Welcome to

HORSE COUNCIL
BRITISH COLUMBIA

Horse Council BC

Manure Management

Program

Quick Facts…

- An average 1,000-pound horse produces 9 tons of manure a year containing valuable fertilizer elements.
- Horse owners have a responsibility to manage the manure that is a byproduct of their industry.
- Manure is commonly stockpiled prior to use. Adequate storage area allows for greater flexibility in timing of manure use.
- Recordkeeping is an essential factor in land application of manure/compost.

- The 50 pounds of manure per day produced by an average horse contains valuable nitrogen when composted. With an additional cubic foot of bedding material and you get 730 cubic feet/year from one horse..

- How the manure is stored and treated has a substantial impact on its value. The labor, storage and utilization costs for manure management can be considerable

Marketing Plan

- Horse owners have a responsibility to manage the manure that is a by-product of their industry. Develop a management plan for manure and soiled bedding. Use it on crop lands, arena surfaces, trail surfaces, and landscaping. If you don't plan to use the manure yourself, develop a marketing plan so others can make use of it.

Marketing Strategies

- Contract or donate compost to crop farmers, community landscapers or parks, and neighborhood gardeners. Offer a discount to boarders if they dispose of manure.

- The people who come to watch others ride are another potential market for manure or compost sales. Before you can market the product, it must be completely and properly composted and free of foreign material such as pop cans, wire, and syringes.

- Make an arrangement or contract with a landscaper, nursery or crop farmer. Be prepared to handle your own by-product. One option may be to deliver manure, at your cost, to a site where contractors do the composting. Pre-determine the bedding types they prefer in their compost mix.

Manure Collection

- Confinement Housing (stalls, paddocks, and runs). Daily maintenance of horses in a confinement setting requires intensive labor. Horses housed in stalls and sheds require soft absorbent bedding. The most common bedding sources in pine sawdust (80 percent), pine wood chips (17 percent), and straw (2 percent). Some other sources are shredded newsprint, peanut shells, peat moss, rice hulls, etc. Remove manure and soiled bedding on a regular basis and handle appropriately to prevent fly infestation and disease transmission.

Pastures

- Manure management in pastures depends primarily on getting good distribution of manure across the pasture. To avoid manure concentration in isolated spots in a pasture, distribute grazing evenly. Rotational grazing is one of the best ways to achieve this goal; however, horse owners don’t usually have large enough pastures for rotational grazing.

- On the other hand, pastures can be split, and the horses moved back and forth between both parts of the pasture to distribute the manure more uniformly. Availability of several watering facilities and moving feeding facilities periodically will encourage better manure distribution.

- Avoid grazing during rainy periods when soils are saturated to avoid soil compaction and manure runoff. Restrict access to streams to avoid manure deposition in or near water bodies. This can be done by fencing or providing shade away from the streams. Refrain from excessive horses on a pasture as it will lead to overgrazing. Damaging the grass stand increases manure runoff potential from pastures.

Storage and Treatment

- **Stockpiling.** Manure is commonly stockpiled prior to use. Adequate storage area allows for greater flexibility in timing of manure use. Therefore, be sure you have a large enough storage area to accommodate the manure produced. Over time, the manure shrinks from decomposition and moisture loss.

Site Selection

- Proper site selection for the storage area is important to safeguard against surface and groundwater contamination. Place stockpiles at least 30.5 m from wells and 30 m away from any watercourse (creeks, ditches and ponds).

This will prevent pollution

- Even a small farm need only a well- selected prepared site and a means to keep rain out of the manure.
- All manure storage systems should be evaluated to ensure that pollution is not occurring.

- Keep field-stored manure piles at least 30 m from any watercourse and keep them covered to prevent runoff to surface water, especially from Oct 1 to April 1. For more information please visit: https://www2.gov.bc.ca/gov/content/environment/waste-management/industrial-waste/agriculture/regulation-requirements/agricultural-composting

- Facilities used to store or compost/manure should be located at least 15 m from any watercourse and should be covered and lined to prevent overflow or leakage.

When can you spread manure?

- Rainy or months with the most precipitation are "no spread months" The fall and winter have a high risk of run off.

