



Nutrient Management

Introduction

Nutrient management is defined as managing the rate (amount), timing, form, and method of nutrient application to ensure adequate soil fertility for plant production and to minimize the potential for environmental degradation, particularly air, soil, and water quality impairment. Nutrient sources on farms may include materials such as animal manures, compost, waste feed, crop residues, green manures, legumes, fertilizers, biosolids, process waste water, soil biological activity, irrigation water, and any other form of organic or commercial soil amendment. The composition and movement (cycles) of nutrients throughout the earth's atmosphere and environment is regulated by many natural processes. Many agricultural practices, however, significantly influence the natural nutrient cycle by physically altering the landscape, soils, and concentrations of nutrients in an effort to grow either crops and/or livestock. Farm specific nutrient management plans, especially when accompanied by a full CNMP, allow producers to understand many facets of their operation, including the nutrient cycles on their farms, environmental resources they may be degrading, and what Best Management Practices could be implemented to increase profitability and/or environmental protection.

Environmental Concerns

Nutrient management is extremely important because farms utilize many acres of the land base; the agricultural practices occurring on these acres greatly influence both the local nutrient cycles and the nearby environmental

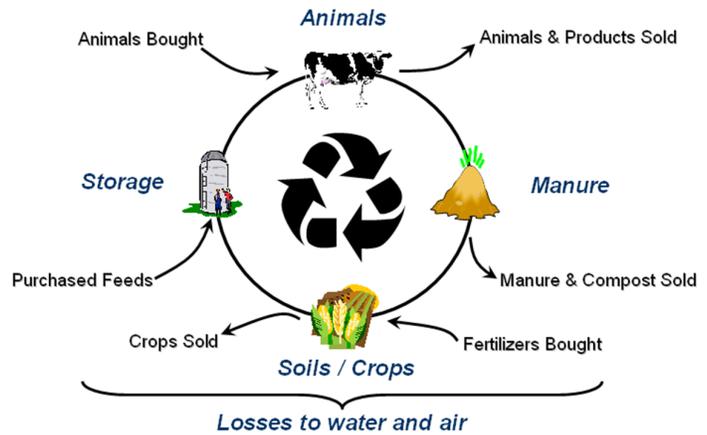


resources. Improper or poor nutrient management practices may result in degraded soil health, air quality, and both surface and ground water. Manures, fertilizers, compost, biosolids, and any other material or soil amendment may contain high concentrations of biodegradable organics, phosphorous, especially soluble P, nitrogen as ammonia or nitrates, pesticides, heavy metals, and potential pathogens which can leach through the soil into groundwater or be carried by runoff or erosion into surface water. Concentrations of nutrients, especially nitrogen and phosphorus, and pathogens can threaten aquatic habitats and contaminate drinking water supplies. Well or spring water with nitrate concentrations above 10 milligrams per liter of water (the public health safety limit) or high fecal coliform counts can negatively affect human and animal health, especially that of infants and young livestock. Phosphorus, along with other nutrients, that is transported to surface waters can cause blooms of algae and eutrophication resulting in the destruction of aquatic habitats, fish kills, and the death of other aquatic species. Excess potassium in feed or water can cause animal health problems including grass tetany and reproductive difficulties. Manure and other amendments degrade air quality with offensive odors, nitrogen emissions (ammonia, oxides of nitrogen), and the formation of atmospheric particulates. Field and weather conditions, nutrient source/type, application rates, timing, and method, along with nearby highly sensitive areas or water sources, all play a role in determining risk levels.

