

# Seed Mixtures

## Overview

Importing seeds individually and in mixtures is one of the primary pathways of introduction of invasive plants to Canada and BC and, therefore, one of the most critical pathways to target for prevention. You can make a difference by making informed decisions when selecting seed mixtures for use in gardens, restoration projects, or when purchasing birdseed.

This document provides a summary of best management practices designed to assist in reducing the introduction of new invasive plants via seed mixtures. Use this document to become better informed and ensure that the seed mixtures you select for your garden, restoration and soil stabilization projects, or birdseed will not escape and become tomorrow's invasive plants.

The term invasive plant, includes provincially listed invasive plants and noxious weeds, as well as other alien plant species with the potential to pose undesirable impacts on humans, animals, or ecosystems.

## Impacts of Invasive Plants

Through competition for water, nutrients, and space, invasive plants displace desirable vegetation and disrupt natural ecosystem functions. Lacking natural pathogens or predators, invasive plants can negatively affect soil productivity, water quality, aquatic habitats, biodiversity, range resources, wildlife habitat, species at risk, wildfire dynamics, culturally important plants, human health, public infrastructure, recreation, and landscape aesthetics. In fact, invasive plants cause estimated crop losses of over \$50 million annually in BC and are the second greatest threat to biodiversity after habitat loss.

The objectives of this publication are to:

1. Identify the use of commercially and privately available seed mixtures as a key pathway for the introduction and spread of invasive plants.
2. Provide land managers, landowners, and the public with information and resources to prevent the introduction and spread of invasive plants through the informed selection, distribution, and planting of seed mixtures.
3. Increase awareness of the negative ecological, social, and economic impacts of seed mixtures containing invasive plants.



## Types of Seed Mixtures

### Birdseed

Commonly marketed as 'wild birdseed', 'wild bird mix', or 'finch mix', birdseed is not currently regulated in Canada unless it contains niger oilseed, which is regulated under the Plant Protection Act. Seed houses and retailers that mix their own birdfeed combinations are not required to declare the contents on the package. Therefore, buying the components separately and mixing them yourself is the only way of being absolutely sure of what you are scooping into your feeders.

British researchers investigated the contaminants of imported seed used to feed caged birds. They germinated seeds from commonly sold bird feed and produced a list of 438 species from around the world believed to be imported in this way. A press release issued in 2006 by the Idaho Department of Agriculture indicated that the agency had ordered 24 companies in the United States (US) to stop the sale of bird and other animal feeds that contain viable invasive plant seeds. Over a period of several months, the Department sampled 92 feed mixtures from 34 manufacturers. Lab tests concluded that 54 of the 92 seed-type feed samples contained viable invasive plant seeds, including buffalo-bur (*Solanum rostratum*), jointed goatgrass (*Aegilops cylindrical*), field bindweed (*Convolvulus arvensis*), johnsongrass (*Sorghum halepense*), Canada thistle (*Cirsium arvense*), and hoary cress (*Cardaria draba*). Most of the products containing the invasive plant seed were domestic or wild bird feed mixes, but some were also feeds for hamsters, gerbils, and squirrels. In Australia, birdseed is a prohibited import and must be gamma irradiated before release from quarantine.

## Types of Seed Mixtures Cont...

### Wildflowers and Ornamentals

Many wildflower seed mixes, including those marketed as 'backyard biodiversity' and 'meadow mix', contain the seeds of invasive plants. Due to limited regulation and increased imports, landscapers, gardeners, retailers, and others play a key role in ensuring that these unwanted plants do not become established in our province. We all need to make sure that seeds chosen to beautify gardens, homes, parks, and public spaces are carefully selected and not anticipated to negatively impact humans, animals, or natural habitats.

Invasive species that commonly occur in wildflower seed mixes include, but are not limited to, oxeye daisy (*Chrysanthemum leucanthemum*), blueweed (*Echium vulgare*), baby's breath (*Gypsophila paniculata*), knapweed species (*Centaurea spp.*), purple loosestrife (*Lythrum salicaria*), and giant hogweed (*Heracleum mantegazzianum*).

In 2002, to illustrate the danger of planting packets of seeds sold as 'wildflower' mixtures, the University of Washington conducted an experiment on seed mixtures produced at, or distributed from, a variety of US and Canadian sources. Researchers grew the 19 packets of wildflower mixtures and found that each contained from three to 13 invasive species and eight had seeds from plants considered 'noxious weeds' in at least one US state or Canadian province. To further challenge the conscientious gardener, a third of the packets did not list any contents and slightly more than a third had inaccurate lists. Only five of the 19 packets correctly itemized the species content.

