INVASIVE Plant Control™

Garlic Mustard Control
(*Alliaria petiolata*)

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Origin of the Name

- The genus name *Alliaria* refers to the garlic or *Allium*-like fragrance of the crushed leaves
- Fragrance fades as leaves age, and is virtually non-existent by fall
- The species name *petiolata* refers to the petiolate leaves

Other Common Names

- Hedge-garlic
- Sauce-alone
- Jack-by-the-Hedge
- Poor-man's-mustard

Where Do You Find Garlic Mustard?

- Common in riparian areas or areas associated with rivers
- Deciduous forest
- Partial shade
- In its native Europe, *Alliaria petiolata* is an edge species, growing in hedges and fencerows

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Modes of Dispersion

Alliaria petiolata spreads exclusively by seed

Floodwaters

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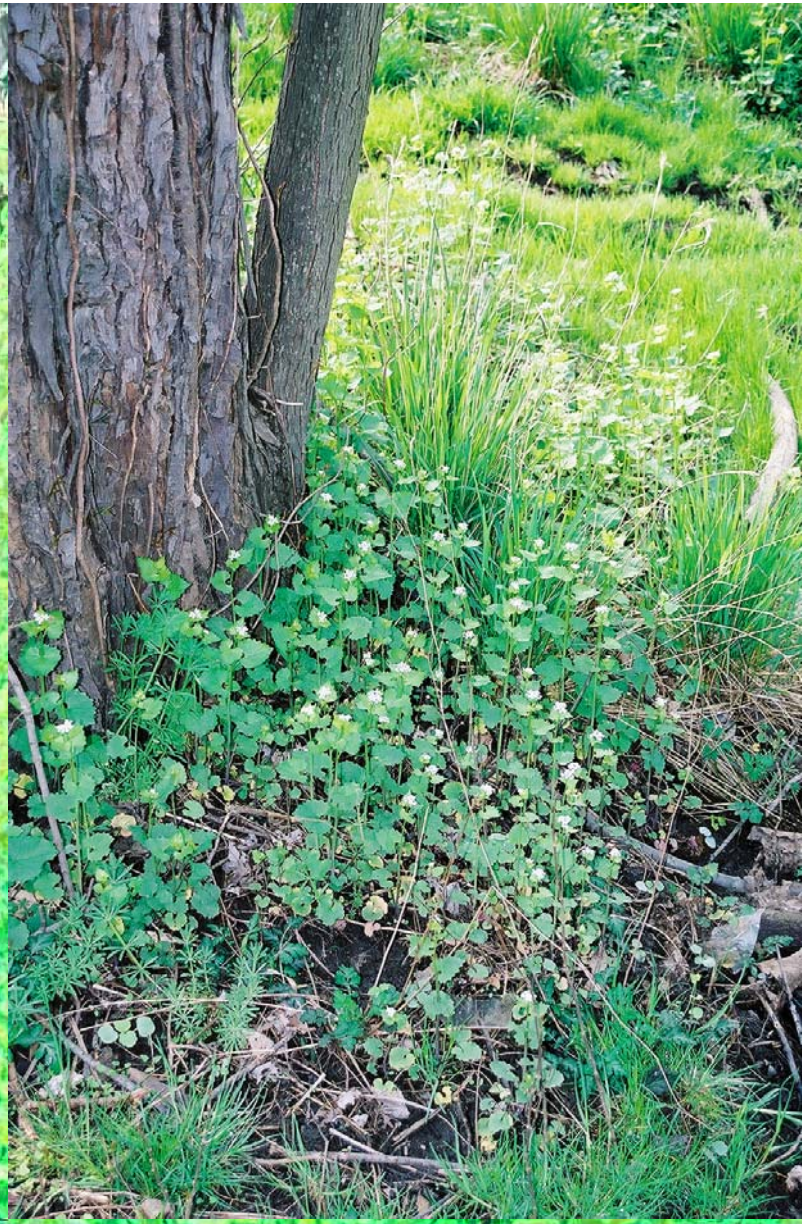
Seeds may possibly be distributed directly
or
indirectly by white-tailed deer

Human Interaction such as mowing hiking and biking

Rodents And Birds



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- Flowers are produced in spring (usually March to May)
- Siliques contain an average of 10-20 seeds

