

# Guidelines & Best Management Practices for Horsekeeping

## An Introduction to Horse Ownership in New Hampshire

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### Land Size Requirements

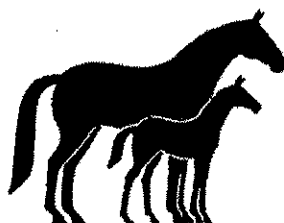
Land size to maintain a horse is not as significant as is the care of the animal and its use. Criteria should be cleanliness in disposing of manure and exercise space for the animal's welfare. For example, a horse kept on less than an acre of land, but that is adjacent to a park or public riding facility may be adequate. In a high-density urban area that has no exercise facilities or manure removal, less than an acre may not be adequate. Consider the intended use of the horse: show horses are confined to stalls and exercised in a ring; breeding stock is housed in open paddocks.

**Housing – space and shelter** –Need large exercise area such as paddock, corral or pasture. Also need natural or man-made shelter from elements, both hot and cold. This can vary from a protective stand of trees during warmer months, to a 3 sided-shed to a complete stable with box stalls.

**RSA 435:14 – an adequately ventilated and dry barn or a windbreaker roofed with at least 3 sides shall be provided and accessible to horses (November 1 through April 15). Animals kept in paddocks or pastures with a roofed windbreaker shelter shall not be kept tied but shall be able to move around freely. Horses housed in barns or other enclosed stables shall have stalls of sufficient size so that the animal is able to lie down. Suitable exercise shall be made available.**

The housing structure should not be closer than 50' to adjacent property lines, and not closer than 100' to a neighboring residence. Horses should also not be penned or tied within a 75' protective radius around a water well. Man-made shelters should be clean and well ventilated with no drafts. Stall sizes/horse: Tie stall=45 sq. feet, 5'x9'; Box stall=96 sq. ft., 10'x10' or 12'x 8'. Ceiling height=at least 8'. Flooring=clay preference; others include sand, rubber mats. Emphasis on well-drained, solid footing surface, with some give when horses lie down. Wooden floors are slippery when wet and can splinter; cement and asphalt are also slippery when wet and cause abrasions. Three-sided shelters should face south away from the prevailing wind, be located on an elevated, well-drained site, and should be accessible for feeding animals and materials handling.

**Pasture & Paddock** – The average amount of pasture needed to feed a mature horse is one to two acres per horse. The amount of pasture needed to feed a mature horse depends largely on the quality of pasture and the nutritional requirements of the animal. The major component of a horse's diet is good forage, such as hay or pasture. A horse that weighs 1000 lbs. will eat about 500 lbs. of forage each month. If your pasture has adequate moisture and is managed well as a crop by soil testing, fertilizing, clipping weeds and managing manure, you may require as little as ¼ - 1 ¼ acres per horse. Your horse will not eat grass that has been trampled or has manure on it. Overgrazing will also damage your pasture. For good regrowth, leave about one-third of the grass uneaten. Overgrazed pastures may never recover. To prevent overgrazing, subdivide the pasture so that the horse(s) graze any given paddock for no more than seven days. Leave about 2" of grass and allow it to grow to 8"



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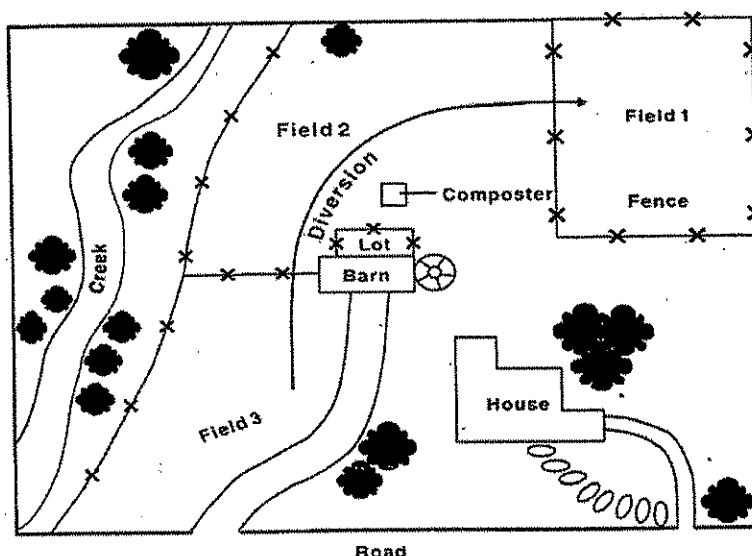
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*These guidelines refer to horses, but also apply to ponies, donkeys, mules and other equidae. They are practical and reasonable, and are offered as the basis for constructive discussion and reasonable solutions. They are geared towards the individual horseowner, but also provide a framework for commercial enterprises which are more intensive and continuous. It is difficult to set restrictions on horse population numbers. Factors involved here are: location, nature of surrounding area, management techniques, and manure disposal system.*

before it is grazed again. At least 4 pasture sub-divisions are needed to accomplish this.

