

**12 INVASIVE
PLANTS
COMMONLY FOUND
IN VERMONT**



Acknowledgments

This guide was compiled by the Vermont Department of Forests, Parks & Recreation's **Forest Health Invasive Plant Program**.

Collaborators

USDA Forest Service
UVM Extension
VT Agency of Agriculture, Food & Markets
VT Agency of Natural Resources

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What Is An Invasive Species?

Invasive species are non-native plants, animals, and other organisms that are introduced into an ecosystem and cause harm to the things we value.

They are able to thrive in their new environment because they leave behind the predators, competitors, and diseases that were keeping them in check in their native range. Invasive plants have adaptations that allow them to grow quickly, often under adverse conditions. They can spread rapidly due to their reproductive strategies, which allow them to quickly colonize an area (see photo, page 4). They out-compete Vermont's native plants, thus altering the ecosystem and causing harm to the things we value such as:

The environment

- Reduced biodiversity
- Disruption of the food web
- Negative impacts on wildlife

Human health

- Increased tick populations
- Rashes caused by contact with certain invasive plants

The economy

Invasive plants impede forest regeneration which negatively impacts:

- Forestry and logging industries
- Maple sugaring
- Hunting and tourism

What Is An Invasive Species?



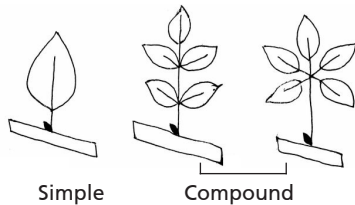
Above: A forest understory infested with a monoculture of invasive Japanese Barberry

Plant Identification Terms

Leaf Types

Simple: only one leaf between stem and leaf tip

Compound: two or more leaflets between stem and leaf tip

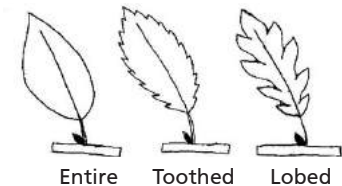


Leaf Edges

Entire/Smooth: leaf edge has no teeth

Toothed/Serrated: leaf edge has sharp teeth

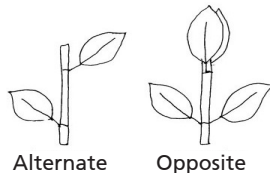
Lobed: leaf edge indents about half way to the midrib



Arrangement

Alternate: leaves are staggered on the stem (1 leaf per node)

Opposite: leaves are straight across from each other (2 leaves per node)



Plant Identification Terms

Cambium: layer of new growth located just under the bark

Herbaceous: plants that have no persistent woody stem above ground, and may be annuals, biennials or perennials

Lenticels: raised pores on the outer tissues of woody plants that allow gas exchange between the atmosphere and the internal tissues

Node: a joint or point of attachment for leaves and branches

Pith: the most central part of a woody plant's branch, composed of soft, spongy cells that store and transport nutrients, usually white or pale in color, some are dark or even hollow

Woody: a plant that produces wood as its structural tissue and are usually either trees or shrubs

Quick Identification Reference Guide

Woody Plants

	Asiatic Bittersweet	Autumn Olive	Burning Bush	Common Buckthorn	Honeysuckle	Japanese Barberry	Multiflora Rose
Alternate	x	x		x		x	x
Opposite			x		x		
Smooth Edge		x			x	x	
Toothed Edge	x		x	x			x
Compound							x
Simple	x	x	x	x	x	x	
Thorns		x		x		x	x

Quick Identification Reference Guide

Herbaceous Plants

	Common Reed	Garlic Mustard	Japanese Knotweed	Purple Loosestrife	Wild Parsnip
Alternate	x	x	x		x
Opposite				x	
Smooth Edge	x		x	x	
Toothed Edge		x			x
Compound					x
Simple		x	x	x	

