

**Management notes: techniques, results and recommendations for  
control of non-native invasive plant species  
by the Marianist Environmental Education Center**

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**Bush Honeysuckle, *Lonicera maackii***

Bush honeysuckle, an invasive shrub from Asia, which seriously degrades native ecosystems, has become well established since it was introduced on this property some 25 years ago. Since the late 1980s we have been engaged in a program to control it. In spite of time and personnel limitations we have cleared a significant portion of the nature preserve, but about 15 acres still has mature, dense stands of bush honeysuckle. These mature stands are mostly found in areas such as edges of the woodland, where light penetrates readily. Areas of old-field succession adjacent to the woods are a seed sources for the property and have priority as the primary targets for management.

We have found that, in terms of time and personnel, the most effective and efficient method for removal of bush honeysuckle has been the Fall foliar spraying with 1% glyphosate (Roundup®). Proper application of this method, where at least 70% of the foliage covered with spray, kills plants completely. Penetrating the shrub area to reach other plants can be physically difficult but our spray 100-gallon capacity spray apparatus can project 15ft forward into a towering line of honeysuckle. Alternatively, we use a spray rig with 300 gallons spray tank that can spray 30 ft ahead at a rate of 100gal/hour. During fall of 2000, we used a 100 gal sprayer to cover nearly 20 acres of infested area with 800 gallons of 1%Roundup, consuming a total of 70 person-hrs.

Because of the seed bank under the mature shrubs, new honeysuckle seedlings germinate and these will begin to reproduce in 2 to 5 years. During the several-year period before the bushes are old enough to flower, we can treat other locations before returning to the location we sprayed earlier. Each year we attempt to address some of the areas with large, mature plants but also reserve time to re-address areas that have become re-infested with seedlings.

Generally, in an area with sufficient light penetration in a rich woodland to support mature honeysuckle, recovery seems to take place on its own. Within a season after removal we find that native herbs predominate the area where the competitor for sunlight, honeysuckle, has been removed. Herbs such as white snakeroot (*Ageratina altissima*), clearweed (*Pilea pumila*), mayapple (*Podophyllum peltatum*) among others, begin colonizing under the dead honeysuckle in areas that were devoid of a functional herbaceous layer when the honeysuckle was alive.

Killing bush honeysuckle releases other species that inhabit the woodland floor, allowing for the germination of many forbs, shrubs and trees, and new honeysuckle seedlings. Spraying creates yet another disturbance to a habitat and the open disturbed areas such as former grazing land, local roads and fence lines once will often show a flush of additional non-native, undesirable species including garlic mustard, *Alliaria petiolata* and Tree-of-Heaven, *Ailanthus altissima*. In places, the fragmented and highly disturbed nature of this habitat may prevent it from recovering naturally on its own within a reasonable time. Here may be a need to restock certain areas that were under a high level of honeysuckle for long enough that the propagules for replacement are insufficient. We are experimenting with ways of introducing plugs and seeds to establish native herbs by seeding such as woodland grasses, wood mints, asters and goldenrods.

We are only beginning to move beyond removal, major task, and are now looking for ways to enhance the restoration process of these susceptible areas. The outlook is positive but will require a long-term management plan and on-going attention.

**Japanese Honeysuckle, *Lonicera japonica***

An application of 1% Roundup on the leaves of Japanese honeysuckle late in the growing season (August-

Sept) resulted in successful control. The vine form of honeysuckle spreads readily and roots many places so control requires several applications of herbicide to kill what initially escaped. The first application generally kills most of the plant. At least one more application is needed in areas with a dense, many layered 'carpet'.

