

# Yearlong Care for Athletic Fields

By: Floyd Perry, Grounds Maintenance Services

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

## **A. Walk your field daily.**

The number one concern of a coach and grounds manager is the safety of the athletes that play on their fields. Therefore, it is important to be aware of the hazards that may be present on your fields. Therefore, it is important to be aware of the hazards that may be present on your fields. The only way to successfully accomplish this is to walk your entire field every day. Potential hazards such as non-retracted 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 (top soil, 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 logbook and start your entries today.

## **C. Maintain a field analysis form.**

You can easily make up a form to record observations made through daily or periodical 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 condition and other information on or for irrigation and drainage. This is especially useful if you feel your field(s) need complete renovation work.

## **I SPORTS TURF MANAGEMENT**

Setting the budget with organization and approach/budget limitations. Maintaining natural turf athletic fields in optimum condition is a challenge. However, through schools, colleges, parks and recreation departments, service consultants show that high quality sports turf can become a reality regardless of the budget available.

The original construction, volume and scheduling of use and resources available for managing and nurturing the field may need to be addressed. Deficient drainage, non-stop, excessive traffic and inadequate control over mowing, fertilizing, aerification, top dressing and overseeding, etc., can undermine the turf improvement campaign. The best place to start is to collaborate between all parties involved and carefully develop a master plan with the support of others responsible for the funding, maintenance and use of the facilities involved. No matter what type of organization

or entity may be involved, once a plan is in place, it is vital that someone be responsible for the various phases of work to be done.

## **II 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 or thin allows weeds to become established and compete for available herbicide applications. 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 that also have limited post-emergent activity.

### **Pre-emergence Weed Control**

Pre-emergence weed control and grass herbicides form a barrier on the soil surface that 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" stop grassy weed seed development without interfering with planted seed establishment. Timing is the most difficult aspect of using a pre-emergent 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-emergence 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 by a mid-May application to ensure the best possible control.

Pre-emergence applications for grassy weeds tend to be quite rate specific in order to avoid adverse effects to desirable turf grass species. Pre-emergence herbicide products control crabgrass and other grassy weeds, as well as nutsedge and many broadleaves. 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 control product is used to eliminate weeds after they are established. Most typically it controls broadleaf 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 few days of rainfall or irrigating and little wind to cause drift to non-target plants. If these conditions are missed, you might consider an alternate 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 to apply and handle chemical products. It is equally vital to read your product label for proper rates, approved turfgrasses and sites, labeled target of seed species and last for safety.

### **III MAINTENANCE 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 that 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.

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

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

The turf manager should develop an understanding of the environmental conditions that enhance 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 regarding your particular problem.

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

Contact fungicides 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 the new leaf tissue is left unprotected. Contact type products are faster acting, which can be important when curative potency is needed.

### **IV INSECT CONTROL**

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

### **CONTROLLING TURF DAMAGE FROM INSECTS**

Healthy, dense turfgrass is not only better able to resist encroachment from weeds and disease, but also from insects. However, the potential problems from these pests are 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 for a turf disease. Don't be fooled, investigate immediately, or it could be both.
3. Test soil with a pyrethrum or liquid soap product or pull up turf with sod lifter to observe pests.
4. Late July applications using a specific broad sweep insecticide.
5. Early August application using a strong solution to bring problem under control.
6. Some insects may have escaped the treatments, 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.

### **V 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, phosphorous, potassium and essential micronutrients to assure optimum turfgrass growth.

Where soils are highly acidic 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-quarter to two pounds of nitrogen per 1,000 sq. ft. depending on grass species, per month. Sandy, porous soils, that 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 spring, so use a high phosphorus turf starter.

Most turf fertilizers supply nitrogen, phosphorous and potassium. The numbers on the fertilizer bags indicate the percentages of N, P and K present. For example, 15-25-12 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. 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, from three to four months or more depending on 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 more prone to thatch problems. High rates of nitrogen can cause top growth at the expense of root development or carbohydrate storage. In situations where adequate irrigation is not 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 requirement. You may wish to cut back your rates of Nitrogen to  $\frac{3}{4}$  lb./m depending on your irrigation methods.

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

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

## **VI 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 do only 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 that allows more frequency during peak growth seasons. 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 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 that 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 a two-inch height were 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 Bermudagrass 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 a 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 that may aid the turf in recuperating from wear.

### **Alternate Mowing Patterns**

Mowing directions 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 that creates a smooth playing surface.

### **Keep Blades Sharp**

Mow with a sharp blade. Dull mower blades not only affect the appearance of the turf, leaving it looking brown and dry, but also can affect the health of the grass by creating fissures through which disease organisms can gain entry into the plant. In addition to shredding the tops, 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 regulators to reduce mowing labor 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.

## **VII IRRIGATION PRACTICES**

Turfgrass quality can suffer from too much or too little water. Turf that is irrigated too frequently, allowing the surface to stay wet for extended periods, tends to be more susceptible to disease. It can promote shadow rooting as well as thatch buildup. The goal of 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 turf is new or well established. Soil type, fertilization practices, and the slope of the field may also affect 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 players. 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 to 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 seed has germinated or the sprigs have been rooted. This initial period is critical to the new plants and they must 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 started to root, 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 a week. Most of my irrigating techniques with sports fields under AFS control, water daily and twice per day at short intervals per each station. I generally alternate my watering 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 use of wetting agents. Wetting agents are soil penetrates 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 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 in 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 runoff.

Watering too often or 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 schedules obviously must be tied to the game and practice schedules of the field. Too much water can also interfere with plant respiration that can cause turf damage.

### **Precautions**

Heavy applications of soluble nitrogen fertilizers will cause high growth rates that will in turn generate higher water requirements. I recommend slow release fertilizers that provide a uniform release of nitrogen.

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.

## **VIII OTHER CULTURAL PRACTICES**

### **Aerification**

Soil compaction and poor drainage are the greatest enemies to a healthy athletic field. Heavy use by participants and equipment presses soil particles together, which interfere with aerations, 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 that 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 mat drag or a harrow. If they still seem to be skeptical, use at least a solid tine aerifier.

Benefits to aerification include deeper rooting, less irrigating and less overseeding. The technical process of

aerification is to create plant food by up-taking 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 topdress mix that 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 great or as part of the 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 top-dress. Topdressing materials can be comprised of several materials and should be tested for soil compatibility. Materials used may include topsoil, sand or peat, baked calcined clay, porous ceramic 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 be contributed to the development of heavy thatch layers. This occurs when the growth of the grass from older plants exceeds the rate at which turf grass residues decompose.

Thatch layers that 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 winterkill.

Heavy use of chemical fertilizers and pesticides can decrease soil microorganisms that in turn will decrease the thatch decomposition rate. Thatch can also be reduced or removed by aerifying, vertical mowing, power raking or dethatching. Topdressing, added in conjunction with verticutting or core aerification, can help reduce thatch buildup by helping to create a favorable environment for soil organisms that aid decomposition. As a general rule, turf should have 30-45 good growing days following dethatching before being heavily used. Best time to dethatch is in spring before the turf greens up.

#### **Overseeding**

Overseeding or slip 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 include 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, a turf manager or the seed manufacturer or distributor nearest you.

*Floyd Perry's*

## **Grounds Maintenance Services For Sports Fields**

**1-800-227-9381**

*Athletic Field Services Available*

### **SEASONAL**

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