

Identification, Management, and Alternative Plants

Identification

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Alternatives

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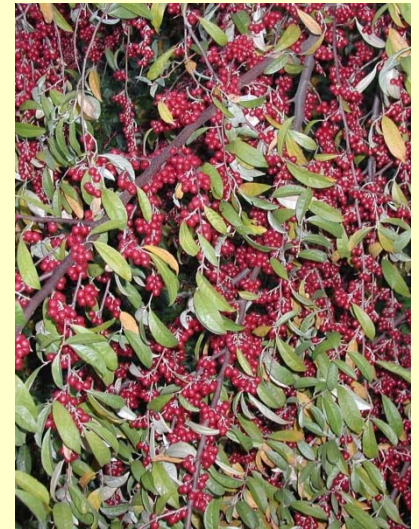
Management

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Tree-of-heaven (*Ailanthus altissima*)



Tree-of-heaven (*Ailanthus altissima*)



Tree-of-heaven

(Ailanthus altissima)

MANAGEMENT

- **MECHANICAL** – Cut stems and paint with herbicide (glyphosate).
- **CHEMICAL** – Foliar spray after mid-August with glyphosate. Basal bark application with triclopyr (BEE) mixed in vegetable oil year round.
- **OTHER** – Not treating cut stems with herbicide will result in extensive root suckering.

Tree-of-heaven

Ailanthus altissima

- **Urban tolerant**
- **Adaptable to compaction, salt spray, pollution etc.**
- **Fast (3-5' annually)**



Tree-of-heaven Alternatives

Acer negundo cvs.

Boxelder



Rhus typhina

Staghorn Sumac



Garlic Mustard

(*Alliaria petiolata*)



Garlic Mustard (*Alliaria petiolata*)



Garlic Mustard

(*Alliaria petiolata*)

MANAGEMENT

- **MECHANICAL** – Pull plants between flowering and seed maturation.
- **CHEMICAL** – Foliar herbicide application glyphosate during basal stage or triclopyr prior to flowering.
- **OTHER** – Extensive seedbank will require several years of control.

Choice Criteria

- **Site Conditions**
 - Sun/Shade
 - Dry soils
 - Riparian
- **Physical Attribute**
 - Flower color
 - Height
 - Growth pattern

Garlic Mustard Alternatives



***Alliaria*
*petiolata***

***Anemone
canadensis*
– Canada
Wind Flower**



***Eurybia divaricata* -
White Wood Aster**



***Eupatorium
rugosum* –
White
Snakeroot**



Mugwort (*Artemisia vulgaris*)



Mugwort (*Artemisia vulgaris*)



Mugwort

(*Artemisia vulgaris*)

MANAGEMENT

- **MECHANICAL** – Mowing will stunt, but not kill. Extensive rhizomes make pulling only effective for small, initial infestations. Repeated tilling is effective.
- **CHEMICAL** – Foliar spray of glyphosate during late season. Imazapyr or mixture of clopyralid/ triclopyr/glyphosate effective during rapid growth stage.
- **OTHER** – May be seed bank at some locations.

Mugwort Alternatives



Artemisia vulgaris

***Solidago* -
Goldenrods**



***Apocynum*
cannabinum -
Indian Hemp**



***Pycnanthemum*
muticum –
Mountain
Mint**



Japanese Barberry (*Berberis thunbergii*)



Japanese Barberry (*Berberis thunbergii*)



Japanese Barberry

(*Berberis thunbergii*)

MANAGEMENT

- **MECHANICAL 1 – Mowing followed by directed heating with propane torch effective for small clumps in forest.**
- **MECHANICAL 2 – Pulling only reasonable for very small clumps.**
- **OTHER – Because few seeds successfully establish under forest shade, no need to remove cut stems.**

Japanese Barberry

(*Berberis thunbergii*)

MANAGEMENT

- **CHEMICAL 1 – Foliar sprays of triclopyr, glyphosate, imazapyr and metsulfuron-methyl are effective.**
- **CHEMICAL 2 – Cutting stems and painting cut stems effective, but labor intensive (use dye).**
- **CHEMICAL 3 – Foliar treatments effective from month after leaf expansion until autumn when leaves turned $\frac{1}{4}$ yellow.**

