

# Environmental Management

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## Mushroom Farm Practices

### Introduction

The long-term well-being of mushroom farms in British Columbia depends on good management practices that protect the environment. Practices necessary to sustain the natural resources around a mushroom farm depend on the farm and its location within the province. Additional measures may be necessary where specified practices do not protect the environment adequately. It is in the best interest of all mushroom producers to determine the necessary environmental precautions for their specific situation.

### Legislation

There are a number of regulations at federal, provincial and municipal levels as well as local government bylaws that mushroom producers are expected to follow. The following section provides a summary of legislation that protects the environment. It is recommended that the actual legislation be consulted for the complete, precise wording. For provincial legislation refer to the Queen's Printer website: Revised Statutes and Consolidated Regulations of British Columbia at <http://www.qp.gov.bc.ca/statreg/default.htm>. The following information is not intended to be a legal interpretation of these Acts. Please refer to a lawyer or legal authority for specific advice.

### Federal

#### *Fisheries Act*

Fish Habitat Protection and Pollution Prevention - prohibits the discharge of deleterious substances (i.e. agricultural wastes and fertilizers) into waters frequented by fish.

### Provincial

#### *Environmental Management Act (formerly the Waste Management Act)*

This Act empowers Ministry of Environment (MOE) to control pollution within BC. Waste is defined to include "air contaminants, litter, effluent, refuse, biomedical waste, and hazardous wastes" and any other substance designated by Cabinet. Pollution is defined in the Act as "the presence in the environment of substances or contaminants that substantially alter or impair the usefulness of the environment."

Section 6 of the Act is of particular interest to agricultural producers; Section 6(4) states that "a person must not introduce waste into the environment in such a manner or quantity as to cause pollution."

On-farm processing, handling and sale of agricultural produce may be defined as "agricultural operations" and if they generate wastes (such as waste water, cull vegetables etc.) may require an Approval Permit or Operational Certificate from Ministry of Environment (MOE).

## Health Act

This Act is administered by the Ministry of Health Services. It includes regulations on farm practices that may result in a health hazard. A health hazard may occur when nutrients, contaminants or pathogens are discharged to land, water or air to pose a public health problem. Spills of potentially harmful substances must be reported to the Local Health Authority. Under this Act, the Local Health Authority must investigate any health hazard and has authority to order the hazard to be eliminated.

## Integrated Pest Management Act (formerly the Pesticide Control Act)

This Act is administered by Ministry of Environment (MOE). It regulates the sale, containment, transportation, storage, preparation, mixing, application and the disposal of pesticides and their containers.

## Farm Practices Protection (Right to Farm) Act

The Farm Practices Protection (Right to Farm) Act (FPPA) applies to farmers who operate in the Agriculture Land Reserve (ALR) and in other areas where farming is permitted by local zoning bylaws. When farmers operate under “normal farm practices”, the Act protects the farmer against nuisance actions, court injunctions, or specific nuisance bylaws related to the operation of the farm. Protection provided by the Act specifically relates to nuisances such as odour, noise, dust or other disturbances. The right to farm is, however, not automatic. It requires that: a farm operation use “normal farm practices” (as defined by the Act) or practices as may be prescribed by Cabinet regulation. The Act stipulates that the farm operation must meet the Environmental Management Act, Integrated Pest Management Act, and Health Act and regulations under those acts. Within the Environmental Management Act and Health Act is the Agricultural Waste Control Regulation which deals with practices for using, storing and managing agricultural waste that will result in agricultural waste being handled in an environmentally sound manner.

## Local Government

Under the Local Government Act local governments (e.g. regional districts and municipalities) have bylaws that deal with a number of matters. Development of farm bylaws that prohibit or restrict agricultural land use or zoning in the Agricultural Land Reserve require approval by the Minister of Agriculture and Lands. Once a regulation is in place for a particular area, it may authorize local government to enact farm bylaws, and/or require review of the rural land use or zoning bylaws. Local governments may use a variety of tools to reduce conflicts between agricultural and residential land uses. The guiding principals are enforced by bylaws including miscellaneous, odour, noise, nuisance, zoning, storm water runoff and rural land use bylaws.

## Farm Practices

The three main disturbances mentioned in the Farm Practices Protection (Right to Farm) Act are odour, noise and dust. All three disturbances can be of particular concern to composting and mushroom farming practices. In addition, these operations must also ensure that all leachate created is contained and not allowed to pollute ground and surface water. Below is a summary of farm practices for composting and mushroom farm activities. Additional information can be found under in the Farm Practices section of the BCMAL Reference Guide:

<http://www.al.gov.bc.ca/resmgmt/fppa/Refguide/intro.htm>

or by calling the BC Ministry of Agriculture and Lands at 604-556-3001.