Asiatic Bittersweet

Celastrus orbiculatus

Arrangement: alternate

Leaf Edge: toothed

Leaf Shape: simple, elliptical to circular

Fruit: red berries with yellow/orange casing

Flowers: small, greenish-white



Woody Vine: can grow up to 60 ft

Bark: tan/gray furrowed bark on older growth

Roots: reddish orange



Asiatic Bittersweet Look-alikes

American Bittersweet, *Celastrus scandens*



Distinguishing features:

Fruit/Flower: at the end of the branches (terminal) as opposed to the invasive bittersweet which has flowers & fruits all along the vine

Fruits: orange when ripe



Other Vines Found in Vermont



Wild Grape



Virginia Creeper



Poison Ivy

Autumn Olive

Elaeagnus umbellata

Arrangement: alternate

Leaf Edge: smooth, wavy margins

Leaf Shape: simple, ovate to lanceolate

Leaf Texture: smooth

Leaf Color: silver scales on the underside

Fruit: reddish pink, silver speckled berries

Flowers: small, yellowish tubular



**Woody Shrub/
Small Tree:** can
grow up to 20 ft
Bark: young twigs
are scaled
Thorns: present



Autumn Olive Look-alikes

Russian Olive, *Elaeagnus angustifolia*

Arrangement: alternate
Leaf Edge: smooth
Leaf Shape: lanceolate
Leaf Texture: smooth
Leaf Color: silver scales on both sides
Fruit: yellow, silver speckled berries
Flowers: silver outside, yellow within



This look-alike is also **INVASIVE**



Woody Shrub/Small Tree: can grow up to 35 ft
Bark: young twigs silver scaled, older growth brown
Thorns: present



Burning Bush

Euonymus alatus

Arrangement: opposite

Leaf Shape: simple, oval with a point

Leaf Edge: toothed

Leaf Color: dark green, turning crimson in the fall

Fruit: reddish capsules split to reveal fleshy orange seeds

Flowers: inconspicuous; greenish yellow; 4 petals



Woody Shrub: can grow up to 20 ft

Stems: 2-4 corky ridges (wings) grow on younger stems



Burning Bush Look-alikes

European Spindle-tree *Euonymus europaeus*

This look-alike is also
INVASIVE



Shrubs with Brilliant Red Foliage

Highbush
Blueberry

Arrowwood
Viburnum



Fragrant Sumac



Distinguishing features:
Fruit: pink capsules open
to reveal orange seeds
Stems: slight ridges on
younger stems



Common Buckthorn

Rhamnus cathartica

Arrangement: alternate (subopposite)

Leaf Edge: toothed

Leaf Shape: simple, ovate, with a pointed tip

Leaf Texture: smooth; prominent "U" shaped veins curving toward tip

Leaf Color: dark, glossy green

Fruit: black berries

Flowers: yellowish green



Woody Shrub/Small Tree:

can grow over 15 ft

Bark: lenticels, dark gray

Cambium: orange/yellow inner tissue

Thorns: present



Common Buckthorn Look-alikes



Glossy False Buckthorn
Frangula alnus

This look-alike is
also **INVASIVE**

Arrangement: alternate
Leaf Edge: smooth
Leaf Texture: smooth, dark glossy green, prominent parallel veins
Fruit: berries ripen from red to purple
Flowers: small, white, 5-petals
Bark: lenticels, grayish brown



Dogwoods

Arrangement: most species opposite
Leaf Edge: smooth
Tear Test: gently tear a leaf (right); fibrous strands are exposed, allowing half of the leaf to “hang”



Chokecherry

Arrangement: alternate
This is just one species of cherry that could be mistaken for buckthorn.

Honeysuckle

Lonicera maackii, *L. morrowii*, *L. tatarica*, *Lonicera x bella*

Arrangement: opposite

Leaf Edge: smooth

Leaf Shape: simple, egg shaped

Leaf Texture: soft/downy (except Tartarian)

Fruit: twinned red or orange berries

Flowers: twinned, fragrant, white/peach/pink



Woody Shrub: can grow over 15 ft

Bark: light brown, shaggy

Pith: hollow, brown center



Native species of honeysuckle have a solid pith

Honeysuckle Look-alikes

Distinguishing features:

Leaf Edge:
toothed

Fruit: capsule



Bush Honeysuckle



American Honeysuckle

Distinguishing features:

Leaf Texture:
smooth

Native species found in VT have a solid pith and invasive species of honeysuckle have a hollow pith. Check the pith of older growth.



