

Principles of Natural Turf Maintenance

Soil Testing: Soil tests reveal the condition of the soil and determine what kinds of amendments might be required. Using a clean sampling tube, take samples from various locations on the field (more samples for larger properties) at a 4 to 5 inch depth. Remove debris (roots, thatch) from the top of the sample, air-dry overnight, mix the samples thoroughly and send one cup of the mixture to the lab. Request a standard test that usually includes soil pH, calcium, magnesium and potassium levels, phosphorus levels and cation exchange capacity. You should also request percent of organic matter.

Adjusting Soil pH Balance: The soil test will reveal the pH of the soil, and in many cases, give you the recommended amount and type of lime to apply to the field. The ideal pH for turf grass is between 6.5 and 7.0. Keep in mind that you should never apply more than fifty pounds of lime per 1,000 sq ft (if you need more lime, it should be made in two applications). Also remember that lime can take up to three months to become fully integrated into the soil. Use calcitic lime if calcium levels are low; dolomitic lime if magnesium levels are low.

Fertilization: The soil test will also come with recommendations for fertilization. The choice and application of the proper fertilizer is one of the most important aspects of natural turf maintenance. Unlike synthetic fertilizers that are water soluble, natural organic fertilizers are water insoluble; they break down by the action of microbes which exist in the soil. In effect, you are feeding those microbes, which in turn make nutrients available to the plants. As the level of organic matter is raised through leaving grass clippings on the ground and the application of compost (see below), the need for fertilizer is reduced.

Natural organic fertilizers will generally not produce the sudden, dramatic greening effect common to many commercial synthetic fertilizers containing high nitrogen levels. Look for lower nitrogen numbers (natural products always have N numbers of 10 or less). Fifty pounds will cover approximately 2,000 sq ft.

Compost Top-Dress: If the soil test reveals an organic matter level of less than 5%, aerate and top-dress with a good quality compost. If the property has been chemically maintained, a 1/4 inch to 1/2 inch layer of compost should be spread directly on top of the entire field. Compost can be spread with a compost spreader, an air blower, or on small areas by broadcasting with shovels. It will take about a yard of compost to cover 1000 sq ft with 1/2 inch of compost; one acre of turf will require approximately 40 yards.

Soil Detoxification and Inoculation Using Other Amendments: Marine products such as kelp and seaweed contain minerals and add organic matter to the soil. They promote deep root growth which helps keep fields green even during times of moderate drought. The minerals and nutrients found in rock dust are particularly useful in re-energizing soil that has been compromised by chemical use. It is also a natural source of potassium (K).

Compost Tea: The application of high quality compost tea can be an effective way to build soil quality, increase resistance to diseases and help during droughts. Compost tea is made by steeping top quality compost and other nutrients in circulating water. Commercial tea brewers in sizes from 5 to 500 gallons are available from many manufacturers. You can spray tea from a backpack sprayer or a traditional spray rig. Remember that you are spraying live organisms, so allow the spray to fall gently on surfaces.

Basic Compost Tea Recipe:

20 gallons of chlorine-free water
1 lb highest quality compost
4 oz. molasses
1 oz. humic acid

Tea should be mixed with water in sufficient dilution to achieve a rate of 15-20 gallons per acre. A typical mix is 20 gallons of tea to 100 gallons of water. Problem areas can be treated with a higher concentration of tea.

Irrigation: Automatic sprinkler systems can be a great time saver, but they can also be the source of trouble. Over-watering is a primary cause of turf fungal problems, and can undo much of the work you are doing. The system should be calibrated to deliver no more than 1.5 inches of water per week, and less if a rain event occurs. (To calibrate the system for this optimal irrigation target number, place an empty tuna can on the field and see how long it takes to fill the can.)

Blade Height: School and municipal turf managers must balance the need for grass plants to grow with the demands of competitive athletic play. Grass plants develop deep root systems when the blades are allowed to grow high, so turf managers try to find at least some time during the growing season when grass can be allowed to grow to 3.5 to 4 inches, usually in summer when fields are used for non-competitive sports. Grass clippings should always be left on the field (they provide free nitrogen). If necessary, rake up clumps and re-broadcast. Remember never to cut more than the top 1/3 of the grass blade at any one time.

Aeration: Compaction is the number one enemy of turf grass, and is the most common problem faced by turf managers, particularly on playing fields with heavy traffic. Compacted soil prevents turf roots from penetrating deep into the soil profile (turf roots grow in the air spaces between soil particles). If the soil is compacted (to the point where a penetrometer reads more than 200 pounds per square inch in the top 3 inches of soil, aeration is required, using either a core or slice aerator. Aeration is stressful for turf and should only be undertaken when the grass is actively growing, but can be performed as often as every two to four weeks when necessary. Aerate in a crisscross pattern until 15-20% of the soil surface has been exposed.

Over-Seeding: The best defense against weeds is a strong and healthy turf. Given the opportunity, grass plants will out-compete most weeds. Over-seeding, which is simply adding new grass plants to an existing lawn or field, rejuvenates the field with new life, fills in bare spots and keeps weeds from growing. Use a high quality seed or seed mix, appropriate for your climate, and with a minimum of noxious weeds (check the label for weed content).

Natural Pest and Disease Control: A healthy, well maintained natural field will be resistant to most pests and disease. However, lack of organic matter, poor cultural practices, too much water and other stresses can reduce turf's ability to fend off pests and disease. When pests present themselves, here are some natural solutions:

Beneficial nematodes have proven to be very effective at dealing with grubs. These are microscopic worms that feed on grub larvae. Nematodes are aquatic animals, and need moisture to survive. Apply with water and keep the soil moist for a few days after application (see package for details.) You can purchase nematodes from an insectary or nursery that carries beneficial insects.

Milky Spore is actually a disease that can be an effective biological control for Japanese beetle grubs. The best time to apply is mid-to late summer when the new brood have hatched and are beginning to feed. The protective effects can last for many years.

Here are some other typical turf problems and recommended solutions:

Symptom	Possible Cause	Solution
Dandelions	Lack of calcium, low pH	Apply calcium, keep pH balanced.
Moss	Low pH, too much moisture	Add lime, improve drainage.
Red Thread	Lack of nitrogen	Fertilize with organic fertilizer; check potassium and raise if necessary.
Dollar Spot	Lack of nitrogen, excess thatch, drought stress	Fertilize with organic fertilizer, apply compost top-dress, irrigate.
Crabgrass	Turf cut too close, excess nitrogen, low pH	Raise cutting height, over-seed, use organic (low N) fertilizer, apply lime to raise pH.
Thatch	Excess irrigation, improper mowing, too much fertilizer	Apply compost top-dress, raise mower blades, leave clippings on the field, adjust irrigation.
Patches of dead grass	Grubs	Apply beneficial nematodes.
Compaction	Sports, high traffic, machinery	Apply compost top-dress, over-seed, apply organic fertilizer, mechanical aeration if necessary.

Landscaping Equipment: Excessive noise and dangerous air contaminants from 2-cycle gas-powered leaf blowers and trimmers make them unsuitable for use around schools. Their highly inefficient polluting engines spew fine particulate matter and up to 30% raw gasoline directly into the air. The raw gas combines with nitrous oxide and UV to create ground level ozone, while the fine particulates are hazardous to developing lungs and individuals with asthma. We highly recommend manual equipment or electric and battery-powered leaf blowers and trimmers for use in and around school buildings.

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