## Compost Production Practices

There are three regulations under the Environment Management Act (EMA) administered by the Ministry of Environment (MOE) that deal with compostins:

- Agricultural Waste Control Regulation - deals with compostins associated with agricultural operations;
- Organic Matter Recycling Regulation - specifies feedstock allowed under Schedule 12 of this regulation;
- Mushroom Composting Pollution Regulation - deals specifically with production of mushroom compost.

The Fisheries Act has sections of importance to compost management including: Section 36(3): prohibits the deposit of deleterious substances into watercourses (deleterious substances could include compost materials and leachate), Section 37: requires approval for any work that may impact fish and Section 38(4): requires reporting infractions of Section 36.

The release of odours is a primary concern with composting operations. How people perceive the odour (nuisance or not) will depend on the frequency, intensity, duration and offensiveness of the odour, how well they smell and personal experiences associated with odour. Odours can cause air pollution when present in the air and cause or are capable of causing material physical discomfort to a person, or substantially alters or impairs the usefulness of the air. Under the Environmental Management Act, the release of odours from activities or facilities that cause pollution are prohibited. In addition to the provincial regulation, local or regional government bylaws may require permits or bylaw applications in order for a composting operation to be constructed or operated on the farm. Farms should check with these agencies prior to developing a composting operation to determine what approval is required.

A primary consideration when designing a compost production area is the prevention of water pollution. A composting site must be located at least 15 m from any watercourse and at least 30 m from any source of water for domestic purposes. Some situations may require distances greater than those specified in legislation. These operations must ensure that all leachate created is contained and not allowed to create pollution.

Potential odour nuisance complaints or other conflicts with neighbours, such as noise impacts may be reduced by using the following: Locate buildings and operations as far as possible from rural residences or residential areas, take advantage of unique topography or microclimatic conditions that could affect odour impacts, site buildings and operations so that prevailing winds transport odours away from rural residences or residential areas and use visual screening such as trees or berms.

## Mushroom Farm Practices

### Dust

Dust may be generated when fine particulate are lifted from fields, roads, buildings and yards by the stirring action of air. Dust in the air is defined as fine grained suspended particulate. Farms engage in a variety of activities that require the use of equipment or practices that will create dust. How people perceive dust (nuisance or not) will depend on the frequency, intensity and duration of the dust generating event. Dust can be a result of many farming activities and could be a source of complaint concerning farm activities.

### Noise

Farmers engage in a variety of activities that generate noise. Noise is defined as any sound that is audible but judged to be an unwanted, irregular or erratic disturbance. Noise may be generated continuously or intermittently and may rise when equipment is run at high RPM.

Hearing damage potential of sound depends not only on the level but also the duration of the sound. Noise levels for workers are provided in the Occupational Health and Safety Regulation by the Workers Compensation Board, An employer must ensure that a worker is not exposed to noise levels above 85 dBA Lex daily exposures and 135 dBA peak sound levels.

Most equipment generates some noise. Good farm practices include: eliminating unnecessary noise such as truck engines running while parked, keeping noisy equipment inside buildings to buffer the noise and maintaining machinery and equipment in good working order with functional mufflers. Consider the loudness of equipment when making purchase decisions. Consider the time when noisy equipment must be used to avoid times that are going to be a nuisance to neighbours.

When building new farms, site new buildings farther away from property lines especially where neighbouring houses are or are likely to be built. Use and maintain landscaping to buffer and provide visual screening for noises.

Numerous jurisdictions in the province have drafted and implemented bylaws that regulate or prohibit noise or sounds which disturb the quiet,

peace, rest, enjoyment, comfort or convenience of neighbourhoods or person(s) in the vicinity. These bylaws most often spell out the hours during which certain levels of noise are not acceptable such as between the hours of 10:00 PM and 7:00 AM. These bylaws are now subject to the approval of the Minister of Agriculture and Lands where agriculture is impacted.

### **Emergency Plan**

An emergency plan outlining steps to be taken in the event of a spill or leak should be posted near the entrance of every facility in which agricultural chemicals are stored. Each emergency plan should include information on the location of emergency and first aid equipment, emergency phone numbers, and clean-up instructions.

### **Farm Buildings**

Farm buildings are given separate status within the National Building Code. This is because they are subject to a low human occupancy load, are often located in remote areas, and are often special in nature with respect to the occupancies involved. Implications of the separate status afforded agricultural buildings are published in the National Farm Building Code of Canada. The Code sets out minimum requirements in matters affecting human health, fire safety and structural sufficiency. The BC Building Code requires all farm buildings within municipal districts to conform to the national code.

