

# Invasive Species Calendar



Minnesota Invasive Species Advisory Council

2009

# Invasive Species Threats to Minnesota

Invasive species are non-native plants, animals, and pathogens that cause environmental damage, economic loss, or harm to human health. These pests displace native species, harm habitats, and degrade natural, managed, and agricultural landscapes.

Minnesota is presently battling a number of invasive pests including Canada thistle, flowering rush, and gypsy moth shown in this calendar. There are also many new invasive species that could arrive and cause problems. The list of potential invaders includes golden nematode, emerald ash borer, and didymo.

In addition to harming the recreational value of our natural resources, invasive pests pose serious economic threats to major Minnesota industries such as agriculture, tourism, and forestry. Nationwide, some estimates peg the economic damage of invasive pests at more than \$100 billion a year.

Public awareness and action are the keys to preventing the spread of invasive species. Please use the information in this calendar to help inform Minnesotans about the invasive species problem and what they can do to take action in the challenge to reduce invasive species spread and harm.

## Information Sources

The Minnesota Invasive Species Advisory Council (MISAC) Web site provides more information about invasive species in Minnesota. This Web site is a gateway to invasive species information including many invasive species profiles, contact information for invasive species experts in Minnesota, and links to other related Web sites.

**MISAC Web site**      [www.mda.state.mn.us/misac](http://www.mda.state.mn.us/misac)

The following Web sites of MISAC members also have information about invasive species.

<b>DNR</b>	<a href="http://www.dnr.state.mn.us/invasives">www.dnr.state.mn.us/invasives</a>
<b>MDA</b>	<a href="http://www.mda.state.mn.us/plants">www.mda.state.mn.us/plants</a>
<b>Minnesota Sea Grant National Invasive Species Information Center (USDA)</b>	<a href="http://www.seagrants.umt.edu/ais">www.seagrants.umt.edu/ais</a>
<b>USDA-APHIS</b>	<a href="http://www.aphis.usda.gov">www.aphis.usda.gov</a>
<b>USDA-Forest Service</b>	<a href="http://www.fs.fed.us/invasivespecies">www.fs.fed.us/invasivespecies</a>
<b>U.S. Fish and Wildlife Service</b>	<a href="http://www.fws.gov/midwest/fisheries/topic-ans.htm">www.fws.gov/midwest/fisheries/topic-ans.htm</a>

Included on the back of this calendar is contact information for six agencies with invasive species responsibilities in Minnesota. These agencies, as well as other MISAC members, can provide informational products such as brochures, species identification cards, and videos about invasive species.



# Minnesota Invasive Species Advisory Council

This calendar was produced and distributed by the Minnesota Invasive Species Advisory Council (MISAC). MISAC is a statewide entity formed to help:

- facilitate statewide coordination and cooperation on invasive species—including the review of information concerning the current status, management, and spread of terrestrial and aquatic invasive insect, plant, animal, and pathogen species into and within Minnesota;
- work cooperatively to prevent new introductions, identify and locate invasive species;
- contain established introductions; to manage invasions and take other actions in order to minimize invasive species impacts within Minnesota; and
- address these and other existing needs by maximizing available resources.

MISAC's co-chairs, from the Minnesota departments of Agriculture and Natural Resources, represent the state agencies that are responsible for coordinating the management of invasive species in the state. The Council also includes these members: Bailey Nurseries, Leech Lake Band of Ojibwe, Minneapolis Park and Recreation Board, Minnesota Association of County Agricultural Inspectors, Minnesota Board of Water and Soil Resources, Minnesota Crop Improvement Association, Minnesota Department of Transportation, Minnesota Forestry Association, Minnesota Golf Course Superintendents' Association, Minnesota Native Plant Society, Minnesota Nursery and Landscape Association, Minnesota Shade Tree Advisory Committee, The Nature Conservancy, Superior National Forest, USDA-Animal and Plant Health Inspection Service, USDA-Natural Resources Conservation Service, U.S. Fish and Wildlife Service, U.S. Forest Service, University of Minnesota-College of Food, Agricultural and Natural Resource Sciences, University of Minnesota Sea Grant Program.

