LEAFY SPURGE STAKEHOLDERS GROUP

BEST MANAGEMENT PRACTICES FOR INDUSTRY:

Top invasive Plant Concerns for Rights-of-Way




Invasive Species Council of Manitoba

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Top Invasive Plant Concerns for Rights-of-Way

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Please report sightings of these invasive species to the Invasive Species Council of Manitoba (ISCM) at www.invasivespeciesmanitoba.com or (204) 232-6021. This document (full color) is available for download at ISCM's website above.

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DISCLAIMER

Mention of herbicide products in this document does not constitute endorsement of any product. Information contained within this document is the best available at the time of printing.

Use chemicals wisely. Always read the entire herbicide label carefully, following all mixing and application instructions and wear all recommended protective gear and clothing. These recommendations are intended for areas that fall under herbicide use permits and should be applied by licensed applicators. These recommendations do not apply to other areas. Contact your local Weed Supervisor for information on herbicide use requirements, restrictions and/or additional recommendations.

This publication is intended as a guide only.
Always refer to the product label for application details and precautions.

INTRODUCTION

Manitoba's ecosystems are under threat…

Invasive weeds:

- are non-native plants that thrive in new environments where they do not naturally occur;
- aggressively out-compete native plants for resources and lack natural enemies; and
- cause environmental harm, economic loss and damage to animal and/or human health

Prevention is key…

Prevention, early detection and rapid response are the most cost effective invasive weed management tools for Manitoba.

The overall goal of invasive weeds is to arrive, survive, establish and spread. Too often invasive weeds are not dealt with until they become out of hand and become difficult and expensive to manage. Once invasive weeds develop a foothold, eradication is nearly impossible resulting in significant economic loss and environmental damage. Canada thistle is likely the greatest example of why preventing invasive plant threats is of paramount importance. Canada thistle has caused greater crop losses than any other broadleaf weed in Western Canada (1).

The earlier an invasive threat can be detected the likelihood of establishment is greatly reduced, resulting in significant economic savings. If you notice a plant that you have never seen before and /or are unable to identify, please report a description and the location of the weed to your local Weed Supervisor. Prevention is critical to stop the spread of invasive weeds. Do not wait until the infestation becomes out of hand!

An important method to prevent the spread of invasive weeds is the use of clean seed in seeding rights-of-way. Clean weed-free seed may initially be more expensive but will save money in weed costs. It is also important to access construction aggregates from clean pits and quarries. Educating all stakeholders on how to identify new weed infestations can improve prevention, reduce further spread and facilitate compliance with the *Manitoba Noxious Weeds Act*.

With new infestations, reducing or eliminating seeds is preferable to prevent further spread. Generally hand-pulling the entire plant, roots and all, is recommended for small infestations. For larger infestations, mowing may be more practical. Nevertheless, all mowing, agricultural or construction equipment should be **cleaned thoroughly** prior to being transported to other non-infested areas to prevent seed spread. This is of particular importance on rights-of-way where uncleaned equipment has been shown to be one of the primary vectors for spreading leafy spurge in southern Manitoba (2).

Great care must be taken when disposing of invasive weeds to prevent further spread. If possible, all invasive weeds should be placed in a tightly sealed plastic bag for transport and burned or incinerated. Invasive weeds should never be composted.

No single control method listed in this *Best Management Practices* is 100% effective. Incorporating an integrated pest management (IPM) program involving a combination of mechanical, chemical and biological control methods is more effective for controlling any invasive weeds.

Layout of document

This *Best Management Practices* document was created to be an easy-to-read and informative guide. Each featured plant has a *Plant Characteristics* section that includes coloured pictures and key identification features that can be used to successfully identify the weed. Also included is a *Reason for Concern* section that outlines specific reasons why the particular plant is a threat to Manitoba, *Habitat* where generally the type of plant is found, the current provincial *Distribution*, and *Mechanical*, *Chemical* and *Biological Control Measures* (if any) for each plant.

Numbers in parentheses within the text denotes references.

