



Department of
Environmental
Conservation

Urban Nutrient Management Plan Guidance

UPPER SUSQUEHANNA AND CHEMUNG WATERSHEDS VOLUNTARY PROGRAM

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Acronyms/Abbreviations

Acronyms/Abbreviations	Definition
BMP	best management practice
ft ²	square feet
HUC	hydrologic unit code
K	potassium
lb.	pound
mg/kg	milligrams per kilogram
MLSN	minimum levels for sustainable nutrition
N	nitrogen
NRCS	Natural Resources Conservation Service
NYSDEC	New York State Department of Environmental Conservation
P	phosphorus
ppm	parts per million
UNMP	urban nutrient management plan
USGS	United States Geological Survey

1 Introduction

Urban nutrient management plans (UNMPs) help to identify fertilization practices that achieve the most efficient nutrient use by turfgrass systems (lawns, golf courses, athletic fields, etc.) while minimizing nutrient runoff from fertilized areas that may negatively impact water quality in surface and groundwaters. The UNMP designates appropriate fertilizer application rates and timing for the turfgrass in a particular management area. The UNMP ensures that the turf has optimum soil nutrient availability for productivity and quality while also minimizing movement of nutrients to nearby waterbodies.

Because of water quality concerns caused by nutrient runoff, the New York State Department Environmental Conservation (NYSDEC) has created guidance to assist with the development of voluntary UNMPs. This guidance document leads you through the steps necessary to develop a voluntary UNMP for turfgrass. You do not need to have experience writing UNMPs, but the resulting plan must be reviewed by a trained expert for approval (see Section 4). To be considered a trained expert, a person must have one of the following: (1) a certification for writing nutrient management plans, (2) a bachelor's degree in natural resources or a related field, or (3) an associate degree in natural resources or a related field with 2 years of relevant experience. This guidance document accompanies the UNMP template that was developed specifically for areas in New York within the Chesapeake Bay watershed, but it can also apply to other areas in New York (See Appendix A). Note that there is nutrient management guidance ([Recommendations for Fertilizer Nitrogen Applications on Residential and Commercial Turfgrass](#)) for lawns and turfgrass that specifically focuses on Nassau and Suffolk counties on Long Island.

The use of voluntary UNMPs supports the State of New York's [Nutrient Runoff Law](#),¹ which does not allow the use of phosphorus on lawns unless necessary. By law, lawn fertilizer that contains phosphorus can only be applied in New York when establishing a new lawn or if a soil test shows that the lawn does not contain enough phosphorus. In addition, lawn fertilizer may not be applied between December 1 and April 1. Other aspects of the Nutrient Runoff Law regulate the application and cleanup on impervious surfaces, application near waterbodies, the display of fertilizers in retail locations, and retail signage. The Nutrient Runoff Law applies to homeowners, landscapers, lawn care professionals, pesticide applicators, retailers, distributors, and manufacturers of lawn fertilizers.

New York Nutrient Runoff Law Requirements

- Do not use fertilizer that contains phosphorus unless you are establishing a new lawn, or a soil test shows that your lawn needs phosphorus.
- Do not apply lawn fertilizer from December 1 – April 1.
- Do not apply fertilizer on sidewalks, driveways, or other impervious surfaces. If fertilizer spills onto these surfaces, you **MUST** sweep it up to prevent it from washing into drains or waterways. Do not hose it off.
- Do not apply lawn fertilizer within 20 feet of any waterbody unless:
 - There is at least a 10-foot buffer of shrubs, trees, or other plants between the area you are fertilizing and the water, or
 - The fertilizer is applied no closer than 3 feet from the water using a device with a spreader guard, deflector shield, or drop spreader.

Source: [New York Fertilizer Law Requirements](#)

¹ New York State Environmental Conservation Law, article 17, title 21 and Agriculture and Markets Law § 146-g, effective January 2012.

The UNMPs can document the rate and timing of nutrient applications; this information can be used to report progress toward improving water quality in the Chesapeake Bay watershed. The U.S. Environmental Protection Agency's (EPA's) 2010 total maximum daily load (TMDL) for nutrients and sediment in the Chesapeake Bay requires significant reductions in pollutant loadings from all seven jurisdictions (Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and Washington, DC) within the Chesapeake Bay watershed. A TMDL represents the maximum amount of a pollutant that a waterbody can receive and still meet applicable water quality standards. As part of the TMDL, each jurisdiction developed watershed implementation plans that detail the implementation of best management practices (BMPs) needed to achieve the TMDL's nutrient and sediment targets. The jurisdictions must track and report the implementation of BMPs in the Chesapeake Bay watershed to the EPA's Chesapeake Bay Program (CBP) to receive reduction credits toward achieving the nutrient and sediment targets in the bay watershed. The CBP has approved methodologies for crediting urban nutrient management in the bay watershed (Schueler and Lane 2013). As a result, NYSDEC is developing a voluntary program to encourage the development and implementation of UNMPs for urban turf.

The Chesapeake Bay's Expert Panel on Urban Nutrient Management recommends 10 core urban nutrient management practices that are expected to minimize the risk of nitrogen export, and to a lesser extent, phosphorus export (Schueler and Lane 2013):

1. Consult with the local extension service, master gardener, or certified applicator for technical assistance with developing an effective UNMP for the property.
2. Maintain a dense vegetative cover of turfgrass to reduce runoff, prevent erosion, and retain nutrients.
3. Choose to not fertilize OR adopt a reduce rate/monitor approach OR use the small fertilizer dose approach.
4. Retain clippings and mulched leaves on the yard and keep them out of streets and storm drains.
5. Do not apply fertilizers before spring green-up or after grass becomes dormant.
6. Maximize use of slow-release nitrogen fertilizer during the active growing season.
7. Set the mower height at 3 inches or taller.
8. Immediately sweep off any fertilizer that lands on a paved surface.
9. Do not apply fertilizer within 15–20 feet of a water feature (depending on applicable state regulations) and manage this zone as a perennial planting, meadow, grass buffer, or a forested buffer.
10. Employ lawn practices to increase soil porosity and infiltration capability, especially along portions of the lawn that convey or treat stormwater runoff.

NYSDEC has developed a UNMP template to assist anyone writing UNMPs for golf courses and athletic fields (high-traffic, sand-based soils) and all other turf (low-traffic native soils). "All other turf" includes home lawns, apartment complexes, parks, school grounds, business parks/offices, municipal open space, churches, and cemeteries, among others. This template was developed with input and expertise from the Cornell Cooperative Extension Service and Cornell University's Turfgrass Program. By developing and following a UNMP, you are helping to protect local waters and the Chesapeake Bay.

The remainder of this guidance document provides recommendations for nutrient application rates and guidance on obtaining a soil test when necessary (Section 2), lists the steps needed to fill out the UNMP templates (Section 3), and describes how to submit the UNMP for review by a trained expert before implementation (Section 4). Appendix A provides a checklist of all information to include in the UNMP and the UNMP template.

This guidance document and the associated UNMP templates are recommended for turfgrass managers and other professional landscapers. Homeowners are welcome to follow this guidance and develop a UNMP for their home lawn as well; homeowners with questions are encouraged to contact the Master Gardeners program through their local [Cornell Cooperative Extension office](#).

