Hill Mustard, an invasive mustard on the move in Southwestern Wisconsin

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Introduction: Hill mustard **(***Bunias orientalis* L.**)** is a non-native, invasive weed found only in a few locations in Wisconsin. This plant was first documented in Wisconsin in 1958, but recently has been spreading rapidly throughout the southwestern part of the state. It inhabits a wide range of habitats, but is typically found in CRP fields, along roadsides, and in other minimally disturbed areas. Once established this plant forms a monoculture of hill mustard plants. It is also called Turkish rocket, Turkish warty-cabbage, warty cabbage, and warted bunias.

Origin and Distribution: Hill mustard is native to southern Europe, but has invaded most European countries. Within the United States it is present within several northeastern states including Virginia, Michigan, and Wisconsin. The University of Wisconsin-Madison Herbarium documented the original infestation in Green County west of the intersection of Co. Highway N and Buehler Road (north of Monroe approximately 3 miles). An inspection of all roads in the vicinity of this site in 2005 found than most hill mustard infestations are within 5 miles of the site of its original appearance. Recently additional infestations were found in Lafayette County, indicating its ability to spread long distances. Further monitoring is needed to determine if hill mustard is present in other counties and to further pinpoint known infestations in these two counties.

Identification

<u>*Leaves*</u> on mature plants can be 12 or more inches long (basal leaves) and become progressively smaller up the stem. Leaves are lanceolate, highly lobed with sharp points.

<u>*Stems*</u> are erect, 10 to 45 inches tall and are branched in the upper region as flowering begins. A key characteristic of hill mustard is the "warty bumps" (tubercules) on the stems which are easily felt by running your finger over the stem surface. Leaves may also have tubercules and these structures give rise to the name "warty cabbage." Both leaves and stems are somewhat hairy.

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Flowers have bright yellow petals, and are very fragrant and are borne on dense racemes.

Fruits are ovate, irregularly warty, 0.25 to 0.4 inches long, contain 2 to 4 seeds, and are borne on stalks about 0.5 inch long.

Taproots on older plants are at least 1 inch in diameter and appear in clusters of multiple thick roots. The central part of the root is often partially rotted away

Seedlings have long to oval cotyledons up to 1 inch long. The first true leaves are round to ovate and entire. Subsequent leaves on seedling plants are arranged in a rosette, are slightly toothed, become very long and have a rough feel and prominent veins.

Similar species: Hill mustard resembles yellow rocket but is easily distinguished by its leaf shape, stem texture, height and fruits. Leaves of yellow rocket do not have pointed lobes and are hairless unlike hill mustard which has toothed and hairy leaves. Yellow rocket stems never have the warty bumps found on hill mustard. Additionally, yellow rocket tends to be shorter and flower before hill mustard. The fruits of the two species are also quite distinct with yellow rocket forming a narrow pod with many very small seeds while hill mustard has tear-shaped pods with few seeds.

Biology: Hill Mustard is described as having either a biennial or perennial life cycle, but observations in Wisconsin suggest most plants behave as perennials. This plant is considered an aggressive invader in Central Europe (Steinlein et al., 1996). Researchers in this region believe its successfulness is due to its ability to establish rapidly and displace desired native species (Dietz et al., 1996). Adult plants can survive for many years, but populations appear to spread from seed as young seedlings are observed the following year along the leading edge of the infestation near parent plants (Dietz, 2002).

Control: Few methods on managing this plant have been tested. Mechanical methods are effective at preventing seed production if plants are mowed before seeds are produced. As soon as yellow flowers are seen, plants must be cut to prevent seed production. Additional mowing should be done if plants resprout and flower later in the summer. We do not know if repeated mowing will kill established plants but mowing will prevent the introduction of additional propagules to enhance spread of this species.

Tillage can dislodge the roots of hill mustard from the soil. No information is available as to how effective tillage alone is at managing this plant, but observations indicate that additional management methods will be required to effectively control this species. Establishment of

desired vegetation after tillage is essential as hill mustard plants maintain a large seed bank from which plants can establish. It is expected that desirable vegetation that is appropriate for the area will compete with hill mustard and reduce its dominance.

Herbicides are currently being evaluated on hill mustard populations within Wisconsin. Preliminary results suggest that this plant is sensitive to glyphosate, 2,4-D and metsulfuron, but more information about long-term control is required. Due to the large seedbank any management practices should include the establishment of desirable plants that will allow for selective management of this plant for several years.

References

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