For more information

For more information on what you can do to help prevent invasive plant infestations, log on to www.invasivespeciesmanitoba.com

References

1) www.gov.mb.ca/agriculture/crops/weeds/fab05s00.html
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LEAFY SPURGE

Euphorbia esula

Plant Characteristics

- Deeply rooted perennial; grows in dense patches
- Grows to a height of 40-80 cm (15-30 in)
- Yellow-green heart-shaped bracts with two seed pods in the centre appear in May and flowering is complete in mid- July (Picture A)
- Hairless pale green stems have numerous narrow green leaves, 2 to 7.5 cm (0.8-3 in)
- All parts of the plant secrete a white milky latex when damaged, making it easy to positively identify the plant (Picture B)
- Reproduces by seed or by root fragments

Picture A

Picture B

Reasons for Concern

Leafy spurge is an aggressive invasive weed species that has infested large areas of southern Manitoba (1). It crowds desirable plants and can inhibit growth and development of nearby species. Left uncontrolled, leafy spurge will dominate an area becoming a monoculture excluding all other plant species (8). A large root system allows the plant to establish huge carbohydrate reserves allowing the plant to withstand drought, grazing stress and herbicide damage (3). Ripened seed pods will explode hurtling seeds up to 5 m (16 ft) from the plant (8). Seeds can also float, enabling infestations along waterways (2). Uncontrolled leafy infestations will double in size every five years (5). The underground root system of leafy spurge can spread over a metre per year (8).

The milky latex found throughout the stem and leaves of the plants is an irritant (4) to livestock and to some humans (8). Leafy spurge is a serious problem if allowed to become established (1, 2, 3 & 4). It is a formidable opponent that cannot be controlled or eliminated by any single entity or management practice (8). Varieties of leafy spurge have been sold as an ornamental plant by various garden centers (8).

Habitat

Leafy spurge will readily establish itself in a variety of habitats and environments (8). It can be found in pastures, rangelands (3), fields, ditches, and in wooded and riparian areas (4). It also quickly infests disturbed areas such as construction sites and along roadsides and rail lines (3, 4 & pictures C and D). In Manitoba leafy spurge has done well on sandy soil with moderate moisture (4).

Picture C

Picture D

Distribution

Very severe (> 20,000 acres) to severe (10,000 to 20,000 acres) infestations of leafy spurge are common in the southwest portion of Manitoba (2). Moderate (1,000 to 10,000 acres) to light (100 to 1,000 acres) leafy spurge infestations are found on the eastern portion of southern Manitoba around Winnipeg, as well as in the city of Winnipeg and extending east (2). Leafy spurge is spreading northward, encroaching on Riding Mountain National Park and appearing in the Interlake.

Control Measures

Successful long-term management of leafy spurge requires an integrated approach (1, 3, & 4). A combination of various control methods has been proven to be more effective in controlling leafy spurge thus all tools currently available should be used to gain a measure of control on its spread (1).

Prevention is the most effective strategy to combat aggressive leafy spurge infestations. New infestations can start due to importation of seed, plant or root pieces. Seeds can be easily transported on recreational, agricultural and mowing equipment. Seeds stuck in mud on vehicle tires and livestock feet serve as vectors for new infestations (2). Regularly check property margins for new patches of leafy spurge before they become established (8).

MECHANICAL

Hand-pulling is recommended for small infestations since it prevents seed production if done at regular intervals (2, 3, 4, & 6). Mowing and burning may stimulate new plant growth. Either method can be used to remove plant litter and allow for uniform re-growth for more effective chemical treatment. Mowing will reduce the plant's ability to set seed if repeated every two to four weeks during the growing season (2, 3, & 4). Mowing has no long-term effect on leafy spurge (8).

Leafy spurge should NOT be mowed after the second week of July. Mowing must occur before the seeds turn brown on mature plants; otherwise, late mowing will result in seed spread by mowing equipment (7). Mowing at this time will have little effect since it may encourage new root buds to develop, leading to more seed production (2 & 4). **It is critical that all mowing equipment be thoroughly cleaned before being transported to prevent further spread of leafy spurge.**

CHEMICAL

Timing is critical for managing leafy spurge. No single chemical treatment will eradicate established plants (2). The optimal time to apply herbicide is during the growing season (4). Herbicide spraying should take place before seed set and in the fall during the second stage of growth. Generally, spraying is optimal if done around the May and September long weekends (6). Spraying five feet beyond the visible infestation should control any small spurge plants.

Picloram is the most effective herbicide to use on spot-spraying small individual patches. There are areas where picloram cannot be used so always refer to the label for information. The use and rate of picloram will vary widely due to soil conditions and type of equipment used to apply the herbicide (11).

2,4-D amine alone will give you top growth control. Application of 2,4-D amine should occur during spring at the early flowering stage (10). A second fall application will be necessary to prevent seed set for season-long control, when using 2,4-D amine alone (10). Control of the established plants may require repeated application for a period of 4 to 5 years (10).