2 Nutrient Application Rates

Nutrient application rates for use in developing UNMPs in New York focus on nitrogen because:

(1) nitrogen is typically the only nutrient that is purposely limited (i.e., in short supply) in turf and (2) New York's Nutrient Runoff Law does not allow the use of phosphorus on lawns unless you are establishing a new lawn, or if a soil test shows that your lawn does not contain enough phosphorus. Nitrogen rates are determined on an annual basis and are specific to the soil type and use of the turf. Home lawns typically need a simple nitrogen fertilization program using relatively low annual nitrogen rates and a limited number of applications per growing season. Athletic fields and golf courses typically need higher annual nitrogen application rates with more frequent applications due to the larger amount of foot and vehicular traffic associated with areas. In rare cases, turf may show a deficiency in nutrients other than nitrogen, and that is also addressed in this section. Table 1 contains the New York UNMP recommendations for annual nitrogen and phosphorus requirements based on soil type and common uses. Figure 1 presents a summary of fertilization priorities based on the types of turf and nutrient application rates presented in Table 1. The purpose of Figure 1 is to help you navigate the steps and priority levels of fertilization for each turf type. You should begin with the highest priority level for your particular turf type and work your way toward the lowest priority level as needed. Each of these fertilizer options are discussed in greater detail in Sections 2.1 and 2.2.

Table 1. New York UNMP Recommendations: Nitrogen and Phosphorus Application Rates Turf Types

Turf type #	Turf type	Maximum N rate per application (lbs./1,000ft ²) ^a	Maximum annual nitrogen rate (lbs./1,000ft ²) ^a	Maximum P rate per application (lbs./1,000ft ²) ^a	Soil type	Use		
1	High-traffic areas (golf courses ^b and athletic fields) ^c	0.5 lbs. for water-soluble N sources	3.5	No supplemental P is typically required for mature turf. <i>If a soil test says P is needed according to MLSN^e guidelines, apply no more than 0.5 lbs. P/1,000 ft².</i>	Sand-based	High traffic		
		0.7 lbs. for slow-release N sources						
2	All other mature turf (residential and commercial lawns) ^d	0.5 lbs. for water-soluble N sources	2		No supplemental P is typically required for newly established turf unless the topsoil has been removed. <i>If a soil test says P is needed, apply at a maximum rate of 1 lb. P/1,000 ft² prior to seeding or within 60 days or follow directions for a “starter” fertilizer (typically 16-24-10).</i>	Native soil ^f	Low traffic	
		0.7 lbs. for slow-release N sources						
3	Newly established turf	0.5 lbs. for water-soluble N sources	2			No supplemental P is typically required for newly established turf unless the topsoil has been removed. <i>If a soil test says P is needed, apply at a maximum rate of 1 lb. P/1,000 ft² prior to seeding or within 60 days or follow directions for a “starter” fertilizer (typically 16-24-10).</i>	All soil types	All uses
		0.7 lbs. for slow-release N sources						

Notes:

ft² = square feet; lb. = pound; lbs. = pounds; MLSN = minimum levels for sustainable nutrition; N = nitrogen; P = phosphorus.

^a Fertilizer application is prohibited between December 1 and April 1.

^b Golf course tees, fairways, and putting greens can all be considered high-traffic, sand-based areas but this can vary. Sometimes only the tees are high-traffic areas, and all other areas of a golf course are low-traffic areas (Turf Type 2 in the table). Be aware of which areas are Turf type 1 versus Turf Type 2 when developing a UNMP for a golf course.

^c It is common for local athletic fields to be built on native soils and to receive frequent traffic. This often results in poor quality turf stemming from insufficient soil physical properties rather than any nutrient deficiency. As such, these systems should be treated as Turf Type 2 until soil physical properties are amended. The best course of action for these turf systems is to address the limiting physical properties through routine cultivation and soil amendment practices. Visit Cornell’s online resources for athletic fields to learn more: <https://safesportsfields.cals.cornell.edu/>

^d Includes home lawns, apartment complexes, roadside rights-of-way, municipal open space, parks, commercial lawns, school grounds, churches/cemeteries.

^e See Section 2.3 for MLSN Soil Guidelines.

^f Native soils have the ability to hold nutrients and water.



Figure 1. Fertilization priorities for various turf types.

2.1 Nitrogen Application

Nitrogen application rates for mature and newly established turf are presented in Table 1. Sand-based, high-traffic turf areas such as golf courses and athletic fields can use up to 3.5 lbs. nitrogen/year, while low-traffic turf on native soils and newly established turf require no more than 2 lbs. nitrogen/year. Tees, fairways, and greens on golf courses can all be considered high traffic areas, but this can vary by golf course. Often, tees and putting greens are the only high traffic area on a golf course.

The quality of your turf determines how many nitrogen applications you need per year and when to apply nitrogen. High traffic turf areas will use several (three to four) light, more frequent applications, while low traffic areas will use one to two applications split into lower rates. Typical applications for low traffic areas (e.g., home lawns) are most appropriate in the fall (around Labor Day) or in spring (around Memorial Day).

Keep in mind that nitrogen should only be applied to mature turf in low-traffic areas when needed to maintain turfgrass goals, which may vary from “maintain vegetative cover” to “maintain uniform stand of lush turfgrass”. If turfgrass is meeting the goal, it does not require nitrogen fertilizer at that time. Table 2 provides a summary of the Cornell Turfgrass Science Program’s recommended number of fertilizer applications per year and when to apply fertilizer for various types of turf.

Table 2. Recommended Number of Nitrogen Applications Per Year

Lawn quality	Lawn description	Number of nitrogen applications	Best time to apply nitrogen	When to apply additional nitrogen as needed
Good (Turf Type 2) ^a	Has limited traffic/use and is mowed at 3–3.5 inches with clippings left in place without clumps. Does not receive supplemental water but may receive targeted pesticide spot-treatment as needed.	0–1	September	Never
Better (Turf Type 2) ^a	Receives more traffic/use; care is the same as detailed for good lawns.	1–2	September	May
Highest quality (Turf Type 1) ^a	Used very often for outdoor activities. Is intensely managed to keep grass shorter than recommended, and clippings are removed. Pesticide applications are used as needed to address identified weeds, insects, or diseases.	3–4	September	May, June, and/or October

Source: Cornell Turfgrass Program (2021)

Note:

^a Type of turf corresponds to Type 1 (high-traffic, sand-based areas) and Type 2 (low-traffic native soil areas) in Table 1.

Many factors can influence the necessary nitrogen application rate, including soil properties, turf age, drainage, amount of traffic, shade, and irrigation (Rossi 2018). Turf that might need more nitrogen includes sandy, well-drained soils; high-traffic areas; irrigated lawns; and lawns that have had clippings removed. Turf that might require less nitrogen includes shady lawns and older turf. See Section 3 for help determining how much nitrogen to apply to your turfgrass.

2.2 Phosphorus and Other Macronutrient Application

2.2.1 Phosphorus

It is important to note that mature turf rarely needs phosphorus, and new lawns can often be established without phosphorus. Standard recommendations say to apply phosphorus when establishing a new lawn; however, recent studies indicate that turf treated with both nitrogen and phosphorus do not show significant growth response when compared to turf treated with only nitrogen (Liu and Landschoot 2018). If a soil test shows that phosphorus is needed, it can be added at a maximum rate of 1 pound (lb.) of phosphorus/1,000 square feet (ft²) before seeding or during the first two months of planting (see Table 1). Another option is to follow the application directions for a “starter” fertilizer.

