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for fields with perennial ryegrass. Knowing the potential for an outbreak is essential for controlling this disease in turf. Using the predictive model to time the right fungicide application has given managers the effective margin of control to manage this disease.▲

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Answers to Test Your Understanding from "Before You Can Mow it," page 7:

1. PH, air, soil moisture, nutrient availability, height of cut, intensity of use
2. 1/3
3. Aeration
4. Macro
5. Micro
6. Large pore space, bulk density
7. Leach
8. Salt index
9. Excessive
10. Alligators

"One Sports Field Manager's Experience"

Developing a Renovation Strategy

by Jim Hermann, CSFM

It was around May of last year when I had the opportunity to be involved in the renovation of three adjacent soccer fields. This opportunity was unique in that we were able to utilize different techniques and products on the different fields with the common objective of achieving a quality stand of turf. By understanding the products and equipment we were using, we hoped to gain optimum results thru different applications and procedures.

As should always be the first objective in any renovation, soil samples were taken and we had both a physical and chemical analysis accomplished on each field. The physical analysis gave us the sand, silt and clay composition or "texture" of the soil. The chemical analysis of the soil provided us with the level of availability of all the major nutrients necessary for the establishment and maintenance of healthy turf. Along with providing us with the current level of availability, the chemical test results gave us recommendations to bring deficient nutrient levels up to optimum.

Our physical analysis reported the soil "texture" to be that of a "sandy loam" with 56% sand, 34% silt and 10% clay. This information was necessary in determining the compatibility of our topdressing material. We wanted a material of the same classification (sandy loam) with at least as much or more sand content.

The first problem we noticed when reviewing the chemical test result was that the soil Ph was reported as 5.5 with a lime recommendation of 150 lbs./1000 sq. ft. Turf grows best at a Ph from 6.0 – 6.7. In addition, the test results recommended that the lime be applied at no more than 50 lbs./ 1000 sq. ft. per application. Subsequently we scheduled the initial application of lime that very week. Lime is very slow to react in the soil and we wanted as much benefit from the lime as possible, prior to seeding. A second application was scheduled to coincide with our renovation around the third week in August. This is considered the optimum time for turf renovations in our area. With ph addressed we moved on to the next priority in our renovation process; evaluation of the balance of the soil test results. Along with the low level of calcium that was addressed with our lime application, our chemical soil analysis also reported phosphorous to be at a low level of availability. Since phosphorous is necessary for the development of a healthy root system, it was imperative to address this deficiency in our renovation process.

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Our test recommendation called for 2 ½ lbs. of phosphorous per 1000 sq. ft. Potassium was above optimum levels in the soil so there was no need to address this nutrient with our initial application of fertilizer.

This is where the process became very interesting to me. I have always had an insatiable need to understand the mode of action of different nitrogen sources and how this affects the health and vigor of the turf. I firmly believe that by understanding and utilizing nitrogen properly you can greatly improve the effectiveness of your fertility program.

I had been in contact with a company that manufactures a UF (urea-formaldehyde) nitrogen product. Blue chip, as it is commonly referred to, is a very slow acting synthetic organic nitrogen source. About 30% of the nitrogen is very slowly water-soluble. The other 70% is water insoluble and is broken down and supplied to the plant thru the microbial action of the soil. Because it is released by the microbial activity of the soil, Blue chip's release pattern somewhat mirrors the growth habits of the turf, releasing more nitrogen during those periods conducive to turf growth such as spring and fall and less nitrogen during drier warmer weather such as summer. Release becomes almost nonexistent thru the winter when soil temperatures fall close to or below freezing. The water insoluble portion of this nitrogen source can take up to 12 months to break down and some say even longer. I have used this product for many years in residential maintenance but have never had the opportunity to observe the results of its use in athletic field fertility programs.

The manufacturer agreed to provide us with enough product to cover the initial nitrogen needs of one soccer field and we in turn agreed to document our procedures and take pictures along the way.