Japanese Barberry

Berberis thunbergii

- Hedge, Barrier
- Mass planting
- Colored foliage
- Adaptability and durability
- Fall color

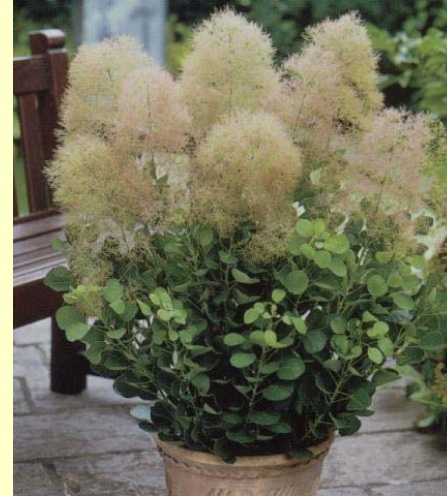


Japanese Barberry Alternatives

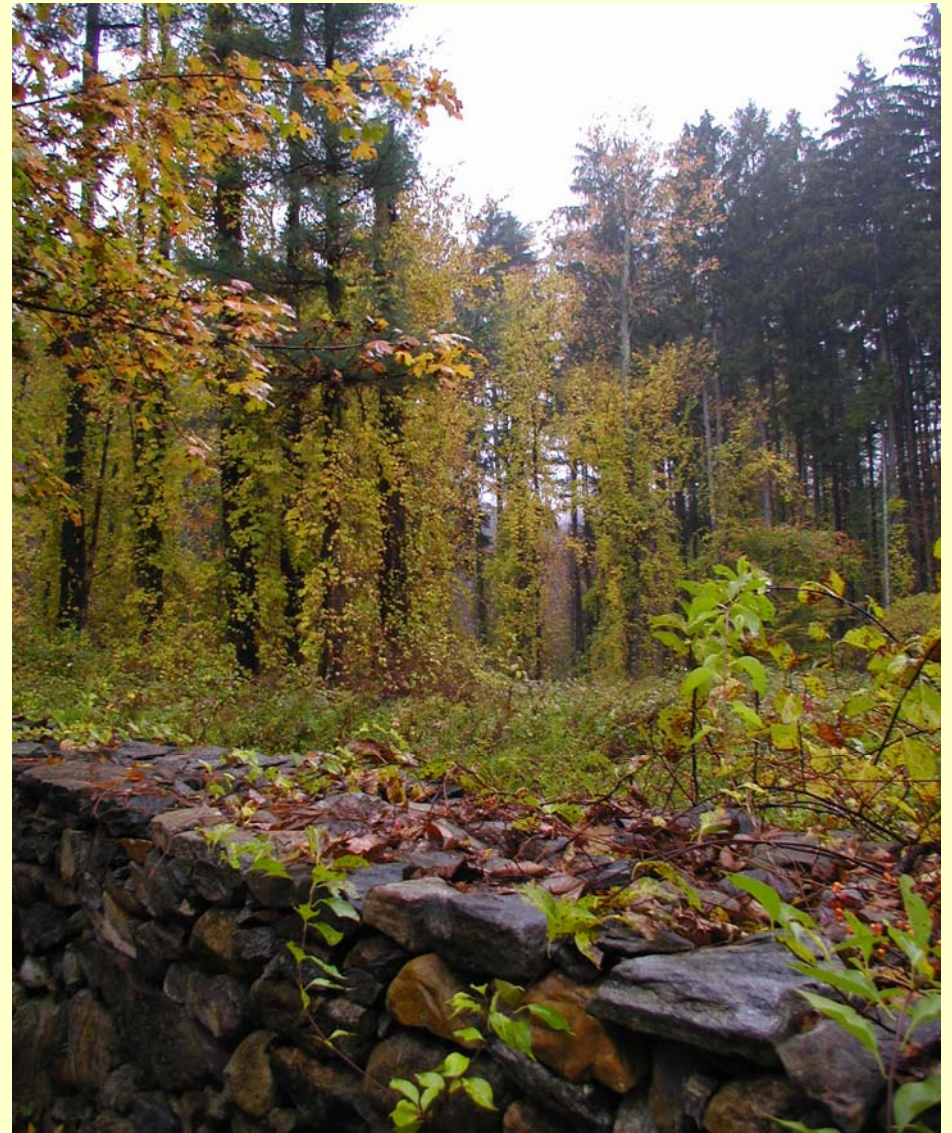
*Physocarpus
opulifolius* cvs.