Potential Economic Benefits

Nutrient management plans account for nutrients from all sources, including prior nutrient applications, soil and crops; incorporate conservation practices that control erosion and manage runoff; and provide Best Management Practices to minimize losses to the environment through efficient nutrient use by crops. Manure and/or fertilizer management based on soil tests and crop nutrient needs can enhance crop productivity and farm profitability by reducing purchased fertilizer costs. Proper nutrient application rate, timing, and method on appropriate fields

protect plant health by avoiding damage to seeds and seedlings (salt burn) and promote plant growth during the correct periods of development. As a result of feeds produced on land with balanced fertility (non-toxic levels of nutrients or metals), fewer animals will have health problems, reducing veterinary expenses. In addition, properly managed nutrient applications accompanying conservation practices may significantly reduce runoff contamination risks to surface and ground waters, reducing the need for large scale water treatment systems and potentially protect contributing landowners from contamination fees. Labor, equipment, and time management in general may be improved by adjustments in nutrient management. In addition, properly managing nutrient sources and applications may “clean” up the farm, improving overall facility aesthetics, neighbor relations, and value of property.



Summary of Best Management Practices

Develop a Nutrient Management Plan to Provide Multiple Barriers Approach to Erosion and Water Contamination.

- (NMP), (CNMP), (WFP), or any other form of conservation plan to address concerns.

Apply Fertilizers Based on Soil Tests and Realistic Crop Yield Potentials.

- Test soils at least every three years to determine its degree of fertility.
- Realistic crop yields obtained on the soil type (yield potential, nutrient-supplying capabilities, texture, and organic matter) and local climatic conditions. Actual farm yield records may be used as well.
- Analyze nutrient risks associated with local soils, subsurface geology, and hydrology.
- Account for erosion potential (slope degree and length, soil coverage, rainfall, and soil conditions).
- Conduct site specific analysis to determine field risk level potentials (runoff, leaching, Karst topography, rapid infiltration, nearby HSA's etc.).

Account for Nutrients from Prior Land Use Practices When Developing Fertilizer Application Rates.

- Account for residual nutrients from previous manure applications, compost, cover crops, crop rotations, crop residues, and any other soil amendment.
- Account for nitrogen released from the decomposition of legumes or grass sod in rotation.

Summary of Best Management Practices continued...

Manage Fertilizer Applications to Protect Against Leaching and Runoff.

- Maintain proper soil pH levels (liming) to facilitate nutrient availability and plant uptake.
- Fertilizer application rates do not exceed crop uptake needs.
- Do not apply additional manure or starter fertilizers to fields with existing high soil test phosphorus levels.
- Time fertilizer applications to match periods of maximum crop uptake/utilization (split applications).
- Calibrate and maintain application equipment to ensure accurate distribution of material.
- Band, Inject, or incorporate manure and fertilizers into soil to minimize nutrient leaching and runoff potential.
- Follow Cornell University Nutrient Guidelines when applying nutrients on high risk soils or during adverse field and weather conditions.

Minimize Soil Erosion and Water Runoff.

- Adopt appropriate crop rotations.
- Use conservation tillage practices such as Mulch Till or Strip Tillage practices; Use No-Till practices when appropriate.
- Implement spring tillage, contour farming, strip cropping, and water control structures.
- Increase use of cover crops, mulches, and crop residues.
- Use managed livestock grazing and access control.

Minimize Soil Contamination.

- Apply nutrients according to a Nutrient Management Plan.
- Test and monitor soil metal levels when applying biosolids.

Maintain Buffer Zones and Follow Manure/Fertilizer Application Setbacks.

- Implement permanent vegetative buffers (filter strips, riparian herbaceous/forest buffers).
- Restrict equipment and livestock access from riparian zones.

Use Natural Resources Conservation Service Approved Best Management Practices.

- Best Management Practices (BMPs) are designed to control soil erosion, increase soil health, and reduce nutrient and sediment contamination associated with land management practices and nutrient applications.

Follow NYS Land Grant University Guidelines – Cornell University Nutrient Guidelines and Soil Health Program Principles and Analyses to Improve Soil Health and Nutrient Recycling.