### Re-vegetation

Invasive plants may also be introduced through the application of seed mixtures for roadside beautification, rangeland improvement, wildlife forage, ecosystem and right-of-ways restoration, and other projects requiring re-vegetation. In addition, some agronomic species commonly included in seed mixtures have the potential to become invasive in certain situations.

### Categories of Seed

With the aim of ensuring the quality of seeds sold for commercial and private use, the federal Seeds Act and Regulations separate seeds into two categories:

**1. Pedigreed Seeds:** These are seeds of known parentage and genetic identity; their progeny will be 'true to type'. Pedigreed certification is approved after five consecutive generations of seed multiplication, which are processed by Registered Seed Establishments. Pedigreed seed names will indicate the generation of seed, with the final generation recognized as 'certified'.

**2. Common Seeds:** Seeds of unknown or uncertain parentage or genetic identity; cannot be sold by variety name.

The Seeds Act and Regulations, as well as other pertinent federal and provincial legislation applicable to invasive plants, are described in Legislation and Regulations on page 4.



## Prevention

Prevention is the most important and cost-effective invasive plant management strategy, but often the least used. It is critical to prevent invasive plants from spreading and becoming established in new areas. Seed mixtures are a key pathway of invasion of new invasive plants into BC and Canada; therefore, the suggestions provided for Seed Mixtures are focused on prevention. Overall, knowing what you are growing and selecting the right plant for the right place are the most effective methods in preventing the introduction and spread of unwanted plants.

## Integrated Pest Management (IPM)

- » IPM is a decision-making process that includes identification and inventory of invasive plant populations, assessment of the risks that they pose, development of well-informed control options that may include a number of methods, site treatment, and monitoring.
- » Control methods vary with species, severity of the plant invasion, and site considerations. Site-specific mechanical, chemical, or biological control methods may be applied.
- » Additional information on control methods is available in the accompanying species-specific factsheets, from a regional invasive plant committee coordinator or MFR regional invasive plant specialist, or online at the IAPP Application Reference Guide.



# Seed Guide:

## Types & Mixtures

### TARGETED INVASIVE PLANT SOLUTIONS >>

#### All Seed Mixtures

These suggestions are always applicable, regardless of the operation or seed mixture type:

- » Read the label and ensure that the species listed are non-invasive and desirable for your location. Be aware that not all plants contained within the mixture may be listed on the label.
- » Check with your regional invasive plant committee coordinator to see if the seeds listed in the mixture are invasive in your area.
- » Look for packets that indicate where the seed material was collected and know the level of 'contamination' from your seed supplier.
- » Discourage the propagation of invasive species.
- » Contact your local chapter of the North American Native Plant Society ([www.nanps.org](http://www.nanps.org)) or Seeds of Diversity ([www.seeds.ca](http://www.seeds.ca)) for more information on native nurseries and seed exchanges.
- » Monitor all seeded areas for invasive plants. Control invasive plant seedlings immediately using IPM methods.

#### Birdseed

- » Carefully select the birdseed mixture you wish to feed to wild birds or, better yet, create the mixture yourself. For example, most tray-feeding birds (finches, chickadees, nuthatches, jays, etc) enjoy black oil sunflower seeds, while quail, sparrows, and juncos will feed on chicken scratch (cracked corn, etc). Both of these examples are non-invasive alternatives to common birdseed products.
- » Throughout the year, monitor and remove any unusual plants growing under or near your bird feeder, before the plant goes to seed.
- » Consult a local bird expert or naturalist club to determine regionally appropriate, non-invasive birdfeed mixtures.



#### Wildflower & Ornamentals

- » Seed and plant species that are appropriate for your area (e.g. native plants) and know what you grow.
- » Avoid exotic wildflower seed mixtures and request only non-invasive species from your seed supplier or local nursery.
- » Do not collect 'wildflower' seeds from roadsides, gravel pits, or other disturbed areas as these areas are home to many invasive plants.

#### Re-vegetation

- » The presence of local native succession species may help to revegetate an area, and if seeding is required, use Canada Common No.1 Forage Mixture or better.
- » Ask for and review the seed lot's Seed Analysis Certificate to learn of any invasive plant species that are present in, or adjacent to, the seed lot.
- » If possible, select seed mixtures produced in the same region of the province as where they will be used.
- » Where appropriate, select seed mixtures that are comprised of native species, appropriate non-invasive agronomic species, or a combination of both.
- » If present, control existing infestations prior to seeding the area with an appropriate mixture.
- » Prepare the site for seeding. For example, apply a starter fertilizer, if necessary and appropriate.
- » Coordinate seeding with favourable conditions, (e.g. spring or early fall).
- » Apply at the recommended seeding rate.
- » Contact a local agrologist, seed supply store, or regional weed coordinator learn more about seed mixture selection and application as well as site preparation.

