

MAINE DEPARTMENT
OF AGRICULTURE

UNIVERSITY OF
MAINE
COOPERATIVE
EXTENSION

Best Management Practices for Athletic Fields & School Grounds

January 2012

Reduce human pesticide exposure!

- * Minimize pesticide use
- * Choose pest resistant plant varieties
- * Spot treatments only
- * Choose products proven to be effective at low application rates
- * Choose products that leave little or no residue
- * Apply when school is not in session or over extended vacations
- * Restrict entry to the treated area after applications for as long as it's feasible
- * Check product label for minimum re-entry time

Introduction

During the winter of 2011, a bill (LD 837) was introduced into the Maine Legislature that would have effectively banned the pesticide use (including weed, insect, rodent and plant disease controls) on Maine school grounds. Ultimately, the Legislature rejected the ban, and instead directed the Maine Board of Pesticides Control to evaluate the use of pesticides on school grounds and to develop Best Management Practices (BMPs) for pesticide use with a goal of minimizing human exposure to pesticides. This brochure explains how schools can implement the best management practices and properly maintain athletic fields and other frequently used outdoor areas while minimizing pesticide use and human exposure. Applying these recommendations should also help schools keep maintenance costs down while improving the appearance of school grounds.

Getting Started

To implement these BMPs, schools should identify the employees who are involved in school grounds maintenance decisions. Generally, the facilities manager, the athletic director (if there is one), the Integrated Pest Management (IPM) Coordinator and the varsity coaches should be included. The IPM Coordinator must be included so that management decisions involving pesticides will be consistent with State law and notification requirements will be followed.

Once the grounds maintenance decision makers have been assembled, their primary task is to assign a Grounds Maintenance Priority Level to frequently used areas such as athletic fields or practice fields, lawns and playgrounds even those owned by the town or private individuals. Decision makers should also make sure the IPM Coordinator is aware of any proposal to use pest control products anywhere on school grounds^{###}.

Assigning Grounds Maintenance Priority Levels (see left sidebar)

The Grounds Care BMPs are separated into four levels that roughly correspond to the intensity of use and aesthetic importance of each area. For example, Level 1 is reserved for high impact varsity athletic fields that are expected to be lush and green. Some school districts may assign their varsity fields to Level 2 since maintaining fields at the highest level can also be expensive. Due to the intensity of use, practice fields may also need a high level of maintenance and most schools will assign practice fields to Level 2 or 3. Lawn areas and playgrounds, depending on location and budget constraints, generally won't warrant a high level of maintenance and will often be assigned to Level 3 or 4. Making a simple map of the Maintenance Levels for future reference will be helpful to both maintenance personnel and the decision makers. (see map example on opposite side and attached Level-Specific BMPs).

Other Key Points to Maintaining Quality Grounds and Reducing Risks

- Maintain good communication between staff and contractors involved in grounds maintenance and the IPM Coordinator
- Emphasize practices that improve turf density and help minimize need for pesticides
- Identify pests specifically and confirm a pest exceeds threshold levels before authorizing any treatments
- Make sure all pest control products (weed, insect, rodent or plant disease controls) are labeled for use on school grounds and applied by licensed commercial pesticide applicators
- Confirm that all contracts for grounds-keeping services follow these BMPs and the guidelines shown on the opposite side of this bulletin
- Consider developing a maintenance schedule for the more intensively managed areas so that key steps aren't missed
- Keep detailed records of soil tests, aeration, seeding, top dressing, nutrients and pesticides applied

^{###}School Grounds means: land associated with a school building including playgrounds, athletic fields and agricultural fields used by students or staff of a school and any other outdoor area used by students or staff including property owned by a municipality or a private entity that is regularly utilized for school activities.

Grounds Maintenance Priority Levels:

Level 1—Highest care areas, e.g., varsity playing fields

Level 2—High care areas, e.g., practice fields or multipurpose fields. May include varsity fields or high visibility lawn areas depending on the school.

