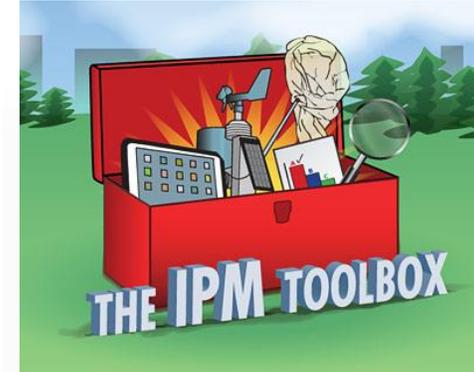


Biology and Management of Troublesome Invasive Species in the Northeast

Toni DiTommaso, PhD

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Cornell University



Northeastern
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Center

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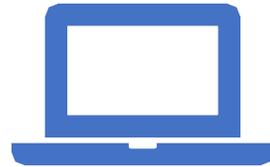
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Webinar Details



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Webinar Presenter

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Some Questions for You



A photograph of a forest with many trees and a dense ground cover of green plants. The trees are mostly thin and have green leaves. The ground is covered with a thick layer of green plants, possibly a groundcover species. The overall scene is a lush, green forest.

Biology and Management of Troublesome Invasive Species in the Northeast

Dr. Antonio DiTommaso, Cornell University

What qualifies as an invasive species?

Non-native

Problematic

Species we'll cover today

ANNUALS

- Japanese stiltgrass (*Microstegium vimineum*)

HERBACEOUS PERENNIALS

- Japanese knotweed and hybrids (*Fallopia/Reynoutria* spp.)
- Purple loosestrife (*Lythrum salicaria*)
- Swallowworts (*Vincetoxicum rossicum/V. nigrum*)
- Common periwinkle (*Vinca minor*)
- Lesser celandine (*Ranunculus ficaria*)
- Bindweeds (*Convolvulus arvensis/Calystegia sepium*)
- Goutweed/Bishop's weed (*Aegopodium podagraria*)
- Common reed (*Phragmites australis*)

SHRUBS

- Bush honeysuckles (*Lonicera* spp.)
- Buckthorn (*Rhamnus cathartica/R. frangula*)
- Multiflora rose (*Rosa multiflora*)



Japanese stiltgrass

- Annual: reproduces by seeds, dies with hard frost
- Wider leaves than other grasses
- Hairy collar region
- Off-center, silvery midvein
- Shallow, fibrous roots



Aggressive invader
of many habitats,
especially shaded,
wet places like
forest understories

Other habitats: wetlands, ditch banks, utility
rights of way, mulched landscape bends, low-
maintenance turf

Japanese stiltgrass: non-chemical management



Shallow root system can be pulled out, so hand weeding works on small infestations



A string trimmer that cuts plants at ground level will prevent regrowth



Mowing the area frequently, or once in late summer, can reduce seed production



Flame weeding is possible in moist sites with little fire hazard



Re-seed bare areas to prevent stiltgrass from taking over

Japanese stiltgrass: examples of chemical options

- Japanese stiltgrass is a grass, so Group 1 herbicides work
- Herbicides that work against crabgrass tend to work against Japanese stiltgrass
- PRE herbicides must be applied before germination
- POST herbicides can be applied until flowering. Two applications may be needed.

Application timing	Herbicide	Product rate*
PRE: Late winter/early spring (2–3 weeks before germination)	ProClipse** (prodiamine) or Pendulum AquaCap** (pendimethalin)	16 to 32 ounces/acre or 64 to 128 ounces/acre
Late PRE: until May	Preemergence herbicide plus Oust XP (sulfometuron)	Preemergence herbicide plus 0.25 to 0.5 ounce/acre
PRE and POST	Oust XP (sulfometuron)	1 to 4 ounces/acre
POST: May to August	Aquaneat (glyphosate) or Finale** (glufosinate) or Assure II** (quizalofop)	8 to 96 ounces/acre or 64 ounces/acre or 4 ounces/acre

*1 oz/acre = 73 mL/ha

**Non-crop site label (e.g., roadsides, fencerows), not forested sites



Japanese knotweed

- Perennial broadleaf
- Woody/ shrubby appearance
- Oval to heart-shaped leaves
- Jointed stems
- Branched white inflorescences
- Long rhizomes

Forms dense monocultures in sunny habitats with wet soils such as riverbanks



Other habitats: roadsides, acidic mine spoils, forest edges, near bridges or road structures

