environmental farm plan
sustainably farmed

INFOSHEET #17

USE AND MANAGEMENT OF MANURE AND OTHER ORGANIC AND/OR PRESCRIBED MATERIALS

How to address concerns identified in Environmental Farm Plan Worksheet #17

Based on Environmental Farm Plan Workbook, 5th ed. 2025

This infosheet outlines options to address problem areas for the use and management of manure and other organic and/or prescribed materials in your operation.

For manure and other organic amendments use in a Source Water Protection Zone, you may need to take measures to reduce risk. **The Farm Source Water Protection Plan framework** and workbook can help you work through the Source Water Protection framework and its application on your farm.

For help with technical terms, please see the full glossary in your EFP Workbook.

All options in this infosheet are classed as **Actions, Compensating Factors,** or **Monitoring**.

- **Actions** address the identified concern, and will change the EFP rating to (3) or (4) Best.
- **Compensating Factors** are alternatives that will adequately address the concern, but will not change the rating in the EFP worksheet.
- **Monitoring** is an alternative in special circumstances only. When and how monitoring can be used is explained in the infosheet.

In most cases, you'll need more information before choosing and implementing options. Sources for more information are noted at the end of this infosheet.

Sustainable Canadian Agricultural Partnership
OSCIA
Ontario
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LAND APPLICATION OF MANURE AND OTHER ORGANIC MATERIALS

17-1. Nutrient management planning for manure and other organic materials (e.g., compost, digestate, biosolids)

BACKGROUND

Managing and tracking on-farm nutrient use is important for achieving good yields and avoiding over-application. Having a plan to manage your nutrients will often help reduce fertilizer input costs.

While some farms require a regulatory Nutrient Management Plan, all farms should consider developing a plan to manage the nutrients on their farm as a best management practice. A nutrient management plan is a living document that you update periodically, and which considers all nutrients applied on the farm.

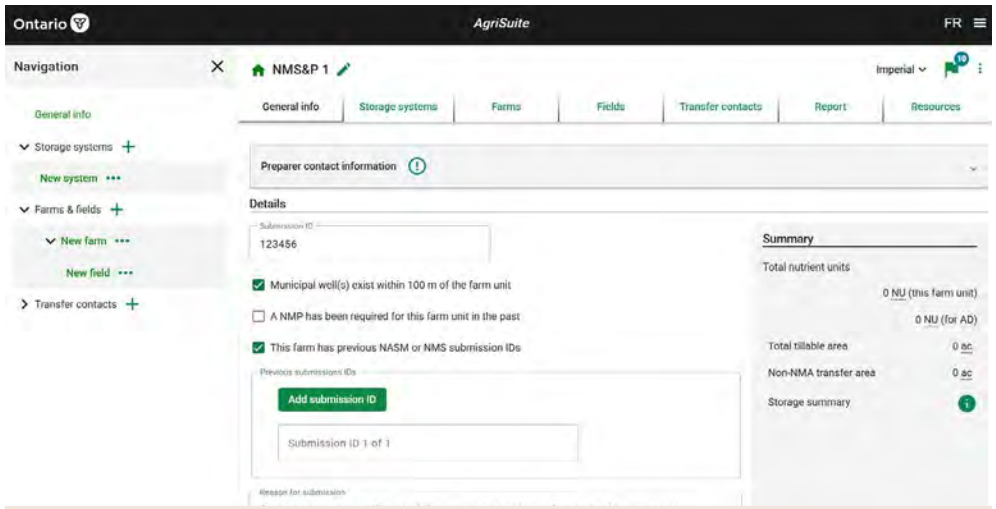
A plan can be prepared by anyone using the Nutrient Management Strategy & Plan (NMS&P) tool in AgriSuite, the free OMAFA online software package.

For more information on when a regulatory Nutrient Management Strategy or Plan is required, refer to the OMAFA website: **When farms require a nutrient management strategy (NMS), a nutrient management plan (NMP) or a non-agricultural source material (NASM) plan**.

Without a plan, farmers may unintentionally apply nutrients at excessive rates, which could lead to contamination of surface and/or groundwater, as well as an accumulation of nutrients in the soil.

For example, frequent manure applications on the same fields in the past on many livestock farms have resulted in phosphorus soil test levels of greater than 30 mg/L (or 30 ppm). Above this soil test level, there is no additional crop requirement for phosphorus. There is also an increased risk of movement to surface water as soil test P increases. The tool identifies these cropping and environmental limits and helps you to plan accordingly.

Nutrient balances can be evaluated on a yearly crop basis or over an entire rotation. It can be used as a record-keeping tool as well.



A nutrient management plan (NMP) will help you achieve optimal crop yields and product quality, minimize fertilizer input costs, and protect soil and water resources.

Use OMAFA'S AgriSuite to determine the best way to store, treat and use materials such as manure on your farm.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Complete a plan that includes:

- testing of both soil and manure for nutrient content
- crop nutrient needs based on yield goals and soil test levels
- contingency plan for manure spills or manure system failures

If using the AgriSuite software, ensure your plan has no red flags.

Have your plan prepared by a qualified person. This may include a Certified Nutrient Management Consultant or Certified Crop Advisor or equivalent. A qualified person will ensure you are getting the optimal value from the nutrients applied on your farm.

OPTION 2 – ACTION

Attend courses, workshops, annual meetings to learn the latest in nutrient management.

