

EFFICIENCY FOR THE ONE MAN GROUND S STAFF

Floyd Perry
Grounds Maintenance Services
Orlando, FL

I. KNOW YOUR FIELD whether it's baseball, softball, soccer, football or any other sport.

A. Walk your field daily.

The number one concern for a coach and grounds manager is the safety of the athletes that play on their field. Therefore, it is important to be aware of the hazards that may be present on your field. The only way to successfully accomplish this is to walk your entire field everyday. Potential hazards such as unretracted sprinkler heads, animal burrows, loose debris/turf, and vandalism are just a few examples that must be addressed before each game or practice. Even if you are cutting grass you can spot some of these hazards, it's easy to pick up a loose rock, tamp turf, or flag an area that needs material (topsoil, Turface, etc.) And come back soon after to repair a troubled area.

B. Take notes on maintenance

practices. As a grounds manager, it is essential to keep records of your maintenance practices such as the last time your turf was fertilized, by whom, at what rate, and under what weather conditions. This information allows you to track your progress as well as point out some of your field's weaknesses. More importantly, it allows your successors to know your field's history. Pick-up a maintenance log book and start your entries today.

C. Maintain a field analysis form.

You can easily make up a form to record observations made through daily and periodic field walks. Baseball/Softball is different from Soccer and Football, but both would serve the purpose to give existing field conditions, maintenance practices, turf conditions, grade conditions, and other information on or for irrigation and drainage. This is especially useful if you feel your field(s) need complete renovation work.

II. SPORTS TURF MANAGEMENT

Setting the budget with organization and approach/budget limitations.

Maintaining natural turf athletic fields in optimum conditions is a challenge. However, through schools, colleges, parks and recreation departments, and service consultants showing that high quality sports turf can become a reality regardless of the budget available.

III. MAINTENANCE GUIDELINES - WEED CONTROL

Healthy, dense turfgrass is better able to resist encroachment from weeds. Once the grass has developed into a thick, uniform stand, it can be difficult for weeds to take hold and grow. Turf that is weak and thin allows weeds to become established and compete for available nutrients. Weeds can be difficult to manage in thin, weak turf.

Digging up weeds manually is not a realistic option. Remove them chemically with post emergence weed control products. There are newer types of pre-emergence products which also have limited post-emergent activity.

Pre-emergence Weed Control

Pre-emergence weed control and grass herbicides form a barrier on the soil surface which does not allow germinated seeds to grow. The use of pre-emergence weed control products must be timed so as not to interfere with reseeding or overseeding. Other pre-emergence formulations containing "Siduron" stops grassy weed seed development without interfering with planted seed establishment.

Timing is the most difficult aspect of using a pre-emergence weed control; for the pre-emergent herbicide application to be effective, most products must be applied before weed seeds begin to germinate. Since germination timing varies according to target weed species and weather patterns, timing the application can be difficult if only one treatment is budgeted. The general guideline is to apply the pre-emergent herbicide according to annual averages (deadlines for applying pre-emergent herbicides to prevent crabgrass varies from state to state, but realize that the degree and duration of control obtained may vary, especially with unusually early or late spring and fall weather patterns.) Normally, use a mid-April application followed up by a mid-May application to ensure the best possible control.

Pre-emergence applications are especially useful in controlling grassy weeds like crabgrass, goosegrass, barnyard grass, and foxtail.

Post-emergence applications for grassy weeds tend to be quite rate specific in order to avoid adverse effects to desirable turf grass species. Crabgrass and other grassy weeds, as well as nutsedge and many broadleaves are controlled by pre-emergence herbicide products. One that I recommend would be Trimec Plus, which, when properly applied, does not result in objectionable discoloration or injury to desirable turf.

Post-emergence Weed Control

A selective post-emergence weed controls broadleaves like dandelions, ground ivy, and chickweed. For optimum control it is generally recommended that the herbicide be applied to young, actively growing weeds. The ideal time is a warm, but not too hot day following a few days of rainfall or irrigation, and a little wind to minimize drift to non-target plants. If these conditions are missed, you must consider an alternative post-emergence weed control product.