Ninebark

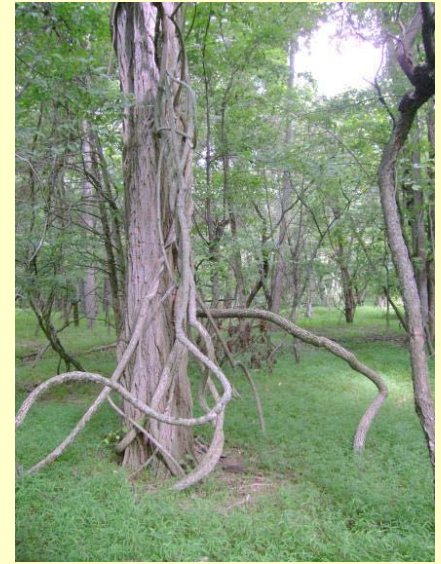
Cotinus coggygria cvs.
Common Smokebush



Oriental Bittersweet (*Celastrus orbiculatus*)



Oriental Bittersweet (*Celastrus orbiculatus*)



Oriental Bittersweet

(*Celastrus orbiculatus*)

MANAGEMENT

- **MECHANICAL** – Cutting stems in trees will not control, but will reduce seed production.
- **CHEMICAL** – Paint cut stems or foliar spray in late summer glyphosate*, triclopyr. Basal bark herbicide application (BEE) mixed in vegetable oil.
- **OTHER** – Deep root system makes pulling or torch impractical except for small stems.

***Dreyer (1998) found glyphosate not effective.**

Oriental Bittersweet

Celastrus orbiculatus

- Vine
- Autumn fruit
- Durability



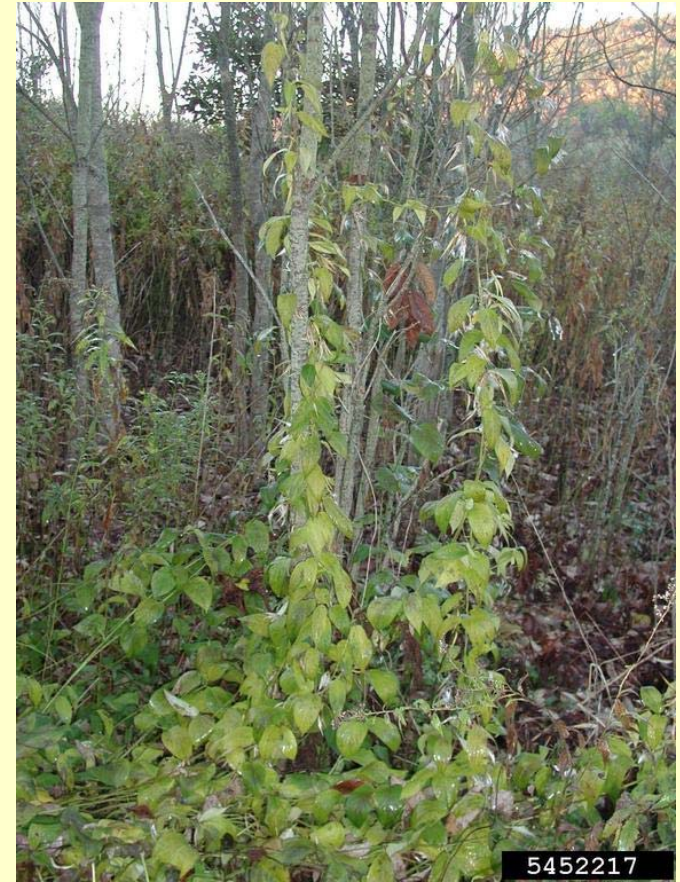
Oriental Bittersweet Alternatives

Celastrus scandens

American Bittersweet



Black Swallow-wort (*Cynanchum louiseae*)



Black Swallow-wort (*Cynanchum louiseae*)



Pale Swallow-wort (*Cynanchum rossicum*)



Swallow-worts

(*Cynanchum* spp.)

