spot applications of herbicide.

Glyphosate herbicides are very effective for killing purple loosestrife. Glyphosate is available under the trade names Roundup, Rodeo, and Pondmaster--all manufactured by Monsanto. Only Rodeo and Pondmaster are legal for use in aquatic sites. Roundup can only be used on upland areas for vegetation control. Glyphosate is nonselective; however, selective application techniques allow it to be used effectively with minimum damage to desirable plants. It is taken up through the leaves or young stems and will kill any plant that it is applied to. Therefore, treat only the loosestrife plants and avoid contact with valuable wetland plants such as cattails. Glyphosate is biodegradable, very short-lived and becomes quickly inactivated when it contacts moist soil.

Only Rodeo and Pondmaster may be used at aquatic sites. It must be mixed with Ortho X-77 Spreader, or another approved wetting agent. Roundup, which is useful in dry (non-aquatic) situations, is readily available at most feed and garden stores. Rodeo is only sold in large quantities and by very few dealers. Pondmaster is available in smaller quantities. If you need to control purple loosestrife in standing water, contact the DNR's Purple Loosestrife Program for help in obtaining the herbicide or for a current list of dealers and licensed commercial applicators.

The overall objective when controlling purple loosestrife with glyphosate herbicide is to spray very carefully so the loosestrife plants are selectively removed but the surrounding desirable vegetation are not harmed. If this can be accomplished most of the loosestrife will be controlled. The relatively small "holes" in the vegetation will be quickly filled by other perennials precluding the establishment of loosestrife seedlings. Follow-up treatment is needed each growing season since some plants will be missed, new seedlings will sprout, and a few plants will survive the initial treatment. Improper mixtures and careless application, however, inevitably kills more surrounding vegetation and leads to the establishment of more loosestrife seedlings.

Broadleaf herbicides can be effective on loosestrife, when used from late May through September. Because they don't harm monocot species like cattails, which are the dominant plants in most wetland types, they can be broadcast sprayed. But, the only aquatically labeled selective herbicide used for loosestrife control is not consistently effective. New selective herbicides are being tested and may prove to be valuable in the future.

- Weather** Treat when rain is not expected for at least 8 hours, preferably 24 hours, and treat only during mid-morning to afternoon (wait until the dew is off and the plants are dry). Do not treat on windy days. Refer to labels for temperature limitations.
- Mixing** Follow the instructions on the label of the herbicide you purchase. Rodeo and Pondmaster: Mix a 1% solution (1 1/3 ounce Rodeo per gallon of clean water) and use .25% of Ortho X-77 Spreader (1/3 ounce per gallon).
- Applying The Herbicide** Wet about 1/4 to 1/2 of the leaf areas of each plant (a "clump" of loosestrife is an individual plant), taking care to avoid spraying other species. Often loosestrife is taller than the surrounding vegetation, so you can spray the top of the plant. Many plants require only one brief squirt of herbicide.
- Planning** Work through the colony starting at one side and backing away from the area you have sprayed to avoid walking through the wet herbicide. For larger patches, tie some bright colored flags to tall plants to mark the boundaries of the areas that have been treated. Work into the wind.
- Signs** If the treatment is carried out on Minnesota public waters or wetlands, you need to post Loosestrife Control Site treatment signs in the treated area to serve notice to anyone who may use the area for water recreation. Use restrictions vary depending on the herbicides and how they are used. Loosestrife Control Site signs (yellow in color) are provided by the DNR when the Aquatic Nuisance Control (ANC) permit is issued.
- Re-visit** Re-visit the wetland each year to kill any surviving plants and new seedlings to prevent reinvasion. Also watch any areas where soil disturbances or exposed mud flats may provide a site for seedling establishment.

GENERAL GUIDELINES FOR LOOSESTRIFE CONTROL

Site Characteristics:	1-20 plants scattered	20-100 plants scattered/ small clumps	100-1,000 plants small clumps/ dense stands	> 1,000 plants Large stands >75% coverage
Walkable or drivable	Hand remove plants and destroy all plant parts.	Same as left or selectively spray with Rodeo.	Spot-spray Rodeo or broadcast-spray selective herbicide.	Broadcast-spray selective herbicide Biological control when available.
Accessible by boat	Same as above or selectively spot-spray w/herbicide.	"Selectively" spot-spray with Rodeo.	Spot-spray Rodeo or broadcast-spray selective herbicide.	Broadcast-spray selective herbicide Biological control when available.
Inaccessible by ground or water	"Selectively" broadcast spray w/ herbicide.	"Selectively" broad-cast spray w/herbicide.	Biological control when available.	Biological control when available.
Sensitive site (e.g., rare plants)	Hand Remove/Wick application of Rodeo.	Hand Remove/Wick application of Rodeo.	Biological control when available.	Biological control when available.
Chemical use prohibited	Hand remove plants and destroy all plant parts.	Hand remove plants and destroy all plant parts.	Biological control when available.	Biological control when available.

PROBLEM SPECIES FACT SHEET #5

Black Locust

Robinia pseudoacacia

Description:

Black locust is a fast growing tree, height 40-100' (12-30m); mature trees have furrowed dark brown bark with flat-topped ridges, seedlings and sprouts have long thorns and grow rapidly. Leaves alternate, pinnately compound with 7-21 elliptic or rounded leaflets, dark green above, pale beneath. Fragrant white flowers appearing in May or June have a yellow blotch on the uppermost petal, and appear in drooping racemes. Fruit pods are smooth, 2-4" (5-10cm) long, containing 4-8 seeds.

Concern:

Black locust is native to the southeastern United States on the lower slopes of the Appalachian Mountains, with outliers north along the slopes and forest edges of southern Illinois, Indiana, and Missouri. This tree has been planted extensively for its nitrogen fixing abilities, to provide nectar for honey bees, hardwood lumber, erosion control and as fence posts. It is commonly found in disturbed areas such as old fields, degraded woods, and roadsides. The trees prefer sites with full sun and little competition. Black locust reproduces vigorously by root suckering and stump sprouting to form groves of trees interconnected by a common fibrous root system. Physical damage to roots and stems increases suckering and sprouting, making control difficult.

Once established, black locust crowds out native vegetation in prairies, upland forests and oak savannas. MN Interagency Exotic Species Task Force 1991 current threat ranking of MODERATE, future threat ranking of SEVERE.



Black locust, *Robinia pseudoacacia*, in flower

K. E. Bojin

Control:

Mid-June to August: Hand application of 6.25% Roundup (glyphosate) solution (15:1 water:Roundup) to cut stumps has been used by MN DNR Region V State Parks Resource Management. Resprouting and suckering from dense clones may require follow up treatment after a few years*. Literature also describes good to excellent success at this concentration.

Year-round: A 25% Garlon 4 solution in basal oil applied with backpack sprayers has been used on cut stumps by the Scientific and Natural Areas Program in Minnesota. Thoroughly wet the cut stump and bark below the cut, down to the root collar, but avoid runoff. Any runoff will kill surrounding vegetation, especially if treated in the winter before snow melt.

*Apparently killed plants can resprout several years after most all treatments, requiring annual or every other year monitoring.

This information is not an endorsement of particular products or practices. Pesticide use must follow label directions and applicable state and federal laws.