Follow through with appropriate record-keeping:

- treat your plan as a living document
- follow all aspects of your plan as closely as possible
- think of your plan record-keeping as your farm diary

This BMP publication is an essential companion for anyone completing a nutrient management plan. Learn how to inventory nutrient sources, interpret results, plan application, keep records, monitor, and adjust.

17–2. Ratio of livestock to farm unit acreage

BACKGROUND

A concentrated number of livestock can be a challenge in matching nutrients to the land available for manure application. To calculate the nutrient units (NU) on your farm unit, use the chart on pp. 223 to 227 in your EFP Workbook.

Risks of soil and water contamination increase when large volumes of manure are stored on the farmstead and/or applied to a small land base.

Many farms with completed NMPs have a ratio of 1 NU/cropland acre. When farms have a ratio of 2 NU/acre or more (i.e., more livestock on a smaller land base), it becomes more difficult to achieve proper nutrient balancing.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Lower the ratio of livestock to farm unit acreage to less than 0.6 nutrient units per acre. This can be achieved through increased land rental, manure agreements with neighbours or brokers, or increased land ownership. This ratio allows manure application to crops in a way that will have an optimized economic benefit from the nutrients applied.

OPTION 2 – ACTION

Lower the ratio of livestock to farm unit acreage to between 0.6 to 1 nutrient units per acre. This can be achieved through increased land rental, manure agreements with neighbours or brokers, or increased land ownership.

17–3. Land application of manure and other organic material (e.g., such as compost, digestate, biosolids, etc.)

BACKGROUND

When spreading manure and other organic amendments, the nutrient balance may not line up exactly with crop needs. For instance, if you are applying material to meet crop nitrogen needs, you may be inadvertently over-applying other nutrients (e.g., phosphorous).

WHAT CAN YOU DO?

OPTION 1 – ACTION

Alternate fields receiving manure and other organic amendments annually or often enough to prevent an overabundance of nutrients in some fields.

Test soil regularly to know the fertility level in the field and aim to keep it at a moderate level.

Reduce the amount of commercial fertilizer applied by the nutrient value in the manure and other organic amendments.

17-4. Application rates

BACKGROUND

Unused nutrients can build up in the soil over time.

Soils with high fertility levels of phosphorus contain more plant-available phosphorus than is required by most crops. Application of additional phosphorus is unlikely to provide an economical yield increase.

Whenever soil tests indicate rare or no probability of profitable crop response, applications of any source of phosphorus should be guided by a Phosphorus Index. The Phosphorus Index will rank the relative risk of phosphorus applied with the risk of surface water contamination. It also determines setbacks from watercourses. The Phosphorous Index is built into Agrisuite calculations.

Advances in manure spreader technology have increased the uniformity of distribution.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Test soil to establish the amount of nutrients already present in the soil.

Estimate the nutrients required to grow the crop:

- consider the targeted crop yield
- determine the nutrient value of the material to be applied and calculate the amount that should be applied
    - generally phosphorus (and sometimes nitrogen) determines the material application rate – additional commercial fertilizer may be required to match crop needs
- apply nitrogen based on the agronomic requirements of the crop
- apply phosphorus at the greater of agronomic requirement or crop removal over the crop rotation or application interval
    - note that once a soil test reaches 30 ppm of phosphorus, there is no further agronomic requirement for phosphorus (with the exception of a few horticultural crops)
- spread nutrients accurately and uniformly
- slope and liquid runoff potential must be considered prior to application

These considerations are built into AgriSuite calculations.

Table 1 in the Worksheet provides guidance on appropriate application rates for different material types.

17-5. Liquid application rates

BACKGROUND

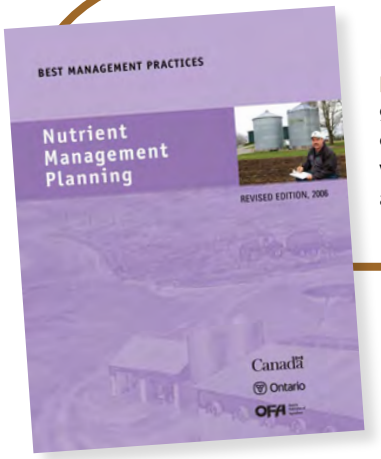
When applying liquid materials, be aware of the potential for the material to move down slope or even run off the field.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Apply liquid material at rates that ensure material will travel no farther than 1 metre (3 ft) from point of application. Note that when you increase the volume applied, you increase the possibility that the material will flow more than 1 metre (3 ft.).

AgriSuite calculations will help you determine an appropriate application rate.



Refer to this BMP publication for guidance and considerations when determining application rates.

17-6. Nitrogen loss to groundwater, volatization and N_2O emissions

BACKGROUND

Nitrogen (N) is present in the soil and organic materials in three main forms: ammonium-N, nitrate-N and organic-N. Much of the nitrogen in manure and other organic amendments is often in the organic form. In this form, it is not available to plants until it has been converted into ammonium-N. The rate at which this occurs depends on temperature, moisture and degradability of the organic material. Most ammonium-N is converted to nitrate-N in the soil before being taken up by plants.

During the fall, winter and early spring when crops are not growing or taking up nutrients, the risk of nitrates moving below and out of reach of the root zone is highest. Sources of the excess nitrate include N left over after crop harvest (more applied than the crop used) and N from fall-applied manure or other organic amendments.