# Help Report Locations of Invasive Species

One of the keys for a rapid response to invasive species is the early identification of new occurrences. Please help report occurrences of invasive species in Minnesota at the following:

- MISAC Web site at: [www.mda.state.mn.us/misac](http://www.mda.state.mn.us/misac) and click on "Reporting Invasive Species".
- "Arrest the Pest" Hotline at: (651) 201-MOTH (metro) or 1-888-545-MOTH (toll free). Please call the hotline to report suspicious pest species arriving on plants or articles from foreign countries or other states and for the latest updates on invasive species such as the gypsy moth, soybean rust, sudden oak death, Asian longhorned beetle, emerald ash borer, bark beetles, and other destructive insect, plant, and disease pest species.
- DNR Invasive Species Program at: (651) 259-5100 (metro) or 1-888-MINNDNR (elsewhere) to report invasive aquatic plants or wild animals such as Eurasian water milfoil, zebra mussels, Asian carp, round goby, non-native deer, and mute swans.
- Or as specified for individual species in the invasive species calendar.

**MINNESOTA INVASIVE SPECIES REPORTING FORM**

Observation Date: \_\_\_\_\_ Association: \_\_\_\_\_  
Observer's Name: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Address: \_\_\_\_\_ Email: \_\_\_\_\_  
Phone: ( ) \_\_\_\_\_

**Species and Location Information**

Common Name: \_\_\_\_\_ Scientific (if known): \_\_\_\_\_  
Locality Name (lake or twosp): \_\_\_\_\_ County: \_\_\_\_\_ Zip: \_\_\_\_\_  
Site Address (if any): \_\_\_\_\_  
Property Ownership (i.e. Private, county, state, federal, etc.): \_\_\_\_\_  
If known, provide one or both of the following location methods:  
Legal Description: Twp \_\_\_\_\_ Range \_\_\_\_\_ Sec \_\_\_\_\_ 14 Sec \_\_\_\_\_ 14 14 Sec \_\_\_\_\_  
GPS: X Coordinate (Lat./Easting) \_\_\_\_\_  
Y Coordinate (Long./Northing): \_\_\_\_\_  
\_\_\_\_\_ (if Legal Description or GPS information is unavailable): \_\_\_\_\_  
\_\_\_\_\_ compass direction, and rough outline of \_\_\_\_\_



# Quagga Mussel *Dreissena bugensis*

Quagga mussels feed throughout the year, consuming food sources for fish and other wildlife.



Photo: U.S. Geological Survey

**Keys to ID:** Quagga mussels are about the size of an adult's thumbnail and have fan-shaped shells with alternating brown to brownish colored stripes. They are often difficult to distinguish from zebra mussels.

# Quagga Mussel

*Dreissena bugensis*

**Species:** Quagga mussels are small barnacle-like aquatic animals.

**Origin:** Native to Ukraine, they first arrived in the Great Lakes about 1989 likely due to discharges of ballast water from transoceanic ships.

**Impacts:** They foul beaches, accumulate pollutants, consume food resources for native species, and clog water intakes. They tend to colonize deeper waters, but can outcompete zebra mussels in warmer shallow waters. They are linked to fish and wildlife die-offs.

**Status:** First found in 2005, they are established in the Duluth-Superior Harbor, but have not been found in Minnesota inland waters.

**Where to look:** Boats, swimming platforms, docks, rocks, and other hard surfaces along shorelines.

## Regulatory classification

**(agency):** It is a *prohibited invasive species* in Minnesota (DNR).

**Means of spread:** Adults can spread by attaching to boats, motors, boat lifts, and aquatic plants. Larvae (veligers) can spread in infested water in tanker trucks, bait buckets, livewells, and bilges.