- For the manure spreading advisory you can go to: https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/agricultural-land-and-environment/soil-nutrients/nutrient-management/what-to-apply/manure-application-seasonal-restrictions

Manure should not be applied

- At rates of application that exceed the amount required for crop growth,
- On areas that have standing water
- On saturated soils
- On frozen land, or
- In diverting winds

- Establish and maintain grass buffer strips between water bodies and manure piles. Construct a perimeter ditch around the storage area, if needed, to prevent runoff onto or off of the area.

What can Result from Poorly Managed Manure

- Excess fertilizers in a watercourse can result in algal blooms. As this excess algae is broken down by bacteria large amounts of oxygen is consumed, and can drop to dangerously low levels causing fish to suffocate and die. The same is true for runoff containing large amounts of organic matter which must also be broken down.

- High levels of nitrates in drinking water can increase the risk of "*blue-baby syndrome*," which can kill infants and has been linked to other health effects.
- Animal by-products can contain disease-causing pathogens. If these pathogens enter drinking water or irrigation water used on fruits and vegetables they can cause human illness. Furthermore, potentially polluted water used for livestock watering may result in animal illness.

Composting

- If composted properly, horse manure produces a relatively dry end-product that is easily handled and reduces the volume of the manure (40 percent to 65 percent less volume and weight than the raw manure).

- Composting at proper temperatures can kill fly eggs and larvae, pathogens and weed seeds. Compost has less of an odor compared to raw manure and is more easily marketed. Composted manure acts as a slow release fertilizer and an excellent soil conditioner.

To be done right

- Composting requires an investment of time and money. Machinery that may be required includes a tractor, a manure spreader and a front-end loader. Some ammonia-nitrogen is lost during the composting process, and an ammonia odor may result for a short period. When composting is done on a large scale, additional land and machinery requirements exist.

What's in manure?

- Microbes that drive the composting process require optimum conditions of temperature, moisture, oxygen, and carbon:nitrogen (C:N) ratio. The C:N ratio should be between 20:1 and 30:1; horse manure has an estimated C:N ratio of 50:1. With the addition of bedding material (high carbon content), the C:N ratio will be even higher. Therefore, N has to be added to the manure for it to compost properly.

- The addition of grass clippings, hay, or fertilizer [25 to 30 pounds N/ton of manure (75 to 90 pounds of ammonium nitrate or 50 to 65 pounds of urea)] should bring the C:N ratio into the optimum range. When microbes work properly, the compost temperature will be between 120 and 160 F. Cooler temperatures result from a lack of N. When the composting process is complete, the temperature will cool naturally.

Balance is the key

- It is important to have the right balance of moisture and air for the microbes to process the manure. The compost should be moist but not soggy, and may need to be watered or covered with plastic to maintain moisture. Aerate the compost by turning it regularly. The manure and bedding particles should be about one-half inch to one and a half inches in size.

Composting does require effort, but the result is a more easily used and economically valuable fertilizer

Fact sheet

- Horse owners are advised to supplement the information on this fact sheet with information from the B.C. Agricultural Composting Guides. It is available on the Internet at https://www2.gov.bc.ca/gov/content/environment/waste-management/industrial-waste/agriculture/regulation-requirements/agricultural-composting

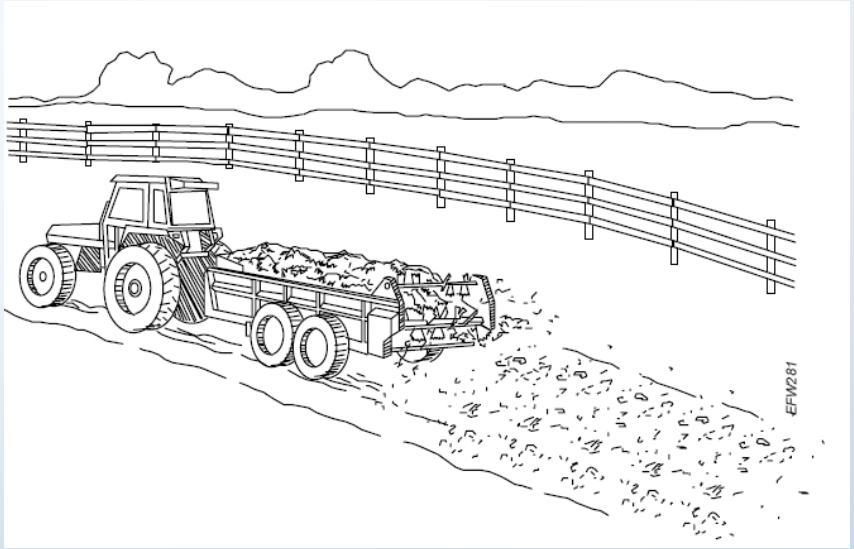
Utilization

- **Land Application.**
- Recordkeeping is an essential factor in land application of manure/compost. It is critical to know how much manure/compost was applied to each field and when it was applied. Analyze manure/compost regularly and record the lab results for future reference. Note changes in nutrient value and factor them in when calculating future application rates.