Other products mentioned in the Weed Control for Non-crop Areas for use on leafy spurge include amitrol (between advance flowering and early seed development), imazapyr, MCPA and dicamba (11).

BIOLOGICAL

Biological control is the most promising ecologically sustainable practice for the long-term control of leafy spurge in combination with other control methods in an integrated pest management program (1 & 4). The use of insects and multi-species grazing using two or more livestock species can weaken plants and may reduce leafy spurge stand density (4). Despite its benefits, biocontrol is not a "quick fix" and should instead be considered a long-term management strategy in which it may take three to five years to establish insect populations (1 & 4).

Flea beetles of the *Aphthona* genera have been imported from Europe for long-term leafy spurge biocontrol programs (3 & picture E). Damage caused by the beetles will make the leafy spurge plants more susceptible to other control measures. The leaf tier moth (*Lobesia euphorbiana*) has spread through much of southwestern Manitoba. It feeds on leafy spurge flower buds preventing flowering which may stress the plants making them more susceptible to other control methods (3 & 4).

Picture E

Continuous livestock grazing can result in the fastest reduction in leafy spurge (4). Over time repeated grazing will eventually kill leafy spurge (4). Cattle and horses will not usually graze leafy spurge however sheep and goats will readily eat leafy spurge once they become accustomed to the taste (4).

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Leafy spurge is a deep-rooted perennial that grows in dense patches.

Stems have numerous narrow green leaves.

Ripening seedpods can explode, sending seeds up to 5m from the plant and aiding spread.

While the flower bracts are showy, the flowers are inconspicuous.

Seeds can float, enabling infestation along waterways.

Herbicide along roadsides can be an effective means of control.

This plant is able to regrow quickly vegetatively from the pink buds on the root after being cut off by mowing or other disturbances.

RED BARTSIA

Odontites serotina

Plant Characteristics

- Annual
- In July, plants grow to a height between 15 to 30 cm (6-12 in) occasionally reaching 60 cm (24 in) tall
- Difficult to identify prior to July due to slow growth in spring
- Stems are erect, branching with leaves attached in opposite arrangement (Picture A)
- Leaves are 1-3 cm (0.4-1.2 in) in length, occur in pairs and taper to a point
- Both leaves and stems are hairy
- Spike-like cluster of flowers found on the top of the stems
- Flowers are present from mid-July to September and resemble a tiny snapdragon flower 1 cm long (0.4 in) and are reddish purple in colour
- Fields will take a purple tinge when infested with red bartsia (Picture B)
- Reproduces by seed

Picture A

Picture B

Reasons for Concern

Red bartsia is a serious concern in hay land and pastures because it chokes desirable forage. Plants can produce 1,400 seeds equipped with coarse hairs enabling them to stick to clothing and machinery where they can be transported large distances (2). The greatest vector for spread has been the movement of contaminated hay (4).

Habitat

Red bartsia is common in disturbed areas such as hay land, rangeland, pastures and roadside ditches (2).

Distribution

Red bartsia infests forage crops, pastures, native hay land and roadsides (Picture C). It thrives on uncultivated land, particularly in areas of low fertility and poor competition from other species (4).

Picture C

Control Measures

MECHANICAL

Red bartsia does not persist under regular cultivation. If the land is suitable, adopt annual cropping. Use a combination of tillage and good agronomic practices to grow a competitive crop (4). Red bartsia seed is viable for a minimum of nine years, so infestations will reappear if the land is returned to a perennial crop and tillage is abandoned (4).

CHEMICAL

Red bartsia is vulnerable to either 2,4-D amine or LV ester at the seedling stage (2 & 5). When the plant turns reddish-purple, 2,4-D is no longer effective (1). Plants along roadsides should be sprayed as soon as plants are noticed, usually in early July. Repeated treatment may be necessary

for later germination (5). There are no herbicides registered to selectively control red bartsia in mixed legume/grass crops (1). With seed viability extending beyond nine years, control measures must be undertaken every year (4). Mapping of the weed is easiest later in August when the plants have become reddish-purple and are easily visible. These areas, along with an adequate buffer to account for offsite seed movement, should be treated in early July with 2,4-D (4).

BIOLOGICAL

There are no known biological control agents available for the control of red bartsia.

