



RURAL
DEVELOPMENT
INSTITUTE

LEAFY SPURGE RANGELAND CONTROL AND MANAGEMENT

FINAL REPORT

March 2009



**BRANDON
UNIVERSITY**

Founded 1899





Leafy Spurge Stakeholders Group

The Leafy Spurge Stakeholders Group (LSSG), a broad coalition of agricultural and conservation groups and all three levels of government, was formed in the fall of 1998 to examine the issues and impacts of leafy spurge. The long-term goals of the LSSG are:

1. to design a process whereby an integrated and comprehensive approach to a province-style strategy can be effectively and efficiently implemented. It is hoped that the RDI / LSSG partnership will result in the establishment of a centre of excellence for leafy spurge issues and research in the Province of Manitoba; and
2. to design a strategy or strategies to reduce levels of leafy spurge infestation in those areas of the province most severely affected.

Rural Development Institute, Brandon University

Brandon University established the Rural Development Institute in 1989 as an academic research centre and a leading source of information on issues affecting rural communities in Western Canada and elsewhere.



RDI functions as a not-for-profit research and development organization designed to promote, facilitate, coordinate, initiate and conduct multi-disciplinary academic and applied research on rural issues. The Institute provides an interface between academic research efforts and the community by acting as a conduit of rural research information and by facilitating community involvement in rural development. RDI projects are characterized by cooperative and collaborative efforts of multi-stakeholders.

The Institute has diverse research affiliations, and multiple community and government linkages related to its rural development mandate. RDI disseminates information to a variety of constituents and stakeholders and makes research information and results widely available to the public either in printed form or by means of public lectures, seminars, workshops and conferences.

For more information, please visit www.brandonu.ca/rdi.

**LEAFY SPURGE RANGELAND
CONTROL AND MANAGEMENT
FINAL REPORT**

Submitted to:

Stan McFarlane
Prairie Farm Rehabilitation Administration
Agriculture and Agri-Food Canada
Bag 2000, 4 – 31 First Street South
Beausejour, MB R0E 0C0

Prepared by:

Ryan Gibson, Research Affiliate
Lynn Ferguson, Research Intern

Submitted by:

Robert C. Annis, Director
Rural Development Institute
Brandon University
Brandon, MB R7A 6A9
(204) 571-8515
rdi@brandonu.ca

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Executive Summary

Leafy spurge (*Euphorbia esula* L.) is a threat to biodiversity in nature lands and agricultural lands, and costs Manitobans in excess of \$20 million per year. Listed on the World Conservation Union's list of 100 worst invasive species, it is estimated that 340,000 acres were infested in Manitoba in 1999. The goal of this project was to increase the adoption of beneficial management practices among producers, land managers, municipalities, and industry for the prevention and management of leafy spurge. The project was designed based on the 'Categories of Manitoba Priorities for Greencover Technical Assistance'.

The project set out to create/reproduce and distribute leafy spurge beneficial management practices knowledge among producers, land managers, municipalities, and industry. The materials focused on rangeland control and management of leafy spurge. The project broadcasted radio advertisements on leafy spurge beneficial management practices on a local radio station targeting producers, land managers, municipalities, and industry.

The project exceeded the anticipated outputs. Key achievements of the project include:

- 2,500 copies of *The Silent Invader: Leafy Spurge* fact sheet printed
- 1,000 copies of *Leafy Spurge and Grazing Cattle* fact sheet printed
- 344 fifteen second radio advertisements ran on radio stations based in Brandon and Altona.
- 11 events and workshops were attended and leafy spurge materials distributed
- 3 news articles circulated (Manitoba Conservation Magazine, Rural Report Newsletter, and Cattle Country Newspaper)
- 2 leafy spurge educational display banners focusing on identification and control methods
- 1 invited presentation on early detection and rapid response of noxious weeds, in conjunction with the Invasive Plants Council of Manitoba
- a variety of leafy spurge materials delivered to high school students in central Manitoba and Assiniboine Community College Agribusiness students

Over the duration of the project, the Leafy Spurge Stakeholders Group observed three key lessons: the need for education and awareness of leafy spurge, the need for multiple approaches to disseminating information, and the need for a multi-stakeholder approach to leafy spurge education and awareness.

Awareness and education on leafy spurge identification, prevention, control, and management is still required. Due to the amount of interest in leafy spurge information and material at tradeshow and events, it is evident that leafy spurge will continue to be a major issue in the foreseeable future. As more people become aware of the threat leafy spurge poses to the biodiversity of nature and pastureland, there will be a greater effort to control the noxious weed.

Multiple approaches to disseminating best management practices are required (radio, in-person workshops/conferences, print materials, online). The benefit of multiple approaches is the larger and more diverse audience that can be reached.

A multi-stakeholder approach is required for leafy spurge education and awareness. Continued funding will ensure that leafy spurge education and awareness remains a priority, that new integrated pest management strategies can be developed to control leafy spurge, and that timely and informative material can be created

The Leafy Spurge Stakeholders Group is a diverse association of public, private and nonprofit agencies involved in increasing awareness of the problem of leafy spurge and in promoting the benefits of integrated pest management. The Rural Development Institute, Brandon University coordinates the Leafy Spurge Stakeholders Group and provides infrastructure and administrative support.

Introduction

Leafy spurge (*Euphorbia esula* L.) is a threat to biodiversity in nature lands and agricultural lands, and costs Manitobans in excess of \$20 million per year¹. Listed on the World Conservation Union's list of 100 worst invasive species², it is estimated that 340,000 acres were infested in Manitoba in 1999.

The goal of this project was to increase the adoption of best management practices among producers, land managers, municipalities, and industry. The project was designed based on the 'Categories of Manitoba Priorities for Greencover Technical Assistance'. The specific objectives of the project were:

- to provide producers, land managers, municipalities, and industry with information on best management practices of leafy spurge to increase rangeland conditions;
- to increase the awareness of leafy spurge among producers, land managers, municipalities, and industry; and
- to facilitate knowledge transfer from researchers and practitioners to producers, land managers, municipalities, and industry.

The project set out to create/reproduce and distribute leafy spurge beneficial management practices knowledge among producers, land managers, municipalities, and industry. The materials focused on rangeland control and management of leafy spurge.

Review of Project Activities

Overall, the project exceeded anticipated outputs.

Unfortunately, the field tour did not occur as anticipated. Efforts for the field tour were hampered primarily by weather and the unexpected discontinuation of a leafy spurge demonstration/field site. Based on discussions with the Project Officer, the funds allocated for the field tour were re-allocated to increase the circulation of best management practices for leafy spurge at seminal agricultural events and the creation of two leafy spurge banners focusing on identification and best management practices.

Activities of the project centred around the dissemination of best management practices to increase awareness and facilitate knowledge transfer. The following provides a description of all activities undertaken through the project.

Radio Ad Broadcasts

A total of 344 fifteen second radio advertisements ran on radio stations based in Brandon and Altona. Each advertisement highlighted a different best management practice for controlling leafy spurge. Due to the later than anticipated start of the project, the first radio advertisement was not utilized.

¹ Leafy Spurge Stakeholders Group (1999). *Leafy spurge impact assessment*. Brandon: Rural Development Institute, Brandon University.

² Lowes, S., Brownee, M., Boujelas, S., & De Poorter, M. (2000). *100 of the world's worst invasive alien species*. Auckland: World Conservation Union.

The two radio stations, CKLQ and CFAM, were selected based on geographical area/coverage of broadcast and the station's focus on agriculture. CKLQ broadcasts from Brandon, Manitoba and serves a trading area of over 180,000 people. CKLQ is the only AM station in western Manitoba, with coverage of approximately 100 miles in any direction. CFAM broadcasts from Altona, Manitoba and covers a large portion of Southern Manitoba. The area stretches from the Ontario/Manitoba border to Killarney. Golden West Radio network has a significant following due to its farm programming.

Each of the radio advertisements (wav. files) can be heard on the LSSG's website (www.brandonu.ca/rdi/leafyspurge.html). The script for each radio advertisement that aired in 2008 is listed below.

Radio Ad #2

Hi, I'm Teagan.-Is Leafy Spurge a problem? Mowing can be a good way to control your spurge from May to mid-July. Be careful to clean your equipment after you are done to prevent contamination of clean fields. This message has been brought to you by the Leafy Spurge Stakeholders Group.

Radio Ad #3

Hi, it's Teagan reminding you about controlling your spurge. You can graze sheep or goats with your cattle from April to September. Goats and sheep will eat the spurge allowing grass to grow for your cattle and horses. Contact your local weed supervisor or MAFRI for more information.

Radio Ad #4

Hi, it's Teagan. I like leafy spurge beetles. Late June to late July are the best times to release them. Beetles will take a bite out of your leafy spurge. Contact your local weed supervisor or MAFRI for more information.

