OAK OPENINGS REGION BEST MANAGEMENT PRACTICES

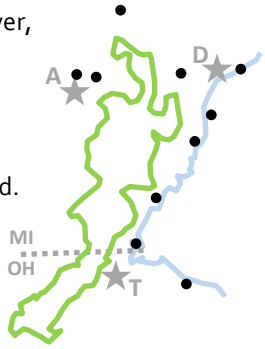
REED CANARY GRASS

Phalaris arundinacea, subspecies *arundinacea*

TARGET

This Best Management Practice (BMP) document provides guidance for managing Reed Canary Grass in the Oak Openings Region of Northwest Ohio and Southeast Michigan. This BMP was developed by the Green Ribbon Initiative and its partners and uses available research and local experience to recommend environmentally safe control practices.

INTRODUCTION AND IMPACTS— The non-native subspecies of Reed Canary Grass (*Phalaris arundinacea,* subspecies *arundinacea)* originated in temperate regions of Eurasia. In the 1800s, both strains were spread across North America for erosion control, hay, and forage. Reed Canary Grass ("R.C. Grass") is now widely distributed across North America and is found throughout OH and MI. Native and non-native strains may occur together and genetic analysis is the only reliable way to distinguish the two. However, native R.C. Grass tends to form sparser stands and has smaller seed heads.



Though widespread across the Oak Openings, R.C. Grass populations are not well documented. The Midwest Invasive Species Information Network (MISIN) has over 230 reports of R.C. Grass (black dots) in or within 5 miles of the Oak Openings Region (OOR, green line), though there is undoubtedly more on the landscape. It is currently found in each of the OOR's 7 counties and is present in many natural areas. R.C. Grass has demonstrated the ability to establish and spread in both healthy and disturbed habitats of the OOR, primarily in the wet, nutrient-rich soils of wet prairies and floodplains.

RCG has many characteristics that contribute to its classification as an invasive, pest species. R.C. Grass limits the light, space and nutrients available to native species. It reproduces prolifically and forms dense monocultures with extensive rhizome systems. The rhizomes, in conjunction with dead stems, form thick sod that cannot be penetrated by native plants. R.C. Grass sod over 1.5' thick has been documented. R.C. Grass is able to out-compete native grasses within 5-6 months of introduction.

Through its inhibition of native plants, RCG severely degrades the quality of the habitats in which it becomes established. Though planted as forage, R.C. Grass provides little benefit to wildlife as food or shelter. R.C. Grass can also contribute to streambank erosion, flooding, and increased water temperatures.

SIMILAR SPECIES— Though R.C. Grass is similar in appearance to several other species of grass, it can be distinguished by its transparent ligule (present on all strains). In the OOR, R.C. Grass may resemble bluejoint grass (native, *Calamagrostis canadensis*), orchard grass (non-native, *Dadylis glomerata*), harding grass (non-native, *Phalaris aquatica*), and native and invasive common reed (*Phragmites* spp.).

HABITAT—R.C. Grass prefers full sunlight and fertile, moist organic soils, but can grow in conditions ranging from dry upland sites to standing water. It is tolerant of partial shade. R.C. Grass is frequently found in marshes, wet prairies, sedge meadows, fens, seasonally wet areas, and disturbed upland sites, as well as along ditches, lake margins, streams and rivers. In the OOR, R.C. Grass has been found along ditch, vernal pool, and pond edges, as well as within fallow fields, wet and mesic prairies, and openings in swamp forests.

IDENTIFICATION—Habit: Large, erect, coarse, perennial grass. R.C. Grass is a cool-season grass and is one of the first to sprout in spring. Reaches 2-7' in height.

Leaves: Alternate and tapering, typically 3.5-18" long and 0.25-0.75" wide. Blades are flat and hairless with a rough texture on both surfaces. Bright green. Leaves stick out at a 45 degree angle from the stem with an open sheath and clasping auricles. Ligules prominent—0.25-0.5" ,long, stiff, membranous, and rounded at the apex.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Stems: Erect, hollow, and hairless. Up to 0.5" in diameter. Bluish-green but often reddish near the top. Persist through winter.

Flowers: Panicles are dense and compact, located on stems high above the leaves. They range from 3-16" long with branches 0.5-1.5" in length. The branches will open as summer progresses and close again when seed is ripe. Single flowers occur in dense clusters and range from green to purple, turning beige as the season progresses.

Fruits: Spikelets, 5 mm long, lanceolate and pale. Most contain 3 florets, 2 of which are reduced and infertile. Lemmas of fertile florets are 3-4.5 mm long, rather than 1 mm in infertile florets. Glumes are compressed and wingless.

Seeds: Shiny and tan to grey-black, less than 2 mm long. Shatter when ripe. Dispersed by water, animals, humans and machines. A single inflorescence can produce up to 600 seeds.

Roots: Dense root systems with stout, creeping rhizomes. Root systems are shallow, averaging 2" in depth. Rhizomes can grow over 10' per year and house dormant buds that will sprout when the aboveground plant is damaged.