Summary of Regulations

State Regulations

NYS DEC - [CAFO Permit](#)

NYS DEC – Environmental Conservation Law (ECL) – [Subpart 360-5: Land Application Facilities](#)

NYS Department of Health – Quality of Water Drinking Sources

Federal Regulations

EPA - [General Information on CAFOs](#)

EPA – Clean Water Act - [Part 503 Rule – Standards for the Use and Disposal of Sewage Sludge](#)

Background Information for Worksheets

Do you follow an up to date nutrient management plan based on soil tests, crop needs and nutrient sources?

A nutrient management plan (NRCS 590) accounts for nutrients available from the soil, soil amendments such as manure, compost, and fertilizers, and legume/grass rotations and rotations as a whole while also balancing production and environmental objectives. Each site is analyzed to determine which fields are susceptible to runoff, erosion, rapid infiltration, or leaching. Soil tests are completed for each field to determine the nutrients present in the soil; large fields may require multiple tests. Past field histories are analyzed to account for residual nutrients resulting from prior applications of manure, use of cover or rotational crops, and crop residues. In addition, any land or soil management practices that minimize soil erosion and water runoff are addressed as well.

If a nutrient management plan has been developed for the farm, is it up to date and being followed?

Keeping the plan up to date will incorporate any changes in the farm operation (i.e., changes in crop fields, crop rotations, manure and fertilizer applications etc.) and will adequately address new concerns. Regulated (CAFO) farms are required to follow and update their CNMP annually.

For More Information

NRCS – [Nutrient Management Plan \(590\) Standard](#)

Cornell Cooperative Extension – Agronomy Fact Sheet #33: [Nutrient Management Planning](#)

How many acres typically receive manure application?

Farms may only spread manure on a percentage of their available acres. In some cases, the farm may only produce a limited amount of manure which could not effectively cover all fields. Fields targeted for manure application typically depend on the following: priority crop demands (corn ground or fields turned over for new seeding), close proximity to barns or storage (travel expenses), and fields that are not environmentally risky for applications or restricted by land owners (rented ground). Identify how many acres receive manure and compare that amount with the total amount of acres operated by the farm. This information may identify specific areas of the farm that may be excessively supplied with nutrients or deficient.



How many animal units do you have? (Complete calculation on page 4)

Based on information collected from the Tier 1 questionnaire, calculate the total number of animal units on the farm. One animal unit equals 1,000 lbs. of live animal body weight, and correlates to the amount of manure produced for a specific type of animal. This information may be used during Tier 3 planning phase to estimate quantity of manure produced. The formula for Calculating Animal Units can be found on page 4 of the AEM Tier 2 Worksheet: Nutrient Management – Manure and Fertilizer.

For More Information

NRCS – [Animal Waste Management Software, AWM](#)

Background Information for Worksheets

If manure is exported off the farm, what percentage is exported?

Exported manure is the manure that is produced on the farm but leaves the farm's land base, management, and responsibility (owned and rented ground). Farms with excess manure, exceeding their land base, crop demands, and/or storage capacity often sell or trade these nutrients to a neighboring farm or other enterprise. The farm or enterprise receiving the manure is responsible for the end use of the product and the affects of the nutrients.

For More Information

Cornell Cooperative Extension – Agronomy Fact Sheet #53: [Manure Cost, Value, and Time Management Calculator](#)

Based on the above information, how many animal units do you have per acre of land to which manure is applied?

The farm's ratio of animal units to acres of land which receive manure provides a rough gauge as to whether there may be potential resource concerns. Farms with many animal units (large quantity of manure) and a limited land base to receive manure are probably supplying nutrients above crop demands and uptake. The surplus of nutrients may be providing surface runoff concerns or ground water leaching concerns, both of which may degrade water quality. Farms with less than 1-2 acres per animal unit may consider reevaluating herd sizes or acquiring more land.



How often do you soil test?