Japanese knotweed: non-chemical management



Can be cut back, but must be cut back multiple times a season over several years due to regrowth



Can be smothered by cutting it back in early June then leaving a plastic tarp over the spot for 3-5 years

Japanese knotweed: examples of chemical options

- Cutting stands back 8 weeks before application is recommended
- Late season application is most effective

Application timing	Herbicide	Product rate*
POST: May to August	Aquaneat** or Glyphomate 41** (glyphosate)	96 ounces/acre or 137.6 ounces/acre
	Habitat** (imazapyr)	48 ounces/acre
	Garlon 3A** (triclopyr)	64 ounces/acre

*1 oz/acre = 73 mL/ha

** Labeled for use near aquatic areas



Purple loosestrife

- Perennial broadleaf
- Whorled, opposite leaves
- Spiked pink to purple inflorescences
- Reproduces mainly by seed



Forms dense colonies in wetlands

Also grows in ditches and disturbed wet areas

Purple loosestrife: non-chemical management



Small infestations can be removed by hand weeding



Remove and destroy flower heads before seeds mature



Larger plants can be dug up with a shovel or digging fork



Rinse off clothing and equipment used in infested areas



Avoid composting this plant

Purple loosestrife: examples of chemical options

Application timing	Herbicide	Product rate*
POST: June to September	Aquaneat** (glyphosate)	96 ounces/acre
	Garlon 3A** or Vastlan** (triclopyr)	80 to 256 ounces/acre or 64 to 192 ounces/acre
	Habitat** (imazapyr)	19 to 38 ounces/acre
	Escort (metsulfuron)	19 to 38 ounces/acre

*1 oz/acre = 73 mL/ha

** Labeled for use near aquatic areas



Swallowworts

- Two species: pale and black swallowwort
- Herbaceous vines
- Small pink (pale swallowwort) or purple (black swallowwort) flowers with 5 petals
- Long, slender seed pods

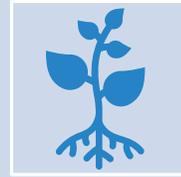


Forms dense mats
in sunny areas that
crowd out native
species



Prefers sun but is tolerant of shade; often
found in disturbed areas like pastures or
roadsides

Swallowwort: non-chemical management



Small patches can be hand weeded



Pods may be removed by hand to prevent the spread of seeds



Mowing should be done before seeds fully mature, ideally when pods are in early development

Swallowwort: examples of chemical options

- Herbicide should be applied in late summer after plants are mowed in early July

Application timing	Herbicide	Product rate*
POST: June to September	Roundup ProMax or Ranger Pro (glyphosate)	1.8 lb ae/acre or 1.2 lb ae/acre
	Garlon 4 Ultra (triclopyr)	51 ounces/acre

*1 oz/acre = 73 mL/ha



Common periwinkle

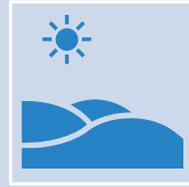
- Evergreen ground cover
- Dark green, waxy leaves with light midvein
- Creeping or spreading habit
- Purple to white flowers

Escapes cultivation and becomes established in shady areas like the forest floor

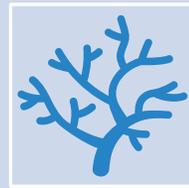


Also found in many shaded, disturbed areas like abandoned homesites, cemeteries, and ditches

Common periwinkle: non-chemical management



Can be cut or mowed



Rake the vines after mowing
to prevent them from
spreading

Common periwinkle: examples of chemical options

- Apply to new growth, or after cutting

Application timing	Herbicide	Product rate*
POST	Roundup or Accord XRT II (glyphosate)	80 to 160 ounces/acre
	Stalker (imazapyr)	43.2 to 86.5 ounces/acre
	Garlon 4 Ultra (triclopyr)	21.5 to 43.2 ounces/acre

*1 oz/acre = 73 mL/ha

Lesser Celandine
Tubers



Joe Boggs, OSU Extension



5455844



5546474



5595371

Lesser celandine

- Spring ephemeral herb
- Kidney-shaped leaves
- Leaves grow in a basal rosette
- Underground tubers
- Waxy yellow flowers



Typically found near bodies of water

Also found in many locations with moist soil such as floodplains and lowlands; can also grow in lawns and gardens