In order to properly calculate the application rate I called on an agronomist who serves as consultant for the fertilizer manufacturer. He recommended a rate of 3.8 lbs. nitrogen per 1000 sq. ft. applied at the time of renovation. The product is a 38–0–0 which means we had to apply 10 lb. of product per 1000 sq. ft. to supply 3.8 lbs. of nitrogen.

At first, this might seem an extreme amount of nitrogen to apply at any one time and to most it would seem it goes against the standard recommendation; do not apply more than 1 lb. nitrogen with any one application. Again, lets look at the product. It is about 30% very slowly water-soluble. In addition, it has a very low salt index. This means about 1 ¼ lb. of the nitrogen is initially available and the product has literally no burn potential. The balance of the nitrogen (70%) will break down over the next year or so.

Another important consideration when applying this amount of product would be that we aggressively aerate the field as a part of the process. This would not only help to incorporate the fertilizer into the soil, but also help to incorporate the seed and lime as well. I would not contemplate applying this amount of nitrogen without aggressive aeration or other method of soil tillage.

As I stated earlier, in order to satisfy the soil test recommendations all three fields were in need of 2 ½ pounds of phosphorous per 1000 sq. ft. Since we had chosen blue chip as our nitrogen source on this field, we needed a source of phosphorous that would not supply us with any nitrogen. We chose triple superphosphate as that source. This product has an analysis of 0-46-0 which means we had to apply approximately 5½ lbs. of material per 1000 sq.ft. to supply 2½ lbs. of "available" phosphorous.

Now that we had a fertility strategy for the one field we still needed to come up with a strategy for the other two fields. We decided on a more traditional approach to the fertility program for these two fields. We needed a fertilizer high in phosphorous but we didn't need potassium because it was already off the board (above optimum) according to our soil test. Our test results recommended a fertilizer with a ratio of 1-3-0. We chose diammonium phosphate (DAP) as our "starter" fertilize Diammonium phosphate has an analysis of 18-46-0, which closely follows our recommendation for a 1-3-0 ratio. Applied at the rate of 5½ lbs. product per 1000 sq. ft., we would be supplying about 2 ½ pounds of phosphorous along with about 1 pound of nitrogen. This fertilizer would not only supply the needs of the germinating seed but would also stimulate the existing turf on the fields.

With all the nitrogen from the 18-46-0 being fast release, we felt we were going to need another application of nitrogen approximately 4 – 6 weeks after our intended renovation at the end of August. We wanted to continue to promote root development and lateral growth in the new seedlings up until turf dormancy. This gave us a tentative time frame of around the first part of October for a second application of nitrogen on these two fields. Because we anticipated cool wet weather thru the end of the growing season, we were looking for a nitrogen source with good low temperature response and dependable release characteristics. We wanted a slow steady supply of nitrogen without the risk of over stimulation, which could potentially be caused by a fast release or less dependable slow release form of nitrogen. We chose Isobutylidene Diurea (IBDU) as the nitrogen source. We felt it would give us the slow steady release pattern we were looking for thru the end of the growing season and it was a stable enough product to carry a portion of it's nitrogen over the winter and give us good response in the spring.

After deciding on the source of nitrogen, we needed to decide on the rate. Due to the slow initial response and the long residual supply of nitrogen provided with IBDU we decided on a rate of 2 lbs. nitrogen per 1000 sq. ft. IBDU has an analysis of 31-0-0. We therefore needed to apply about 6½ lbs. product per 1000 sq. ft. to supply a total of 2 lbs. nitrogen.

The next two decisions necessary in the renovation process were the choice of topdressing material and the rate of application.

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We chose a product that combines 60% mushroom compost with 40% sandy loam topsoil. The soil texture classification of this material still conformed to a sandy loam, which made it compatible with our soil. The mushroom compost adds organic matter and available calcium to the blend along with organic nitrogen and some phosphorous and potassium. Although we did have a chemical analysis completed on the material, in hindsight I wish a test had been done on this material to determine the fertilizer affect we were gaining from it. This unknown factor continues to bother me. It should have been accounted for in our fertility program. We did however anticipate some adjustment in Ph thru the use of this product. It seems that over the years, mushroom farmers have learned that the higher the Ph of the mushroom compost (to a degree), the more mushrooms they can grow. Mushroom compost is therefore typically full of calcium. For this reason, no more lime will be applied until after another soil test is completed.

