Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

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DRAFT

Pest Risk Management Document for *Galega officinalis* (Goat's-rue) in Canada

http://www.hlasek.com/galega_officinalis_a773.html

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EXECUTIVE SUMMARY

This Risk Management Document (RMD) is part of a three step pest risk analysis process examining the risk associated with importation, cultivation and trade of *Galega officinalis* in Canada. The RMD includes a summary of the findings of a pest risk assessment and identifies and evaluates potential mitigation measures which may be applied to reduce the identified pest risk to acceptable levels. It examines policy alternatives and identifies a recommended risk management approach.

Galega officinalis is a perennial herb of the pea family and is hardy to zone five. It is recognized as a medicinal plant. It spreads in pastures and forage crops, diminishing forage quality by its toxicity to cattle. It can indirectly affect the dairy and beef industries through the increased cost of control in forage crops. It also invades natural areas where it out-competes native species. *Galega officinalis* spreads by seeds which are mainly carried on agricultural machinery and in contaminated alfalfa seed.

Galega officinalis is regulated as a federal noxious weed in the United States (U.S.). It is also regulated in the following states: Alabama, California, Florida, Massachusetts, Minnesota, North Carolina, Nevada, Oregon, Pennsylvania, South Carolina, Vermont, and Washington. The species is established locally in some states of the U.S. where measures are being taken to eradicate the populations.

Two small populations of *Galega officinalis* are known to be present in Ontario and are the only ones known in Canada. One of these is located on Petrie Island, a natural area of ecological significance. The spread of *Galega officinalis* could lead to a deterioration of Petrie Island's natural ecosystem.

The Canadian Food Inspection Agency (CFIA) recommends regulating *Galega officinalis* as a quarantine pest under the *Plant Protection Act*, placing this species on the *List of Pests Regulated by Canada*, and regulating the plant as a prohibited noxious weed under the *Weed Seeds Order* of the *Seeds Act.* These are cost-effective measures to prevent the dispersal of *Galega officinalis* into Canada and will give the CFIA the authority to implement measures for the eradication of populations present in Canada.

With the present document, the CFIA is seeking input from a range of potentially affected stakeholders. Stakeholder views on the recommended risk management option are herein being solicited. Details of the implementation of potential eradication measures will also be discussed with concerned stakeholders.

Preface

As described by the International Plant Protection Convention (IPPC), Pest Risk Analysis (PRA) includes three stages: initiation, pest risk assessment and pest risk management. Initiating the PRA process involves identifying pests and pathways of concern and defining the PRA area. Pest risk assessment provides the scientific basis for the overall management of risk. Pest risk management is the process of identifying and evaluating potential mitigation measures which may be applied to reduce the identified pest risk to acceptable levels and selecting appropriate measures. Pest risk communication is an additional component of PRA that is common to all stages of the PRA process.

This Risk Management Document (RMD) includes a summary of the findings of a pest risk assessment and records the pest risk management process for the identified issue. It is consistent with the principles, terminology and guidelines provided in the IPPC standards for pest risk analysis which may be found at https://www.ippc.int/.

1.0 PURPOSE

The purpose of this document is to examine, with affected stakeholders, the options for mitigating the risks associated with the introduction of *Galega officinalis* L. (goat's-rue) into Canada.

2.0 SCOPE

This Risk Management Document (RMD) examines the risks associated with the introduction of *Galega officinalis* into Canada and outlines potential risk management options. It focuses on the phytosanitary risks associated with the plant itself. Pest risk analysis of pests that may be associated with the plant is not within the scope of this document.

Additional points for consideration:

1. Prior to use as human food, new plants and/or derived products that fit the definition of a novel food require approval under the authority of the *Food and Drugs Act* from Health Canada.
2. Prior to use as livestock feed, new plants and/or derived products must be assessed and approved by the Animal Feed Division, Canadian Food Inspection Agency (CFIA) under the authority of the *Feeds Act* and Regulations. A positive list of approved ingredients can be found in Schedules IV and V of the *Feeds Regulations, 1983*.
3. Release (e.g. cultivation) of new plants into the Canadian environment may require prior approval under the authority of the *Seeds Act* and the *Seeds Regulations* from the Field Crops Division, CFIA.

4. The importation and sale of seed in Canada must meet the requirements of the *Seeds Act, Seeds Regulations* and *Weed Seeds Order*.
5. In addition to the mitigation measures suggested in this document, imported commodities likely to contain **Scientific name* must meet the phytosanitary requirement for other regulated organisms, as stated in CFIA's Plant Protection Policies and Directives (http://www.inspection.gc.ca/english/plaveg/protect/dir/directe.shtml).

3.0 DEFINITIONS

Definitions for terms used in this document can be found in the Plant Health Glossary of Terms at www.inspection.gc.ca/english/plaveg/protect/dir/glosterme.shtml or the IPPC Glossary of Phytosanitary Terms at www.ippc.int.

4.0 BACKGROUND

Two populations of *Galega officinalis* are present in Ontario, Canada. This species is not currently regulated in Canada, but it is regulated as a federal noxious weed in the U.S.

Galega officinalis is being considered for regulation as part of the Least Wanted Invasive Plants project:

- The CFIA has initiated a "Least Wanted Invasive Plants" project in order to expand on its efforts to prevent the introduction and spread of invasive plants[1] in Canada. The goal of this project is to identify Canada's "least wanted" plants and regulate them as quarantine pests[2] under the *Plant Protection Act*. .
- This project builds on past efforts to prevent the introduction of invasive plants and weeds into Canada under the *Plant Protection Act* and the *Weed Seeds Order* under the *Seeds Act.*
- The CFIA is carrying out this project as part of its commitment to limit the introduction and spread of invasive plants under *An Invasive Alien Species Strategy for Canada* (Government of Canada 2004). The Strategy aims to reduce the risk of invasive species to the environment, economy, and society, and to protect environmental values such as biodiversity and sustainability.

5.0 PEST RISK ASSESSMENT SUMMARY

The information in Section 5 is taken from the pest risk assessment (PRA# 2009-20goaf) conducted by K.Allison, Plant and Biotechnology Risk Assessment Unit, CFIA, in 2009.