**How can people help?** Remove mussels, aquatic plants, and drain water before transporting boats and equipment from one waterbody to another. Report new infestations.

**Further information:** Contact the University of Minnesota Sea Grant Program or the DNR Invasive Species Program.

# January

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 <small>New Year's Day</small>	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19 <small>Martin Luther King, Jr. Birthday</small>	20	21	22	23	24
25	26	27	28	29	30	31



# Canada Thistle *Cirsium arvense*



**Keys to ID:** Canada thistle grows to a height of 2-5 feet. Stems are grooved and become hairy as the plant matures. Leaves have crinkled edges, spiny margins, and are somewhat lobed. Flowers are lavender, white, or reddish-purple without spines.



Canada thistle is most abundant during years of wet cycles.



# Canada Thistle

*Cirsium arvense*

**Species:** It is a perennial herbaceous forb in the Asteraceae (Composite) family.

**Origin:** Native to Europe and Asia, it was likely introduced with forage and grains imported in the late 1600s and 1700s.

**Impacts:** It is unpalatable to many livestock and wildlife grazers. It can reduce desirable crops, the quality of wildlife habitat, and degrade native prairies.

**Status:** It has invaded most of the state, especially western Minnesota.

**Where to look:** It is found in disturbed pastures, prairies, CRP plantings, roadsides, and trails, often first invading low-lying areas and perimeters of seasonal wetlands.

**Regulatory classification (agency):** It is a *prohibited noxious weed* in Minnesota (MDA).

**Means of spread:** Movement of seed in hay, root fragments, or infested soil establishes new stands.

### How can people help?

- Prevent seed production.
- Report infestations to your local County Agricultural Inspector.
- Prevent seed production by cutting, pulling, mowing, selective grazers, rotational grazing, and herbicides.

### Management information:

- [www.mda.state.mn.us/plants/badplants/thistlecanada.htm](http://www.mda.state.mn.us/plants/badplants/thistlecanada.htm)
- [http://appliedweeds.cfans.umn.edu/pubs/FS\\_Noxious%20Weeds.pdf](http://appliedweeds.cfans.umn.edu/pubs/FS_Noxious%20Weeds.pdf)
- <http://appliedweeds.cfans.umn.edu/weeds/CanadaThistle.html>

# February

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2 <i>Groundhog Day</i>	3	4	5	6	7
8	9	10	11	12 <i>Lincoln's Birthday</i>	13	14 <i>Valentine's Day</i>
15	16 <i>Presidents' Day</i>	17	18	19	20	21
22 <i>Washington's Birthday</i>	23	24	25	26	27	28
	<i>National Invasive Weed Awareness Week Feb. 23-27</i>					



# Watergarden Pathway



Photo: Donna Perleberg, MNDNR

## Yellow Iris

*Iris pseudacorus*

**Keys to ID:** Grows 2-3 feet tall in shallow water along shores. There are two or three deep yellow flowers on a round stalk; blooms May through July.



Photo: Peter Dziuk, MDA

## Non-native Waterlilies

*Nymphaea* sp.

**Keys to ID:** Look similar to native white waterlilies in form, but they have colored flowers.



Photo: Peter Dziuk, MDA

## Flowering Rush

*Butomus umbellatus*

**Keys to ID:** Emergent form has three angled fleshy leaves that may produce an umbel shaped cluster of pink flowers on a round stem.

**Invasive aquatic plants can spread if placed in or near natural waters.**



**Yellow Iris**  
**Non-native Waterlilies**  
**Flowering Rush**

**Species:** Invasive aquatic plants.

**Origin:** They are native to Europe and Asia.

**Impacts:** They can invade shallow areas of lakes, wetlands, and stream banks, displacing native aquatic plants. Flowering rush can impede water recreation.