Large mushroom barns, composting facilities and storage areas need a management plan that addresses both the quantity and quality of storm water runoff. The plan should include drainage systems that keep rainwater separated from contaminated water, such as irrigation water containing nutrients from the mushroom growing facility. Mushroom barn roof water that is allowed to flow onto concrete slabs could create contaminated runoff. Roof water should be kept separate from contaminated water. On-site storm water detention should also be provided, to avoid overloading municipal or regional drains or waterways. The post-development storm water flow

release rate from the property should be similar to pre-development flows unless other mitigative drainage measures are taken. Local government bylaws should be checked.

### **Fill Placement or Soil Removal**

As necessary, soil removal or placement of fill is a permitted agricultural activity. For specified farm and non-farm uses, including the construction and maintenance of mushroom farm building or a composting facility, with conditions. Where the removal of soil or placement of fill exceeds 2% of the area of the parcel, a 'Notice of Intent' must be submitted to the Agricultural Land Commission. Proposals under the 'Notice of Intent' may be allowed with terms and conditions set by the CEO of the Commission or require an approval of the Commission.

### **Storage of Chemicals**

All agricultural chemicals should be stored in a dedicated facility. Minimum standards dictate that a storage structure must:

- be ventilated naturally or mechanically to the outdoors to prevent the accumulation of toxic or flammable vapours,
- be accessible from outdoors and secured from unauthorized entry,
- have an impervious floor, typically concrete, without a floor drain and curbed to contain a volume at least equal to the largest container stored within,
- be separated from all food, feed and water supplies,
- be separated from all other occupancies either by an open space or by a fire separation wall having a fire rating resistance of at least one hour,
- be clearly identified with a sign saying "Danger", "Chemical Storage" or "Authorized Persons Only" permanently attached to the outside of each entrance,
- contain shelving that separates oxidizing chemicals from combustible chemicals and
- have an insulated and heated cabinet for chemicals requiring protection from freezing.

A storage facility should be dedicated to the storage of full and partially full containers only. Empty containers should be triple-rinsed or cleaned to the point where they pose no threat to people, animals or the environment. If temporary storage is required, the site selected should be one that is used infrequently, does not attract public attention and, ideally, is fenced. Landfill disposal of clean empty containers is permitted. Containers must be triple rinsed or cleaned with a pressure washer. Care must be taken to ensure that rinse water does not run into storm drains, creeks or other water supplies.

To minimize the number of containers that must be disposed of, farmers are encouraged to calculate their chemical needs carefully. Chemicals that are not likely to be needed in future or whose efficacy is likely to decline before they will be used again should be disposed of in an environmentally responsible manner. Unopened pesticides can be returned to the vendor. Excess pesticide, whether diluted or not, should never be disposed of in an inconspicuous farm location or drained into the sewer system. Under no circumstances should expired chemicals or incompletely washed containers be stored in an area not dedicated to pesticide storage.

To reduce the volume of waste going to landfill sites, agri-chemical manufacturers and dealers in B.C. have initiated a recycling program. They will accept and recycle triple rinsed or pressure-rinsed plastic and metal containers. (For a list of participating dealers contact the B.C. Ministry of Agriculture and Land or the Crop Protection Institute.)

### ***Storage of Compost and Raw Materials***

Compost and other raw materials should be stored in a closed storage facility or placed on an impermeable pad and covered to protect them from the rainy weather and to prevent the production of leachate and/or runoff. Raw materials may be piled in the open for short periods of time, but precautions must be taken to ensure that no runoff enters surface or ground water supplies. Compost and raw materials also have a potential to cause odours, dust or pest problems. They should be covered or managed so that problems do not occur.

### ***Storage of Fertilizers***

Large dry bulk fertilizer storages should be sited on elevated ground with all rain, snow melt or flood water diverted away. Fertilizers must be kept dry in well-constructed facilities to prevent caking and consolidation.

### ***Storage of Hazardous Material***

Commercial fertilizers, petroleum products, and pesticides and other products may be stored on farms. Potentially poisonous, corrosive, volatile, flammable or dangerous materials or liquids must be stored in structurally sound facilities to prevent leaks and spills.

### ***Storage of Petroleum Products***

Appropriate guidelines must be followed when setting up fuel storage facilities to ensure that environmental and fire safety concerns are met. Siting and labelling regulations vary and are dependent on sizes of fuel tanks and whether storage is aboveground or underground. Disposal of used oil products and the recycling of used petroleum are subject to regulation.