Phosphorus application rates are based on the amount of existing phosphorus in the soil. Because of New York’s Nutrient Runoff Law requirements (see Section 1), a soil sample is necessary to determine whether phosphorus needs to be applied to a managed lawn or turf area. See Section 2.4 for instructions on how to collect and submit a soil sample for testing.

Phosphorus should only be applied to mature lawns and turf if a soil test using Minimum Levels for Sustainable Nutrition (MLSN) Soil Guidelines indicates additional phosphorus is needed. The MLSN guidelines use a sustainable approach to managing soil nutrient levels; they indicate that phosphorus is not necessary unless a soil test shows that phosphorus levels in the soil fall below 21 parts per million (ppm) or milligrams per kilogram (mg/kg). If a soil test indicates a deficiency according to MLSN guidelines, phosphorus can be applied at no more than 0.5 lbs. per 1,000 ft² to mature turfgrass. See Section 2.3 for a more detailed discussion of the MLSN Soil Guidelines.

2.2.2 Other Macronutrients

If your soil test indicates a MLSN deficiency in macronutrients other than nitrogen and phosphorus (i.e., potassium, calcium, magnesium, and sulfate), consider applying these nutrients with the next fertilization. Carefully check the fertilizer label to see what nutrients are included. Apply at the recommended rate and retest the following year. See Section 2.3 for a more detailed discussion of the MLSN guidelines.

2.2.3 pH

The MLSN guidelines also address pH, stating it should be above 5.5. Note that a pH of 7.5 is generally considered to be at the top end of acceptable turfgrass standards. Fertilizer products can be used to adjust pH if the pH range is outside the 5.5–7.5 range *and* if the turf is not performing to standard. See Section 2.3 for a more detailed discussion of the MLSN guidelines.

2.3 Minimum Levels for Sustainable Nutrition Soil Guidelines

In rare cases, turf may show a deficiency in nutrients other than nitrogen. In that case, Cornell Cooperative Extension recommends following the [MLSN Soil Guidelines](#). The MLSN guidelines help to interpret soil tests to make fertilizer recommendations, which is a more sustainable approach to managing soil nutrient levels. The MLSN indicates the minimum amount of nutrients that can be in the soil to sustain “good” turfgrass quality. The use of MLSN can reduce fertilizer use and costs, while still maintaining the desired turf quality. The MLSN guidelines were developed based on data from thousands of turf samples (including all types, from golf courses to lawns) around the world to develop general minimum levels of nutrient concentrations that are able to support healthy turf.

Traditional soil tests report the concentration of nutrients in the soil (with the exception of nitrogen, which currently does not have a reliable test for turfgrass) and indicate if they are “low,” “medium,” or “high.” The indicators of low, medium, and high can be arbitrary, so a better option is to have your soil tested using the Mehlich 3 extraction method to use with the MLSN Soil Guidelines.

Mehlich 3 soil test data can be directly compared to the MLSN guideline levels presented in Table 3. If the data show that a nutrient in your soil is above the guideline, then you do not need to add more of that nutrient. If the level of that nutrient in your soil falls below the MLSN guideline, you should add enough of the deficient nutrient to raise it above the guideline (Woods 2021). It is important to note that the MLSN guideline is a minimum value that you do not want your soil to drop below. It is not a target level to aim for your soil. However, if your soil is below the MLSN value, it does not necessarily mean that your soils is deficient in that nutrient (Woods 2021). The MLSN guideline represents a level in which the soil has enough of a particular nutrient to produce high-quality turf. High-quality turf can exist in soils with less of that particular nutrient, but to ensure necessary nutrients for healthy turf, it is suggested to keep your soil from dropping below the MLSN guideline (Woods 2021).

If your soil test indicates that your soil is below the MLSN guideline for the nutrients in Table 3, see the information on the MLSN website, along with the Climate Appraisals and Growth Potential (also at the MLSN website), to determine your annual fertilizer needs. Useful website links are provided below. The Climate Appraisal Form provides nutrient demand conditions for your specific location. If your soil test shows a nutrient deficiency, you should also consider contacting your local cooperative extension office to help you determine how much phosphorus you need to apply ([local Cooperative Extension offices](#)). Other resources include:

- MLSN Guidelines: [MLSN Soil Guidelines](#)
- MLSN Guidelines User Manual: [MLSN Operations Manual](#)
- Climate Appraisals and Growth Potential: [Climate Appraisal Form](#)

Table 3. Minimum Levels for Sustainable Nutrition Soil Guidelines

Parameter	MLSN soil guideline (ppm)
pH	>5.5
Potassium (K)	37
Phosphorus (P)	21
Calcium (Ca)	331
Magnesium (Mg)	47
Sulfur as sulfate (S)	7

Notes:

MLSN = minimum levels for sustainable nutrition; ppm = parts per million

2.4 Soil Testing

Soil tests provide information to help you make educated choices when fertilizing managed turf. Remember that standard soil tests for turfgrass do not currently contain data to guide nitrogen applications.

How do you know if your lawn or turf needs a soil test?

If your lawn looks healthy, a soil test is not needed.

As mentioned earlier, New York's Nutrient Runoff Law prohibits the use of phosphorus on lawns unless the lawn is newly established or a soil test shows phosphorus is deficient (see Section 1); therefore, a soil sample is necessary to determine if phosphorus needs to be applied to a managed lawn or turf area. If your lawn looks healthy, it likely does not need phosphorus.

If a lawn is being established on native topsoil, a soil test is not necessary because soil nutrient levels are likely above MLSN guidelines. If a lawn is being established on subsoil, then a soil test is recommended. For existing turf, soil testing should occur based on the fertilization schedule. Test the frequently fertilized areas, such as putting greens, once per year. In areas that are fertilized less often, such as golf course fairways, athletic fields, or home lawns, you can test every 3 years. Soil samples should be collected at the same time every year for a given lawn or turf area to avoid seasonal variation in soil nutrient concentrations. Spring and fall are considered to be the best times to collect soil samples.

The Cornell Turfgrass Science Program prefers using the MLSN guidelines to interpret soil tests over the more traditional Sufficiency Levels of Available Nutrients (SLAN) approach of indicating low, medium, and high nutrient levels in the soil (see Section 2.3). Traditional soil testing focuses on turf response—will the grass grow more if a particular nutrient is added? In contrast, the MLSN method focuses on what is more important—turf performance.

Soil tests should be sent to a certified lab that assesses soil nutrients based on MLSN guidelines using the Mehlich 3 extraction method (other soil test methods will result in incorrect recommendations). Acceptable Mehlich 3 soil testing services are listed below; however, if you have questions or are not sure where to send your soil sample, you can contact your [local Cornell Cooperative Extension offices](#).