**Status:** They are found in a few lakes and rivers in Minnesota.

**Where to look:** Look in lakes, rivers, and wetlands.

**Regulatory classification (agency):** Flowering rush is a *prohibited invasive species* (DNR). Yellow iris and non-native waterlilies are *regulated invasive species* illegal to place in public waters (DNR).

**Means of spread:** Plants, fish, and animals used in watergardens may establish in natural waters when planted or discarded there.

**How can people help?**

- Inspect plant orders and remove unwanted seed, plant fragments, snails, and fish.
- Do not release or plant non-native plants in natural waters.
- Contact DNR before transplanting aquatic plants.

**Further information:**

- [www.dnr.state.mn.us/invasives](http://www.dnr.state.mn.us/invasives)
- [www.habitattitude.net](http://www.habitattitude.net)

# March

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6	7
8 <small>Daylight Saving Time Begins</small>	9	10	11	12	13	14
15	16	17 <small>St. Patrick's Day</small>	18	19	20 <small>Spring Begins</small>	21
22	23	24	25	26	27	28
29	30	31				



# Oak Wilt *Ceratocystis fagacearum*



**Keys to ID:** Symptoms appear early to late summer. Leaves on infected trees wilt, discolor and prematurely drop. Leaves turn red-brown-bronze to olive green, often retaining a distinct green triangle at the base of the leaf. Dark brown streaks along the wood's grain may be present beneath the bark. Laboratory testing is needed for confirmation.

Oak wilt can fruit on uncured firewood up to a year after the tree dies.



# Oak Wilt

**Species:** Oak wilt is a fungal disease caused by *Ceratocystis fagacearum*.

**Origin:** Recent genetic research suggests a Central or South American origin

**Impacts:** It can affect and kill all species of oak; red oaks are very susceptible, dying within three months of infection.

**Status:** First identified in the Great Lakes region in the 1940s, it has just recently been declared an invasive species in Minnesota.

**Where to look:** It is widespread throughout central and southeastern Minnesota. Damage is particularly high in red or pin oak forests.

**Regulatory classification (agency):** It is not regulated in Minnesota.

**Means of spread:** It spreads below ground through root grafts, and above ground by sap-feeding beetles. A long-distance means of spread is through the movement of firewood.

**How can people help?**

- Avoid wounding oaks during April, May, and June.
- Do not move infected wood.
- Tightly tarp and cure fresh firewood for a year before using it.
- Debark, chip, burn, or bury any infected wood that will not be tarped or processed by April the year following the tree's death.

**Further information:**

- [www.na.fs.fed.us/spfo/pubs/howtos/ht\\_oakwilt/toc.htm](http://www.na.fs.fed.us/spfo/pubs/howtos/ht_oakwilt/toc.htm)
- [www.dnr.state.mn.us/treecare/forest\\_health/oakwilt/whatisoakwilt.html](http://www.dnr.state.mn.us/treecare/forest_health/oakwilt/whatisoakwilt.html)

# April

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 <i>April Fool's Day</i>	2	3	4
5	6	7	8	9	10	11
12 <i>Easter</i>	13	14	15	16	17	18
19	20	21	22 <i>Earth Day</i>	23	24 <i>Arbor Day</i>	25
26	27	28	29	30		

# Tartarian, Morrow's, and Bella Hybrid Honeysuckles *L. tatarica*, *L. marrowii*, *L. ×bella*



**Keys to ID:** The 1-2 inch, oval leaves are opposite along the stem. Morrow's has downy leaves. Pairs of fragrant, tubular flowers are less than an inch long and vary from creamy white to pink, or crimson in some varieties of Tartarian honeysuckle. Flowering generally occurs from early to late spring, but varies for each species and cultivar. Fruits are red to orange, and bear many seeds. Older stems are often hollow, while most native bush honeysuckles have solid stems.