Lesser celandine: management options

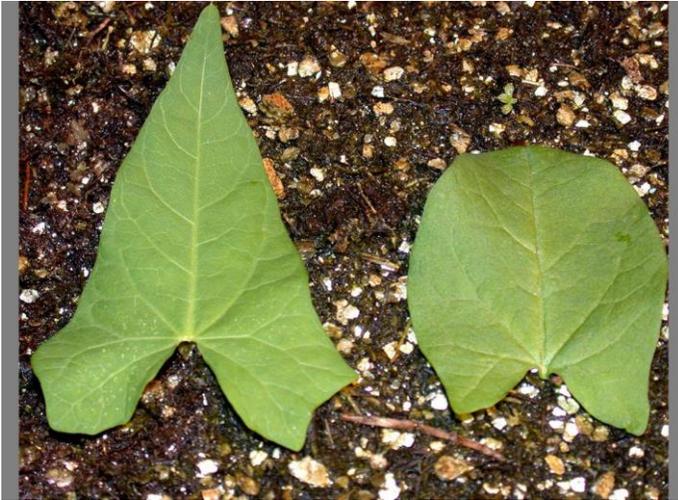


Can be dug up and destroyed, but all of the tubers must be removed

Application timing	Herbicide	Product rate*
POST (late March through April)	Rodeo** (glyphosate)	72 to 120 ounces/acre
	Aquasweep** (2,4-D and triclopyr)	44 to 88 ounces/acre

*1 oz/acre = 73 mL/ha

** Labeled for use near aquatic areas



Bindweeds

- Hedge and field bindweed
- Twining perennial herbs
- White to pink trumpet shaped flowers
- Hedge bindweed leaves more pointed than field bindweed leaves
- Has rhizomes



Problematic in cropland and turfgrass

Also found in disturbed areas and landscaped gardens

Bindweeds: non-chemical management



Frequent tillage during fallow periods disrupts rhizomes



Cover crops help to suppress bindweed emergence



Inter-row cultivation should be started early in the season, and equipment should be cleaned thoroughly afterwards



Hand weeding works for home gardeners, but must be done frequently

Bindweeds: examples of chemical options

Application timing	Herbicide	Product rate*
PRE	Arsenal (imazapyr)	16 ounces/acre
POST	2,4-D or Clarity (dicamba) or Roundup ProMax (glyphosate) or Escort (metsulfuron) or Garlon 3A (triclopyr) or Vista XRT (fluroxypyr) or Tordon 22k (picloram)	64 to 96 ounces/acre or 1 to 4 lbs/acre or 96 to 128 ounces/acre or 1 to 2 ounces/acre or 96 to 128 ounces/acre or 22 ounces/acre or 1 to 2 ounces/acre

*1 oz/acre = 73 mL/ha



Goutweed/ Bishop's weed

- Perennial herb
- Leaves grouped in three
- Most leaves basal
- Flat-topped clusters of white flowers
- Long, white, rhizomes



Grows in partially shaded areas disturbed by human activities

Other habitats: forests, old gardens, flowerbeds, abandoned fields, and pastures

Goutweed: non-chemical management



Cover affected areas with a tarp for at least one season



Frequent mowing may help curb its spread



Reseed the area with native plants



Hand weeding is possible for small infestation, but rhizomes must be removed

Goutweed: examples of chemical options

Application timing	Herbicide	Product rate*
POST	Roundup PRO (glyphosate)	8 to 64 ounces/acre
	Garlon 4 Ultra (triclopyr)	32 to 128 ounces/acre

*1 oz/acre = 73 mL/ha



Common reed

- Perennial grass
- Between 6 and 12+ ft tall
- Fluffy gray or purple flower heads
- Spreads by rhizomes



