BUILDING MOMENTUM ON
LEAFY SPURGE BIO-CONTROL

HIGHLIGHTS FROM THE
LEAFY SPURGE BEETLE FORUM

May 2009
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.
BUILDING MOMENTUM ON
LEAFY SPURGE BIO-CONTROL

HIGHLIGHTS FROM THE
LEAFY SPURGE BEETLE FORUM

May 2009

Prepared by:
Ryan Gibson, RDI Research Affiliate
Lynn Ferguson, RDI Research Intern

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

Introduction ......................................................................................... 1

   Invasive Species Council of Manitoba ................................................. 1
   Agri-Environment Services Branch, Agriculture and Agri-Food Canada .... 1
   Leafy Spurge Stakeholders Group .................................................... 2

Experiences and Lessons Learned in Bio-Control Initiatives..... 3

   Saskatchewan ................................................................................... 3
   Manitoba .......................................................................................... 19

Challenges and Future Needs of Leafy Spurge Bio-Control ..... 29

   Challenges ....................................................................................... 29
   Future Needs ................................................................................... 29

Moving to Action ................................................................................. 30

   Continued Coordinated Approach of Leafy Spurge Bio-Control Initiatives...... 30
   Explore Bio-Control Nurseries for Manitoba and Rearing Tents .................... 30
   Maintain Education and Awareness .................................................. 30
   Encourage a Research Agenda on Leafy Spurge .................................. 31

Resource Materials and Websites ...................................................... 31

   Publications and Fact Sheets ........................................................... 31
   Websites .......................................................................................... 32

Appendix A: Forum Participant List .................................................. 33

Acknowledgements

The Leafy Spurge Stakeholders Group would like to acknowledge the financial
contributions of the Manitoba Cattle Producers Association and Agriculture
and Agri-Food Canada.
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 year. To assist producers and organizations in understanding and developing bio-control plans for leafy spurge management a one-day forum. The forum addressed pertinent topics and provided participants resource materials. Four guest speakers provided insight to leafy spurge beetle control, establishing harvest/nurse sites, and shared lessons learned from Manitoba and Saskatchewan experiences.

This document serves as a legacy for the *Leafy Spurge Beetle Forum*. The report contains copies of the presentations delivered, highlights the forum’s discussions, outlines actions to be taken, and identifies resources and materials.

Approximately 30 individuals participated in the *Leafy Spurge Beetle Forum*, representing producers, provincial government departments, federal departments, and industry. A list of Forum participants is included in Appendix A. The forum was held May 12, 2009 in Brandon, Manitoba. The *Leafy Spurge Beetle Forum* is co-hosted by the Leafy Spurge Stakeholders Group, Invasive Species Council of Manitoba, and the Agri-Environment Services Branch of Agriculture and Agri-Food Canada. A brief overview of each organization is listed below.

**Invasive Species Council of Manitoba**
The Invasive Species Council of Manitoba is a non-profit organization providing a centralized and coordinated province-wide leadership body adopting a collaborative approach to the prevention, early detection, management and potential eradication of invasive species in Manitoba. The ISCM is comprised of representatives from government, industry and organizations. Since its formation in December 2006 the council continues to grow, currently encompassing nearly 200 stakeholders.

For further information about the Invasive Species Council of Manitoba visit [www.invasivespeciesmanitoba.com](http://www.invasivespeciesmanitoba.com).

**Agri-Environment Services Branch, Agriculture and Agri-Food Canada**
The Agri-Environment Services Branch is an integration of three existing components – Prairie Farm Rehabilitation Administration, National Land and Water Information Service and Agri-Environmental Policy Bureau – to address Agriculture and Agri-Food Canada agri-environmental issues. The branch is committed to an integrated approach to sustainable agriculture in Canada which recognizes that environmentally responsible agriculture and competitive agriculture are part of an integrated system. The branch will bring ideas to the table and solutions to the sector, helping the sector make the best possible decisions for the environment. This includes finding new
opportunities and enabling innovation, favouring a voluntary stewardship approach, and improving the public image of the sector.