[1] **Invasive plants** are plant taxa that spread when introduced outside of their natural past or present distribution and cause serious and often irreversible damage to Canada's ecosystems, economy and society (definition adapted from *An Invasive Alien Species Strategy for Canada* (Government of Canada 2004).
[2] A **quarantine pest** is a pest of potential economic importance, not yet present in Canada or present but not widely distributed and under official control (IPPC 2007).

5.1 Identity of Organism

NAME: *Galega officinalis* L. (family Fabaceae (alt. Leguminosae), subfamily Faboideae, tribe Galegeae, subtribe Galeginae) (USDA-ARS 2009)

SYNONYMS: *Accorombona tricolor* (G. Don) Benth. ex Walp., *Callotropis* tricolor G. Don, *Galega bicolor* Boiss. & Hausskn. ex Regel, *Galega coronilloides* Freyn & Sint., *Galega patula* Steven, *Galega persica* Pers., *Galega vulgaris* Lam. (Tropicos 2009; USDA-ARS 2009).

ENGLISH COMMON NAMES: goat's-rue, catgut, French-lilac, galega, Italian fitch, professor weed, goat's rue, goatsrue

FRENCH COMMON NAMES: galéga officinal, avanèse, lilas d'Espagne, rue de chèvre, rue des chèvres

DESCRIPTION: *Galega officinalis* is a stout, erect, glabrous, tap-rooted perennial herb of the Fabaceae. It grows to a height of 60-150 cm. The leaves are pinnately compound and the inflorescence is a many-flowered raceme of white to lilac flowers. It has oddly-pinnate leaves with 6-12 pairs of leaflets. The seed pods are roughly 2.5 cm long, narrow and round in cross section (Clapham et al. 1962; Oldham 2009). It has been grown for medicinal use, as a forage crop and as a honey plant (Bailey and Bailey 1976; USDA-ARS 2009).

5.2 Organism Status

Galega officinalis has been reported to occur very locally in Canada. Based on this information, for the PRA area, the species is considered present in specific very small areas. Known occurrences are in Toronto in 1953, where it did not become established, and three locations in Ottawa (Darbyshire and Hanrahan 2000; Reddoch and Reddoch 2000; Scoggan 1979). At least two of the Ottawa populations have persisted to the present. One is located on a private land, and the other location is owned by the City of Ottawa, at Petrie Island. The persistence of the last one has not been confirmed (S. Darbyshire, AAFC, personal information, 2009). The species is listed as present in Quebec in one publication (Darbyshire 2003), but it is not listed in the PLANTS database (USDA-NRCS 2009) or Kartesz (Kartesz and Meacham 1999) so its current status there is uncertain.

5.3 Current Regulatory Status

CANADA: *Galega officinalis* is not currently regulated as a pest in Canada.

UNITED STATES: Listed in the USDA-APHIS[3] Federal Noxious Weed List under the *Noxious Weed Regulation* (*Federal Noxious Weed Act*). No person may move a Federal Noxious Weed into or through the United States, or interstate, unless this person obtains a permit for such movement (*Noxious Weed Regulation*). Also regulated in the following states: Alabama, California, Florida, Massachusetts, Minnesota, North Carolina, Nevada, Oregon, Pennsylvania, South Carolina, Vermont, Washington (USDA-ARS 2009; USDA-NRCS 2009).

[3] Animal and Plant Health Inspection Service, United States Department of Agriculture

5.4 Probability of Entry

Galega officinalis reproduces only by seed and the most likely entry pathway is as a deliberate introduction of seed for planting (Table 1).

Table 1. Summary of Pathways

Type of pathway	Specific pathways
Natural dispersal	Spread is entirely by seed. Seeds can float and flowing water seems to be the most common means of dispersal locally. This would only be an entry pathway if there were populations very close to the border.
Intentional introduction	*Galega officinalis* was introduced in 1891 to Logan, Utah for testing at the Utah Agricultural Experiment Station in the late 1800s as a possible forage crop (Oldham 2009). The plants are also used medicinally. The species is no longer being seen as a potential forage because of palatability and toxicity issues, but it is still mentioned widely on the internet, for example, as a herbal medicine, so it could be brought in for this purpose.
Unintentional introduction	Movement of seed on farm equipment could introduce *Galega officinalis* into new areas (Patterson 1992). This would only be a pathway if contaminated vehicles were moved from the infested areas of the U.S. into Canada. Contaminated seed lots are a possible entry pathway (Oldham 2009). This is a possibility if suitable seed lots, such as alfalfa, were imported from infested areas.

5.5 Probability of Establishment

Galega officinalis is native to North Africa (Algeria, Morocco), Asia (n. Pakistan) and Europe (Austria, Czechoslovakia, Germany, Hungary, Poland, Albania, Bulgaria, Greece, Italy, Romania, Yugoslavia, France and Spain) (USDA-ARS 2009). It has been introduced in North America as a medicinal herb and for trials as a forage crop. In Utah, the species has escaped from unsuccessful experimental plantings to become an invasive weed (Darbyshire and Hanrahan 2000). Populations in Utah are mostly in areas of high soil moisture such as ditch- banks, irrigated pastures and alfalfa fields, and natural seepage areas (Patterson 1992). Experimental plantings in Philadelphia (Pennsylvania) also spread locally along the banks of a waterway