Soil tests are the most tangible and accurate source of information regarding soil nutrient levels (pH, CEC, N, P, K, Ca, Mg, Organic Matter and other micronutrients); the rest of the nutrient management plan revolves around this focal point. Test soils at least every three years to determine its degree of fertility. Samples should be taken around the same time each year (i.e., month, spring or fall) to reduce seasonal variations and at least one month after manure or fertilizer applications or sod turnover. Fertilizer recommendations based on soil tests should account for yields obtained on the soils being analyzed, local climatic conditions, and nutrient risks associated with local soil, subsurface geology, and hydrology.

Soil testing laboratories and nutrient management planners may use agronomic and/or environmental criteria for providing fertilizer recommendations. Agronomic recommendations are based predominantly on crop nutrient needs. Environmental recommendations account for nutrient risks associated with local soils, subsurface geology, and hydrology. Special soil analysis methods (for bio-available nutrients, micronutrients, or heavy metals) may be necessary to provide accurate recommendations for environmental protection. Records of soil tests over time can indicate whether crop management practices are resulting in nutrient accumulations, deficiencies, or imbalances. Soils testing high in nutrients, above crop uptake levels, may indicate fields where excess nutrients may be potentially degrading surface or ground waters.

For More Information

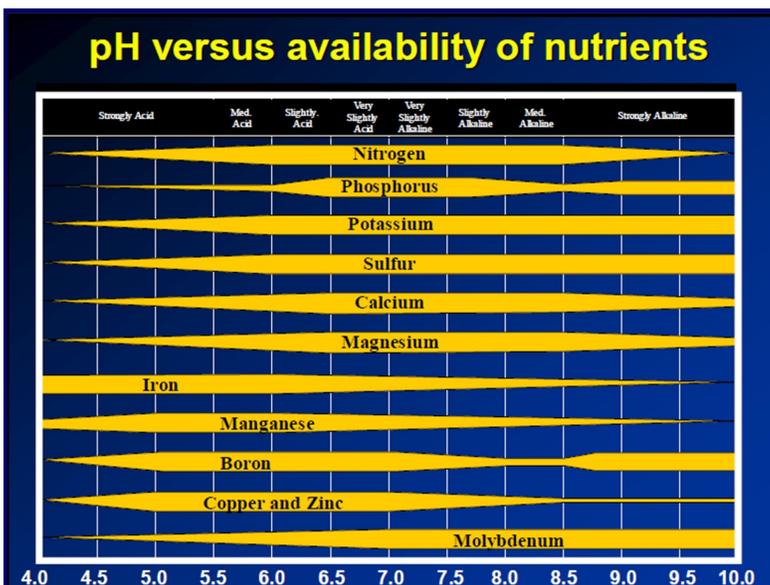
Cornell University – Cooperative Extension – Agronomy Fact Sheet #1: [Soil Sampling for Field Crops](#)

Background Information for Worksheets

Does your farm manage soils for optimum pH levels?

Soil pH is a measure of the activity of hydrogen (H^+) ions in the soil solution (soil acidity). Outside of New York's lime belt, most soils are fairly acidic (low pH), thus limiting yield potentials for many crops. All species of field crops have unique pH ranges levels for optimal growth. In many cases, low pH levels will restrict important nutrients from crop uptake, increase the availability of other elements, such as aluminum, to potentially toxic levels, decrease effectiveness of certain herbicides, and constrain microorganisms, thus decreasing crop yields and hindering overall soil conditions. Soil test lime guidelines will recommend lime (limestone) applications to raise the pH level to suit the crop in the rotation with the highest optimal pH range. Lime applications have to account for the soil's pH buffering capacity (Cation Exchange Capacity) and are then adjusted to reflect the effective neutralizing value (E.N.V.) of the limestone source and tillage practices.