MANAGEMENT

- **MECHANICAL** – Cutting repeatedly will prevent production and dispersal of seeds, but regrowth from root crowns will occur.
- **CHEMICAL** – Foliar sprays w/ surfactant: Triclopyr most effective in late spring to early summer; glyphosate most effective in mid to late summer (before pods mature).
- **CHEMICAL** – Cut-stem treatments: In summer to early fall, apply glyphosate directly to freshly cut stems.

Swallow-worts Alternatives



***Asclepias syriaca* –
Common Milkweed**



***Smilax
herbacea*
Carrion
Flower**



***Apocynum
cannabinum* -
Indian Hemp**



Autumn Olive (*Elaeagnus umbellata*)



Autumn Olive (*Elaeagnus umbellata*)



Autumn Olive

(*Elaeagnus umbellata*)

MANAGEMENT

- **MECHANICAL** – Pull small stems. Propane torch in August may be effective.
- **CHEMICAL** – Foliar sprays with surfactant: Imazapyr, triclopyr or glyphosate ... Imazapyr tends to be the most effective, especially early in growing season.
- **CHEMICAL** – Cut-stump treatments: Apply glyphosate or imazapyr directly to freshly cut stumps (late spring into fall).

Autumn Olive

Elaeagnus umbellata

- **Hedges, massing**
- **Barriers**
- **Silver-green leaves**
- **Durability**
- **Autumn fruit**



Autumn Olive Alternatives

Ilex verticillata

Winterberry Holly



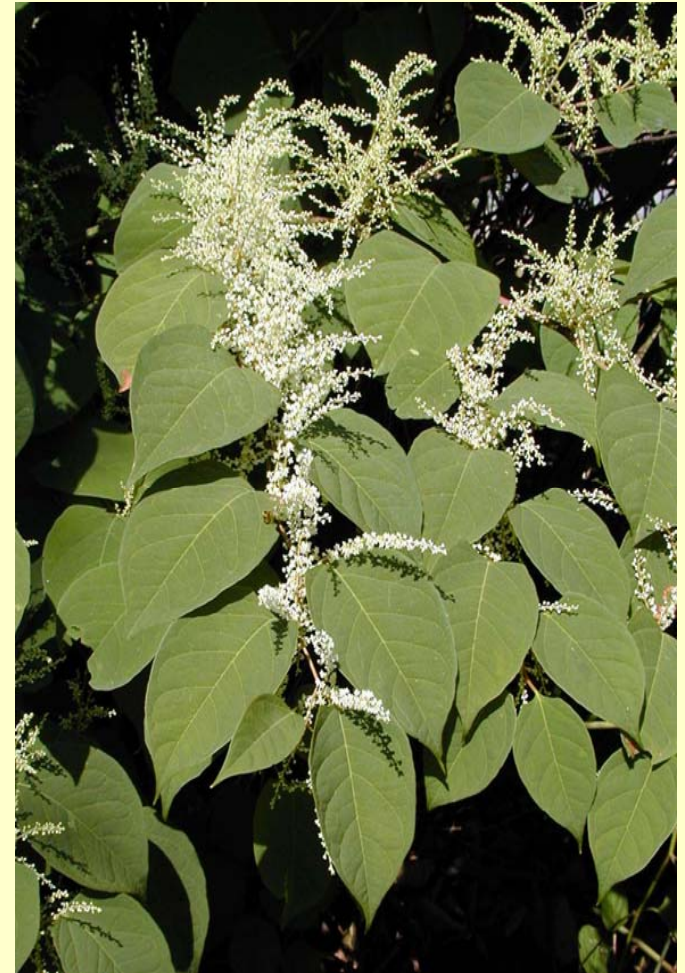
Aronia arbutifolia

Red Chokeberry



Japanese Knotweed

(*Fallopia japonica*; *Polygonum cuspidatum*)



Japanese knotweed
(*Polygonum cuspidatum*)



Japanese Knotweed

(Polygonum cuspidatum)

MANAGEMENT

- **MECHANICAL** – Repeated mowing will reduce, but not eliminate.
- **CHEMICAL** – Foliar sprays of glyphosate or imazapyr effective in August or Sept. (before first frost). Stem injections of glyphosate suitable for small infestations.
- **OTHER** – May require multiple years to eliminate sprouting from all rhizomes.