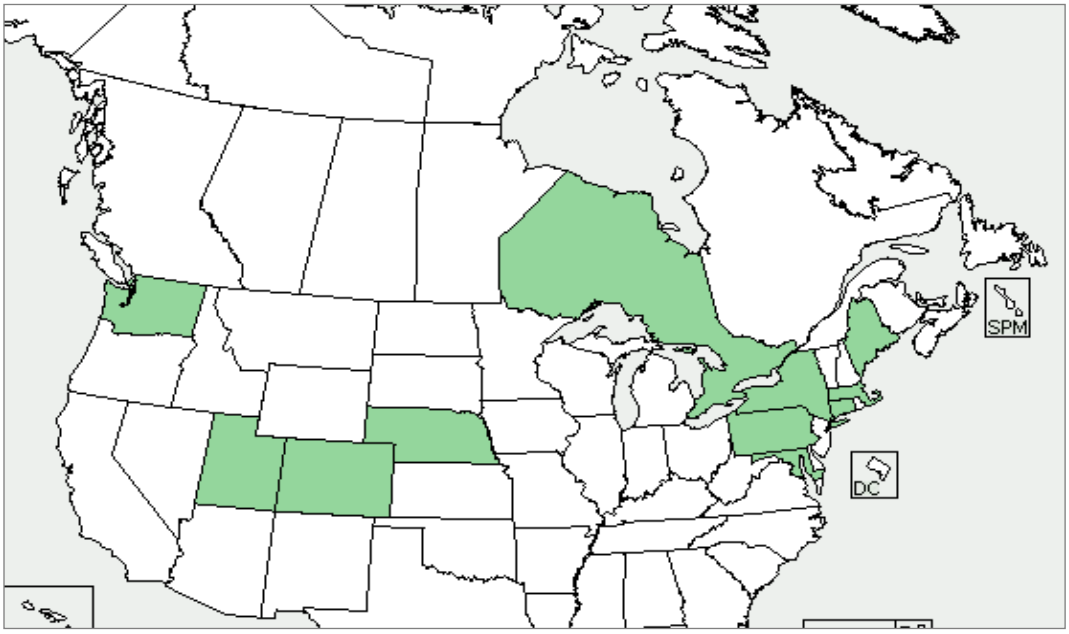


Figure 1. Range of *Galega officinalis* in North America (USDA, NRCS 2009)

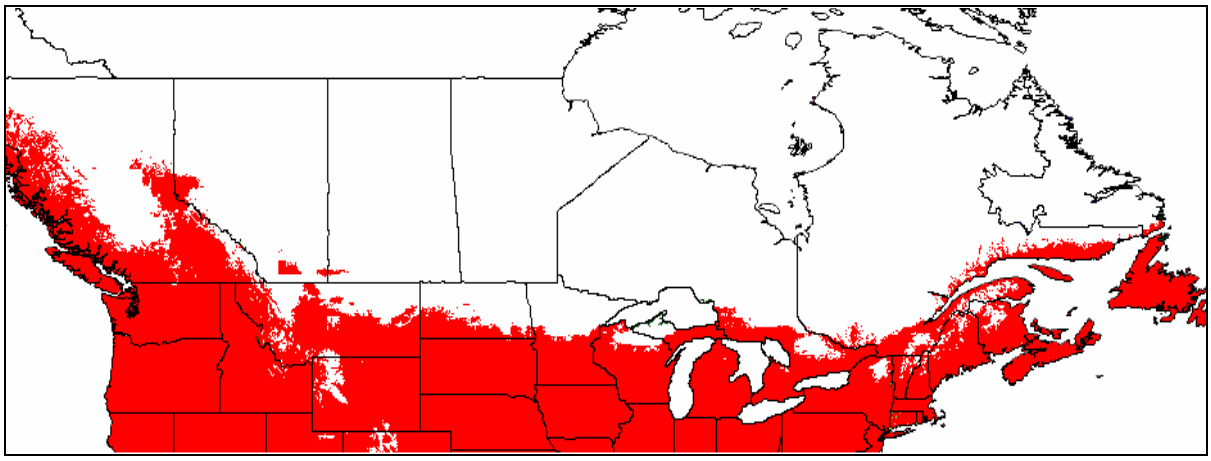


Figure 2. Potential range of *Galega officinalis* in Canada (NAPPFAST zones 5-9)

(Stokes 1964). To date, the population in Philadelphia has been greatly reduced and still under control (A. Rhodes, Morris Arboretum of the University of Pennsylvania, personal communication, 2009). *Galega officinalis* has been reported in Colorado, Connecticut, Massachusetts, Maryland, Maine, Nebraska, New York, Pennsylvania, Utah and Washington (USDA-NRCS 2009). See Figure 1 for a map of the distribution in Canada and the U.S. The collections in Colorado, Connecticut, New York and Maine are old (1930-1960), and it is uncertain that it still persists in those states. *Galega officinalis* has also been reported from Argentina, Chile, Ecuador, and New Zealand (Lasseigne 2003).

The current range of *Galega officinalis* suggests that plants can survive to NAPPFAST zone 5. This would mean that the potential range in Canada would include coastal, southern and interior British Columbia, small areas in the Peace region of Alberta as well as parts of southern Alberta and Saskatchewan, southern Ontario and Quebec, and most of the Maritime Provinces, including Newfoundland (Figure 2).

5.6 Probability of Spread

The plants prefer stream banks and other moist areas in full sun. Apparently, the pods are buoyant for a short time before becoming saturated with water and sinking (Klugh 1998). *Galega officinalis* is most commonly found where there is an ample water supply keeping the soil moist throughout the year. It is often found along waterways, pastures, fencelines, roadways and wet marshy areas in Utah (Oldham 2009). These types of habitats are readily available in the parts of Canada where *Galega officinalis* is hardy.

Galega officinalis was introduced in 1891 to Logan, Utah. By 1974 the species had spread substantially in Cache Valley County and was placed on the Utah Noxious Weed list. In the late 1970's it was estimated to have infested 60 square miles (Oldham 2009).

Most seed dispersal is by means of waterways, but may also occur through harvesting equipment, animal manures, soil moving operations, and contaminated alfalfa seed (Oldham 2009).

5.7 Potential Economic Consequences

Galega officinalis has become a locally serious weed in Pennsylvania and an invasive on at least 95 km^2 in Utah. Eradication efforts are being made in both of these states (Klugh 1998). The species has also become a weed problem in New Zealand, England, Chile, Ecuador, and Argentina (Oldham 2009)

Galega officinalis contains a poisonous alkaloid, galegin, which gives the plants a bitter taste, making them unpalatable to cattle and horses. In goats, the foliage causes vomiting and even death under some conditions (Lasseigne 2003). Its presence as a contaminant of alfalfa hay can make the hay unpalatable (Patterson 1992).

Galega orientalis (fodder galega), a similar species, demonstrates a great potential as an alternative forage crop. It has been tested by Agriculture and Agri-Food Canada at nine stations across Canada (AAFC 2001). The levels of alkaloids in *Galega orientalis* are not high enough to be toxic to ruminant livestock, which is the case of *Galega officinalis* (AAFC 2001).

5.8 Potential Environmental and Social Consequences

Plants form dense crowns and spread along waterways (Klugh 1998). The species has spread to natural seepage areas in Utah (Patterson 1992). In Pennsylvania, *Galega officinalis* became well-established along waterways in open areas (Stokes 1964).