Many farms over apply nutrients and fertilizers trying to reach crop yield goals instead of addressing soil pH levels. Extra nutrients do not solve low pH constraints and excess nutrients may potentially degrade surface or ground waters. Frequent soil pH testing and lime applications are necessary to maintain optimum levels; over time, soils will revert back to their natural pH levels. In addition, many fertilizers and organic manure/compost materials lead to formation of acids and continual crop harvesting removes plant essential elements Ca and/or Mg, thus decreasing soil pH levels.



For More Information

Cornell Cooperative Extension Agronomy Fact Sheets: #5 – [Soil pH for Field Crops](#)
#6 – [Lime Recommendations](#)
#7 – [Lime Materials](#)

How often do you test manure for nutrient content?

Farms that do not sample the nutrient content (N, P, K and other plant essential elements) of their manures have little information to base manure or fertilizer applications on. Crop fields deprived of nutrients may show decreased yields and experience “soil mining” of nutrients; fields overwhelmed with nutrients may lead to potential water quality concerns. Farms with no previous manure sample records should start with at least two manure analyses in the first year, and maintain testing manure samples annually and for major spreading events (required by NYS DEC for CAFOs). Accurate samples should be taken for each type/source (e.g., liquid storage, bedded pack, daily spread...) of manure that is managed separately. Nutrient management planners may use running averages of annual analyses or just the prior year's manure analyses to accurately plan for current-year manure applications and adjust commercial fertilizers appropriately. See Reference below for accurate sampling guidelines, estimating the \$ of manure, and tracking farm management changes.

For More Information

Cornell Cooperative Extension – Agronomy Fact Sheet #38: [Manure Sampling, Analysis, and Interpretation](#)

Background Information for Worksheets

Does your farm regularly use nitrogen management tests (e.g., PSNT, CSNT, ISNT) to adjust nitrogen rates?

Field crops, especially corn, require nitrogen for proper growth, maturity, and optimum yields. Complex processes, both increasing and removing/losing plant available N in the nitrogen cycle and the outside forces influencing it make it very difficult to estimate/manage plant available nitrogen. Expensive nitrogen fertilizers and the environmental concerns of “lost” nitrogen make it necessary to maximize nitrogen efficiency by providing most of the plant available nitrogen during high plant uptake periods. The Pre-Sidedress Nitrate Test (PSNT) is a soil test taken in-season (prior to sidedressing) to estimate the soil’s nitrate supplying potential and determine if additional nitrogen fertilizer is needed for corn. The Corn Stalk Nitrate Test (CSNT) requires sampling multiple corn stalks at harvest time which reflects the N availability during the growing season. This test, if conducted over multiple years, allows for evaluation and fine-tuning of N management for specific fields and the overall production acreage. The Illinois Soil Nitrogen Test is a soil test that measures the soil organic N mineralization potential for the following 2-3 years for corn. It is one management tool for fine-tuning N applications and compliments the CSNT test nicely.

For More Information

Cornell Cooperative Extension – Agronomy Fact Sheets: #3 – [Pre-Sidedress Nitrate Test #31](#) and #72 – [Corn Stalk Nitrate Test #36](#) – [Illinois Soil Nitrogen Test for Corn](#)

Do you keep records of nutrient applications to fields?

Record keeping practices may be required in order to comply with various permits and/or agricultural programs; record keeping is recommended on all farms to enhance overall management, potentially increases profitability and environmental protection. Nutrient management planners and farmers should maintain accurate records for plan implementation and future planning (e.g., land base, animal numbers, rotations/yields, manure/fertilizer source, timing, rate, and method of application, weather conditions, etc.). Tools such as quick reference tables, notebooks, maps, and software programs such as Cropware aid in the collection and maintenance of records.

For More Information

Cornell Cooperative Extension – Agronomy Fact Sheet #37 – [Nutrient Management Data Collection](#)

Do you calibrate manure and fertilizer application equipment?

Clean and maintain fertilizer application equipment regularly. Calibrate equipment annually to ensure that application rates provide optimal amounts of fertilizer for plant growth with minimal impact on surface and ground waters. Accurate equipment calibration minimizes “guess work” and aides the producer in following their Nutrient Management Plan.