# Legislation & Regulations

## Federal

The Seeds Act defines seed as ‘any plant part of any species belonging to the plant kingdom, represented, sold, or used to grow a plant’. Therefore, grain fed to animals (e.g. birdseed) cannot be regulated under the Seeds Act and Regulations. The Seeds Act and Regulations are relevant to large-scale plantings, roadsides, landscaping, gardening, ornamentals, land reclamation, soil conservation, green cover, wildlife grazing or habitat, wetland restoration, and other similar activities.

<https://laws-lois.justice.gc.ca/eng/acts/S-8/>

The Plant Protection Act and Regulations aim to ‘prevent the importation, exportation, and spread of pests injurious to plants and to provide for their control and eradication and for the certification of plants and other things’.

<https://laws-lois.justice.gc.ca/eng/acts/p-14.8/>

## Provincial

In BC, invasive plant management is regulated by the Weed Control Act (WCA), the Forest and Range Practices Act (FRPA), the Integrated Pest Management Act (IPMA), and the Community Charter.

The FRPA requires forest and range managers to specify and implement measures that prevent the introduction or spread of the 42 invasive plants listed under the Invasive Plants Regulation within their forest stewardship plans, woodlot license plans, range use plans, and range stewardship plans.

[http://www.bclaws.ca/Recon/document/ID/freeside/00\\_02069\\_01](http://www.bclaws.ca/Recon/document/ID/freeside/00_02069_01)

The WCA requires all land occupiers to control the spread of 48 provincial and/or regional noxious weeds on their land and premises, and specifies provisions for transportation, movement, and cleaning of machinery.

[http://www.bclaws.ca/civix/document/id/lc/statreg/96487\\_01](http://www.bclaws.ca/civix/document/id/lc/statreg/96487_01)

The IPMA regulates herbicide applications that may be used to control invasive plant infestations.

[http://www.bclaws.ca/civix/document/id/complete/statreg/03058\\_01](http://www.bclaws.ca/civix/document/id/complete/statreg/03058_01)

The Community Charter is enabling legislation that provides powers that municipalities may use for, among other things, invasive plant control. Authority for invasive plant control is available under either weed control powers or broad powers for the protection of the natural environment.”

[http://www.bclaws.ca/civix/document/id/complete/treg/03026\\_00](http://www.bclaws.ca/civix/document/id/complete/treg/03026_00)



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## References/Links

### Provincial and Regional Coordination:

- » The Invasive Species Strategy for British Columbia: [https://bcinvasives.ca/documents/IS\\_Strategy\\_for\\_BC\\_Final\\_2012\\_06\\_07\\_print\\_sm.pdf](https://bcinvasives.ca/documents/IS_Strategy_for_BC_Final_2012_06_07_print_sm.pdf)

### Species Identification and Management

- » BC Ministry of Agriculture. 2014. Field Guide to Noxious and other Selected Weeds of British Columbia, 8th ed. [https://bcinvasives.ca/documents/Field\\_Guide\\_to\\_Noxious\\_Weeds\\_Final\\_WEB\\_09-25-2014.pdf](https://bcinvasives.ca/documents/Field_Guide_to_Noxious_Weeds_Final_WEB_09-25-2014.pdf)
- » E-Flora BC, Electronic Atlas of the Plants of BC: [www.eflora.bc.ca](http://www.eflora.bc.ca)
- » Global Invasive Species Database: <http://www.iucngisd.org/gisd/>

### Provincial Inventory and Mapping Database

- » BC Ministry of Forests, Lands, and Natural Resource Operations, Invasive Alien Plant Program (IAPP). <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/invasive-species/plants>

### Integrated Pest Management

- » BC Ministry of Environment Integrated Pest Management Program: <https://www2.gov.bc.ca/gov/content/environment/pesticides-pest-management>

### Seed Mixtures

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- » Hines, Sarah. 2002. “Wildflower seed mixes include some wicked bloomers”, April 18, 2002. University of Washington Office of News and Information. Accessed Online March 27, 2008. <http://www.washington.edu/news/2002/04/18/wild-flower-seed-mixes-include-some-wicked-bloomers/>
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