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2004

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Committed to enhancing the professionalism of athletic field managers in New Jersey by improving the safety, playability and appearance of athletic fields at all levels through seminars, field days, publications and *networking* with those in the sports turf industry.

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Calendar of Events

Rutgers University Athletic Turf Classes

* February 24-26 Athletic Field Construction and Maintenance course
* March 9th The Importance of Understanding Athletic Field Soil
* March 16th The Importance of Understanding Athletic Field Turfgrass
* March 23rd Understanding Athletic Field Construction Procedures

For information call 732-932-9271
10% off for SFMANJ members

Annual SFMANJ Spring Field Day

April 20, 8am-3:00pm
Drum Point Sports Complex, Brick NJ
Box lunch included, Door prizes
No vendor booths
$35 members, $45 non-members
For more info call 908-730-7770
Fliers will be sent soon.

New Jersey Recreation & Parks Assoc.

Annual Convention & Trade Show

March 14-17 at Ballys in Atlantic City
For more information call NJRPA at 732-568-1270

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- ***Order supplies***
- ***Schedule all maintenance & repairs necessary for field through outside vendors.***
- ***Hire, train and supervisor full-time hourly employees and game day staff.***
- ***Establish and maintain budgets.***
- ***Be a team player. Actively participate in other operational functions as necessary including but not limited to pulling tarp, attending all scheduled events and meetings.***

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A common mistake committed by many sports field managers is to add infield mix to compensate for an improperly maintained lip.

Lip build up is caused by many factors and is to a large degree site specific in nature and severity. In this article we will consider some of the causes and controls.

The most obvious cause for lip buildup is the movement of infield mix from the infield into the grass perimeter. Improper grooming technique is the most limiting factor in proper lip management. Both wind and water erosion are also contributing factors. Game play is another obvious factor in particle migration and therefore lip buildup. The buildup caused by game play is most obvious at the turf adjacent to first and third base.

There is clearly no maintenance technique capable of preventing material movement within the confines of the infield skin. However, there are considerations and cultural practices, which can help to minimize this movement and its negative effects on safety and playability. There are in addition, procedures that can manage the lip buildup that does occur.

Most importantly, prior to all other maintenance procedures, the infield turf perimeter should be cleared of any infield mix that has accumulated since the last maintenance. This maintenance is essential prior to rain since rain has the ability to wash the mix down into the thatch layer where removal is much more difficult if not impossible.

Procedures available for this purpose are blowing, power washing and brooming. In more severe circumstances the use of a thatch rake is sometimes effective.

In view of the fact that you can't keep the infield mix from moving to the turf perimeter, it is sometimes beneficial to move the turf perimeter away from areas of concentrated disturbance caused by game play. By cutting out existing turf and increasing the distance from first and third base to the outer perimeter of the infield, the amount of mix that is deposited into the turf can be greatly reduced. There are different designs conducive to this concept. The number of options is limited only by your imagination.

Grooming technique is most limiting and therefore first on the list of preventative maintenance considerations. Always rake parallel to the foul lines and turf perimeters. When dragging the infield, always stay 6" from the turf. Vary your dragging pattern. Alternate your starting and stopping point. Never contaminate the turf with infield mix for any reason.

The amount of moisture contained by an infield mix, while being maintained within maximum and minimum limits could be considered the glue that holds an infield together and as such is a factor in lip management. The key is to determine these limits. The limits will vary based on site-specific factors. The most important factor to be considered when addressing moisture management is particle size and distribution of your infield mix. What is the physical analysis of your infield mix? What is the sand, silt and clay particle size analysis? Would your mix be considered a sandy mix or would your mix be considered a clayey mix?

The ASTM Standard Guide for Construction and Maintenance of Skinned Areas on Sports Fields has provided guidelines to help in identifying and classifying your particular mix. In general a mix containing 70%-85% sand size particles and containing 15%-30% clayey mix is considered an acceptable product. The sandier a mix is, typically the less stable it is given the affects of game play. The higher the percentage of sand a infield mix contains, the more difficult it is to maintain moisture at levels sufficient to promote stability.

The more clayey an infield mix is, the more that mix tends to retain moisture and the more effective moisture becomes as a means of stabilization. Let me repeat; this moisture is only beneficial when maintained between site-specific limits. Most all of us are aware that a clayey mix usually takes more time to condition after a heavy rain than a sandy mix. The benefit derived from the ability of a clayey mix to retain moisture is lost in this circumstance because the level of moisture has exceeded the limits of potential benefit.