- DairyOne Mehlich 3 (standard 803 soil test package)
 - <https://dairyone.com/services/soil-laboratory/soil-analysis/packages/>
 - Use form D, check "Other States Mehlich III", and choose package 803
 - Use the ppm (mg/L) soil test values with the MLSN guidelines to generate nutrient application recommendations and ignore any nutrient application recommendations that may be provided with the soil test report.
- Brookside Mehlich 3 (soil test package S001)
 - <https://www.blinc.com/node/28>
 - If the soil test report returns with Bray II phosphorus results, ignore them and use only the Mehlich 3 results.
 - Use the ppm (mg/L) soil test values with the MLSN guidelines to generate nutrient application recommendations and ignore any nutrient application recommendations that may be provided with the soil test report.
- Spectrum Analytic Mehlich 3 (Turf and Ornamental Soil Analysis)
 - <https://spectrumanalytic.com/services/analysis/turfsoil.html>
 - Use the ppm (mg/l) soil test values with the MLSN guidelines to generate nutrient application recommendations and ignore any nutrient application recommendations that may be provided with the soil test report.

Detailed instructions on [how to properly collect a soil sample](#) for lawn or turf are provided by Cornell University and are summarized here.

- Use collection tools that are clean and free of rust. Do not use brass or galvanized tools or containers because they can contaminate samples. The best way to collect a soil sample is with a soil probe, which can be purchased online or from garden centers or other stores. Stainless steel probes are recommended because they collect a continuous core through the entire soil sampling depth with a minimum disturbance of the soil.
- Ensure that each sample represents only one area, such as a particular turfgrass area of a golf course or healthy and unhealthy lawn areas. Submit samples from healthy and unhealthy areas separately.
- Once you select uniform areas to sample, the next step is to collect a representative composite sample from a depth of approximately 4 inches.
- Collect 10–12 core samples from each area. Push the soil probe into the soil to about 4 inches and remove any surface plant material before placing it in the sample bucket. Collect the subsamples from random spots within the sample area by following a zigzag pattern as you walk across the landscape.
- Place all core samples for one unique area in a clean bucket and mix well. It is best to send air-dried samples in a sample container or plastic bag. Fill the soil sample container or plastic bag with about 2 cups of soil.

3 Steps to Complete an Urban Nutrient Management Plan

If you do not need to collect a soil test, you are ready to write your UNMP. If you need to collect a soil test, you can begin writing your UNMP once the soil test results are received.

3.1 UNMP Template

NYSDEC has developed a UNMP template that can be used to help you develop a UNMP and guide your fertilizer application activities in New York. The template is suitable for sand-based, high-traffic turf areas and native soil-based, low-traffic areas. The template includes five key sections: (1) Site-Specific UNMP Information, (2) Narrative, (3) Determining the Amount of Nitrogen to Apply, (4) Nutrient Application Worksheet, and (5) Fertilizer Application Record Keeping Form. Each of the template's sections and the information necessary to complete them are described below. The template can be found in Appendix A.

3.1.1 Site-Specific UNMP Information

The *Site-Specific UNMP Information* section in the UNMP template (Table A-1 in Appendix A) includes the plan's start and end date, the landowner's contact information, the nutrient planner's contact information, the property type, location information, the size of the fertilized areas, and the soil test results (Table 4).

Table 4. Site-Specific UNMP template information table

UNMP components	Site-specific data
Date and duration of plan (should not exceed 3 years)	
Owner/operator of the turf area or home lawn	
Mailing address (street, city, state, zip)	
County	
Phone	
Email	
Nutrient consultant/planner name (if applicable)	
Mailing address (street, city, state, zip)	
Phone	
Email	
Total property acreage	
Property type (golf course, athletic field, residential home, etc.)	
Latitude/longitude (leave blank – to be filled in by reviewer)	
Watershed designation [name of HUC 12 watershed(s)] (leave blank – to be filled in by reviewer)	
Attach soil tests (if available)	
Attach other maps (if available)	
Attach map or aerial photo of fertilized areas	

To complete the *Site-Specific UNMP Information* section of the template, you will need:

- **Date and duration of the plan** – Enter the UNMP’s start date and end date. The end date should be 3 years after the start date. Submitted and approved UNMPs are good for 3 years; after that, you may resubmit it for Chesapeake Bay model credit renewal. Currently this information is only required to be collected for the Chesapeake Bay watershed. The information in the UNMP should be followed for each year of the 3-year UNMP. However, if the fertilization plan changes in that 3-year timeframe, a new UNMP should be completed and submitted to NYSDEC for tracking and reporting purposes.
- **Owner/operator of the turf area or home lawn** – Enter property owner’s name and mailing address, county, phone number, and email address.
- **Nutrient consultant/planner name** – Enter the name(s) of individuals and/or companies that make decisions about applying nutrients to your turf (e.g., nutrient consultant, nutrient planner, landscaping company) as well as their mailing address, phone number, and email.
- **Total property acreage** – Include the number of acres of property.
- **Property type** – Indicate whether the property is a sand-based, high-traffic area or a native soil-based, low-traffic area. Sand-based, high-traffic areas include golf courses and athletic fields; native soil-based, low-traffic areas include all other mature turf (e.g., home lawns, apartment complexes, parks, school grounds, business parks/offices, municipal open space, churches, cemeteries). Remember that some areas of golf course turf may actually be low-traffic areas; therefore, the UNMP for a golf course may contain a combination of the two types of turf. Golf course tees, fairways, and putting greens are often considered to all be high-traffic areas, but this can vary depending on the golf course. In most cases, only the putting greens and tees are high-traffic areas (Turf Type 1 in Table 1) and all other areas of the golf course are low-traffic areas (Turf Type 2 in Table 1). When developing a UNMP for a golf course, be aware of which areas support high traffic (Turf Type 1) versus low traffic (Turf Type 2).

- **Latitude/longitude (optional)** – Include latitude and longitude coordinates if available; if not available, this section can be left blank, and a reviewer will fill it in. Coordinates should be in the form of decimal degrees (e.g., 42.15, -75.64).
- **Watershed designation (optional)** – This can be left blank, and a reviewer will fill it in. If you choose to include the U.S. Geological Survey’s (USGS) 12-digit hydrologic unit code (HUC) for the watershed in which the property is located, you can identify the HUC 12 watersheds using the [NYS 12 Digit HUC and Aquifer](#) map application.
- **Soil tests (if available)** – Attach a copy of your soil test results, if necessary. If your lawn looks healthy, a soil test is not needed.
- **Other maps (if available)** – Attach optional maps, which could include a soil survey and maps showing the locations of surface waters, irrigation systems, sensitive/high risk areas, buffer zones (wellhead, wetlands, etc.), and soil sample collection sites.
- **Map or aerial photo of fertilized areas** – Attach the required site location map and map of managed areas. The site location map should be a map or aerial photo that shows the location and boundaries of the entire property (including names of common landmarks and roads). The map of the managed areas should be a map or aerial photo of each individual managed (fertilized) area(s) with boundaries.

3.1.2 Narrative

The *Narrative* section of the UNMP template helps you develop the UNMP narrative for the particular user or client. The goal of this section is to describe the operation in more detail and assist with tailoring the plan to the individual property. To complete the narrative section, answer the following questions and prompts:

- **What type of operation is this?** Choose from the following: home lawn, athletic field, golf course, park, apartment complex grounds, school grounds, business park/offices, municipal open space, church, cemetery, or other (please explain).
- **Include any common landmarks or major road names and intersections near the site to help describe the location.** Examples include the names of particular housing developments or schools where the managed areas are located.
- **Include a general description of the managed area in the operation.** The managed areas should match the map of the fertilized areas provided in the *Site-Specific UNMP Information* section (see Table 4). This section should provide a brief summary of the managed areas and plant species on the property. For example, a UNMP for a home lawn may state that there’s a 1-acre lawn, with 0.5 acres in the back yard and 0.5 acres in the front yard, that will receive the same fertilizer application once a year. A summary of the managed areas at a golf course can include the number of acres and types of turf on the property (e.g., acres of trees; acres and species of turf near the clubhouse; acres and species of turf on the greens, fairways, and roughs).
- **Are there any additional BMPs that are being implemented in the management areas in addition to the nutrient application rates and timing?** If yes, please list them. See Section 3.2 for recommended BMPs for turfgrass.