For More Information

Cornell Cooperative Extension – Agronomy Fact Sheet #18 – [Manure Spreader Calibrations](#)



Background Information for Worksheets

How is the rate of manure/fertilizer application determined? How is nitrogen application determined?

Manure and fertilizer application rates should be based on a nutrient management plan supported by Cornell University guidelines. The NY Phosphorous Runoff Index, NY Nitrate Leaching Index, and any other applicable field-specific risk factors will determine the priority nutrient (N, P, and K) to be controlled to minimize environmental risk. The recommended nutrient application rates of manure and/or fertilizer are based on the following: soil type (yield potential, nutrient-supplying capabilities, texture, and soil organic matter), local climate data, erosion potential, nutrient levels as indicated by soil tests, past and current crop sequence, past and current year manure applications (nutrient levels as indicated by manure analyses), and past and current year nutrient applications. Farms not following a nutrient management plan or accounting for the above factors have a much higher risk of over applying nutrients which may potentially degrade water quality. Software programs such as “Cropware” developed by Cornell University incorporate all factors concerning nutrient management into one comprehensive nutrient management planning tool.

For More Information

Cornell Cooperative Extension – Agronomy Fact Sheet [#9 – Cornell Cropware](#)

Are field runoff potentials considered in scheduling manure applications?

Depending on field and weather conditions, manure spreading may potentially result in nutrient losses and water quality concerns. The timing and placement of manure should correspond as closely as possible with the plant/crop nutrient uptake and utilization period. Considerations such as nutrient source, application rates and methods, cropping system limitations (rotations and tillage practices), soil properties, climate and weather conditions, field drainage systems, and nearby Highly Sensitive Areas, waterbodies, wells, and neighbors impact the application schedule. Risk assessment tools such as the NY Nitrate Leaching Index, NY Phosphorus Runoff Index, and RUSLE2 aid in identifying field specific nutrient and soil loss concerns and provide BMPs that may reduce runoff concerns. In addition, Cornell University provides specific manure application guidelines which address nearly all aspects of nutrient management and application concerns in New York. Following a NMP and all guidelines may not prevent manure runoff concerns in all possible cases; however the level of risk is significantly reduced.

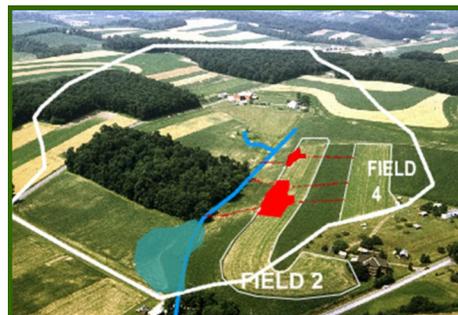
For More Information

Cornell University Extension

Agronomy Fact Sheet #11 – [Nitrogen Leaching Index](#)

Agronomy Fact Sheet #10 – [Phosphorus Index](#)

NRCS – [Erosion Prediction \(RUSLE2\)](#)



Have there been any concerns about manure contamination of wells on or near the farm? How close is manure spread to wellheads or springs?

Characteristics of New York bedrock, soil types, topography, hydrology, climate, and the close proximities of farmlands to residential wells and drinking sources increase groundwater contamination concerns associated with manure spreading. Well or spring water testing high in fecal coliform counts or over 10 ppm nitrate may indicate nutrient leaching/contamination from manure. The minimum recommended and/or required manure spreading setback from wells and down-gradient springs is 100 feet. Setbacks greater than 100 feet decrease contamination risks. Additional spreading setbacks and manure management practices (e.g., rates and incorporation) may be required or recommended by state and local rules when operating near a public water supply (surface water, wellhead, or aquifer). In addition, NRCS Nutrient Management Plan Standard (590), Cornell University Nutrient Management Guidelines, NY Nitrate Leaching Index, and NY Phosphorus Runoff Index may all recommend/require specific BMPs or additional setbacks.