Manure nitrogen is predominantly in the ammonium and organic form. The ammonium portion is converted to the nitrate form quickly during good growing conditions (i.e., late summer). These are the forms of nitrogen that the plant can use but also are more vulnerable to loss.

Manure applied after cereal harvest, in late summer and early fall on sandy soils without growing crops (i.e., cover crops), creates the highest risk for nitrate movement to groundwater.

Manure applied in the fall on clay loam and clay soils will have little risk of leaching below the root zone. However, loss to the atmosphere due to denitrification is higher. Denitrification is the process where nitrate (NO_3) is converted to nitrogen gas (N_2) or nitrous oxide (N_2O).

A number of the AgriSuite calculators have a built-in tool called the N-Index which can help you determine the risk of your nitrogen application practices.

For more information about building soil health and using cover crops and other agronomic practices to take up nutrients, review these BMP publications.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Use cover crops when applying nutrients in the fall to take up nitrogen and hold it in an organic form that is less vulnerable to loss:

- cover crops can include red clover, rye, rye grass, oilseed radish, oats or barley, a uniform stand of volunteer wheat, winter wheat crops, etc.
- when volunteer wheat is planned as a cover crop and wheat harvest is done with a wide-head combine, consider planting additional cereals between the “swaths” to even out the volunteer wheat stand
- weeds are not considered a cover crop due to their potential detrimental effect on subsequent crops

OPTION 2 – ACTION

For fall nutrient application on fields without cover crops:

- apply manure and other organic amendments late in the season, before freeze-up, when temperatures are lower

OPTION 3 – ACTION

For spring application:

- apply manure and other organic amendments as close as possible to the time a crop can use the nitrogen, including side-dressing into growing crops:
  - this is best from an economic and N-utilization perspective

Following harvest of high N-use crops, cover crops can be sown to take up nitrates for release during the next growing season.

17-7. Application of liquid materials on tile-drained land

BACKGROUND

Tile-drained land has many benefits. However, when liquid manure is applied on tiled land, extra precautions must be taken to ensure that manure does not move through the macropores (open passages that are preferential flow channels in the soil) directly to tile drains. Macropores and cracks in the soil should be broken up by tillage to prevent liquid manure from moving through them. Pathogens and nutrients, including ammonium nitrogen and phosphorus, are the major concern for contaminating surface water.

Generally, the higher the application rate or volume being applied, the greater the risk for preferential flow to tiles. When liquid or solid manure application is followed by a rainfall event, the risk for preferential flow increases. When rain is forecast, consider postponing the application or incorporating the manure as quickly as possible.

If your land has tile drains, it is important to prevent manure nutrients from flowing through them. If manure-contaminated water is entering tile drains, take immediate action to correct the problem.

For much more information about surface and subsurface drainage, including systems, issues, maintenance and troubleshooting, review this BMP publication.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Apply liquid manure when tiles are not flowing, and visually monitor drain outlets during and after application, even when rain is not forecast within 24 hours.

OPTION 2 – ACTION

Cultivate and pre-till soil before applying liquid manure at recommended rates, and visually monitor drain outlets during and after application.

OPTION 3 – ACTION

Apply liquid manure at low rate (less than 16,300 L or 3,600 gallons per acre).

OPTION 4 – ACTION

Apply liquid manure when tiles are not flowing, and visually monitor drain outlets during and after application even when rain is not forecast within 48 hours.

When liquid manure is applied on tiled land, extra precautions must be taken to ensure that manure does not enter subsurface drains.

17-8. Buffer alongside surface waters

BACKGROUND

Surface water (e.g., creeks and streams) can be contaminated by runoff from manure or other organic material applications in nearby fields. The establishment of a permanent vegetated buffer is recommended.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Establish and maintain a permanent, 3 m (10 ft.) wide, vegetated buffer alongside surface water bodies:

- the buffer protects surface water by slowing down field runoff – allowing transported materials to settle out instead of running directly into the water

Refer to Buffer Strips for more information.

17–9. Applying manure and other organic materials (e.g., compost, digestate, biosolids) to fields with surface water within 150 m (500 ft.)

BACKGROUND

Nutrients in manure and other organic amendments can become pollutants when they reach surface water. Pollutants include nitrogen, phosphorous, bacteria and organic matter. To reduce the risk to nearby surface water when applying materials to land, maintain the required setback distance from surface water and tile drain inlets. In addition, manure and other organic amendments should be applied at appropriate rates based on crop need, but less than the liquid loading rates that may generate runoff.

Liquid loading rates are determined by considering the steepness of slope and soil texture. The steeper the slope and the higher the clay content of the soil, the greater the possibility of liquid movement and risk to surface water. When materials are applied near surface water, there should be a separation distance adjacent to the top of the bank, depending on the type of material, slope, soil characteristics, and method of incorporation.

A vegetated buffer strip adjacent to surface water will also help to reduce the amount of eroded soil and contaminants that may reach surface water. Application to areas of the field where a concentrated flow moves toward the surface water should be avoided. Spring-application of manure and other organic amendments with melting snow, wet soils, and frequent rainfall will increase the risk of runoff.

A well-maintained permanent buffer alongside surface water bodies will slow and help filter field runoff. When applying manure near surface water, maintain a separation distance to the top of the bank. The actual distance will depend on manure type, slope, soil characteristics, and method of incorporation.

WHAT CAN YOU DO?