As a reminder, remember that the states have strict guidelines when using weed and pesticide liquid chemicals. You or someone on your staff should be licensed for applying and handling chemical products. It is equally vital to read our product label for proper rates, approved turfgrasses and sites, labeled target of seed species, and lastly for safety.

IV. MAINTAINENCE GUIDELINES DISEASE CONTROL

A good turf management program is the first step toward disease control. The selection of grass species, proper fertilization, and cultural practices are all important in creating a healthy turf which is better able to resist and recuperate from turf disease. If turf is weak and susceptible when environmental conditions favor disease development, turf disease can cause a great deal of damage.

Disease occurrence and severity can also be affected by fertilizer programs. Fungi invasion of warm season grasses can be increased by high nitrogen levels, while low nitrogen levels may increase susceptibility to dollar spot, red thread, and rust. Low soil pH may increase the severity of many diseases and is increased by low potash levels.

Fungi is the most prevalent cause of turfgrass disease. Fungi are minuscule plants which have no chlorophyll and rely on green plants for food.

The turf manager should develop an understanding of the environmental conditions which fungi growth. This understanding will enable the development of a more effective fungicide application schedule.

Fungicides may be preventative, curative, or both. There are a variety of products available on the market through various distributors and several manufacturers. Consult your local extension service for your particular problem.

There are two basic types of activity: contact and systemic.

Contact fungicide coat the leaf tissue to provide a protective barrier against disease. When environmental conditions favor a certain fungus growth, a contact fungicide may need to be applied every week. As grass grows and is mowed, the leaf tissue coated with the product is cut off and new leaf tissue is left unprotected. Contact type products are faster acting which can be important when a curative potency is needed.

V. INSECT CONTROL

Any turf area will have a wide variety of insect population at any given time. Insect control only becomes an issue when populations of certain insects increase sufficiently to cause damage which the turf cannot outgrow. Insects can reduce the quality, making it more susceptible to disease, some insects may even transmit the disease and heavy infestations may even kill the turf plants.

Where populations reach high levels, it may be necessary to use an insecticide to prevent or control populations. It is important to identify the problem population in order to select the appropriate product. Leafhoppers, flea beetles, and spider mites can be located by examining the leaves, stems, and crown of the plant. Sod webworms, cutworms, and other caterpillars can be brought to the surface within ten minutes by applying one tablespoon of pyrethrum product (with 1% to 2% pyrethrins) mixed in one gallon of water to square yard of turf. The soil around the roots of living grass can be examined to identify billbugs and white grubs.

Again, insecticides should be handled carefully, and please read your product label. It may also be essential to alter your insecticide product usage from season to season as pests may become immune to certain chemical active ingredients and have tendencies to resist over periods of extended use.

CONTROLLING TURF DAMAGE FROM INSECTS

Healthy, dense turfgrass is not only better able to resist encroachment from weed and disease, but also from insects. However, the potential problems from these pests is ever present and the sports turf manager must be diligent in both preventative and curative action to keep the turf healthy and growing. The following represent some general guidelines for pest management:

1. Look for abundant populations of birds on your athletic fields. This is a true indication that you have insect problems.
2. It is easy to mistake an insect problem with a turf disease. Don't be fooled, investigate immediately, or it could be both.
3. Test soil with pyrethrum or liquid soap products or pull up the turf with a sod lifter to observe pests.
4. Late July application using a specific broad sweep application.
5. Early August application using a strong solution to bring problem under control.
6. Some insects may have escaped the treatments, and can be noticed early in September. Repeat application, rate depending upon severity or spot treat areas.
7. Contact a turf specialist for preventative and curative recommendations.

VI. DEVELOPING A FERTILIZATION PROGRAM

Nutrient requirements will vary according to soil fertility. An annual soil test is recommended to determine the available levels of nitrogen, phosphorus, potassium, and essential micro-nutrients to assure optimum turf grass growth.

Where soils are highly acid or alkaline, iron or magnesium may be required. Soil tests taken will provide the basis for determining what nutrients should be added to adequately feed your turf.

