

Farm Practices in B.C. Reference Guide

Strengthening Farming Program



Ministry of
Agriculture
and Food

FACTSHEET

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FARM ACTIVITY: IRRIGATION

Description

Irrigation is the application of water to a crop to replace the climatic moisture deficit over an irrigation interval. Chemigation is the application of fertilizers and other chemicals to a crop through an irrigation system.

Irrigation is often required in British Columbia because climatic moisture deficits occur in many parts of the province during the summer months. Farmers access water for irrigation purposes by pumping from surface water or groundwater sources, or by having it delivered from an irrigation district or other water purveyor.

Activities and Operations

Access to Water

The provincial *Water Sustainability Act* (WSA) stipulates that a water licence is required to divert, store or use water from a surface water or a groundwater source for non-domestic water use purposes, including agricultural use. Domestic use of unrecorded surface water may not require a licence, though obtaining one is recommended. Work in and about streams may also require authorization under the WSA. The federal *Fisheries Act* prescribes that irrigation pumps and water intakes used on fish-bearing water sources are to be properly screened to prevent fish from being trapped.

Irrigation

Irrigation equipment may operate 24 hours a day during the crop-growing season. The amount of water applied should not exceed the climatic moisture deficit for the area or an amount that can be stored by the soil within the crop rooting depth. Irrigation systems should be designed and operated in accordance with the BC Sprinkler Irrigation Manual or the BC Trickle Irrigation Manual. Irrigation water should only be applied to target areas. Part-circle sprinklers, shields or other devices should be used to ensure that irrigation spray is not introduced to public roads, power lines or other non-target areas.

See also Farm Practice: [Mobile Equipment](#)
[Stationary Equipment](#)

Manure Application

Irrigation systems may be used to apply liquid manure to land. Among other requirements to follow, operators must ensure that prevailing winds and spray patterns are considered to prevent spray drift or direct introduction of slurry into watercourses or wells, whether potable or not. A variety of alternative manure application methods may be more suitable near particularly sensitive areas, such as applying manure with tanker units, dribble bars or by direct injection. Each method has its advantages and disadvantages. In the case of manure application using a stationary irrigation gun, an advantage is the avoidance of vehicle traffic that can compact soils, which would increase the risks of runoff and erosion, and disadvantages include greater ammonia and odour emissions. Whenever possible, it is advisable to apply slurry between forage crop cuts at rates matched with nutrient requirements rather than relying on frequent or daily applications.

For systems that incorporate cross-connections, fail-safe mechanisms or practices are essential to ensure that waste is not inadvertently introduced via system piping into surface water or groundwater sources. Acceptable methods include the removal of a pipe section between the surface or groundwater source and the liquid slurry source, double check valves on the surface or ground water side of the system, or some other approved device such as a check valve with a low-pressure drain and vacuum relief valve. Drainage resulting from the opening of lines should be directed away from water sources. End caps or plugs must be installed on the pressure side of systems after pipe sections are removed.

See also Farm Practice: [Manure Storage and Use](#)

Chemigation

Fertilizers and other chemicals may be applied to agricultural crops through sprinkler and trickle irrigation systems, provided that the product label states that the given chemical is approved for chemigation and that proper backflow preventers have been installed. The standards listed in the publication entitled Chemigation Guidelines for British Columbia provide guidance to backflow prevention. Approvals from water purveyors may also be required.

Maintenance

Drip or trickle irrigation systems may require injection of acids or chlorine to prevent emitters from plugging over time.

Frost Protection

Irrigation equipment is often used to protect crops from frost during the spring and fall. Irrigation must be initiated prior to the onset of the frost and continued until the danger of frost has passed. Frost protection measures may be implemented for a variety of commodities and crops such as tree fruits, berries and vegetables.

Crop Cooling

Some apple varieties must be cooled when summer temperatures peak to prevent the fruit from becoming scalded by the sun. Overhead irrigation systems may be used to keep fruit at an acceptable temperature. Irrigation systems will operate intermittently throughout the day for crop cooling.