#### **Garlic Mustard, *Alliaria petiolata***

This plant is common when the soil has been disturbed in or along the edges of woodlands. It is especially prominent following honeysuckle control. Although pulling the plant can be done just before blooming, this method further disturbs the soil and so is counterproductive. Also, after blooming, the pulled plant material must be removed from the site or the flower heads will continue to mature and the area will be reseeded. MEEC has been experimenting to produce a reliable control method based on a time for cutting and a height where the flower head should be cut. Cutting the flower stalk off just below the lowest flower after blooming of the last flower on the stalk but before seeds mature has proven to be an efficient way to control garlic mustard populations. Seed viability test thus far indicate the plants cut off during the 3<sup>rd</sup> to 4<sup>th</sup> week of May did not produce viable seed. Also the length of the flower stalk (which continues to feed immature seed) is critical in seed maturity. The less plant material to feed immature seed the better chance that seed will never mature. Defining the critical point between these two criteria provides control that gives efficient use of personnel time.

#### **Tree-of-Heaven, *Ailanthus altissima***

We have had good results in reducing invasion with the EZ-Ject Roundup pellets. This apparatus inserts a small diameter cartridge in the trunk loaded with concentrated glyphosate. All trees with Diameter Breast Height (DBH) under 4 inches were killed in our trials. The cartridges were embedded at the base of the trees at 2" intervals. A tree with an 4" DBH received 5-7 Roundup-filled. Fewer than half of the treated trees ranging from 5-10" DBH were killed. Larger trees can be treated by completely girdling the tree and applying Roundup herbicide on the exposed wood.

#### **Asiatic bittersweet, *Celastrus orbiculatus***

Asiatic bittersweet establish in thickets and often strangles trees by wrapping its stem around trees as they climb. MEEC controls bittersweet by cutting and treating the stump with 20% glyphosate herbicide. This is a plant that can be easily confused with the native bittersweet vine (*Celastris scandans*). The latter, native species has terminal flower clusters... at the ends of the vine and branches while the invasive Asian species has flowers in the notch where leaves and stem meet (axil = "arm pit"). A second walk through of the area is necessary to remove the missed plants. It appears that applying 1% Roundup to the leaves late in the growing season, August, can kill the above ground vegetation. It is uncertain to what extent the roots re-sprout.

#### **Periwinkle / Myrtle, *Vinca minor***

This plant was successfully controlled by application of glyphosate herbicide in late winter before spring ephemerals began to emerge. The large mass of evergreen leaves sprayed in mid February to mid March a solution of Rodeo and surfactant (1 part surfactant, 4 parts Rodeo and 15 parts water). Dawn dish detergent at 2% seems to work well. For the first month the plant appeared unaffected, however, by the middle of spring it was clear that the periwinkle that was sprayed had died. No negative results were found when the herbicide was applied before spring wildflowers appeared above ground.

#### **Crown Vetch, *Coronilla varia***

A perennial planted along roadsides for erosion control and soil rehabilitation. This creeping stemmed plant spreads vegetatively by a rhizomatous root system. A broad leaf herbicide such as Tri-Mec© (2,4-D ester type) is effective on the vetch. Several treatments are necessary and several years of post monitoring is required.

#### **Canada Thistle, *Cirsium arvense***

A non-native herbaceous perennial with an extensive rhizome root system allows the plant to form large colonies. A common nuisance for agricultural fields, and disturbed land. The wind blown seeds can remain

viable for up to 20 years. A combination of management techniques seem to be most successful for control of Canada thistle. Prescribed burns reduce colonies in native grasslands. Mowing can temporarily reduce patches of this plant but years of mowing is needed to remove colonies.

MEEC has a large, many-acre, old agricultural field in which this species is a major management problem. Several applications of herbicide (broad-leaf or general) are required to control patches. In this large area we have using a combination of mowing and herbicide management followed by establishment of native grass and forb species. MEEC mows before or just as blooming starts and then allowing several weeks for the plants to re-grow, before following up again with another round of mowing throughout the growing season. This slows the plant and reduces the seed spread. In designated areas we apply herbicide a few weeks after the first mowing hoping the herbicide effectively reaches the whole root system. We are currently switching to Stinger herbicide to see if it gives better root kill.

### **Common and Cut leaved Teasel, *Dipsacus sylvestris*, *D. laciniatus***

This European plant is common along roadsides and disturbed ground as a biennial or short lived perennial forming a rosette the first year and flowering the following. Teasel is common in old fields and roadsides. Mechanical control, by pulling or a root digger, is suggested by prairie restorationist . The mechanical removal to control small populations does minimal damage to established prairie communities. MEEC mows teasel just as flowering begins, but the plant will readily re-flower. Teasel produce massive amounts of seed and so plants should be removed from the site.