Radio Ad #5

Hi, it's Teagan again, I am headed back to school. September long weekend is a good time to break out the herbicide and spray your leafy spurge. This message has been brought to you by the Leafy Spurge Stakeholders Group.

Fact Sheet Production

In total, 3,500 copies of the following fact sheets were printed.

The Silent Invader: Leafy Spurge

This fact sheet provides a thoroughly description of leafy spurge to assist in the identification and management of this invasive weed. Integrated Pest Management strategies (IPM) are outlined and include the topics of prevention, plant competition, physical control, biological control, grazing control, and chemical control strategies.

The fact sheet was re-produced with the permission of the Mixed Grass Prairie Stewardship Society. Appendix C contains a copy of the project fact sheet.

Leafy Spurge and Grazing Cattle

A fact sheet on training cattle to graze leafy spurge was developed and produced through this project. Training cattle to graze leafy spurge is a new concept in the Integrated Pest Management strategy. Cattle can be trained to eat leafy spurge within a couple of weeks with no negative consequences. Appendix D contains a copy of the project fact sheet.

Meetings, Conferences, Workshops

Leafy spurge best management practices on rangeland control and management information was disseminated at 11 key events in Manitoba. The Leafy Spurge Stakeholders Group employed a variety of methods to disseminate information to ensure effective use of funding, such as materials in conference packages, event booth, and sponsoring a keynote speaker. A list of the meetings, conferences, and workshops participated in are listed below with a brief description.

- Meeting with Invasive Plants Council of Manitoba
Portage la Prairie – September 26, 2008
- Leafy Spurge Stakeholders Group Meeting
Brandon – October 9, 2008

Multi-stakeholder meeting of representatives of conversation districts, Manitoba Cattle Producers Association, Association of Manitoba Municipalities, government, and industry to discuss the project activities.
- Invasive Plants Council of Manitoba’s Annual General Meeting
Portage la Prairie – November 21, 2008

Assisted in supporting two presentations by Randy Westbrooks on early detection and invasive species management (Portage la Prairie – November 20, 2008). The two presentations were attended by over 75 people from across Manitoba.
- Manitoba Grazing School
Brandon – November 25-26, 2008

Over 100 leafy spurge materials were distributed to producers and land managers.
- Manitoba Conservation District Conference
Brandon – December 2-4, 2008

Over 150 leafy spurge materials were distributed to producers, land managers, conversation organizations, and municipal representatives.
- Assiniboine Community College Agribusiness Students
Brandon – December 2008

Over 25 leafy spurge materials were distributed to Assiniboine Community College Agribusiness students as part of a noxious weeds class.
- Manitoba Cattle Producers Association Annual General Meeting
Brandon -December 10-11, 2008

- Meeting was attended by over 200 participants from across Manitoba. All participants received at least one piece of awareness or control methods information on leafy spurge.
- Manitoba Ag Days
Brandon – January 20-22, 2009
In partnership with the Manitoba Weed Supervisors Association leafy spurge materials were distributed to event participants.
- Manitoba Forage Symposium
Morris – February 18, 2009
A leafy spurge display was set up to provide information on identification, prevention, control and management.
- Riding Mountain Beef Seminar
Wasagaming – February 19, 2009
100 educational materials produced through the project were distributed to land managers, producers, and municipalities.
- Manitoba Weed Supervisors Association – Municipal Weed Control Meeting
Holland – March 18, 2009
Leafy spurge materials were distributed to interested members of the Manitoba Weed Supervisors Association.

Newsletters and News Articles

Four newsletter and newspaper articles were produced during the project.

- Manitoba Conservation Magazine
The magazine was distributed through the *Manitoba Co-operator* (12,500 copies) on November 27, 2008, and in early December, an additional 5,500 copies were distributed to conservation districts, Manitoba businesses, government departments, and rural municipalities. [Appendix A](#) contains a copy of the article.
- Rural Development Institute's *Rural Report*
The publication was released in March 2009. Over 500 printed copies of the publication were distributed throughout rural and northern Manitoba. In addition, the publication is also available online for free download. A copy of the article is available at www.brandonu.ca/rdi. [Appendix F](#) contains a copy of the article.
- Manitoba Cattle Producers Association's *Cattle Country*
An article encouraging leafy spurge rangeland best management practices was submitted to the *Cattle Country* for the April edition. The article encourages producers and land managers to develop a leafy spurge plan for the upcoming field season and highlights leafy spurge control methods. The inclusion of this article in the *Cattle Country* is at the discretion of the Manitoba Cattle Producers Association. [Appendix G](#) contains a copy of the article submitted.
- *Manitoba Co-operator* Newspaper Article – January 8, 2009

This article was written by Lorraine Stevenson and featured quotes from Wayne Digby, Chair of the LSSG and Ryan Gibson, co-ordinator of the LSSG. The topic is how the lack of consistently applied weed management plans contributes to leafy spurge problems. [Appendix H](#) contains a copy of the article.

Website Postings

Over the course of the project the following resources were posted to the LSSG and RDI websites:

- Early Detection and Rapid Response presentation by Randy Westbrooks
- Five radio advertisements
- The Silent Invader: Leafy Spurge fact sheet
- Leafy Spurge and Grazing Cattle fact sheet
- Leafy Spurge Rangeland Control and Management fact sheet

Summary

The project created/reproduced and distributed leafy spurge beneficial management practices knowledge among producers, land managers, municipalities, and industry. The materials focused on rangeland control and management of leafy spurge. The project broadcasted radio advertisements on leafy spurge beneficial management practices on a local radio station which targeted producers, land managers, municipalities, and industry. The table below outlines project activities/deliverables, anticipated outcomes, and actual outcomes.

Deliverable or Activity	Anticipated Outcome	Actual Outcome
Best management practices for leafy spurge radio advertisements	5 radio advertisements on one local radio for 3 months	4 radio advertisements on two radio stations (1 in southwest and 1 in south central Manitoba) for four months
Website postings	2 postings on the Leafy Spurge Stakeholders Group website	Over 10 postings to the Leafy Spurge Stakeholders Group website
Develop and re-print leafy spurge and rangeland materials	Print 3 materials with 500 copies of each (1,500 total)	Printed 2 materials (one new material and one re-printed) with 3,000 total copies
Presentations to meetings, conferences, workshops, events targeting producers/land managers	3 meetings	11 meetings Two educational display banners focused on best management practices printed
Field tour to promote leafy spurge control and management techniques in rangeland settings	1 field tour	0 field tours
Newsletter/new paper articles	2 articles	4 articles
Administrative reporting	4 quarterly reports 1 final report	4 quarterly reports 1 final report

Key Achievements of Project Activities

The key achievements of the project were:

- 2,000 copies of *The Silent Invader: Leafy Spurge* fact sheet printed
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- 344 fifteen second radio advertisements ran on radio stations based in Brandon and Altona.
- 11 events and workshops were attended and leafy spurge materials distributed
- 3 news articles circulated (Manitoba Conservation Magazine, Rural Report Newsletter, and Cattle Country Newspaper)
- 2 leafy spurge educational display banners focusing on best management practices for leafy spurge identification and control methods
- 1 invited/keynote presentation on early detection and rapid response of noxious weeds, in conjunction with the Invasive Plants Council of Manitoba

Lessons Learned

Over the duration of the project, the Leafy Spurge Stakeholders Group observed three key lessons: the need for education and awareness of leafy spurge, the need for multiple approaches to disseminating information, and the need for a multi-stakeholder approach to leafy spurge education and awareness.

Multiple approaches to disseminating best management practices are required (radio, in-person workshops/conferences, print materials, online). The benefit of multiple approaches is the larger and more diverse audience that can be reached.

Awareness and education on leafy spurge identification, prevention, control, and management is still required. Due to the amount of interest in leafy spurge information and material at tradeshow and events, it is evident that leafy spurge will continue to be a major issue in the foreseeable future. As more people become aware of the threat leafy spurge poses to the biodiversity of nature and pastureland, there will be a greater effort to control the noxious weed.