Similar Looking Native Species

- Violets (*Viola* sp.),
- White avens (*Geum canadense*),
- *Cardamine* sp in midwestern and northeastern states, and fringecup

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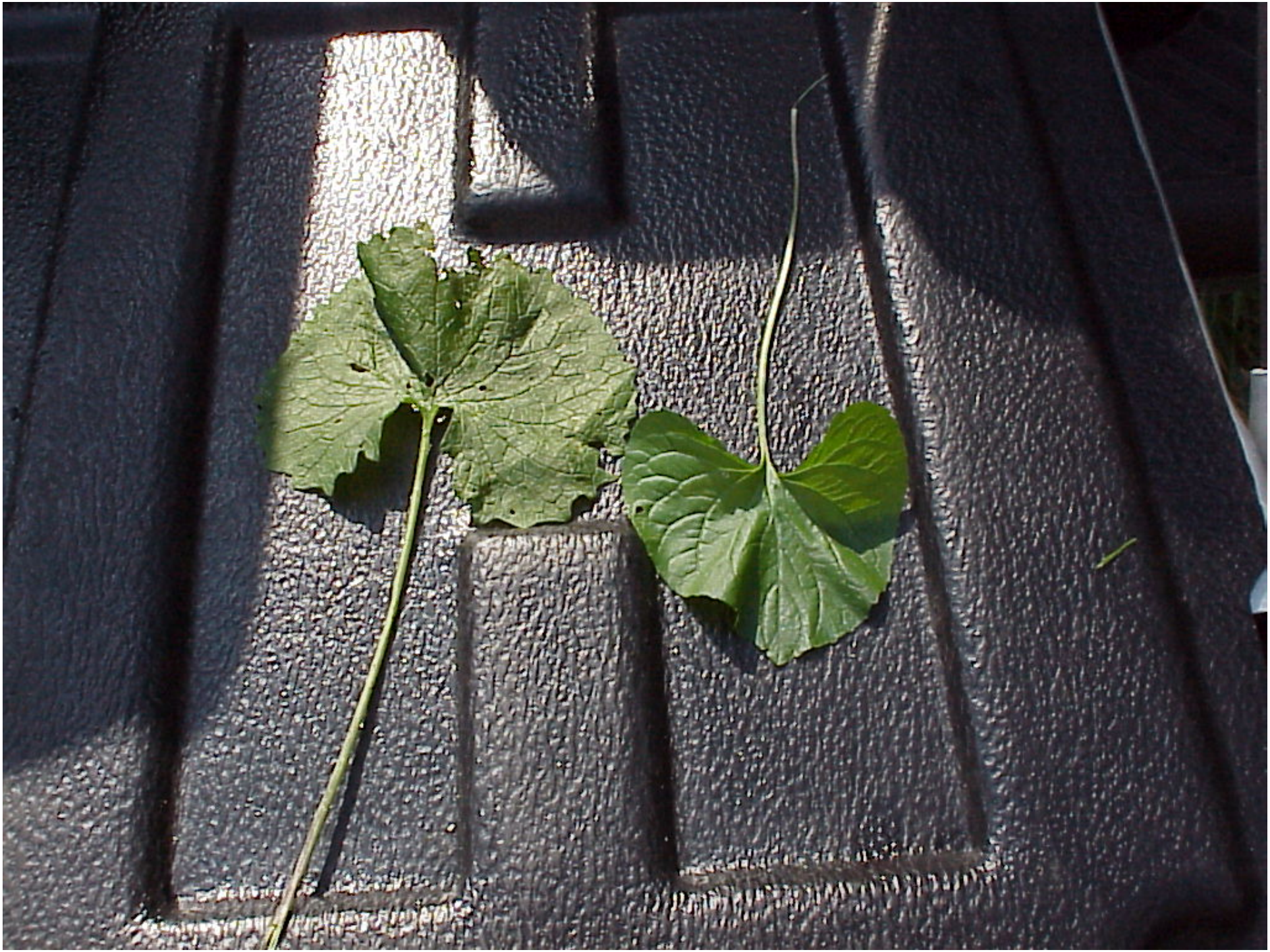

How do you tell the difference?

