

Nutrient management planning for landowners with horses



A nutrient management plan (for horse farms) is a documented strategy that accounts for all nutrients (horse manure) going on to crops (pastures) and being removed by harvest (forage) in a manner that optimizes economic return, ensures soil conservation, and protects water quality.



WHY is a nutrient management plan important?

Many horse owners have never heard of a nutrient management plan (NMP), much less know if they need to have one.

Writing an NMP is a great way to gain an understanding of the amount of manure your horse(s) produce and the potential environmental risks.

Implementing an NMP helps to streamline manure handling and reduces the risk of negative impact to the local community and nearby natural resources.

An NMP can also act as a form of insurance. For example, if a neighbor complains about a manure stack or application, the county land conservation department can check your NMP, verify that your actions are compliant, and defend you against the claim.

What's the big deal about my manure?

Manure contains essential plant nutrients that may cause harm to human and animal health as well as the environment. The two main manure nutrient concerns are nitrogen and phosphorus.

- ✓ In excess on fields or pastures, **nitrogen** can leach into groundwater, which in high enough concentrations can cause harm to human health.
- ✓ When not managed properly, **phosphorus** can cause surface water contamination, which can create poor water conditions for both aquatic life and community use.



WHO needs a nutrient management plan?

All landowners must have and follow an NMP when applying nutrients to any field (including pastures) if they:

- ✓ Received cost-share for developing an NMP
- ✓ Accepted manure storage cost-share
- ✓ Participated in the Farmland Preservation Program
- ✓ Are regulated under a local ordinance for manure storage or livestock siting
- ✓ Are regulated under a WI Pollutant Discharge Elimination System (WPDES) permit
- ✓ Were issued a Notice of Discharge (NOD) for causing a significant discharge

To find out more about local requirements in your area, contact your township or municipality.

* the fine print

The Wisconsin Department of Agriculture, Trade and Consumer Protections (DATCP) provides financial help and training to farmers, landowners, agronomist and agriculture educators. The University of Wisconsin-Madison has developed free software called SnapPlus to assist in writing NMPs. To find training in your area, contact your county land conservation office or visit the SnapPlus website (snapplus.wisc.edu).

NMPs must meet the following requirements:

Wisconsin NRCS 590 Standard: The USDA-Natural Resources Conservation Service's (NRCS) and state conservation agencies' framework for nutrient management planning

ATCP 50: A state regulation (administered by Wisconsin DATCP) that lays out how landowners meet the nutrient management standard

NR 151: A state regulation that sets performance standards and is enforced by the Wisconsin Department of Natural Resources (DNR)

WHEN is a nutrient management plan required?

As a landowner with horses, the scenarios that would require a compliant* NMP are:

- ✓ Your pastures are stocked at a rate **over** one animal unit (AU) per acre during the grazing season. [See page 2 to calculate AUs per acre]

OR

- ✓ You mechanically spread manure and/or fertilizer on your land.

To be compliant, NMPs must be written using the nutrient management planning software **SnapPlus**.*

Keep in mind that if your operation doesn't meet either of the scenarios above, you may still be required by your local township or municipality to fill out and submit the **Horse Nutrient Management Form** (see next page).

Taking inventory

The following pages will help you determine if you need an NMP and offer some suggestions for the different areas of planning.

To begin with, have the following information available before you start:

- ✓ How many animals do you have?
- ✓ Do you have plans for adding more animals?
- ✓ Do your animals deposit the majority of their manure on pasture?
- ✓ How many acres of pasture do you operate?
- ✓ Do you daily haul and spread manure?
- ✓ How many acres are available to spread on?
- ✓ Do you stack (stockpile) manure?
- ✓ Do you transfer manure off-site to another landowner?
- ✓ Is your manure hauled offsite via a dumpster?

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Determine animal units per acre

Animal units (AUs) are the result of using a factor to convert animals of different species or sizes into equivalent units for planning purposes.

- ✓ For horses, the equivalency factor is 2.
If you 10 horses, then you have 20 AUs.
- ✓ If you have other pastured livestock, then mixed animal units should be calculated using SnapPlus.

TO CALCULATE AUs PER ACRE:

Use these equations in the example below

You have 10 horses grazing on a 5 acre pasture for 225 days per year; they spend 50% of the day on the pasture. The grazing season usually runs from April to November, which is 244 days.

number of horses x equiv. factor = AU

$$10 \times 2 = 20$$

AU x days on pasture x % of day = AU/day

$$20 \times 225 \times 50\% = 2,250$$

AU/day ÷ pasture acres = AU/day/acre

$$2,250 \div 5 = 450$$

AU/day/acre ÷ days of grazing season = AU/acre

$$450 \div 244 = 1.84$$

Do you need an NMP?