For further information about the Agri-Environment Services Branch, Agriculture and Agri-Food Canada visit http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1187362338955&lang=eng.

**Leafy Spurge Stakeholders Group**

The Leafy Spurge Stakeholders Group is a broad coalition of agricultural and conservation groups and all three levels of government. The Leafy Spurge Stakeholders Group was formed in the fall of 1998 to examine the issues and impacts of leafy spurge. The long-term goals of the LSSG are: to design a process whereby an integrated and comprehensive approach to a province-style strategy can be effectively and efficiently implemented; and to design a strategy or strategies to reduce levels of leafy spurge infestation in those areas of the province most severely affected.

For further information about the Leafy Spurge Stakeholders Group visit www.brandonu.ca/rdi/leafyspurge.html.
Experiences and Lessons Learned in Bio-Control Initiatives

To gain a greater appreciation for the use of bio-control agents in controlling leafy spurge infestation three speakers were invited to share their experiences and lessons learned. A copy of each presentation is listed below.

Saskatchewan
Presented by Nancy Gray and Harvey Anderson

Leafy Spurge Management in Saskatchewan
Nancy Gray P Ag
Invasive Alien Plant Species Group Planning Advisor

What do you see?

Leafy Spurge - Spread
Key Features
- Patches, green yellow bracts
- Latex, deep roots

Problem
- Dominates pastures
- Cattle refuse to eat

Weed Movement
- Lateral root spread
- Seed catapult 16 ft (satellite infestation)
- Human, animal assisted (source infestation)

Annual rate of loss for seed – 13%
Leafy Spurge
Why do you control this weed?
- Highly invasive
- Very difficult to control
- Roots and seeds very viable
- Waxy latex coating
- Takes over rangelands and riparian areas

Strategy for LS
- Map now at the start of project
- Controlling LS is like fighting a range fire...
- Rule of Thumb….
  - For every year leafy spurge has been established in a location, two years of treatment will be needed for complete control.

Weed Control Strategies
- Weed Control is a reduction in the population of a weed to a level below its existing population
  - Exclusion (quarantine at far away locations)
  - Eradication (reduce population to zero)
  - Containment (contain a population within a specific area)

The Invasion Process
- Seed Viable for 10 yrs
- Naturalization
- On Site Control
- Containment
- Proactive Weed Inspector
- Time
- Area Occupied

Leafy Spurge Seed Problem
- Research: Lost of seed from soil is 13%/yr
- Research: Seed Rain, 4,500 seeds/m²
- Start Control Program
  - 1 year later 3,815 seeds/m² in the soil
  - After 10 yrs, no seed set, 970 seeds/m² in the soil
- If the patch was not controlled for 10 yrs
  - Seed Rain 4,500 seeds/m²/yr
  - After 10 years, 23,600 seeds/m² in the soil
Distribution of Plants by Animals

- Ingesting and egesting seeds
  - Birds and Rodents are effective transporters
  - Crow dropping – 2 viable seeds/g
- Predators feed on seed eaters, secondarily disperse seeds
- Ruminant animals will pass a few seeds of nearly every species they consume

Weed Control Methods

- Utilizing the methods to best meet your needs
- Your Needs:
  - Time
  - Costs
  - Land type

Integrated Weed Control:

- Integrated Weed Control – Combination of non-conflicting control methods

<table>
<thead>
<tr>
<th>Physical</th>
<th>Manual</th>
<th>Mechanical</th>
<th>Kill the Plant</th>
<th>Prevent seed set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical</td>
<td>Herbicides</td>
<td></td>
<td>Kill the plant</td>
<td></td>
</tr>
<tr>
<td>Biological</td>
<td>Insects</td>
<td></td>
<td>Suppress weed population</td>
<td></td>
</tr>
<tr>
<td>Ecological</td>
<td>Plants</td>
<td></td>
<td>Suppress weed population</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Animals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Control of Leafy Spurge

- Outliers
  - Eradication
  - Herbicides
  - Border
  - LS Beetles
  - Sheep
  - Goat
  - Horticidal
  - Herbicides
  - Tordon 22K
  - Dicamba
  - 2,4-D
  - Amthol
  - (Mow?)

