
SUSTAINABLE PLAYING FIELDS

8 Steps to an Easy Field Facelift

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INTRODUCTION

According to the National Safe Kids Coalition, 30 million young people play organized sports in the United States annually. One million of them are treated annually in an emergency room and 50% of those treated injuries are preventable. As more people are encouraged to be active in their daily lives to combat health issues and obesity, an increased demand on recreational and sport facilities and playing surfaces will increase the degradation of the playing surfaces and thereby increase the risk of sports related injuries. Continual maintenance and upkeep of playing surfaces can become a sinkhole for budgeted dollars if a facility use plan and a maintenance plan are not in place for dealing with the increase in play on athletic fields and parks. So why do the statistics of athletic injury matter? As we manage sports fields, our jobs are to reduce the number of injuries on our playing surfaces. We need to make our fields as safe as we can. There are a number of agronomic practices that many times are overlooked or forgotten about when managing sports turf. "8 Steps to an Easy Field Facelift" is a list of the management practices we can employ that will sustain our fields safer for play for a longer period of time at minimal cost.

KEYWORDS

play field sustainability, athletic field safety, landscape management, field safety, turf management, lawn care

1. SOIL TESTING

Soil testing is the first step in any field facelift. Without a soil test we have no idea what the soil needs and thus what the turf plant needs to thrive. I like to compare soil testing to a human blood pressure. Medical professionals can tell a lot about our health by taking our blood pressure. Turf managers and athletic field staff can tell a lot about our soil's health by conducting a simple soil test. This test will indicate the soil pH and nutrient levels present in the soil.

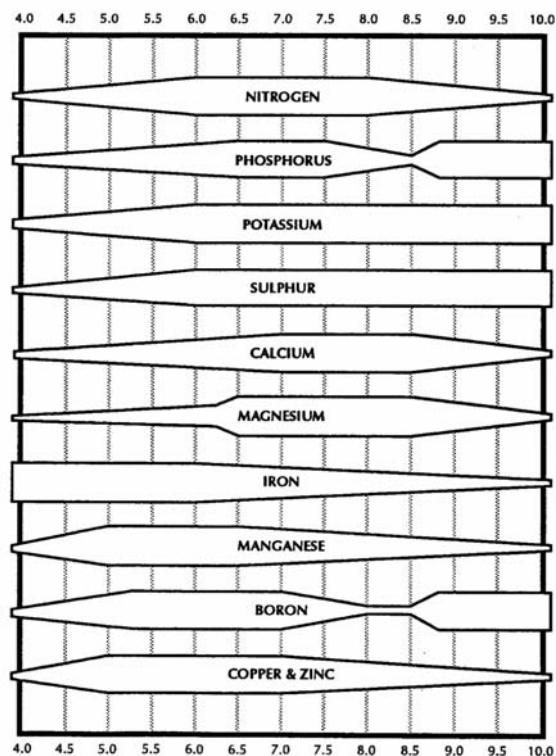
A soil test is conducted by taking 20–35 core samples on the field, mixing them together and allowing them to dry, and taking a representative sample and sending it to a certified laboratory. Check with your local County Extension Office for a list of laboratories in your state that can perform this test. Cost will range from six to twenty-five dollars, but the cost of this test will pay for itself many times over in the amount of money that you save on lime and fertilizer expenses.

2. LIME AND FERTILIZER

Dollar for dollar, fertilization does more to improve poor quality turfgrass than any other single management practice (1). Proper fertilization practices will produce a dense, medium to dark green turf that resists pests and environmental stresses. However, careless application techniques and/or applying excessive amounts of fertilizer at the wrong time of the year can result in serious turf damage and contamination of water resources. Successful turf maintenance fertilization requires an assessment of the nutritional requirements of your turf, an understanding of fertilizers, how much and when fertilizers should be applied, as well as proper application techniques. If recommended, a lime application will alter the pH of the soil. Attaining the proper pH will allow nutrients to be more readily available for plant uptake. In the chart you can see that the pH plays a very important role in the amount of each nutrient that is available for the plants. The majority of the nutrients are most readily available between 6.0 and 7.0, the target for optimum nutrient availability.²

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FIGURE 1.



3. MOWING

Whether mowing with a reel-type or rotary-type mower, always make sure to use a sharp blade. Mowing frequency depends upon the rate of growth. Also, never remove more than one-third of the green growth in a single mowing. For example, if you want to maintain a height of two inches, then mow when the plant reaches 3 inches. Clippings do not need to be removed as long as a regular mowing schedule is maintained. Clippings being returned to the soil will increase the nutrients available and decrease water needs by increasing organic matter content of the soil. If clippings are removed, they can very easily be composted and turned into reusable organic matter that can be used as a topdressing.

In Figure 2 the blade on the left was cut with a dull blade, the one on the right with a sharp blade. You can clearly see that in 24 hours the one cut with a sharp blade has grown more and recovered quicker. You may be thinking, dull blade makes the grass grow slower, so if I use a dull blade I can cut

less. However, you will also have poor quality grass and more disease than if cut with a sharp blade.