**There are three major invasive honeysuckle shrubs in Minnesota.**



## Tartarian, Morrow's, and Bella Hybrid Honeysuckles

*Lonicera tatarica*, *L. marrowii*, and *L. x bella*

**Species:** Upright, generally deciduous shrubs ranging from 6 to 15 feet tall.

**Origin:** Native to Europe and Asia, they were introduced to the U.S. for ornamental shrubs and wildlife habitat.

**Impacts:** Most natural communities can be invaded by one or more of the species. They leaf out earlier than herbaceous plants and shrubs, outcompeting native plants for sun.

**Status:** They occur throughout the eastern U.S. and into southern Canada. They are widely distributed in Minnesota.

**Where to look:** Invades forest edges, abandoned fields, pastures, roadsides, upland habitats, and disturbed woodlands. Morrow's honeysuckle can invade bogs, fens, lakeshores, and sandplains.

**Regulatory classification (agency):** They are not regulated in Minnesota.

**Means of spread:** Birds disperse their seeds. Plants sold as ornamentals are a source of introductions.

**How can people help?** Do not purchase or plant non-native honeysuckle shrubs.

**Management information:** Pull when soil is moist or burn. Cut-stump treatment is most effective with mature shrubs, followed by Glyphosate application.

# May

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3	4	5	6	7	8	9
10 <i>Mother's Day</i>	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25 <i>Memorial Day Observed</i>	26	27	28	29	30
31						



# Emerald Ash Borer *Agrilus planipennis*

All North American ash trees appear to be highly susceptible to emerald ash borer attack.



Photo: Mark Abrahamson, MDA

**Keys to ID:** The larval gallery can be found beneath the bark of ash trees and is characteristically "S" shaped. Adults emerge from approximately 1/8-inch wide "D" shaped holes. Other insects also tunnel beneath the bark of ash trees and leave emergence holes in the bark; however, emerald ash borer is the only one with "S" galleries and "D" emergence holes.



# Emerald Ash Borer

*Agrilus planipennis*

**Species:** Emerald ash borer (EAB) is a wood boring beetle in the Buprestidae family.

**Origin:** Native to eastern Asia, it was first discovered in North America in Michigan and Ontario in 2002, and may have been imported in ash wood packing material.

**Impacts:** It causes high mortality in ash trees, including an estimated 30 million in southeast Michigan alone.

**Status:** EAB is present in Michigan, Ohio, Indiana, Illinois, Maryland, Virginia, West Virginia, Wisconsin, Pennsylvania, and Missouri, as well as in Ontario and Quebec, Canada.

**Where to look:** Infested trees tend to die from the top down. Profuse sprouting at the base of the tree and woodpecker damage may be present. Infestations generally begin in the canopy of trees, moving downward over a number of years.

## Regulatory classification

**(agency):** It is a *federally quarantined pest* (USDA-APHIS).

**Means of spread:** Long-distance spread is by infested firewood or other fresh ash wood including nursery stock. Short-distance spread is by flight.

## How can people help?

- Do not transport firewood.
- Report infested trees to MDA at [arrest.the.pest@state.mn.us](mailto:arrest.the.pest@state.mn.us) or (651) 201-6684 or 1-888-545-6684.

## Further information:

- [www.mda.state.mn.us/plants/pestmanagement/eab.htm](http://www.mda.state.mn.us/plants/pestmanagement/eab.htm)

# June

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2	3	4	5	6
7	8	9	10	11	12	13
14 <i>Flag Day</i>	15	16	17	18	19	20
21 <i>Father's Day Summer Begins</i>	22	23	24	25	26	27
28	29	30				



# Gypsy Moth *Lymantria dispar*

Gypsy moth caterpillars are found in late spring to early summer.



Photo: Kimberly Thielen Cremers, MDA



Photo: Kimberly Thielen Cremers, MDA



Photo: Kimberly Thielen Cremers, MDA



Photo: Rusty Haskell, University of Florida

**Keys to ID:** Caterpillars are hairy and have 5 pairs of blue dots and 6 pairs of red dots down their backs. Adult males are brown, daytime fliers with feathery antennae. Adult females have creamy white wings, tan bodies, and do not fly.