OPTION 1 – ACTION

When applying and incorporating manure and other organic amendments within one day near surface water, keep a minimum separation distance:

- spread liquid manure and other organic amendments at least 30 m (100 ft.) from surface water
- spread solid manure and other organic amendments more than 15 m (50 ft.) from surface water
- NASM Category 2 and 3 are applied at distances that meet or exceed setbacks as required by NASM Plan

Note: If soil tests for phosphorus are greater than 30 ppm, then phosphorus applied within 60 m (200 ft.) of surface water from all sources should be minimal amounts (i.e., starter only).

OPTION 2 – ACTION

When applying and incorporating manure and other organic amendments within 48 hours near surface water, or applying into a growing crop, keep a minimum separation distance:

- liquid materials are applied greater than 20-30 m (66-100 ft.) from surface water
- solid materials are applied 10-15 m (33-50 ft.) from surface water
- NASM Category 2 and 3 are applied at distances that meet or exceed setbacks as required by NASM Plan

These BMP publications can help you keep nutrients in the field and out of surface water.

A Phosphorus Primer describes risks related to phosphorous in its various forms in soil and water and presents BMPs to manage it in livestock and crop production.

Buffer Strips shows several options for buffer strip design and plantings.

17-10. Timing of incorporation after application (any field)

BACKGROUND

With liquid manure and other liquid organic amendments, often the largest portion of the total nitrogen (50–75% or more) is in the ammonium form. This form is easily volatilized and lost to the air as a gas.

When liquid manure and other liquid organic amendments are not immediately incorporated, there is increased odour and greater risk of ammonium-nitrogen loss. This risk is highest when weather conditions are hot and dry. Under these conditions, surface-applied liquid manure and other liquid organic amendments can lose up to 90% of the ammonium portion of the nitrogen within a few days of application.

Where manure and other organic amendments are applied to living crops or high-residue fields, volatilization losses can still be significant, but lower than when applied to bare soil.

When manure and other organic amendments are applied in weather conditions where soil/air temperatures are less than 10°C, microbial activity in the soil is reduced, which also reduces the rate of volatilization.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Incorporate or inject:

- most or all of liquid manure or organic materials – as soon as possible and within 24 hours, to minimize odour and ammonium-nitrogen volatilization
- most or all of solid manure or organic material to tilled land – as soon as possible but before rainfall

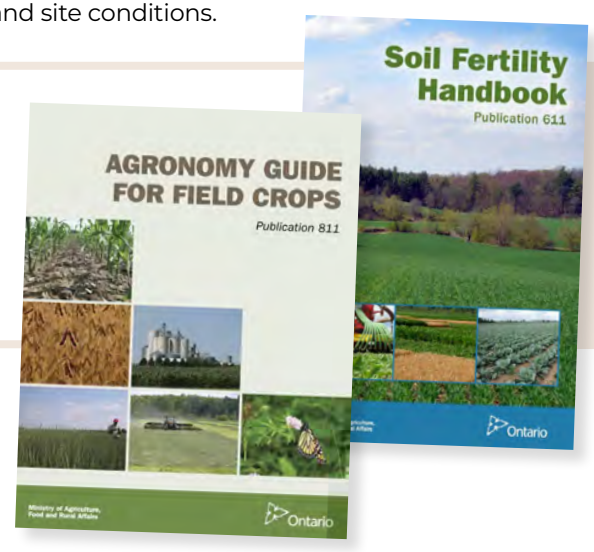
OPTION 2 – ACTION

On pasture, hay land, and no-till fields, apply manure or organic amendments at rates based on crop needs and site conditions.

Review these OMAFA resources:

Soil Fertility Handbook, Publication 611

Agronomy Guide to Field Crops, Publication 811



17-11. Distance to wells

BACKGROUND

Contamination of wells can occur in two ways:

- the well is poorly constructed, and surface water (with contaminants) enters the well, or
- contaminants flow through the soil profile and enter the groundwater

Poor well construction and shallow well depths increase the risk of contaminants reaching groundwater.

An unused well that has not been properly plugged, sealed and decommissioned is a direct pathway to groundwater. If manure and other organic amendments are spread directly over or near an unmarked well, the risk of contaminants entering the groundwater is high.

Spreading manure and other organic amendments on soil further from a well provides the opportunity for the soil to act as a filter, removing nutrients and other contaminants. Increased distance generally decreases risks.

WHAT CAN YOU DO?

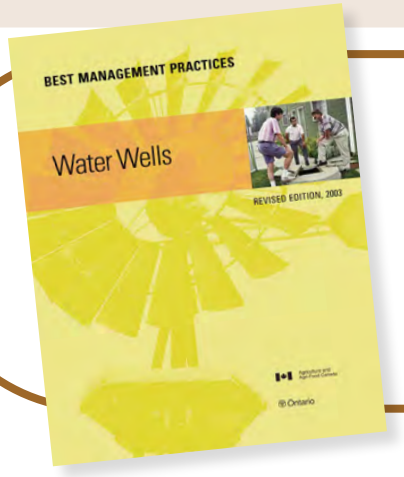
OPTION 1 – ACTION

Municipal well:
Apply all nutrients more than 100 m (330 ft.) from any municipal well as this distance will cover a significant portion of the "2-year capture zone", which is the location where water moving below the root zone will reach the groundwater within two years.

Drilled well:
Apply manure and other organic amendments farther than 15 m (50 ft.) from a drilled well that has a watertight casing to a depth of at least 6 m (20 ft.) below ground level.

Dug, sand-point or shallow-drilled well:
Apply manure and other organic amendments more than 30 m (100 ft.) from any of these well types.

