Identification and Management of *Rorippa sylvestris* (Yellow Fieldcress) in Ornamental Crops

Michigan State University Extension Service
Robert J. Richardson, Department of Horticulture, Steven A Gower, Diagnositc Services, and Bernard H. Zandstra, Department of Horticulture

December 2003
4 pages

Extension Bulletin E-3006 • New • December 2003

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Robert J. Richardson, Dept. of Horticulture; Steven A. Gower, Diagnostic Services,
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Rorippa sylvestris (yellow fieldcress) is an introduced and invasive perennial weed that is very difficult to control. This weed has invaded many nurseries in Michigan, infesting both field- and container-grown stock. Yellow fieldcress has been found in perennial planting material such as hosta and has also been associated with strawberries in other states. California, North Carolina and Oregon regulate this plant as a noxious weed, and it has been found in most states where ornamentals are grown.

Background and biology

Yellow fieldcress is a perennial member of the mustard family (Brassicaceae) with creeping roots (Fig. 1). This plant is native to temperate climates in Asia and Europe and has been introduced into North America several times since 1818. As a result of these introductions, yellow fieldcress has become naturalized in many moist habitats including stream banks, ditches, shores, wetlands and moist fields (Fig. 2). This weed is also known by several other common names, including creeping yellowcress and kiek. Yellow fieldcress grows at a moderate rate and is not likely to exceed 12 inches in height.

Figure 1. Yellow fieldcress creeping roots and sprouts from adventitious buds. This plant was growing in a 4-inch pot in the greenhouse. Distance from top of foliage to tip of longest root is about 24 inches.

Figure 2. Yellow fieldcress in flower beside a road and drainage area.

Yellow fieldcress may reproduce vegetatively from almost any plant part. Creeping root sections as small as 0.06 inch may form adventitious buds and sprout to produce new shoots (Fig. 3). In studies at Michigan State University, 100 percent of 1- to 4-inch root sections formed new plants when kept moist. Adventitious buds may form when roots are separated or when roots are exposed to sunlight (Fig. 4). In field situations, the sprouting of new plants from roots produces the creeping behavior. Mechanical disturbance of roots will likely increase

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Figure 3. Adventitious buds on a yellow fieldcress creeping root.

Figure 4. Yellow fieldcress sprout from an adventitious bud.

the rate of vegetative propagation. Leaves of this species may also sprout in soil or water.

Soil may limit yellow fieldcress growth in some instances. This species will grow in moist soils with a pH of 5 to 8 and favors coarse and medium-textured soils but not fine-textured soils. Plants tolerate temperatures at least as low as 28 degrees F and have easily survived recent Michigan winters, although shoots will die back partially or completely during winter. Yellow fieldcress has intermediate shade tolerance but no salinity tolerance. This species is reported to have low fire tolerance, but surface heating should not damage roots. Shoots are sensitive to dry conditions, but roots may persist.

Identification

Yellow fieldcress requires a chilling period to flower. Flowers form atop 6- to 12-inch flower stalks (Fig. 5). Flowers have four yellow petals longer than four green sepals. A superior ovary and six stamens are present in each flower. The species has an indeterminate bloom period usually lasting from May to September. Flowers have been reported to

Figure 5. Yellow fieldcress flower cluster.

be self-incompatible, indicating that genetically distinct plants would have to cross to produce viable seed. Fruit are slender, linear siliques (pods) up to 0.4 inch long and may have a very short beak. If seeds are produced, they will be small and reddish brown and may persist in the soil.

The fact that *R. sylvestris* may hybridize with other *Rorippa* species makes identification more difficult. *R. sylvestris, R. amphibia* and *R. palustris* may cross to form hybrids. In addition, leaf shape can be quite variable and changes with age (Fig. 6). Young leaves may appear narrowly toothed but will develop deeper lobes with age. Lobes on all leaves will appear opposite and old leaves will have lobes much longer than they are wide. Leaves are alternate and usually smooth.

Figure 6. Variation in leaf shape of yellow fieldcress.