Invades freshwater wetlands and salt marshes

Other habitats: roadsides, river edges, and the shores of lakes and ponds

Common reed: non-chemical management



Cutting below the lowest leaf
can control small stands



Heavy plastic tarps can help
prevent regrowth after
cutting a stand back

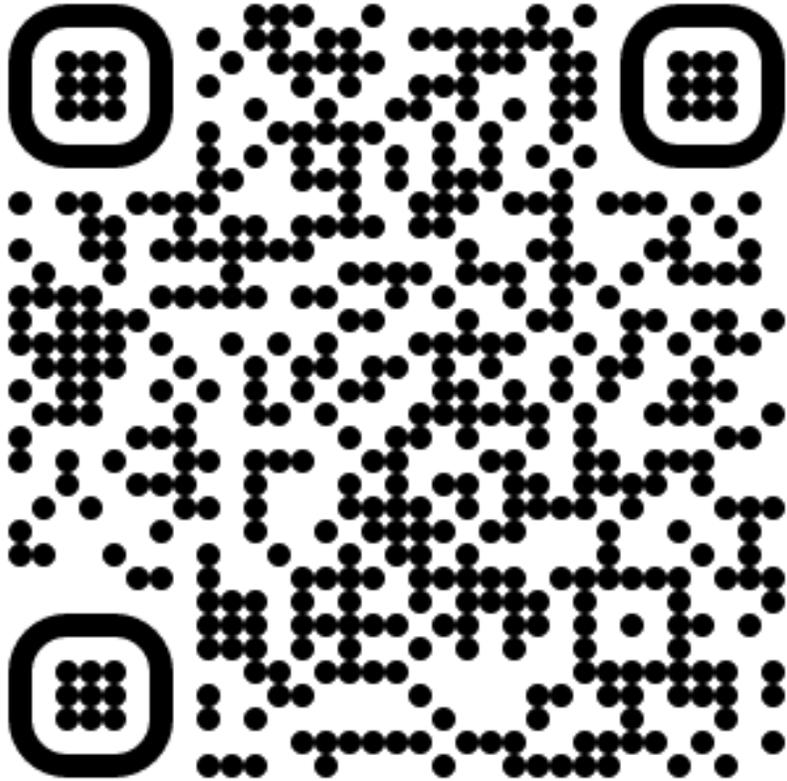


Burning can be effective if
performed before flooding or
after herbicide application

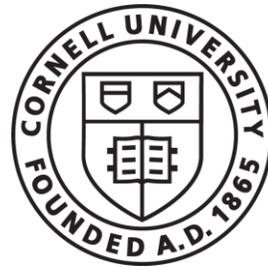
Questions?

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Bush honeysuckle

- Medium to large shrub
- Simple, opposite, oval leaves
- White to pink flowers with four petals
- Small orange to red berries



Not shade tolerant;
frequently invades
forest edges and
disturbed
woodland

Other habitats: lakeshores, roadsides,
abandoned fields, pastures

Bush honeysuckle: non-chemical management



Can be hand pulled when they are still small (diameter of ½ in or less)



Larger plants can be cut at the base, but they will likely grow back unless this is followed up with herbicide application



Whole plants may be pulled out with a skid steer or tractor



Prescribed burns can help to kill seedlings and should be performed in early spring or fall

Bush honeysuckle: examples of chemical options

Treatment	Herbicide	Product rate*
Foliar Treatment** (From full leaf expansion to onset of fall color)	Ranger Pro or Accord XRT II (glyphosate) plus Garlon 3A or Vastlan (triclopyr)	128 ounces/acre or 96 ounces/acre plus 64 ounces/acre or 48 ounces/acre with water
Cut Stump or Basal Bark Treatment (Year Round)	Pathfinder II or Garlon 4 Ultra (triclopyr ester)	Ready-to-use or 20%, 1:4 in basal oil

*1 oz/acre = 73 mL/ha

** Can also be applied to freshly cut stems in a 1:1 mix with water



Buckthorn

- “Thorns” come from the ends of branches breaking off
- Common buckthorn:
 - Opposite, toothed leaves
 - Yellow inner bark
 - Monoecious
- Glossy buckthorn:
 - Alternate, glossy leaves
 - White lenticels
 - Dioecious



Able to invade forest interiors due to its ability to tolerate deep shade

Common buckthorn is found in drier sites while glossy buckthorn invades wetlands

Buckthorn: non-chemical management



Can be pulled up with a root-wrenching tool or hoe, and small plants can be hand weeded



Mowing is an option, although it should be followed by herbicide application



Controlled burning every two to three years can help manage populations



Grazing by goats helps to control buckthorn

Buckthorn: examples of chemical options

Treatment	Herbicide	Product rate*
Foliar Treatment** (June to onset of fall color)	Accord XRT II (glyphosate) plus Garlon 3A or Vastlan (triclopyr)	96 ounces/acre plus 64 ounces/acre or 48 ounces/acre with water
Cut Stump or Basal Bark Treatment (Year Round)	Pathfinder II or Garlon 4 Ultra (triclopyr ester)	Ready-to-use or 20%, 1:4 in basal oil

*1 oz/acre = 73 mL/ha

** Can also be applied to freshly cut stems or as a hack-and-squirt treatment in a 1:1 mix with water



Multiflora rose

- Large shrub that forms thickets
- Fringed stipules on leaf stalks
- Red thorns on stem
- Clusters of white to pink flowers
- Spreads by seed and by canes