- Containment Area
- Integrated Weed Control
- Right-of-Way
- Fence
- Road

Physical Control Method

Mowing and Burning

- Burning reduces litter in the area and creates a more uniform stand for beetles and spray but be itself does not reduce leafy spurge populations
- Mowing eliminates seed set if done every 4 weeks from early flower on for the rest of summer. Also weakens plants and root development.
Road Right-of-Way Weed Control

What is happening to the Noxious Weeds?
- Spreading seed or
- June herbicide treatment, no seed spread

Do You Need to Treat for Industrial Weed Control?
- Yes, snow accumulation

Notice in the photograph:
- Misty morning, wet vegetation
- Water act like a Post-in Note glue
- One of the best ways to move seeds

Grass Competition

- IF an infestation is in the field and you have sprayed and cultivated the best grasses to compete against LS is:
  - Brome esp Smooth 80% competitive
  - Western Wheatgrass 70%
  - Dahurian Wildrye 60%
  - Russian Wildrye 40%

Chemical Control

Herbicides

- Not a cure all
- Not an overnight solution

- Good planning
- FOLLOW THROUGH!!!

- No herbicide has ever been developed specifically for LS

Leafy Spurge Industrial Weed Control

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Leafy Spurge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amdril 240 G</td>
<td>Control</td>
</tr>
<tr>
<td>Non-crop areas (non-selective)</td>
<td></td>
</tr>
<tr>
<td>Vergask 300G</td>
<td>Top-growth control</td>
</tr>
<tr>
<td>Non-crop areas</td>
<td></td>
</tr>
<tr>
<td>2,4-D amine 5% 500L (Resent 3% 2x)</td>
<td>Top-growth control Pastures Non-crop areas</td>
</tr>
<tr>
<td>Tordon 20K 41% 600X</td>
<td>Control</td>
</tr>
</tbody>
</table>

TORDON 22K

- Developed for in wheat control of weed in US
- 3.6 L rate most effective with 75% control in first year but if not treated again by third year most of control lost
- Using a second application 2-4 years later when required gives up to 95% control
- Late May to mid June or fall if new regrowth occurs
RM Tordon 22K control

Glyphosate
- Non selective kills everything including grass
- Alone give control for 1 year only must reapply every year.
- Best in Fall application or after seed production
2-4 D

- Little control be itself less than 20%
- Usually added to Tordon and Glyphosate to add bang for the buck.

Leafy Spurge Control - Border

This is when Leafy Spurge should be found

Road Right-of-Way Weed Control

Yearly Road and Right-of-Way Maintenance
- Mowers
- Motor graders

Road Right-of-Way Weed Control

Weed Control Solution
- Spot spray
- Motor grader?
Maintaining Momentum on Leafy Spurge Bio-Control

Biological Control

Biological control covers two key concepts:
- the deliberate use of a weed’s “natural enemies” to suppress its population
- the use of these live organisms to maintain this lower population density

Types of Biocontrol Agents for Leafy Spurge
- Brown near upper leg
- Black near upper leg
- Released in prairies 1995 (MT 1985?)
- Released in ON 1995
- Since 2002, in southern AB, SK (from MT?), (US virus disease)