Fertilization is especially important on athletic fields where the growth rate must be adequate to replace grass blades damaged by intense traffic. During the growing season the athletic field will generally require at least three-quarters to two pounds of nitrogen per 1000 sq. ft. (depending on grass species) per month. Sandy porous soils which are more subject to leaching require more fertilizer, more often.

Most of my turf programs consist of nitrogen feedings monthly from May through September at one pound per thousand. This gives my fields up to five pounds of N per year. You don't need to put N down in the spring, so use a high phosphorus turf starter.

Most turf fertilizers supply nitrogen, phosphorus, and potassium. The numbers on the bags indicate the percentages of N, P, and K present. For example, 16-25-12 indicates 15% N, 25% P, and 12% K. For sports turf applications, I recommend higher potassium levels because it is known to increase traffic tolerance and is more resistant to wilting and disease.

The use of soluble nitrogen fertilizers will generate a fast growth and green-up which is fairly short lived. This increased growth rate can require more frequent irrigation to support growth. Surges of growth may also result in thinner plant cell walls which are more susceptible to insect and disease damage (in the middle of the growing season.)

Slow release nitrogen fertilizers will generate a slower response in growth rate and color. The fertilizer application, however, will provide a much longer period of nitrogen availability, for three to four months or more depending on the type of material used and environmental conditions.

Over fertilization can cause the turf to be susceptible to insect and disease damage. The turf will also be prone to thatch problems. High rate of nitrogen can cause top growth at the expense of root development or carbohydrate storage. In situations where adequate irrigation is not made available and rainfall is limited, fertilizer applications should be minimized. Nitrogen is taken up with soil water: no water, no uptake.

All athletic field situations vary. remember to take a soil test in spring to note your fertility requirements.

You may wish to cut back your rates of Nitrogen to 3/4 lbs/M depending on your irrigation methods.

Certain Vigoro/Par Ex have never burned or left application patterns.

This is just a basis on which to start. Then, if you wish, take a soil test in the fall to check your fertility rates and deficiencies. It's also a great tool to prepare for next year's budget.

VII. MOWING FOR HEALTHY AND ATTRACTIVE TURF

If you think of mowing as something you have to do to keep grass from getting high, or worse, something you only do when the grass is too high, you're not utilizing your equipment or man-hours to their fullest potential. Mowing can encourage thickening of the turfgrass, creating a thick carpet-like effect, which not only looks good, but also has increased durability. Proper mowing techniques

enhance root development which is important to a healthy stand of turf.

Some general guidelines include:

Regular Maintenance

Develop a regular mowing schedule which allows for more frequency during peak growth season. On athletic fields, frequent mowing is essential. For optimum density, the sports field should be mowed three or more times a week, or a minimum of twice weekly, during peak growing seasons.

If the grass is allowed to grow too high, necessitating removal of more than one-third the length of the blade, the plant will be stimulated to replace the length by using up root food reserves. This is why close mowing, especially on a frequent schedule, will result in root loss, weakening the grass plants. They become more susceptible to disease and pests and less able to recuperate from damage, including the wear which sports turf must endure.

Knowing Your Turf

Different turfgrass species have different optimum mowing heights. Even so, it is important to cut the grass frequently enough so that no more than one-third of the blade length is removed at any one time. If two-inch height is considered to be desirable on a bluegrass/ryegrass field, the grass would require mowing when it reaches three inches high.

Warm season grass species, on the other hand, are generally mowed to a height of one, one and one-half, to two inches. If you are working with Bermuda grass and a one and one-half inch height is considered to be desirable, the maximum height should not be allowed to exceed two and one-quarter inches.

Mowing height is very important factor in managing sports turf. While lower mowing heights improve the playability and present a more pleasing appearance, a lower cut also induces stress to turf. A higher mowing height might be required on rough playing surfaces to avoid scalping. The frequency at which the field is used is also a consideration. More frequent use may require a higher mowing height to allow optimum root development which may aid the turf in recuperating from wear.