5.9 Uncertainty

There is uncertainty about the ability of *Galega officinalis* to persist in NAPPFAST zone 5. Populations in Ontario are either very recent or have failed to establish in the long term.

5.10 Conclusion

Based on the outcome of this pest risk assessment, *Galega officinalis* is likely to establish and become weedy or invasive in much of southern, interior and coastal British Columbia, limited areas in Alberta and southern Saskatchewan, southern Ontario, southern Quebec and most of the Maritime Provinces, if it is introduced to these areas. This plant should be considered for regulation under Canada's *Plant Protection Act* and *Seeds Act*. It is recommended that the pest risk analysis process continue for this plant with the completion of a Risk Management Document.

5.11 Technical Issues for Consideration

There should be no problems with identifying either the plants or seeds of *Galega officinalis* by trained personnel.

6.0 RISK MANAGEMENT CONSIDERATIONS

6.1 Introduction to Mitigation Measures

In cases where different risk mitigation approaches are possible, the RMD provides a means of communicating and recording information. In this section, potential risk mitigation measures are provided for each pathway type outlined in Section 5.4, Table 1. The effectiveness and feasibility of those mitigation measures are discussed including impacts on the CFIA, practicality of implementation, impacts on Canadian stakeholders, impacts on trading relationships, and short-term and long-term sustainability.

This RMD documents the rationale in determining the regulatory status of the plant. It outlines the possible phytosanitary requirements for traded commodities. The commodities may be the plant under consideration for regulation itself (intentional introduction) or a product contaminated with the plant (unintentional introduction).

6.2 International Responsibilities, Government of Canada Priorities and CFIA Objectives

The CFIA plays an important role in protecting Canada's plant resource base from pests and diseases. The objectives of the Plant Protection Program within the CFIA are: (1) to prevent the introduction and spread within Canada of plant pests of quarantine significance, including invasive plants; (2) to detect and control or eradicate designated plant pests in Canada; and (3) to certify plant and plant products for domestic and export trade.

Canada is a contracting party to the International Plant Protection Convention (IPPC). Canada is a member of the World Trade Organization (WTO), and the IPPC is formally identified in the WTO Sanitary and Phytosanitary (SPS) Agreement as the international standard setting organization for phytosanitary measures. The IPPC is an international treaty to secure action to prevent the spread and introduction of pests of plants and plant products (including plants as pests), and to promote appropriate measures for their control. As the administrator of the *Plant Protection Act*, the CFIA is Canada's official National Plant Protection Organization responsible for implementing the standards of the IPPC in Canada.

The *Plant Protection Act* provides authority to prevent the importation, exportation and spread of pests injurious to plants, and provides for control and eradication methods and for the issuance of certificates.

In 1996, as a party to the United Nations Convention on Biological Diversity (CBD), Canada developed its own Canadian Biodiversity Strategy, which recognized the need to conserve biological diversity and promote the sustainable use of biological resources through legislation, incentives, increased understanding and other means. As party to these international and national instruments, Canada has a strong commitment to addressing the deleterious impacts of invasive plants.

6.3 Values at Risk

6.3.1 Alfalfa Production and Livestock Industry

Galega officinalis is found in established alfalfa fields in its current range. Up to 658 000 ha of alfalfa is cultivated in hardiness zone 5 and higher in Canada (Table 2). Most of these areas are located in Southern, Central and Western Ontario.

The presence of *Galega officinalis* in forage would reduce its quality. Alfalfa forage is a valuable feed to ruminants. Increase in alfalfa production costs due to the cost of control could impact dairy production, as well as beef production. In 2007, the dairy and beef industries brought total revenue of $1206.2 and $842.7 million respectively to farms located in Southern, Central and Western Ontario (OMAFRA 2006).

6.3.2 Seed Trade

The spread of *Galega officinalis* in Canadian forage seed crops could impact seed trade with the U.S.

Galega officinalis is listed as a federal noxious weed in the U.S. U.S. authorities could therefore refuse the entry of a seed lot found to contain *Galega officinalis* seed. Canadian growers export $12.6 to $37.4 million of alfalfa seed to the U.S. every year (Table 3).

Table 2. Alfalfa crops at risk to be impacted by the spread of *Galega officinalis* in areas located in Plant Hardiness Zones 5 and higher

	Alfalfa and alfalfa mixtures [a] (ha)
Ontario	580 000
Atlantic	27 000
British Columbia	51 000
Total area under cultivation	**658 000**

[a] Source: Statistics Canada 2002.

Table 3. Canadian alfalfa seed exports

	2004	**2005**	**2006**	**2007**	**2008**
United States (U.S.) ($million)	17.4	12.6	20.3	32.8	37.4
Other countries ($million)	13.0	5.5	10.3	10.2	6.2
Total all countries ($million)	30.6	18.1	30.6	43.0	43.6

Source: Statistics Canada in Industry Canada 2009 [HS code 120921]

6.3.3 Petrie Island, Ottawa (ON)

- The *Galega officinalis* population present at Petrie Island is a threat to the ecological integrity of a significant natural ecosystem in Ontario. Located in the Ottawa Greenbelt, Petrie Island is a 270 ha representative piece of Canada's wetlands surrounded by urban lands. The island is designated as a provincially significant area by the Ontario Ministry of Natural Resources (OMNR 2008).

  The entire area supports a wide diversity of plants, including 29 regionally or provincially rare plant species, and the greatest known concentration of *Celtis occidentalis* (hackberry tree) in this part of Canada (Hanrahan and Darbyshire 1998).

  Petrie Island is a nesting area for three turtle species that are designated as national Species at Risk, as well as two other turtle species. The Friends of Petrie Island and the Ottawa Stewardship Council, with support from OMNR, undertook a project in 2009 to enhance and expand the existing nesting site (FOPI 2009).

- The *Galega officinalis* population present at Petrie Island, Ottawa (Ontario) is a threat to the integrity of a popular natural area frequented by residents of the National Capital Region. Petrie Island provides the population of the National Capital Region with a place for practicing a range of activities and enjoying natural ecosystems of Canada.