R. sylvestris and *R. palustris* (formerly *R. islandica*) are fairly widespread in Michigan. *R. sylvestris* was introduced; *R. palustris* is native to the state. Table 1 compares *R. sylvestris* and *R. palustris* and two species

Table 1. Comparison of selected *Rorippa* species.

Species	Life cycle	Flowers	Fruit (seed capsules)
R. austriaca	Perennial, spreading to form colonies by thick, fleshy creeping roots.	Yellow petals present, 3 to 5 mm long, and slightly longer than the sepals.	Fruits 1 to 2 mm long, globe-shaped with a visible stalk (3 mm or more long). Rarely produces seed.
R. palustris (formerly *R. islandica*)	Taprooted annual, biennial or occasionally weak perennial; plants solitary.	Yellow petals present, 1.5 to 2.5 mm long, equal to or shorter than the sepals.	Fruit 2 to 3 mm long, globe- to short cylinder-shaped with a visible stalk (3 mm or more long). Produces numerous seed.
R. sessiliflora	Annual	Petals absent.	Fruit 7 to 10 mm long, cylindrical and very thick (often over 2 mm). Fruit on a very short stalk (0.5 to 1.5 mm). Produces numerous seeds.
R. sylvestris	Perennial, spreading to form colonies by creeping roots.	Yellow petals, greater than 3 mm long and longer than the sepals.	Fruit 5 to 10 mm long, linear to cylindrical with a visible stalk (5 mm or more long). Rarely produces seed.

not known to exist in Michigan but found in nearby states. Leaf shape is not included in the table because of extreme variablity. However, *R. sylvestris* is usually more deeply lobed than the other *Rorippa* species.

Management

Some reports of rootstock contaminated with yellow fieldcress have been attributed to hosta imported from Holland, but there is no reason to believe that this species may not be introduced with other crops from various foreign or domestic locations. It is very important to buy planting material from reputable sources and to maintain a stringent prevention and sanitation program. Newly purchased stock should be watched carefully for the presence of any undesirable hitchhikers such as yellow fieldcress.

Control of established yellow fieldcress can be quite difficult. Mechanical control of this weed with equipment such as disks or plows is not suggested because these implements will divide the roots and may carry root pieces to non-infested areas (Fig. 7). The divided plant sections will also result in an increase in the total number of plants — unless the soil is very dry at cultivation. One option for control is fumigation of the affected area with methyl bromide. Yellow fieldcress roots may grow several feet deep into the soil, however, beyond fumigation depth.

Figure 7. Yellow fieldcress growing in a row of sunflowers.

Preemergence herbicides typically do not control weeds growing from perennial reproductive structures. Research in California demonstrated that yellow fieldcress may be suppressed by certain preemergence herbicides, but the roots remain alive and will re-sprout after herbicide residual has dissipated. Postemergence herbicides have controlled yellow fieldcress in MSU research studies.

Glyphosate (Roundup and others), dicamba (Clarity), 2,4-D, and triclopyr plus clopyralid (Confront) may control the weed in labeled non-crop situations (Fig. 8). These products do not have adequate safety for in-crop use, however. Imazapic (Plateau) and halosulfuron (Manage) also effectively controlled yellow fieldcress in research trials. These two herbicides are not currently labeled for use in nursery crops, but Manage may be applied to landscape settings and Plateau may be used for wildflower establishment and maintenance as defined by the respective labels. Because this is a perennial weed, multiple herbicide applications may be required. An active scouting and hand weeding program should be used in combination with chemical controls for long-term management of yellow fieldcress.

Figure 8. Untreated yellow fieldcress (left) and treated (right) with 2,4-D.

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Photos: Figure 6: Annissa Beckerink; All others: Robert Richardson, Michigan State University Horticulture Department

Project GREEEN

Research on *Rorippa sylvestris* control at Michigan State University has been funded by Project GREEEN, the Michigan Nursery and Landscape Association and the MSU Center for Integrated Plant Systems (CIPS).

NOTICE: The user of this information assumes all risks for personal injury or property damage. Always read the label before making pesticide applications. The pesticide label is the legal document that regulates the use of a pesticide. Pesticide labels can change suddenly. These recommendations are not intended to replace the specific product labels.

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