



Living in Nature Series

WEEDS: THE INVADERS

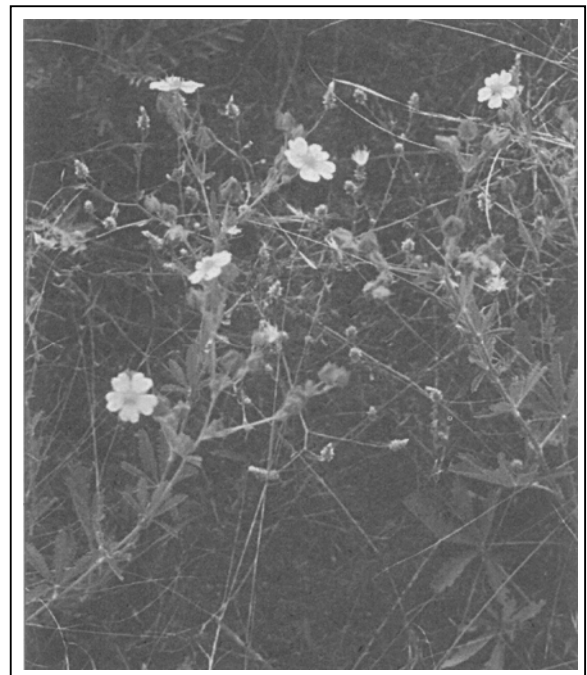
Weeds are an ever increasing problem in British Columbia. This fact sheet focuses on the management of non-native weeds that out compete desired vegetation in grasslands, wetlands, forests and cultivated fields.

What are Weeds?

The term 'weed' commonly refers to any unwanted plant. Gardeners know weeds as invasive plants that challenge gardens and contaminate lawns; chickweed and dandelion are good examples. Plants that interfere with forage production or are poisonous to livestock, like timber milk-vetch or silky locoweed, are considered to be weeds by ranchers. Technically, weeds are plants that interfere with land management objectives.

The B.C. Ministry of Agriculture, Fisheries and Food has designated some of the most harmful weeds as "noxious".

Legislation imposes a duty on land holders to control and prevent the spread of noxious weeds.



Sulphur cinquefoil (*Potentilla recta*)

Photo: Lisa Scott

Weeds: Characteristics and Impact

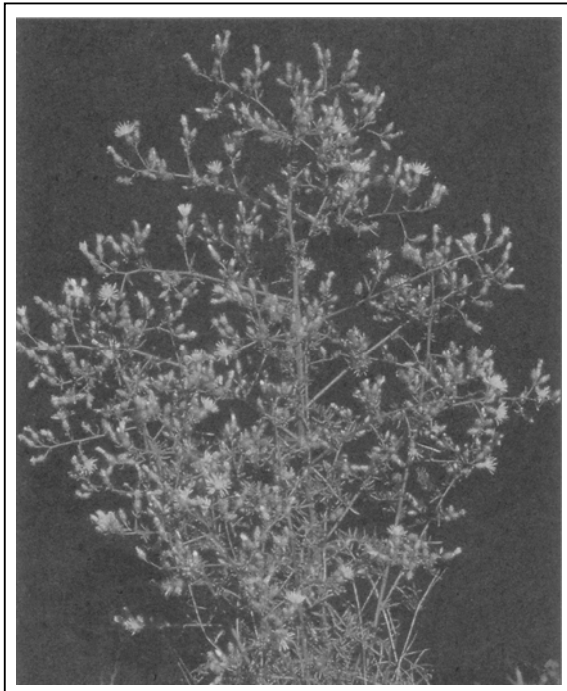
Weeds are masters of adaptation. They are able to produce huge numbers of seeds and tolerate severe stress conditions such as drought, soil compaction and frequent disturbances.

Weed invasion decreases the capacity of affected areas to support wildlife, livestock, and agricultural crops. In British Columbia alone, it is estimated that the loss of crops due to weed infestation and associated cost of weed control, exceeds \$50 million annually.

The dry grasslands of the Southern Interior are extremely vulnerable to weed infestation. There are 21 species of weeds designated as noxious for the province of British Columbia, and an additional 19 weeds so designated within the boundaries of specific regional districts.

Most of the weeds found in B.C. are native to Europe and Asia. Many have arrived as contaminants in crop seed or livestock feed. Diffuse knapweed is one such stowaway. Other weeds have spread from the introduction of ornamental plants, like Dalmatian toadflax and purple loosestrife.

Some have been intentionally introduced for use as forage crops or for revegetating



Diffuse knapweed (*Centaurea diffusa*)
Photo: Ministry of Agriculture, Fisheries and Food

roadsides, like reed canary grass and Kentucky bluegrass.

An ideal environment for these invaders is possible because of a similar climate to

that of their native habitats, extensive landscape modification and a lack of natural enemies.

A concentrated effort is required to control weeds and

minimize the loss of important plant populations. The cost of management increases with delay.