Level 3—Moderate care areas, e.g., playgrounds, low use areas, common areas. May include practice fields and some lawn areas depending on the school.

Level 4—Lowest care areas, e.g., most lawn areas, natural areas, fence lines, property edges, slopes, utility areas, ditches or trails

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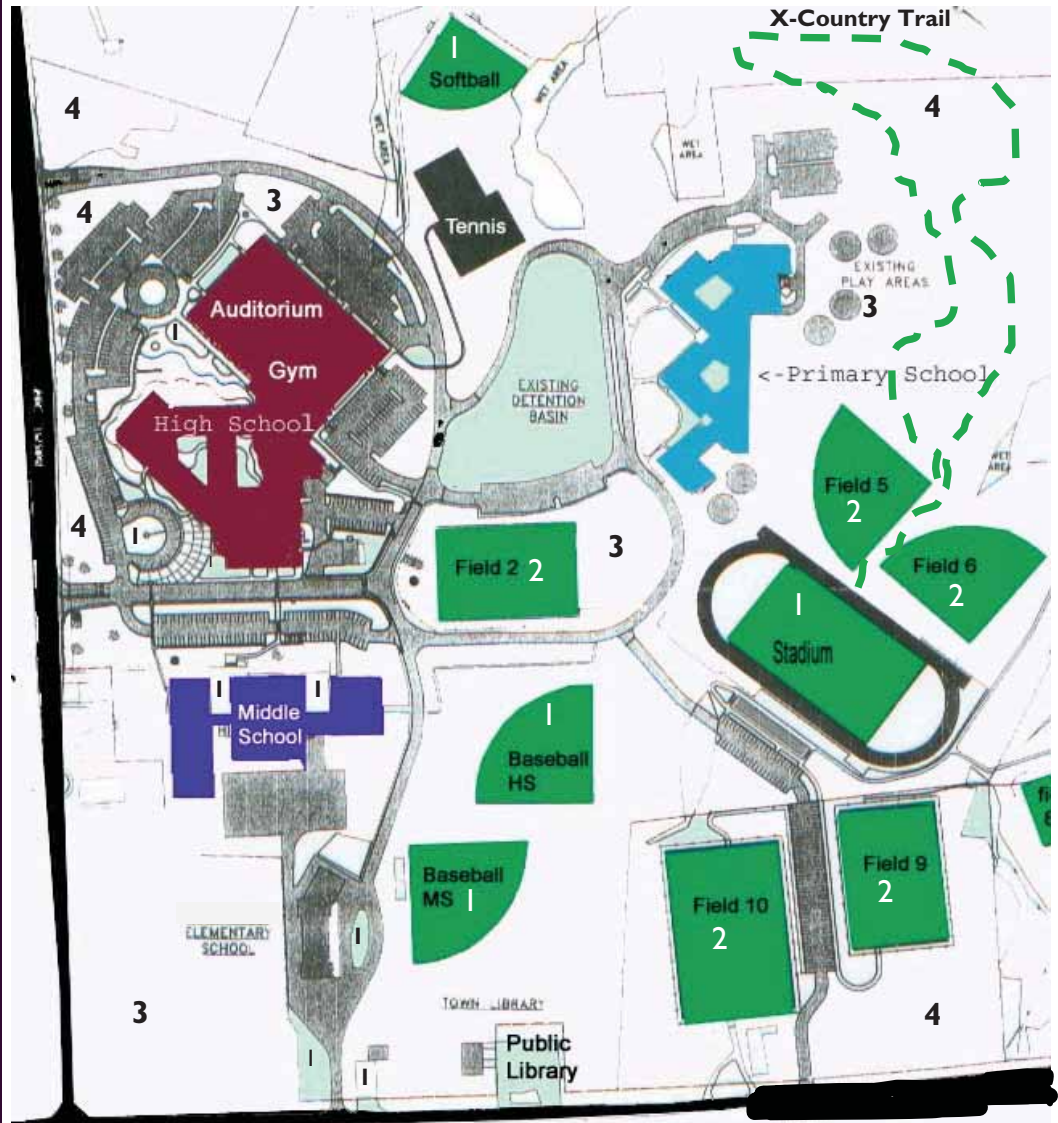
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thinkfirstspraylast.org