Paddock areas should be large enough for the horse to move around in comfortably and well drained, so that standing water does not accumulate. A minimum of 350 sq. ft. per adult horse is needed, with a minimum width of 14'. It does not have to be grass, and may have other appropriate footing.

**Fencing**—Outside lots that are used for exercise and/or grazing should be fenced in a manner that is safe to both animals and people and located so that horses don't cause damage to a neighbors property. The fence must be **VISIBLE** to the horse. Fences should be constructed of: wood materials, woven wire, pipe, or PVC with a height of 48" and posts that are 10' apart; or electric fencing (wide ribbon wire is the best because of visibility). Electric fence is best used as an interior fence and not as a major exterior fence.



**Example of a properly laid out landscape for managing horses and their waste. Runoff should not be allowed to discharge directly into a stream, creek, or other water body. Placing a diversion above a high-use area may prevent outside run-off from flowing across the barn or manure containing paddock and storage areas. A diversion placed below the high-use area will help direct runoff from the lot away from water or wet areas.**

From "Pollution Control for Horse Stables and Backyard Livestock", Terrene Institute, Publications Division, Washington, DC, February 1994

## Feed and Water

An average saddle horse weighs 1,000 lbs. and will eat approximately 17-22 pounds of feed per day (total ration). Total ration is a combination of hay, grain and pasture. Salt should always be available to the horse.

**The horse must have plenty of fresh, clean water available at all times.** The horse will drink 10-12 gallons a day depending on temperature, humidity, feed, and work. Remember that wintertime is no exception. Stock tank heaters may help keep water accessible at all times.

**Horses need supplemental hay during times of snow cover and when pasture forage is not available.** Feeding hay also extends the grazing season on small acreage properties. How much hay to feed should be based on weight of the bales and nutrient value of the hay. Hay quality varies greatly, and can not be judged by color alone. Have your hay analyzed to determine nutrient value. You can get this through your county cooperative extension office and your local Agway. An average 1000 lb. horse will eat 20 lbs. of medium quality hay per day. How much hay will you need?

**# days to feed hay X 20 lbs. hay per day, divided by lbs. of weight per bale = # bales needed**

**Grain (usually oats and corn) is typically added to the diet of working horses.** Young and old horses may also need grain.

## Health Care

It's crucial to develop a partnership with a veterinarian prior to an emergency situation. Locate a veterinarian to consult about your horse's routine and preventive health care.

**Vaccinations** - Horses should be vaccinated at least once a year, usually in the spring. The vaccination program is determined by age, use and overall health of the horse. Time of year affects the risk of infectious diseases, so be sure to consult the veterinarian for recommendations.

**Internal Parasite control** - Horses need to be dewormed several times each year. Frequency of treatment varies with the horse's management.

**Foot Care** - Hooves should be cleaned before and after riding. Check them regularly for problems. They also need to be trimmed regularly. Hoof care varies with the use and age of the horse. Contact a qualified farrier for your horse's needs.

**Dental Care** - Teeth should be checked by a veterinarian at least once a year. Teeth may need to be floated (filed) because of uneven wear while eating.

**First Aid** - Ask your veterinarian about what you need in a first aid kit. It should have a thermometer, bandage material, ointments and other related items. Contact your veterinarian whenever your horse appears sick, disoriented, or has been injured.

**Manure Management** - Please remember that the proper manure management helps to keep horses healthy.

## Manure Management

**Pollution Prevention**—Get started by making a map of the layout of your property. Show placement of barns, pastures, paddocks, streams, ponds, and wetlands. Ask yourself how you can improve the current layout and facilities. Look at how, where, when you collect, store, and dispose of manure. Learn and chart how the water runs off your property. Where does it enter and exit? Where are the slopes? Are there problem wet areas? Where is your well and septic system? Locate your neighbors on the map as well, and note appropriate setbacks. Then take these steps:

- 1) *Cover your manure piles* to: protect lakes, ponds and wetlands; reduce fly breeding; prevent well water contamination.
- 2) *Divert clean water* away from your barnyard to: minimize mud; prevent erosion; and reduce polluted runoff.
- 3) *Fence* to: keep horses out of lakes, ponds, streams and wetlands; and to promote healthy grass by subdividing to allow pasture rotation and rest.
- 4) *Pick up manure daily from heavily used areas*: to store in a dry area or to compost.
- 5) *Test pasture soils to*: save money and reduce pollution by not over-fertilizing; and maintain healthy grass to reduce erosion, mud and polluted runoff.