6.4 Potential Mitigation Measures for Populations Present in Canada

6.4.1 Potential control measures

- The regulation of *Galega officinalis* under the *Plant Protection Act*, as a quarantine pest, would provide the CFIA with the authority to eradicate populations of the weed and prevent its spread. The CFIA could require different risk-based measures. These could include restriction or prohibition of movements and activities in the infested areas and requiring control actions to be taken.
- The CFIA will prefer to complete the eradication work in partnership with the provincial government and/or the municipality. Roles and responsibilities of the partners would be described in a memorandum of understanding.

6.4.2 Cost of the control measures

The cost would vary depending on the approach chosen. Different approaches can be explored with affected stakeholders and CFIA partners. In Utah, an integrated approach is used to eradicate *Galega officinalis* (Evans et al. 1997; Evans 1984). Mechanical methods of control are not efficient alone. They can be used in combination with herbicide applications. Several herbicides efficiently control *Galega officinalis* (Oldham 2009). Because the seeds remain viable for up to 26 years, any eradication approach should focus on seed bank management (Oldham 2009).

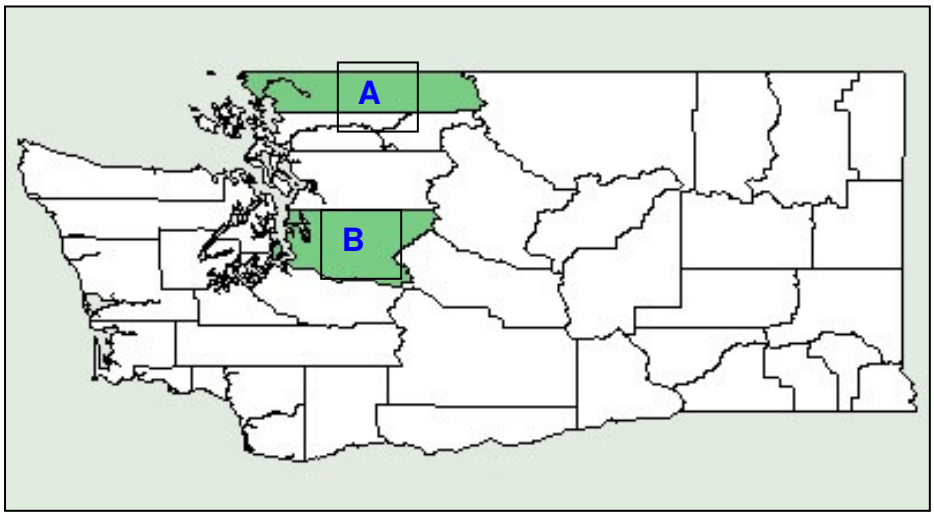
6.4.3 Feasibility and cost-efficiency of the control measures

At this time, eradication of *Galega officinalis* is still feasible. If the CFIA delays taking action, this opportunity may be lost. The populations are small but their size could increase and the plant could spread to other locations. If that were to occur, the difficulty and the costs of control would increase exponentially.

6.5 Potential Mitigation Measures for Natural Means of Dispersal

No mitigation measures are needed for natural means of dispersal. *Galega officinalis* seeds are not likely to enter Canada by flowing water. There is no population very close to the U.S.-Canada border:

- The population in the state of Pennsylvania is under control and located in Philadelphia, far away from Lake Erie.
- *Galega officinalis* has a very limited distribution in the State of Washington (see Figure 3).
    - Records indicate that *Galega officinalis* was reported from a county adjacent to Canada (Whatcom County, Washington) in 1921. However, no populations are currently reported in that area (Washington State NWBC 1999 *in* Discoverlife.org, 2007).



Legend: A - Whatcom County; B - King County.

Figure 3. Distribution of *Galega officinalis* in the State of Washington (USDA, NRCS PLANTS Database)

- The only known field locations in the State of Washington are in King County and the populations are all being actively controlled (King County Government 2009; Washington State NWBC 2008).

6.6 Potential Mitigation Measures for Intentional Introduction Pathways

6.6.1 Plants for Planting excluding Seed

6.6.1.1 Previous imports

- Based on the information available, no plant of *Galega officinalis* has been recently imported into Canada (CFIA, internal data). The CFIA issued one import permit for *Galega* sp. in 2005. When contacted, the proponent declared that *Galega officinalis* is neither cultivated or offered for sale at his nursery.
- Imports from the continental U.S. are not likely to occur because *Galega officinalis* is regulated in the U.S. as a federal noxious weed.

6.6.1.2 Potential risk mitigation measures

Non-regulatory measures

a. Use sterile cultivars if they exist. Effiency is unknown. The CFIA has never received an application to import sterile cultivars of *Galega officinalis*.

b. Encourage voluntary cessation of the sale of *Galega officinalis.* Voluntary cessation is not effective by itself, but could support other measures.

c. Increase public awareness of the risk posed by this plant, publish a factsheet online, and distribute awareness material to garden centers, botanical gardens, gardeners

associations, horticulture industry groups, etc. Not considered effective by itself, but could support other measures.

Regulatory measures

d. Allow sale of *Galega officinalis* with special conditions such as not to be grown close to natural areas and mandatory control of volunteers. Allowing sale with special conditions is not considered effective because once grown in private gardens, CFIA does not have adequate resources to monitor.

e. Regulate *Galega officinalis* under the *Plant Protection Act* as a quarantine pest:

- Refuse to issue Permits to Import for plants of *Galega officinalis* [4].
- Will require that importers of material from regions other than the continental U.S. specify the scientific name when applying for a Permit to Import plant and propagative material;
- Will require that the scientific name be provided on the Phytosanitary Certificate for all plants exported to Canada from the continental U.S..

6.6.1.3 Trade Implications

The restriction to market access is expected to be insignificant because most imported plants for planting come from the U.S. where *Galega officinalis* is listed as a Federal Noxious Weed.

Trade implications are expected to be low. There does not appear to be any real interest in growing *Galega officinalis* in Canada. *Galega orientalis* demonstrates more potential than *Galega officinalis* as a forage plant (AAFC 2001).

6.6.1.4 Cost-effectiveness and Feasibility

- No additional staff would be required at the CFIA Plant Health and Biosecurity Permit Office.
  - Applications to a Permit to Import from the non-continental U.S. (CFIA 2008a, 2009a) are reviewed by CFIA officers on a regular basis.
  - Phytosanitary certificates for imports from the continental U.S. (CFIA 2008b) are reviewed by the Import Service Center, but imports from this origin are not likely to occur.
- Official control for the purpose of eradicating the two known populations located in Ottawa is feasible and cost-effective (see Section 6.4).

