



1st year rosettes

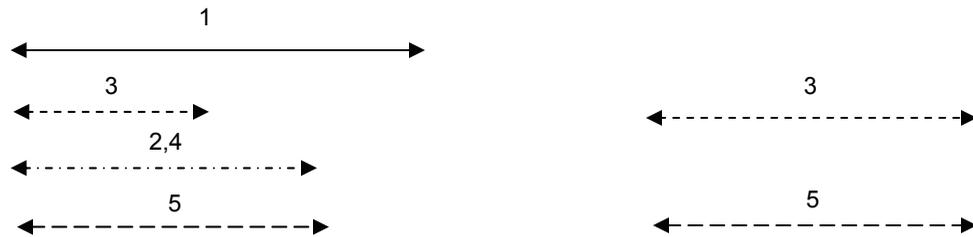


2nd year plant



2nd year flowers and seed pods

Jan Feb March April May June July Aug Sept Oct Nov Dec



Management Techniques

- (Spring– Early Summer) Hang-pulling. Remove the entire plant, including the S-shaped taproot. Stem disturbance will cause additional stems to develop. Bag all of the plants and take to the landfill or burn. Do not pull the plant after seedpods have dried and begin to release seeds, this will only spread further seeds. *Follow up with technique 4.*
- (Spring) Cutting, or weed whipping. Cut the flowering stems to ground level after the flower stalks have elongated but before the flowers have opened and seeds have been produced. Repeat for 2-5 years in a row. *Follow up with technique 4.*
- (Early Spring and/or Fall) Foliar spray. Apply herbicide to leaves using a sprayer, but not to the point where leaves are dripping. This method will have a deeper root-kill if used in the fall, but can also be used to top kill the plant in the spring. Foliar spray can be used as long as no rain is expected for the next 8 hours. *This technique should be followed with technique 4.*
 - 1% triclopyr solution formulated for use with water
 - 1% 2,4-D amine
- (Spring) Plant fast-growing, shade-tolerant, native species:
 - Among a moderate infestation of garlic mustard, to reduce the amount of bare soil that garlic mustard seeds would be able to spread to.
 - In areas where garlic mustard has been pulled, to prevent garlic mustard and other invasive plants from seeding the disturbed soil.
- (Spring and Fall) Prescribed burn. A fire that's too cool can increase garlic mustard, too hot can alter the composition of the ground layer. Burns must be done for 3-5 years in a row. Monitor for re-growth.

For More Information Visit:

<http://www.HawkeyeCWMA.org>

ALWAYS READ AND FOLLOW PESTICIDE LABELS.

Proper training for prescribed fires is highly recommended.

Basic training can be found online at <http://training.nwccg.gov/courses/s130.html> and <http://training.nwccg.gov/courses/s190.html>

For More Information:

<http://www.iowadnr.com/forestry/invasive.html>
<http://plants.usda.gov>
www.invasivespecies.gov
www.nps.gov/plants/alien

Mention of any trade names is for the convenience of the reader and does not imply any endorsement by the Hawkeye CWMA

Credits:

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The **Hawkeye Cooperative Weed Management Area (HCWMA)** is a collective group of county, state, and federal agencies, nonprofit organizations and community associations who have come together to **combat the invasive species problem in Eastern Iowa**. The HCWMA serves Benton, Cedar, Johnson, Jones, Linn, and Louisa Counties and is open to all interested parties. The Term CWMA, or Cooperative Weed Management Area, refers to a local organization that integrates invasive species management resources across jurisdictional boundaries in order to benefit entire regions.

Funding for this brochure provided by the US Forest Service through a Healthy Forest Initiative Grant.

All Hawkeye CWMA members (agencies, organizations, and individuals) are equal opportunity providers and employers.

Garlic Mustard

Alliaria petiolata



A SERIOUS THREAT
To
Iowa's Woodlands

What is Garlic Mustard

- Brought to U.S. by early settlers for use in cooking and medicines.
- Is a biennial:
 - Emerges in spring as basal rosette of leaves that stay green and continue to grow through the winter.
 - Plants produce flowers and seeds in second year of growth.
 - Plants die after seeds are produced.
- Can shade or crowd out native plants.



Garlic mustard invading a forest

What is the threat to Iowa?

- Can rapidly take over our native forests.
- Forms dense colonies that shade out native wildflowers and tree seedlings.
- Can totally dominate a forest floor within 5-7 years of its introduction.
- Seeds become viable within a few days of flowering, allowing for rapid germination.
- Has two periods of germination: one in mid-spring and the other in late summer.
- Seeds remain viable for up to 7 years in soil.

What Does Garlic Mustard Look Like?

Identifying traits: Generally found in shaded woods that have been disturbed. Leaves smell like garlic when crushed. First year plant comes in a rosette form. Second year plant produces the flowers and seeds.

Rosettes:

Round, dark green, scallop-edged rosettes emerge in early spring. Rosettes stand up to 6" tall and stay green throughout the winter.



2nd Year Leaves:

The leaves are simple, alternate, and largely toothed. Most of the leaves are heart shaped, but leaves towards the top of the stalk are more triangular. Leaves can reach up to 3" wide and the stalk can reach up to 4' tall. Easily identified as non-native, because no native wildflower reaches this height!

Flowers:

Clusters of white, small flowers form at the tops of stalks. The flowers bloom from late April or early May through early June.



Seeds:

This is the sole means of reproduction for garlic mustard. Seeds come in a long green pod, that turns light brown/tan when plant dies. Each plant contains hundreds of oblong, black seeds. Seeds can remain viable for up to 7 years in the soil.



Native Alternatives:

New Jersey Tea (*Ceanothus americanus*)-

An effective shrubby ground cover for hard-to-grow areas such as steep slopes or disturbed soils. Tiny fragrant flowers emerge in late spring. Dried leaves can be used as a tea substitute. Very low maintenance!



Wild Blue Phlox (*Phlox divaricata*)-

This shade tolerant perennial offers lavender, blue, rose, or white colored flowers from late March until May. Wild Phlox prefers moist soils and stands no more than 1' tall. This native will be one of the first to bloom in the spring, attracting butterflies and hummingbirds with its showy flower clusters.



Possible Biological Control Method-



Ceutorhynchus scrobicollis:

The newest control method for Garlic Mustard comes in the form of an insect. The weevil called *C. scrobicollis* feeds on the root crown of Garlic Mustard plants, stopping the flow of nutrients and water from the roots to the rest of the plant. This causes the plant to either produce fewer seeds or die before any seeds are produced.

C. scrobicollis lives for 1 year and produces only 1 batch of offspring. Native vegetation should not be negatively impacted because the weevil only feeds on Garlic Mustard.

This control method is still in the experimental stage. Be on the lookout for updates on this Garlic Mustard munching insect.