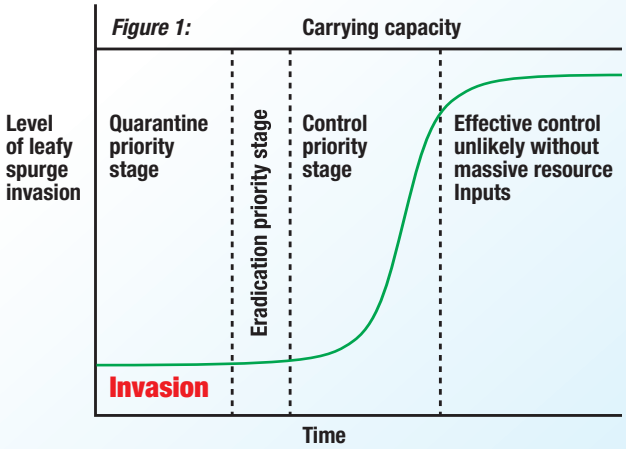
Mapping and Monitoring the Spread of Leafy Spurge

Leafy spurge is a noxious perennial weed that has rapidly spread across much of North America, especially throughout the pastures, hay lands, roads, railways, gravel pits and watersheds of the Prairie Provinces and neighboring states in the US. In 2010, there were approximately 1.3 million acres of pastures, hay lands, roads and railways infested with leafy spurge in Manitoba.

Land managers use a variety of control methods for leafy spurge including biocontrol, chemical control, and grazing. The effectiveness of these controls depends on the distribution of the spurge and the density of the infestation. As shown in Figure 1, the optimal time to control spurge is when the plant is newly introduced. If there are only a few plants the priorities are to quarantine and eradication of the plants. As the level of spurge increases, quarantine and eradication are no longer realistic options. Other control measures such as chemical control or grazing by sheep or goats are needed. Over time, and if no control methods have been used, eradication is no longer possible. The spurge can only be controlled with massive and expensive resource inputs.



Prevention and Early Detection

Prevention and early detection of leafy spurge at its earliest stages of infestation are the most economical means of managing infestations. Prevention helps stop the spread of leafy spurge by ensuring that weed seeds or vegetative reproductive plant parts are not introduced into an area. For example, leafy spurge is spread through contaminated forage, gravel, movement of dirty equipment such as mowers and haying equipment. Early detection is aimed at eradication and control at the earliest stages of infestation. One of the challenges of early detection is the availability of current and accurate knowledge of the distribution of leafy spurge. Mapping and monitoring the spread of leafy spurge is the most efficient method of early detection.

Importance of Mapping and Monitoring Leafy Spurge

The primary objective of mapping leafy spurge is to accurately identify land with infestations of leafy spurge. Monitoring is used to track the level of infestation over time and to evaluate the effectiveness of control methods. This information helps land managers predict areas that are potentially subject to the invasion of leafy spurge and determine how the spurge spreads. Mapping and monitoring are also used to develop weed management plans, assess the economic impact and increase public awareness.

How to Develop a Leafy Spurge Mapping and Monitoring System

The foundation of a mapping and monitoring system for leafy spurge is the consistent and standardized collection of information about the distribution and severity of the infestation. Mapping of spurge can be hand-drawn or based on GPS information. Maps are part of weed survey forms that are used to monitor the spurge population each year. A standardized survey is necessary to provide consistent and reliable information that can be compared from year to year and shared with others.

The level of detail of the weed survey is determined by the time constraints, the terrain to be mapped and monitored, and the objectives of the land manager. The main consideration is to consistently use the same standardized survey and mapping system each year.

Mapping Procedures

Mapping procedures follow a set of standards that include acreage symbols and density codes. They can be created by hand-drawing infestation boundaries on base maps or by collecting location coordinates using Global Positioning System (GPS) technology. In spite of the method used the standards for mapping should be used consistently year after year.

Certain features should be common to all leafy spurge maps. These include the topographic features such as wetlands and man-made features such as roads, gravel pits, drainage ditches, power lines and railways. Jurisdictional boundaries such as conservation areas and recreational areas should also be marked. They also include an estimate of the acreage infested by spurge.

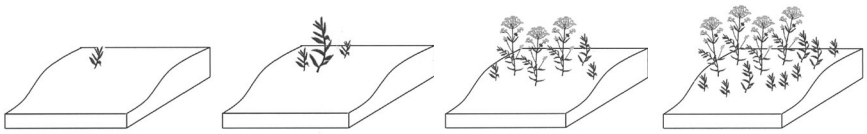
One of the most important considerations for mapping is to be realistic about what can be accomplished based on available resources and terrain and time constraints. Aerial photos, topographic maps and historical spurge data will help identify which areas have the highest priority for mapping and monitoring.

Monitoring Information

Monitoring information also includes information about the density of the infestation. Two of the major uses of the density of spurge cover are to (1) determine the loss in grazing capacity of pastures and (2) prioritize control methods. The density of spurge is determined by estimating the cover of the spurge plants in a particular area. The cover is given as an estimated percentage. Figure 2 illustrates the density of spurge that has been determined to be the most suitable for Manitoba.

Figure 2:

Reproduced from the 2010 Economic Impact Assessment of Leafy Spurge prepared by K. Rempel and D. Eberts, Rural Development Institute, Brandon University.



T = (Trace; rare): between 1 and 10% cover

L = (Low; occasional plants): between 11 and 30% cover

M = (Moderate; scattered plants): between 31 and 60% cover

H = (High; fairly dense): between 61 and 100% cover

Helpful Hints for Mapping and Monitoring

- Mapping and monitoring systems must be simple, easy to collect and meet local needs.
- Determine the level of mapping and monitoring needs by establishing spurge management goals and objectives.
- Set realistic goals for the mapping and monitoring based on funding, time and terrain.
- Carry out the inventory when leafy spurge is most visible.
- Keep mapping and monitoring methods simple and the areas well-defined.
- Include mapping and monitoring as part of the yearly work plan.
- Complete details of the leafy spurge survey during the off-season.
- Keep the information in a central place and share it freely with others.

Prairie Region Invasive Plant Species (PRIPS) Data Base

The Invasive Species Council of Manitoba (ISCM) manages the comprehensive invasive species database and inventory website known as the Prairie Region Invasive Plant Species Data Base (PRIPS). This on-line database operates in the same way as the mapping and inventory procedures described above. The database also includes options to map and inventory a wide variety of invasive species including leafy spurge. Individuals and rural municipalities or regions are encouraged to use the site for data entry and planning purposes. Access to the PRIPS database is through the ISCM website and they would welcome your participation.

Resources

- Leafy Spurge Stakeholders Group: www.leafyspurgemb.ca
- Invasive Species Council of Manitoba: www.invasivespeciesmanitoba.com

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