Figure 1 Grounds Maintenance Priority Levels



Black or white numbers indicate the grounds maintenance priority level

Other Important Guidelines

Informed Product Choice:

- * Read labels and MSDS thoroughly prior to making a choice
- * Choose products with proven efficacy at low doses
- * Choose products that pose the lowest exposure potential (watered into the soil, little to no surface residues, low volatility & low drift potential)
- * Choose selective products that affect a narrow range of organisms
- * Avoid products like weed and feed that require broadcast application

Grounds Maintenance Contracts should clearly establish:

- * The goals of the IPM program
- * What services are provided and how they are implemented
- * Posting and notification responsibilities
- * Consultation with the IPM coordinator
- * The population levels of specific pests that can be tolerated without treatment
- * Appropriate least-risk procedures to correct pest problems
- * The restrictions on pesticide use: types of applications, timing of applications, restricted locations, materials that can be used
- * The pest management actions that are the responsibility of the school district

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Level Specific BMPs

	Level 1 –Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
	High impact athletic game fields, e.g. varsity football, soccer, field hockey fields	<ul style="list-style-type: none"> • Low impact athletic game fields, e.g. baseball, softball • Multipurpose fields • Athletic practice fields 	<ul style="list-style-type: none"> • High visibility lawns • Moderate use areas • Playground fields 	<ul style="list-style-type: none"> • Utility areas, slopes, ditches • Natural areas • Fence lines/property edges • Lawns
Field Use Restrictions	<ul style="list-style-type: none"> • Whenever possible restrict field use when soils are saturated and surface water is present • If field size allows, move goal areas regularly 			
Soil Test	<p>Every 1-3 years. Determine:</p> <ul style="list-style-type: none"> • Nutrient levels and pH • Compaction • Soil texture and structure • Organic matter • Thatch • Rooting depth 		Rarely needed	Seldom to never
Irrigation	<ul style="list-style-type: none"> • Supplement rainfall when needed to provide a total of 1” of water per week when grass is actively growing (April – November) • Water turf early in the morning 	<ul style="list-style-type: none"> • As needed to promote active turf growth and prevent summer dormancy • Water turf early in the morning 	Not required; allow summer dormancy	
Aeration	<ul style="list-style-type: none"> • 2-6 times/year at a depth of 3-12 inches using a combination of hollow core, solid tine, or shatter aeration • At least one of the aerations should be deep tine or shatter to a depth of at least 8 inches • Intense use areas require the most aeration 	<ul style="list-style-type: none"> • 1-2 times/year as needed • Use a combination of hollow core, solid tine, or shatter aeration at a depth of 3 – 8 inches 	Once every two years or as needed	Never