Alternative Mowing Patterns

Mowing direction or patterns generally should be alternated with each mowing to avoid causing the grass blades to develop a lean in one direction. Although this may be done intentionally on occasion, to create a "striped" visual effect, the swept blades are subject to misses and an uneven cut. Everyday needs are generally better served by an even cut which creates a smooth playing surface.

Keep Blades Sharp

Mow with a sharp blade. Dull mower blades not only affect the appearance of the turf, but also can affect the health of the grass by creating fissures through which disease organisms can gain entry to the plant. In addition to shredding the tips, dull blades pull at the turf and may even pull the turf blades out of the ground when the soil is wet.

Avoid Mowing Wet Turf

Disease organisms can be carried from one part of the field to another in drops of moisture picked up by the mower. Additionally wet soil can become compacted by heavy mowing equipment, requiring additional aeration. Wet turf is also a hazard to mowing laborers.

Turf Growth Regulation

The use of Turf Growth Regulations to reduce mowing when fields are not in use can be a great aid to the sports turf manager. The use of Primo (TGR) readily assists in the painting of field lines since it retards vertical growth of the grass blade and the paint isn't mowed off.

VIII. IRRIGATION PRACTICES

Turfgrass quality can suffer from too much or too little water. Turf that is irrigated too frequently,

allows the surface to stay wet for extended periods, tends to be more susceptible to disease. It can promote shallow rooting as well as thatch buildup. The goal in irrigation is to provide sufficient water to assure a steady growth rate during peak growing seasons. How much irrigation will be required depends to a large degree on the species of turfgrass, rainfall availability, and whether the turf is new or well established. Soil type, fertilization practices, and the slope of the field may also effect the watering.

Field safety is an additional consideration for sports turf managers. If the field is allowed to dry out, the surface can become as hard as concrete and cracks in the soil could become a hazard for the players. And, of course, irrigation should be scheduled so as to leave the field dry when in use.

New Turf Area

New turf has special watering requirements until the turf has become established. Where sod or plugs have been used, they should be soaked two or three inches under the point where the sod or plug roots reach the soil. The sod or plugs should then be resoaked whenever they begin to dry out. The turf should be established after about two weeks at which time regular irrigation practices can be initiated.

Seeded or sprigged areas should be kept uniformly moist, not saturated, for the first two weeks, or until seeds have germinated, or the sprigs have rooted. This initial period is critical to the new plants, and they must not be allowed to dry out. If the weather is hot and/or dry, they will require more frequent watering, possibly up to five times per day. Once the seeds have germinated, or the sprigs have rooted, deeper, less frequent irrigation is needed to initiate deeper rooting. A regular irrigation schedule could then be implemented after the first month.

Established Turf

As a general guideline, established turf should be watered to a soil depth of four to six inches just before it begins to wilt. Most fields will require watering twice per week. Most of my irrigation techniques, with sports fields under AFS control, water daily and twice per day at short intervals for each station. I generally alternate my water at times to every other day, depending on changes in weather conditions and use of fertilizers, fungicides, or insecticides. A good turf manager will follow daily weather forecasts, and with an average to high budget for materials, everyday watering fits into the plan.

The amount of water required to penetrate the soil to depths of four to six inches will vary according to soil type. In clay soils, one inch of water will generally wet the soil to a depth of five inches. Where heavy clay soils having been used in constructing a field, "deep watering" may not be possible in one irrigation. You may need to stop watering once run-off is observed and repeat the cycle after surface water has penetrated. The rate of water infiltration can be increased by soil aeration or by the use of wetting agents. Wetting agents are soil penetrants that are especially useful where localized dry spots or areas may be a problem.

Loamy soil will absorb water to a greater depth and will only require about three-quarters of an inch of water to wet the soil to the desired four to six inch depth. Sandy soils require even less: about one half an inch of water will reach the optimum depth, but may require greater frequency of watering.

Aeration practices will increase the movement of water in any soil type, and will also aid the penetration of water applied to slopes. Where there is a high degree of incline, water should be applied at the top of the slope to minimize loss due to run-off.