4. AERATION

Aeration is the process of disturbing the soil to relieve compaction. Compacted soil does not allow proper air, water, and nutrient penetration and makes it difficult for proper plant root growth. You simply cannot maintain a quality field that gets a lot of play without aerifying. Core removal should be performed at least two times a year when the plants are actively growing. There are many different aeration methods that can be used during the playing season that will not disrupt play; the goal of aerification is to disturb the soil and relieve compaction. The chart at the bottom of the next page was put together by Dr. David Minner of Iowa State University and shows the amount of aerification and the amount of soil that is disturbed.⁴

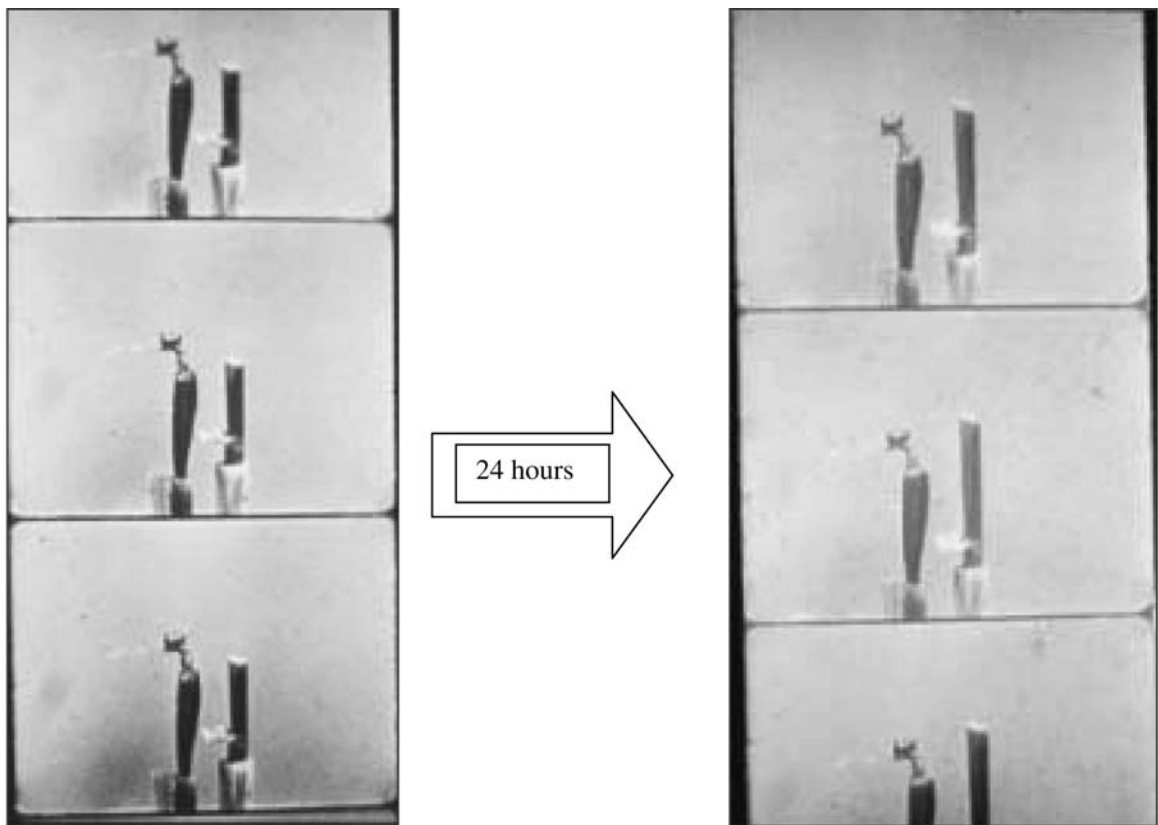
5. TOPDRESSING

Topdressing is the addition of sand, soil, or organic matter to the surface of the turf. Topdressing gives the sports turf manager a chance to improve the soil quality, and improve the seedbed for new plants and rooting of both new and existing plants. Topdressing also gives an opportunity to level the surface of a playing field. The material used during topdressing should be chemically and physically very similar to the existing soil unless the intent is to modify the soil texture. Topdressing should not exceed a half-inch in a given application. The addition of compost as a topdressing allows the sports turf manager to add organic matter to the soil. The addition of organic matter not only increases the soil's water holding capacity, it also introduces nutrients to the soil, thus potentially reducing fertilizer costs.

6. OVERSEEDING

Overseeding is the distribution of seed into thin or thinning turf or patches of bare soil. Overseeding can be done in late winter, spring, or early fall. When overseeding, it is especially important that the seed comes in contact with the soil and has space to germinate. Perennial ryegrass overseeded at the rate of 8–10 pounds/1000 sq. ft. serves very well. Perennial rye is a quick germinating variety that can tolerate enough wear to be effective on an athletic field.

FIGURE 2. Photo from the file of Jack Harper, PSU Extension Turf Specialist.