# Gypsy moth

*Lymantria dispar*

**Species:** A moth in the Lymantriidae family.

**Origin:** Native to Europe and Asia, it was introduced to the U.S. in 1869.

**Impacts:** It is a defoliating insect that can weaken and kill trees, especially oaks, aspen, and birch.

**Status:** It is a forest pest from maritime Canada south to North Carolina and west to Wisconsin, with known infestations in northeast Minnesota.

**Where to look:** They are found near trees where they feed, hide, mate, and lay eggs. Egg masses can be found on plant materials, outdoor furniture, and firewood.

## Regulatory classification

**(agency):** Gypsy moth is a *federally quarantined pest* (USDA-APHIS and MDA).

**Means of spread:** Gypsy moths disperse short distances on their own. However, they are good “hitchhikers” and humans can distribute them long distances on vehicles, nursery stock, timber, firewood, or outdoor household articles.

**How can people help?** Inspect your vehicles and outdoor equipment and remove egg masses, caterpillars, and pupae before traveling. Don’t transport firewood. Report sightings to MDA.

**Further information:** Call MDA at (651) 201-6684 or 1-888-545-6684.

• [www.mda.state.mn.us/gypsymoth](http://www.mda.state.mn.us/gypsymoth)

# July

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2	3	4 <i>Independence Day</i>
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	



# Orange-Banded Arion *Arion fasciatus*



**Keys to ID:** Adults grow up to 2 inches long with a thin pale brown stripe below a dark brown stripe down each side. An orange or yellow stripe is often visible below the dark brown stripe. It produces a clear slime.



The ecological impacts of the orange-banded arion may compound the damage caused by non-native earthworms.

# Orange-Banded Arion

*Arion fasciatus*

**Species:** The orange-banded arion is an invasive slug.

**Origin:** Native to Europe, it was introduced to the U.S. in the 1800s.

**Impacts:** It is a common pest of vegetables, field crops, and ornamentals throughout the United States and Canada, consuming ground cover plants such as wildflowers and tree seedlings. It can alter and reduce forest floor plant diversity and may displace or compete with native land snails.

**Status:** Minnesota infestations include the Wood Rill Scientific and Natural Area and the Chippewa National Forest. Little else is known about its distribution in Minnesota.

**Where to look:** They are found on crops and in the ground cover of forests and grasslands.

**Regulatory classification (agency):** They are an *unlisted non-native species* in Minnesota (DNR).

**Means of spread:** People unintentionally move slugs and their egg masses in soil, plants, and on logs.

**How can people help?**

- Do not move firewood.
- Inspect plant material, soils, and firewood, and remove slugs and egg masses before moving to forest areas.

**Management information:** There are no known methods to control the slugs in natural habitats. Preventing new infestations is the best protection.

# August

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					



# Common St. Johnswort (Klamathweed)

*Hypericum perforatum*



**Keys to ID:** Plants are 1 to 4 feet tall; leaves are simple, stalk-less and covered with translucent glandular dots; bright yellow flowers with five petals and numerous stamens are borne at the top of the plant. Flowers bloom in mid-late June and are  $\frac{3}{4}$  to 1 inch in diameter; each petal is lined with tiny black dots along the margins. Seeds are produced in a three-celled capsule near the end of July and early August.

**Certain areas of Minnesota have seen an increase in distribution of St. Johnswort over the past decade.**

## Common St. Johnswort (Klamathweed)

*Hypericum perforatum*

**Species:** A stout, yellow flowered perennial in the Clusiaceae family.

**Origin:** Native to Europe, western Asia, and North Africa, it has been documented in the U.S. since the late 1700s.

**Impacts:** It displaces native species and is toxic to livestock. Its sap can cause photosensitivity in humans.

**Status:** It has been found in Cass, Chisago, Cook, Itasca, Pine, Ramsey, and Washington counties.

**Where to look:** Look in grasslands, roadsides, gravel pits, waste areas, open woods, and heavily grazed pastures.

**Regulatory classification (agency):** It is not regulated in Minnesota.

**Means of spread:** It spreads by rhizomes and seeds. Seeds are transported by mowing, spraying, and construction equipment.