Wells that have not been properly abandoned are a direct pathway to groundwater.



This BMP publication can help you better understand risks to well water quality, and what you can do to protect it. Water Wells explains common well types, construction, maintenance, troubleshooting and how to manage wells no longer in use.

17-12. Testing of manure and other organic amendments

BACKGROUND

Different types of manure and other organic amendments have very different nutrient values. Nutrient values can vary even from load to load in the same manure or other organic amendment types.

By testing the manure and other organic amendments for specific nutrients such as nitrogen and phosphorus, you will have a better idea of the amount of nutrients that are being applied to the soil. This will allow you to calculate the amount of additional fertilizer, if any, that will be required for the planned crop.

Knowledge of the nutrient value of manure and other organic amendments (i.e., the commercial fertilizer equivalent) will help in obtaining land application agreements or in selling manure or other organic amendments off-farm. Other common analysis include pH, micro-nutrients (sulphur, magnesium, manganese, zinc, etc.), carbon to nitrogen ratio (to determine if additional nitrogen may be required), organic matter, and salts.

Analysis of manure and other organic amendments analysis can be done at any Ontario laboratory accredited to do soil analysis. Analysis of the manure and other organic amendments should include total nitrogen, ammonium nitrogen, phosphorus, potassium and dry matter.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Test your manure and other organic amendments. Begin by using average nutrient values to determine approximate nutrients that will be supplied by the planned application rate. Then, during land application, take a representative composite sample for analysis (each time the storage is emptied for three years or until you are satisfied that the analysis results are a good representation of the manure and other organic amendments). For liquid manure and other organic amendments, fill a clean plastic sample jar halfway to allow for some expansion without leakage. Store sample in a cool place until sending by courier or taken directly to a lab.

Analysis of manure and other organic amendments can be done at any Ontario laboratory accredited to do soil analysis. It should include total nitrogen, ammonium nitrogen, phosphorus, potassium and dry matter.

Analysis results will help determine an application rate, and additional commercial fertilizer needs and/or adjustments. Management factors such as time to incorporation, season of application, and stage of crop growth will also impact available nutrients from the application.

While the nutrient analysis will give an indication of nitrogen levels, significant losses can occur after application if manure and other organic amendments are not promptly incorporated or if they are applied during the non-growing season or during prolonged wet conditions.

Only a small portion (5–20%) of organic N from manure and other organic amendments is available for crops in the year of application. This will vary with livestock type, bedding, season of application, weather conditions, and organic matter levels in the soil. The remainder of the organic N becomes available over time.

Manure Management includes step-by-step instructions for sampling manure. This BMP publication also explains manure content, how to mitigate concerns regarding storage, odours and runoff, and how best to plan, set up and time its application.

17-13. Calibration

BACKGROUND

It is important to measure the amount and uniformity of manure and other organic amendments that are applied. Calibrating application equipment will avoid over- or under-application of nutrients.

Uniform application will ensure consistent nutrient levels across the field.

Advanced technology and GPS monitoring tools are available to improve rate calibration and uniformity of application.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Calibrate application equipment at least annually. If you change materials being spread, or the rate of application, re-calibrating can improve accuracy of nutrient application.

Manufacturer's instructions/guidelines for equipment setup are a good place to start. However, in-field calibration will give the most accurate measure of manure and other organic amendments applied. When combined with an analysis, this is the best form of record-keeping for rate and nutrients applied.

For solid manure and other solid organic amendments:
Place a sheet of plastic on the path of the spreader in the field and spread the manure and other organic amendments. Measure the area of the plastic and weigh the manure or other organic amendments deposited on the plastic and calculate the rate.

For liquid manure and other liquid organic amendments:
Measure the area that the volume from one tanker load covers. This will give the average application rate per load and may also show the distribution across the width of application from beginning to end of load. Set a straight-edge pail and measure the depth in the pail. For site-specific measurements, review the Nutrient Management Planning BMP book to learn how to calculate the application rate.

Check with your equipment supplier for new equipment options that give a more accurate rate of application for liquid manure and other organic amendments.

17-14. Soil conditions during application

BACKGROUND

It is best to avoid spreading manure and other organic amendments on wet soil, due to the increased risk of soil compaction. Compacted soils slow infiltration, increase runoff potential, and affect overall soil health. Crops grown on compacted soils are often lower-yielding and have higher potential for root diseases.

Avoid surface-applying manure and other organic amendments to steeply sloping fields, especially near surface water. The risk of contamination due to runoff increases as the slope increases. Avoid application if precipitation is expected, as this could lead to contaminated runoff reaching surface water. Where possible, incorporate all manure and other organic amendments before rainfall occurs.

Incorporate as soon as possible to minimize nutrient loss.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Before application, wait until soil is dry enough to pre-till and/or cultivate, although with some risk of compaction.

OPTION 2 – ACTION

Before application, wait until soil is in optimal condition to pre-till and/or cultivate and risk of compaction is low.

Review OMAFA's Agronomy Guide for Field Crops, Publication 811.

Soil Management is a practical BMP guide to help you diagnose soil problems and build up soil health and productivity.

Avoid surface-applying manure or other organic amendments to steeply sloping fields, especially near surface water.