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COMMON TANSY
Tanacetum vulgare

Plant Characteristics

- Perennial
- Grows to a height of 1.5 m (4.9 ft) tall
- Button-like, bright yellow flowers occurring in flat-topped clusters on top of the plant (Picture A)
- Leaves are deeply divided and have a fern-like appearance (Picture B)
- Individual leaflets have toothed edges and are strongly aromatic when crushed
- Stems are branched, erect and purplish-red in colour
- Difficult to identify when not flowering
- Shallow, branching roots (Picture C)
- Reproduces by seed or by rhizome

Picture A

Picture B

Reasons for Concern

Common tansy can form dense stands and is a serious concern in pastures. If ingested, the plant can be toxic to humans (7) and may cause abortions in livestock (1 & 2). The plant is used as an ornamental species and is likely still available at garden centres (2).

Habitat

The plant grows well in full sun and well-drained soils. It is usually found in abandoned fields, old yards, fence lines, pastures, rights-of-way, drainage ditches and along roadways (1).

Distribution

Patchy distributions of common tansy can be found throughout the province but larger infested areas are known in the eastern and central regions of the province (Picture D). The plant is extremely prolific in the Whiteshell areas around the Ontario border.

Picture C

Control Measures

Competition by native plants has shown favourable results for small infestations of common tansy (2 & 5). The most effective control measure involves mowing or hand pulling in addition to herbicide treatment (2).

MECHANICAL

Mowing prior to flowering will reduce seed production and will likely need to be repeated frequently over the growing season (2 & 5).

Picture D

CHEMICAL

According to the Weed Control for Non-crop Areas guide, Dichlorprop + 2,4-D, metsulfuron, chlorsulfuron and aminopyralid can be used to control common tansy in Manitoba; meanwhile, MCPA Ester 500 can be applied for top control only (9).

BIOLOGICAL

Common tansy is an excellent candidate for biological control since few related species are found in North America and in its native range, common tansy is controlled by numerous insects and diseases (6). Several insects are currently being tested for plant specificity in Europe for common tansy control including a stem-mining weevil, a leaf-eating beetle, a flower-eating moth and a midge (7). It is thought these potential biocontrol agents will be available for use in the next five years (7).

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SCENTLESS CHAMOMILE
Anthemis arvensis

Plant Characteristics

- Annual, biennial or short-lived perennial with fibrous roots
- Grows up to 1 m (3.3 ft) tall
- Leaves are separated into finely divided fern-like segments (Picture A) and are odourless when crushed
- Numerous small white daisy-like flowers with a yellow centre (Picture B)
- Flowering can occur from May until a killing frost
- Flowers are 2 to 4 cm (0.75 – 1.5 in) across
- Newly produced seeds need light for germination
- Flowers can be produced 58 days from germination (3)
- Seed is viable as soon as flowers are produced (3)
- Reproduces by seed

Picture A

Picture B

Reasons for Concern

Scentless chamomile normally grows as a summer or winter annual and is a prolific seed producer throughout the entire growing season (1 & 2). This plant can produce 300,000 to upwards of 1 million seeds with favourable conditions (3) and can form dense monocultures (2). Seeds can easily be spread by water, contaminated seeds, feeds, and with equipment, gravel and soil (1 & 2). Seeds have no dormancy if left on the soil surface. If buried, the seeds can remain viable for fifteen years (1 & 2). Scentless chamomile is not eaten by livestock (2). As a showy plant, scentless chamomile may also be planted by gardeners or left to grow if found in urban areas where it can quickly spread.

Scentless chamomile is a formidable weed with multiple growth habits that makes timing of control efforts difficult. It can flower all year and has huge seed potential. Growth to flowering and seed set is rapid, and seeds can germinate throughout the growing season producing multiple flushes.

Habitat

Scentless chamomile is well-adapted to heavy, moist soils and periodic flooding. It can also survive in drier areas and perennial forage crops (1 & 5). Scentless chamomile can be found along roadways, rights-of-way, power lines, industrial areas, adjacent to wetlands fence lines, and in farm yards, shelterbelts, urban and disturbed areas (2 & 5).

Distribution

Scentless chamomile is found throughout Manitoba but is not widely spread as yet. Occurrences should be reported to your local Weed Supervisor.

Control Measures

Preventing seed production in an integrated approach including a combination of herbicides and competition from desirable plants can be effective for managing scentless chamomile. Scentless chamomile reproduces by seed so controlling it depends on eliminating seed sources. An important method to prevent the spread of this weed is the use of clean seed in seeding rights-of-way (6). Also, encouraging neighbouring plants will increase competition for new emerging scentless chamomile (3).