	Level 1 –Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Fertilization and Nutrients	<ul style="list-style-type: none"> • Only apply amendments indicated by soil test, including phosphorus and potassium • Apply N at a rate of 2-4 lbs per 1000 sq.ft per year in several applications rather than all at once • Fertilize frequently (7 to 10 applications) throughout the season • Apply no more than 0.5 pound of soluble nitrogen per 1,000 square feet per application • Slow release nitrogen (N) fertilizers that are 40-60% water insoluble can be applied at higher rates and less often • Fertilizer rate should be reduced or eliminated during hot and dry periods unless irrigation is available • Sand based fields may require additional fertilizer • Apply calcitic or dolomitic limestone in spring and/or fall to maintain soil pH within the 5.5 – 6.5 range and to meet soil test requirements for calcium or magnesium 	<ul style="list-style-type: none"> • Only apply amendments indicated by soil test, including phosphorus and potassium • Apply N at a rate of 1-3 lbs per 1000 sq.ft per year with 2/3 in the fall and 1/3 in the spring • Apply in several applications rather than all at once • Apply no more than 0.5 pound of soluble nitrogen per 1,000 square feet per application • Slow release nitrogen (N) fertilizers that are 40-60% water insoluble can be applied at higher rates and less often • Apply calcitic or dolomitic limestone in spring and/or fall to maintain soil pH within the 5.5 – 6.5 range and to meet soil test requirements for calcium or magnesium 	<ul style="list-style-type: none"> • Only apply amendments indicated by soil test, including phosphorus and potassium • If the turf begins to thin or is not acceptable, apply N at a rate of 1-2 lbs/1000 sq.ft per year with 2/3 in the fall and 1/3 in the spring • Apply no more than 0.5 pound of soluble nitrogen per 1,000 square feet per application • Slow release nitrogen (N) fertilizers that are 40-60% water insoluble can be applied at higher rates and less often • Apply calcitic or dolomitic limestone in spring and/or fall to maintain soil pH within the 4.5 – 6.5 range and to meet soil test requirements for calcium or magnesium 	Seldom to never
Mowing	<ul style="list-style-type: none"> • Mow to greatest height tolerable for the sport, e.g. 1 to 3 inches depending on type of sport and required playing schedule • Mow to 3 inches or higher during off-season • Do not remove more than 1/3 of plant height at each mowing • Keep mower blades sharp • Unless the turf has an active fungal disease or play will be interrupted, return the grass clippings • Use a mulching mower 		<ul style="list-style-type: none"> • Mow to a height of not less than 3 inches • Do not remove more than 1/3 of plant height at each mowing • Keep mower blades sharp • Whenever possible return the grass clippings • Use a mulching mower 	<ul style="list-style-type: none"> • As needed to maintain function of area • Do not remove more than 1/3 of plant height at each mowing • Keep mower blades sharp • Whenever possible return the grass clippings • Use a mulching mower • Field areas need only be mowed in late fall

	Level 1 – Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Seeding <ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Athletic fields should be either a mix of 2 – 3 Tall fescue varieties or a combination of perennial ryegrass and Kentucky bluegrass • Maintain vegetative cover by repeated seeding any time soil is exposed. This may be 4-8 times/year • Mid-August-early October is ideal timing • Mid-April-early June to repair worn areas • Select hardy, wear-, pest-, and draught-tolerant grass seed mixture including: tall fescues, perennial ryegrass and Kentucky bluegrass • Use a variety of seeding strategies: <ul style="list-style-type: none"> ▪ Drill seed in 2 to 4 directions ▪ Use pre-germinated seed and sand mix to fill worn areas and divots ▪ Broadcast seed before each game to allow players to “cleat-in” the seed ▪ Broadcast seed prior to dragging aeration cores 	<ul style="list-style-type: none"> • Lawns should be primarily fine fescue or tall fescue mixtures with limited Kentucky bluegrass or perennial ryegrass • Mid-August through early-October as needed • April to repair worn areas or establish new grass areas • Drill seed or broadcast seed and drag in combination with aeration • Select hardy, wear-, pest-, and draught-tolerant grass seed mixture including tall fescues, perennial ryegrass and Kentucky bluegrass 	<ul style="list-style-type: none"> • Lawns should be primarily fine fescue or tall fescue mixtures with limited Kentucky bluegrass or perennial ryegrass • Seldom to never • Without irrigation seed only September to mid-October when adequate moisture is anticipated 	<ul style="list-style-type: none"> • Lawns should be primarily fine fescue or tall fescue mixtures with limited Kentucky bluegrass or perennial ryegrass • Seldom to never • If turf cover is lost and erosion or other problems are anticipated • In September when adequate moisture is anticipated
Re-sodding	<ul style="list-style-type: none"> • Intense use areas, such as soccer goals and between the hash marks on football fields, every 1 to 3 years as needed 			

- Choose seed mixtures based on soil type and intensity of use
- Rescue seeding can be done with high quality perennial ryegrass mixtures
- For seed selection use the National Turf Evaluation Program spreadsheet**