Common Snowberry

Distinguishing features:

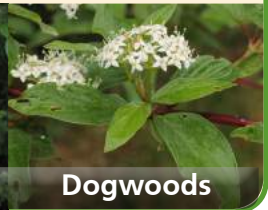
Fruit: white berries



Shrubs with Opposite Leaves



Border Privet



Dogwoods

Japanese Barberry

Berberis thunbergii

Arrangement: alternate (leaves are clustered along branches)

Leaf Edge: smooth

Leaf Shape: simple, small, oval

Fruit: bright red berries, persist into winter

Flowers: pale yellow, drooping below branches

A cultivar with red leaves is commonly used in landscape plantings



Woody Shrub:

multiple arching branches, can form a dense understory

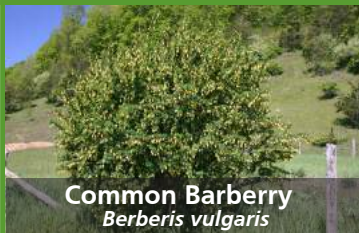
Cambium & Roots:

bright yellow

Thorns: single spine at each cluster of leaves



Japanese Barberry Look-alikes



Common Barberry
Berberis vulgaris

This look-alike is
also **INVASIVE**

Distinguishing features:

Leaf Edge: toothed

Flowers: pale yellow
clusters droop below
branches

Woody Shrub: can grow
up to 13 ft

Thorns: 3-pronged
spine at each cluster of
leaves



Other Thorny Shrubs



Roses



Raspberry/Blackberry

Multiflora Rose

Rosa multiflora

Arrangement: alternate

Leaves: pinnately compound, 7-9 leaflets

Leaf Edge: toothed leaflets

Fruit: small, red rose hips

Flowers: clusters of numerous, white flowers with 5 petals

Fringed Stipules: (appendage at base of leaf stalk) distinguishes it from other rose species



Woody Shrub: multiple canes, can grow up to 15 ft

Thorns: stout, curved



Multiflora Rose Look-alikes



Distinguishing features:

Flowers: pink to pale pink flowers; grow singly or in small clusters of flowers

Stipules: entire

Growth: smaller, shorter, less extensive shrubs

Common Reed

Phragmites australis

Arrangement: alternate

Leaf Shape: simple, long, flat, pointed leaves

Leaf Texture: smooth

Fruit: seeds are light brown

Flowers: dense, feather-like inflorescence; gray or purple in color



Perennial Grass: stems can grow over 10 ft tall

Stems: thick, round, hollow

Ligule (outgrowth at junction of leaf and leafstalk): 0.1-0.4 mm with dense, thick hairs

Dead leaves adhere to brown dead stems through winter



Common Reed Look-alikes

Ornamental Grasses



American Reed



Distinguishing features:

Stem Color: green to maroon, bright maroon on lower portions of culm where sheath is removed

Leaf Sheaths: pull off easily from dead stems

Garlic Mustard

Alliaria petiolata

Arrangement: alternate
Leaf Edge: coarsely toothed
Leaf Shape: simple, heart/
triangular, vary in size
Fruit: long, slender seed pods
Flowers: small, white 4 petals



Herbaceous Biennial: 1st
year- basal rosette; 2nd
year-produces flowers on
1-4 ft stalks

Roots: "S" shaped taproot
Stems: young plants have
purple stems
Scent: crushed plants
smell like garlic



Garlic Mustard Look-alikes

Distinguishing features:

Stem: square
Scent: minty odor when crushed
Growth Form: runners
Flowers: purple



Ground Ivy

Distinguishing features:

Leaves: heart-shaped base
Leaf Edge: finely toothed
Flowers: blue, violet, yellow or white



Native Violets

Species with White Flowers in Early Spring



Toothwort



Early Saxifrage



Sweet Cicely

Other species in the mustard family can have similar seed pods



Japanese Knotweed

Fallopia japonica

Arrangement: alternate
Leaf Edge: smooth
Leaf Shape: simple, broad, spade shaped; flat at base
Fruit: small, triangular seeds
Flowers: form spikes made up of many small white flowers



Herbaceous Perennial: can grow over 10 ft
Stems: hollow between nodes, bamboo-like; green with pinkish red accents
Young Shoots: reddish
Rusty red standing dead in winter



Japanese Knotweed Look-alikes

Horsetail species



Distinguishing features:

Leaves: bush like growth, resembling a horsetail

Height: resembles knotweed shoots in the early spring, but do not grow very tall

Bamboo species



Distinguishing features:

Leaf Shape: long and slender

Stems: harder than Japanese knotweed



Purple Loosestrife

Lythrum salicaria

Arrangement: opposite/whorled leaves

Leaf Edge: smooth

Leaf Shape: simple, lanceolate

Fruit: capsules containing many reddish-brown seeds

Flowers: magenta 5-7 petaled flowers form spikes



Herbaceous Perennial: multiple stems, can grow up to 5 ft

Stems: square on younger stalks, many angles on mature plants

Often found in wet areas



Purple Loosestrife Look-alikes

Distinguishing features:

Arrangement:

alternate

Stem: round

Flowers: pink,
4 petals



Distinguishing features:

Flowers: bluish
purple with 5
fused petals

Distinguishing features:

Arrangement:

upper opposite,
lower alternate

Stem: winged

Flowers: solitary 6
petals, pink-purple



Distinguishing features:

Flowers: pink/
purple whorled
in a dense cluster
around stem; 8-10
white-tipped pink
stamens

Wild Parsnip

Pastinaca sativa

Arrangement: alternate
Leaves: coarsely toothed
Leaf Shape: compound, 5-11 leaflets
Fruit: flat, brown seeds
Flowers: small yellow flowers form a flat top (umbel)



CAUTION: Exposure to sap causes extreme skin irritation!

Herbaceous Biennial/Perennial:
1st year- basal rosette; flowering plant can grow 5 over ft
Stems: hollow, except at nodes; ridges
Root: taproot, smells like parsnip



Wild Parsnip Look-alikes

Distinguishing features:

Size: grows up to 2 ½ feet tall

Leaves: 3-5 leaflets



Golden Alexander



Cow Parsnip

Distinguishing features:

Flowers: white umbel

Distinguishing features:

Flower: large, white umbel

Stems: purple blotches



Giant Hogweed

Distinguishing features:

Stems: fine, bristly hairs

Flowers: white umbel



Queen Anne's Lace

This look-alike is also **INVASIVE**

Prioritization

Prioritizing invasive plant work is important to ensure that time and resources are spent efficiently in the face of seemingly overwhelming invasive infestations. Focus time and resources on high priority areas where management actions can make the most difference with emphasis on resources and values protected rather than individual invasive plants controlled. There are populations of invasive plants that will not meet these criteria and, given limited time and budget, may not be managed.

High Priority Invasive Plants:

- Aggressive plants (could have the most impact on an ecosystem)
- Uncommon plants (few to no populations in the state)
- Plants that are new to an area
- Plants that pose a threat to human health