MECHANICAL

To be effective, repeated mowing is necessary and should occur before flowering to prevent seed dispersal. Each successive mowing should be done lower to the ground than the previous one (3) since the plant can also flower again below the cut line or later in the season (6). Flowers can still mature when cut, so plant parts should be disposed of properly to avoid further seed spread (6).

Hand-pulling can be done on solitary plants or small areas to prevent further infestations (3) and is preferable over mowing for small infestations (5). Infestations are generally found once flowering has started, at which time up to 71% of seed present can germinate (3). All plant materials should be collected carefully to prevent seed dispersal and subsequently burned (5).

Picture C

CHEMICAL

New scentless chamomile seedlings are easier to control than plants that have over-wintered (3) or have started flowering. The earlier herbicide applications will achieve better control (3). Control of small plants can be achieved with dicamba/2,4-D or metasulfuron, but control of larger plants will only be achieved with picloram, clopyralid or amynopyralid (7). Non-selective herbicides such as glyphosate should not be used around scentless chamomile where other vegetation is growing.

BIOLOGICAL

Scentless chamomile does not do well with competition and alternatively, will generally be aggressive, taking advantage of slow-growing crops or in waste areas (3).

Several insects have been introduced for biological control (3) however some are more successful than others (1). The majority of the insects have successfully displaced only semi-permanent stands of scentless chamomile (4). Colonies of seed-head weevils, *Omphalapion hookeri*, have effectively reduced the production of seeds in Western and Eastern Canada (4). A bud-gall midge *Rhopalomyia tripleurospermum*, has been used to reduce scentless chamomile stem height in both Alberta and Saskatchewan. A stem-boring weevil (*Microplontus edentulous*) was also introduced into Alberta with limited success due to difficulties in establishing breeding populations (4).

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DALMATIAN TOADFLAX
Linaria dalmatica

Plant Characteristics

- Erect perennial
- Stems light to dark green and hairless
- The plant will grow 1 to 1.2 m (3 - 4 ft) tall
- Waxy, pale green, heart-shaped leaves 2.5 to 7.6 cm (1-3 in) long with a pointed tip that clasp the stem (Picture A)
- "Snapdragon-like" flowers 3.5 cm (1.4 in) long (including the spur extending from the base)
- Flowers are yellow often with an orange or red tinge (Picture B)
- Flowering occurs midsummer to fall
- Seeds are produced in a 1.3 cm (0.5 in) pod
- Deeply rooted taproot 1.2 m (4 ft)
- Reproduces by seeds and by creeping rhizomes

Reasons for Concern

Dalmatian toadflax is not widely known as yet in Manitoba and occurrences should be reported immediately to your local Weed Supervisor or Weed Inspector. This plant is an escaped ornamental (1 & 3). A mature plant can produce upwards of 500,000 seeds which can remain viable for 10 years (2). The plant can also reproduce vegetatively (7). Another invasive plant with a similar flower, yellow toadflax, is found throughout Manitoba. Although both species are "pretty", they are invasive weeds and should be dealt with as such. Dalmation toadflax can quickly invade natural habitat and rangelands (Picture C). Seeds are unfortunately found in "wildflower" seed packs and readily planted by gardeners.

Picture A

Picture B

Habitat

Dalmatian toadflax can tolerate a wide array of conditions yet prefers dry, course-textured soils (2). The weed is commonly found in overgrazed rangelands (1), gravel pits, abandoned lots and fields, along roadsides and rights-of-way (4). The plant grows best in southern exposures (2).

Distribution

A patch of dalmation toadflax can be found immediately north of Cartwright, Manitoba. Dalmation toadflax infestations are not well documented in Manitoba.

Control Measures

Integrated management should focus on prevention of vegetative and seed spread (7) which is achieved by pulling plants and using herbicides before seed production. Treatments must be repeated for several years to ensure eradication of dalmation toadflax stands (7).

MECHANICAL

Repetitive hand-pulling of the entire plant is a prefered method for eradicating new or small infestations (2). Mowing won't kill the plant but will instead prevent seed production (2).

CHEMICAL

British Columbia recommends fall application of picloram or a mix of picloram with 2,4-D. Diclorprop has also been effective for controlling dalmation toadflax (7)

Chemicals such as dichlorprop 2,4-D, glyphosate, and picloram are suggested for use on toadflax in the guide to Weed Control for Non-crop Areas (6). Ecoclear is suggested for top growth suppression of perennial weeds on the product label.