**<http://apps.hort.iastate.edu/turfgrass/extension/InteractiveNTEPSpreadsheet.xlsm>

	Level 1 –Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Topdressing	<ul style="list-style-type: none"> • Apply in combination with aeration to prepare seed bed, modify soil and smooth field • Use finished composts with low nitrogen and phosphorus content, or • Use a soil mix that is similar to the existing soil • In all cases avoid forming soil layers which may cause shallow rooting depth 		Never	Never
Weeds	<ul style="list-style-type: none"> • Following the previous BMPS will establish a healthy, thick turf which will outcompete broadleaf weeds • Depending on weed species present, accept 15-30% weeds • Use broadleaf herbicides only when needed, based on monitoring, to reduce weed populations to acceptable levels • Coordinate with annual over-seeding program so desirable turf seed is not damaged • Broadleaf weed control in spring or fall is more effective but to reduce student exposure applications may be more acceptable during the summer when school is not in session • Effective post-emergent crabgrass control is available and may be used as an alternative to routine pre-emergent crabgrass applications when areas of crabgrass are limited 	<ul style="list-style-type: none"> • Following the previous BMPS will establish a healthy, thick turf which will outcompete broadleaf weeds • Depending on weed species present, accept up to 30% weeds • Use broadleaf herbicides only when needed, based on monitoring, to reduce weed populations to acceptable levels • Apply pre-emergent herbicide in spring primarily for crabgrass if needed, based on weed monitoring during the previous year • Broadleaf weed control in spring or fall every 2-3 years, only as needed • Effective post-emergent crabgrass control is available and may be used as an alternative to routine pre-emergent crabgrass applications when areas of crabgrass are limited 	<ul style="list-style-type: none"> • Hand-pull weeds, use a weed whacker, till or use heat or steam to kill weeds • Use mulch in flower beds and around landscape plantings to reduce weeds • Use landscape fabric under playground shock absorption materials • Depending on weed species present, 50% weeds or more is acceptable in most lawns 	<ul style="list-style-type: none"> • Hand-pull weeds • Use a weed whacker around fences and other structures • Spray fence lines only when necessary and schedule when students will not be in the area for several days • Use herbicides to control invasive and noxious plants when necessary

	Level 1 –Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Insect Pests <ul style="list-style-type: none"> • White Grubs are the larvae of Japanese beetles, May/June beetles, European Chafers, Asiatic garden beetles, Oriental beetles and other scarabs. Turf injury occurs from late July through November and from April - June and is often localized. A site-specific strategy should be practiced • Action Thresholds for non-irrigated turf (grubs/sq.ft.) Action thresholds may be doubled with irrigation • European chafer: 4 to 6/sq.ft. • Japanese beetle: 6 to 12/sq.ft. • Oriental beetle: 6 to 12/sq.ft. • Asiatic garden beetle: 10 to 20/sq.ft. 	<ul style="list-style-type: none"> • Monitor July-September • Beginning of football season coincides with peak turf injury from white grubs • Action threshold levels are species dependent (see cell to left) • Irrigate as needed to promote grass root growth throughout the growing season • Insect parasitic nematodes can be very effective when applied properly^{%%} • Consider preventative grub control applications on fields that are infested more than 2 – 3 years in a row 	<ul style="list-style-type: none"> • Monitor July-September • Action threshold levels are species dependent (see cell to far left) • Irrigate as needed to promote grass root growth throughout the growing season • Action thresholds may be doubled with irrigation • Insect parasitic nematodes can be very effective when applied properly^{%%} 	<ul style="list-style-type: none"> • Monitor July-September • Scarab beetles (adult white grubs) often avoid laying eggs in low maintenance non-irrigated turf • Action threshold levels are species dependent (see cell to far left) • Action thresholds may be doubled with irrigation • Insect parasitic nematodes can be very effective when applied properly^{%%} 	Pesticide treatment never required
<ul style="list-style-type: none"> • Chinch Bugs 	<ul style="list-style-type: none"> • Supplement rainfall when needed to provide a total of 1" of water per week during summer • Avoid over-fertilizing to prevent thatch build-up. Dethatch and/or core aerate if thatch exceeds ¾ inch • Pesticide applications only as needed when damage is evident and more than 5-10 chinch bugs per sample using coffee can-float monitoring method^{&&} • If seeding, select resistant varieties such as endophyte enhanced varieties 			
Turf Diseases <ul style="list-style-type: none"> • Brown Patch • Dollar Spot • Leaf Spot 	<ul style="list-style-type: none"> • Apply no more than 0.5 pound of nitrogen per 1,000 square feet per application • Time fertilization and liming to avoid disease critical periods (e.g. avoid fertilization in early spring and just before hot, humid weather) • Remove dew from fields early in the morning, by dragging with a bar • Improve air circulation over turf areas • Irrigate early in the morning only 			
<ul style="list-style-type: none"> • Snow Mold 	<ul style="list-style-type: none"> • Avoid fertilizing turf after mid-October • Continue mowing until growth ceases and gradually reduce mowing height to 1 inch at last mowing 			