It should be understood that a mix on the clayey side of the ASTM standard that is allowed to become very dry is somewhat difficult to rewet. Tilling or some other means of cultivation is sometimes necessary as a part of the wetting procedure.

When a level of maintenance is reached which allows for the "scheduled" periodic application of water, a soil amendment such as calcined clay may be beneficial in extending the duration of time between water applications. It must be understood that these products constitute the potential for a double-edged sword.

As was addressed earlier, a sandier mix or a mix with more sand "sized" particles is less stable and is more likely to migrate given the effects game play. If moisture levels are permitted to vary beyond the limits of potential benefit (either too wet or too dry), these products will display characteristics similar in nature to sand. When allowed to dry out, a mix that has been modified with an amendment such as calcined clay will have characteristics similar to a sandier mix, which does not have an amendment added. If allowed to become saturated, a mix amended with a product such as this will move in much the same way as a sandier mix.

For the purposes of this article the characteristics of a dry infield mix are determined almost solely by particle size and nothing more. When discussing the stability of an infield mix, a dry calcined clay particle will differ little from a dry sand particle given the same particle size. If anything, the clay particle will be more mobile due to being lighter and maintaining a lower bulk density. The benefits of products such as calcined clay are only realized in their ability to absorb moisture and aid in maintaining moisture levels between site-specific maximum and minimum limits.

I have in the past used the following comparison to explain the affects of moisture on a sandy infield mix. When walking along the beech an observation can be made. Up on the beach where the sand is dry the conditions are very unstable. You sink into the sand. As you approach the waterline, the sand has more moisture content and as such gains stability and firmness. As you enter into the water and the sand becomes saturated it again looses stability. The moisture in the sand provides stability only between maximum and minimum saturation levels.

Wind erosion is a subtle culprit that can slowly but surely eat away at the integrity of your infield. It is obviously site specific based on the severity and consistency of the wind. As with any erosion problem (wind or rain) wind erosion impacts on the smaller and or lighter particles. For this reason wind erosion has the potential to erode the silt, clay, fine sand and or added amendments from your infield and deposit this material at the turf perimeter adding to the problem of lip buildup. Along with adding to lip buildup, if allowed to persist, wind or rain erosion will destroy the integrity of a clayey mix and leave you with a sand box.

Controls would include providing a windbreak to minimize wind velocity. This can be incorporated into the permanent perimeter fencing. It can also be provided as snow or silt fence utilized during the off-season. If snow or silt fence is utilized as a windbreak during the off-season, remember to keep it away from the turf on the down wind side of the field. If a windbreak is installed to close to the turf it will cause airborne particles to drop right into the turf. As can be observed by the effective use of snow fence in winter storm management, drifting occurs on the downwind side. Maintaining moisture levels within the mix will increase stability of the mix and also minimize erosion.

When discussing erosion of a specific infield mix caused by water (rain), two major factors contribute to the severity of the problem. These two factors are water volume and velocity. The more water there is and the faster it travels, the more severely it impacts on the stability of the infield mix.

First, consider water volume. The volume of water is the amount of water you are dealing with. Although you cannot control the amount of rain you receive, there are a number of ways to control the volume of water that travels within the confines of an Infield.

1. Cover the infield when it rains. For most of us this is an impossibility

2. As water travels along a linear path it increases in volume. Limit the distance the water travels before exiting the infield and you limit the accumulated volume. By properly grading the infield, you can direct water the shortest distance to the perimeter thereby limiting the volume of water. An example of one such grading plan would be to maintain the pitchers area as the high point of the infield and slope the infield to the perimeter with all bases being approximately level to one another.

3. Limit the concentration of water in specific areas when exiting the field. An example of the very worst grading design which encompasses the very worst of examples #2, #3 and #4 would be a skinned infield with home plate as the low point of the entire infield. As

water is funneled to a central location potential volume is increased and therefore the potential severity of erosion is increased. This problem is also magnified due to the distance the water has traveled in order to exit the infield.

4. Eliminate the potential for water to enter the infield from other areas during episodes of rain. If the outfield or foul territory is higher than the infield, water should be channeled away from the infield by some means.