Yes, you need a plan because the AUs per acre are greater than 1.

OR

Use the Horse Nutrient Management Form

This form is an Excel file, see below on how to obtain a copy.

For AUs and AUs per acre, use the Farm Story (sheet 1).

For manure production, use the Manure Calculator (sheet 2).

For transfer records, use the Manure Transfer Record (sheet 3).

To obtain this form, contact: Jordan Schuler
NPM Southeast Regional Outreach Specialist
jkschuler@wisc.edu
1 (414) 399-0373

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Estimate manure production

Knowing how much manure your animals produce on an annual basis is extremely helpful in the planning process, as well as in determining if you have enough acres for the amount of nutrients being deposited.

To estimate how much manure is being produced in pounds (lb), you will need to know the approximate weight of each horse. Use the **Horse Management Form** or follow the steps below:

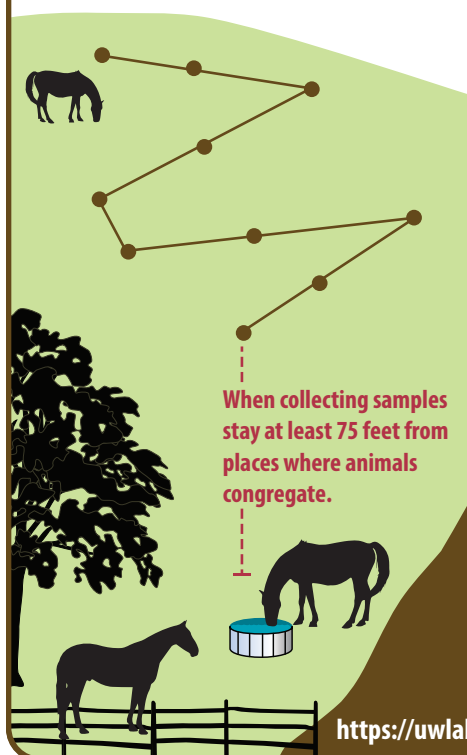
On average, an 1,100 lb horse produces about 57 lb of manure per day. If your horse(s) are different weights, use the following equation:

$$(\text{lb of your horse} \times 57 \text{ lb/day}) \div 1,100 \text{ lb} \\ = \text{lb manure/day for your horse}$$

To get the annual amount, add up all your horses manure per day and multiply by 365.

$$(\text{lb manure/day of all your horses}) \times 365 \text{ days/year} \\ = \text{lb manure/year}$$

Take a composite sample (minimum of 10 cores) while travelling across the pasture or paddock in a "W" shaped pattern.



When collecting samples stay at least 75 feet from places where animals congregate.

<https://uwlab.soils.wisc.edu/soil-samples/field-soil-sampling/>



Scan or click to view the **Nutrient Management Training for Graziers** video



Scan or click to view the **SnapPlus Nutrient Management on Pastures** publication

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Plan for taking soil samples

Accurate soil tests are the foundation of an NMP. You must use a DATCP-certified soil testing laboratory to ensure consistent results and recommendations suited for Wisconsin (for a list of certified labs, see <https://datcp.wi.gov/Documents/NMSoilManureLabs.pdf>)

Soil fertility recommendations for pasture are based on soil test results.

- ✓ Soil testing measures plant-available nutrients, as well as soil pH.
- ✓ Test results determine if phosphorus (P) or potassium (K) levels are potentially limiting or not. For pastures, these levels are usually not limiting as manure deposited by livestock tends to supply adequate P and K for the year.
- ✓ Test results do not directly indicate the amount of nitrogen (N) in the soil; the tests measures organic matter. Along with other factors, the N recommendation is determined.
- ✓ Soil pH should be managed according to test results as a low or high pH can directly influence forage growth and success.

Take care when taking soil samples to ensure that test results accurately reflect the pasture's fertility.

- ✓ In general, one composite sample should be taken per 5 acres of pasture or paddock.
- ✓ If paddocks are smaller than 5 acres, then 2 or more paddocks with similar management history can be combined into a single management unit for sampling.
- ✓ A composite sample is made up of a minimum of 10 soil cores taken to a depth of 6 inches with a soil probe. The 10 cores should be collected in a "W" shaped pattern across the management unit. Cores should be collected in a bucket, thoroughly mixed, and placed in a labeled bag for delivery to the lab.
- ✓ Avoid hot spots when sampling. They can be found near places where animals congregate, such as near water sources, lanes, supplemental feeding bunks, and trees or shade. In general, stay at least 75 feet from these areas.