6.6.2 Seed

6.6.2.1 Previous imports

[4] Plants intended to be grown in confinement for research purposes may be imported under a Section 43 Import Permit. The measures required on the permit should be respected. Importing facilities are subject to CFIA inspection.

- Based on available information, no seed in the genus *Galega* has been recently imported into Canada. Imports from the continental U.S. are unlikely (see section 6.6.1.1).

6.6.2.2 Potential risk mitigation measures

a. Regulate *Galega officinalis* as a prohibited noxious weed (Class 1) under the *Weed Seeds Order* of the *Seeds Act*[5].

   - Seed of the species listed in Class 1 Prohibited Noxious Weed Seeds of the *Weed Seeds Order* cannot be imported into Canada.
   - To meet the definition for Class 1[6], this species must be under official control (consult Section 6.4), which is currently not the case. The implementation of official control requires the regulation of *Galega officinalis* under the *Plant Protection Act*.

b. Regulate as a quarantine pest under the *Plant Protection Act*. Add this species to the *List of Pests Regulated by Canada* (CFIA 2009b) in order to:

   - Prevent the importation, movement, and cultivation of this species in Canada. Currently, seed of many new crop species, such as field crops, can be imported without a Permit to Import or a Phytosanitary Certificate [7].
   - Enable inspectors to take appropriate action for the purposes of eradicating the pest or preventing its spread[8].

Regulatory actions under the *Plant Protection Act* could include the following:

- Prohibit importation of *Galega officinalis* seed and refuse to issue Permits to Import for seed of *Galega officinalis*. The only exceptions would be for the importation of devitalized seed and the importation of seed or preserved specimens for scientific research purposes by recognized herbaria and research facilities.
- Require importers of plant material from the non-continental U.S. to apply for a Permit to Import with scientific name specified.
- Seed of horticultural plants is not within the scope of CFIA's draft directive D-08-04 on plants for planting (CFIA 2008b). Therefore phytosanitary

[5] The *Seeds Act* provides authority for the testing, inspection, quality and sale of seeds in Canada.
[6] A **prohibited noxious Class 1 species** is not yet present in Canada, or is under official control as it has not yet reached its full ecological range. Official control is used to prevent further spread of the species and with the goal of eradicating the species. The species must be a weed whose presence in seed could affect the value and/or intended use of the seed; and/or could have potential impact on the economy, human and/or animal health. This determination would be based on a Pest Risk Assessment type process. The species must have identifiable seeds that can be visually distinguished from those of other species, or in rare instances, from entire genera.
[7] *Ibid* note 4.
[8] This could include: quarantine of commodities suspected of being infested with the pest; request for appropriate treatment to remove the pest; prohibit or restrict items coming from an infested area; or request that items suspected of being infested with the pest are disposed of by the party in possession of the items.

requirements will be specified under a new regulatory directive or D-08-04 will be revised.

c. Sufficient information about the use of *Galega officinalis* as a potential crop does not exist. If the proponent, located in Canada, needs to collect more information about the plant (e.g. to generate data for a determination of environmental safety), then confined research trials under Part V of the *Seeds Regulations* could be authorized by the Plant Biosafety Office.

6.6.2.3 Trade Implications

- The loss of market is expected to be very low (see section 6.6.1.3).

6.6.2.4 Cost-effectiveness and Feasibility

- The CFIA Seed Program is already in place to prevent the entry of prohibited noxious weeds. Verification of compliance can easily be carried out through the Seed Marketplace Monitoring Program[9].
- Official control for the purpose of eradicating the two known populations located in Ottawa is feasible and cost-effective (see Section 6.4).

6.7 Potential Mitigation Measures for Non-intentional Introduction Pathways

6.7.1 Seed of alfalfa

6.7.1.1 Previous imports

- *Galega officinalis* has never been identified in imported seed lots (CFIA, internal data).
- Between 2004 and 2008, low values of alfalfa seed (an aproximative average of $345,000 /year) were imported from countries and states where *Galega officinalis* is present (see Figure 4 and Appendix 1).
- The imports are destined to Ontario (54%) and British Columbia (7%), where *Galega officinalis* could find suitable conditions to establish (Statistics Canada *in* CSTA 2009).

[9]This sampling program helps to ensure that seeds sold in, imported into and exported from Canada meet established standards for quality, including varietal purity and germination, and are labelled so that they are properly represented in the marketplace, and in the case of most agricultural crop varieties, are registered prior to sale in Canada.

