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Odeys FIELD EXPERTS

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"We can do your project or coach you through it"

Athletic Turf Maintenance Practices

Your athletic turf fields undergo tremendous stress and wear that other turf areas will never encounter. To be their best in safety, playability, and appearance requires different management practices than any other turf area.

The following practices will help you to provide a safe, playable, and aesthetically pleasing athletic turf playing field.

Turfgrass Selection (cool season)

Kentucky bluegrass: Forms a dense, dark green turf with a rhizome system that spreads laterally, allowing the turf to recuperate from the stresses put upon it.

Pros - Rhizomatous provides good sod knitting (dense turf).
Good recovery.
Robust growth.
Moderate wear resistance.
Good surface resiliency.
Can be mowed from 1" to 3".

Cons - Slow establishment from seed (14 – 21 days).
Produces substantial thatch, requiring periodic aerifying and vertical mowing to control.

Perennial ryegrass: Bunch type grass with dark green color, which has excellent wear tolerance, but recovers more slowly than Kentucky bluegrass.

Pros - Excellent wear resistance.
Robust growth.
Prolific tillering.
Rapid seedling growth (4 – 7 days)
Can be mowed from 1" to 3".

Cons - Lacks rhizomes or stolons, poor sod knitting and recovery.

Tall Fescue (turf type): Bunch type grass with finer texture than other types of fescue.

Pros - Excellent wear resistance.
Robust growth.
Good surface resiliency.
Very drought tolerant.

Cons - Weak determinate rhizomes, poor sod knitting
Bunch type grass, can become clumpy in wear areas.
Should not be mowed lower than 2" to 3".
Requires frequent overseeding to promote recovery.

In this region, Kentucky bluegrass and perennial ryegrass predominate, and a mixture of these is probably the most popular sports turf. This mixture allows for the aggressive spreading and recovery characteristics of Kentucky bluegrass, along with the stability, wear resistance, and quick seed establishment of perennial ryegrass. Generally, if the athletic field is irrigated, turf type fescue in not recommended because of it clumpy nature in wear areas, creating a very uneven playing surface.

Over-seeding

Is crucial to maintain an aggressive over-seeding program throughout the season, especially in the high wear areas of an athletic field. Should select varieties that are particularly adapted to your mowing height, show good wear tolerance, and strong recovery. It is best to utilize a variety of seeding techniques (slit seeding, aeration-broadcast seeding, cleat-in seeding, and divot mixes) to vary the vertical placement of seed in the soil. Generally, a Kentucky bluegrass / perennial ryegrass combination provides excellent results because of the benefits associated with each species. As move into early to mid-fall, suggest using a higher percentage of perennial ryegrass in this mixture because of its shorter germination period, providing better establishment prior to winter.

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Fertility

Athletic turf undergoes stress and wear that other turf areas are not required to endure. Because of this, it is critical to develop a fertility program designed uniquely for the athletic turf, unique from the fertility program used on other turf areas.

The only way to determine the fertility requirements of an athletic field is through a soil analysis to determine existing nutrient levels in the soil. A soil test should be performed at minimum every other year. A soil analysis is also important in determining the soil pH level, which has a significant impact on turfgrass heath, vigor, and nutrient uptake. The best time to take a soil test is in mid- to late summer.

Turfgrass requires three macronutrients, nitrogen (N), phosphorous (P), and potassium (K), in higher quantities than the 13 micronutrients. Is important to be flexible in a fertilization program to meet the needs determined from the soil analysis, and not just randomly "dump" fertilizer onto an athletic field. The benefits of each of the macronutrients are:

nitrogen (N):	stimulates above ground growth.
	produces dark green color.
	increases recuperative potential.
phosophorous (P):	effects seedling establishment rate.
	stimulates root growth.
potassium (K):	stimulates root growth.
	benefits heat, cold, and drought hardiness.
	improves wear tolerance and disease susceptibility.

Turfgrasses have a fairly constant ratio of nitrogen, phosphorous, and potassium in the plant tissues – generally about 4% N : .5% P : 2% K by weight. The consistency of these ratios is reflected in the use of fertilizers with similar ratios to maintain N, P, and K levels in the turf. Excesses or deficiencies of some nutrients (particularly nitrogen) will lead to excesses or deficiencies of other nutrients, so it is important to keep the fertility program properly balanced to optimize turfgrass growth. Most Kentucky bluegrass and perennial ryegrass fields require 4 – 6 pounds of nitrogen per 1,000 square feet annually. Turf type fescue fields need 3-4 pounds of nitrogen per 1,000 square feet annually. Because of the wear tolerance characteristics of potassium, many university turf programs recommend N and K be applied in a 1 : 1 ratio for additional wear tolerance.

Cool season turf fields should get less than 30% of their annual nitrogen in the spring. Restricting N at this time of year helps to prevent excessive shoot growth, which often comes at the expense of root growth. Applying the largest portion of N in the fall contributes to strong root growth, and helps the turf recover from the stresses placed upon it. The most important time, and very best time, to apply N is in the late fall, right after the last mowing of the season when the grass is still green. During this period, shoot growth slows to a stop, but root growth continues. The extra N is absorbed and stored by the root system, and results in an early spring green up, and a further enhancement of the turf's ability to withstand summer stresses. This schedule of fertilizer application is in direct contrast to many lawn services schedule of fertilization, which apply up to 60% of the annual N by early summer with no late fall application. Most lawn service fertility programs are designed for residential turf, and not the demands that are placed on an athletic field.