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Consider manure analysis

Manure is a great on-farm resource for pasture fertility. Several factors impact manure nutrient content such as animal type, bedding, ration, storage/handling, and other animal management practices. The nutrient content of manure can vary between operations, since no two are exactly alike.

Sampling and testing manure ensures that you have the most accurate numbers when crediting manure nutrients in your NMP. It also reflects how animal management and other factors that can change over time affect nutrient content.

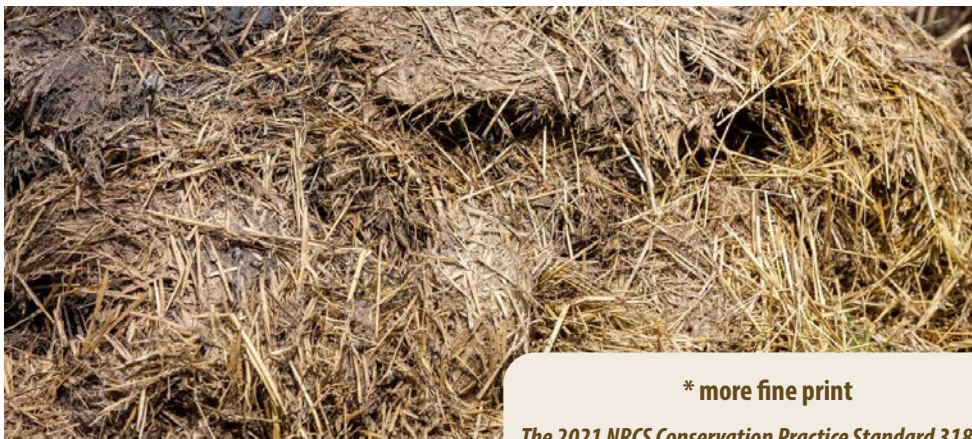
When sampling a stockpile:

- ✓ Take 10–20 subsamples and place them into a clean plastic bucket.
- ✓ Begin each subsample 18" below the surface of the stockpile.
- ✓ Mix subsamples and place a portion of the mixed subsamples into a quart size plastic bag.
- ✓ Place sample bag inside another quart size plastic bag and label with contact information.
- ✓ Store in a freezer or cool area until shipment.

It's best to avoid:

- ✓ Shipping samples late in the week.
- ✓ Mixing in soil with the manure subsamples.
- ✓ Sampling from areas of the stockpile that don't represent the majority of the stockpile.

For more information on sampling:
<https://uwlab.soils.wisc.edu/manure/>



Authors: Andrea Topper (DATCP); Jordan Schuler & Mimi Broeske (NPM Program)
 This publication is available for download from the Nutrient & Pest Management Program's website: ipcm.wisc.edu

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Assess manure storage options

When storing manure, consider how the location may affect daily task efficiency and ensure appropriate environmental stewardship practices. Additionally, the storage needs to be economically feasible to build and maintain.

- ✓ Manure storage should be conveniently accessible to the area where the majority of manure is produced.
- ✓ Labor considerations include time efficiency and equipment needed or used.
- ✓ Environmental stewardship considerations include maintaining the correct distances from surface water sources, wells, sensitive areas, and neighboring residences.
- ✓ Keep manure contained to prevent runoff from the pile. Consider walls or concrete barriers that can direct water flow and contain runoff.
- ✓ The base material of the manure storage should be compliant with NRCS Waste Storage Facility Code 313.
- ✓ For anyone considering a permanent manure storage facility, it is highly encouraged you reach out to your county land conservation department for engineering assistance.

Proper manure storage can reduce the risk of:

- ✓ Runoff into surface waters
- ✓ Leaching into groundwater
- ✓ Harboring pathogens and parasites
- ✓ Attracting pests like flies and rodents
- ✓ Movement and deposition of weed seeds

* more fine print

The 2021 NRCS Conservation Practice Standard 318 — Short Term Storage of Animal Waste and By-Products is the standard used in Wisconsin for manure stacking.

For setback requirements for each sensitive area:

<https://lwr.d.countyofdane.com/documents/pdfs/Chapter-49/ManureStackingStandard.pdf>

Note that separation distances can vary based on manure consistency, make sure to choose the appropriate column.

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Plan stacking sites

If a constructed manure storage system is not an option, temporarily stockpiling manure on the ground is an acceptable practice with appropriate management.