**How can people help?** Call your local Cooperative Weed Management Area Lead, County Agricultural Inspector, or township officer.

### Management information:

- [www.bwsr.state.mn.us/grantscostshare/CWMA.html](http://www.bwsr.state.mn.us/grantscostshare/CWMA.html)
- [www.mda.state.mn.us/plants/weedcontrol/caolist.htm](http://www.mda.state.mn.us/plants/weedcontrol/caolist.htm)
- [www.mda.state.mn.us/plants/weedcontrol](http://www.mda.state.mn.us/plants/weedcontrol)
- <http://appliedweeds.cfans.umn.edu/weeds.html>
- [www.extension.umn.edu/offices](http://www.extension.umn.edu/offices)

# September

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3	4	5
6	7 <i>Labor Day</i>	8	9	10	11	12
13 <i>Grandparents' Day</i>	14	15	16	17	18	19
20	21	22 <i>Fall Begins</i>	23	24	25	26
27	28	29	30			



# Didymo *Didymosphenia geminata*

Eradication of didymo, or rock snot, is not possible once it is established.



## Keys to ID:

Four growth stages:

- Initially colonies appear as small, light tan to brown, circular clumps that feel like a cotton ball, not slimy.
- Colonies merge and may cover the substrate as rope-like strands begin to form.
- Stalks lengthen, forming white ropy strands 2-3 feet long, resembling wet toilet paper.
- Stalks persist on the substrate for two months or more after cells die.



## Didymo

*Didymosphenia geminata*

**Species:** A freshwater, single-celled algae.

**Origin:** It is native to some temperate regions of the Northern Hemisphere.

**Impacts:** It forms 10-12 inch thick blooms typically on riverbeds, smothering aquatic insects, native algae, and other organisms.

**Status:** It occurred mostly at northern latitudes in low-nutrient waters including locations in Lake Superior, but now is spreading to more nutrient-rich waters at lower latitudes in many states such as South Dakota, West Virginia, and Arkansas.

**Where to look:** Check rocks and hard surfaces in lakes and rivers.

### Regulatory classification

**(agency):** It is not regulated in Minnesota.

**Means of spread:** It can spread on fishing gear, research equipment, watercraft and equipment, waders, water shoes, and other items placed in infested water.

### How can people help:

- Inspect and remove clumps of algae and plant material from fishing gear, waders, clothing, water shoes, canoes, and kayaks.
- Wash items above with hot tap water.
- Dry items at least 48 hours.
- Report possible infestations.

### Further information:

- [www.epa.gov/region8/water/didymosphenia/](http://www.epa.gov/region8/water/didymosphenia/)

# October

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31 <small>Halloween</small>



# Golden Nematode *Globodera rostochiensis*



Photo: Bonsak Hammeraas, Norwegian Institute for Agricultural and Environmental Research

**Keys to ID:** Females are white when they protrude from the root surface, but later become a golden-yellow color that lasts about 4-6 weeks. When females mature and die, their skin hardens and turns brown, forming an egg-filled cyst. The final color of many cysts when found in the soil is a dark color, so color can not be used as an identification characteristic. Mature females and cysts are barely visible to the naked eye. Positive identification can only be done microscopically.



**Fertilized eggs form a cyst, which may persist in the soil for 20 years or more.**

## Golden nematode

*Globodera rostochiensis*

**Species:** A sedentary obligate parasite of roots, this species is closely related to the pale or white cyst nematode (*Globodera pallida*).