A multi-stakeholder approach is for leafy spurge education and awareness. Continued funding will ensure that leafy spurge education and awareness remains a priority, that new integrated pest management strategies can be developed to control leafy spurge, and that timely and informative material can be created

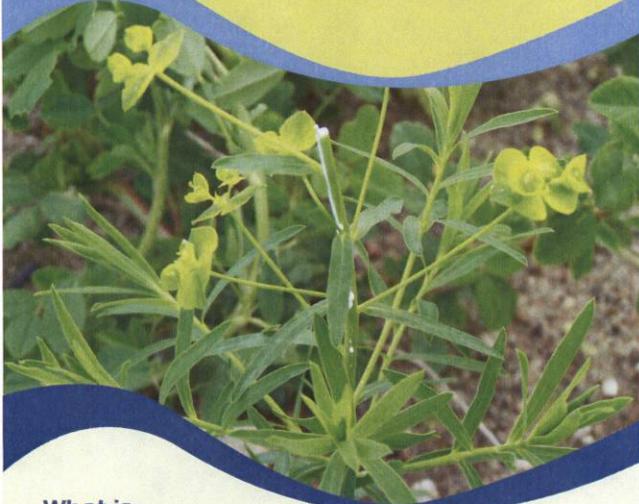
Appendices

Appendix A: Manitoba Conservation District Magazine

	<p>Conservation Magazine 2009</p>
<h3>Leafy Spurge Control</h3> <p>Across Manitoba, leafy spurge is a threat to biodiversity in nature lands and agricultural lands. The cost of leafy spurge infestations to Manitobans exceeds \$20 million per year.</p> <p>Leafy Spurge is listed on the World Conservation Union's list of 100 worst invasive species and it is estimated that over 340,000 acres were infested in Manitoba in 1999. Since 1999, the number of infested acres has continued to increase across Manitoba.</p> <p>Leafy spurge, a non-native species to North America, is a noxious perennial weed that has rapidly spread across much of North America. The plant is a long-lived and hardy plant. Quite distinctive during its blooming period, the vegetative form of leafy spurge is often overlooked, giving it time to establish. Each plant ranges in height from 16-32 inches and flowers in June-July. Seed dispersal occurs from late July to early August.</p> <p>Leafy spurge spreads rapidly through seed and vegetative reproduction. Each leafy spurge plant can produce 140 seeds, with most seeds remaining viable for eight years. Leafy spurge roots can reach a depth of 26 feet and extend 15 feet across.</p> <p>The best defence against leafy spurge is early detection and treatment of new infestation patches. There is no single control method that will always work. The most effective control is to take an integrated management approach (combine a variety of techniques). Control techniques need to be customized to individual infestations, however, common techniques include herbicide applications, cultivation, mowing, burning, multi-species grazing, bio-control agents (beetles and moths), and forage competition.</p> <p>New infestations often occur as the result of</p>	 <p>disturbance. Avoid transporting forage, straw, soil, or gravel from leafy spurge infested areas. Clean vehicles and equipment when moving from infested areas as seed and root fragments can cause new infestations.</p> <div data-bbox="824 1117 1284 1764"><h3>Home building centre</h3><p>We Carry A Large Line of Sporting Goods for the Outdoorsman, Including a Full Line of Rifles, Shotguns, Muzzle Loaders, Handguns, Archery, Ammo, etc. Also Avail Licences & Bait and Tackle Specialty Shop</p><p>Wanda Uilberg <i>Western Manitoba's Number 1</i> Angling, Hunting & Shooting Pro Shop</p><p>Phone: 204 728 2230 1020 18th Street Fax: 204 727 8633 Brandon, MB Toll Free: 1 877 728 2837 R7A 5C1</p></div>

Appendix B: Leafy Spurge Educational Banners

Leafy Spurge in Manitoba



What is Leafy Spurge?

Leafy spurge, a noxious weed in Manitoba, is a long-lived and hardy perennial plant. In 1999 it was estimated that at least 340,000 acres were infested by leafy spurge with a net economic impact of approximately \$20 million per year.

- Mature stems are 16 to 32 inches
- Leaves are pale blue-green, or green
- Stem and leaves both contain latex
- Numerous yellow bracts form a flat-topped cluster
- Flowers appear in late May – early June

Why Care?

Leafy spurge will readily establish itself in a variety of environments, particularly disturbed sites.

Severe infestations can create decreased land values, reduced cattle stocking rates and reduced incomes.



www.brandonu.ca/rdi/leafyspurge.html



Leafy Spurge Management and Control



Integrated Approach

There is no single method that will always work to control leafy spurge. The most effective strategy is to combine a variety of techniques - an integrated management approach.

- More effective control of leafy spurge
- Greater cost-effectiveness
- Lower environmental impact

Control Techniques

- Cultivation
- Digging/Hand Pulling
- Flea Beetles
- Herbicide
- Mowing
- Multi-Species Grazing



www.brandonu.ca/rdi/leafyspurge.html



Appendix C: Silent Invader Fact Sheet

Leafy Spurge

THE SILENT INVADER

Introduction

Few plants introduced from Europe have had such an impact on North American native prairie as leafy spurge (*Euphorbia esula* L.). Introduced to the United States in 1827 as a contaminant of seed grain, it has marched a steady path across the mid-west and western plains states and the Canadian prairies. Its impact has been felt over a large area, as it now infests over 3,000,000 acres in 29 states; 340,000 acres in Manitoba; 45,000 acres in Saskatchewan and 15,000 acres in Alberta. (1999 estimates).

Leafy spurge is a tenacious plant that infests grazing lands, degrades wildlife habitat and associated recreational lands, decreases native prairie plant diversity as well as threatens their very survival through displacement. Land values on affected lands are dropping, as experienced recently by a landowner whose land infested with leafy spurge dropped from an assessed value of \$150 per acre to \$60.



Leafy spurge is usually found in dense patches which exclude most other plants.

Identification

Leafy spurge is a long-lived, deep-rooted perennial that is most often found growing in dense patches. It has a hairless stem with pale blue-green or green leaves and grows from 16 - 32 inches tall (40 - 81 cm). The flowers are small, green and inconspicuous, appearing two weeks after the yellow-green, heart-shaped bracts which are often mistaken for the flowers. These appear in May, with flowering complete by mid-July. Seed matures and is dispersed in late July and early August.

Biology

Few plants have the competitive advantage exhibited by leafy spurge. It has several mechanisms that enable it to exclude competition from other plants. These mechanisms include wide-spread seed dispersal, an aggressive root system, the ability to inhibit growth and development of nearby species, as well as a resistance to herbicide treatment.



Seeds, which form three to a capsule, "explode" when ripe, ejecting seed up to 15 feet (4.6 m) from the plant.

Seeds are produced three to a capsule and usually about 140 per stem. At maturity, the seed capsules "explode", projecting the seeds up to 15 feet (4.6 m) from the plant. The seeds are moved from place to place in a variety of ways, such as in mud picked up by vehicle tires (including recreational vehicles); in contaminated hay, gravel and topsoil or the hair and feet of animals. They also float on water, enabling infestations along waterways or flood plains. Sheep, goats, rodents, birds and deer ingest the seeds and deposit them some distance away in their dung. Viability of the seeds lasts up to eight years in the soil. The deeper the seeds are in the soil, the longer they last.

Leafy spurge has an aggressive root system. The roots of a mature plant can reach 26 feet (7.9 m) deep and move laterally 15 feet (4.6 m) annually. The root system has huge carbohydrate reserves which can support the plant through long periods, even years, of drought, grazing stress and herbicide damage. They regenerate quickly from the hundreds of buds along the roots, which can each produce a new, independent plant. New shoots appear quickly if the top growth is damaged or removed by hand-pulling, herbicide treatment, mowing, grazing or fire. These young shoots are highly competitive and aggressive.

Growth begins in early April, allowing the spurge to become well established before surrounding plants begin active growth. In this manner they monopolize surrounding moisture, light and nutrients. While the main growth period is from April to July, a second growth stage occurs in fall. In the absence of competition, seedling roots can grow three feet deep and spread up to 40 inches horizontally. Existing patches usually spread vegetatively up to four feet per year.

Tremendous genetic variability allows this plant to be extremely adaptable. It is found in tame or native pasture, native range, roadsides and ditches, woodland and farmland; from wet riparian areas to dry hillsides. Spurge is very successful in disturbed areas, including overgrazed pastures, where continual selection of desirable plant species by grazing animals and avoidance of leafy spurge enhance the weed's success.

Management

Successful management of leafy spurge requires an integrated approach. All tools currently available should be used to gain a measure of control on its spread. Five control methods can be used - prevention, plant competition, physical control, biological control and chemical control. *Leafy spurge control must be considered a long-term management program.*

Prevention –

New infestations of leafy spurge come from importation of either seeds or root pieces by a variety of means – recreational activities, agriculture and construction. Seeds stuck in mud on vehicle tires or feet of livestock serve as vectors for new infestations as are landscaping soil, fill dirt or gravel. It is well-advised to check and clean agricultural machinery when moving from infested to non-infested areas.

Livestock feed and crop seed can contain spurge seeds. Avoid using hay that comes from affected areas as it may be contaminated. Certified weed-free forage and grain seed is available. Before moving animals from infested areas, hold them in small paddocks or pastures for 6 to 11 days to allow seeds time to pass through their digestive tracts.