Background Information for Worksheets

Are vegetative buffers maintained along watercourses in fields receiving manure?

How close is manure spread to surface water sources?

Permanently vegetated buffer zones along field edges, water courses, and other highly sensitive areas will protect water quality by filtering or decreasing the loading of sediments, nutrients, and pathogens from cropland runoff. The minimum recommended and/or required manure spreading flow path setback from surface waters and surface water inlets without a vegetated buffer is 100 feet. Additionally, a 35-foot minimum flow path setback is recommended and/or required when a natural occurring or NRCS Standard compliant buffer is present. Spreading within the 35-foot flow path setback recommendation includes the recommendation/requirement of manure incorporation within 24 hours of application and a minimum vegetated buffer of 15 feet. Increased flow path setbacks and vegetated buffer zones may be necessary depending on field slope, soil type, and the type of vegetation in the buffer. Spreading manure in concentrated flow paths within the field is also not recommended.

For More Information

NRCS Standards NY – Filter Strip (393), Riparian Herbaceous Buffer (390), and Riparian Forest Buffer (391): [NRCS eFOTG for NY](#)

How is manure incorporated after spreading?

Nutrient rich manure spread on the land surface is highly susceptible to run off which can potentially degrade water quality, especially during heavy rainfall events. In some cases, manure may be incorporated or injected directly into the soil, allowing the material to mix and react with the soil, thus decreasing runoff. Common manure incorporation practices include forms of chiseling, disking, coulters, and light aerators.

Surface application of manure without incorporation will subject all inorganic nitrogen (ammonium) to volatilization “losses” (ammonia); manure incorporation within 2 days of application may reduce ammonia nitrogen “losses” by an estimated 50%, thus retaining the nutrient for future plant uptake. Manure incorporation is also a method of odor control.

For More Information

Cornell Cooperative Extension- Agronomy Fact Sheet #4 – [Nitrogen Credits from Manure](#)

If the farm has soils shallow to bedrock or with a high leaching potential, how is manure spread?

Is fertilizer spread on soils shallow to bedrock or with a high leaching potential?

The potential for ground water contamination from manure spreading is increased on soils shallow to bedrock and/or with a high leaching potential. The depth to bedrock determines how much soil is available for “filtering” nutrient, pesticide, and pathogen laden water. The leaching potential of the soil is a measure of how fast water percolates or moves through the soil. In these conditions, contaminated waters may travel great distances, both vertically and horizontally. To reduce the risk of groundwater contamination, manure (especially liquid) should not be spread when fields are saturated, frozen, or during other high runoff conditions. When possible, liquid manure should be incorporated or injected to mix with soil and reduce the potential for runoff and leaching through preferential flow paths. Manure applications should be timed as close to crop uptake as possible. If not restricted by a high phosphorus index, the nutrient management program should comply with the Nitrate Leaching Index management guidelines. Additional manure spreading considerations apply if Karst topography is prevalent in the area.

For More Information

Cornell University – [Field Crop Nutrient Guidelines](#)

Background Information for Worksheets

How is the rate of fertilizer application determined?

Fertilizer rates should be developed based on a nutrient management plan that is designed to optimize crop yields while minimizing nutrient losses from the farm to surface and groundwater. The nutrient management plan calculates fertilizer application rates based on the following: nutrient



levels as indicated by soil tests, soil type (yield potential, nutrient-supplying capabilities, texture, and organic matter content), erosion potential (slope degree and length, soil coverage, rainfall, and soil conditions), crop rotations, and manure applications (past and present) if applicable, and guidelines from New York's land grant university (Cornell University).

What is the timing of application?

