INVASIVE WEEDS IN WISCONSIN: AN APPROACH TO THEIR MANAGEMENT

Jerry D. Doll[1]

Invasive weeds continue receiving attention at local, state, national and international levels. The interconnected world we live in means that people, animals and goods often travel great distances. Whether introduced from a neighboring farm, in feed from another county, with nursery stock from another state, or by international commerce, weeds move from site to site. Some become invasive in agricultural settings, natural areas or other habitats.

One way to stem the tide of new introductions would be with an effective noxious weed program. Several years ago steps were initiate to reinvent Wisconsin's noxious weed law. Kelly Kearns and I spoke at this meeting in 2000 regarding the plan of action to navigate it through the legislative maze. The Noxious Weed Technical Advisory Committee has met numerous times and held several public listening gatherings. The document to create a new noxious weed program was sent to the Legislative Reference Bureau to be translated into legislative language. The Advisory Committee reviewed the first draft if the translation in early 2003 but the state's budget problems overwhelmed the legislative agenda and no further progress has occurred. Effectively the new noxious weed program is dormant but not dead. All parties remain committed to see it enter the legislative process and be approved and funded. (See the Proceedings of the 2000 Fertilizer, AgLime and Pest Management Conference for the basics of the new program which have not changed.)

In the absence of a new program, what can be done? Things are already happening in circles mostly outside of agriculture. The best example at the state level would be the Invasive Plants Association of Wisconsin, IPAW. Created in 2001, it has an active cadre of people who are working to organize, motivate and educate people and to coordinate activities related to invasive plants. Full information on IPAW and its activities is found on their web site: www.ipaw.org. Some may be familiar with IPAW's list of invasive species. While of no legal status, the list has generated concern in agricultural circles because some species used in agriculture are on the list. If and when an official list of invasive plants is developed in Wisconsin, we need to be sure agricultural interests are represented. Current involvement in the Noxious Weed Technical Committee and IPAW board of directors ensures that our interests will be expressed.

Overall Approach to Invasive Plants

I will not debate which species should be considered invasive here, nor will I attempt to present management strategies for many species. I will describe an overall approach regarding invasive plant management and then give some examples of how to control specific plants. I will discuss

---

[1] Extension Weed Scientist, Department of Agronomy, University of Wisconsin, 1575 Linden Dr., Madison, WI 53706

the following points:

- Know your enemy
- Be alert for new invaders
- Search for existing information
- Take action sooner rather than later
- Iinvite/encourage others to join the effort
- Document where, what, when, and who

Know your enemy. It's perhaps easy to think we know what to be on the lookout for. We all know garlic mustard, buckthorn and purple loosestrife are invasive and of concern in Wisconsin. But what invaders do Iowa, Minnesota, Michigan and Illinois have that we might need to watch for? One answer to this question is the "Weed Watch" flyer published in 2003 that highlights 16 species that are problematic and increasing in some north central states but not others - yet. Many of us are not familiar with the weeds on the flyer and those are exactly the species to learn about. The bulletin of weeds in no-till systems produced in Missouri (Fischel et al. 2000) also alerts us to invasive weeds others are finding that may migrate this way by natural or human actions.

Be alert for new invaders. Many of us in agriculture travel the roads, walk the fields, hike the trails and hunt in the woods, marshes and grasslands. Any time we're on the move, we can have our "antennas" out for new plants. This requires that you know many of the already present plants so that you know when new species appear or that previously known species are now in new locations. But don't let this deter you from being a full time scout for new infestations of invasive plants.

You can also take note of what is already in parts of Wisconsin but not throughout the state. For example, traveling to last year's Farm Technology Days in Shawano County took us on many state and county roads in the county. Only a few areas with wild parsnip were observed. What an opportunity to take action before wild parsnip becomes as prevalent in this area as it already is in many counties in southwestern Wisconsin.

What should you do once new infestations are found? In the absence of an official recording mechanism, as a minimum, make a written record of what was observed and where the infestation is found. A crop consultant in Green Co. was instrumental in finding, noting the location and obtaining the identification of Hill mustard (also known as Turkish warty cabbage), a very aggressive and so far rare perennial mustard. The University of Wisconsin Herbarium identified the specimen and wanted to know the exact location as this was one of the few locations know with this weed in Wisconsin.

The location of a plant may be a new discovery to us, but is it really new in Wisconsin? The Herbaria at both the UW Madison (www.botany.wisc.edu/wisflora/) and the UW Stevens Point (www.wisplants.uwsp.edu/) have excellent web sites with information regarding the presence and distribution on 1000s of vascular plants in Wisconsin. These sites and the USDA Plants Database site (http://plants.usda.gov/) will provide excellent information on the known distribution of plants in general and invasive plants in particular. If you find a plant not listed in these databases or in only a few locations, sound the alert and let the managers of these sites know of your observation.