- Include any other information you feel is important.

3.1.3 Determining the Amount of Nitrogen to Purchase and Apply

In the *Instructions for Determining the Amount of Nitrogen to Purchase and Apply* section of the UNMP template, you will calculate the amount of nitrogen to apply to the managed area(s) of your property. There is no need to calculate amounts of nutrients to apply other than nitrogen (see Sections 2.2 and 2.3). The *New York UNMP Recommendations* table (see Table 1 in Section 2 and Table A-2 in Appendix A) provides guidance on the maximum amount of nitrogen to be applied depending on whether your fertilized area is a sand-based, high-traffic area (Turf Type 1); a native soil-based, low-traffic area (turf Type 2); or a newly established turf area (Turf Type 3).

Using the application rate information presented in Section 2, Table 1, follow the steps presented below to calculate the amount of nitrogen fertilizer needed for your particular turf area. These values will be used to complete the *Nutrient Application Worksheet* described in the next section. Another option for calculating the amount of nitrogen fertilizer needed on your turf area (given a particular nutrient application rate) is to use Purdue University's Turfgrass Science Program's [Turf Fertilizer Calculator](#).

Steps to Calculate the Amount of Nitrogen to Apply

Step 1 – Measure the size of your turf area or home lawn. Area must be in square feet (ft²). You can multiply the number of acres in the turf area by 43,560 to convert to ft². Be sure to subtract the square footage of any houses and other structures, driveways, or unfertilized areas on the property.

Step 2 – Calculate the amount of nitrogen fertilizer to apply per application. For all turf types, apply at maximum either 0.5 lbs. water-soluble or 0.7 lbs. slow-release nitrogen per 1,000 ft² per application (see Table 1 and Figure 2). Determine the percent nitrogen in the fertilizer by locating the first of the three numbers on the label—these indicate the percent of nitrogen, phosphorus, and potassium (N-P-K), respectively. For example, if the numbers on the label are 16-10-10, your fertilizer contains 16% nitrogen. Follow the steps in the example below to calculate the amount of nitrogen fertilizer needed per application:

Example: You want to apply 0.5 lbs. of slow-release fertilizer per 1,000 ft² to your 4,000 ft² home lawn. Your fertilizer contains 16% N. How many total pounds of this fertilizer should be applied evenly to the lawn?

Equation: $(100 / \% \text{ of N in fertilizer}) \times (\text{square footage} / 1,000) \times \text{desired N rate per application} = \text{lbs. of fertilizer to apply for each 1,000 ft}^2$

Answer: $(100 / 16) \times (4,000 / 1,000) = 6.25 \times 4 \times 0.5 = 12.5 \text{ lbs. of fertilizer for one application}$

Step 3 – Determine the amount of fertilizer needed annually. If your turf is Type 1 (sand-based, high-traffic areas) you will typically fertilize 3–4 times per year, but should not exceed a total of 3.5 lbs. of nitrogen per 1,000 ft² annually (see Table 1 and Table 2). If your turf is Type 2 (all other mature turf) or Type 3 (newly established turf) you can fertilize 1–2 times per year, but you should not exceed a total of 2 lbs. of nitrogen per 1,000 ft² annually. Follow the two examples below for high-traffic turf and all other mature turf to determine the amount of nitrogen needed to fertilize your entire property annually:

Example for Type 1 Turf (high-traffic golf and athletic fields):

You want to apply 0.5 lbs. water soluble N per application to your golf course. The fertilizer contains 30% N and the turf area is 20 acres, which is 871,200 ft² (20 acres x 43,560).

Equation: (100 / % of N in fertilizer) x (square footage / 1,000) x desired N rate per application = lbs. of fertilizer to apply for each 1,000 ft²

Answer: (100 / 30) x (871,200 / 1,000) = 3.33 x 871.2 x 0.5 = 1,450.5 lbs. of fertilizer needed for 1 application

If you are fertilizing four times per year (not to exceed 3.5 lbs. N annually per 1,000 ft²):
1,450.5 lbs. N per application x 4 = 5,802 lbs. N needed annually

0.5 lbs. N/1,000 ft² applied four times per year is a total of 2 lbs. N applied per 1,000 ft² and is below the 3.5 lbs. N maximum

Example for Type 2 Turf (all other mature turf):

You are using 0.5 lbs. slow-release N per application. The fertilizer contains 16% N, and the turf area is 4,000 ft².

Equation: $(100 / \% \text{ of N in fertilizer}) \times (\text{square footage} / 1,000) \times \text{desired N rate per application} = \text{lbs. of fertilizer to apply for each 1,000 ft}^2$

**Answer: $(100 / 16) \times (4,000 / 1,000) = 6.25 \times 4 \times 0.5 =$
12.5 lbs. of fertilizer needed for 1 application**

If you are fertilizing two times per year (not to exceed 2 lbs. N annually per 1,000 ft²):
12.5 lbs. per application x 2 = 25 lbs. needed annually

0.5 lbs. N/1,000 ft² applied two times per year is a total of 1 lb. N applied per 1,000 ft² and is below the 2 lbs. N maximum

3.1.4 Nutrient Application Worksheet

You will use the steps described above to calculate how much nitrogen to apply and fill in the *Nutrient Application Worksheet* section of the UNMP template (i.e., Determining the Amount of Nitrogen to Apply and Purchase) (Table 5 and Table A-3 in Appendix A). This table is used to record the amount of fertilizer to be applied per application and how much is needed annually for each managed area. Make additional copies of this page as needed.

Table 5. Determining the amount of nitrogen to apply and purchase

Managed area #	Type (1, 2, 3)	Expected dates of applications (mm/dd/year) ^a	% N of fertilizer (X-x-x)	% P of fertilizer (x-X-x)	% K of fertilizer (x-x-X)	Turf area or home lawn size (ft ²)	Rate of N (per 1,000 ft ²) ^b	Total N to be applied per application	Total P to be applied per application	Total K to be applied per application	Max amount of N to purchase per year

You must complete one row of the table for each managed area within a particular property. The completed *Nutrient Application Worksheet* contains detailed recommendations for each of those management areas. All recommendations should be designated on a “per 1,000 ft²” basis. The information needed for the *Nutrient Application Worksheet* includes:

- **Managed Area** – Each row in this column should contain a unique identifier to signify each specific managed (fertilized) area within a particular property. The unique identifier should match the labels of the individual managed areas in the location map (see *Site-Specific UNMP Information* above).
- **Type (1, 2, 3)** – Indicate whether the managed area is Type 1 (sand-based, high-traffic turf), Type 2 (all other mature turf) or Type 3 (newly established turf) (see Table 1).
- **Expected Dates of Application (mm/dd/year)** – The quality of your turf or lawn determines how many nitrogen applications are needed per year and when. Cornell’s Turfgrass Program’s [Standard Nitrogen Recommendations for Home Lawns](#) provides guidance on how often to apply nitrogen to your lawn (see Table 2). Include the date of each fertilizer application that each management area will receive annually. There may be several applications of nutrients on your management area per year depending on the type of turf being fertilized. This column allows you to designate the dates on which the nutrient applications should be applied.
 - If the management area is small, such as a home lawn, it will likely receive the same applications for each year of the UNMP. Only the month and day for the application needs to be entered, along with a note explaining that this annual application program is applicable for all the years of the plan.
 - If the management area is part of a larger property, such as a golf course, and fertilizer applications will vary from year to year, then each year of the plan should be entered into its own row of the table with the appropriate dates entered in the “Expected Date of Application” column. This may be necessary if specific applications are needed to achieve desired soil fertility levels in the management area. It is understood that the estimated month and day designations may not always be followed due to weather or other circumstances; however, applications should occur as close to the month as possible, using the day designation to determine the interval between applications.
- **% of N fertilizer** – The percent of nitrogen in the fertilizer (located first on the fertilizer’s N-P-K label).
- **% of P fertilizer** – The percent of phosphorus in the fertilizer (located second on the fertilizer’s N-P-K label).
- **% of K fertilizer** – The percent of potassium in the fertilizer (located third on the fertilizer’s N-P-K label).
- **Turf area of home lawn size (ft²)** – Include the area to be fertilized. You can multiply the number of acres in the turf area by 43,560 to convert to ft². Be sure to subtract the square footage of any houses and other structures, driveways, or unfertilized areas on the property.

- **Rate of N per 1,000 ft²** – Include the rate of nitrogen you plan to apply per 1,000 ft² for each application. You should apply no more than 0.5 lbs. of nitrogen/1,000 ft² for water soluble sources and no more than 0.7 lbs. of nitrogen/1,000 ft² for slow-release nitrogen sources.
- **Total N to be applied per application** – Include the total amount of nitrogen to be applied per 1,000 ft² for each application. This value is based on the calculations described in the previous section (*Instructions for Determining the Amount of Nitrogen to Purchase and Apply*).
- **Total P to be applied per application** – Include the total amount of phosphorus to be applied per 1,000 ft² for each application. Supplemental phosphorus is not typically necessary for mature turf. *If a soil test says phosphorus is needed, follow the MLSN Guidelines. Supplemental phosphorus is not typically necessary for newly established turf unless the topsoil has been removed. If a soil test says phosphorus is needed, apply at a maximum rate of 1 lb. phosphorus/1,000 ft² within 60 days or follow directions for a “starter” fertilizer, which is typically 16-24-10 (see Table 1, Section 2.2.1 and Section 2.3 for more details).*
- **Total K to be applied per application** – Include the total amount of potassium to be applied per 1,000 ft² for each application. If your soil test indicates a MLSN deficiency in potassium, apply with the next fertilization. Most fertilizers available in New York have all nutrients except phosphorus. Apply at the recommended rate and retest the following year (see Section 2.2.2 and Section 2.3 for more details).
- **Max amount of N to purchase per year** – Include the maximum amount of nitrogen fertilizer you should purchase and apply each year based on the maximum annual nitrogen application rates of 3.5 per 1,000 ft² for Type 1 and 2 lbs. per 1,000 ft² for Types 2 and 3 turf (see Table 1) and the number of times you plan on applying fertilizer to a particular area (see Table 2). See the previous section (*Instructions for Determining the Amount of Nitrogen to Purchase and Apply*) for help calculating the maximum nitrogen application per year.

3.1.5 Fertilizer Application Record Keeping Form

The *Fertilizer Application Record Keeping Form* is the final part of the UNMP template (Table 6 and Table A-4 in Appendix A). It documents the rate and timing of nutrient applications to the managed area. You must complete one row of the table for each managed area within a particular property. Additional copies of this form can be made as needed.

Table 6. Fertilizer application recordkeeping form

Managed area #	Type (1, 2, 3)	Turf description ¹	Date of application (mm/dd/year)	Weather conditions ²	Fertilizer analysis or % N (e.g., 10-10-10)	Rate of N per 1,000 ft ²	Total amount of N used (lbs.) (for entire property)	Total amount of P used (lbs.) (for entire property)	Total amount of K used (lbs.) (for entire property)

To complete the *Fertilizer Application Record Keeping Form*, you will need the following information:

- **Managed Area** – Each row in this column should contain a unique identifier to signify each specific managed (fertilized) area within a particular property. The unique identifier should match the labels of the individual managed areas in the in the location map (see *Site-Specific UNMP Information* above) and in the *Nutrient Application Worksheet* described in Section 3.1.4.
- **Type (1, 2, 3)** – Indicate whether the managed area is Type 1 (sand-based high traffic turf), Type 2 (all other mature turf) or Type 3 (newly established turf) (see Table 1).
- **Turf Description** – Describe the specific type of turf you are fertilizing. Type 1, sand-based high traffic turf consists of golf courses and athletic fields. Golf course tees, fairways, and putting greens are often considered high-traffic areas, but this can vary. Sometimes only the tees are high-traffic areas (Type 1), and all other areas of the golf course are considered low-traffic areas (Type 2). Be aware of which areas are Type 1 versus Type 2 when developing a UNMP for a golf course. All other mature turf (Type 2) includes home lawns, apartments, roadside rights-of-way, municipal open space, parks, commercial lawns, school grounds, and churches/cemeteries. Type 3 turf is any newly established turf, regardless of the traffic or use.
- **Weather Conditions** – Provide weather conditions at the time of application (i.e., air temperature, precipitation, soil frozen or snow covered, etc.)
- **Fertilizer Analysis or % N (e.g., 10-10-10)** – Include the N-P-K analysis of the fertilizer you are applying (or the percent nitrogen if only applying nitrogen).
- **Rate of N per 1,000 ft²** – Include the standard nitrogen application rate per 1,000 ft² for each management area calculated in the *Nutrient Application Worksheet* above.
- **Total amount of N used (for entire property)** – Use the nitrogen rate per 1,000 ft² calculated in the *Nutrient Application Worksheet* above to determine the total amount of nitrogen applied to the property area (in lbs.). Divide the total square footage by 1,000 and multiply by the nitrogen rate per 1,000 ft².

- **Total amount of P used (for entire property)** – Use the phosphorus rate per 1,000 ft² calculated in the *Nutrient Application Worksheet* above to determine the total amount of phosphorus applied to the property area (in lbs.). Divide the total square footage by 1,000 and multiply by the phosphorus rate per 1,000 ft².
- **Total amount of K used (for entire property)** – Use the potassium rate per 1,000 ft² calculated in the *Nutrient Application Worksheet* above to determine the total amount of potassium applied to the property area (in lbs.). Divide the total square footage by 1,000 and multiply by the potassium rate per 1,000 ft².

3.2 Additional BMPs to Use in UNMPs

In addition to the nutrient application rates and timing, the UNMP can also include any additional BMPs in the *Narrative* section that help to reduce the use of fertilizer. Below is a list of the “Top 10” BMPs for lawns and turfgrass in New York.