Leafy Spurge Beetles (Aphthona)
Life Cycle

Collection Site Information

Electronic Book can be sent to all Rural Municipalities

Table 1. List of Sites for Collecting Spurge Flea Beetles

<table>
<thead>
<tr>
<th>Site</th>
<th>No. of Beetles / Sweep</th>
<th>Diameter (mm)</th>
<th>No. of Flowers / m²</th>
<th>Height of Leafy Spurge (cm)</th>
<th>% Short</th>
<th>% Clip</th>
<th>% Dead</th>
<th>% Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morden (Cann)</td>
<td>3 to 6</td>
<td>12 x 20</td>
<td>80</td>
<td>25</td>
<td>90</td>
<td>95</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Leafy Spurge Beetle Collection

*Aphthona* *jacentosa* (black with brown femurs)

*Aphthona nigrescens* (brown with a black dot)

- *Aphthona* spp. adults emerge from the soil in late spring to early summer. Following emergence, adults feed on leafy spurge leaf tissue and mate. Females begin laying egg clusters of three to 15 eggs almost immediately. Egg laying continues every three to five days throughout the adult life stage. *Aphthona* spp. females produce an average of 220 to 280 eggs over a lifetime. Eggs are yellow and laid on the soil surface or slightly below, near the leafy spurge stem base. Larvae emerge from eggs in 12 to 19 days. The longevity of the beetles will vary from year to year depending on weather conditions. A hot, dry spring and summer will shorten the time adults are present while a cool, wet season will lengthen it. Generally, adults live for 1.5 to 2 months in the field. Most leafy spurge flea beetles have a single generation, egg to adult, each year.

A little more about beetles

- Although *Aphthona* spp. adults feed on leafy spurge foliage, the major damage to the plant occurs when the larvae feed on the roots. Larvae feed on both the fine feeder roots used by the plant to absorb water and nutrients and the storage tissue of the root crown. This feeding both destroys root tissue directly and causes the plant to be more susceptible to other methods of control, such as herbicides and infection from soil borne pathogens.
Leafy Spurge Beetle Collection
- Proper Net Technique for beetle collection

Leafy Spurge Beetle Collection

Leafy Spurge Beetle Collection

Leafy Spurge Beetle Collection

Leafy Spurge Beetle Collection

Leafy Spurge Beetle Collection

Leafy Spurge Beetle Collection
Leafy Spurge Beetle Collection

Leafy Spurge Beetle Collection

Leafy Spurge Control - Ring

- Leafy spurge control in a ring around the release point
- Collect from 'hot spots'

Assessing Sites

- A successful release should result in 50 or more flea beetles in five sweeps, the summer following release. If densities are less than 50 flea beetles per five sweeps then re-infest the site with additional flea beetles of the same and/or different species.

Control of Leafy Spurge with Beetles (Aphthona) at Maxim SK.

Maxim July 2008
Continuous Sheep Grazing

Creating Plans to Assess The Control Methods and Budgets

Just doing things a little differently?

Long-term Management Planning

- Development of formal management plans for noxious weeds and Invasive Alien Plants (IAPS)
  - Collection of data on “IAPS” populations
  - Setting of priority species
  - Listing possible management strategies
  - Listing planned management activities
  - Setting follow-up dates
  - Setting communication goals
  - Etc.

Weed Management Area

- Cooperation
- Cost
- Budget
- Who does the work?
- Who is in charge?
- Committee
- The Common Good
Control of Leafy Spurge with Beetles (Aphthona) at Maxim SK.

Summary of Integrated Management

<table>
<thead>
<tr>
<th>Integrated Pest Management (IPM)</th>
<th>Growth</th>
<th>Flowering</th>
<th>Seed Dispersal</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbicide</td>
<td>April</td>
<td>May</td>
<td>June</td>
<td>July</td>
</tr>
<tr>
<td>Cultivation (binary 2 months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mowing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-species grazing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotational grazing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-species grazing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitive grazing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beetle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compositional</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary of Integrated management techniques

Wanted Dead Plants

- Saskatchewan top 5 invasive weeds at the current time.
Scentless Chamomile Seed Weevil
Omphalapion hookeri

FOR SALE
John Deere A

Runs good. Missing steering wheel and seat. Ideal for the person who has lost his ass and don't know which way to turn.
Manitoba
Presented by Sherry Punak-Murphy

Leafy Spurge – the problem
✦ Native of Europe and temperate Asia
✦ First appearance of leafy spurge in North America was along new England coast in early 1800’s.
✦ Likely a contaminant in ship ballasts
✦ Unfortunately, no European or Asian insects that feed on leafy spurge made the voyage.

