HILL MUSTARD (*BUNIAS ORIENTALIS*): ON THE MOVE IN WISCONSIN. Jerry D. Doll, Weed Scientist Emeritus, Univ. of Wisconsin, Department of Agronomy, Madison, WI 53706.

Hill mustard originated in southern Europe and is already present in most northeastern states, Virginia, Ohio and Michigan. The presence of hill mustard in Green Co. Wisconsin was documented in 1958. The original Wisconsin site is about four miles north of the county seat, Monroe, WI and the population apparently spread very slowly for many years. The first call we received regarding hill mustard as a plant of concern came from a crop consultant in 2002 who noticed a dense population of yellow flowering plants in a CRP site that spring. He sent us plant samples and the University of Wisconsin Herbarium confirmed our identification that the plant was hill mustard. Others reported a "new yellow-flowered weed" in the same vicinity in 2003 and 2004. The county agricultural Extension agent identified the land owner of the original site. We visited this site in 2004 and established an initial herbicide demonstration trial that included three modes of action: a growth regulator, an ALS inhibitor and a photosynthesis inhibitor. The results suggest that growth regulators and ALS inhibitors need to be tested further to determine the optimal time and rate of application.

The intriguing aspect of hill mustard in Wisconsin is that the infested area is very small, perhaps no more than 100 acres, and yet its potential to spread is in the moderate to high range. If we had a functional noxious weed program, this species would seem to be an ideal "prohibited" weed. In the absence of an effective program, we tried to document the distribution of hill mustard in Green Co. by driving all the roads within the area of the original infestation. The results were both encouraging and surprising. Encouraging because most of the infestations were within three miles of the epicenter, and the most distant populations in Green Co. were approximately five miles from the original site. And these observations were also discouraging because clearly the weed had invaded new sites and no one was taking action to prevent further spread. Further evidence of the weed's spread occurred a few days later when several hill mustard populations were detected in Lafayette Co. (adjacent to Green Co. to the west); some of these included hill mustard in no-till soybean fields. Previously infestations were only noted in non-disturbed sites such as roadsides, CRP fields and waterways. The Lafayette Co. infestation are 20 to 25 miles from the epicenter in Green Co.

Most of the literature on hill mustard is from Europe where this species is considered highly invasive. If this is the case in the region of origin, we should give due attention to its threat to become an aggressive invader in North America. The epicenter gives us a preview of what can happen if no action is taken.

Since 1958, when first detected, areas of the original site are now 100% hill mustard. The species is a perennial with a huge but non-spreading taproots so it achieved this dominance via prolific seed production, numerous seedlings in open areas, a very large rosette leaf area (rosettes nearly 1 meter in diameter have been observed), aggressive early season growth, and perhaps allelopathy. Mature plants are highly aromatic. Another common name for this species is Turkish warty cabbage. Turkish for its region of origin, warty for the tubercles found on the stems (and perhaps the leaves), and cabbage for the strong cabbage smell emitted when stems or leaves are crushed. Whether these aromatic compounds (or others) in hill mustard are inhibitory to other species should be investigated.

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Hill mustard is described as a biennial or perennial. In Wisconsin, it seems to behave as a perennial. Plants flower once in late spring (about 10 to 14 days later than yellow rocket) and flowers produce a highly aromatic nectar and plants are prolific seed producers. Many fruits remain on plants until the end of summer. Thus mowing after viable seeds are formed seems to be the primary threat of spreading hill mustard to new sites. Seedlings of hill mustard can form a complete ground cover in open areas.

Much can be done to contain and hopefully eliminated many of our hill mustard infestations. Educational opportunities include preparing and disseminating printed material on hill mustard biology and management, working with local highway departments to prevent further spread of hill mustard, and encouraging early detection of infestations via the Wisconsin "Weed Watcher" program. Research opportunities are abundant. We need information on 1) seed biology (dormancy and germination; seed production; seed bank dynamics); 2) how to convert of dense infestations into desired vegetation (method of control, the role of soil tillage in rejuvenating infested sites, species to reintroduce), 3)practical management programs that roadside managers, farmers and others can adopt; and 4) ecological studies to determine how it spread and dominates other species and to understand its habitat range.

On the regulatory front, hill mustard in Wisconsin could be the poster child of how to address the appearance of a relatively new invader. Before implementing any of these ideas, a hill mustard assessment and planning session is needed so that the interests and concerns of land owners, highway departments, Departments of Natural Resources and Agriculture, University Extension, private environmental groups (The Nature Conservancy, Prairie Enthusiasts) and the Invasive Plants Association of Wisconsin are included. A multi-state or regional effort would be even more beneficial. Perhaps that could be done at our next NCWSS meeting.

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