17-15. Custom applicators

BACKGROUND

All farms hiring a custom applicator should ensure they are using a reputable company that:

- is insured
- has up-to-date calibrated equipment
- has competent operators who are able to apply the manure and other organic amendments uniformly and at the required rate
- understands and follows the 4R principles

Farms that require a Regulatory Nutrient Management Plan and hire a custom applicator need to verify the applicator has a Nutrient Application Technician Licence, and the company holds a Prescribed Materials Application Business (PMAB) Licence that is up to date.

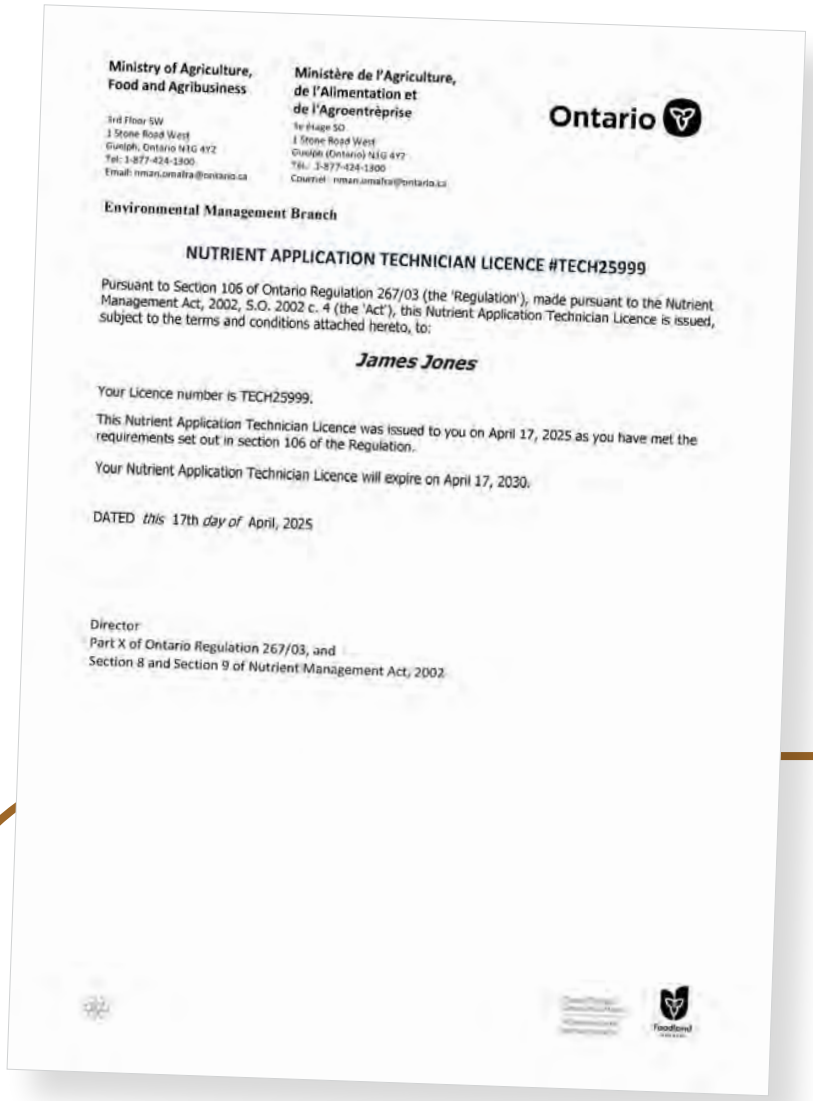
Request records of work done, such as volume applied, weather conditions, a map of field locations and rates applied to each field, dates of application, and separation distances from sensitive features/water sources.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Verify the following before any work by a custom applicator begins:

- their licence(s) is valid and up to date
- their equipment is calibrated before application
- they follow 4R principals
- they have reviewed your Nutrient Management Plan or Non-Agricultural Source Material Plan, if one is required for the field(s)
- they will supply you with a report detailing application of manure and other organic amendments on your operation – it is for your protection in case a complaint arises
- their report will include information such as the dates of application, what fields, volumes applied, wind direction, weather conditions, and any other pertinent information



Ministry of Agriculture, Food and Agribusiness

Ministère de l'Agriculture, de l'Alimentation et de l'Agroentreprise

Ontario

Environmental Management Branch

NUTRIENT APPLICATION TECHNICIAN LICENCE #TECH25999

Pursuant to Section 106 of Ontario Regulation 267/03 (the 'Regulation'), made pursuant to the Nutrient Management Act, 2002, S.O. 2002 c. 4 (the 'Act'), this Nutrient Application Technician Licence is issued, subject to the terms and conditions attached hereto, to:

James Jones

Your Licence number is TECH25999.

This Nutrient Application Technician Licence was issued to you on April 17, 2025 as you have met the requirements set out in section 106 of the Regulation.

Your Nutrient Application Technician Licence will expire on April 17, 2030.

DATED *this* 17th *day of* April, 2025

Director
Part X of Ontario Regulation 267/03, and
Section 8 and Section 9 of Nutrient Management Act, 2002

A custom applicator hired by a farm that requires a Regulatory NMP must have up-to-date licences, and be willing to provide you with detailed records of application on your fields.