Leafy Spurge – the problem
✦ In Canada – it was first recorded in Huron county, ON – 1889
✦ Then in Manitoba 1911 shortly after being recorded in North Dakota
✦ 3,000 ha in 1952
✦ 46,000 ha in 1982
✦ 54,600 ha in 1995

CFB Shilo
Biocontrol of Leafy Spurge
Sherry Lynn Punak-Murphy
Base Biologist

Carmen McNabb
Natural Resource Technician

Location of CFB Shilo
200 km west of Winnipeg...
...30 km east of Brandon
Leafy Spurge – the problem

- Reported leafy spurge in Shilo area before 1920
- He indicated the risk of it becoming a noxious weed!

Why we care about Leafy Spurge

- Schedule A of our leasehold agreement between Manitoba and Federal Government states we will have a noxious weed control program in place – and it particularly mentions leafy spurge
- The DND’s environmental stewardship initiative in late 1980’s
- Training area – native prairie binds the soils where the military trains – thus ensuring training land for years to come!

Biocontrol Program at CFB Shilo

- “Destruction of all noxious weeds” as stated in the Lease Agreement is not the goal at CFB Shilo
- Our goal is to control leafy spurge and allow native prairie plant species to again predominate in the training area

Leafy Spurge Control at CFB Shilo

- It all started with Dr. Peter Harris from Agriculture Canada in 1984
- DND agreed to contribute to the research program to find natural agents to control leafy spurge (leafy spurge consortium)

Leafy Spurge Control at CFB Shilo

- DND provided $450,000 in direct expenditures to the International Consortium between 1986-1996
- Personnel and materials ARE NOT included in this price
- In 1990 formalization of the biocontrol program at CFB Shilo and the creation of a SOP
- Now part of the Manitoba Leafy Spurge Stakeholders Group
Maintaining Momentum on Leafy Spurge Bio-Control

**Successes**
- Almost 200,000 insect agents released since 1989
- Over 370 established biocontrol sites
- After 5 years, harvesting of Base sites was done
- Almost 25,000 beetles have been harvested on the base!

**New & Future Projects**
- Creating large release sites
  - Started in 2006 with release of 30,000 A. lacertosa from Mico, ND
- Covering areas with biocontrol sites in fixed patterns
  - Started in 2006 in Area 1B
- Mapping leafy spurge plots year to year
  - Started in 2008 with the use of U.A.V.
  - In conjunction with Brandon University Biology & Geography Departments
Biological Control of Leafy Spurge in the R.M. of Stanley

Presented by: Richard Warkentin
Technical, Stanley Soil Management Association

Leafy Spurge

Aphthona flava first released in 1993. It has not been found again. Presumably, it did not survive the winter.

Aphthona nigriscutis first released in 1986. It has survived, but leafy spurge control has been not very effective.

Aphthona cynTHISIAE first released in 1991. It has been quite effective in controlling leafy spurge in some areas.

Aphthona lacertos a first released in 1998. Leafy Spurge control has been very good at most sites.

Aphthona lacertosa (leafy spurge beetle) on leafy spurge flower.
This is Aphthona czwalingae, which is found in mixed populations with the lacertosa beetles. It is hard to distinguish one from the other.

Lacertosa beetles feasting on leafy spurge. This is not a common site!