BIOLOGICAL

Nine agents for the control of toadflax have been released in Canada or are naturalized. (8). A defoliating moth (*Casophasia lunula*) has successfully been used as a biological control agent (5) in Idaho (1), British Columbia and Alberta (2). Two seed capsule-feeding beetles (*Gymnaetron antirrhini and G. netum*) and an ovary-feeding beetle (*Brachypterolus pulicarius*) have been introduced in parts of Canada and the US to control all species of toadflax (5).

Picture C

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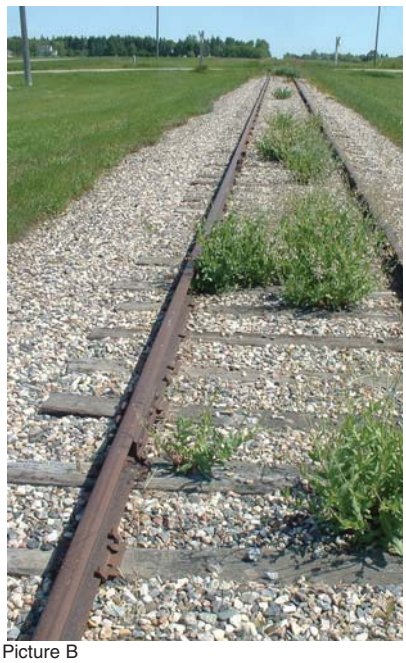
BLADDER CAMPION
Silene vulgaris

Plant Characteristics

- Perennial
- Smooth, erect stem grows to 0.6 m (23 in) tall
- Deep white tap root with numerous lateral woody branching roots
- Leaves are waxy, light green to whitish and lanceolate shaped
- Leaves vary in size between 3 to 8 cm in length (1.2 – 3.4 in) and are attached to stems in opposite pairs
- Flowers have five petals and appear from mid-June to fall (Picture A)
- The base of the flower expands into a balloon or "bladder" enclosing the seed pod
- Reproduce through seed or vegetative propagation

Picture A



Picture B

Reasons for Concern

Bladder campion will infest areas of low disturbance, for example, along roadsides and will proliferate in perennial crops (5). If not controlled, the weed will reduce the yield of many economically important crops and contaminate forage crop seed (6). Bladder campion is resistant to most herbicides registered for use in forage crops (6).

Habitat

Bladder campion prefers medium to coarse, well-drained soils. It is commonly found in undisturbed areas along roadsides, rail lines (Picture B), rights-of-way, pastures, forage crops and in open areas such as gravel pits and gardens (4).

Distribution

Bladder campion is most common in the eastern region of Manitoba, but is found in other areas throughout the rest of southern Manitoba (7).

Control Measures

MECHANICAL

Repetitive mowing – often enough to prevent flowering or seed set – can be effective in controlling established infestations (1 & 5).

CHEMICAL

Generally, bladder campion grows in small patches along roadsides and will only require spot treatment. Picloram can be used for spot treatment in some soils (8), but this weed will readily grow in gravelled areas. Imazapyr is another product that can be used to control bladder campion on rights-of-way (8). Soil and/or substrate type must be considered before chemical applications are made.

BIOLOGICAL

A beetle has been released in the Prairie Provinces to reduce bladder campion (2). Larva of *Cassida azurea* will defoliate the upper leaves and consume the majority of the flower (3). This beetle reduces the seed production but does not control the weed (2).

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3) res2.agr.ca/lethbridge/weedbio/agents/acasazu_e.htm
4) www.omafra.gov.on.ca/english/crops/facts/ontweeds/bladder_campion.htm
5) www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/prm2584
6) www.gov.mb.ca/agriculture/crops/weeds/fab58s00.html
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PURPLE LOOSESTRIFE
Lythrum salicaria

Plant Characteristics

- Perennial
- Maximum height of 2 m (6.5 ft)
- Flowers arranged in a spike at the end of each stem with pink to purple flowers (Pictures A & B)
- Blooms from July to September
- Mature plants have upwards of 50 square stems per plant
- Leaf arrangement is opposite, or occasionally whorled, and main leaves are lance-shaped and 3-10 cm (1.2 - 3.9 in) long, either smooth or with soft hairs
- Seeds are kidney-shaped, 1.5 mm (0.06 in) in diameter, greyish and enclosed in a pod
- Reproduce by seed


Picture A


Picture B

Reasons for Concern

This plant is aggressive and extremely prolific; a single plant can produce over 2 million seeds (5). It will out-compete native plants in wetlands and along waterways consequently deterring wildlife (1, 2, 4 & 5). The plant is still sold as an ornamental except in areas such as Manitoba where regulations prohibit the sale or possession of purple loosestrife.

