

From Shore to Shore

For Minnesota citizens promoting the health of our rivers & lakes

September-October 2005

#69

Calendar of Events

→ Shoreland Revegetation Workshop
September 30, 2005 – Grand Rapids, MN – North Central Research and Outreach Center
Contact: Itasca Soil and Water Conservation District, 218-326-0017 or kathy.loucks@mn.nacdn.net

→ Shoreland Revegetation Workshop
October 8, 2005 – Onamia, MN – The Depot
Contact: Mille Lacs Soil and Water Conservation District, 320-983-2584 ext. 1 or susan.shaw@mn.nacdn.net

→ 4th Annual Nonpoint Source Educ. Programs Conference
October 17-20, 2005 – Chicago, IL – The Depot (The Shoreland Education program will be presented.)
http://cfpub2.epa.gov/npdes/courses.cfm?program_id=0&outreach_id=238&o_type=1

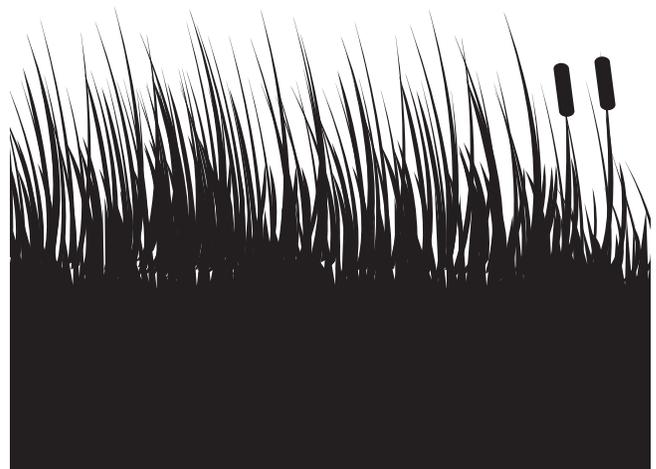
→ Water Resources Conference
October 25-26, 2005 – Brooklyn Center, MN
<http://wrc.coafes.umn.edu/waterconf>

→ Brainerd Area Environmental Learning Network Green Buildings Site Tour – November 3, 2005
Contact: Phil Hunsicker, 218-824-5095, phunsicker@1000fom.org or Eleanor Burkett, 218-828-2326, burke044@umn.edu

Introducing...

Jackie Froemming

Jackie Froemming is the new technical advisor in water resource management and policy and horticulture for the University of Minnesota Extension Service in Crow Wing County. Jackie has master's degrees in biology from the University of Texas at Austin and from the University of Puerto Rico. Jackie will work with shoreland volunteers, shoreland property owners and local lake associations. She will also coordinate the Master Gardener Program in Crow Wing County. You can contact her at froem022@umn.edu or by phone at 218-824-1068. ■



Water Gardeners and Shoreland Owners Concerned About Aquatic Invasive Species

Submitted by: Barbara Liukkonen, Minnesota Sea Grant Program, 612-625-9256, liukk001@umn.edu

Recent news stories about finding zebra mussels in Mille Lacs have reminded us about the impacts that non-native plants, fish, and other animals may have on Minnesota's waters, and highlighted the expense and effort needed to control them. While non-native species do not always pose a threat, some can out-compete native species, contributing to loss of native plant communities and habitat for fish and wildlife, resulting in economic and recreational impacts.

Non-native plants and fish are often the centerpieces of water gardens, adding interest and beauty, but if these species escape or are released in our lakes and streams, they may have significant ecological effects. In 2002, research at the University of Minnesota Horticulture Department, indicated it is easy to receive prohibited invasive species through catalogs and the Internet and that 92.5% of plant orders included unintended "hitchhikers."

To further identify the potential for introducing aquatic invasive species through water gardening and to help stop the spread of those invasive species, a research study and outreach effort was sponsored by Minnesota Sea Grant in collaboration with the Minnesota Water Garden Society, the Department of Natural Resources, and the Minnesota Nursery and Landscape Association.



In 2004, we queried water gardeners, Master Gardeners, and shoreland property owners with an online or written survey, and conducted one-on-one interviews with 37 nursery and landscape design professionals in the Twin Cities and greater Minnesota. The survey tools were designed to measure awareness and knowledge levels, identify their sources of plants and information, characterize sales and gardening practices, investigate willingness to pay, and assess opportunities for educating customers and nursery employees.