Top 10 BMPs for Lawns and Turfgrass in New York

1. Avoid spillage of fertilizer and turfgrass clippings onto impervious surfaces.
2. Return clippings to turf to recycle nutrients (not applicable on golf course putting greens).
3. Avoid late-season applications (after mid-October) of all nitrogen sources and avoid high rate early-spring applications of water soluble (quick release) nitrogen sources.
4. Per NYSDEC regulation: Avoid fertilizer applications within 20 feet of water *unless*
 - (a) there is a 10 foot buffer of vegetation between the management area and waterbody, or
 - (b) a spreader guard or other control device is used (then the closest you can get is 3 feet)
5. Conduct soil testing to establish nutrient requirements for non-nitrogen nutrients (MLSN Guidelines preferred). Note: phosphorus application is controlled under a NYSDEC regulation.
6. If turf has desirable function, growth, and quality, fertilizer (of any kind) is not required.
7. Set mower height at 3.5 inches or taller.
8. Fertilizer applications should not be made when soil temperatures are under 50° Fahrenheit.
9. Maximize use of slow-release nitrogen fertilizer, especially on sandy soils.
10. If more assistance is needed, work with a professional to develop a UNMP based on a soil test analysis.

4 Steps for Submitting Urban Nutrient Management Plans for Review

Once an UNMP has been completed and reviewed by a trained expert,² it can be submitted by email to Cassandra Davis, NYSDEC Environmental Program Specialist (cassandra.davis@dec.ny.gov) for approval. The UNMP can be submitted as a Word document or as a PDF file. Consult soil and water conservation districts and regional planning and development boards to find trained experts who can review your completed UNMP (Table 7).

The completed UNMP is intended to be a 3-year plan; therefore, the plan should be updated every 3 years, including soil sampling if necessary. After 3 years, the plan can be renewed based on affirmation from the owner or applicator that they (1) are maintaining the plan, (2) have modified the plan based on professional feedback, or (3) have modified the plan based on new soil sample information.

Table 7. UNMP Reviewers (Trained Experts) Contact Information

Organization	Web link
New York's soil and water conservation district offices	Soil and water conservation district offices
Southern Tier 8 Regional Board	Southern Tier 8 Economic Development Organization for the Southern Tier Region of New York
Southern Tier Central (STC) Regional Planning and Development Board	STC Regional Planning and Development Board

²To be considered a trained expert, a person must have one of the following: (1) a certification for writing nutrient management plans, (2) a bachelor's degree in natural resources or a related field, or (3) an associate's degree in natural resources or a related field with 2 years of relevant experience.

5 Bibliography

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Appendix A – New York Urban Nutrient Management Plan Checklist and Template

The following is a checklist of information needed to develop a voluntary Urban Nutrient Management Plan (UNMP) for golf courses and athletic fields (high-traffic, sand-based soils) and all other turf (low-traffic, native soils) in New York. The checklist is followed by the UNMP template.

1. Site-Specific UNMP Information

- a. Date and duration of plan _____
- b. Owner/operator name, mailing address, county, phone, and email _____
- c. Nutrient consultant/planner name, mailing address, phone, email (if applicable) _____
- d. Size of fertilized area (square footage) _____
- e. Type of property (e.g., golf course, athletic field, home lawn, commercial lawn) _____
- f. Written description of site location _____
- g. USGS HUC 12 watershed designation (optional) _____

2. Maps

- a. Map/aerial photo of entire property and boundaries of fertilized areas _____
- b. Soil survey map showing soil types (optional) _____
- c. Map with location of all surface water on property (optional) _____
- d. Map of irrigation system location (optional) _____
- e. Map of sensitive/high-risk areas (optional) _____
- f. Mapping of buffer zones (waterbodies, wetlands, etc.) (optional) _____
- g. Map of soil sample location(s) (optional) _____

3. Soil Tests Results

- a. Copy of soil test results if necessary for application of phosphorus _____

4. Nutrient Application Worksheet

- a. Rate of nutrient application – Calculate the amount of fertilizer to be applied per application and how much is needed annually for each managed area. Nitrogen rates are based on turf type and use. Phosphorus rates are based on soil tests. _____
- b. Timing of nutrient application – Identify when the fertilizer will be applied (number of times and expected dates) _____
- c. Type of nutrient application – Identify the type of fertilizer to be applied (i.e., percent of N-P-K) _____

5. BMP Recommendations

- a. Include any additional BMPs that will be implemented to help reduce the use of fertilizer _____

6. Maintain Fertilizer Application Records

- a. Identify the date of application _____
- b. Weather conditions during time of fertilizer application _____
- c. Fertilizer type applied (i.e., % N-P-K) _____
- d. Rate of nitrogen applied (per 1,000 ft²) _____
- e. Total amount of N, P, and K applied per year (in pounds) _____

New York Urban Nutrient Management Plan (UNMP) Template (June 2022)

An urban nutrient management plan (UNMP) manages the amount, placement, timing, and application of fertilizer to reduce nutrient loss to the environment and to produce quality turf and landscape plants. This document will guide your fertilizer application activities in New York. Follow the steps outlined in the *Urban Nutrient Management Plan Guidance* (UNMP Guidance) document and then fill out the tables and other sections below. Once completed, have the UNMP reviewed by a trained expert and submit it by email to Cassandra Davis, Environmental Program Specialist with the New York State Department of Environmental Conservation (cassandra.davis@dec.ny.gov) for approval. See Section 4 of the UNMP Guidance for more information.

Table A-1. Site-Specific UNMP Information

UNMP components	Site-specific data
Date and duration of plan (should not exceed 3 years)	
Owner/operator of the turf area or home lawn	
Mailing address (street, city, state, zip)	
County	
Phone	
Email	
Nutrient consultant/planner name (if applicable)	
Mailing address (street, city, state, zip)	
Phone	
Email	
Total property acreage	
Property type (golf course, athletic field, residential home, etc.)	
Latitude/longitude (leave blank – to be filled in by reviewer)	
Watershed designation [name of HUC 12 watershed(s)] (leave blank – to be filled in by reviewer)	
Attach soil tests (if available)	
Attach other maps (if available)	
Attach map or aerial photo of fertilized areas	

Narrative

Please answer the following questions and prompts to the best of your ability.

1. What type of operation is this? Choose from the following: home lawn, athletic field, golf course, park, apartment complex grounds, school grounds, business park/offices, municipal open space, church, cemetery, or other (please explain).
2. Include any common landmarks or major road names and intersections near the site to help describe the location.
3. Include a general description of the managed area in the operation. The managed areas should match the map of the fertilized areas provided in the *Site-Specific UNMP Information* section of the UNMP. See Section 3 of the UNMP Guidance document for help addressing this prompt.
4. Are there any additional BMPs that are being implemented in the managed areas in addition to the nutrient application rates and timing? If yes, please list them here. See Section 3.1 of the UNMP Guidance for recommended BMPs for turfgrass.
5. Include any other information you feel is important to include.