- Manual loading and land application are labor intensive and impractical for managing the manure generated by more than 25 horses. Consider mechanical loading and application with a bobcat or tractor-operated loader when the manure or the land application becomes large.

Spreading manure

- Apply the manure/compost uniformly to achieve an acceptable application rate. The finer textured and more uniform the manure, the easier it is to apply uniformly. Spreaders apply manure/compost at different rates depending on ground speed, PTO speed, gear box settings, discharge openings, and manure moisture and consistency



- Do not apply manure to land that is highly erodible, frozen or saturated. To protect water sources from manure runoff, do not spread manure within at least 30.5 feet of a water source (such as a well, creek or pond).

- Incorporate manure into the soil as soon as possible. Mixing the manure with the soil immediately reduces losses of manure nutrients to runoff and volatilization, and reduces odor problems associated with manure left on the soil surface.

Landfill

- Manure and compost are sometimes landfilled, dumped in gullies and used to repair roads. These are not recommended practices due to high runoff and leaching potential from gullies and roadways. If the areas are not vegetated and are waterways for storm runoff, the potential for runoff of manure nutrients into creeks and ponds is high. When excessive nutrients exist in surface waters, plant and algal growth becomes extreme, the oxygen supply is depleted, and fish can be killed.

Footing for Riding Arenas

- An ideal arena surface provides resilient footing for optimum horse performance. Drain the arena well, maintain adequate depth to protect horses' legs from contusions, and keep the arena absorbent to hold moisture efficiently and prevent dust. The arena surface also must be odor-free.

- Composted manure/bedding makes an ideal surface addition when mixed with river sand and wood products. Uncomposted manure and bedding results in ammonia fumes that can cause respiratory problems in horses. Surface depth of compost depends on soil type and climate; too much organic matter can hold excess moisture and may cause the horses to slip and fall.

Precautions

- Virtually no viral diseases are transmitted between horses and humans through fecal material, but some bacteria and protozoans (such as E. coli and Giardia) can be transmitted in this manner. Therefore, handle manure carefully to prevent disease transmission. In addition, horse manure runoff into waterways may produce fecal coliform contamination levels that can be potentially hazardous to fish and anyone who drinks that water.

Runoff

- Runoff water from dry lots, pastures, and manure storage or compost areas carries pollutants (such as nitrogen, phosphorus, and bacteria) into surface waters. Avoid over irrigation of pastures. Build berms or trenches to prevent water from entering or leaving dry lots and manure storage and composting areas. Do not allow a creek or irrigation canal to pass through drylots.