Respondents indicated the threat posed by aquatic invasive species is of serious concern (91% consumers, 57% nursery professionals), but most were unable to correctly identify non-native, invasive species of concern in Minnesota. Few consumers (7%) purchase plants or animals over the Internet; 56% choose plants at local retail outlets. Most (86%) expressed a willingness to pay more for plants they were sure were free of hitchhikers.

Two thirds of the nurseries had received unintended plants or animals in shipments. Fewer than 15% of the retail outlets had a process in place to identify or eliminate



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Controlling Reed Canary Grass (*Phalaris arundinacea*) in Wetland Restorations

Submitted by: Carrie Reinhardt Adams, Landscape and Restoration Ecology, University of Florida, 352-392-1831 ext. 223, creinhardt@ifas.ufl.edu

What is reed canary grass?

Reed canary grass is a sod-forming perennial grass that produces tall (2 to 8 ft) shoots, and reproduces by seed, underground spread, and from fragments. This plant forms thick creeping underground stems called rhizomes (Figure 1). Reed canary grass is considered native to the temperate regions of all five continents.

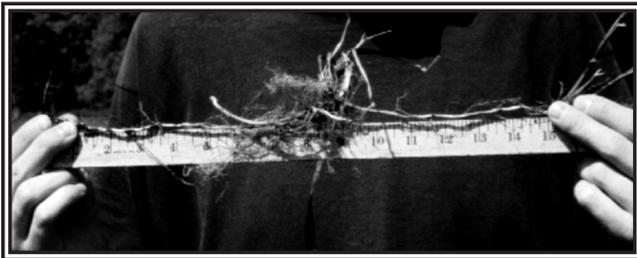


Figure 1. Thick creeping underground stems, called rhizomes, contribute to reed canary grass persistence.

This species was bred to be an important cultivated forage grass for nearly two centuries, and has also been planted to stabilize slopes and drainage ways. Although reed canary grass had conservation value in the past, it is now considered an invasive species. The invasive character of some *Phalaris* populations may be the result of agronomic breeding for vigorous growth and drought tolerance. Most often, you will find reed canary grass growing in moist habitats, like wetlands, streamsides, lakeshores, and road ditches, but reed canary grass also grows well in upland habitats.

Be careful not to confuse reed canary grass with native bluejoint grass (*Calamagrostis canadensis*). Bluejoint grass and reed canary grass seedlings are particularly difficult to distinguish. Look for the prominent transparent ligule (collar-like flap where the leaf attaches to the stem) on reed canary grass to positively identify this species (Figure 2).

Why is reed canary grass a problem?

Wetland restoration projects in Minnesota (and across temperate North America) are often invaded by reed canary grass before native plants can establish. Reed canary grass also invades natural wetlands, forming vast monotypic stands and displacing native vegetation. Development and urbanization alter the landscape, creating habitat for which reed canary grass is especially suited; it thrives in high nutrient, fluctuating hydrology conditions that are typical of sites that receive stormwater inputs. Reed canary grass also spreads through underground connections, allowing it to move into otherwise unsuitable conditions. This species is a problem for wetlands across the northern United States. Washington state lists reed canary grass as a noxious weed.

Controlling reed canary grass: what works?

Herbicide treatments reduce reed canary grass when applied at the right time. Glyphosate-based herbicides are most commonly used to control reed canary grass because they are relatively non-toxic and they are known to be effective for this species. Because of glyphosate's mode of action, later season herbicide applications (late August or later in Minnesota) are more effective than spring herbicide applications (April

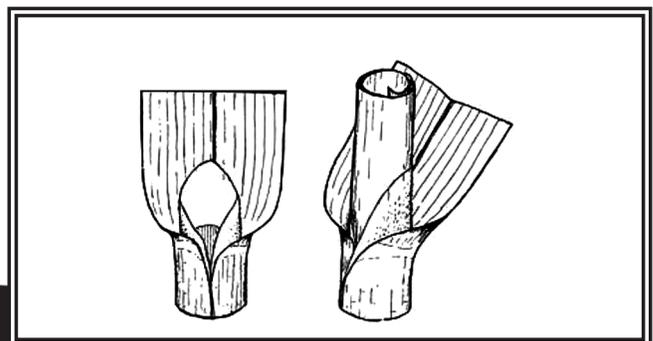


Figure 2. Reed canary grass has a prominent ligule.

and May in Minnesota) (Figure 3). Glyphosate moves with carbohydrates in the plant. A herbicide application in spring, when the plant uses carbohydrates to produce shoots, will kill the shoots of the plant but



Figure 3. This photo was taken one year after these plots had been treated with herbicide in Minnesota. The late August and late September applications were more effective than the spring herbicide application.

rhizomes will survive and resprout. But glyphosate herbicide applied in the later season, when the plant is storing carbohydrates in the rhizomes, will translocate directly to rhizomes, killing both the above and below-ground parts of the plant.