Table A-2. New York UNMP Recommendations

Turf type #	Turf type	Maximum N rate per application (lbs./1,000ft ²) ^a	Maximum total annual N Rate (lbs./1,000ft ²) ^a	Maximum P rate (lbs./1,000ft ²) ^a	Soil type	Use	
1	High-traffic areas (golf courses ^b and athletic fields)	0.5 lbs. for water-soluble N sources	3.5	No supplemental P is typically required for mature turf. <i>If a soil test says P is needed according to MLSN^d guidelines, apply no more than 0.5 lbs./1,000 ft².</i>	Sand-based	High traffic	
		0.7 lbs. for slow-release N sources					
2	All other mature turf (home and commercial lawns) ^c	0.5 lbs. for water-soluble N sources	2				
		0.7 lbs. for slow-release N sources					
3	Newly established turf	0.5 lbs. for water-soluble N sources	2		No supplemental P is typically required for newly established turf unless the topsoil has been removed. <i>If a soil test says P is needed, apply at a maximum rate of 1 lb. P/1,000 ft² prior to seeding or within 60 days or follow directions for a “starter” fertilizer (typically 16-24-10).</i>	All soil types	All uses
		0.7 lbs. for slow-release N sources					

Notes:

ft² = square feet; lb. = pound; lbs. = pounds; MLSN = minimum levels for sustainable nutrition; N = nitrogen; P = phosphorus.

^a Fertilizer application is prohibited between December 1 and April 1

^b Golf course tees, fairways, and putting greens can all be considered high traffic/sand areas but this can vary. Sometimes only the tees are high-traffic areas, and all other areas of a golf course are low traffic areas (Type 2). Be aware of which areas are Type 1 versus Type 2 when developing a UNMP for a golf course.

^c Includes home lawns, apartments, roadside rights-of-way, municipal open space, parks, commercial lawns, school, and churches/cemeteries.

^d See Section 2.3 of UNMP Guidance for information on MLSN.

^e Native soils have the ability to hold nutrients and water.

Instructions for Determining the Amount of Nitrogen to Purchase and Apply

Step 1. Measure the size of your turf area or home lawn so that you do not over-apply fertilizer. For all turf types, apply no more than 0.5 lbs. water-soluble nitrogen and 0.7 lbs. slow-release nitrogen per application per 1,000 ft². Use the [Find Lot Size](#) website site to determine the size of your turf area or home lawn. If you are applying fertilizer to a large turf area with multiple managed areas that will be treated differently, you will need to determine the size of each managed area. To convert acres to square feet (ft²), use the following equation:

$$\text{Number of acres} \times 43,560 = \text{ft}^2$$

Step 2. Calculate the amount of fertilizer to apply per application (using 0.5 lbs. slow-release nitrogen to 1,000 ft² as an example). Determine the percent of nitrogen in the fertilizer by locating the first of the three numbers on the label—these indicate the percent of nitrogen, phosphorus, and potassium (N-P-K), respectively. For example, if the numbers on the label are 16-10-10, your fertilizer contains 16% nitrogen. Then follow these steps:

$$(100 / \% \text{ of N in fertilizer}) * (\text{square footage} / 1,000) * 0.5 (\text{application rate}) = \text{lbs. of fertilizer to apply for each 1,000 ft}^2$$

Example: the fertilizer contains 16% N and your turf area or home lawn is 4,000 ft²

$$(100 / 16) * (4,000 / 1,000) = 6.25 * 4 * 0.5 = 12.5 \text{ lbs of fertilizer for one application}$$

Step 3. Determine the amount of fertilizer needed annually. If your turf is Type 1 (sand-based, high-traffic area), you will typically fertilize 3–4 times per year, but the amount should not exceed a total of 3.5 lbs. of nitrogen per 1,000 ft² annually. If your turf is Type 2 (all other mature turf) or Type 3 (newly established turf) you can fertilize 1–2 times per year, but the amount should not exceed a total of 2 lbs. of nitrogen per 1,000 ft² annually. Follow the examples below to determine the amount of nitrogen needed to fertilize your entire property annually.

Example: the fertilizer contains 30% N and the turf area is 20 acres, which is 871,200 ft² (20 acres * 43,560)

$$(100 / 30) * (871,200 / 1,000) = 3.33 * 871.2 * 0.5 = 1,450.5 \text{ lbs. of fertilizer needed for 1 application}$$

If your turf is Type 1 and you are fertilizing four times annually: 1,450.5 lbs. per application * 4 = maximum of 5,802 lbs. annually (not to exceed 3.5 lbs./1,000 ft²)

If your turf is Type 2 and you are fertilizing two times annually (using the 4,000 ft² example under step 2): 12.5 lbs. per application * 2 = maximum of 25 lbs. annually (not to exceed 2 lbs./1,000 ft²)

Nutrient Application Worksheet

Use the table below to calculate the amount of fertilizer to be applied per application and how much is needed annually for each managed area. Make additional copies of this page, as needed.

Table A-3. Determining the Amount of Nitrogen to Purchase and Apply

Managed area #	Type (1, 2, 3)	Expected dates of applications (mm/dd/year) ^a	% N of fertilizer (X-x-x)	% P of fertilizer (x-X-x)	% K of fertilizer (x-x-X)	Turf area or home lawn size (ft ²)	Rate of N (per 1,000 ft ²) ^b	Total N to be applied per application	Total P to be applied per application	Total K to be applied per application	Max amount of N to purchase per year

Notes:
 ft² = square feet; mm = two-digit month; dd = two-digit day; K = potassium; N = nitrogen; P = phosphorus.
^aIf the managed area is small, such as a home lawn, it is likely that it will receive the same fertilizer applications for each year of the UNMP. Only the month and day for the application needs to be entered, along with a note explaining that this annual application program is applicable for all 3 years of the plan.
^bNitrogen application rate is not to exceed a maximum of 0.5 lbs water-soluble N or 0.7 lbs slow-release N per 1,000 ft².

Fertilizer Application Recordkeeping

Make additional copies of this table, if necessary. Maintain records for 3 years from date of application.

Address or location of the application site: _____

Name of applicator making or supervising the application or name of homeowner: _____

Total amount of fertilizer applied for the year (sum of the last column in the table below): _____

Table A-4. Fertilizer Application Recordkeeping Form

Managed area #	Type (1, 2, 3)	Turf description ³	Date of application (mm/dd/year)	Weather conditions ⁴	Fertilizer analysis or % N (e.g., 10-10-10)	Rate of N per 1,000 ft ²	Total amount of N used (lbs.) (for entire property)	Total amount of P used (lbs.) (for entire property)	Total amount of K used (lbs.) (for entire property)

³ Use Table 2, footnote b to briefly describe the turf type.
⁴ Provide weather conditions at the time of application (i.e., air temperature, precipitation, soil frozen or snow covered, etc.)

Appendix B – Additional Resources

- [Apply fertilizer according to directions - Delaware Livable Lawns](#)
- [2017 Cornell Guide for Commercial Turfgrass Management](#)
- [BMPs for New York State Golf Courses](#)
- [Long Island Nitrogen Action Plan](#)
- [Nitrogen Fertilizer Management in Suffolk County](#)
- [Regional Clean Water Guidelines for Fertilization of Urban Turf](#)
- [Cornell University – Lawns as an Environmental Asset](#)
- [New England Regional Nitrogen and Phosphorus Recommendations](#)
- [Fate and Transport of Phosphorus in Turfgrass Ecosystems](#)
- [Drought and Management Plan Worksheet](#)
- [Quick Reference Guide for Best Management Practices – Chesapeake Bay](#)
- [Golf Course Sustainability Practices](#)
- [Minimum Levels for Sustainable Nutrition Soil Guidelines \(MLSN\)](#)