Herbicides such as 2,4-D Ester are used to reduce top growth and reduce seed production. *Sheep and goats will graze leafy spurge and are effective at controlling both the spread of the plant and seed production.*

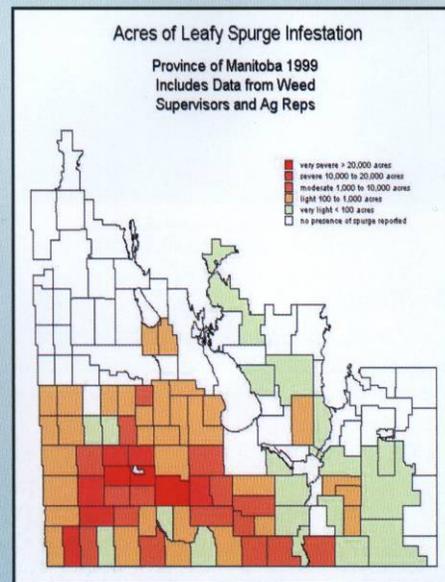
Plant Competition –

Plant communities can be manipulated to favour one type of plant over others. The absence of grazing pressure on leafy spurge gives it an advantage over the more desirable grasses. By introducing grazing pressure on leafy spurge using sheep or goats, its competitive edge is reduced. Grazing rotations can be used to benefit the grasses, by introducing the sheep twice during the growing season - spring and fall. Each grazing period must be followed by a rest period to allow the grasses to re-grow. Schedule the rotations to prevent the leafy spurge going to seed, usually in May and June as well as August and September. Once the “yellow” is gone, the sheep can be moved to another location. Stocking rates will vary, but a starting point is three to six ewes per acre of leafy spurge per month, or one to two ewes with lambs per acre per summer. Adjust the stocking rate as required by the carrying capacity of the pasture.

Goats are also used to graze leafy spurge and are more effective especially in rough terrain. The stocking rate must also be flexible, but three to four goats per acre of leafy spurge for four months is a good place to start.

Physical Control –

Cultivation can be used to control leafy spurge in cropland, beginning in spring when the stems are three to four inches tall. Repeated cultivation throughout the growing season will help



Leafy Spurge Distribution in Manitoba, 1999

control its spread. This treatment must however be continued for up to two growing seasons. Plants can reform from root pieces as small as 1/2 inch long (1.5 cm) and 1/10 inch diameter (1.5 mm). Care should be taken to prevent transporting root pieces from one field to another.

Mowing and burning stimulate new plant formation. Either can be used however to remove ground litter and allow uniform re-growth for more effective herbicide treatment. Mowing will reduce the plant's ability to form seed if it is repeated every two to four weeks during the growing season.

Hand weeding is impractical except with small patches of leafy spurge. It does however prevent seed production if done at regular intervals.



The black dot spurge beetle (*Aphthona nigricutis*) is one of the insects used as a biological tool to control of leafy spurge.
Actual size - ●

Biological Control -

Biological control refers to using a plant's natural enemies to adversely affect growth and reproduction. These enemies may be insects, fungi, bacteria or some other organism. Their actions may selectively retard the plant's growth, prevent seed development or kill the plant completely. These controls serve as an environmentally-friendly method of weed control especially where other techniques cannot be used or in combination with other control methods.

Several insects have been imported from Europe to North America to support long-term leafy spurge biological control programs. Most successful so far have been spurge beetles of the Aphthona family. The black dot spurge beetle (*A. nigricutis*) has been most successful when released on an open, south-facing hillside with well-drained sandy or sandy-loam soils. A leafy spurge density of 150 - 200 plants is desirable. Other spurge beetles are the brown dot (*A. cyparissiae*), and *A. czwalinae*. These flea beetles range in size from 2 to 3.5 mm and tend to congregate for feeding, mating and egg-laying. They feed on leafy spurge leaves and bracts in the summer.

The spurge leaf roller, which as an adult is a moth (*Lobesia euphorbiana*) whose larvae feed on the flowers, has become well established in some areas of southwest Manitoba especially in the Shilo and Brandon area.

Site selection is very important for the success of insect biological controls. The spurge beetles do most of their damage while in the larval stage. The spurge beetles have the greatest effect on plant grown in loam, silt loam, silt clay and sandy loam soils. The sites should be well-drained, usually a south-facing slope, away from shady areas. It is also recommended that placement of beetles occurs in patches of moderate infestation (60 - 90 stems per square meter), rather than in heavy infestations. They will move into those heavier areas once established. At each new site, at least 1,000 beetles should be released to produce an effect on the plants and to facilitate population establishment.

From late June through July, the adult female lays her eggs at or near the base of the plant. In 8 to 10 days, the eggs hatch and the larvae burrow through the soil to the roots. For maximum benefit, the roots should be located no more than two to three inches below the soil surface. The larvae feed on the roots through summer and fall, hibernating during winter. With the insect damage to the root system, the plant becomes weakened and often cannot flower the following year. As the beetle population increases, the plants may die. In spring, the larvae will feed for about three weeks before pupating and emerging as adults.

Care of the release site is very important. Avoid herbicide application at the release site except around the perimeter. Refrain from spraying insecticides within half a kilometer of the site. Chemical drift may adversely affect the spurge beetles. Cultivation and burning at a site will reduce the number of beetles considerably. It is only through ever-increasing numbers of beetles that control may be obtained. Allow three years for the insect population to increase before collection of beetles for introduction to a new site.



A cattle pasture where no control measures have been taken to control leafy spurge. Assessed land values are now dropping as a result of leafy spurge infestations.

Economic Impacts of Leafy Spurge Infestation

- **Income losses from grazing capacity reductions (ie. – a 40% leafy spurge infestation results in a 50% reduction in carrying capacity)**
- **Lost livestock sales**
- **Reduced grazing land values in the absence of alternative uses**
- **Reduction of plant diversity reduces a site's value as wildlife habitat**
- **\$20 million in economic impact annually in Manitoba**

Chemical Control–

Herbicides have been used to help control leafy spurge on agricultural lands, but their effectiveness is generally short-lived. 2,4-D has been used to temporarily kill top growth. Both the ester and amine formulations are effective. Proper timing of the spraying has produced the best results and is most cost effective. Two applications annually give the best results - in spring, just prior to true flowering and in fall during the re-growth phase. Avoid using 2,4-D around trees, as it may affect their growth if it gets onto the green wood or leaves.

Picloram (Tordon®) is effective on clay-based soils however not cost effective with repeated applications. It is 90% effective in its first year of application, but the plants' recovery reduces this to 70% after three years and more rapidly after that. Picloram is not recommended in sandy or sandy-loam soils because it is very slow to break down in soil and its movement in ground water can be considerable. Only licensed chemical spray operators can obtain the chemical.

Glyphosate (Roundup®) will give effective control in combination with 2,4-D; however, one must be aware that as a non-selective herbicide, it will kill surrounding vegetation. Good results have been achieved from spraying between mid-July to early-September, when many of the cool-season grasses are

semi-dormant. Warm-season grasses will still be affected as this is their active growth period. Fall applications of this combination are effective in controlling spurge and with little damage to the grasses, which are inactive by then.

Conclusion

Leafy spurge is a tenacious, resourceful plant that is difficult to control. For a successful suppression program, one must use all the current tools available. An effective spurge management program will be long-term and need to be constantly monitored. Every program will require adjustment as plant populations and conditions change. Success in reduction and eradication of this weed is possible, but only with commitment, time and persistence.

For more information, contact your local Weed Supervisor or Manitoba Agriculture, Food and Rural Initiatives.

WEB SITE LINKS

- www.brandonu.ca/rdi/leafyspurge.html
- www.invasivespeciesmanitoba.com
- www.mbweeds.ca
- www.gov.mb.ca/agriculture
- www.team.ars.usda.gov
- www.ianr.unl.edu/pubs/Wees/g834.htm
- www.ag.ndsu.nodak.edu/ndagres/winter97/ar30298b.htm



The Silent Invader Fact Sheet was originally created by:
Mixed-Grass Prairie Stewardship Program

Text and photos provided by Gerry Oliver



Agriculture and Agri-Food Canada

Agriculture et Agroalimentaire Canada

Prairie Farm Rehabilitation Administration

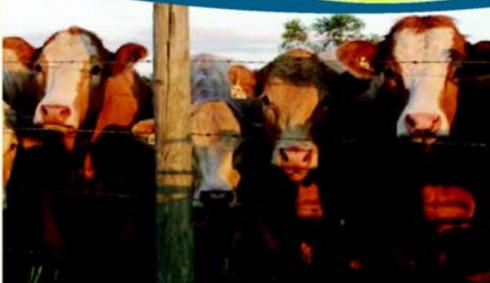
Administration du rétablissement agricole des Prairies

Greencover Canada

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Appendix D: Cattle Selective Grazing Control Method Fact Sheet

Leafy Spurge and Grazing Cattle



Declared a noxious weed in Manitoba, leafy spurge (*Euphorbia esula* L.) is a long-lived and hardy plant introduced to North America from Europe and Asia. Leafy spurge growth begins in April but can be unrecognizable until it starts to bloom in late May to early June. It is a shrubby plant that at maturity is 16-32 inches in height. Leaves are pale blue-green, or green with numerous yellow bracts that form a flat-topped cluster to resemble flowers.