A striking example of the consequence of delayed weed management action is found in the case of diffuse knapweed. Three small, isolated infestations of this weed were identified in the late 1940's. Two of these areas were in B.C. and the third was in Washington State.

Immediate control of these weed patches was recommended. Failure to heed that advice has resulted in the spread of knapweed to over 40,000 hectares (100,000 acres) in B.C. There is potential for this infestation to exceed one million hectares of grassland range and areas of fringe forest. Economic loss to farmers and ranchers is over \$400,000 annually in equivalent hay production. Other weeds such as sulphur cinquefoil are even more aggressive and have the ability to cause much greater economic loss.

The B.C. Weed Control Act imposes a duty on all land occupiers to control designated noxious plants. The purpose of the Act is to protect our natural resources and industry from the impacts of foreign weeds.

INTEGRATED WEED MANAGEMENT

Successful long-term weed control requires a variety of measures. These include prevention as well as chemical, mechanical, cultural, and biological methods. Choosing the most effective method depends on the location and severity of the infestation. Several methods working together are often necessary to combat severe weed problems. This is referred to as 'integrated weed management'.

are recognized and controlled early, we can help to prevent a "knapweed situation" from happening again. You can learn how to identify weeds by using the **Field Guide to Noxious and Other Selected Weeds of British Columbia**, available from the Ministry of Agriculture, Fisheries and Food.

Areas where soil has been disturbed are more vulnerable to weed invasion. Heavy grazing by livestock, tilling, road construction, excavation, the effects of off road recreation and high temperature fires all contribute to weed invasion. Particular attention to weed control in disturbed areas. such as hay fields and pastures, roadsides, quarries and

construction sites, is vital. Reseeding disturbed areas will help prevent weed invasion.

Vehicles and equipment spread weeds by carrying seed and disturbing soil.

To minimize weed spread:

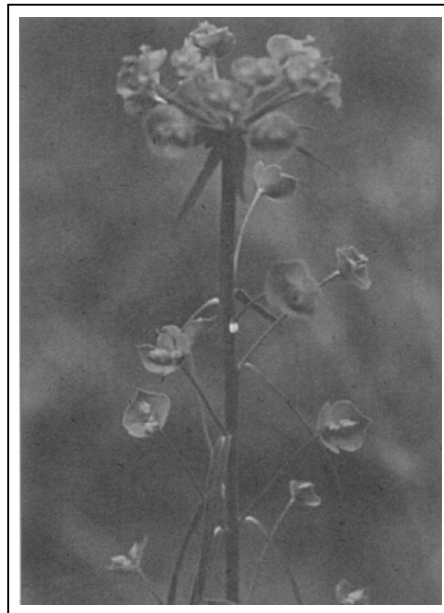
- restrict vehicle use in weed infested areas
- check all machinery for weeds and weed fragments before leaving an infested site

Weed Prevention

Weed prevention is the most critical element of an integrated weed control program. A preventive approach will significantly reduce time, cost and effort.

It is important to:

- identify weed species
- control or eradicate new or existing infestations
- understand how human activities contribute to weed spread
- employ appropriate land management practices



Leafy spurge (*Euphorbia esula*)
A potential invader

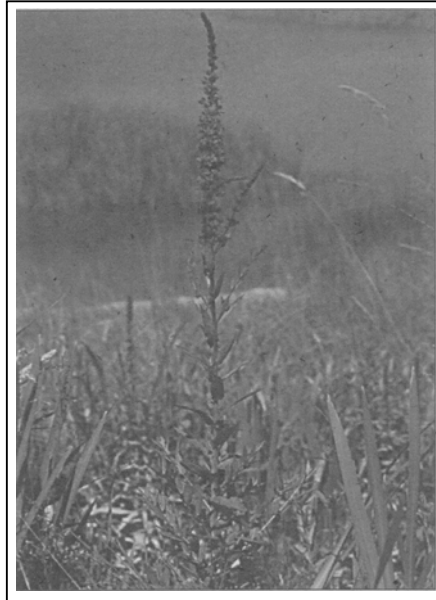
Photo: Ministry of Agriculture, Fisheries and Food

Weeds know no boundaries; they can invade from other regional districts in B.C. and from Washington State. If new weeds

- investigate the source of topsoil, fill, hay and seed for crops to ensure that weed seed has not contaminated the material.

Herbicides

Herbicides are classified according to their chemical structure, mode of action and selectivity. They can be used to control existing weed problems or to protect uninfested areas. The nature of the weed, the specific weed problem, and environmental factors determine which herbicide, if any, should be used. Responsible chemical control requires a thorough knowledge of herbicide application safety precautions, appropriate timing of application, spraying equipment and the impact on the environment.



Purple Loosestrife (*Lythrum salicaria*)

Photo: Ministry of Agriculture, Fisheries and Food

Herbicides provide effective weed control, however, environmental considerations limit their use.

Mechanical and Cultural Methods

Mechanical control includes hand-pulling, hand-cutting, mowing or plowing of weeds. These methods are often used in environmentally sensitive areas or when only a few individual plants have become established.

