

ELEMENTS OF A NUTRIENT MANAGEMENT PLAN FOR TURF

Development and implementation of a nutrient management plan (NMP) are critical to the proper management of the turf with environmental protection and enhancement as priorities. A nutrient management plan should address not only sound agronomic practices as they relate to the function of the turf, but also the protection of natural resources, particularly water. The following guidelines outline the components of a nutrient management plan, and are adaptable to a wide variety of turf management systems.

In the case of lawn turf management, the components of an NMP are covered in greater detail in Section 7 of UMass Extension's *Best Management Practices for Lawn & Landscape Turf* manual. This manual can be accessed online at <http://extension.umass.edu/turf/publications-resources/best-management-practices>. Although the focus of the manual is lawn and landscape turf, much of the included information is also applicable to the management of other types of turf such as high value playing surfaces or very low maintenance turf areas.

A complete NMP should include:

- Site analysis and mapping.
 - Identification and mapping of environmentally sensitive areas as well as areas at high risk for off-site movement of nutrients.
 - Mapping of specific buffer zones delineated in environmentally regulated areas such as but not limited to Zone I wellheads, wetlands and certain coastal zones, and for protection of environmental resources.
 - Mapping, including measured square footage or acreage, of areas being fertilized or receiving nutrient containing materials.
 - Soil tests to determine chemical and physical condition of the soil and to ascertain recommendations for adjustments.

- Determination of:
 - need for nutrient inputs based on soil testing, turf function and quality desired, and proximity to environmentally sensitive sites.
 - lowest rate of input of nitrogen, phosphorus and other nutrients that will produce dense turf cover and promote deep rooting.
 - form (source) of nutrients appropriate for the management plan and the use of the turf on the site.
 - appropriate placement of fertilizer and nutrient containing materials.
 - frequency of fertilizer and nutrient containing material applications based on the nitrogen characteristics of each material.
 - timing of fertilizer applications so that maximum nutritional availability corresponds with periods of active turfgrass growth:

- fertilizer and other nutrient containing materials should not be applied before spring green-up or when turf is dormant.
 - fertilizer and other nutrient containing materials should not be applied when the ground is frozen.
 - fertilizer and other nutrient containing materials should not be used as de-icers.
- Considerations for phosphorus (P):
 - determination of phosphorus (P) levels by soil test, and where and when application of phosphorus containing materials may and may not be allowed.
 - application of phosphorus containing fertilizers and other nutrient containing materials, regardless of the source of nutrients or the purpose of the application, should not exceed levels recommended by a soil test.
 - accounting of all phosphorus inputs into the management program and turf system. These may include, for example: fertilizers; turfgrass clippings retained in the system; composts, compost derivatives and other organic amendments; topdressings and other materials.
 - ample available P is critical to the success of turf establishment, renovations and major repairs. Levels of P applied in conjunction with such activities should be adequate for rapid turfgrass germination, growth and development.
 - Considerations for nitrogen (N):
 - determination of nitrogen (N) fertilization need based on turfgrass species, time of year, turf vigor and plant response, and frequency of turf use.
 - determination of nitrogen rate based on turf needs as influenced by turf function and use as well as by presence of and proximity to environmentally sensitive areas, keeping N level to the lowest possible level required to realize management objectives while protecting the environment.
 - use of slow release sources of N as often as possible based on management objectives.
 - accounting of all N inputs into the management program and turf system. These may include, for example: fertilizers; retained turfgrass clippings; composts, compost derivatives and other organic amendments; topdressings; corn gluten used as an herbicide or fertilizer; and carryover N from prior seasons.
 - Implementation of cultural practices that maximize nutrient uptake by plants, reduce nutrient waste and reduce off-site movement of nutrients.

These practices include:

- minimization of bare soil and maintenance of dense turf cover to reduce erosion, prevent runoff and increase nutrient retention within the turf/ soil system.

- implementation of practices that result in rapid establishment of turf following new planting or repairs.
 - application of fertilizer and other nutrient containing materials only to turf, avoiding designated environmentally sensitive areas.
 - application of fertilizer and other nutrient containing materials in a manner that prevents entry into surface waters or conduits such as catch basins that lead to surface waters or other environmentally sensitive areas.
 - application of fertilizer and other nutrient containing materials so as not to fall on hardscapes such as driveways, sidewalks and roadways as well as non-vegetated surfaces. Should materials inadvertently land on such surfaces they should be removed promptly and handled properly.
 - handling of turfgrass clippings in an appropriate manner:
 - retention of clippings within the turf system whenever possible.
 - management of turfgrass clippings so that they are not allowed to enter surface waters or conduits such as catch basins that lead to surface waters.
 - clippings that are removed should be composted or handled in a manner that does not to pose a threat to the environment.
 - mowing at the highest end of the proper mowing height range for the grasses and cultivars present, and for the use of the turf, with the goal of maintaining turf density and maximizing rooting.
 - irrigation practices that promote infiltration and plant uptake, that do not lead to runoff and leaching, and that encourage deep and extensive turfgrass rooting.
 - relief of compaction through appropriate cultural practices such as core aeration.
- Implementation of proper storm water management techniques aimed at reducing off-site movement of soil and nutrients.
 - Detailed application records for inputs of fertilizer and nutrient-containing materials.

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