As there is no single method to control leafy spurge, the Leafy Spurge Stakeholders Group advocates for an Integrated Pest Management (IPM) strategy that incorporates biological, mechanical, chemical, and grazing controls. These controls offer more effective control of leafy spurge, greater cost-effectiveness, and lower environmental impact. Without coordinated prevention and control strategies, the costs of leafy spurge will rise exponentially above the 1999 estimates of \$20 million a year for Manitoba.

Training Cattle to Graze Leafy Spurge

Training cattle to eat leafy spurge is just one more technique to implement in an IPM strategy. Recently several studies conducted in the USA and Canada suggest cattle can be trained to eat leafy spurge and a variety of other weeds, including Canadian thistle and knapweed. This training process does not involve manipulation through starvation. Although previous research indicates cattle will not eat leafy spurge due to its toxicity, new research has suggested the opposite with no negative health effects observed. For more information about the U.S. project, please consult www.livestockforlandscapes.com.

Cattle, preferably young heifers, can be trained to eat leafy spurge and other weeds with the implementation of a training period as short as 8 days in length. Cattle are fed nutritious unfamiliar feed twice a day that has been lightly sprayed with molasses distaff. Weeds are picked and mixed with feed until the feed is gradually reduced. Initially cattle will leave the weeds in the feeding trough. However, after a few days of reducing the feed-to-weed ratio, the cattle will be tempted to try more of the leafy spurge. Eventually,

the feed is reduced to the point where only the weeds remain. Cattle grazing during leafy spurge's bolting or flowering stage is most damaging to the plant. Training and subsequent grazing is most effective in intensively managed pastures.

Do's

- Training cattle to eat leafy spurge will help to control weeds.
- Trained cattle will influence untrained cattle.
- Trained cattle are more willing to add new varieties of weeds to their diets.
- Having cattle eat weeds increases forage options and reduces the competitive advantage of weeds on pastureland.

Don'ts

- Cattle should not be stressed before implementing training.
- Producer must be willing to devote sufficient time to work with animals during the training process.
- Trained cattle should never be placed in leafy spurge infested area that offers no other additional nutritional grazing.
- Training cattle in larger pastures will not be as effective as smaller intensively managed pastures as the effect on weeds and grass will be sporadic.
- Grazing on leafy spurge early in the season is suggested as grazing after the seeds have set will not help control infestations.

Resources

- Leafy Spurge Stakeholders Group: www.brandonu.ca/rdi/leafyspurge.html
- Team Leafy Spurge: www.team.ars.usda.gov
- Local MAFRI Office
- Local Weed Supervisor



Leafy Spurge Identification and Prevention



Declared a noxious weed in Manitoba, leafy spurge (*Euphorbia esula* L.) is a long-lived and hardy plant introduced to North America from Europe and Asia. Without coordinated prevention and control strategies, the costs of leafy spurge will rise exponentially above the 1999 estimates of \$20 million a year for Manitoba alone.

What does it look like?

Growth begins in early April, allowing the spurge to establish itself before surrounding plants begin active growth. Although leafy spurge is quite distinctive during its blooming period, the vegetative form is often overlooked enabling time for the plant to establish itself before landowners notice it.

Each plant may produce several stems, giving the spurge a shrubby appearance. Height of mature stems may vary from 16-32 inches (40-81 cm). The stems are hairless, with numerous linear-shaped, pale blue-green or green leaves. The alternating leaves are 3/4 - 3 inches (2-7.5 cm) long.



Numerous greenish yellow bracts forming a flat-topped cluster start to appear in May, about three weeks after the plant emerges. Often mistaken for the flowers, these bracts form a flat-topped umbel. The small, green and inconspicuous true flowers will emerge two weeks after the bracts. Flowering is usually complete by mid-July, and the seeds have matured and are dispersed by late July to early August. Some plants may produce flowers until frost.

Each leafy spurge plant produces approximately 140 seeds per stem. At maturity, the seed capsules will explode, hurling the seeds up to 15 feet (4.6 m) from the plant. Most leafy spurge seeds will remain viable for up to eight years, although some may survive even longer.

The root system of leafy spurge is extensive, often growing 26 feet (7.9 m) deep and 15 feet (4.6 m) across annually. Buds along the root system will create new seedlings, which is the main method leafy spurge spreads.



All parts of the plant produce sticky latex, often irritating the skin, mouth, eyes, and/or digestive tract when in contact.

Where is it found?

It is most commonly found on roadsides, trails, pastures, wet riparian areas and disturbed sites such as gravel pits and construction areas. Leafy spurge invades overstocked grazing land and under-vegetated or fragile grasslands where it has the competitive advantage.

How do you stop it?

The best defence against leafy spurge is early detection. New infestations often occur as the result of a disturbance. If you see a new infestation, contact your local weed supervisor who can provide assistance. Avoid transporting forage and straw, and soil or gravel from contaminated areas. Clean vehicles and equipment when moving them from infested areas as seed and root fragments can cause new infestations.

Need More Info?

- Leafy Spurge Stakeholders Group: www.brandonu.ca/rdi/leafyspurge.html
- Team Leafy Spurge: www.team.ars.usda.gov
- Local MAFRI Office
- Local Weed Supervisor



BRANDON UNIVERSITY
Founded 1899



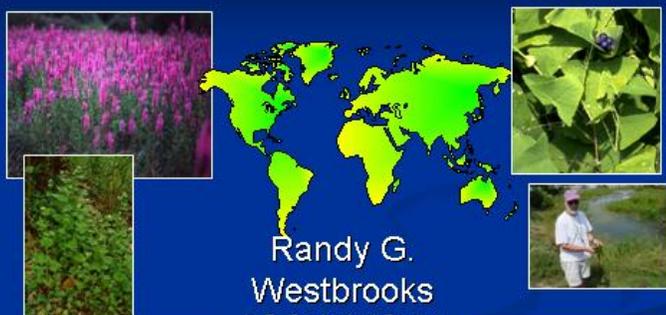
Canada Agriculture and Agri-Food Canada
Prairie Farm Rehabilitation Administration
Greencover

Canada Agriculture et Agroalimentaire Canada
Administration du rétablissement agricole des Prairies

Printed 2009 • IMG 173463

Appendix E: Early Detection and Rapid Response Presentation

Invasive Species - Coming to America
New Strategies for EDRR in Manitoba



Randy G. Westbrooks
 U.S. Geological Survey
 Whiteville, North Carolina, US





USGS BRD
 Whiteville, North Carolina



Green Swamp – Venus Flytrap

“One of the penalties of an ecological education is that one lives along in a world of wounds. Much of the damaged inflicted on land is quite invisible to laymen. An ecologist may either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise”.

Aldo Leopold
A Sand County Almanac, 1949.




Weekly Reader
 THE CHILDREN'S NEWSPAPER (1960-61, Issue #1, Nov. 29, 1960, p. 1)

Buddy Good Citizen

cherry

Fish are water animals.

Invasive Species in America

- **Creation of Invasive Species**
 - Free Living Exotic Species
 - Native Species – Remove Top Predators
- **Uncontrolled Introductions**
 - 50,000 Introduced Species and Varieties
 - 1,500+ Introduced Invasive Plants
- **Impacts on Human Health**
 - Spread of Disease, Injury, Stings
- **Ecological Impacts**
 - Outcompete / Hybridize with Natives
 - Destroy Habitat (Gypsy Moth)
 - Alter Ecosystems (*Melaleuca* in FL)
 - Alter Fire Cycles (Cheatgrass in the West)
 - #2 Threat to Endangered Species (400/958 spp.)
- **Economic Impacts**
 - Food and Fiber Production
 - Increased Losses and Control Costs (\$150 Billion)



‘Seek first to understand.... Then to be understood’.
Stephen Covey
The 7 Habits of Highly Effective People, 1989



Private Land Owners

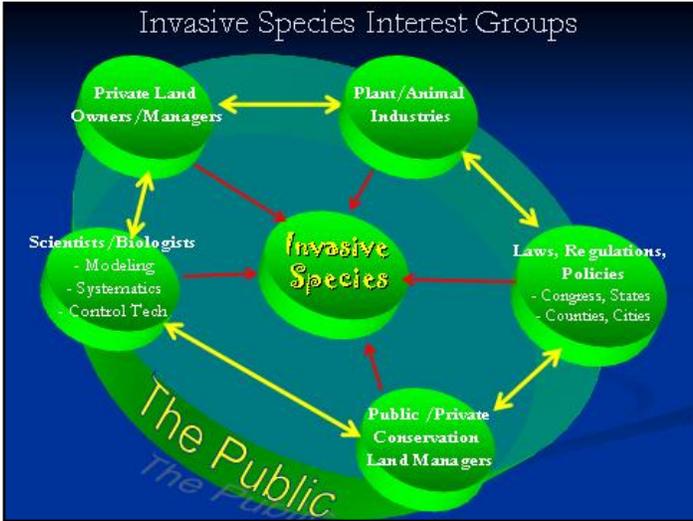
Purple Loosestrife

The Public

Federal, State, Local Government

Public/Private Conservation Land Managers

Biologists



The Great American Exchange

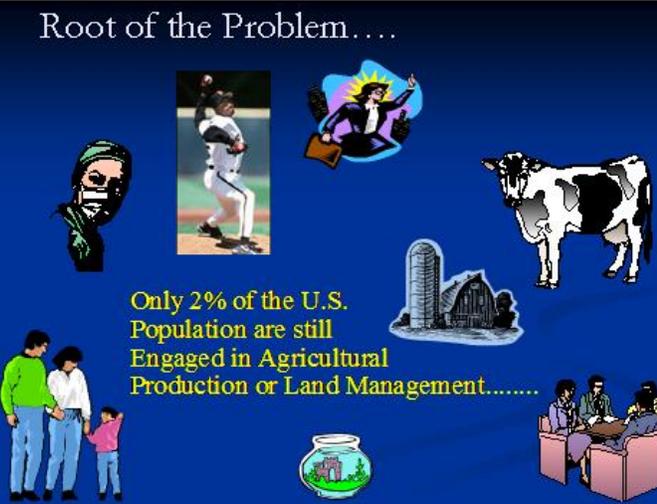
Panama Land Bridge, 3 Million Yr. BP



North American Mammals

South American Marsupials

Root of the Problem....