In order to reduce fertilizer "losses" to the environment, which is costly to the producer and may runoff/leach and degrade water quality, nutrients should be applied as close to the period of maximum plant nutrient uptake as possible. Fertilizer may be applied in a dry granular or liquid form. Depending on the nutrient composition and crop type, fertilizer may be applied in the following ways: broadcast, banding, side-dress banding, foliar application or fertigation. For many crops, split fertilizer applications may be necessary to properly manage the timing of available nutrients in order to reduce losses, protect plant health, and promote plant growth during the correct periods of development. Depending on fertilizer composition, high application rates, especially during primary banding, may damage seeds and seedlings (salt burn). Cornell University's Guide for Integrated Field Crop Management provides fertilizer recommendations for many crop types.

For More Information

Cornell Cooperative Extension – Agronomy Fact Sheet #75 – [Basics of Fertilizer Management](#)

Does your farm import other sources of nutrients (e.g., manure, poultry litter, whey, or other food waste, bio solids) and are they accounted for in your applications to fields?

All forms of organic material may be a potential source of nutrients, including imported manure, poultry litter, biosolids, composts, and food processing by-products/wastes (whey and fruit/vegetable peels, trimmings, and other wastes). The nutrient content and content of other accompanying materials of the source should be analyzed to determine fertilizer values and identify the presence of heavy metals and potential pathogens. Organic food processing wastes are generally applied for their organic matter, not fertilizer values. Biosolids are solid, semi-solid, or liquid materials resulting from treatment of domestic sewage that have been sufficiently processed to permit these materials to be land-applied safely. Biosolids are commonly applied to cropland for Nitrogen and Phosphorus values, as well as, its liming capabilities and improvement of physical soil properties such as bulk density, aggregation, porosity, and water holding capacity. Strict state and federal regulations monitor land applications of sludges or biosolids in New York. Biosolids are classified based on the extent of pathogen treatment and regulatory limits for nine heavy metals set by the U.S. Environmental Protection Agency. Food processors and farm lenders may impose restrictions on the use of biosolids or processed waste materials from municipal sewage systems. Those operating or purchasing a farm may have concern about the accumulation of pathogens and heavy metals on the farm.

For More Information

NYS DEC – Environmental Conservation Law (ECL) – [Subpart 360-5: Land Application Facilities](#)

Cornell University – Waste Management Institute – [Considerations for Dairy Farms Regarding Use of Sewage Sludges, Sludge Products and Septage](#)

Additional Resources for Nutrient Management

For More Information Regarding Agricultural Nutrient Management

Cornell University – [Field Crop Nutrient Guidelines](#)

Cornell University – [Nutrient Management Spear Program](#)

Cornell University – Cooperative Extension – [Cornell Guide for Integrated Field Crop Management](#)

Cornell University – Cooperative Extension – [Agronomy Fact Sheet Series](#)

Cornell University – [Cornell Waste Management Institute](#)

Cornell University – [Cornell Soil Health Test and Management Planning](#)

NRCS - [Agricultural Waste Management Handbook](#)

NRCS - [Nutrient Management \(590\) Standard](#)

NRCS – [National Agronomy Manual](#)

SUMMARY

AEM Tier 2 Assessments document environmental stewardship and establish benchmark conditions on the farm. They also identify resource concerns and areas of opportunity. The AEM Tier 2 worksheets also help to further establish baseline data that can be used to prioritize issues for Tier 3 planning.

Tier 2 Assessments should be completed on-site with the farmer. When the initial assessment is completed, appropriate feedback in the form of an AEM Tier 2 Worksheet Summary should be provided to the farmer. The summary should include an overall level of concern for the worksheet, explanation of the overall ranking, a list and description of items of greatest concern, as well as, documentation of what is being done well and what areas need improvement. After the evaluation is complete, the farm should be given a ranking which will determine their priority to advance to the AEM Tier 3 planning phase. Appropriate ranking categories that could be used are: High, Medium, or Low Priority. A ranking procedure that has been approved by your local AEM Team should be used to make the ranking determinations.