Life Cycle of Aphthona Species Flea Beetles Biological Control Agents of Leafy Spurge
R.D. Richard & H.W. Zinkowski, USDA-APHIS & Lana King, USDA-NPS

Checking for leafy spurge beetle activity in late spring

Larvae eat holes in the roots
Since 1998, we have made over 123 Aphthona lacertosa releases in the R.M. of Stanley.

17 monitoring sites have been established since 2005.

In 2008, we traveled to Rugby, North Dakota to collect leafy spurge beetles.
A pheromone insect drawing device was installed adjacent to an artificial pheromone attractant to capture leafy spurge insects, seeds, and plants. Insects associated with leafy spurge were successfully collected.

Approximately 4000 beetles were put into each container.

75 containers were collected and imported to Manitoba. (approximately 300,000 beetles!)

2006
This site had a 83% decrease in Leafy spurge stems since 2005. 300 lacertosa were originally released in 2003.

This site had a 44.9% decrease in leafy spurge stems in one year. 4000 lacertosa were released in 2007.
Challenges and Future Needs of Leafy Spurge Bio-Control

The afternoon of the Leafy Spurge Beetle Forum provided the opportunity for a round-table discussion on the challenges and future needs of leafy spurge bio-control. The discussion has been summarized below under each of the headings.

Challenges

- Leafy spurge infestations continue to grow.
- Permits required for import/export of *Aphthona* beetles can be cumbersome and the process is continually changing.
- The reorganization of federal and provincial government departments and agencies has created uncertainty for financial and human resource support.
- Single fiscal year funding does not permit beetle monitoring or follow up field work required to measure the success of beetle release sites.
- Beetle monitoring is often neglected due to other organizational commitments.
- Keeping the momentum within organizations for leafy spurge bio-control can be difficult.
- Maintaining a robust Leafy Spurge Stakeholders Group without annual operating funding.

Future Needs

- Continue the efforts of the Leafy Spurge Stakeholders Group for education, awareness, and coordination.
- Create additional opportunities for education and awareness presentation to organizations throughout Manitoba, such as municipalities.
- Creation of bio-control nurseries in Manitoba to increase the availability of beetles to Manitobans and decrease the distance the beetles move.
- Establish a provincial bio-control specialist that could provide information and training to interested producers, organizations, and departments. This position could serve as the central contact for producers, conservation groups, and government departments.
- Increased training opportunities to create awareness of how beetles work, how to collect, how to distribute, and how to monitor.
- Increased knowledge of Manitoba-based collection sites and beetle releases.
• Encourage leafy spurge bio-control research among universities and government departments.
• Increased communication with all stakeholders regarding leafy spurge efforts and initiatives.
• Revive the annual bio-control collection trip to North Dakota conducted by the provincial government.
• Renew the leafy spurge economic impact study for Manitoba.
• Encourage conservation districts to adapt invasive species management like Saskatchewan counterpart

Moving to Action
Based on discussions of the challenges and future requirements for robust leafy spurge bio-control initiatives in Manitoba, the following four themes emerged for moving to action.

**Continued Coordinated Approach of Leafy Spurge Bio-Control Initiatives**

- Maintain the momentum of the collective discussions. Hold regular opportunities for dialogue among producers, conservations organizations, industry and government departments involved and interested in leafy spurge bio-control.
- Organize an annual organized bio-control collection trip to North Dakota.
- Lobby for a provincial bio-control specialist to serve as a central contact and source of information.
- Explore opportunities for a mentorship program for people wishing to start leafy spurge bio-control initiatives.

**Explore Bio-Control Nurseries for Manitoba and Rearing Tents**

- Explore the idea of creating leafy spurge bio-control nurseries in Manitoba to increase accessibility for Manitobans and to decrease the distance transported.
- Examine the effectiveness of rearing tents to increase the survival of the *Aphthona* beetles.