Only 2% of the U.S. Population are still Engaged in Agricultural Production or Land Management.....



“Houston, we have a Problem.....”

Four Major Types of Invasive Species....

Aquatic Nuisance Species

Injurious Wildlife

Insects and Diseases

Invasive Plants

(4,200+ Free Living Exotics)

Forests

Natural Areas

Crop Weeds

Rangelands

Chestnut Blight (*Cryphonectria parasitica*)

Map of the United States showing the distribution of Chestnut Blight in the eastern half.

Close-up images of tree trunks showing characteristic lesions caused by Chestnut Blight.

Asian Long-horned Beetle (*Anaplophora glabripennis*)

Map of the United States showing the distribution of the Asian Long-horned Beetle in the Midwest.

Close-up images of the Asian Long-horned Beetle on wood.

Image of a lumber yard with stacks of wood.

Invasive Plants!



- 🌍 18,000 Native Plants in North America
- 🌍 4,200 Exotics with Free Living Populations
- 🌍 19% Exotics!

Invasive Plants of the Northeast

Purple Loosestrife

Garlic Mustard

Mile-a-Minute

Mud Mat

Invasive Plants of the Southeast

Kudzu

Tropical Soda Apple

Hydrilla

Chinese Privet

Invasive Plants of the Midwest



Johnsongrass



Lespedeza



Grecian Foxglove



Leafy Spurge

Weeds in the West.



Leafy Spurge



Musk Thistle



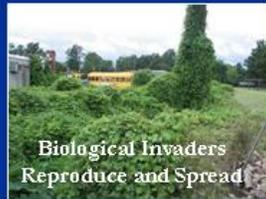
Salt Cedar



Cheat Grass



Chemicals Degrade over Time.....



Biological Invaders Reproduce and Spread

Biological Pollution vs Chemical Pollution

Native to Central America



Native to Eurasia



Native to Asia



Native to Asia



Value of American Agriculture: \$195 Billion per Year.....

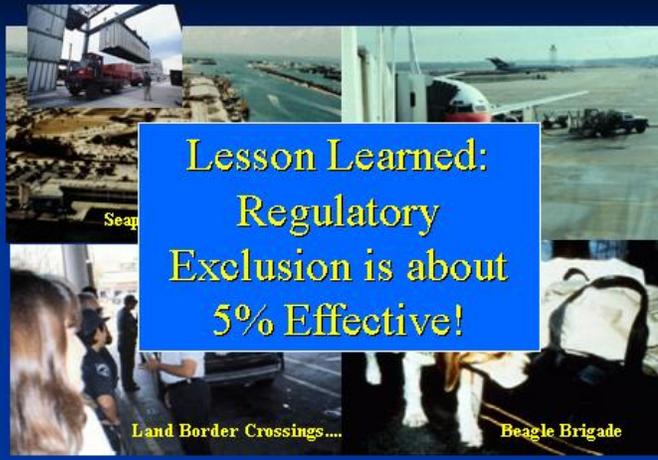


Old World Climbing Fern and Melaleuca.
Native Bush in Queensland, Australia.

Lessons Learned: Invasive Plants are Plants out of Place.....



USDA & DHS. First Line of Defense.....



**Lesson Learned:
Regulatory
Exclusion is about
5% Effective!**

Land Border Crossings....

Beagle Brigade

Federal/State Cooperative Weed Eradication Projects. 1958-2005.

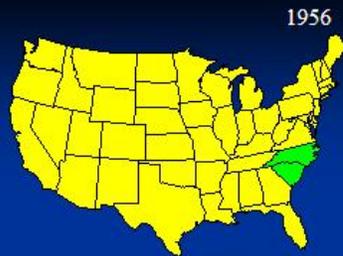
Successful Projects

- **Witchweed** (*Striga asiatica*). NC, SC. 1958-Current
- **Hydrilla** (*Hydrilla verticillata*). CA. 1980-1995.
- **Tropical Soda Apple** (*Sida acuta*). FL, GA, SC, NC, TN, AL, ME, PA. 1995-2006.
- **Japanese Dodder** (*Cuscuta japonica*). SC. 1991-1997.
- **Small Broomrape** (*Orobanchicorymbis*). VA, NC, SC, GA, OR. 1991-2001.
- **Giant Hogweed** (*Hieracium mantegazzianum*). PA. 1995-2006.
- **Giant Salvinia** (*Salvinia molesta*). SC, NC. 1995 - 2006.

Unsuccessful Projects

- **Common Crupina** (*Crepis setosus*). ID, WA, OR. 1981-1991.
- **Goatsrue** (*Galega officinalis*). UT. 1981-1996.
- **Catclaw Mimosa** (*Mimosa pigra*). FL. 1985-1992.
- **Wild Sugarcane** (*Saccharum spontaneum*). FL. 1991.
- **Wedland Nightshade** (*Solanum elaeagnifolium*). FL. 1995.

Lessons Learned: Develop Capacity for Interagency Partnering



1956

Witchweed (*Striga asiatica*)

A Parasitic Weed of Grass Crops from Africa in the Eastern Carolinas.

Witchweed in the Carolinas.....



Goatsrue (*Galega officinalis*)

● Infested States

U.S. National Invasive Species Campaign

Federal Interagency Coordination

- **FICMNEW** (1990)
 - 1995 - National Weed Summits (CO, FL, NM)
 - BLM Survey - Weeds Increased from 2-9 Million Acres; 4,600 Acres/Day
 - 1997 - National Invasive Plant Strategy
 - 1998 - Pulling Together Challenge Grant Weed Management Program
 - 1998 - Weed Fact Book

ANS Task Force (1990)

- **Invasive Terrestrial Animals & Plants Committee (ITAP)** - 2004

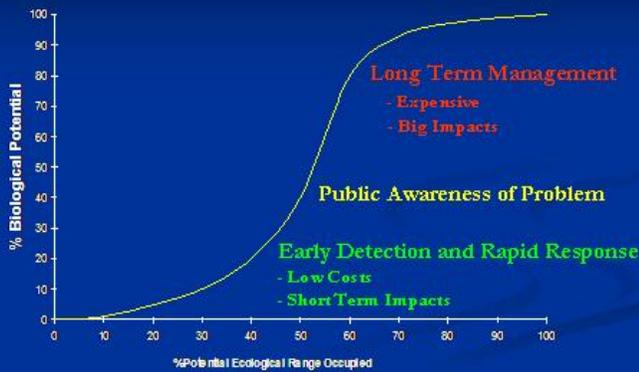
National Oversight and Coordination

- **Presidential Executive Order 13112** (1999)
- **National Invasive Species Council** (2001)
- **National Invasive Species Management Plan** (2001)
 - 67 Major Objectives
 - 1. Build New Capacity - Local, State, and Regional Partnerships
 - 2. Early Detection and Rapid Response (EDRR)
 - 3. Outreach and Education



<http://www.invasivespecies.gov>

Why a Strategic Approach to EDRR?