- Strong garlic odor in spring and summer
- Violets have more serrate leaves

Threats or Concerns

- Threaten some butterfly species
- Form monocultures and out-compete native spring growth
- The plant has no known natural enemies in North America, is self-fertile, and is difficult to eradicate once established

Six Factors To Consider

I. Long Term Plan for the Site
II. Selectivity and Timing
III. Level of Infestation
IV. Type of Labor Available
V. Choice of Methodology (IPM)
VI. Determining the Cost of the Project

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I. What is the Long Term Plan for the Garlic Mustard Site?

- Annual Maintenance is Critical
- The goal of *Alliaria petiolata* management is to prevent seed production
- *Alliaria petiolata* should be removed from natural areas before it sets seed

- Seeds of garlic can remain viable in the soil for five years or more
- Effective management requires a long term commitment
- Prevent seed production until the stored seed is exhausted

Controlling Disturbances that lead to Garlic Mustard growth

- Overpopulation of Deer
- Construction or other human site disturbances
- Flood impacts
- Invasive Earthworms

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EDRR Plan for Susceptible Sites

- Prevent initial establishment.
- Monitor annually, and remove all *Alliaria petiolata* plants prior to seed production.
- Once established, prevent seed production until the seed bank is depleted, potentially 2-5 years

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II. How Selective Do You Need To Be?

- Are other Natives Present?

- Choice of Methodology
- Choice of Herbicide
- Timing

Timing is Critical

- Late fall
  - *Most selective time for control when few evergreens are present*
- Early spring prior to flower production
  - *Important to consider other spring growth*

Define the Level of Infestation

III. Define Infestation Levels

- Level One
- Level Two
- Level Three
- Level Four
- Level Five

OR

- High Intensity
- Medium Intensity
- Low Intensity

Is it an Established Population?

Are you protecting a pristine site?

IV. Type of Labor

Labor Types	Infestation Levels
• Volunteers Labor	**1-2**
• In House Labor	1-**2-3**
• Contract Labor	1-2-**3-4-5**

V. Integrated Pest Management

- *Chemicals*
- *Digging Tools*
- *Cutting Equipment*
- *Spray Equipment*

Chemical Options

- Burning and herbicide application both provide control at a lower labor cost, but each has potential drawbacks

- When Can you Apply Herbicide to Garlic Mustard?
  - Above 65 Degrees
  - No Chance of Rain within 2 hours

Chemical Control

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- Glyphosate (Roundup, Rodeo, Accord)
  - 2-3% Mixture
  - Late Fall or Early Spring application
  - Non-selective

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- Triclopyr (Garlon 3A, Garlon4, Pathfinder)
  - Spring application of triclopyr amine (Garlon 3A) mixed at 2%
  - Nu-Film

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Bentazon (Basagran SG and Basagran T/O)

- 0.50-1.0 lb /acre
- Post-emergent contact herbicide that kills dicots (broadleaf plants) and some sedges but will not kill most grasses
- Used in agricultural fields and is primarily a contact herbicide, meaning it kills or injures portions of the plant that it lands on and little else
- Very soluble in water and does not bind to soil particles which suggests a high potential for groundwater contamination

Chemical Control

- Nu-Film
- Blue Dye

Adjuvants

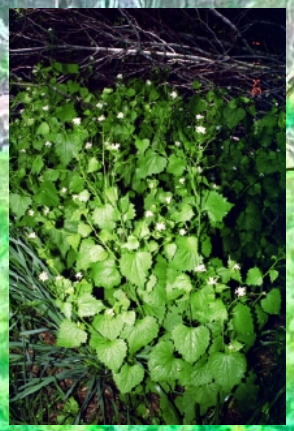
Prescribed Burning

- Inconsistent management results
- After a single fire, total *Alliaria petiolata* cover can increase due to survival of adult plants, and/or to enhanced seedling survival
- Burns must be conducted for three to five consecutive years

Prescribed Burning

- Weed eater
  - Cut flowering *Alliaria petiolata* plants at ground level
  - Eliminates seed production.
  - Selective Technician
  - Cutting with a weed whip may distribute cut stems (and hence seeds) across the site; remove cut material whenever possible.