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RCG Timeline	J	F	M	A	M	J	J	A	S	O	N	D
Life History	Winter Dieback		Emer-gence	Leaf Growth	Flowering/ Fruiting		Growth Declines		Root/Rhizome Growth		Winter Dieback	
Cutting Only			5x or more per year, for 5-10 years									
Cut and Spray				Mow (reduce seed)					Mow	Spray		
Herbicide Only			Before Natives			Before Dieback			After Natives			
Cut and Cover	Can begin any time, leave in place at least 1 growing season											
Grazing			Palatable?						Palatable?			
Prescribed Fire				Burn		Burn		Burn				

REPRODUCTION AND DISPERSAL—R.C. Grass reproduces by seed and rhizome. All plant parts float, facilitating its spread in standing or flowing water. Detached stems and rhizomes will sprout if in contact with soil. ***Thoroughly cleaning equipment is a critical prevention measure for R.C. Grass in the OOR. Land managers should consider incorporating pre– and post-project equipment cleaning into contracts.***

R.C. Grass produces immense quantities of seed, capable of germinating immediately after maturation. Germination rates are greatly reduced in shady areas, though seeds may remain viable for up to 4 years. Though most of its reproduction seems to be by rhizome, seed establishment is key to R.C. Grass' colonization of new areas.

REPORTING—R.C. Grass is identified as a Target species in the OOR. Reporting R.C. Grass is essential for its control. Report R.C. Grass at www.misin.msu.edu and/or to the county CWMA or CISMA.

CONTROL—The best control is integrated control. Management plans should focus on the depletion of the rhizome reserves and seedbank, followed by chemical damage to the rhizomes where conditions permit the use of herbicides. Annual follow-up is essential to the control of R.C. Grass.

Chemical: The following recommendations have been compiled from groups working in OH, Ontario, NY, MO, IA, IL, WI, MN and the Pacific Northwest . It is the responsibility of the applicator to ensure compliance with herbicide labels and regulations when planning chemical treatment. Special care should be taken to use herbicides approved for aquatic areas when appropriate.

Foliar Spraying or Wicking—Best for large, dense populations or as follow-up after cutting, disking or burning. Herbicides should be used with an appropriate non-ionic surfactant (e.g. LI 700®, Nu-Film® P, etc.). Applying herbicide at different times of year confers different benefits, though fall applications seem to produce the best control.

Mechanical: *Mowing*—Most effective when repeated frequently to prevent seed formation and continually deplete the rhizomes, but is unlikely to eradicate RCG.

Covering—Mowing R.C. Grass and covering the infested area in thick plastic or geotextiles is labor and cost intensive, but can effectively control R.C. Grass if left in place for at least one growing season.

Herbicide	Trade Names	Concentration
Sethoxydim	Vantage®, Poast®	3.75 pints/acre
Fluazifop	Fusilade II®, Horizon®	1-1.5 pints/acre
Quizolofop	(P-Ethyl) Assure II®	See label
Clethodim	Select®, Intensity One®	See label
Imazapyr		3% by volume
Glyphosate	Rodeo®, Aquamaster®, Glypro®	2-3%, 1-5% AI, 33% for wick

Disking—May be applied to established populations, but will only reduce R.C. Grass density, not kill it outright. Can be used as a pre-treatment to herbicide application.

Hand-Pulling/Digging—May be applied to small populations, but only effective if the entire root system is removed. Must be repeated 2-5 times/year for several years. Best if done before R.C. Grass flowers.

Excavating—requires the removal of 6-12" of soil from the invaded site and proper disposal of said soil. Best done in dormant seasons.

In all mechanical removal scenarios, ensure equipment is cleaned and all plant material is disposed of appropriately (see Disposal below). Plants can mature and produce viable seed even after pulling.

Biological: *Grazing*—May reduce stand density and weaken plants, but palatability varies and compounds in older cultivars have been linked to stock illness. Not recommended in wetland habitats.

Shading/Competition—Because R.C. Grass cannot grow in full shade, it can be suppressed by planting native tree and shrub cuttings if ecosystem appropriate. R.C. Grass must be controlled until trees/shrubs establish. Some native grasses, sedges and rushes may be able to outcompete R.C. Grass, but only in places where habitat is marginal for R.C. Grass.

Carbon Enrichment—Mulching with sawdust can deplete excess nitrogen in the soil, making native plants more competitive.

Create Uneven Ground—R.C. Grass can face more competition from native species if sediment accumulation is prevented and a mosaic of micro-topographies is maintained.

Prescribed Fire: Though fire alone will not control R.C. Grass, it does help deplete the seedbank. Best if used in conjunction with spraying: herbicide to "brown-off" R.C. Grass, burn, then spray regrowth.

Hydrological: In situations where water levels can be manipulated, extended periods of flooding may be able to control R.C. Grass.

DISPOSAL—If R.C. Grass plant material has been cut or removed, it must be rendered non-viable and disposed of in accordance with state invasive species legislation. Options for fully destroying cut material include:

Drying—place material on asphalt, tarps, or plastic, ensuring no contact with soil. Cover. When dry, dispose in landfill or burn.

Liquefying—place material in heavy duty garbage bags, seal. Place bags in direct sunlight for at least 1 week. Dispose of in landfill or burn.

- Do not remove soil from the site unless it is being disposed of in a landfill.
- DO NOT COMPOST

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