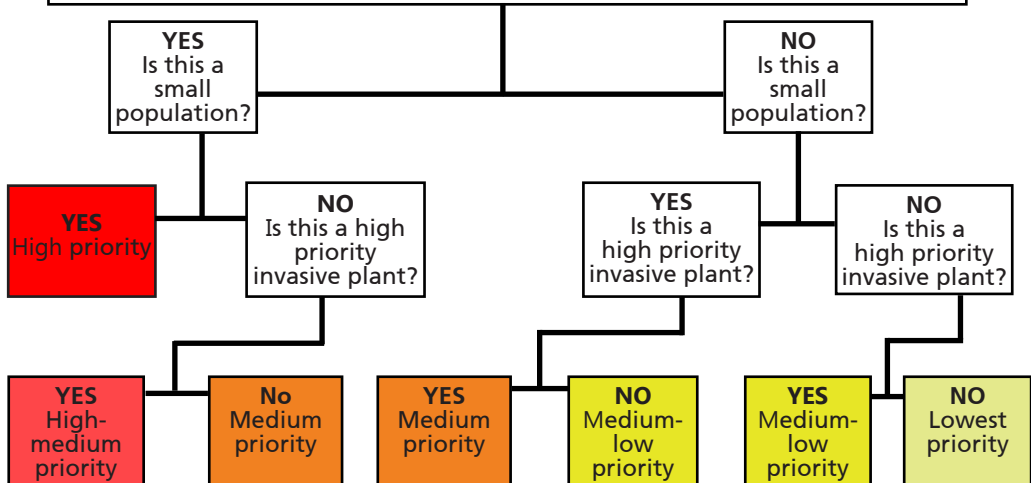
Note: Chart on the following page to be used for each invasive plant encountered in an area. Use the chart for each plant found and consider the combined results.



Above: Volunteer uses a Weed Wrench

Prioritization

Is this area a high priority for protection?
Do you place value on the area?
Valuable resources (example: sugarbush, woodlot), little/no existing invasives,
used frequently for recreation, important wildlife habitat, intact forest



Control Methods

Setting reasonable goals and expectations is important. In most cases the goal is to control the spread of the infestation, not eradicate the invasive population entirely. For instance, the quicker an infestation is identified, the easier and more cost-effective it will be to manage it. Once an infestation is identified, use the prioritization flow chart (p35) to determine the intensity/severity of the situation.

To slow the spread, there are two main forms of management to consider:

- **Mechanical:** hand pulling, digging, burning, mowing, cutting, smothering, grinding and any other techniques that physically remove the plant
- **Chemical:** using both organic and conventional herbicides

Which method(s) to utilize will vary situationally, depending on a variety of factors including target plants, size of infestation, site specifications, time of year, prioritization, resources available, etc. In some situations, the most effective treatment plan is a combination of mechanical and chemical treatments.

Regardless of the management techniques used, monitoring and follow up treatments are extremely important to long term success.

For more information on specific control methods visit VTinvasives.org.

Phenology Information

Phenology: the study of the timing of biological events in a plant such as leaf out, flowering, and seed production

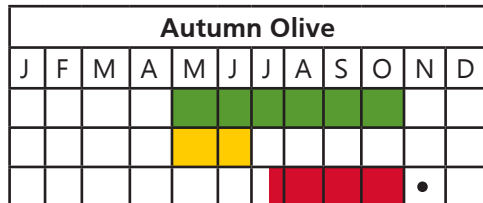
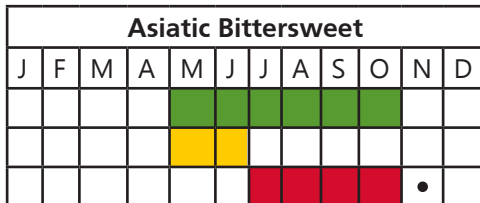
When considering treatment options, understanding the plant's phenology is very important as different treatment options are most effective at different times in the plant's life cycle. For example, to effectively control some herbaceous plants using the treatment method of mowing, the treatment would need to take place before the plants produce seeds. If the plants are mowed too late, after they have gone to seed, mowing will only exasperate the problem by spreading the seeds.