Mechanical



- Labor intensive but effective
  - *Upper half of the root must be removed*
  - *Pulling can result in substantial soil disturbance*
- Can be done during most of the year
- If plants have seed capsules present, they should be bagged and disposed of

Hand Pulling

VI. How to Determine the Cost

- Price according to:
  - Cost Per Acre
  - Cost Per Hour
  - Cost Per Day

Herbicides

- Glyphosate-Razor Pro: $17.00 per Gallon
- Glyphosate-Rodeo: $26.45 per Gallon
- Triclopyr-Garlon 3A: $66.15 per Gallon
- Nu-Film-Adjuvant: $24.70 per Gallon
- RR 90-Surfactant: $8.50 per Gallon
- Bullseye-Blue Dye: $40.00 per Gallon

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OFF ROAD

WARNING
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Nozzels

- Handgun versus wand sprayer
- Nozzels

shindaiwa
SP415
PROFESSIONAL

jacto
COMMERCIAL 2000
5.5 GALLONS

BIRCHMEIER
Iris
US gal

SP Systems
THE PISTON
SWISSMEX

3
10
2
5

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BIRCHMEIER

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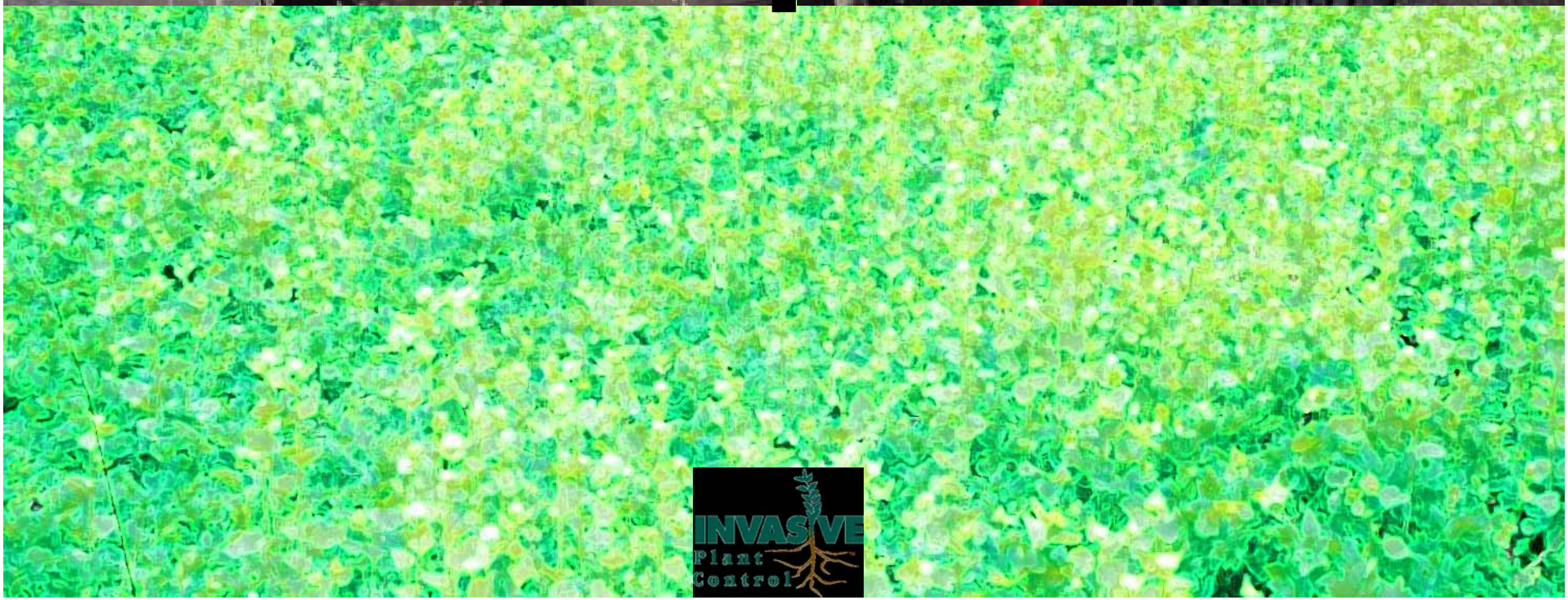
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- Montpellier
- Fort Detrick
- Rock Creek NP
- Pittsburgh Parks Conservancy

Scenario Analysis

Montpellier

What’s Lurking Behind the Mustard?

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