Invasive Species are like Dominoes



State Invasive Species Partnerships

- Interagency Coordination
- Stakeholder Involvement
 - ~30 Agencies, Tribes, NGOs, Industry, Land Owners
- Subgroups
 - State Weed Team, ANS Panel
 - Insect/Disease Team
 - Injurious Wildlife Team
- Strategic Plan and Vision
 - State/Local Regulations
 - **State EDRR Framework**
 - Control/Restoration
 - State/Local Regulations
 - Research Needs
 - Outreach/Education

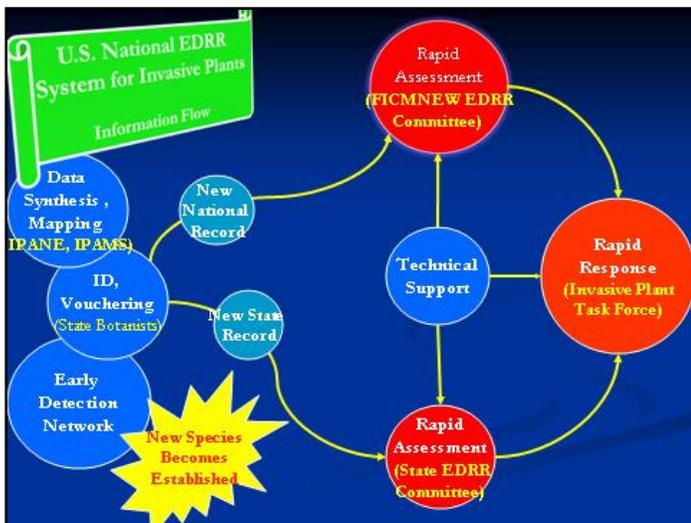
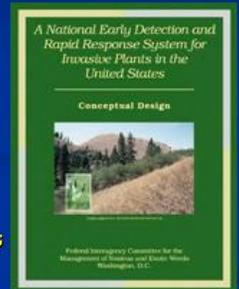


2001: Alaska Committee for Noxious and Invasive Plant Management

National EDRR System for Invasive Plants

Processes

- **Early Detection and Reporting**
 - Agency Field Personnel
 - Trained Volunteers
 - General Public
- **ID and Vouchering**
 - Cooperating Botanists
- **Rapid Assessment of New Species**
 - Federal and State Scientists
- **Rapid Response**
 - Land Owners; Interagency Task Forces



Carolinas Beach Vitex Task Force

(*Vitex rotundifolia*) - EDRR Pilot Project



- SC, NC - Sea Turtle Network
- SC Native Plant Society
- SC-EPPC, NC-EPPC
- SC Nursery & Landscape Association
- Clemson, NCSU, USC
- SCDNR, NCDENR
- USDA FS, USGS, FWS



2008 - Progress in Addressing Beach Vitex



Betsy Brabson,
Sea Turtle Volunteer,
Georgetown, S.C.

- High Profile Invaders - Not Yet Present in Manitoba

- Common Water Hyacinth (*Eichhornia crassipes*)
- Curly Leaf Pond Leaf (*Potamogeton crispus*)
- Saltcedar (*Tamarix* spp.)
- Eurasian Watermilfoil (*Myriophyllum spicatum*)



Advantages of EDRR

- EDRR does not restrict trade and movement of species that may or may not become invasive.
- EDRR addresses only species that have established free living, self-perpetuating populations.
- EDRR causes minimal and short impacts on the invaded habitat.
- EDRR aims to restore the invaded habitat to a natural balance.

Evolution of Public Welfare Concepts

■ 2000 BC - Ancient Greece – Democracy, Slavery, Polygamy

- **Democracy**
 - 1311 – England - Magna Charta
 - 1776 – USA Created
- **Human Rights**
 - 1861 – Slavery Abolished
 - 1912 – Voting Rights for Women
 - 1954 – School Integration
 - 1964 – Civil Rights Act
- **Crop Protection**
 - 1912 – Federal Plant Quarantine Act
 - 1974 – Federal Noxious Weed Act – Listed Weeds Prohibited Entry
 - 2000 – Federal Plant Protection Act
- **Environmental Protection**
 - 1964 – FITRA, Warnings About Tobacco
 - 1970 – EPA Established
 - 1980s-90s – Public / Private Nuisance Ordinances and Statutes on Smoking

■ Biological Protection – Invasive Species

- 1973 – Endangered Species Act
- 1990 – National ANS Act
- 1993 - OTA of Technology Assessment Report on HIVE
- 1994 – FICMNEW and TN-EPPC Formed
- 1999 – Presidential Order #13112
- 2000 – National Invasive Species Council
- 2001 - National Invasive Species Management Plan
- 2007 – Importation of Plants and Animals Still Permitted Unless Prohibited
- 2010 - *African Animals on the Great Plains!*
- 2035 – ??

A New Biological Protection Ethic

■ Environmental Protection Ethic - 20th Century

- Wildfires
 - Smokey Bear
- Chemical Pollution and Hazardous Waste
 - Silent Spring, EPA
- Anti-Littering Campaigns
 - Woodsy Owl - Give a Hoot, Don't Pollute
- Recycling (1980s)

■ Biological Protection Ethic – 21st Century

- Biological Pollution
- New Paradigm on Exotic Species
 - 'Use Plants that are not spread by the Wind – Water – Animals – Birds.....'



Ellen Koch with Beach Vitex,
Caswell Beach, NC. 2006.

The Future: What will it be??

- 12 European Knapweeds in the American West.....
- 140 More in Europe...



Russian Knapweed (*Centaurea repens*)

When you get a good idea like EDRR...



LET IT SHINE!



Weeds Won't Wait!

Appendix F: Rural Report Newsletter Article

Increasing Leafy Spurge Awareness through Collaboration

by Ryan Gibson

Throughout Manitoba, leafy spurge is a threat to biodiversity in nature and agricultural lands. Recognizing this threat, the Leafy Spurge Stakeholders Group (LSSG) is working in collaboration with non-profit organizations and government departments to increase the detection, control, and management of leafy spurge.

In May 2008, the LSSG initiated a leafy spurge project focused on rangeland management and control through the assistance of the Greencover Technical Assistance Program, Prairie Farm Rehabilitation Administration. Agricultural and conservation organizations across southwestern Manitoba and governments have been working on this initiative coordinated by the LSSG. The goal of this project is to increase the adoption of beneficial management practices among producers, land managers, municipalities, and industry for the prevention and management of leafy spurge.

Radio advertisements were aired

throughout the summer to increase awareness and education about leafy spurge. These radio announcements could be heard through southwestern and central Manitoba. Over the fall and winter months, the initiative supported the creation and dissemination of information sheets and participation at key events and workshops throughout Manitoba. These events assist in building a wider understanding of leafy spurge as a noxious weed and promote prevention strategies and control methods. In partnership with the Invasive Species Council of Manitoba, the project supported a presentation and discussion of early detection and rapid response by Randy Westbrooks of the United States Geological Survey. The presentation and discussion took place at Portage la Prairie from November 21-22, 2008.

The LSSG is a diverse base of public, private and non-profit agencies, and it has been actively involved in increasing awareness of the problem of leafy spurge and in promoting the benefits of integrated pest

management for a decade. The LSSG is coordinated by RDI. Further information on this initiative or the LSSG can be found at www.brandonu.ca/rdi/leafyspurge.html.



Appendix G: Cattle Country Newsletter Article

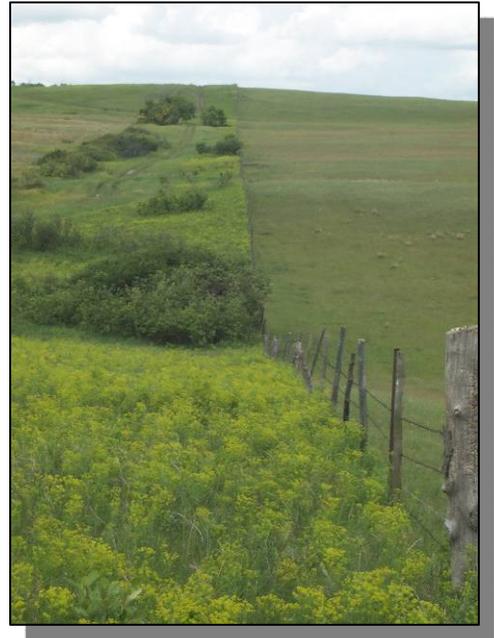
Article has been submitted for May 2009 publication.

Draft

Spring into Leafy Spurge Control

Spring is the time when producers and land managers need to think about developing a plan to prevent, manage and control leafy spurge. Early detection is the most effective prevention as new infestation can start due to importation of seed, plant, or root pieces.

Leafy spurge is a noxious weed in Manitoba that is a long-lived and hardy perennial plant. Leafy spurge growth begins in April but can be unrecognizable to affected landowners until it starts to bloom. It is a shrubby plant that at maturity is 16-32 inches. The leaves are pale blue-green, or green with numerous yellow bracts that form a flat-topped cluster and flowers appear in late May to early June.



Leafy spurge should be a concern of all producers and land managers. Grazing lands with severe infestations may face decreased land values, reduced cattle stocking rates, and a reduced income. Left uncontrolled leafy spurge will choke out all other vegetation and it is estimated uncontrolled leafy spurge infestations double in size every five years.

The best defense against leafy spurge is early detection and treatment of new infestation patches. There is no single control method that will always work to control leafy spurge. The most effective control is to take an **integrated management approach** (combine a variety of techniques). Control techniques need to be customized to individual infestations, however, common techniques include herbicide applications, cultivation, mowing, burning, multi-species grazing, bio-control agents (beetles and moths), and forage competition. These controls offer more effective control of leafy spurge, greater cost-effectiveness, and lower environmental impact.