The second player in this game of erosion is velocity or the speed of the water. Water increases in speed or "velocity" with an increase in slope. By minimizing slope you minimize velocity and therefore minimize erosion. Professional fields I have read about maintain around ½ % slope. This equates to approximately 5 ½ inches of fall from the area at the base of the pitchers mound to the turf radius assuming a 90' radius. I prefer to maintain a slope of between ¾ % and 1½ % on the infields I take care of. I believe, at less than ¾ % there is too much potential for ponding and above 1½ % there is too much potential for erosion. These tolerances become more critical as the distance to exit increases. Remember, volume and velocity increase with distance as long as the supply (rain) remains constant

The last factor that contributes to the development of a lip that I stumbled on (literally) by accident is the combined affects of freezing and thawing along with the increased development of a thatch layer at the turf perimeter.

In November of last year I returned to an infield I had recently renovated to admire my work. I had completely resodded the perimeters of the infield and for that reason I was certain there was no lip. To my dismay a defined lip had developed within a period of days. The freezing and heaving of the very edge of the sod caused the lip. I believe this honeycombed soil structure provides an avenue for the inwashing of material from the infield. In addition to increasing the volume of soil within the lip, this modified root zone coupled with increased moisture supply at the perimeter of the infield promotes a localized environment conducive to the development of a concentrated root system. With this proliferation of root development comes an increase in thatch layer and therefore an increase in elevation contributing to a lip.

Depending upon the severity of the lip, there are a number of ways to deal with it after it has established. The most aggressive procedure would be to use a sod cutter and remove the entire area of turf that rises above the desired elevation. The excess material that has accumulated below the sod is removed and the area is either resodded using the existing sod or new sod is brought in for the procedure.

A less aggressive approach to the problem is to dig a shallow trench adjacent to the turf lip and roll the lip into the trench. This procedure is most effective if the lip is very narrow and defined in relation to the desired elevation.

* A procedure that fills the gap between the least invasive (trench and roll) and most invasive (sod cut) procedures is to aggressively core aerate the area of lip, remove the cores and then roll the lip to the desired elevation. There must be enough volume of material removed through the aeration process to allow for the movement of remaining material without increasing compaction. The aeration procedure must penetrate deep enough to provide compaction relief 2" to 3" below the desired finish grade. There must be sufficient soil moisture available so as to allow for movement in the soil but not so much moisture so as to allow for smearing of the soil, which is in fact damaging to the soil structure.

*This idea was contributed by Brian Meola of Washington Township Parks & Recreation (Morris County). ◆

Did You Know?

Phosphorous is the least soluble of the major turf nutrients and as such moves very slowly through most native soil root zones. For this reason much of the phosphorous applied, is not available to the turf roots in the year of application. In new construction, if soil test results report phosphorous as "low" availability, it is advisable to incorporate half of the recommended phosphorous into the root zone prior to seeding and topdress the balance. ◆

Rutgers Corner — Crabgrass control strategies for sports fields

By Brad Park, Rutgers University — *park@aesop.rutgers.edu*

"Crabgrass can grow on bowling balls in airless rooms, and there is no known way to kill it that does not involve nuclear weapons" – Dave Barry, Miami Herald

With spring soon to arrive, it is an important time to begin thinking about options for controlling crabgrass. If a significant soil seed bank exists and there are voids in the turfgrass stand which minimize competitive benefits of the turf, as a summer annual, crabgrass will germinate profusely in the spring, mature throughout the summer months, and die in early fall at the first killing frost leaving dead "skeletons" throughout the landscape. Crabgrass seed will typically begin germinating after April 10 in South Jersey and by April 20 in Central and North Jersey. Crabgrass will continue to germinate though mid-July.

Integrated Pest Management (IPM)

Recall that IPM attempts to reduce the risk that pest control strategies may have on the environment and people by incorporating all suitable techniques to maintain pests within acceptable limits. Although it is a common misconception, IPM ***does not*** entail the elimination of pesticide use.

Simply mowing at a cutting height suitable for the specific turfgrass species or mowing at a frequency such that scalping is avoided can constitute IPM. Improper mowing techniques leading to scalped turf will thin-out turfgrass areas, lead to voids in the stand, and subsequently provide opportunities for crabgrass to encroach. IPM also entails proper fertilization. Under-fertilizing turfgrass will often result in a weak stand, poor turf density, and an environment in which crabgrass can readily invade. Yearly nitrogen requirements per 1000 ft^2 for cool season turfgrasses used on New Jersey sports fields are: Kentucky bluegrass, 2-5 lbs; perennial ryegrass, 3-5 lbs; tall fescue, 2-4 lbs. High-use sports fields often necessitate the high-end of these nitrogen fertilization guidelines in order to encourage turfgrass recovery from traffic.