When choosing a location for your manure stack, be sure to avoid sensitive locations such as areas close to wells, surface water bodies, concentrated flow channels, and where depth to bedrock is shallow (less than 5 feet). These areas have specific setback requirements that must be considered when choosing a manure stack location.*

- ✓ Manure stacks may only be stockpiled for 180 days.
- ✓ Manure may not be stacked higher than 7 feet.
- ✓ If removal is necessary during the normal stockpile period, have a strategy in place that will not have a negative environmental impact.
- ✓ Access to the stack should not be limited by poor weather conditions such as ice, snow, or muddy ground.
- ✓ Make sure the location limits seepage and provides drainage away from the area.
- ✓ Know where runoff will flow and ensure that it doesn't lead to surface waters (ponds, streams, lakes) or other sensitive areas (playgrounds, community recreation areas, drainage tile inlets).
- ✓ Prevent water ponding in the area surrounding the manure stack and divert runoff from other sources away from the area.
- ✓ After manure removal, seed the area and allow vegetation to take-up nutrients that have accumulated in the soil.
- ✓ Keep previous locations vegetated for a minimum of 3 years before reusing the sites.
- ✓ If your property does not have viable manure stacking locations, large dumpsters may be a potential but not ideal option, especially during the winter months. This type of manure storage, which includes removal, can be expensive. However if this is your only option, choose a location where driveway accessibility is appropriate for pick-up and delivery during inclement weather.

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Identify requirements for manure transfer & application

Whether you are mechanically applying manure on your land or moving manure to another person's land, you should understand the requirements of both.

If you mechanically spread manure on your own acres, you are required to keep track of your applications for each field or pasture. Good records are essential when developing an NMP. Documenting how much manure, how it's stored, and when, where and how it's applied will make the planning process much easier. An added benefit from using SnapPlus is that you can export manure spreading maps; these maps can help you when recording applications and also remind you of vulnerable areas to avoid.

If you are a horse owner that doesn't have access to spreadable acres, you have a couple of options:

- ✓ Stockpile manure and then transfer manure to another's acreage.

and/or

- ✓ Use dumpsters to dispose of manure.

If you are looking to stockpile for a period of time until you are able to transfer manure, you still need to manage the stockpile site in accordance with the NRCS Conservation Practice Standard 318 (see section 6 **Plan Stacking Sites**).

When transferring manure to another's land, it is important to maintain accurate records of the transfer. Use the **Manure Transfer Record** (sheet 3) in the Horse Nutrient Management Form to record the transfer date, name of person receiving manure, destination address and pounds or tons transferred. You can also keep track with a ledger or other form but just make sure records are entered in a timely and consistent manner.



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Utilize the Runoff Risk Advisory Forecast

If you are mechanically applying manure, the Runoff Risk Advisory Forecast (RRAF) can be a great resource. The website can help determine the potential for manure runoff from a field or pasture.

The RRAF includes maps showing short-term runoff risk for manure application. The maps account for soil saturation, temperature, and precipitation on a scale of 1.5 square-mile grids. The National Weather Service updates the forecast 4 times daily.

During the summer, the forecast looks out 3 days and in the winter, 10 days to account for frozen or snow-covered ground, which has a greater risk for a manure runoff event.

To view the website:

<http://www.manureadvisorysystem.wi.gov/runoffrisk/index>

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Be prepared for a manure spill

Regardless of size, all agricultural or livestock operations (including landowners with horses) must report manure spills or runoff that may affect Wisconsin's waters to the Department of Natural Resources.

It is highly recommended that you create an emergency action plan; it should include phone numbers, equipment location, and site-specific provisions to minimize negative impact.

Customize the template below and post a copy of your plan in a prominent area of the barn or tack room.

Manure Spill Emergency Procedure

1. STOP the source of the spill.

2. ASSESS the situation and make appropriate calls for people, equipment, and materials.

- ✓ Call 911 first if someone is injured.
- ✓ Call the DNR 24-hour spill emergency hotline: **1-800-943-0003**
- ✓ Notify the county sheriff's office for traffic control if the spill is on a public road or any other right-of-way.

3. BEGIN clean-up.

- ✓ Use a skid loader or tractor with a bucket. Shovels and brooms also work.
- ✓ Clear the manure from both the road and shoulder.
- ✓ Be aware of any nearby surface waters, tile drainage intakes, or culverts and take steps to prevent the clean-up from making matters worse.

4. DOCUMENT your actions.

- ✓ Be thorough in documenting the time line of the spill and cleanup.
- ✓ Take photos.
- ✓ Use your phone to record any notes or thoughts while still at the spill site.