It is very important to understand the label on a bag of fertilizer as to apply the appropriate amount and type of nutrients. Using high amounts of quick release nitrogen will result in a burst of shoot growth resulting in more frequent mowing being required. Also under heavy irrigation, high amounts of quick release nitrogen may be leached through the soil and thus unavailable to the grass plant. It is desirable to use a fertilizer containing a portion of slow release nitrogen to spread out the availability of N to the grass plant.

Aeration and Topdressing

Aeration is the process of disturbing the soil in a controlled fashion in order to relieve compaction and allow air, water, and nutrients to penetrate the soil. Compaction on an athletic field can be a particular problem because of the excessive amounts of foot traffic, and because that traffic is largely concentrated in certain areas of the field. Compaction becomes detrimental to turfgrass growth for two primary reasons: turf root systems can't get the oxygen they need, and the compacted soil becomes a physical barrier to root penetration.

Aeration should take place when the turf is actively growing. Aeration does cause stress to the grass plant, and the turf is best able to overcome this stress when actively growing. Cool season athletic turf fields should be core aerated a minimum of twice a year, ideally once in May and once in September. Additional aeration, particularly in high traffic areas during the playing season, can be of great additional benefit to turfgrass health. There are a variety of aeration techniques, hollow core, solid tine, deep tine, deep drilling, shatter tine, water-injection, and spiking and slicing. Each of these types have their benefits, and the type used depends on the needs of the particular field.

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Aeration and Topdressing (cont.)

Topdressing is the addition of sand, soil, peat, or an inorganic soil amendment to the surface of the turf, usually following aeration. Topdressing can aid in amending the soil composition, as well as helping to level an uneven playing surface. It can enhance the soil for better drainage and rooting, help to control thatch, and even assist seeding operations.

Mowing

Mowing is one of the most important of all turf management processes. When it is done right, mowing can help regulate moisture in the turf, control pests, and recycle nutrients. If done improperly, it can almost ensure sickly, unattractive turf. Some rules to follow regarding mowing:

Rule 1: Always mow with a sharp blade. A sharp blade cuts each plant cleanly, and this minimizes the impact of mowing on the health of the turf. A dull blade pulls and shreds the blades of the plants, and that makes the turf vulnerable to diseases.

Rule 2: "The One-Third Rule" Cut off no more than 1/3 of the grass blade at a single mowing. Cutting off more than 1/3 of the grass blade erodes the health of the plants, slows or even stops root development, and it also leaves an unacceptable layer of clippings, which can smother the turf. For example, if the turf is is maintained at a height of 2", the turf will need to be mowed when it reaches 3". Studies show that if rather than 1/3 of the grass blades are removed:

50% removed – root growth is stopped for 30 days
60% removed – 25% of the roots are killed
75% removed – 50% of the roots are killed

If the turf is allowed to exceed the height of this 1/3 rule, it is best to raise the mowing height so as to only remove 1/3 of the grass blade, and then work the height of cut back down to its original level by mowing it again in a few days.

Rule 3: When using a rotary mower, always use the highest recommended blade speed. Rapidly moving blades cut the plant more cleanly and evenly, and distribute clippings in a more uniform layer.

Rule 4: Do not mow at an excessive ground speed with any type of mower. Speeding across the field will get the job done faster, but results in tearing of the grass blades, uneven mowing, and bunching of clippings.

The height of cut is determined by the playing conditions desired, but in general, a shorter cut turf will require more frequent mowing and heavier irrigation. A lower cut turf will also result in a shallower roots system, but a more dense turf. Unless a pattern is being put into the turf (burned in), it is best to alternate the mowing pattern each time the field is mowed.

Irrigation

Proper irrigation promotes deep and healthy roots, and helps the turf recover quickly from the damage inflicted by practices and competition. Among athletic field managers, the principle of "deep and infrequent" watering remains the norm. While this practice is generally effective, the physical soil properties must also be considered. A heavy clay soil will not accept as much water as a sandy soil, and will require lighter, more frequent irrigation.

The best time to irrigate athletic turf is in the early morning hours, just prior to or just after sunrise. Early morning irrigation does not interfere with field usage in most situations, and serves to minimize the period of leaf surface wetness, which helps to reduce disease incidence. Early morning irrigation tends to get more water to the soil, since evaporation rates at that time of day are minimal. Also, wind disruption of the irrigation pattern is of less concern in the early morning hours.

Most Kentucky bluegrass and perennial ryegrass fields will require between 1" and 1.5" of water per week. This can vary somewhat depending on the daytime temperature, cloud cover, wind conditions, and the fields soil composition.

Weed / Insect / Disease Stresses

The key to successful Integrated Pest Management (IPM) is the proper identification of the pest that is the cause of the problem. In diagnosing a problem, we must rule out as many of the cultural and environmental factors as possible, and then use all available clues to diagnose the problem. Once the problem is properly diagnosed, we can turn our attention to specific strategies for the control of pests, such as host resistance; biological, chemical, mechanical and cultural control.

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Weed / Insect / Disease Stresses (cont.)

It is important that we have a common understanding of the meaning of the term “pest”. When we speak of pests, we mean any living organism that competes with turfgrass plants for nutrients, light, water, air, and even space. Secondly, we need to be in agreement about the goal of pest control. While a few pests cannot be allowed to remain in athletic turf, for the most part our objective must be to control, and not to totally eradicate the pest in question. Proper scouting for pest problems will help to determine when pest problems are present, when the impact threshold of the pest infestation is reached, and when a control strategy should be implemented.

One of the first and foremost methods for resisting pest infestations is to choose turfgrass varieties that have been enhanced for pest resistance. Proper fertility, irrigation, and cultural management decisions can greatly reduce the incidence of pests in athletic turf and help the turf better withstand some levels of pest infestation. A healthy, vigorous turf is the best preventative in reducing the need for pest management programs.

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