Core spacing inches	Number of holes/ sq. ft.	% area removed each pass	50% removed	25% removed	10% removed
			Number of passes over field		
2	36	5.0	10	5	2
3	16	2.2	22	11	5
4	9	1.3	40	20	8
6	4	0.5	90	45	18
Amount of coring required to remove various amounts of soil or sod from a sports field. Calculations based on 0.75-inch diameter (0.44 sq. inches) hollow tines and 100% efficiency on successive passes over the field.					
Core spacing inches	Number of holes/ sq. ft.	% area removed each pass	50% removed	25% removed	10% removed
			Number of passes over field		
2	36	11	5	2	1
3	16	5	10	5	2
4	9	3	18	9	4
6	4	1.3	40	20	8

Overseeding can be accomplished with a mechanical seeder or simply with a push spreader. Areas that should be focused on include the middle of the field, goal mouths, and other heavy wear areas. A study done by Dr. Dave Minner at Iowa State University,³ has shown improvements in turf quality to excessively high rates of overseeding. He has found benefit to overseeding rates into the hundreds of pounds per 1000 sq. ft. Why do I mention this study? My intent is not to have everyone go out and overseed with hundreds of pounds of seed per 1000 sq. ft., but to let you know that a ceiling to the amount of overseeding is far greater than we ever imagined. The more seed that is placed in those heavy wear areas, the higher the quality of the playing surface will be.

7. PLAYING SURFACE

Many of the problems that occur on the playing surface are related to drainage, and many of the drainage issues on fields are related to grade. Proper grade and slope of the playing surface has more to do with the quality of a playing surface than any underground drainage system. Many of the underground drainage systems fail soon after installation. They clog, collapse, or the water never gets into the system. Underground systems are much more effective in lowering the water table than they are at draining surface water. Surface water needs to be dealt with by having proper grade and slope. There are many different theories regarding proper slope of a playing surface. American football can be played on a 1.5 to 2% slope where soccer, lacrosse, and field hockey typically prefer a 1% slope. Baseball fields have tolerances around .5% on the infield and 1–1.5% in the outfield. Many discussions have taken place around tables regarding slope of the playing surfaces. The bottom line is there needs to be slope to move surface water off the playing surface. I have been asked many times at different athletic field maintenance seminars if I would do a quick demonstration on “puddle repair.” My answer has always been the same, “NO,” because we cannot fix puddles; we fix low spots in our playing surface by constantly working the skinned portion of a softball or baseball field. Working with a favorite leveling drag, it is important to constantly work the skin in all directions to maintain a playing surface that will not form low spots, thus not to allow puddles to form after a rain.

Do not use brooms to sweep water from puddles; all that does is make the low spot deeper and will make the area worse the next time there is rain. On non-baseball and softball fields low spots can be dealt with by using step 4 and 5 of this article, aerification and topdressing. Annual topdressing will assist the turf manager by adding material to those spots that have become deficit in the past.

8. TRANSITION AREAS

The appearance of the transition areas can make your field look like a million bucks or a million ducks, depending on the care. These areas are where the grass and skin areas on a baseball or softball field meet, the areas where players run on and off of the field, or athletes always walk to and from the practice field and can really make or break the appearance, safety, and playability of a field. The number one headache areas on a field for players and field managers are the transition areas. Grounds crews need to continually work to keep these areas from forming lips, dips, and safety hazards on our playing fields. I have seen many ways to keep these areas safe for play including high pressure water hoses, raking with a garden rake, brooming, or cutting with a sod cutter. Your goal should be to be able to place your foot on the transition area and not be able to feel a hump or ridge either on the grass or on the dirt. Transition areas of other types of sports fields like football, soccer, and lacrosse can be dealt with by aerification, topdressing, and overseeding to keep these areas safe for play.

FIGURE 3.



9. COMMUNICATIONS

Although the title of this article is eight steps to an easy field face lift, I have added a ninth step. As Garth Brooks sings in his song “Friends in Low Places,” I was going home one night and thought to myself, Jeff, is this really the way this article should end? No. So I wrote another step, just like Garth wrote another verse.

Even if everything is known about the first eight steps of a field facelift, no one will understand them without a step nine: communication. The sports turf manager must not only maintain the fields, he or she must explain the importance of proper maintenance to bosses, supervisors, coaches, players, volunteer parents, and school administrators—not only what is needed for a safer and more playable field, but also why. When all stakeholders are engaged as a team, the improved maintenance of the field becomes a direct reflection of their cooperation; the result is a

“level playing field” that is not only safe, but a turf to be proud of for all who use it.

Thus, with the adoption of these nine steps to formulate a game plan for our fields, these steps will have spectators saying, “How did they do that?” And the goal of sustainable fields will have been achieved.

NOTES

1. Turfgrass Fertilization, A Basic Guide for Professional Turfgrass Managers, Peter Landschoot, Assoc. Professor of Turfgrass Science, the Pennsylvania State University.
2. Certified Turfgrass Professional, University of Georgia, Chapter 3, page 10.
3. Hoiberg et al., 2009 (Seeding rates of annual ryegrass that maximize turf cover when sown during traffic); Minner et al., 2008 (Seeding rates that maximize turf cover when sown during traffic).
4. Minner, D.D., How much field area does your core cultivation program actually impact?