^{%%}http://www.yardscaping.org/lawn/documents/Beneficial_Nematodes.pdf
^{&&}<http://www.gardening.cornell.edu/lawn/lawncare/pestpro.html>

	Level 1 –Highest Care	Level 2 – High Care	Level 3 – Moderate Care	Level 4 – Lowest Care
Other Pests • Mice, Rats or Other Rodents		<ul style="list-style-type: none"> • Seal or fill in all potential nesting sites • Reduce potential food sources by maintaining covered and sealed dumpsters and trash cans • Clean up all food scraps and waste left out by students, staff or visitors • Avoid installation of bird feeders 		
• Stinging Insects <ul style="list-style-type: none"> • Yellowjackets • Wasps • Hornets • Bees 		<ul style="list-style-type: none"> • Beginning in early spring, monitor for stinging insect hives or nests and remove before they become established • Fill in abandoned animal dens (including rodent burrows) in areas students use • Seal cracks and crevices within walls of buildings and on play structures • Restrict outdoor eating and drinking in the late summer/fall when yellowjackets are foraging • Keep garbage cans covered • Install stinging insect traps outside of areas that people frequent • Use RTU aerosol sprays in emergency situations 		
• European Red Ants are stinging insects found primarily along the coast. Nests in a variety of habitats including bark mulch, lawns, forested areas, leaf litter, and under rocks and human debris		Contact the University of Maine Cooperative Extension (1-800-287-0279) to confirm suspected infestations and obtain current management recommendations		
• Mosquitoes		<ul style="list-style-type: none"> • Eliminate sources of standing water and keep all roof gutters free flowing • When monitoring indicates the potential for mosquito vectored disease, restrict outdoor activities to mid-day • Encourage students, staff and visitors to use insect repellents during activities that expose them to biting mosquitoes • When the Maine CDC determines there is a credible threat for mosquito-borne disease near a school, consider hiring a licensed commercial pest management company to apply mosquito controls 		
• Ticks		<ul style="list-style-type: none"> • Move all play structures or class areas at least 3 yards away from forest or brushy edges of school yards • Install a 3 foot wide strip of mulch or crushed rock next to any forest or brushy edges of school yards • Do not allow students to walk into forest or brushy areas next to schools • Keep trails cleared to at least a 6 – 8 foot width to prevent students from brushing up against brushy areas • Remove stone walls or other structures that provide harborage for squirrels, mice and other small mammals • Do not feed birds or other animals on school grounds • Encourage students, staff and visitors to use insect repellents during activities that might expose them to tick habitats • Encourage proper attire to prevent ticks from accessing skin areas • Encourage tick checks each time students and staff enter tick habitats • Keep play areas mowed • Avoid any pesticide application to control ticks unless students or staff must frequently use forest or brushy areas that provide suitable deer tick habitat and deer tick numbers are high 		