**Maintain Education and Awareness**

- Explore opportunities for education and training sessions on topics such as site selection and beetle monitoring.
- Host regular field tours to demonstration sites and successful leafy spurge bio-control site to promote best practices.
Develop a generic presentation/slide deck and speaking notes on leafy spurge, its impact, and control methods that could be delivered to diverse audiences.

Develop and produce relevant educational materials on topics such as when and how to use each leafy spurge control methods.

**Encourage a Research Agenda on Leafy Spurge**

- Renew the economic impact study on Manitoba’s leafy spurge infestation.
- Build a list of key leafy spurge research questions to be circulated among university and government researchers.
- Encourage dialogue among the research community and producers, conservation organizations, industry, and government departments.

Over the course of the next year, the Leafy Spurge Stakeholders Group will work with partners to move forward on suggestions discussed at the *Leafy Spurge Beetle Forum*.

**Resource Materials and Websites**

During the meeting, a number of resources, publications, and fact sheets were distributed to participants. Throughout discussion additional materials were mentioned and are listed below.

**Publications and Fact Sheets**


Leafy Spurge and Species Diversity Fact Sheet. Available online –
www.brandonu.ca/rdi/LSSG/Documents/SAR-SpeciesDiversity-
factsheet2007.pdf

Leafy Spurge: The Silent Invader Fact Sheet. Available online -
www.brandonu.ca/rdi/LSSG/Documents/LeafySpurge-
TheSilentInvaderFactsheet.pdf

**Websites**

- Agriculture and Agri-Food Canada
  www.agr.gc.ca

- Bioquip Products
  www.bioquip.com

- Fred Provenza
  www.behave.net

- Invasive Species Council of Manitoba
  www.invasivespeciesmanitoba.com

- Leafy Spurge Stakeholders Group
  www.brandonu.ca/rdi/leafyspurge.html

- Manitoba Agriculture, Food and Rural Initiatives
  www.gov.mb.ca/agriculture

- Manitoba Forage Council
  www.mbforagecouncil.mb.ca

- Manitoba Cattle Producers Association
  www.mcpa.net
Appendix A:
Forum Participant List

**Anderson**, Harvey
IAPS Coordinator West of Saskatchewan
Ph: 306-221-5289 or 306-933-7695
Harvey.Anderson@gov.sk.ca

**Beddome**, Gordon
Ph: 204-763-4773

**Bell**, Kelly
Agriculture & Agri-Food Canada
Ph: 204-841-0002
kelly.bell@agr.gc.ca

**Bencharski**, Brent
Manitoba Hydro
Ph: 204-360-6313
bbencharski@hydro.mb.ca

**Campbell**, Glen
Manitoba Cattle Producers Association
Ph: 204-772-4542
mcpa.office@mts.net

**Digby**, Wayne
Leafy Spurge Stakeholders Group
Ph: 204-727-1394
wdigby@mts.net

**Dunlop**, Bev
Agriculture & Agri-Food Canada
Ph: 204-578-3635
dunlopbe@agr.gc.ca

**Elsinger**, Mae
Agri-Environmental Services Branch
Ph: 204-578-3634
elsingerm@agr.gc.ca

**Ferguson**, Lynn
Rural Development Institute, Brandon University
Ph: 204-571-8521
fergusonl@brandonu.ca

**Fortney**, Gene
Nature Conservancy of Canada
Ph: 204-942-4845
gene.fortney@natureconservancy.ca

**Gardiner**, Bill
Manitoba Agriculture, Food and Rural Initiatives
Ph: 204-648-4637
bill.gardiner@gov.mb.ca

**Gibson**, Ryan
Rural Development Institute, Brandon University
Ph: 204-571-8552
gibsonr@brandonu.ca

**Gray**, Nancy
IAPS Coordinator East of Saskatchewan
Ph: 306-946-3135
ngray@sasktel.net

**Heming**, Cheryl
Invasive Species Council of Manitoba
Ph: 204-232-6021
caheming@hotmail.com
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.