Reed canary grass is less likely to invade a site that has a dense cover of native plant species (Figure 4). If managers can quickly establish native plants, by seeding and planting, they will spend less effort controlling reed canary grass. While the native species



Figure 4. A dense cover of native species can really slow down reed canary grass invasion.

are establishing, however, managers will probably need to selectively remove new reed canary grass juveniles, especially if it is easy for reed canary grass seed to get to the site from other nearby populations.

Controlling reed canary grass: what doesn't work?

Mechanical control (mowing, grazing, tilling) alone does not reduce established reed canary grass populations. Mowing and grazing removes top growth and stimulates more shoot production. Tilling splices rhizomes into pieces and triggers dormant buds to produce new shoots, producing a more dense reed canary grass stand than if nothing had been done in the first place.

Burning alone also doesn't work. In fact burning increases reed canary grass shoot density as new shoots sprout from rhizomes rapidly following a burn. And implementing a controlled burn prior to a glyphosate herbicide application does not increase the effectiveness of the herbicide. Just partial contact with live tissue is enough for absorption of glyphosate herbicide, it isn't necessary to burn to get a flush of new green shoots.

Although mechanical removal methods are not successful for established stands of reed canary grass, if other hardy native species are mixed with the reed canary grass, burns or mechanical removal may be more effective. If reed canary grass can be set back, the area might be readily occupied by species that could potentially outcompete reed canary grass.

Is one year of control enough?

Following control, reed canary grass can rapidly recolonize, possibly from rhizomes, from seeds on site, or from dispersal of seeds to the site. If reed canary grass has dominated a site for many years, managers will definitely need to control reed canary grass for more than one year, and maybe more than 2 years. Although the effort required to keep reed canary grass out of the site diminishes over time, hand weeding might be necessary indefinitely. At the Spring Peeper Meadow wetland restoration demonstration at the University of Minnesota Landscape Arboretum, effort to keep the wetland reed canary grass-free was substantial at first, but declined over time (Figure 5).

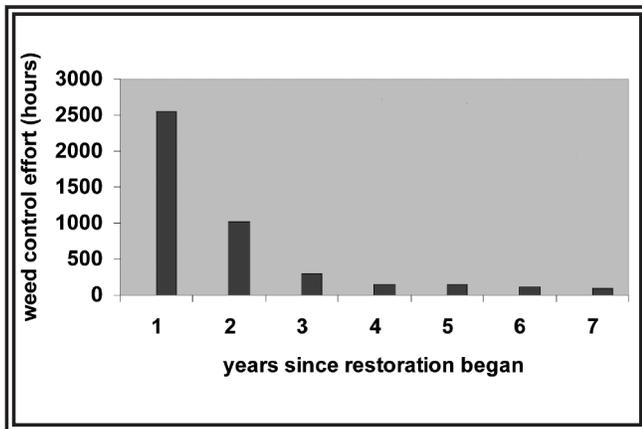


Figure 5. Effort required to keep a wetland restoration reed canary-grass free declined over time.



Figure 6. Reed canary grass produces many seeds.

The devil is in the seed bank.

For sites that have had reed canary grass for more than 20 years, many reed canary grass seeds (Figure 6) are stored in the soil, forming a reed canary grass seed bank. After clearing away the existing reed canary grass, seeds in the seed bank have enough light exposure to germinate and grow, and the site is recolonized with reed canary grass. How do you diminish the reed canary grass seed bank? There are several options:

1. Spray the reed canary grass, till the seed bank to encourage germination of a new generation of reed canary grass plants. Kill that generation of plants, and repeat.
2. Excavate and remove the top 4-6 inches of soil.
3. Turn and till under the layer of soil containing reed canary grass.

For more information:

- ❑ The Nature Conservancy Wildland Invasives Team <http://tncweeds.ucdavis.edu/esadocs/phalarun.html>
- ❑ Wisconsin Department of Natural Resources <http://www.dnr.state.wi.us/org/land/er/invasive/factsheets/reed.htm> ■

Recommendations are based on studies in the published literature and research performed at the University of Minnesota, in partnership with Minnesota DNR, Minnesota DOT, and Ramsey-Washington Metro Watershed District: C.H. Reinhardt and S.M. Galatowitsch. 2004. Best Management Practices for Reed Canary Grass: Final Technical Document for the Department of Transportation.