 Leafed out

 Flowering

 Fruiting

 Berries persist through winter



Phenology Information

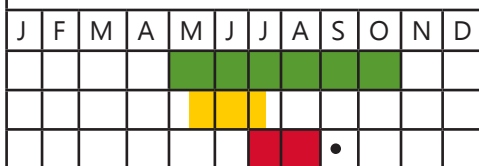
Burning Bush



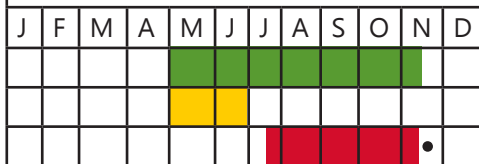
Honeysuckle



Multiflora Rose



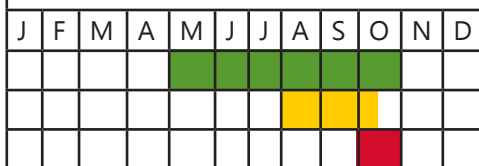
Common Buckthorn



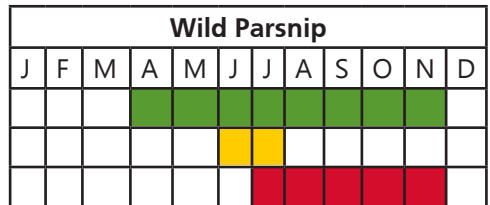
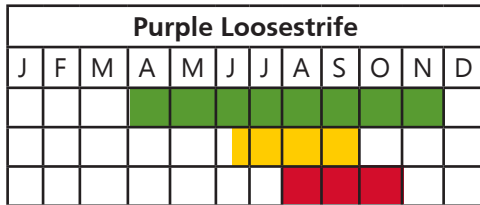
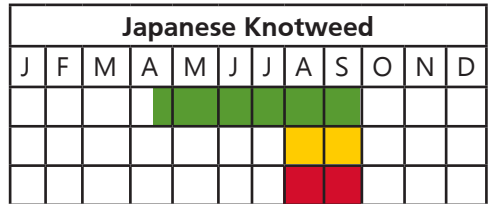
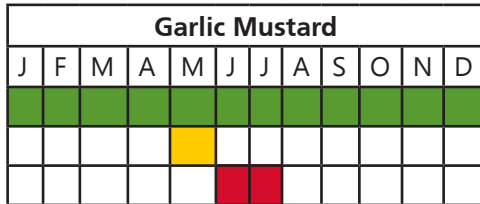
Japanese Barberry



Common Reed



Phenology Information



Leafed out

Flowering

Fruiting

• Berries persist through winter

Seed Bank Information

Seed Bank: the accumulation of viable seeds in the leaf litter or on the soil surface which serves as a source for the production of subsequent generations of plants

Seed Viability: a seed which is able to germinate given the right conditions of moisture, temperature, light etc is called "viable"

It is important to note that even once the seed producing plants are removed, there are still subsequent generations of seeds in the soil. The area needs to be monitored for several years and follow up treatments are necessary until the seed bank is depleted.

Average Seed Bank

These are averages and should be used as a guideline only.

Common Buckthorn: 2-6 years	Burning Bush: low seed viability after the 1st year	Honeysuckle: 3-5 years
Wild Parsnip: 5 years	Japanese Barberry: low seed viability after the 1st year	Japanese Knotweed: length of viability debated
Multiflora Rose: 10-20 years	Garlic Mustard: 5-10 years (most germinate in 1-2 years)	Autumn Olive: 3 years
Purple Loosestrife: 3 years	Asiatic Bittersweet: low seed viability after the 1st year	Common Reed: length of viability debated

Modes of Spread

Understanding how invasive plants spread can be critical for preventing new infestations and slowing the spread of existing infestations. Management strategies should take these potential modes of spread into consideration to prevent unintentional spread.

Reproductive Strategy	Potential Methods of Spread
Roots (Rhizomes)	Ditching, road grading, transporting contaminated fill, flooding, improper disposal
Stem and/or root	Mowing, ditching, road grading, transporting contaminated fill, flooding, improper disposal
Seeds	Mowing, transporting contaminated fill, equipment, birds and animals, wind, improper disposal

Disposal

Invasive plants can be spread unknowingly and accidentally through improper disposal. Proper disposal is extremely important for successful invasive plant management. For the most updated disposal guidelines please visit VTinvasives.org.