Preemergence herbicides: Are they an option?

For sports field managers whose cultural program includes spring overseeding of his or her fields, applying most preemergence herbicide products at the time of seeding will not only deter crabgrass emergence, it will also inhibit establishment of cool season turf. Products such as pendimethalin (Pendulum or Pre-M), benefin + trifluralin (Team), prodiamine (Barricade), oxadiazon (Ronstar), and dithiopyr (Dimension) are not viable options for preemergence crabgrass control if overseeding is a part of the manager's spring program. Depending on the product and the application rate, the residual of these products is such that the seeding of desired cool season turfgrasses may not begin for 2 to 6 months following the application of the herbicide. Additionally, these products many not be used in newly seeded turf as young turfgrass seedlings are highly susceptible to the phytotoxic effects of these herbicides.

Siduron

Siduron (Tupersan) is a herbicide that is labeled for preemergence crabgrass control in newly seeded Kentucky bluegrass, tall fescue, and perennial ryegrass. Tupersan is formulated as a wettable powder and should be applied in the spring to coincide with maximum crabgrass germination. The label calls for either a single application of product at 4.0-12.0 lbs/Acre or sequential applications at 6.0-12.0 lbs/Acre followed by a 4.0-6.0 lbs/Acre application 4 weeks later.

Postemergence herbicides

In order to use the chemical tools available to selectively treat crabgrass postemergence, the sports field manager must be able to accurately identify crabgrass at various seedling stages. Large crabgrass seedlings are characterized by upright growth and leaves that are rolled in the bud, lack auricles, and have a jagged membranous ligule. Large crabgrass leaf blades and sheaths are covered with stiff hairs. Smooth crabgrass is similar to large crabgrass, however it has fewer hairs on its leaf blades and sheaths.

Quinclorac and fenoxaprop

Quinclorac (Drive) and fenoxaprop (Acclaim Extra) are labeled for the selective postemergence control of crabgrass in perennial ryegrass, Kentucky bluegrass, and tall fescue. Quinclorac is effective in controlling young, un-tillered crabgrass seedlings and may be applied up to 0.75 lbs/Acre (1.0 lb Drive/Acre). To increase the efficacy of weed control, the label recommends applying quinclorac with an oil-based adjuvant such crop oil concentrate or methylated seed oil.

Quinclorac may be applied up to 7 days prior to the seeding of tall fescue, Kentucky bluegrass, and perennial ryegrass, at the time of seeding for perennial ryegrass and tall fescue, 7 and 14 days after the emergence of tall fescue, and 1 month after the emergence of Kentucky bluegrass, perennial ryegrass and tall fescue. The label notes that adjuvants should not be added to quinclorac applications to newly seeded turf prior to 28 days after seedling emergence.

Fenoxaprop may be applied at rates ranging from 0.016-0.17 lbs/A (3.5-39.0 fl. oz Acclaim/A) depending on the stage of crabgrass growth and established turfgrass species. For example, 4-5 tiller crabgrass may be treated with fenoxaprop at 0.17 lbs/A (39.0 fl oz Acclaim Extra/Acre) in perennial ryegrass and tall fescue whereas no more than 0.12 lbs of fenoxaprop (28.0 fl oz Acclaim Extra/Acre) may be applied to 3-4 tiller crabgrass in Kentucky bluegrass turf.

Following applications of fenoxaprop, tall fescue and perennial ryegrass may be seeded immediately. Following germination of tall fescue and perennial ryegrass, fenoxaprop should not be applied until seedlings have matured for 1 month. Of the cool season turfgrasses used on sports fields in New Jersey, Kentucky bluegrass is the most susceptible to phytotoxic effects associated with fenoxaprop. For example, when utilizing fenoxaprop rates greater than 0.04 lbs/A (9.0 fl oz Acclaim Extra/A), Kentucky bluegrass seedlings must be at least 3 growing months old before fenoxaprop can be applied. Additionally, 21 waiting days should be allowed following the application of fenoxaprop prior to seeding Kentucky bluegrass

Due to the complexity of Drive and Acclaim Extra labeling with respect to crabgrass growth stage susceptibility, individual turfgrass species herbicide tolerances, and turfgrass seeding timings, pesticide labels ***must*** be thoroughly read and understood prior to the application of these materials.

Literature Cited

Hart, S. 2000. Crabgrass and goosegrass control in cool season turfgrass. Rutgers Coop. Ext., NJ Ag. Exp. Stn., E233. ◆