Watering too often and not deep enough can contribute to turf stress and injury to shallow root development. Grass species and available rainfall will determine how often the field requires watering. The turf should be observed for signs of wilting and watering scheduling must obviously be tied to game and practice schedules of the field. Too much water can interfere with plant respiration which can cause turf damage.

Precautions

1. Heavy application of soluble nitrogen fertilizers will cause high growth rates which will in turn generate higher water requirements. I recommend slow release fertilizers which provide a uniform release of nitrogen.
2. Avoid watering in the evening when the leaf surface will remain wet into the night to avoid susceptibility to disease problems. As a general rule, the best time to water is in the morning between 6-9 a.m. when cool temperatures decrease evaporation and as supplemental 3 p.m. for short intervals just to cool off the plant, but avoid watering after 5 p.m.

IX. OTHER CULTURAL PRACTICES

Aerification

Soil compaction and poor drainage are the greatest enemies to a healthy athletic field. Heavy use by participants and equipment press soil particles together which interferes with aeration, porosity, water infiltration, and root growth. Prolonged compaction causes thinning until the ultimate total loss of athletic field turf. Soil compaction also causes a hard playing surface which creates an additional risk of injury to athletes.

Healthy turf cannot be maintained on a sports field without frequent aerification. Ideally, athletic fields should be core aerified at least once per month (although few are.) If your coaches or athletic directors complain about plugs, find yourself a window to allow the plugs to dry and break them up by using a drag mat or a harrow. If they still seem to be skeptical, use a solid tine aerifier.

Benefits to aerification include deeper rooting, less irrigation, and less overseeding. The technical process of aerification is to create plant food by uptake of carbon dioxide and increasing the amount of oxygen available to the root systems and also to reduce thatch.

Also, when core aerifying, cores can be left on the field for topdressing, when topdressing after aerification you improve the soil profile, using a compatible topdressing mix which blends with your existing soil conditions.

Topdressing

Topdressing twice per year with a high budget or at least once per year with an average budget to provide a true and firm playing surface would be ideal. It can be done where the need is major or as part of a general maintenance program.

Topdressing materials generally include large amounts of sand and it is important that the materials be specifically mixed for use as a topdress. Topdressing material can be comprised of several materials and should be tested for compatibility. Materials used may include topsoil, sand or peat, baked calcine clay, porous ceramics, or most often only sand. Contact a turf manager or consultant for the mixture that will work best for your soil conditions.

Thatch Removal

The high levels of nitrogen required for athletic field management can contribute to the development of heavy thatch layers. This occurs when the growth of the grass from older plants exceeds the rate at which turfgrass residues decompose.

Thatch layers which do not exceed one-half inch are not a problem; in fact, they may provide many benefits to the turf. The thatch cushion can increase resistance to wear, keep soil moist, and provide insulation from high temperatures, as well as returning organic matter to the soil. Problems occur, however, where there is a heavy thatch layer; it can prevent water movement into the soil and reduce soil aeration, as well as harboring insect and disease organisms. Roots and rhizomes in the thatch are most susceptible to drought stress and winter kill.

Heavy use of chemical fertilizers and pesticides can decrease soil microorganisms which in turn will decrease the thatch decomposition rate. Thatch can also be reduced and removed by aerifying,

vertical mowing, and power raking or dethatching. Topdressing, added in conjunction with verticutting or core aerification, can help reduce thatch buildup by helping create a favorable environment for soil organisms which aid decomposition.

As a general rule, turf should have 30-45 good growing days following dethatching before being heavily used. The best time to dethatch is in the spring before the turf greens up.

Overseeding

Overseeding or slit seeding provides the quickest means to thicken or replace turf areas damaged by excessive wear. Grass species and varieties should be selected for their ability to withstand wear and climatic conditions. Avoid cheap seed as it can cost you in germination as well as the possibility of weed seed contamination, including *Poa annua*.

When overseeding during the off seasons, the use of a plant growth regulator to put existing grass on hold for 4 to 5 weeks can allow new seedlings to get established without being damaged by mowing or weakened by competition.

There are many techniques and methods of overseeding. Please consult athletic field services, turf managers, your seed manufacture, or a distributor nearest you.