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VEGETATION MANAGEMENT GUIDELINE

Hesperis matronalis L. (Purple rocket**)**

SPECIES CHARACTER

DESCRIPTION

Purple rocket is a perennial or biennial in the Brassicaceae (Mustard family). It has slightly thickened roots, grows to 1 meter (3 feet) tall and the upper part of the plant is often slightly branched. The leaves are alternately arranged, lance-shaped, sessile or on short petioles, sharply toothed, at least on the distal portion, and slightly hairy on the upper and lower surfaces. Its flowers are fragrant, up to 2.5 cm (1 inch) broad, have four petals and six stamens with the four inner stamens longer than the outer two. Flower color is usually purple, but can vary from pink to white. The fruit is a several-seeded, 5 - 15 cm (2 - 6 inches) long silique (a dry fruit, usually more than twice as long as it broad, having two valves that split open at maturity).

SIMILAR SPECIES

Purple rocket can be confused with garden phlox (*Phlox paniculata*), a native plant of moist soil habitats. Garden phlox resembles purple rocket in that it is a perennial, grows in similar habitat, can be 1 - 2 m (3 - 6 feet) tall, and has purple, pink or white flowers that are similar in size to purple rocket. Garden phlox is differentiated from purple rocket by having opposite leaves with smooth margins, flowers with five petals and five stamens, and a 3-parted fruit. Purple rocket should be accurately identified before initiating control efforts. If identification of the species is in doubt, the plant's identity should be confirmed by a knowledgeable person and/or by consulting appropriate plant identification manuals or keys.

DISTRIBUTION

Purple rocket is native to Eurasia and was first introduced into North America in the 1600's. It occurs throughout Canada, Alaska and much of the continental U.S. except Arizona, Oklahoma, South Carolina, and the Gulf coast states. Purple rocket occurs as widely scattered populations throughout all of Illinois. Its spread is facilitated by its inclusion in "wildflower" seed mixes and it has been listed for growing as an alternative to purple loosestrife.

HABITAT

Purple rocket can be found in disturbed sites, along roads, railroads and streams, in open woods, thickets and moist bottomlands.

LIFE HISTORY

Purple rocket prefers a rich, moist, well-drained, neutral to alkaline soil, but can tolerate poor soils. It can grow in partial shade or full sun. Once established, it can tolerate drought. Plant density can range up to 48 plants per square meter. Purple rocket usually produces a basal rosette the first year and

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flowers the following year. The plants bloom from April through August. Purple rocket plants that grow in high density populations tend to bolt earlier than those growing in low density populations. Each plant can produce as many as 50 flowers. Purple rocket is visited, and may be pollinated, by a wide range of insects including bees, moths, and snipe flies. The flowers are very aromatic especially at night when higher levels of certain chemicals are released. Each capsule may contain more than 35 seeds and a plant can produce up to 5,000 seeds. The seed does not require a cold stratification and germination rates can be as high as 98 percent. Optimal soil temperature for seed germination is 15-18^{o} C (60-65^{o} F). Purple rocket can accumulate significant concentrations of lead in its roots and aboveground stems. Purple rocket may have reduced root systems when growing in areas with high salinity or manganese; however, these findings did not correlate to a reduction is seed mass.

EFFECTS UPON NATURAL AREAS

Purple rocket has only recently been given consideration as an invasive in the Midwest. It likely out-competes native species and is an alternate host for a number of viruses that affect vegetable and ornamental crops.

CURRENT STATUS

Purple rocket is included on Colorado's B list of noxious weeds. It is listed as invasive and banned in Connecticut, prohibited in Massachusetts, and is considered a significant threat in Tennessee.

CONTROL RECOMMENDATIONS

Because of its recent consideration as an invasive plant, little information is available on effective control measures. As with any invasive, early detection and prompt initiation of control measures are important and repeated control measures will likely be needed.

RECOMMENDED PRACTICES IN HIGH QUALITY NATURAL COMMUNITIES

For small populations, hand pulling is an effective control measure. If the plants can be properly identified, pulling should be done before they begin to flower. Plants at this stage are generally smaller and the root systems are less extensive. Pulling is easier when the soil is moist. When feasible, pulled plant material should be removed from the site and burned or otherwise disposed of to prevent seed maturation, especially if control is initiated after the onset of flowering. For larger plants, use of a spading fork or other similar device may be needed to loosen soil and facilitate pulling.

For larger infestations or dense stands, herbicides may be a more appropriate alternative. 2,4-D is a selective herbicide that kills broadleaf weeds but not grasses and is one of the most commonly used herbicides on the market. Because there is no longer a patent governing the manufacture and sale of 2,4-D, any company is free to produce it. It is inexpensive and available under a variety of trade names including Barrage HF, Savage CA, Weedone 638, and Weedar 64. It is also available in many different formulations and concentrations. A 0.2% active ingredient

solution is recommended. Always read and follow the label for the specific product that is being used.

Other herbicides that combine 2, 4-D with other triclopyr (tradename Crossbow) or clopyralid (tradename Curtail) may also be effective for control of purple rocket. For Crossbow, use a 0.5% active ingredient solution. For Curtail, use a 0.2% active ingredient solution.