**Manure Management**—The issues: collection, storage, spreading, composting, transportation, give away.

Manure storage design and management consultation is available from UNH Cooperative Extension, US Natural Resources Conservation Service, and NH Department of Agriculture, Markets & Food. See the resources section for contact information.

**RSA 431:33 - Definitions. In this subdivision:**

**I. "Agricultural compost"** means mixtures of decomposing vegetable matter, including manure, stored and managed on farms and used to condition and fertilize soils used for production of agricultural crops.

**II. "Chemical fertilizer"** means substances as defined in RSA 431:3, I-V.

**III. "Manure"** means the excreta of animals, including poultry, that are kept or harbored as domesticated animals, together with bedding materials used in housing such animals.

**RSA 431:34 - Best Management Practices. In consultation with the agricultural advisory board, the commissioner of environmental services, the United States Natural Resources Conservation Service, the New Hampshire agricultural experiment station, the University of New Hampshire cooperative extension, and other appropriate agencies, the commissioner of agriculture, markets and food shall identify and publish the best management practices for handling manure, agricultural compost and chemical fertilizer. Such practices shall be based upon the best available research and scientific data so as to permit the maximum use of nutrient and soil conditioning values, while achieving the least possible adverse impact upon the environment or human, animal and plant health.**

**RSA 431:35 - Improper Manure Handling.**

**I. The commissioner shall investigate complaints of improper handling of manure, agricultural compost, and chemical fertilizer, including, but not limited to, complaints of improper storage and spreading. If the commissioner is able to identify the source of the improper handling and has reason to believe such handling is a nuisance caused by failure to use best management practices, the commissioner shall:**

- a. Determine who is responsible for such handling.
- b. Determine the changes needed in handling to comply with best management practices.
- c. Notify, in writing, the person responsible of the findings and changes necessary to conform to best management practices.
- d. Require a plan for compliance if the corrections, under RSA 431:35, I(c), have not been made within 10 days after notification.

**II. If the person responsible fails to implement the recommended changes, the commissioner shall notify the health officer of the municipality and the commissioner of environmental services, who shall take such action as their authority permits.**

**Manure, Agricultural Compost, and Chemical Fertilizer Handling**—Did you know that the average horse (1000 lbs.) will produce about 50 lbs. of manure a day, and 8 to 10 tons per year? Manure must be handled in a way that it becomes an asset and resource and not a nuisance. The majority of manure nuisance complaints are odor related. Fly and rodent populations will also be minimized with proper manure management. (Fly elimination must start in the spring with an aggressive program. Fly traps and fly strips work remarkably well when coupled with a good manure management program. Rodents can additionally be discouraged from stable areas by keeping feed in tightly covered and rodent-proof containers.)

- 1) **Collection:** Manure should be picked up regularly from the horse's stall, paddock and pasture. Daily pick-up is recommended in population dense areas, high herd count facilities and/or low acreage availability. It then will need to be stored at least temporarily.
- 2) **Storage:** You will require an area about 12' x 12' x 5' to hold the manure for one horse for a year. Storage facilities don't have to be elaborate. Locate your storage facility in a low profile place, conveniently located with regard to the manure source. A carefully sited field stack can work as well as a constructed facility. A cement pad is advisable to prevent nitrogen build up over time in certain soils. Ground surface slopes should range from 1%-7%, with 2%-4% being ideal. Building grassy swales will help take care of potential run-off. Covering the pile will also help reduce nutrient leaching. Be sure that your pile is easily accessible to power equipment that may be needed for loading and unloading. Storage is a temporary solution. Manure will then need to be spread, composted, transported or given away.
- 3) **Spreading:** Manure can be spread on well-vegetated fields at appropriate times of year, at an application rate of 10 tons per

## Resources

NH Department of Agriculture, Markets & Food, 25 Capitol Street, PO Box 2042, Concord, NH 03302-2042  
(603)271-3551

UNH Cooperative Extension, 59 College Road, Taylor Hall, UNH, Durham, NH 03824  
(603)862-1520

Natural Resources Conservation Service, Federal Building, 2 Madbury Road, Durham, NH 03824-2043  
(603)868-7581



NH Horse Council, Inc., 273 Poor Farm Road, New Ipswich, NH 03071  
www.nhhorsecouncil.com  
(603)878-1694

*Compiled and produced by Lisa Derby Oden, Blue Ribbon Consulting, New Ipswich, NH, and NH Horse Council, Inc.*

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## References/Additional Reading

\*\*\*Good Neighbor Guide for Horse-Keeping: Manure Management, a joint publication by the NH Department of Agriculture, NH Department of Environmental Services, the UNH Cooperative Extension, and the US Department of Agriculture Soil (Natural Resources) Conservation Service, 1990.