Invades forest
edges, hedgerows,
and abandoned
fields

Other habitats: roadsides, mature forests

Multiflora rose: non-chemical management



Eradication is difficult for this species, so focus on stopping spread to new areas



Brush mowing multiple times a year for 2 to 4 years will slow the spread and potentially kill smaller infestations



Digging up the root crown prevents regrowth



Grazing by goats will help remove existing stands, but multiflora rose will persist in the seedbank

Multiflora rose: examples of chemical options

Treatment	Herbicide	Product rate*
Foliar Treatment** (Mid-May to onset of fall color)	Accord XRT II (glyphosate) plus Garlon 3A or Vastlan (triclopyr)	96 ounces/acre plus 64 ounces/acre or 48 ounces/acre with water
Cut Stump or Basal Bark Treatment (Year Round)	Pathfinder II or Garlon 4 Ultra (triclopyr ester)	Ready-to-use or 20%, 1:4 in basal oil

*1 oz/acre = 73 mL/ha

** Can also be applied to freshly cut stems in a 1:1 mix with water

General takeaways

Be persistent! For most invasive species, repeated control will be needed

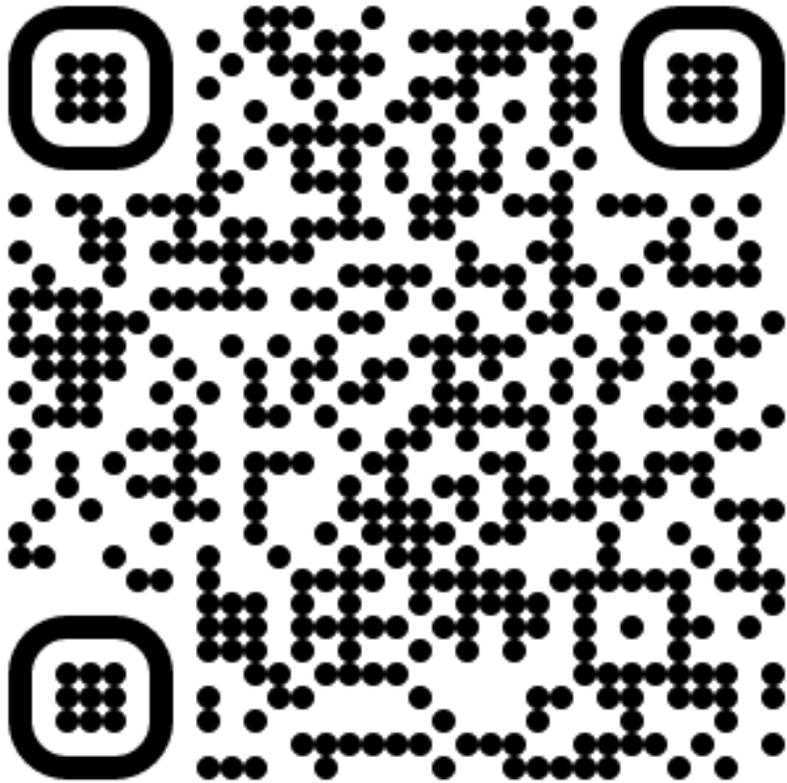
Systemic herbicides are required for chemical control of perennials

Timing matters. Late-season operations can reduce seed production

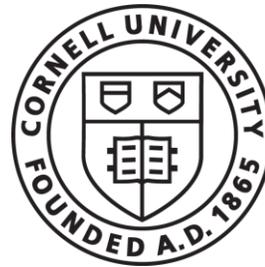
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Upcoming Webinars

Monday, March 11th - **The use of IPM in beekeeping to control parasitic varroa mites** with Robyn Underwood

Monday, March 25th - **Kosher, Halal and Insects: How do they relate?** with Joe Regenstein

<https://www.northeastipm.org/ipm-in-action/the-ipm-toolbox/>



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Cornell University is located on the traditional homelands of the Gayogohó:nq' (the Cayuga Nation). The Gayogohó:nq' are members of the Haudenosaunee Confederacy, an alliance of six sovereign Nations with a historic and contemporary presence on this land. The Confederacy precedes the establishment of Cornell University, New York state, and the United States of America. We acknowledge the painful history of Gayogohó:nq' dispossession, and honor the ongoing connection of Gayogohó:nq' people, past and present, to these lands and waters.

This land acknowledgment has been reviewed and approved by the traditional Gayogohó:nq' leadership.



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