Hand-pulling is not effective for the control of weeds that have laterally spreading roots like Dalmatian toadflax, or those with deep roots, such as rush skeletonweed. This method may also aggravate the weed situation by providing disturbed soil for seed germination. Hand-pulled or hand-cut weeds should be heaped and burned. Some weeds

like purple loosestrife can re-root from pieces of stalk or other fragments. It is, therefore, important to carefully remove and destroy the entire plant.

Sometimes plants that have gone to seed dry and break at the base. These 'tumbleweeds' are blown about by the wind and spread seed over a large area. These dead plants should also be gathered and destroyed by burning. Burning permits may be required. Applications should be made to the Ministry of Forests or the appropriate municipality.

Cultural methods include selective grazing, planting competitive vegetation, mulching, irrigation and deliberate flooding. These methods suppress weeds and make it harder for them to become established.

Biological Control

Biological control exposes weeds to insects and diseases that keep them in check in their native environments.

Reduced seed production or fewer weeds at a particular site, may indicate the presence of a biocontrol agent. Insects bore into roots or eat seeds, stems or leaves. This decreases plant vigour, reproduction and

and competitive ability but seldom kills the weed outright.

Biocontrol attempts to reduce weed populations to levels that no longer cause environmental or economic concerns. This can be a stable and long-term solution to weed problems. It is economically sound, cost effective, sustainable and environmentally friendly.

However, biological control will not eradicate weeds nor work for all weed species.

Biological control was first used in British Columbia over forty years ago. There are currently over fifty

biocontrol agents at work in our province.

Populations of St. Johnswort, tansy ragwort, diffuse and spotted

knapweed and leafy spurge are declining at many sites due to successful biocontrol.

Unfortunately, there are currently no

bioagents established for Dalmatian toadflax and sulphur cinquefoil. Research to determine the most effective use of biological control agents is ongoing. **The Field Guide to the Biological Control of Weeds in British**

Columbia provides an informative guide to problem weeds of B.C. and their biocontrol agents.

Before distribution, bioagents must be collected, propagated and adapted to Canadian climates. Exhaustive research and long-term results are reviewed before approval for their release is granted. This

process is rigorous to ensure that the agents do not attack native, ornamental or agricultural plant, species. Several biological control agents are usually required to achieve the desired decline in weed population.

Consequently, the effects of biocontrol may take some time to be evident.

Biological control is an important tool for controlling large and widespread weed infestations. However, it can only succeed in concert with other methods.

Discovery of any weeds new to the district must be reported to the Crop Protection Program, Ministry of Agriculture, Fisheries and Food at Kamloops or Cloverdale, or call the Ministry of Forests District Office.

What You Can Do

To help ensure successful weed control:

- learn to identify weeds
- hand-pull, hand-cut or spot-spray small isolated weed patches
- use appropriate methods to prevent seed production and weed spread
- encourage weed control on adjacent properties, including rights-of-way and easements
- minimize soil disturbance
- reseed disturbed natural areas with native plants

For Further Information

The B.C. Ministry of Agriculture, Fisheries and Food has produced a series of informative weed pamphlets.

The Crop Protection Program at Kamloops or Cloverdale has the most current information on weeds, herbicides, herbicide application procedures as well as effective mechanical and cultural control methods.

The Pesticide Control Branch of B.C. Environment regulates the use of pesticides and herbicides. They offer certification programs for applicators.

Recommended Reading

Cranston, R. 1994. **Weed control: an introductory manual.** B.C. Ministry of Agriculture and Food. Victoria, B.C. 35 pp.

Cranston, R., D. Ralph, and B. Wikeem. 1996. **Field guide to noxious and other selected weeds of British Columbia.** Ministry of Agriculture, Fisheries and Food, and Ministry of Forests. Victoria, B.C. 79 pp.

Powell, G.W., A. Sturko, B.M. Wikeem, and P. Harris. 1994. **Field guide to the biological control of weeds in British Columbia.** Ministry of Forests, Research Branch. Victoria, B.C. 163 pp.

Taylor, R.J. 1995. **Northwest weeds: the ugly and beautiful villains of fields, gardens, and roadsides.** Mountain Press Publishing Company. Missoula, MT. 177 pp.

Whitson, T.D., L.C. Burrill, S.A. Dewey, D.W. Cudney, B.E. Nelson, R.D. Lee and R. Parker. 1992. **Weeds of the West.** The Western Society of Weed Science, Newark, California. 630 pp.

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BC Environment



HABITAT
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TRUST FUND



Okanagan Region
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The South Okanagan Similkameen Stewardship Program (SOS Stewardship) was set up by The Nature Trust of British Columbia, the Habitat Conservation Trust Fund and BC Environment to help private landowners protect and enhance natural areas on their lands.

The Nature Trust of British Columbia, director of the SOS Stewardship Program, is a non-profit organization dedicated to the conservation of areas of ecological significance in British Columbia.