D-6. Urban Nutrient Management

General Information

Turfgrass is everywhere in suburban and developed areas of the Chesapeake Bay Watershed, comprising roughly ten percent of the region's total land area. Therefore, the management of turfgrass – whether it is a private lawn, public park or golf course – affects local water quality. Three Bay States (Maryland, New York and Virginia) have passed laws that ban residential fertilizers from containing phosphorus, among other requirements.

Figure D-6-1. Fertilizers contain nutrients such as nitrogen, phosphorus and potassium that help grass and other plants grow. Excessive nitrogen and phosphorus can create water quality problems, however. Jurisdictions in the Chesapeake Bay Watershed have programs to educate homeowners and certify commercial applicators in best practices for nutrient management. Photo: Centers for Disease Control.

CBP Definition(s)

Urban Nutrient Management (UNM) is defined as the proper management of major nutrients for turf and landscape plants on a property to best protect water quality.

An *urban nutrient management plan (UNM plan)* is a written, site-specific plan which addresses how the major plant nutrients (nitrogen, phosphorus and potassium) are to be annually managed for expected turf and landscape plants and for the protection of water quality. The goal of an urban turf and landscape nutrient management plan is to minimize adverse environmental effects, primarily upon water quality, and avoid unnecessary nutrient applications. It should be recognized that some level of nutrient loss to surface and groundwater will occur even by following the recommendations in a nutrient management plan. The impacts of urban nutrient management plans will differ from lawn-to-lawn depending on nutrient export risk factors.

High risk areas: Pervious areas that are subject to one or more risk factors listed in Table D-6-2 (left-hand column).

Specifications or Key Qualifying Conditions

The technical support and qualifications needed to write a UNM plan varies in each Bay State. Localities should consult with State agencies to determine information requirements for UNM plans or if state regulations prevent reporting UNM plans as unique BMPs (see resources listed under Additional Information).

Nitrogen, Phosphorus and Sediment Reductions

There are no sediment reductions for UNM practices. The nutrient reductions are summarized in Table D-6-1.

Table D-6-1. Nitrogen and Phosphorus reductions for Urban Nutrient Management in the Phase 6 Watershed Model

	TN reduction	TP reduction
Nutrient Management Maryland Commercial Applicators	9%	0%
Nutrient Management Maryland Do It Yourself	4.5%	0%
Nutrient Management Plan*	9%	4.5%
Nutrient Management Plan High Risk Lawn	20%	10%
Nutrient Management Plan Low Risk Lawn	6%	3%
* Default practice for lawns with unknown risk type.		

Table D-6-2. Lists of risk factors and core nutrient management practices for turf and lawns. Source: Nutrient Management Expert Panel (Aveni et al, 2013).

High Risk Export Factors for nutrients	Core Urban Nutrient Management Practices
1. Currently over-fertilized beyond state or extension recommendations	1. Consult with the local extension service, master gardener or certified applicator to get technical assistance to develop an effective urban nutrient management plan for the property
2. P-saturated soils as determined by a soil P test	2. Maintain a dense vegetative cover of turf grass to reduce runoff, prevent erosion, and retain nutrients
3. Newly established turf (i.e., less than three years old)	3. Choose not to fertilize, OR adopt a reduce rate/monitor approach OR the small fertilizer dose approach
4. Steep slopes	4. Retain clippings and mulched leaves on the yard and keep them out of streets and storm drains
5. Exposed soil	5. Do not apply fertilizers before spring green up or after grass becomes dormant
6. High water table	6. Maximize use of slow release N fertilizer during the active growing season
7. Over-irrigated lawns	7. Set mower height at 3 inches or taller
8. Soils that are sandy, shallow, compacted or have low water holding capacity	8. Do not apply fertilizer within 15 to 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
9. High use areas (e.g., athletic fields, golf courses)	9. Immediately sweep off any fertilizer that lands on a paved surface
10. Adjacent to stream, river or Bay	10. Employ lawn practices to increase soil porosity and infiltration capability, especially along portions of the lawn that convey or treat stormwater runoff.
11. Karst terrain	

Specific Reporting and Modeling Information

Applicable Land Use Types (or other load sources) Treated by the BMP:

- All Developed pervious land uses (Non-Regulated, MS4 and CSS), which includes Turfgrass and Tree Canopy over Turfgrass
- Construction (Non-Regulated, MS4 and CSS)

The load source group "Pervious" can be used as a default, which includes all Turfgrass and Tree Canopy over Turfgrass (Non-Regulated, MS4 and CSS).

Brief Description of BMP Simulation in the Model

All UNM practices are *Efficiency Value BMPs*. Nutrient loads from pervious areas are reduced by the corresponding efficiency values listed in Table D-6-1. In the Phase 6 Watershed Model there is no more "state-wide" phosphorus credit because all P application rates are now adjusted to reflect non-agriculture fertilizer sales data.

Annual or Cumulative? Annual (1-year credit duration)

Can this practice be combined with other BMPs? Yes.

Figure D-6-2. Soil tests by university extension or commercial professionals help determine optimal fertilizer application rates for UNM plans. Photo: USDA NRCS.

Key Elements for State BMP Reporting through NEIEN

- *BMP Name:*
  - Nutrient Management Maryland Commercial Applicators
  - Nutrient Management Maryland Do It Yourself
  - Nutrient Management Plan
  - Nutrient Management Plan High Risk Lawn
  - Nutrient Management Plan Low Risk Lawn
- *Measurement unit(s):* Acres or percent
- *Land Use:* Approved NEIEN Developed load source groups (Non-Regulated, MS4, CSS) including Pervious and Construction; if none are reported the default load source group will be Pervious
- *Geographic location:* Approved NEIEN geographies: County; County (CBW only); Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); State (CBW only)
- *Date of implementation:* Year UNM plan was active.

Table D-6-3. Synonymous BMP names for Watershed Model, NEIEN and other sources

CBP or Expert Panel term	NEIEN BMP name	Other common practice names
UNM, Maryland Commercial Applicator Lawn	Nutrient Management Maryland Commercial Applicators	
UNM, Maryland Do It Yourself (DIY) Fertilized Lawn	Nutrient Management Maryland Do It Yourself	
UNM [Blended]*	Nutrient Management Plan*	
UNM High Risk	Nutrient Management Plan High Risk Lawn	
UNM Low Risk	Nutrient Management Plan Low Risk Lawn	
* Default practice for lawns with unknown risk type.		

Additional Information

Expert panel report:
Aveni, M., Berger, K., Champion, J., Felton, G., Goatley, M., Keeling, W., Law, N., & S. Schwartz. 2013. Recommendations of the Expert Panel to Define Removal Rates for Urban Nutrient Management. Prepared by T. Schueler and C. Lane, Chesapeake Stormwater Network. Approved by the WQGIT March 2013. https://www.chesapeakebay.net/documents/Final_CBP_Approved_Expert_Panel_Report_on_Urban_Nutrient_Management--short.pdf

Chesapeake Stormwater Network, Good Recipes for the Bay Pollution Diet: U-5: Urban Nutrient Management. Available at: http://chesapeakestormwater.net/bay-stormwater/fact-sheets/

Chesapeake Stormwater Network, Archived (2014) webcast: Crediting BMPs used for New and Redevelopment Webcast: http://chesapeakestormwater.net/events/webcast-urban-nutrient-management/

Version and History Statement

This info sheet was first published on August 10, 2018 and reflects the BMP definitions and reductions approved by the WQGIT in March 2013.

All BMP effectiveness estimates are subject to potential future reviews according to the availability of new scientific information and CBP partnership needs, as defined in the BMP Review Protocol.