### ***Safe Use of Pesticides***

Although only contractors and those using restricted-use pesticides are required to take the Pesticide Applicator Course for Agricultural Producers, it is recommended that all agri-chemicals users take the course.

### ***Spills: The Spill Reporting***

Regulation of the Environmental Management Act describes the levels of substances that must be reported when a spill occurs and who to report it to. The Regulation requires a person to report to the Provincial Emergency Program at 1-800-663-3456, any spill of pesticide greater than five kilograms, fertilizer (including manure) greater than 50 kilograms and petroleum products greater than 100 litres. Check the regulation for other specific substance and reportable quantities.

### ***Water Management***

Uncontaminated stormwater runoff from farms may enter municipal drainage systems providing that a stormwater management plan has been prepared in accordance with local government

bylaws. Wastewater or other contaminated runoff cannot be discharged to ditches or streams. Contaminated runoff or wastewater must be collected and applied to vegetated land at an appropriate time and rate or under a permit from the Ministry of Water, Land and Air Protection treated and discharged.

### ***Handling of Spent Mushroom Substrate (SMS) and Mitigation of Environmental Concerns***

Mismanagement of agricultural waste products such as SMS is typically associated with environmental problems. These problems are a result of improper handling of SMS during the storage, processing and application procedures. This section will give an overview of where environmental issues occur when handling SMS.

#### ***Leachate Generation***

The primary environmental concerns with SMS is the production of leachate. Reduction of leachate generation should be the primary focus of any SMS storage or handling practices. Leachate from SMS contains high concentrations of dry organic matter and inorganic salts. The environmental concerns associated with leachate include the pollution of groundwater and/or drinking water reservoirs. Leachate has the potential to damage critical habitat for other species if it leaches into the surrounding watershed.

#### ***Storage and Handling***

(e.g. further composting to add value) of SMS in areas of high precipitation should be conducted on impermeable surfaces with leachate collection system. In the Lower Mainland, where precipitation is high from October to April, it is regulated to cover piles of SMS in order to avoid environmental pollution. The best solution is to prevent leachate generation. Cover stored SMS and divert uncontaminated runoff to prevent leachate production and contaminated runoff.

### ***Odours***

Piles of SMS may become anaerobic and give off offensive odours. Odours are an indication of reduced sulphur and/or nitrogen compound emissions. Odours generate nuisance complaints from neighbours and may foster negative attention in the community where SMS is stored and processed. Odours generated from SMS may be reduced or eliminated by ensuring piles are aerated using forced aeration or turned regularly. Low C:N ratio may also increase odour generation because microbial activity is increased.

### ***Nutrient Application***

SMS may be stored on the farm and applied to crop land as a fertilizer however, for pest management reasons it is not recommended to stored SMS at the mushroom farm site. SMS is classed as a fertilizer based on the property of C:N ratio less than 30:1. Therefore, when applied to soil there are environmental concerns that one must be aware of. Land application rates should not exceed the agronomic requirements of the soil and the crop to be grown. Care must be taken to ensure that there is no runoff. Applying SMS at rates that exceed the soil's ability to assimilate nutrients may result in water or soil pollution. Application of SMS to saturated soils or during times of heavy rainfall can result in groundwater pollution. By applying SMS too close to watercourses or to soil with low infiltration rate water pollution may occur and sensitive habitat may be negatively impacted. SMS cannot be applied on frozen fields in areas or times of high precipitation or snowfall if runoff or escape of agricultural wastes causes pollution in nearby watercourses, or goes beyond the farm boundary.

There are several bodies of legislation that govern the storage, handling and use of SMS. The sustainability of any SMS operation depends on its compliance with the legislation outlined below. Efforts should be made to educate SMS handlers regarding regulations.

## Environmental Management Act– Agricultural Waste Control

This Act has three Regulations that address agricultural composting on farms. The Code under the Agricultural Waste Control Regulation specifies acceptable agricultural composting activities.

*Section 3:* agricultural wastes must be collected, stored, handled, used and disposed of in a manner that prevents pollution.

*Section 15:* agricultural waste may only be composted on the farm if the agricultural waste consists only of waste produced on the farm, or if produced elsewhere, is being composted for use on the farm. The composting site must be located at least 15 m from any watercourse and at least 30 m from any source of water for domestic purposes and must be composted in a manner that does not cause pollution.

*Section 19:* states that the Code is not intended to prohibit various odours from agricultural operations or activities on a farm, providing such operations or activities do not pollute.

*Section 30:* agricultural products must be managed to prevent the escape of agricultural wastes (agricultural products include farm inputs and outputs).