Notifying Dept. of Natural Resources or Agriculture personnel may also be helpful.

Search for existing information. The internet is a tremendous resource for finding information on invasive plants. I was asked by someone for help in controlling black swallowwort (also known as dog strangler vine) in a city park. I knew nothing from personal experience nor literature that I have on invasive plants. An internet search took me to The Nature Conservancy site with very helpful information on how triclopyr (Garlon) can be used to control black swallowwort. The Nature Conservancy is heavily involved in invasive species issues at the state, national and international levels and takes a sound, holistic approach to dealing with them. Their web site (http://tncweeds.ucdavis.edu/) is one you may want to make note. And locally, IPAW is developing educational materials to put on their web site.

Take action sooner rather than later. This is an obvious and important step in dealing with invasive plants. And yet, how many who planted multiflora rose knew that plants were appearing in new and unwelcomed sites but controlled neither the original plantings nor the invading populations? Why are control measures so seldom taken promptly? A lack of someone to initiate an action program is the probable answer. A statewide system to assess problems, educate land owners and recommend action would be part of the new noxious weed program and would be an important element to promote effective action once invasiveness has been documented.

Invite/encourage others to join the effort. This is becoming easier all the time. Organizations like IPAW are serving a valuable role in linking groups interested in invasive plants. Their biennial conferences (held in 2001 and 2003) are an excellent example of bringing all the relevant parties to the table. In some counties, the USDA is using EQIP (Environmental Quality Incentives Program) funds in the battle against multiflora rose and buckthorn. Land owners must prepare a three-year action plan to receive partial financial support to implement the plan. We need encourage this approach in more counties.

Our Department of Natural resources is very active in the invasive species arena and is a logical starting point for invasive plants in non-agricultural settings. Those near Ft. McCoy are probably aware that the Department of Defense has a biologist at the 60,000-acre facility with a team of people both within the Fort and in the community involved with invasive plants on military land and in the surrounding communities. This is commendable and should be encouraged on other state and federal land holdings.

The Department of Transportation is concerned about invasive plants and willing to help where possible with control measures but we have a long way to go to have town, county and state highway departments educated and motivated on invasive plant issues. Of course budgets for vegetation management along roadways are an issue. Perhaps we could work with the DOT to develop a program to "Adopt a Patch" of invasive weeds similar to the highway cleanup "Adopt a Highway" program that has been so successful in providing an excellent service built on volunteer efforts. I can envision similar efforts of dealing with invasive weeds being welcomed by the town

boards who appoint weed commissioners as part of the existing noxious weed law.

Document where, what, when and who for many years. If there was ever a fit for GPS and weed management it is in the battle with invasive plants. Infestations often occur in small areas and keeping track of them is less than simple unless the locations are documented with GPS coordinates or other precise records. Keeping records of what was done is essential so that results can be interpreted based on the measures taken. The data collected should include when actions were taken and who did them. IPAW could serve as a collection point for such observations. A group within the state to track this information on a species by species basis would provide an excellent service to the state.

Examples of Invasive Weed Control

The examples presented will suffice to illustrate the principles and practices that will most likely be appropriate for many other species. I will give examples based on plant life cycles as this drives the basic decisions in many cases.

Winter annual species. Without a doubt garlic mustard is our most invasive winter annual species. Its appearance in numerous habitats and locations in the last 10 to 15 years is indeed alarming and the weed is receiving due attention.

Michigan State University has a very complete web site on garlic mustard: www.ipm.msu.edu/garlicmustard.htm. Information on its biology, identification, management and control is presented. The site gives this information regarding how garlic mustard arrived here and is an example of the kind of information available on the internet.

"Garlic mustard may have been brought to North America for use as a cooking herb, although it is also possible that seeds were accidentally introduced from Europe. The first record of garlic mustard in the United States is from Long Island, NY, in 1868. Since then, humans and animals have spread it across North America. By 1991 it was found growing in 30 U.S. states and three Canadian provinces. Garlic mustard produces large numbers of seeds that can be transported by humans on boots, clothing, hair, by mowing, in automobiles and trains. Birds, rodents and whitetail deer are likely seed dispersers in woodland habitats." (From MSU web site, Jan. 2004)

Typical of plants in the mustard family, garlic mustard is a cool season plant and continues growing on snow-free days when temperatures are above freezing. This provides an opportunity for selective treatment of garlic mustard if applications are made when other plants have not yet appeared (spring) or have died for the year (late fall). Most seem to use glyphosate to control of garlic mustard seedlings and rosettes. Treat when plants are actively growing and this can be in very early spring (March-April) or very late fall (some years into mid or late November). At these times few if any other plants beside garlic mustard are actively growing and thus are not affected by the glyphosate application. When temperatures are warmer, 2,4-D can also be used to control

garlic mustard. Fall applications are likely to give more consistent results.