We chose a rate of ¼" depth for the topdressing. We have found that with a renovation a ¼" cover of topdressing improves the germination rate of our seeding. I believe this is caused by improved soil seed contact and improved nutrient availability in close proximity to the seed.

At this point we had developed a program, actually two different programs to address the fertility requirements of our fields. We then needed to develop a plan to cultivate the fields and plant the seed.

Our arsenal of equipment consisted of a slice seeder, aeravator, deep tine core aerator and a top dresser along with the tractor to operate them.

The aeravator is a solid tine aerator with the added benefit of vibration supplied to the tines through PTO power. It is very effective in the heavy textured soils predominant in our area.

Our first course of action was to deep tine core aerate each of the fields to relieve the compaction four to five inches in the soil and bring cores to the surface which when dragged in would help to smooth the surface. Our second objective would be to aeravate the fields with an initial pass to further fracture and cultivate the top two or three inches. We then topdressed with 1/8" topdressing in hopes that the topdressing material would filter into the aeration holes and fractures created by the initial operations. We decided to aeravate the fields a second time to further cultivate the soil and incorporate the topdressing material.

As we started aeravating it became evident that we were dealing with a couple of different factors, which affected the aggressiveness of the aeravation procedure. First, we were still in the midst of a drought and the fields were very dry. Aeravation is much more aggressive in dryer conditions than it would be in a soil with more moisture content. If we had been aeravating for the purpose of a maintenance procedure and not as a procedure incorporated into a renovation, I would have determined the result to be overly aggressive with a great potential to cause damage to the existing turf. Because we wanted good soil seed contact and there was rain in the forecast, we felt the procedure was safe and effective.

We decided to use the drier than normal conditions and the aggressiveness of the aeravation to our advantage. We chose to apply half the seed with our second aeravation procedure utilizing the attached seed box in hopes of getting a little more even distribution of seed and apply the other half the seed by slice seeding.

The second factor we were dealing with was that there were variations in the amount of existing turf cover on each of the fields. One field in particular had very little existing turf. The second aeravation procedure proved so aggressive that we felt we could apply all the seed and eliminate slice seeding on this field. This decision was also due in part to a strong prediction for rain that very evening and the need to complete the project as quickly as possible.

Because the fields were initially seeded in perennial rye we decided to stay with perennial rye but also wanted to try incorporating Blue grass into the mixture to gain the recuperative ability of Blue grass to rhizome into damaged areas of turf. We decided on a mixture of 70% perennial rye, 30% blue. Although we chose aggressive varieties of blue grass, It is considered a difficult task to introduce blue grass into a predominantly perennial rye field and for this reason a higher percentage of blue grass may have been more effective.

It should be noted at this time that there are very few absolutes in athletic field maintenance. Every decision you make is a judgment call. All you can do is look at the situation from as many angles as possible and draw your conclusions based on your experience and the experience of the professionals around you.

The two remaining fields were slice seeded in addition to the two aeravation passes and then topdressed with the remaining 1/8" of material. That having been done, our renovation process was complete.

As the fields developed after the renovations, the rows of turf created by the slice seeder became very evident on both of the slice-seeded fields. The third field, though not slice seeded had significant and acceptable turf development due to the aggressive cultivation and soil seed contact caused by the aeravator.

The first week in October IBDU was applied to the two fields that did not receive the blue chip nitrogen. Development of all the fields was impressive. There were no differences in their development that could be attributed to the different nitrogen programs. As turf dormancy took over around the end of October I did have some concern for the lush green appearance of the turf and its potential to stimulate snow mold thru the winter.

An evaluation in March did reveal significant snow mold damage, the cause of which could not be blamed solely on high fertility. Snow mold was common throughout the state due to the severity of the winter.

Spring green up was consistent and acceptable throughout all the fields and the turf recuperated from much of the snow mold damage. As the rainy wet weather continued throughout the spring, Red Thread

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fungus became the next consideration. Although a light application of a fast acting water soluble nitrogen is recommended to alleviate the symptoms of Red Thread we felt the potential increase in top growth caused by the application was not warranted based on the extent of the Red Thread we observed.