**Origin:** It is native to South America.

**Impacts:** Golden nematodes reduce tuber weight by entering host roots and restricting their uptake of nutrients; may cause up to an 80% reduction in yield. It can also infest other Solanaceae, including tomato and eggplant.

**Status:** Due to strict quarantine in the U.S., it has been confined to nine counties in New York. Neither species has been detected in Minnesota.

**Where to look:** Fields planted to potatoes for consecutive years are most likely to support high nematode populations, once the pest is present. Look for patches of poor plant growth, often with yellowed, wilted, or dead foliage.

### Regulatory classification

**(agency):** It is a *federally quarantined pest* (USDA-APHIS).

**Means of spread:** Long-distance spread is by soil on nursery stock and tubers, potatoes, contaminated equipment, and vehicles.

**How can people help?** Plant clean seed and clean all equipment before entering a field. Potatoes should be grown in rotation with other crops.

**Further information:** Contact the MDA "Arrest the Pest Hotline" at (651) 201-6684 or 1-888-545-6684.

# November

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 <small>Daylight Saving Time Ends</small>	2	3	4	5	6	7
8	9	10	11 <small>Veterans' Day</small>	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26 <small>Thanksgiving Day</small>	27	28
29	30					



# Rainbow Smelt *Osmerus mordax*

Live rainbow smelt may not be possessed, transported, or introduced into Minnesota waters.



**Keys to ID:** Adults have pale green on the back, with purple, blue, and pink iridescent reflections on the side when freshly caught. Adults are typically less than 8 inches long. Teeth on both mouth and tongue; native shiners and cisco do not have teeth on mouth or tongue.



## Rainbow smelt

*Osmerus mordax*

**Species:** It is a small, soft-rayed fish.

**Origin:** Native to Atlantic drainages from Newfoundland to the Delaware River and Pennsylvania. Upper Great Lakes populations are the result of stocking in and escapement from Crystal Lake, Michigan, and were the probable source of introductions into Minnesota.

**Impacts:** The species is a possible cause of decline of lake herring (cisco or tullibee). In Wisconsin, rainbow smelt apparently caused the extirpation of lake herring, disrupting the food web for walleye, muskellunge, and northern pike.

**Status:** They are present in Lake Superior, Voyageurs National Park, Lake of the Woods, the Mississippi River, and other waters along Minnesota's northern border.

**Where to look:** They prefer lake shorelines and usually are only present in rivers during spawning.

**Regulation classification (agency):** It is a *regulated invasive species* (DNR).

**Means of spread:** They can be transported through the harvest, use, and release of live bait. Fertilized eggs can adhere to boats, gear, or equipment.

### How can people help?

- Do not transport or introduce live smelt.
- Never release fish from one waterbody into another.

**Further information:** Contact the DNR Invasive Species Program or the University of Minnesota Sea Grant Program.

# December

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21 <i>Winter Begins</i>	22	23	24	25 <i>Christmas Day</i>	26
27	28	29	30	31		



**For information about  
invasive species in  
Minnesota, contact:**

**Aquatic Plants and Animals**

Minnesota Department of  
Natural Resources-Invasive  
Species Program  
(651) 259-5100

University of Minnesota-  
Sea Grant-Aquatic Invasive  
Species Program  
(218) 726-8712

U.S. Fish and Wildlife Service  
(612) 713-5114

**Terrestrial Plants and Insects**

Minnesota Department of  
Agriculture-Invasive Species  
Exclusion Unit  
(651) 201-6328

USDA-Animal and Plant Health  
Inspection Service  
(612) 725-1722

Minnesota Department of  
Natural Resources-Division of  
Forestry  
(651) 259-5300

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Jay Rendall, Minnesota Department  
of Natural Resources



Quagga Mussel



Canada Thistle



Watergarden Pathway



Oak Wilt



Hybrid Honeysuckle



Emerald Ash Borer



Gypsy Moth



Orange-Banded Arion



Common St. Johnswort



Didymo



Golden Nematode



Rainbow Smelt