Learn. Get Involved. Make a Difference.

Learn

- Get to know the invasive plants found in Vermont
- Familiarize yourself with state quarantines and regulations

Get Involved

- Create and implement a management plan for your property
- Volunteer with local invasive efforts
- Add your invasive sightings to the "Mapping for Healthy Forests: Vermont" project on iNaturalist

Make a Difference

- Garden with native plants
- Help spread the word, not the invasive!



More information on all these topics and more can be found at:
VTinvasives.org

Learn. Get Involved. Make a Difference.



Above: Volunteers from Orvis work together to remove invasive plants from a Vermont State Park

Citations

Photos are listed by page number/position - (T)op, (M)iddle, (B)ottom, (L)eft, (R)ight.

Cover, 9/BL, 15/TR, 17/BL, 17/T, 17/BR, 25/BL, 29/R, 41	VT Dept. Forests, Parks & Recreation	11/TM, 11/TR, 26/TR	Karan A. Rawlins, U. of Georgia
		12/BR	Patrick Breen, Oregon State University
4, 9/TM, 9/TR, 9/BR, 10/TR, 12/BR, 15/BL, 16/TL, 19/BL, 19/TR, 20/TL, 20/M, 23/BL, 31/BL, 31/BR	Leslie J. Mehrhoff, University of Connecticut	12/BR, 26/BR	Joseph M. DiTomaso, U. CA - Davis
		12/TM, 14/L	Jan Samanek, Phytosanitary Ad- ministration
		13/BL, 24/TL, 24/BL	John Ruter, University of Georgia
10/BL, 20/BR	David Cappaert	14/L	Norbert Frank, U. of West Hungary
10/BM, 27/TR, 28/TL 31/TR	John Cardina, The Ohio State University	14/L, 18/BL	Robert Vidéki, Doronicum Kft.
		14/BR	Bruce Marlin
10/BR, 13/TR, 18/BR, 29/BL, 32/BL,	Richard Gardner	14/TR	David J. Stang
		14/TR	Kent McFarland
10/TL, 11/BL, 15/BR, 20/TR, 25/BL, 25/TR, 26/TL, 27/BL	Chris Evans, University of Illinois	16/TR, 16/BR	Paul Wray, Iowa State University
11/BR	James R. Allison, Georgia Dept. of Natural Resources		

Most photos are courtesy of Bugwood.org

Citations

Photos are listed by page number/position - (T)op, (M)iddle, (B)ottom, (L)eft, (R)ight.

16/TR, 18/TL, 18/BL, 18/TR, 18/BR, 21/ TM, 21/BR, 24/TM, 24/TR, 25/TM, 26/BL, 30/TR, 30/BR	Rob Routledge, Sault College	27/BR	Tom Heutte, USDA Forest Service
		27/TM	Britt Slattery, USFWS
		28/BR	Whitney Cranshaw, Colorado State University
		28/TL	Mary Ellen Harte
19/BR	Barry Rice, sarracenia.com	28/TR	Caryn Rickel, Institute of Invasive Bamboo Research
21/BL, 22/TR	James H. Miller, USDA Forest Service	29/TM	Steve Dewey, Utah State University
21/TR	James W. Amrine Jr., West Virginia University	30/BL	Rebekah D. Wallace, U.of Georgia
22/BL	Michael Becker	30/TR	Bonsak Hammeraas, NIBIO - The Norwegian Institute of Bioeconomy Research
22/M	Steven Katovich, USDA Forest Service	32/BL	USDA APHIS PPQ - Oxford, North Carolina
22/TL	John D. Byrd, Mississippi State University	32/TL	Peter Dziuk, Minnesota Dept. of Agriculture
23/TM, 23/TR, 23/ BR, 31/TM	Ohio State Weed Lab , The Ohio State University	32/TR	Alex Katovich
27/BL	Jenn Grieser, New York City Department of Environmental Protection		