17-16. Winter application of manure and other organic materials (e.g., compost, digestate, biosolids)

BACKGROUND

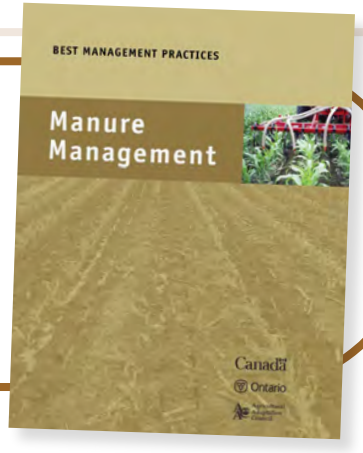
Occasionally the opportunity arises to apply manure and other organic amendments (with immediate incorporation) during winter months. However, winter application of manure and other organic amendments should never be part of the plan, but rather only part of a contingency plan.

When manure and other organic amendments are surface applied to soils that are frozen and/ or snow-covered, there is little opportunity for infiltration, but significant risk for environmental and economic impact from the loss of material. Snowmelt conditions are often accompanied with rain events, which results in surface flow of contaminated water into surface water (rivers, streams) or concentrated nutrients in ponded areas.

When winter application is part of a contingency plan due to inadequate storage, assess the risks of surface water contamination on different parts of your farm and select the area with the least risk.

Liquid manure and other organic amendments should not be applied to snow-covered fields.

For more guidelines and tips for setup and timing of solid and liquid manure and other organic amendments, see Manure Management, a BMP publication.



WHAT CAN YOU DO?

OPTION 1 – ACTION

For liquid material, locate or construct additional storage. Transfer manure and other organic amendments to avoid overflow or winter spreading.

OPTION 2 – ACTION

For solid material, avoid winter spreading by using temporary field storage option to stockpile material in a safe location for spreading at a later date when conditions are better.

There may be regulatory requirement for temporary field storages.

OPTION 3 – COMPENSATING FACTOR

Reduce the risk of runoff if liquid manure and other organic amendments must be land-applied during frozen or snow-covered condition:

- apply to a field that is farthest away from surface water, has a slope less than 3% within 100 m (330 ft.) of the top of the bank of surface water, and preferably not be tile-drained
- inject or incorporate applied liquid manure within six hours of application or apply to a living crop, or a field with greater than 30% crop residue

Review this OMAFA resource to learn more about winter application of manure and other organic amendments:

Winter application of manure and other agricultural source materials

17-17. Transportation and transfer of manure and other organic amendments (e.g., compost, digestate, biosolids) from storage to field

BACKGROUND

When transporting manure and other organic amendments from storage to field, it is extremely important to take steps to prevent a leak or spill. Spills can flow into surface water or leach into groundwater, contaminating drinking water supplies as well as damage aquatic habitats.

Spills of manure and other organic amendments can also contaminate the soil by concentrating a large amount of nutrients in one area. This can impair crop growth.

Spilling manure and other organic amendments is never allowed on public road surfaces.

When moving manure and other organic amendments from storage to field, consider the wear and tear (axle weights) on the roads.

Contain the spill using commercial booms, earthen berms, bales of straw, or sandbags.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Install a chimney or riser over the loading hole of the liquid manure spreader so manure and other organic amendments do not spill on the road when starting and stopping.

For solid manure, do not load manure above side-board height to avoid the risk of manure spilling over the edge of the spreader.

Leave the area around the field entrance free of manure and other organic amendments until the last load to prevent manure and other organic amendments from reaching road surfaces.

Be aware of municipal half-load restrictions while frost is coming out of the ground to minimize damage to local roads.

OPTION 2 – ACTION

Contingency planning: Prepare an emergency plan that outlines the steps to be taken if a spill occurs. Keep it handy and ensure everyone involved in manure management on the farm is familiar with it.

Reporting to Spills Action Centre and other measures in the event of a spill: Immediately report any spills to the Ministry of Environment, Conservation and Parks Spills Action Centre, 1-800-268-6060.

Eliminate the source of the spill by turning off all pumping equipment, plugging tile outlets, plugging leaks, and repairing or replacing broken lines.

Contain the spill using earthen berms, bales of straw, or sandbags.

Address any minor leaks immediately by repairing equipment and cleaning up any spilled material.

For a spill on the roadway, contact the local authority that has jurisdiction over the road before starting any cleanup.

Once spilled manure and other organic amendments have been cleaned up, spread the material on land at proper application rates.

17-18. Soil Compaction – Tires

BACKGROUND

When spreading manure and other organic amendments be aware of the danger of soil compaction in the field. Soil compaction has a negative effect on crop production and yield.

The type of soil, moisture content of the soil, axle weight, weight distribution, inflation of the tires, and type of tires are all important factors in determining the extent of soil compaction that will occur.

Soils with higher clay content tend to be more prone to compaction, especially when wet. In spring, or after a rain event, determine if the soil is in the proper moisture range before applying manure and other organic amendments.

Ensure an adequate land base and storage capacity so that applications to wet fields can be avoided. Fields with tile drainage often reach uniform ideal moisture levels more quickly.

Be aware of the total weight of manure and other organic amendments and equipment, axle weights, number of tires and their inflation. Where possible, choose tires on application equipment that minimize the tire footprint (i.e., radial tires at reduced inflation pressure in the field).

Subsurface Compaction, provides information on diagnostic tools to describe the type, nature and extent of subsurface compaction.

The tires for tractors and implements are usually set at a higher air pressure for travelling on the road. However, lower tire pressures are better in the field for distributing weight over a larger tire surface area, reducing soil compaction. Central Tire Inflation Systems offer the ability to change tire pressures from road to field on the go. For example, an operator can inflate tires to 23 psi required for road travel and then drop the pressure down to 9 psi for field work.