Cultivation - Cultivations should start in the spring, 2-4 weeks after leafy spurge emerges. Continue cultivation every 2-3 weeks until fall.
Digging/Hand Pulling - Only practical and effective on small patches. Remove plant before it reaches 2" in height. Burn plants to dispose of them.

Flea Beetles - Adult beetles feed on leafy spurge leaves during the summer, and larvae mine the plant's roots during the winter.

Herbicide - Spraying must be regular and well-timed. No single treatment will work to control leafy spurge.

Mowing - If used properly, mowing can be used to prevent leafy spurge from seeding. Mow only during the early flower stage to prevent spreading seed

Multi-Species Grazing - Introducing sheep and goats can reduce leafy spurge infestations on grazing land.

Control Method	Growth		Flowering		Seed Dispersal	
	April	May	June	July	August	September
Herbicide		■				■
Cultivation (every 2-3 weeks)	■	■	■	■	■	■
Mowing		■	■	■		
Burning	■					
Multi-species grazing	rotational grazing				rotational grazing	
Multi-species grazing	continuous grazing					
Beetles			■			
Forage competition	■					

It is important to create a plan for the prevention, control, and management of noxious weeds in the spring. Please contact your local weed supervisor, MAFRI office, or the Leafy Spurge Stakeholders Group for more information.

MB Co-operator
Jan. 8/09

Lack of consistently applied weed management plans contributes to problem

More help needed to control spurge

BY LORRAINE STEVENSON
Co-operator staff

Municipal leaders want the provincial government to step up aid for local government's trying to control the spread of leafy spurge, a voracious noxious weed now said to be infesting some 700,000 acres of land across Manitoba.

Reeves and councillors are growing increasingly concerned they can no longer contain it, and want the province to provide more human and financial resources for a dedicated management program.

A study 10 years ago estimated the weed's economic impact on Manitoba at \$20 million annually. At that time, the infestation was less than half of the area covered today.

Infestations diminish land values, threaten ecosystems, and without action to contain it, gain new ground every year. "It is a huge problem," said

Bob Brown, deputy reeve of the R.M. of Cornwallis in an interview.

Spurge is everywhere in their municipality, he said. He estimates infestations are easily "in the thousands of acres." Yet they have no viable means to address it.

"Pastures are just covered with it. Road allowances are bad. In the southeast corner of our R.M. it's bad. It's showing up on the edges of our roads now."

His council brought forward a resolution, which was strongly supported at the Association of Manitoba Municipalities (AMM) convention in November calling the province to help create a more "meaningful and effective" leafy spurge management program.

Many local landowners and municipal leaders feel there's little they can do on their own,

Brown said. Their municipality has not been part of a weed district since Brandon withdrew from it a few years ago. So they have neither a weed supervisor

nor weed management plan. There are few resources to contact for advice or help, he said.

"We're just on our own," he said. "There's other weed districts around, but they've got all they can handle. There really isn't anything out there to help us, or to help landowners to control it."

"We're just on our own. There's other weed districts around but they've got all they can handle."

Bob Brown, deputy reeve,
R.M. of Cornwallis

Cornwallis's situation is by no means rare, according to Ryan Gibson, co-ordinator of the Leafy Spurge Stakeholders Group (LSSG), based at the Rural Development Institute (RDI) in Brandon.

One reason spurge is so out of control is that weed manage-

ment practices are inconsistent across jurisdictions.

"Management plans across Manitoba vary greatly," Gibson said. "Whether they be at the individual producer level or at the municipal level or even in some instances at the corporate or industry level, each of those levels have very different plans, and some may not have plans at all." The LSSG released a major study in 2000 showing 340,000 acres of land were threatened by the weed. The net economic impact at that time was approaching \$20 million a year. "Things have changed dramatically," added Gibson.

Given the extent of infestations, it's now felt containment, rather than eradication is the most realistic goal, said Wayne Digby, chair of the LSSG. That's why more consistent control measures are so critical to keep the problem from becoming even worse, he said.

"One of our main concerns in particular is with what we call the fringe municipalities, which

might be just on the outside edge of the existing leafy spurge areas," he said.

The weed's seed is spread by natural dispersal through wind and water, but also through human activity. Day-to-day public works carried out by municipalities is one of these activities. Gravel or soil infested with the seed hauled from site to site advances its spread. Roadside maintenance activities, such as mowing when spurge is producing viable seed also spreads it around.

The LSSG wants to conduct more educational events and host workshops for municipalities to help develop weed management plans, Digby added.

All these efforts require money, however. The LSSG also wants to update its now 10-year-old impact study.

Digby said he's glad the AMM is making this issue a higher priority now.

"We feel very strongly that there should be more resources put to it," he said.

lorraine@fbcpublishing.com

Appendix I: Research Team

Robert Annis

Director, Rural Development Institute



Dr. Annis is actively engaged in many community-based development organizations and research activities. He is past Chairperson of the Board of Community Futures Partners of Manitoba and Community Futures Westman and is a Co-chair for Pan-West Community Futures Network of Western Canada. He was the founder of Brandon University's innovative Community Outreach Service and continues to serve on its advisory committee. He is a member of the technical assistance committee of CEDNet. Dr. Annis is also a member of Brandon University's Department of Rural Development (1999-present) and is a former member Brandon University's Department of Native Studies (1983-1988) and of Scotland's Caledonian University's Department of Psychology (1977-1983). Dr. Annis has published more than 50 journal publications, reports and foundation documents reviewing many of the important social and economic issues facing rural and northern people on the Prairies.

Wayne Digby

Chair, Leafy Spurge Stakeholders Group



Wayne Digby holds a Bachelor of Science in Agriculture Degree in addition to a Masters in Adult Education. Wayne has considerable experience in needs assessment, project development, project management and agricultural extension from both a Canadian and International perspective. For 17 years prior to taking early retirement from Manitoba Agriculture and Food in 2001, Wayne worked as the Regional Director, Southwest Region with Manitoba Agriculture and Food. Previous to that he was Agricultural Representative in the Killarney area, Senior Livestock Officer in Botswana, Africa with CUSO, as well as Rural Development Counselor in the Swan River and Russell areas.

More recently Wayne worked for 2 ½ years as Extension Project Manager with the Canada Ukraine FARM Program establishing agricultural extension services in Ukraine. At present he works with a western Manitoba firm Prairie Practitioners Group in providing renewable energy consulting services to Manitoba and Saskatchewan communities. While with Manitoba Agriculture and Food Wayne was very concerned about Leafy Spurge and recognized the need for a major effort to control or contain the spread of this weed. With this in mind for the past year Wayne has served as Chair of the Leafy Spurge Stakeholder Group.

Ryan Gibson

Research Affiliate, Rural Development Institute



Originally from rural Manitoba, Ryan has been engaged with the Rural Development Institute since 2002. During this time, Ryan has been involved in many RDI research projects. His research interests include community development, cooperatives, broadband connectivity, rural governance, and rural revitalization.

Currently, Ryan is involved with the Community Collaboration Project: Empowering Communities and Building Capacity, Managing Invasive Species – Leafy Spurge Control, and the Community Collaboration to Improve Health Care Access of Northern Residents. Through these projects, Ryan is often traveling to meet with communities in northern Manitoba, Saskatchewan and the Yukon.

Ryan is actively engaged with the Manitoba Co-operative Youth Leadership program and is a Director with Westman Communications Group. Ryan holds a Master in Rural Development from Brandon University.

Sylvia Henry

Project Office Assistant, Rural Development Institute



Sylvia provides project administrative support for researchers with RDI. She assists on a range of projects, as well as reception for the office. Sylvia came to RDI with ten years of experience as administrative support in both the manufacturing as well as clinical sectors.

She is a graduate of the Office Administration Program at Assiniboine Community College.

Lynn Ferguson

Research Intern, Rural Development Institute



Lynn grew up on a fifth generation family farm near Gladstone, Manitoba. She holds a Bachelor of Arts (Honours) in History and Political Science from the University of Winnipeg. She is currently in the Masters of Rural Development Program.

Lynn was excited to join the RDI team as a research intern working on the Managing Invasive Species – Leafy Spurge Control Project.

Bev Lischka

Office Assistant, Rural Development Institute



Bev is the Administrative Assistant to the Director of RDI, and she is responsible for the accounting and day-to-day operations of the office. She also functions in a support capacity for consultants on numerous projects.

Bev has a rural background, raised in southwestern Manitoba. She has several years of management experience, working as acting editor and office manager of the Deloraine Times & Star for 12 years.

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The role of the RDI Advisory Committee is to provide general advice and direction to the Institute on matters of rural concern. On a semi-annual basis the Committee meets to share information about issues of mutual interest in rural Manitoba and foster linkages with the constituencies they represent.