Reclaimed Water Application

Treated reclaimed water can be used to irrigate agricultural land. The provincial *Environmental Management Act*, its Municipal Wastewater Regulation, and local bylaws should be adhered to when reclaimed water is used to irrigate crops. The Reclaimed Water Guideline, a companion document to the Municipal Wastewater Regulation, gives guidance on its use.

See also Farm Practice: [Non-Agricultural Waste](#)

Water Storage

Storage is often required to ensure that sufficient irrigation water is available later in the irrigation season, when streamflows are low. Farmers may capture and store spring runoff using dams, dugouts, or other reservoirs.

Under B.C.'s *Water Sustainability Act* (WSA), water licences and other approvals may be required to divert, use, or store water from a stream or an aquifer. Storage works that meet the definition of a dam are regulated under the WSA require a licence and must comply with the Dam Safety Regulation (DSR). Dugouts licensing requirements depend on the source of water.

Authorization is required if any water in the dugout is from a stream or an aquifer, including groundwater seepage, whereas it is generally not required if the dugout fills entirely from precipitation or surface runoff. Producers should consult the Province's [Authorization requirements guidance for storage and use of water in dugouts](#) to determine whether their specific situation requires a licence.

Legislation

Agricultural producers are expected to follow all legislation that pertains to their farming operations. The provincial *Farm Practices Protection (Right to Farm) Act* stipulates that a “farm operation” must meet the *Public Health Act*, *Integrated Pest Management Act*, *Environmental Management Act* and the regulations under those Acts, as well as any land use regulation (amongst other requirements), to be protected from liability in nuisance, from being prevented from conducting that farm operation by court order, and from the application of certain local government bylaws. Local government bylaws may also apply to some farm practices, and farmers affected should contact their relevant local government for more information.

Some of the Acts, regulations, and bylaws that may be relevant to this topic may include the following:

Federal Legislation

The *Fisheries Act* protects fish and fish habitat in ditches, streams, rivers and wetlands and prohibits the discharge of deleterious substances such as fertilizers, manure and pesticides into watercourses frequented by fish, or that may end up in water frequented by fish. It also may require proper screening of irrigation intakes in watercourses to protect fish.

Provincial Legislation

The *Environmental Management Act* protects land, water and air environments from “pollution” and “waste”, and regulates the handling and disposal of hazardous materials. Below is a list of some of the regulation(s) under this Act:

- The Code of Practice for Agricultural Environmental Management (AEM) applies to all “agricultural operations” in British Columbia, from small hobby farms to large commercial operations and, among other things, regulates the storage and use of manure and other agricultural by-products, and allows farmers to operate without a waste permit in certain circumstances when storing and managing mortalities, manure, or other byproducts and managing agricultural composting operations.
- The Municipal Wastewater Regulation regulates, among other things, the use of reclaimed water on agricultural land.

Plumbing provisions within the British Columbia Building Code establish standards for backflow preventer installation, among other things.

The *Water Sustainability Act* is the principal law for protecting and managing the diversion and use of water resources and requires that a water license be applied for to divert, store or use water from streams or aquifers for all water use purposes, or from groundwater sources for non-domestic purposes that include agricultural use.

Local Government

Applicable water purveyor bylaws may specify water delivery rates or backflow prevention requirements.

Publications

Publications that provide further information on irrigation include the following:

British Columbia Environmental Farm Plan Reference Guide

British Columbia Environment Farm Plan Reference Guide - Nutrient Application

British Columbia Environmental Farm Plan Reference Guide – Irrigation System Assessment Guide

British Columbia Frost Protection Guide

British Columbia Sprinkler Irrigation Manual

British Columbia Trickle Irrigation Manual

Chemigation Guidelines for British Columbia

Reclaimed Water Guideline

Irrigation Management Guide – Chapter 9 (Chemigation, Frost Protection and Crop Cooling)

Irrigation Management Guide - Chapter 10 (Use of Reclaimed Water)

Irrigation Scheduling Techniques