### **Common Ragweed, *Ambrosia artemisiifolia***

This annual form is common in agricultural fields, landscapes, nurseries, roadsides, meadows, and waste places. Reproduction is by seed. It does not tolerate frequent mowing. MEEC has used a combination of mowing and broad leaf herbicide for management. Within the last several years, this species and it's relatives (Giant ragweed and western ragweed) have become more of a problem in old fields and prairies.

### **Wild Parsnip, *Pastinaca sativa***

Parsnip is a taproot biennial common in fields, roadsides. It grows in a range of moisture conditions but does not tolerate shade. Caution is needed when controlling the plant which can cause phytophotodermatitis. In small populations hand pulling (gloves!) and removal of material is recommended. MEEC has a large population in which we mow or use a brush-cutter to cut just after peak flowering and before the seeds set. Plants may re-sprout when cut above the ground, and should be cut again a few weeks later to prevent flowering. Cutting done after seed set will greatly reduce the likelihood that the plants will be able to resprout and flower. Recently a restorationist has recommended severing the tap root a couple of inches below ground and removing the top from the site. We plan to try this method.

### **Canada Goldenrod, *Solidago canadensis***

This is a native perennial with a tendency to invade and dominate by means of an extensive fibrous rhizome root system. This species is common in nurseries, orchards and old fields. For control of the species in a prairie, MEEC will mow goldenrod in late June/ early July. Mowing then releases the prairie grasses from competition and the grasses readily re-grow after mowing. The goldenrod re-sprouts and again controlled by a weed whip in late August/ September before seeds set. Mowing regime once or twice during the growing season works in old field habitats. Mowing does not fully remove goldenrod but definitely limits it to a manageable level.

### **Autumn Olive, *Elagaeagnus umbelata***

Non-native, deciduous shrubs with nitrogen fixing root nodules for easy adaptation to poor soils. They establish in pastures, fields and open woodlands and can aggressively out-compete native species. If cut or burned, the plant vigorously re-sprouts. Cut and stump "squit" treatment is successful.

**Glossy and Common Buckthorn, *Rhamnus frangula*, *R. cathartica***

These non-native woody shrubs have an easily invade habitats from wetland to upland and with rapid growth rates abundant seeds are widely dispersed by birds. These species once established can aggressively invade natural areas and displace native species. Application of 20% glyphosate to the cut stump successfully kills the root system.

**Japanese knotweed, *Polygonum cuspidatum***

This plant is beginning to be established in drainage ditches and along streams. It will be difficult and should be removed by cutting and using herbicide to kill the stumps. Initial attempts with a fall foliar 1% Roundup appear successful in killing the plant.

**Privet, *Ligustrum vulgare***

This shrub is beginning to become more prevalent. There is a concern that this may be the next major problem in our local deciduous woodlands. Application of 20% glyphosate to the cut stump successfully kills the root system.

**Purple Loosestrife, *Lythrum salicaria***

At present this plant is not found in MSJ wetlands. When located in small infestations the plant can be pulled taking care to remove the entire root system from the site. Mowing can exacerbate the infestation. An effective chemical control method is to cut the stem and selectively apply a glyphosate that is permitted for wetland use (Accord©). Yearly monitoring for reinvasion is necessary. Biological control methods are being studied.

**Wintercreeper Euonymus, *Euonymus fortunei* & Japanese Barberry, *Berberis thunbergii***

We are just beginning to address these species. Try 2% Roundup and Dawn dish detergent as surfactant

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**Marianist Environmental Education Center**

Mount Saint John, 4435 East Patterson Rd Dayton, OH 45430-1095

PHONE: (937) 429-3582 FAX: (937) 429-3195 EMAIL: [meeec@udayton.edu](mailto:meeec@udayton.edu) WEBSITE:

[www.udayton.edu/~meeec](http://www.udayton.edu/~meeec)