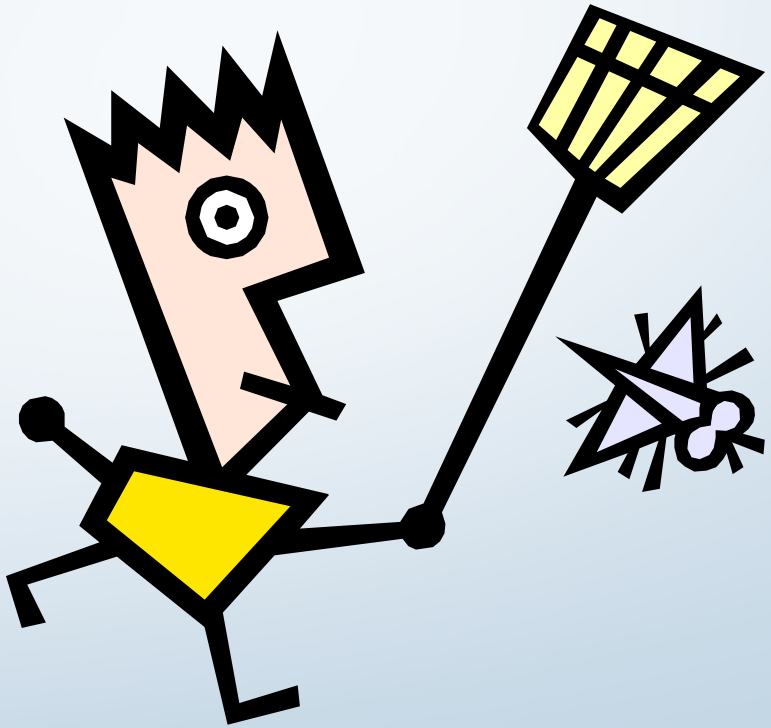
Parasite Prevention and Control

- Horses pick up parasites by ingesting grass, feed, or water that is contaminated with parasite larvae and eggs. The most common internal parasites of horses are the ascarids, strongyles (large and small), pinworms and bots.

Insect Control

- Excellent fly-breeding conditions occur in mixtures of manure, spilled feed and decaying bedding. To help eliminate these areas, remove and spread the manure regularly and prevent accumulation of other wastes. Composting at proper temperatures inhibits fly development. Several pesticides can be used on manure piles to kill maggots.

- Cover manure stockpiles or compost sites to exclude flies and prevent their development.



- Noncomposted manure piles can provide an ideal environment for the bumble flower beetle white grub. White grubs feed on decaying manure; however, these grubs do not damage home lawns. Therefore, there is no need to control them.

- Mosquitoes require standing water to reproduce; therefore, it is imperative to prevent ponding of water in manure storage areas.

Salinity

- Manure tends to be high in salts, which when land applied at excessive rates, contribute to soil salinity. Soil salinity causes plants to become water stressed or, in extreme cases, die. When manure is not soil-incorporated, as in applications to pasture, the salts accumulate on the soil surface unless they are leached into the subsoil. Irrigation or rainfall may move salts out of the topsoil and move them into deeper depths of the soil profile

Weeds

- A weed is an unwanted, out-of-place plant. Weeds compete with crops for limited resources of water, nutrients and light. Manure has contributed to weed problems where it has been applied to cropland. Use composted manure to avoid these problems. When manure is composted, the high temperatures achieved during the composting process kill most weed seeds. Some weed infestations may be the result of overgrazing, not due to manure applications.

Manure management

- A. Remove all manure from stalls, small corrals, and paddocks on a daily basis.
  B. Compost all manure to a temperature of 145 F for at least two weeks to kill most parasite eggs, or compost at lower temperatures for longer periods of time.
  C. Spread manure on pastures only after composting.
  D. Manure that has not been composted should be spread only on crop land or other ungrazed, vegetated areas.

Pasture management:

A. Mow two to four times a year and chain harrow (drag) to break up manure piles and expose parasite eggs to the elements.
B. Don’t overstock.
C. Practice rotational grazing if possible.
D. Graze young horses separately from older horses; the younger horses have a higher susceptibility to parasites.
E. Follow horses with cattle or sheep before returning a pasture to horses. This interrupts the life cycles of horse parasites.
F. Deep harrow or plow pastures that are badly parasite-infested. Deep plow pastures and reseed every three to five years. This also helps break parasite cycles.

Feed and water management:

A. Use feeders, racks, bunks or mangers for feeding hay and grain. This will prevent feed from getting mixed with feces. Don't feed off the ground.
B. Provide horses a clean, fresh drinking water supply.
C. Avoid water contaminated with feces.

Farm Planning

- Several programs have been developed to provide farm owners with tools to improve the economic and environmental viability of their operations. Farm owners are encouraged to contact Ministry of Agriculture and Lands staff for more information:

For assistance in managing manure and meeting other requirements of the *Agricultural Waste Control Regulation* you may wish to consult with any of the following sources:

- ***Agricultural Waste Control Regulation***
- https://www.bclaws.gov.bc.ca/civix/document/id/loo78/loo78/10_131_92

- **Ministry of Environment**
- https://www2.gov.bc.ca/gov/content/governments/organizational-structure/ministries-organizations/ministries/environment-climate-change
- **Agriculture and Agri-Food Canada**
- https://agriculture.canada.ca/en

- **BC Institute of Agrologists**
- http://www.bcia.com

- **BC Agriculture Council**
- https://bcac.ca/