Winter annuals to watch for in agricultural settings are described in the bulletin, "Early Spring Weeds of No-Till Crop Production" (Fischel et al. 2000). Of particular concern are purple deadnettle, henbit, an array of chickweeds, bedstraw, prickly lettuce and buttercups. Early detection and timely application with appropriate fall of spring herbicide treatments will prevent serious problems with these and other winter annuals.

Biennial species. New biennial weeds of concern include teasel (common and cutleaf) and older biennial invasives that do not have statewide distribution such as wild parsnip and musk thistle. Many of the plants of concern in the initial years of prairie and CRP plantings and in non-disturbed sites in general are biennials.

The formula of how to succeed with biennial weed control is very simple: prevent seed production. The window for doing this from the perspective of the plant's life cycle is very long: from the time seedlings are present through the end of the first year's growth and development and until flowering starts in the second year. Control can be accomplished mechanically by removing individual plants in the rosette, bolting or very early flowering stage to a 1- to 2-inch depth below the crown of the plant. A shovel or heavy hoe will do the job or you can inquire about and obtain a "Parsnip Predator" from the Prairie Enthusiasts' organization (www.theprairieenthusiasts.org/). This light weight tool can be used to dislodge any biennial plant from the soil.

I am amazed at how little attention, recommendation and use fall applied 2,4-D receives for biennial plant management. It is safe to all grasses and most taller, non-treated vegetation (trees and shrubs) and very economical. Personal experience has documented that 2,4-D works just as well on teasel and wild parsnip along roadsides as it does on musk and plumeless thistles in pastures. And it will also do the job on burdock and wild carrot. It is more selective than glyphosate and more economical than any other growth regulator herbicide.

Perennial species. Common herbaceous perennials of concern are leafy spurge and Canada thistle. Much has been done, written and promoted on Canada thistle management and clopyralid is gaining back some of the infested areas. Such is not the case with leafy spurge and we continue to loose ground to this invasive exotic perennial. An example of how to find, map and manage leafy spurge before the infestations are too serious is what is being done in Adams County. Here's a slightly abridged description of the action taken by the Department of Natural Resources biologist Jim Keir in that area. It exemplifies many of the steps I outlined in how to approach invasive weed management.

> "Plateau was applied to all known sites with leafy spurge along state highway ROW's in Adams County on September 24, 2003. Mapping (location) of sites occurred in 2002 and 2003 by WDOT and WDNR personnel and all sites located were cut/mowed in early July, 2003 to prevent seed set this year. These sites (all were small) were found along state highways 13, 21 and 82. No sites were located along state highways 23 or 73 in Adams County. Plateau was applied by two WDNR Wildlife Management personnel using Solo backpack sprayers. The

herbicide was applied at a rate of approximately 10-12 ounces per acre to 25 sites ranging in size from a few plants and a few square feet to approximately ½ acre. The herbicide was applied in combination with methylated seed oil.

The application required one full day. The cost for materials is estimated to be less than $200 and will be forwarded to WDOT for payment. The remainder of the cost for treatment is in salaries (two people) and mileage (less than 150 miles), both paid for by WDNR.

Plateau is the current herbicide of choice for control of leafy spurge. These sites will be monitored in 2004 to assess impact. Additional sites may well be located." (J. Kier, personal communication, 2003.)

Another category of invasive perennial plants of concern are the woody species such as buckthorns, multiflora rose and honeysuckles. Because they are woody, taller than most other invasive plants, and often in rugged terrain, hand cutting and foliar herbicide applications with backpack sprayers and even mowing with tractors can be intimidating. Too often attention is delayed until infestations are less than simple to attack. Here again the simple approaches seem to be unknown by many. Cut surface application of several products will control nearly all woody species. This is not practical with multiflora rose nor prickly ash but can be done with most other woody plants. While glyphosate can be mixed with water (50:50 ratio) for cut surface application to many woody species, Garlon or Crossbow can be mixed with diesel fuel or purchased in ready-to-use formulations and gives excellent results on most woody plants.

References

Annon. 2002. Weeds to Watch. Iowa State Univ., Ames, IA. IPM flyer 72. 2 p.

Fischel, F., W. Johnson and D. Peterson. 2000. Early Spring Weeds of No-Till Crop Production. Univ. of Missouri Ext. and Ag Information. North Central Regional Extension Publication NCR 614. 24 p.