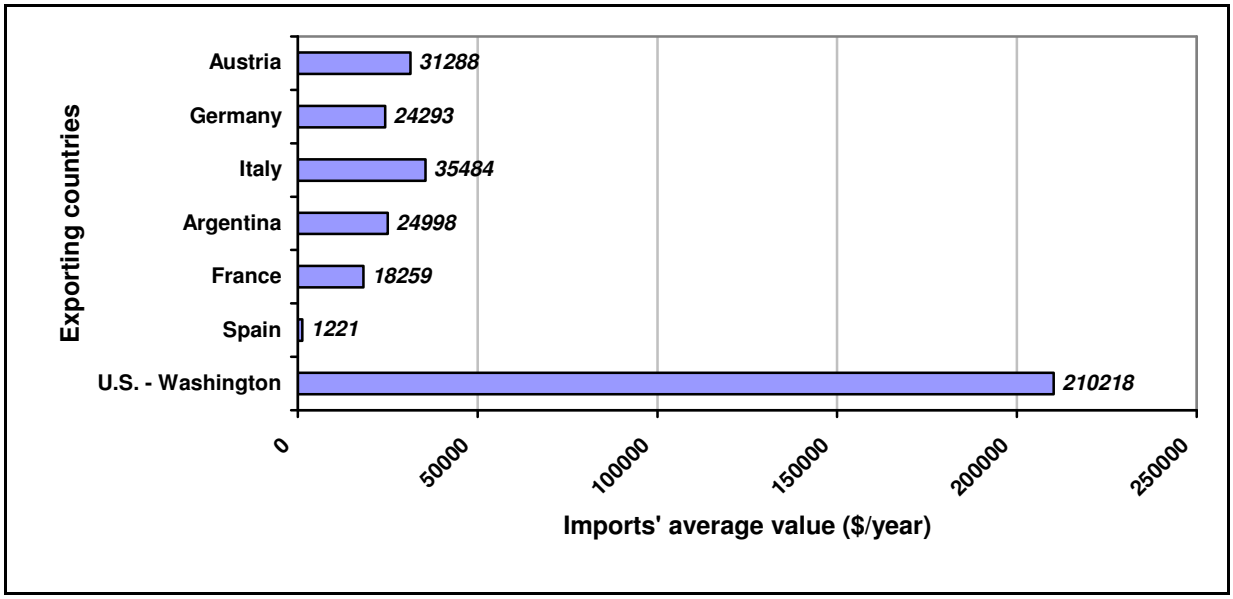


Figure 4. Average annual value of alfalfa seed (HS code 120921) imported into Canada between 2006 and 2008 from countries where *Galega officinalis* is present (Statistics Canada).

6.7.1.2 Potential risk mitigation measures

a. Regulate *Galega officinalis* as a prohibited noxious weed (Class 1) under the *Weed Seeds Order* of the *Seeds Act.* Refer to Section 6.6.2.2.

b. Regulate *Galega officinalis* as a Class 2 under the *Weed Seeds Order* of the *Seeds Act.*

- Definitions have been developed for each class under the *Weed Seeds Order* and listing this species as Class 2 would help to slow its spread within Canada. This species meets the definition for Class 2.[10]

c. Regulate *Galega officinalis* as a quarantine pest under the *Plant Protection Act* and add this species to the *List of Pests Regulated by Canada* (CFIA 2009b) in order to:

- prevent the importation, movement, and cultivation of this species in Canada.
- enable inspectors to take appropriate action for the purposes of eradicating the pest or preventing its spread.

Regulatory actions under the *Plant Protection Act* could include one or more of the following:

[10] The **primary noxious Class 2 species** is present in Canada and has not reached its full ecological range. The species must be a weed whose presence in seed could affect the intended use of that seed lot and could have a potential impact the economy, human and/or animal health. This determination would be based on a Pest Risk Assessment type process. The species must have identifiable seeds that can be visually distinguished from those of other species, or in rare instances, from entire genera.

- Exporters could be required to obtain a Phytosanitary Certificate stating freedom from *Galega officinalis*.
- Exceptions may be made for the importation of preserved specimens for scientific research purposes by recognized herbaria and research facilities and the importation of seed for research in containment facilities.
- Could negotiate phytosanitary agreements to certify imports from pest free areas and/or recognize noxious weed certification in countries or states of origin.

6.7.1.3 Trade implications

- Exporting countries currently devote resources towards inspection of seed lots and issuance of Phytosanitary Certificates. Laboratories in exporting countries will need to be able to identify seeds of *Galega officinalis* within a seed sample. Exporters need to ensure freedom of *Galega officinalis* in seed lots, otherwise CFIA can refuse import.
- Regulating *Galega officinalis* under the *Weed Seeds Order* as a prohibited noxious weed would facilitate seed trade with the U.S. because this species is listed as a Federal Noxious Weed in the U.S.

6.7.1.4 Cost-effectiveness and Feasibility

- The CFIA Seed Program is already in place to prevent the entry of prohibited noxious weeds. The CFIA monitors compliance with the Canadian standards through the Marketplace Monitoring Program.
- The seeds of *Galega officinalis* are easily identified. Due to the relative large size of *Galega officinalis* seeds (4.2 X 2.1 mm), they can be removed from alfalfa seeds by screening.
- Official control for the purpose of eradicating the two known populations located in Ottawa is feasible (see Section 6.4). The CFIA will evaluate the cost-effectiveness of this option with its partners.

6.7.2 Vehicles and Used Farm Machinery

6.7.2.1 Previous imports

- A considerable volume of vehicles cross the U.S.-Canada border every year.
- Information is not available on the volume of imports of used farm machinery.

6.7.2.2 Potential Risk mitigation measures

Enforcement of the Directive 95-26: "*Phytosanitary requirements for soil and related matter, alone or in association with plants*" (CFIA 2008c).

In 2003, the Canada Border Services Agency (CBSA) assumed responsibility for the initial import inspection services in respect to the Acts and Regulations administered by the CFIA to the extent that they are applicable at Canadian border points. The

inspection of goods that may be contaminated with soil are among the responsibilities that were transferred to the CBSA in 2003. The Food, Plant and Animals Programs Section of the CBSA is currently finalizing its Standard Operating Procedures (SOP) concerning the "Inspection of Imported Goods Potentially Contaminated with Soil." This SOP provides the CBSA's Border Services Officers with formal procedures for the inspection and disposition of goods that may be contaminated with soil, including used agricultural machinery and vehicles.

7.0 PEST RISK MANAGEMENT OPTIONS

7.1 Introduction

Table 4 summarizes the risk management options considered for *Galega officinalis*.

Table 4. Advantages and disadvantages of the pest risk management options

Options	Advantages	Disadvantages
1 Place *Galega officinalis* on the *List of Pests Regulated by Canada* AND Regulate *Galega officinalis* as a prohibited noxious weed under the *Weed Seeds Order* of the *Seeds Act.* AND Implement Official Control measures for *Galega officinalis* populations present in Canada.	· Control over all of the pathways of introduction. · Authority to enforce Official Control for populations present in Ontario. · Protection of natural ecosystems, including Petrie Island's marshes and recreational area. · Protection of seed trade with the U.S. (trade value is worth $12.6 to $37.4 million/year) · Protection of 658,000 ha of alfalfa crops. · Protection of the dairy and livestock industry that is worth about $2.05 billion in the areas at risk.	· Potential costs to the owner of the non-compliant good in the exporting country. · Potential costs and impacts to trading partners and trading relationships (trade value potentially affected is worth $345,000/year). · Resources needed by CFIA for marketplace monitoring, surveillance, inspector training, communication material, sampling. · Resources needed by CFIA to enforce the regulation if non-compliance found. · Resources needed by CFIA to administer and enforce Official Control for populations in Ontario (eradication or containment measures). · Potential costs to businesses, citizens and municipality affected by the trade impacts of regulation and official measures to control any infestations, as specified in the Regulations of the *Plant Protection Act*. Financial impacts will depend of the approach chosen
2 Do not place *Galega officinalis* on the *List of Pests Regulated by Canada* AND Add to list as a prohibited noxious weed under the *Weed Seed Order* of the		· Not feasible. The species does not meet the definition of Class 1 unless the CFIA implements control measures for the populations present in Ontario. Control measures can only be implemented if the species is regulated as quarantine pest under the *Plant Protection Act*.