All three fields started to look a little hungry around the end of May and it was agreed that we would apply 1.5 pounds of nitrogen per thousand square feet utilizing methylene urea. This particular product has a small amount of urea for immediate response with approx. 50% being slowly water soluble and the remaining portion being released by the microbial action of the soil similar to the urea- formaldehyde we used for the renovation of the one field. The difference being, methylene urea incorporates a higher percentage of slowly water-soluble nitrogen with a little less water insoluble nitrogen, giving it a faster release pattern than the UF. In contrast methylene urea has a longer residual affect than most of the coated urea products along with a lower salt index. It's a matter of matching the product with the desired response.

There is little if any difference in the quality of each of the fields even though we used different products to accomplish our objectives.

Its now August and the soccer teams are using all three fields. I guess that's job security. ▲

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"Question & Answer"

by Jim Hermann, CSFM

Question: This year it seems as though we have a bumper crop of crabgrass. What is the right way to deal with this problem?

Fact: Crabgrass is a summer annual that germinates, matures, reseeds itself and dies within the confines of one calendar year. The seeds germinate and small plants emerge in the late spring or early summer after soil temperatures reach or exceed 55 degrees for an extended period of time. The young crabgrass is course textured and light green in color. Initially, as an immature plant, crabgrass really doesn't seem too competitive or invasive. As it matures crabgrass has a very prostrate or horizontal growth habit, which interferes with the existence and development of desirable turf. These mature crabgrass plants reseed before dying with the first frost thus setting the scene for next year's generation.

Answer: The correct answer is that there is no single right or correct way to deal with crabgrass. The best answer to this question lies in your ability as a sports field manager to assess your individual turf program and as such the degree to which crabgrass infestation impacts on the objectives of that program.

There are a number of ways to deal with crabgrass control. You can treat in the spring with a preemergent control product or you can treat in the summer or fall with a selective post-emergent product. You can even treat with a product combining both pre and post-emergent qualities thereby extending the application window of that product in the late spring, early summer. In certain situations a non-selective post-emergent (total kill) application is warranted.

Now, what does all this mean? A 'post' emergent crabgrass control product is a product that controls the crabgrass after it has emerged and is visible within the stand of desirable turf. A 'pre' emergent crabgrass control product is a product that prevents an anticipated infestation of crabgrass by interfering with the seed germination. 'Selective' means that you have discretion on what plants you want controlled based on the label of the product chosen. 'Nonselective' means you have little discretion on what plants are affected by the application. A complete understanding of the label description of any product is required by every applicator prior to the application of that product. It should be understood that most preemergent crabgrass control products also interfere with the germination and establishment of desirable turf seed

As a sports field manager, my main objective is to maintain my fields in a 'safe' and 'playable' condition. If I can't shut a field down and crabgrass is the only existing turf cover, it would be my decision to leave it. Once this decision is made, a long-term plan would need to be considered in order to correct the problem in the future. This could include a late fall seeding after the cool weather has killed or severely compromised the development and competition of existing crabgrass. Slice seeding is recommended for this procedure. A follow-up application the following season in the late spring of a crabgrass control product would be indicated. This application should be made after the new seeding has emerged and established in the spring.

If in late summer, it is decided that there is a significant amount of desirable turf within an infestation of crabgrass, the crabgrass could be treated selectively with a post emergent product. In this situation overseeding of desirable turf could be accomplished earlier in the fall while still being effective due to the earlier elimination of competition caused by the crabgrass. The crabgrass control product label should be referenced to insure that seeding is not accomplished too soon after the crabgrass control application.

If the field can be shut down for the fall season, the following options exist.

1. If desirable turf is non-existent or at best not worth considering, a non-selective herbicide could be applied to kill all existing vegetation and overseeding accomplished after the label recommended wait time.
2. If there is a significant amount of desirable turf, a selective post emergent product could be applied to eliminate the crabgrass and seeding could be accomplished after the label recommended wait time has elapsed.

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