Habitat

Purple loosestrife prefers wet habitats invading wetlands, rivers, lakes, streams and ditches (2, 3 & 4), but can grow in areas not as moist. This plant can also be found along rail lines (2) and is becoming increasingly common in agricultural and pasture lands (5). Purple loosestrife is still commonly found growing as an ornamental plant in yards.

Distribution

Purple loosestrife infestations have been found throughout southern Manitoba, particularly near the southern regions of Lake Winnipeg and Lake Manitoba.

Control Measures

Preventing seed production is important because this plant is a prolific seed producer and seed can remain viable for several years (7). Seed viability is extremely high. The key to control is to eradicate small infestations by pulling plants prior to establishment of a seed bank otherwise large infestations are best managed through biocontrol (8).

MECHANICAL

Small infestations can be effectively controlled by hand-pulling prior to seed set which generally occurs mid-summer (4 & 5). Removing the entire plant, roots and all, is required to prevent regeneration of new plants by remaining roots (5). The area should be monitored for several years for re-growth and seedlings. Cutting the plant at the base may prevent seed spread and inhibit plant growth (5).

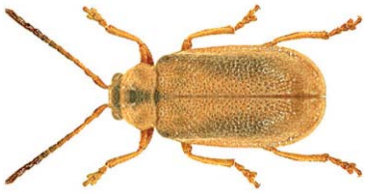
CHEMICAL

A variety of chemicals can be used on purple loosestrife infestations in upland areas; however, no herbicides are approved in Canada for purple loosestrife control located near or in water (1 & 5). In dry areas on suitable sites, glyphosate can be applied to actively growing, or plants beyond the

bloom stage (7). Seed heads should be removed prior to spraying to prevent seed set (6).

BIOLOGICAL

Biological control is the most effective long-term control of large infestations (2) or infestations near water where chemicals are not to be used (4). A variety of introduced insects have successfully consumed portions of purple loosestrife. Leaf defoliating beetles (*Galerucella calmariensis*) have been used by the Manitoba Purple Loosestrife Project to control purple loosestrife infestations in southern Manitoba (Picture C).



Picture C

For further information or to report purple loosestrife sightings, please call the Manitoba Purple Loosestrife Project at (204) 981-5387 or info@invasivespeciesmanitoba.com.

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OX-EYE DAISY

Leucanthemum vulgare

Plant Characteristics

- Perennial
- Grows to 1 m (3 ft) tall
- Stems are smooth and frequently grooved
- Lower leaves are spoon-shaped, stalked with "toothed" edges
- Upper leaves are smaller, alternately arranged and stalkless or clasp the stem
- Daisy-like flower is at the end of the stems with a central yellow disk 10 to 20 mm (0.4 to 0.8 in) wide (Picture A)
- Petals are white and 1 to 2 cm (0.4 to 0.8 in) long with slightly notched tips
- Flowering occurs between early June and fall
- When crushed all parts of the plant have a dis agreeable, sour odour
- Reproduces primarily by seed but also by shal low creeping rhizomes

Picture A

Reasons for Concern

Despite its "pretty" appearance, ox-eye daisy is an aggressive, noxious weed detrimental to the Manitoba landscape. Plants can produce 500 seeds which can remain viable for 3 or more years (6). Ox-eye daisy is avoided by cattle thus, the weed can form dense monocultures in pastures reducing native plant diversity (2). If dairy cows consume ox-eye daisy, milk produced will have a disagreeable taste (3). Unknowing gardeners unfortunately spread this showy plant as an ornamental species.

Habitat

Ox-eye daisy can thrive in a variety of conditions and can tolerate lower pH and nutrient poor soils (2 & 4). It is common in overgrazed pastures with exposed soil, meadows, cultivated lands, lawns and along roadways and rights-of-way (4 & 5) (Picture B).

Picture B

Distribution

Ox-eye daisy is common in parts of the Interlake region of Manitoba (6). It is also increasingly found as an occasional weed in other parts of Manitoba. In areas where it is not addressed, ox-eye daisy can become a serious local issue (6) (Picture C).