	Seeds Act.		
3	Do not place *Galega officinalis* on the *List of Pests Regulated by Canada* AND Add to list as a primary noxious weed Class 2 under the *Weed Seeds Order* of the *Seeds Act*.	· Would help to slow its spread within Canada.	· No authority to refuse the entry of plants of *Galega officinalis* for planting. · No authority to require phytosanitary measures for seed lots containing *Galega officinalis* seed and meeting the standard for the grade of the seed lot. · No authority to require mitigation measures for commodities other than seed contaminated with *Galega officinalis*. · No authority to apply official control measures to populations in Ontario. · Only limited increase in protection of natural ecosystems.
4	*Status Quo* – Do not place *Galega officinalis* on the *List of Pests Regulated by Canada* AND Do not regulate *Galega officinalis* as a prohibited noxious weed under the *Weed Seeds Order* of the *Seeds Act*.	· No additional costs for the CFIA. · No additional requirements for exporters to Canada.	· No authority to refuse the entry of plants of *Galega officinalis* for planting. · No authority to require mitigation measures for commodities contaminated with *Galega officinalis*. · No authority to apply official control measures to introduced or established populations. · No protection of our natural ecosystems.

7.2 Preferred Option

The CFIA recommends Option 1.

- As a signatory party under the International Plant Protection Convention (IPPC), the Government of Canada has a right to prevent the entry into Canada of invasive plants that can cause serious damage or threaten biodiversity, and to officially control them if they are present. As a signatory party to the Convention on Biodiversity, the Government of Canada shall, as far as possible and as appropriate, prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or native species.
- *Galega officinalis* presents a serious risk to the Canadian environment and economy, to seed trade between Canada and the U.S. and to the biodiversity of native ecosystems.
- Effective mitigation measures currently do not exist to prevent the entry of *Galega officinalis* in Canada.
- The proposed risk management option is cost-effective and the advantages clearly outweigh the disadvantages.

Under the *Plant Protection Regulations,* imported commodities must be free from species on the *List of Pests Regulated by Canada*. Seeds or grain suspected of being contaminated with *Galega officinalis* could be re-cleaned to remove the contaminant seeds. *Galega officinalis* seeds can be readily screened out of alfalfa due to the relative large size of the seeds (4.2 X 2.1 mm). This should be done in the exporting country. Field inspections or laboratory testing could be used to ensure freedom from species of quarantine concern.

Exemptions may be made for the importation of devitalized seed and the importation of preserved specimens for scientific research purposes by recognized herbaria and research facilities. Grain of *Galega officinalis* or commodities that may contain *Galega officinalis* as a contaminant may be accepted for import if certified as 100% devitalized at country of origin. Devitalization methods, such as heat treatment, proposed by the exporting country will be evaluated by the CFIA on a case-by-case basis to ensure efficacy. A Heat Treatment Certificate must accompany the shipment.

8.0 RISK MANAGEMENT DECISION

8.1 Decision

The CFIA will make a decision after consulting with stakeholders and reviewing their comments. The CFIA will engage its federal, provincial and territorial partners, affected Canadian stakeholders, the scientific community and the general public in the consultation process.

8.2 Next Steps

The implementation of the regulation of *Galega officinalis* will require the following steps:

- World Trade Organization (WTO) notification;
- Canada Border Services Agency (CBSA) notification;
- amendments to existing import directives;
- changes to the *List of Pests Regulated by Canada*;
- amendments to the Automated Import Reference System (AIRS);
- develop an official control program and eradication plan.

8.3 Re-evaluation of the Risk Management Decision

The CFIA will review the risk management decision at least every five years to ensure that the action being taken is still appropriate. Potential triggers for a review of the risk management decision are: (1) new information becomes available about the invasiveness of the species, (2) new incursions in Canada occur, (3) the species' world distribution changes, and (4) Canadian international trade patterns change. The extent of the review and potential amendments will be determined by the nature of the new information. In some instances, additional consultation with stakeholders will be required. Amendments are recorded in Appendix 2.

9.0 COMMUNICATION PLAN

If the CFIA, after consultation, decides to add *Galega officinalis* to the *List of Pests Regulated by Canada*, it will implement the following actions:

- post the Risk Management Decision document on the CFIA website;
- amend and post all relevant directives on the CFIA website;
- send a notification to the World Trade Organization 60 days before implementation of the regulation;
- amend the Automated Import Reference System (AIRS) to inform importers and the Canada Border Services Agency (CBSA) of the prohibition of entry for *Galega officinalis*; and
- prepare and disseminate education and awareness materials.

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11.0 ENDORSEMENT

Approved by:

_____ _____

Chief Plant Health Officer Date

APPENDIX 1: IMPORT DATA FOR ALFALFA SEED

Import data for alfalfa seeds for sowing [a] originating from countries where *Galega officinalis* is present (2006-2008).

	2006		2007		2008	
	Value ($CAN)	**Quantity (kg)**	**Value ($CAN)**	**Quantity (kg)**	**Value ($CAN)**	**Quantity (kg)**
Exporting Country						
U.S. - Washington	26,447	5,457	404,826	80,165	199,382	43,479
Spain	0	0	3,662	600	0	0
France	27	19	2,529	180	52,220	6,335
Argentina	71,872	20,286	3,122	513	0	0
Italy	19,969	4,990	16,963	3,019	69,519	21,428
Germany	3	1	30,812	3,451	42,065	3,975
Austria	76,716	19,875	10,270	1,999	6,877	1,150
TOTAL:	**195,034**	**50,628**	**472,184**	**89,927**	**370,063**	**76,367**

[a] HS code 1209.210000

Source: Statistics Canada.

APPENDIX 2: AMENDMENT RECORD

Amendment Number / Document Version	Amended by:	Date Amended:	Purpose of Amendment
1			
2			
3			