Triclopyr is a broadleaf specific herbicide that may effectively control purple rocket without harming monocot species. Triclopyr is available under the trade names Garlon 3A or Tahoe 3A. For Garlon 3A or Tahoe 3A, a 0.7% active ingredient solution should be effective. The addition of 0.5% (2/3 ounce per gallon) of a nonionic surfactant is needed for Garlon 3A. Triclopyr is also commercially available through herbicides such as Ortho Brush-B-Gon Poison Ivy Killer concentrate. These formulations generally contain lower concentrations of herbicide and are therefore less expensive for small projects. If using Brush-B-Gon, 1.5% active ingredient solution.

Care should be taken to avoid contacting non-target plants. **Do not spray so heavily that herbicide drips off the target species.** The herbicide should be applied while backing away from the area to avoid walking through wet herbicide. By law, herbicides may only be applied as per label instructions and by licensed herbicide applicators or operators when working on public properties.

RECOMMENDED PRACTICES ON BUFFER AND SEVERELY DISTURBED SITES

Same as above with additional recommendations as noted below.

The recommendations for high quality natural areas also apply to buffer of severely disturbed areas. Additionally, glyphosate, a non-selective, broad spectrum herbicide available under a variety of trade names by be used. A 0.6% active ingredient solution should be effective.

BIOLOGICAL CONTROL AGENTS

Ceutorhynchus inaffectatus Gyllenhal (Coleoptera: Curculionidae: Ceutorhynchinae) is a monophagous species that feeds only on *Hesperis matronalis* L. in northwestern Europe and may offer some hope as a future biocontrol agent. Purple rocket is also a susceptible host to the turnip mosaic virus and a number of others.

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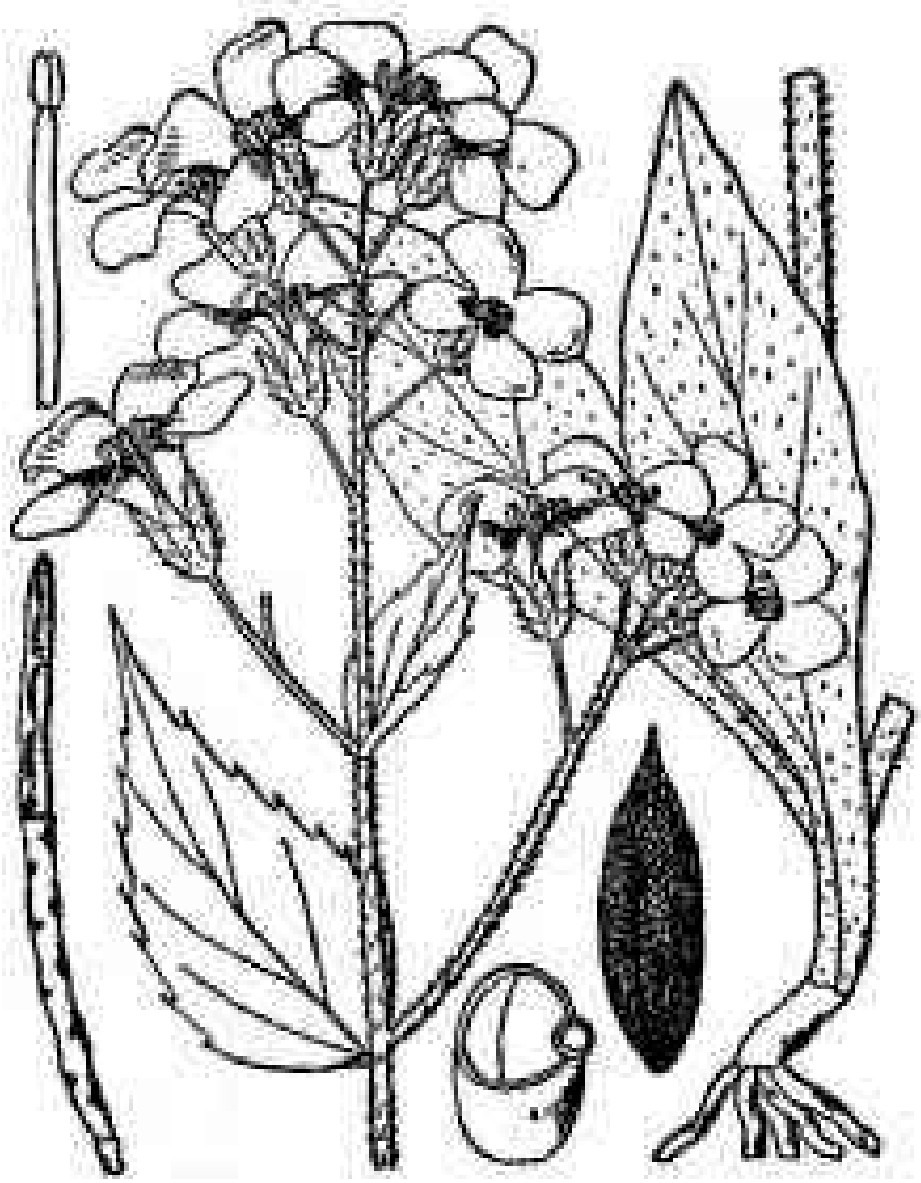

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