Picture C

Control Measures

MECHANICAL

Hand-pulling or digging the plant prior to seed production is effective only if the majority of the roots are also removed. Hand removal will have to occur for several years due to the presence of viable seed (2). Repeated mowing prevents seed production however, it will stimulate shoot

growth (2 & 4). Mowing can unintentionally aid the spread of ox-eye daisy (6). Intensive cultivation effectively kills ox-eye daisy due to its shallow root system (4).

Although cattle will not graze ox-eye daisy, horses, sheep and goats will, therefore these species can be used for companion grazing for controlling the weed. A combination of grazing and trampling will reduce the number of seeds produced (2).

CHEMICAL

Ox-eye daisy can be effectively controlled on rights-of-way, rangelands and pastures with picloram and on rangelands and pastures with Grazon (7). Other products that can be used to control ox-eye daisy on rights-of-way include imazapyr and clopyralid (suppression only) (8).

BIOLOGICAL

There are no known biocontrol options for ox-eye daisy (9) and may be difficult to find due to the fact that ox-eye daisy contains polyacetylenes and thiophenes that are generally toxic to insect herbivores (4).

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9) http://www.weedsbc.ca/pdf/oxeye_daisy.pdf

Photo Credits

Leafy Spurge

A) Leafy spurge flower. Source: Rural Development Institute. Credit: Keith Farquhar
B) Leafy spurge latex. Source: www.invasive.org
C) Rail lines and leafy spurge. Source: Rural Development Institute. Credit: Alison Ham
D) Leafy spurge infestation. Source: Rural Development Institute. Credit: Keith Farquhar
E) Brown dot flea beetle. Source: www.invasive.org Credit: USDA APHIS PPQ Archives
F) Leafy spurge plant watermark. Source: www.agf.gov.bc.ca

PAGE 6: Leafy spurge root (bottom right). Source: Biological Control of Leafy Spurge Information Resource CD, Nov 2001, Produced by USDA-ARS TEAM Leafy Spurge. Credit: Rod Lym, North Dakota State University, Department of Plant Science

All other photos. Credit: Michèle Ammeter

Red Bartisa

A) Close-up of red bartsia plant. Credit: Fred Paulson
B) Field of red bartsia. Source: PRFA
C) Fenced area with red bartsia infestation. Credit: Fred Paulson

Common Tansy

A) Common tansy flower. Credit: Candace Parks
B) Common tansy stem with leaves. Source: www.agf.gov.bc.ca/cropprot/weedguid/commtan.htm
C) Common tansy roots. Credit: Michèle Ammeter
D) Patch of common tansy along a roadside. Credit: Candace Parks

Scentless Chamomile

A) Scentless chamomile plant. Source: www.agf.gov.bc.ca/cropprot/weedguid/chamomil.htm
B) Close-up of scentless chamomile flowers. Credit: Michèle Ammeter
C) Field infestation of scentless chamomile. Credit: Michèle Ammeter

Dalmation Toadflax

A) Dalmation toadflax clasping leaves. Source: www.invasive.org/search/action.cfm?q=dalmatian%20toadflax Credit: Steve Dewey
B) Dalmation toadflax flowers Source: www.invasive.org/browse/detail.cfm?imgnum=1459806 Credit: Utah State University Archive, Utah State University, Bugwood.org
C) Dalmation toadflax plant found on a roadside Credit: Kent Shewfelt

Bladder Campion

A) Bladder campion plant showing the flowers and leaves. Credit: Kent Shewfelt
B) Bladder campion plants along a rail line. Credit: Kent Shewfelt

Purple Loosestrife

A) Purple loosestrife plant. Source: www.cwss-scm.ca/Weeds/images/Ly1-purple-loosestrife.JPG
B) Close-up of purple loosestrife flower. Source: www.nps.gov/plants/alien/fact/img/lysa1.jpg
C) Picture of an enlarged Galerucella calmariensis beetle. Source: www.biol.uni.wroc.pl/cassidae/European%20Chrysomelidae/Iconography/Galerucella%20calmariensis.jpg

Ox-eye Daisy

A) Ox-eye daisy flower with quarter for size comparison. Source: Michèle Ammeter
B) Ox-eye daisy plant. Source: www.cwss-scm.ca/Weeds/images/Comp33-ox-eye-daisy.JPG
C) Ox-eye daisy infestation beside a roadway. Credit: Michèle Ammeter