\*\*\*Manual of Best Management Practices for the Handling of Agricultural Compost, Fertilizer and Manure, prepared by Agricultural Best Management Practices Task Force and the USDA Natural Resources Conservation Service for the NH Department of Agriculture, Markets & Food, revised 1998.

\*\*\*Manure Management: Don't Waste a Valuable Resource, produced by Belknap County Conservation District as part of the Lake Winnepesaukee Watershed Partnership, 1999.

\*\*\*Manure Disposal and Water Quality; and Manure Storage: The Latest Poop; two brochures by Rockingham County Conservation District.

\*\*\*Nutrient Management and the Horse: A Practical Guide on Horse Manure Management, Composting, and Pollution Prevention; prepared by Litchfield County Conservation District, Torrington, CT, 1998.

\*\*\*Guidelines for Space and Housing of Farm Animals, by David C. Seavey, Extension Educator, Agricultural Resources and John C. Porter, Extension Specialist, Dairy, UNH Cooperative Extension, 1999.

\*\*\*A Plan for Intensive Pasture Management, by Bruce Clement, published in Critter Exchange, February 1999.

\*\*\*Poisonous Plants in a Pasture Setting, by George Hamilton, UNH Cooperative Extension, 1994.

\*\*\*Bedding for Horses, published as Wisconsin Horse Facts and Analysis by Wisconsin Cooperative Extension Service, by Ray J. Antoniewicz

\*\*\*Horse Industry Handbook, A Guide to Equine Care and Management, American Youth Horse Council.

\*\*\*Colorado Horse Care, sponsored by Colorado State University Cooperative Extension and Colorado Horse Development Board, 2000.

\*\*\*H.E.A.P (Horse Environmental Awareness Program), 5 Ways to Prevent Pollution on Your Farm, and Horses - A Common Sense Approach, King's Mark Resource Conservation and Development, Wallingford, CT. <http://neirnt.ct.nrcs.usda.gov/horse/>

**Size your manure storage facility** according to your number of animals and the number of days you intend to hold manure before use or delivery. To estimate the base size of your storage pad use the following equation:

~Number of animal units (a.u. = the average total weight of your animals divided by 1000 lbs., or one horse per a.u.) x number of days storage = cu. feet of manure

~Number of a.u. x cu. feet of bedding per day x number of days = cu. feet of bedding

~Cu. feet of manure + cu. feet of bedding = total volume

~Sq. feet of area required = total volume divided by desired storage height

Let's look at an example using 3 horses with a total weight of 3200 lbs. Let's also assume the manure is removed 4 times a year, and you want to build a manure pad with sides 4' high.

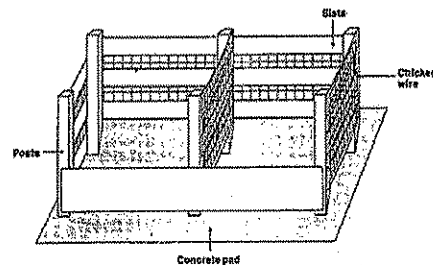
~3.2 a.u. X 90 days = 288 cu. feet of manure

~3.2 a.u. X 2 cu. feet of bedding/day X 90 days = 576 cu. feet of bedding

~288 + 576 = 864 total volume

~864 / 4 = 216 sq. feet required

A space 15' x 15' would be adequate for your needs. Other dimensions are also possible, such as 10' x 22', or 12' x 18'.



**Two-bin composter—ideal since once the process begins no new manure should be added. The 2nd bin stores new manure. Bins that are covered and turned correctly and that maintain the proper high temperature are not attractive to insects and rodents.** From "Pollution Control for Horse Stables and Backyard Livestock", Terrene Institute, Publications Division, Washington, DC

acre or the latest recommendation from the University of New Hampshire, based on soil tests. Manure should not be spread during the winter months.

- 4) **Composting:** Actively managed compost piles can be part of a good manure management program. A manure pile DOES NOT qualify as a composting procedure. To compost manure, you must pile it properly, monitor the pile, keep it moist, turn it over several times for several months, and allow it to cure for at least one month. Because of the wood content when shavings are used as bedding, horse manure makes a good addition to cow manure for composting purposes. It also combines well with grass clippings and other landscaping by-products. Contact local dairy and cattle farmers, and landscapers to see if you can combine efforts.
- 5) **Transportation:** How will you remove the manure from your property? Do you have the necessary equipment, or will you need to hire someone to assist you?
- 6) **Give away:** Place your manure in empty feedbags, shavings bags or other biodegradable bags tightly closed. Offer it as fertilizer free for the taking. You may also be able to sell it if it's been composted first. Even if you provide the bag and give it away free, it may cost a lot less than storing it and moving it by bulk process.