**\*Note:** Mushroom Composting Pollution Regulation - deals specifically with production of mushroom compost.

## Fisheries Act

This Act has two sections of importance to compost management: Section 36(3): prohibits the deposit of deleterious substances into watercourses (deleterious substances could include compost materials and leachate). Section 37: requires approval for any work that may impact fish. Section 38(4): requires reporting infractions of Section 36.

## Farm Practices Protection (Right to Farm) Act

This act protects farmers from undue nuisance complaints regarding odour, dust and noise and provides a complaint resolution process.

## Fertilizer Act

If SMS is to be used as an organic fertilant, the Fertilizer Act must be abided by. Applicable sections in the Act are titled: exemptions from Registration, Registration, Standards, Regulations, Guaranteed Analysis and Labelling. Depending on the operation, a permit may or may not be required.

## Further Resources

Farm Practices section of the BCMAL Reference Guide:

<http://www.al.gov.bc.ca/resmgmt/fppa/Refguide/intro.htm>

Reference Guide: The Canada – British Columbia Environmental Farm Plan Program.

Refer to the EFP section in this guide. For information on current EFP programs, contact the BC Agriculture Council at

[www.bcac.bc.ca](http://www.bcac.bc.ca)

or Tel: (604) 854-4483 or contact the closest BCMAL office. Also

Best Environmental Practices for Mushroom Growers in Canada

[http://www.canadianmushroom.com/pdf/Best\\_Practices\\_Guide.pdf](http://www.canadianmushroom.com/pdf/Best_Practices_Guide.pdf)

Report: Value-Added Strategies for Spent Mushroom Substrate in BC

For a copy of this report call BCMAL Abbotsford office at 64-556-3001

## Environmental Farm Planning (EFP)

The long-term prosperity of British Columbia's agricultural sector is linked to its environmental sustainability. With increasing agricultural production intensity and expanding knowledge of our biological and physical environment, the need for improving farm practices has been recognized. The goal of Environmental Farm Planning is to raise awareness amongst producers and enhance environmental farm stewardship. This can be accomplished through the establishment and implementation of Environmental Farm Plans. Environmental Farm Planning (EFP) is normally seen as a voluntary, confidential, producer-driven planning exercise that uses specifically designed resource materials and technical assistance. In British Columbia, both senior governments and the agriculture industry recognize the value of EFP's, and programming is available in all agricultural regions of the Province. Between 2003 and 2008 recognized planning advisors working under the Canada-British Columbia Environmental Farm Planning Program provided Planning Workbook and Reference Guide materials to participating farmers. These materials are used to develop a farm plan that identifies on-farm environmental risks and subsequently establishes a priority sequence of action items for addressing those risks. The EFP concept has been around for over two decades. The first in North America was the Farm-A-Syst program in Michigan. This was adapted by the Ontario Farm Environment Coalition for use by Ontario farmers. The Ontario program has been in place for well over 10 years. Since 2004 all Canadian provinces have had an EFP program in place. EFP's are voluntary. There are no government laws or regulations that require a farmer or rancher to prepare a plan. However: recently, institutions such as banks, insurance companies, food processors and buyers are paying increasing attention to the impact of agriculture on the environment and are requesting some form of environmental risk assessment from their clients. Farmers may find their environmental farm plan to be a very useful tool when dealing with these other organizations.

### What is an EFP?

An EFP is an agriculture-environment risk identification process. It is conducted through a comprehensive review of activities and facilities that exist on the farm or ranch with respect to their impact on the environment. The review also looks at the impact of the environment on the farm, for example impacts from wildlife or flooding. The review considers current environmental regulation requirements and beneficial management practices that should be in place on the farm. It looks at the risk of the operation to the environment as well as the risk of the environment to the farm or ranch operation.

### Why do an EFP?

- To determine the standing of the farm with respect to environmental rules and regulations and the environmental risk of management practices.
- To sustain the resources used and affected by farming practices for long-term production.
- To increase public confidence that BC farmers are "doing it right" with respect to the environment.
- To improve farm/ranch profitability. Potential economic benefits include things such as minimizing cost of pesticides by using integrated pest management techniques.
- To differentiate your product(s) in the marketplace and thereby maintain or enhance marketing opportunities.
- To help plan for unforeseen contingencies such as floods, spills or fires.
- To demonstrate due diligence on the part of the producer.
- To reduce potential for new legislation/regulation.
- To improve relationships with regulatory agencies reducing the need for further regulation.

For information on current EFP programs, contact the BC Agriculture Council at — [www.bcac.bc.ca](http://www.bcac.bc.ca) or the BCMAL office.