Japanese Knotweed Alternatives



Fallopia japonica

***Clethra alnifolia* -
Summersweet**



***Cornus
amomum*
Silky
Dogwood**



***Cornus
racemosa* –
Gray
Dogwood**



Morrow's Honeysuckle (*Lonicera morrowii*)



Tartarian Honeysuckle (*Lonicera tartarica*)



Shrub Honeysuckles

(*Lonicera* spp.)

MANAGEMENT

- **MECHANICAL** – Repeated cutting prior to fruit development to prevent seeds.
- **CHEMICAL** – Foliar sprays of triclopyr in late spring to mid summer, or glyphosate in mid to late summer. Cut-stump treatments: Glyphosate somewhat more effective than triclopyr.
- **OTHER** – Full leaf expansion is necessary for foliar applications or resprouting will occur.

Shrub Honeysuckles

(*Lonicera* spp.)

MANAGEMENT

- **MECHANICAL** – Pulling only reasonable for very small clumps
- **CHEMICAL 1** – Foliar sprays of glyphosate, triclopyr (BEE) and imazapyr are effective. Addition of imazapyr or metsulfuron-methyl to glyphosate improves results.
- **CHEMICAL 2** – Basal bark application of triclopyr (BEE) mixed in vegetable oil.

Shrub Honeysuckles

***Lonicera tatarica* and others**

- **Hedges, massing**
- **Durability**
- **Spring flowers**
- **Late summer fruit**



Shrub Honeysuckle Alternatives

Cephalanthus occidentalis

Buttonbush



Diervilla sessilifolia

Southern Bush
Honeysuckle



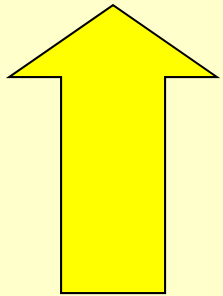
Japanese Stiltgrass (*Microstegium vimineum*)



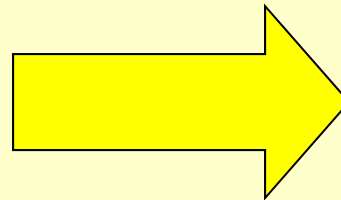
Japanese Stiltgrass (*Microstegium vimineum*)



NOT Stiltgrass!



Stiltgrass!



Japanese Stiltgrass

(*Microstegium vimineum*)

MANAGEMENT

- **MECHANICAL 1 – Pull plants between flowering and seed maturation; will require return visit to get missed plants.**
- **MECHANICAL 2 – Mow plants in late August when dry. Need to cut close to ground and will require return visit.**
- **MECHANICAL 3 – If wet, propane torches can be used for return visit treatment to kill missed plants.**

Japanese Stiltgrass

(Microstegium vimineum)

MANAGEMENT

- **CHEMICAL (EFFECTIVE) – Foliar spray with imazapic, fenoxaprop-p-ethyl, glyphosate, pelargonic acid plus pendimethalin, and glufosinate.**
- **CHEMICAL (NOT EFFECTIVE) – Foliar spray with pelargonic acid or vinegar.**
- **CHEMICAL (EXTRA) – Foliar spray at one-quarter labelled rate was effective.**
- **OTHER – Extensive seedbank will require several years of control.**

Japanese Stiltgrass Alternatives



***Carex
pennsylvanica***
Pennsylvania
Sedge



Dennstaedtia punctilobula
Hay scented Fern



***Brachyelytrum
erectum***
Southern
Long-awned
Wood Grass



Photo Credits and Acknowledgements

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