Tire pressure at 23 psi in the field

Tire pressure at 9 psi in the field

Low-pressure tires on application equipment can increase the surface area of the tire in contact with the soil surface and help lower the risk of soil compaction.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Apply only when soil conditions are suitable.

Install Central Tire Inflation System on application equipment or operate with tire pressure less than 15 psi.

OPTION 2 – ACTION

Apply liquid material only when soil conditions are suitable using a direct flow system (e.g., dragline).

17-19. Liquid application using direct flow system (e.g., drag line)

BACKGROUND

Direct flow systems allow you to move large volumes of material in a short amount of time. They also reduce compaction because a manure tanker does not need to be driven across the soil. However, a spill occurring when a pumping system control is left unattended can potentially result in large volumes of manure and other organic amendments contaminating soil and water. To prevent a spill, a direct-flow system must have the capacity to be shut down at a moment's notice.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Shut down the pumping system at the first sign of any problem. Have one person operating the system who stays within clear view of the field applicator, storage and pump, and is close enough to the system to shut it down within 1 minute of observing a problem.

OPTION 2 – ACTION

Shut down the pumping system at the first sign of any problem. Have two people operate the system with contact between them to shut down the system promptly.

OPTION 3 – ACTION

Shut down the pumping system at the first sign of any problem. Have one person with a remote-controlled shutdown system that can stop the pump promptly.

In order to prevent a spill, a direct-flow system must have the capacity to be shut down at a moment's notice.

Review the OMAFA factsheet:

Automatic and remotely controlled shut-off systems for direct-flow liquid manure system

17-20. Applying Category 2 and 3 NASM materials (e.g., food processing wastes, sewage biosolids, etc.)

BACKGROUND

Non-agricultural source materials (NASM) can be used as a nutrient source for cropland. Before application, farmers must have a NASM plan prepared by a certified NASM plan developer. For all Category 3 NASM and some Category 2 NASM, this NASM plan must be approved by OMAFA.

Refer to Adding Organic Amendments.

WHAT CAN YOU DO?

Non-agricultural source materials have restrictions and/or limits for metal content, maximum application rates, time of application, and separation distances that can be more restrictive than those for manure application. These materials must be applied by a licensed applicator or the farmer. Farmers are advised to take the required applicator training to gain a good understanding of the regulations.

OPTION 1 – ACTION

Prepare a NASM plan. Get it approved.

Follow your approved plan:

- all Category 2 and Category 3 non-agricultural source materials must have a NASM plan prepared by a certified person before land application
- complete a soil test to determine the crop nutrient needs, and account for the nutrients in the NASM when determining any additional nutrients needed from fertilizer (you must account for NASM nutrients that were applied in the previous five years)
- maintain application setback distance to surface water and all well types as determined in the NASM plan

OPTION 2 – ACTION

Prepare a NASM plan. Get it approved.

Follow your approved plan.

NASM is applied by a licensed applicator or by a trained farmer on their own farm.

FOR MORE INFORMATION

ONTARIO MINISTRY OF AGRICULTURE, FOOD AND AGRIBUSINESS (OMAFA)

- Agricultural Information Contact Centre (AICC)
  Toll free: 1-877-424-1300 | e-mail: ag.info.omafa@ontario.ca

  Find most of the resources listed below at www.ontario.ca

Publications

- Agronomy Guide for Field Crops, Publication 811
- Soil Fertility Handbook, Publication 611
- Guide to Forage Production, Publication 30
- Pasture Production, Publication 19

Factsheets

- Organic crop and livestock production in Ontario
- Available nutrients and value for manure from various livestock types
- Understand the benefits of manure analysis
- Removing liquid manure from storage
- Automatic and remotely controlled shutoff for direct-flow liquid manure application systems
- Winter application of manure and other agricultural source materials
- Nutrient application on farms and the 4Rs
- Incorporation of liquid and solid prescribed materials
- Manure management for farms producing more manure than their crops need

ONTARIO MINISTRY OF AGRICULTURE, FOOD AND AGRIBUSINESS (OMAFA), *continued*

Best Management Practices series

- A Phosphorus Primer
- Buffer Strips
- Field Crop Production
- Managing Crop Nutrients
- Manure Management
- Nutrient Management Planning
- Soil Management
- Cropland Drainage
- Best Management Practices for Phosphorus
- Field Crop Production
- Water Wells
- Soil Health
  - Adding Organic Amendments
  - Cold and Wet Soils
  - Contour Farming and Strip Cropping
  - Cover Crops and Manure Application
  - Droughtiness
  - Inter-Seeding Cover Crops
  - Winter Cover Crops
  - Low Fertility
  - Perennial Systems
  - Rotation of Agronomic Crops
  - Wind Strips
  - Subsurface Compaction
  - Surface Crusting
  - Subsurface Drainage

FOR MORE INFORMATION, *continued*

ONTARIO MINISTRY OF AGRICULTURE, FOOD AND AGRIBUSINESS (OMAFA), *continued*

AgriSuite

- Crop Nutrient Calculator
- Organic Amendment Calculator
- Phosphorus Loss Assessment (PLATO)
- Field Management Planner
- Greenhouse Gas Calculator

Ontario Crop Protection Hub

LEGISLATION/ACTS

- Nutrient Management Act, 2002
- Ontario Regulation 267/03
- Clean Water Act, 2006
- Environmental Protection Act, 1990
- Ontario Water Resources Act, 1990