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hitchhikers in their plant receipts. Only 25% had a process to prevent customers from receiving unintended plants in their purchases. Seventy five percent of retailers requested educational materials to train employees about risks and proper protocols. Nearly all retailers (95%) were willing to provide their customers with outreach education about aquatic invasive species.

After developing preliminary messages and graphics, we conducted focus groups with managers from large and small nurseries, pond designers and installers, state agency staff, Extension specialists, Master Gardeners, and representatives from the Minnesota Water Garden Society. From those meetings and subsequent conversations we refined the messages and finalized the design and layout of the materials.

The new educational materials include tip cards (www.seagrant.umn.edu/exotics/ais_wg_materials.html), plant sticks and tags for nurseries to include with potentially invasive plants, and posters. The posters are available in both an 8-1/2 by 11 inch format and a larger size (18 by 24 inches) for nurseries and garden centers to post.

In a pilot program this summer about 40 Minnesota nurseries, garden centers, and landscape businesses used the materials to inform employees and reach customers with the primary message, "Do Not Release" plants or animals from water features. We're currently in the process of evaluating how the materials were used, customer response and interest, employee response, and willingness to pay for these or similar materials in the future. ■

Toxic Algae: When in Doubt, Keep Out!

Adapted from the MPCA Web site: www.pca.state.mn.us/water/clmp-toxicalgae.html

Lake lovers, especially those with pets or livestock, should be aware of a potential hazard stemming from algae growth in lakes during summer. Under certain conditions some algae species, called blue-green algae, can become toxic. Pets and livestock drinking lake water containing the toxic form of these algae may become sick and even die.

Special characteristics of blue-green algae allow them to become more abundant than other types of algae. Some blue-green algae are able to use nitrogen from the air as well as nitrogen dissolved in the water, which gives them an advantage over algae that depend only on nitrogen in the water.



Blue-green algae can use sunlight more efficiently than most algae. Some contain pockets of gas allowing them to float on the water surface and out-compete other algae for sunlight. In nutrient-rich lakes, blue-green algae can become so abundant that they completely dominate other free-floating algae. The whole appearance of the lake water can be changed by these large concentrations of algae. This condition is called an algae bloom.

The lake water will become cloudy, with a green or blue-green cast, and is often described as looking like pea soup. It often develops a strong musty or earthy odor as the algae accumulate in large floating mats and begin to decompose. In extreme cases, surface scums of dead and decomposing algae may occur.

These algae blooms can occasionally become toxic. Most problems occur when the algae are concentrated by wind along a shoreline and livestock, pets, wild animals, and birds drink the water or otherwise ingest the algae.

Toxic effects in animals can occur only when they ingest the contaminated water or algae. The degree to which an animal is affected depends on several factors: the amount of water or algal cells ingested, the animal's body size, amount of food in the animal's stomach, the sensitivity of the species and individual animal, and the type and amount of toxin present in the bloom. An animal that has ingested toxins from an algae bloom can show symptoms ranging from nausea and skin irritation to severe disorders involving the circulatory, nervous and digestive systems, and severe skin lesions. In the worst case, the animal may suffer convulsions and die.

Humans are seldom seriously affected by toxic algae because the unpleasant odor and taste of water associated with a blue-green algae bloom tends to make them avoid it. However, humans and animals may experience illness or other health effects if their skin is in contact with algal toxins or they ingest large amounts of algae while toxins are being produced.

The Minnesota Department of Health recommends that you not ingest the water, or let children or pets enter the water. Avoid contact with the algae whenever possible. If contact does occur wash off the material thoroughly, paying special attention to the swimsuit area. If your pet comes in contact with a bloom, wash off your pet's coat to prevent it from ingesting the algae while licking.

If you suspect an animal has been affected by an algae bloom, contact your veterinarian as quickly as possible. Some of the toxins that can form in a bloom have the ability to kill in an hour or less, while some may take up to 24 hours to take effect. For more information on toxic algae or to report a possible toxic bloom, please contact: Matt Lindon, MPCA, at 651-297-8218, or toll-free from Greater Minnesota at 1-800-657-3864. You can download a PDF of a new poster about toxic blue-green algae at: www.pca.state.mn.us/water/clmp-toxicalgae.html. ■

wrc.coafes.umn.edu

www.seagrant.umn.edu

www.extension.umn.edu

www.shorelandmanagement.org



Shore to Shore is made possible by Minnesota Sea Grant, in cooperation with the University of Minnesota Water Resources Center.

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