MAINTENANCE PROGRAMS TO REDUCE ATHLETIC FIELD INJURIES

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In a recently published article about sports related field injuries researchers from Penn State University found that overall 21% of all field related sports injuries could be correlated to the conditions of the field. In light of this published finding I am certain it will not be long before we see some one in court trying to defend the fact that a player was injured on a field that was clearly not properly maintained. I wonder how much longer we can use the adage "That's the home field advantage" when what we are really referring to is a problem of poor field maintenance. We in the turf grass industry have long recognized the relationship between quality playing surfaces and player safety. However, we have not always been so successful when we attempted to improve these conditions. Factors such as employee costs, fertilizer costs, and lack of knowledge have really hindered many well intended turf managers. What this really may relate to is poor turf management and salesmanship. At Detroit Country Day School we have been able to develop a very successful turf management program that makes careful consideration of field conditions and player safety.

When you think of a school, the first images that come to mind are usually crushed concrete playgrounds, monkey bars and unkempt playing fields with more dirt than grass. Such is not the case at DCDS. In fact nothing could be further from the truth. Located in the village of Beverly Hills, a northwestern suburb of Detroit, DCDS boasts a deep heritage of educational excellence begun in 1914 by its founder F.Alden Shaw. Following the motto of "a sound mind, in a sound body," the private coed school offers a quality, college-prep program from pre-kindergarten through high school, and an athletic program few schools could match.

The school is located on a 46 acre tract of land (12 acres were just added) that is geologically represented by heavy clay soils that resulted from the last glaciation of this region of Michigan about 14,000 years ago. On the eastern border is the 7 acre Schlegel Nature and Fitness area. There is approximately 17 acres of land now devoted to athletic practice and game fields. As a result of the school's strong commitment to a quality athletic program the fields are used approximately 5 hours a day by 700 students. The sports of football, soccer(men's in the fall and women's in the spring), women's field hockey, baseball, and La Crosse are played on these fields. Since the fields are all built on heavy Michigan clay, the result is one, continuous battle with compaction. It was not uncommon four years ago in the spring to go from field conditions that were too muddy for good play to fields that were so hard and dry that shin splitting of the players became a problem. For this reason it was indeed very important to establish the best cover of quality turf grass possible.

The Department of Grounds Operations was challenged by the schools headmaster Dr. Richard A. Schlegel, to come up with a school where the outside environment was in keeping with the traditions of excellence that

had been established in the classroom. As a result of this challenge we have today some of the best natural turf grass playing fields possible.

The field maintenance practices that will be discussed in this paper may be divided into four part program where each part of the program is a compliment of each of the other parts. The first and quite possibly the most important part of the program comes from the simple idea of COMMITMENT. At Detroit Country Day School turf grass excellence begins with a commitment from the president/headmaster Dr. Schlegel and is passed down through the ranks to translate into an organization that is built around the individual employees and the professionalism that each is capable of contributing to the organizational team. The appearance of any place of business, whether a school or not, reflects the overall quality of the organization. It is this type of attitude that gives the Grounds Operations Department the opportunities it has to construct the fields to the best possible specifications. An attitude "that all work is worth only the very best results" prevails in this type of organization. It provides the employees with a feeling of individual self-worth. They are able to feel a part of the entire process.

The second part of this program of maintenance conditions as they relate to sports field injuries has to do with ADJUSTING THE CHEMISTRY OF THE SOIL. Right in line with this is coupled the quality of the grounds supplies that you use and as equally important to this is the quality of the suppliers technical representatives. These individuals receive training in may of the various fields that relate to the turf care industry. Any good turf manager can tell you that growing grass is a very easy task. However, for the sports turf manager nothing could be further from the truth. How the grass grows, its ability to withstand day after day practice and game playing, its ability to perform under even the worst possible playing conditions are just some of the things that go through the sports turf managers mind every day of the season.

A good turf manager recognizes that there are people in this industry that actually know more about treating certain turf problems and how to correct them than the the manager may at that time. Each and every day new products are being developed to meet the needs of the turf manager. Many of the largest suppliers of turf related products have some of the best educated and scientifically trained research scientists available. These people are in touch with what is happening in the turf grass industry and their livelihood depends on their ability to properly represent the products that they sell and then offer technical support to the turf manager as he attempts to adjust and correct his or her situation. This is why we feel this second part of our program ADJUSTING THE SOIL CHEMISTRY is so very important to the establishment of a proper growing medium for quality turf grass growth.

It is very important to realize that at times the turf manager must make use of the such things as testing of the soil chemistry to develop the proper program for quality turf grass growth. One might speculate that if you could adjust the soil conditions to enable better top growth and root growth of athletic turfgrass then it would be possible to reduce possible related field injuries. The Technical representatives of the various turf product suppliers are there not only to sell their product but to also help

you as the turf manager produce better quality turf grass. We at DCDS have been able over the last four years to dramatically alter the soil chemistry with which we work.

Four years ago when we had our football field soil tested we found that the pH of the soil was 8.1. This is a very basic soil condition that causes many of the nutrients to be bound up in the chemistry of the soil and not available to the turf grass for growth. With the proper program of sulfur treatment, the addition of micro-nutrients, and the adjustment of many of the other major soil nutrients we have been able to reduce the pH of our soil 7.0-7.1. This is almost an ideal pH for the establishment of quality turf grass growth. Therefore through the use of proper soil testing techniques we have had a significant impact on our ability to produce the kind of quality turf grass that can stand up to day in and day out practice and play.

However, simply adjusting the pH of the soil will not produce quality results. A good sports turf manager knows that all fields that are green are not necessarily quality turf grass. Often after close examination of the field, large patches of chickweed, knotweed and other closely grouped above ground running weeds can be found. The elimination of these types of turf grass problems must first be addressed before any successful program can begin. Here at DCDS we have met this challenge by using a carefully planned program of fertilizer with d cot weed control application. Over the years we have found that working with the same product time and time again may cause a reduced return. The technical representatives from the O.M. Scott's Co. have really been one of our greatest assets. They have helped us to better understand the needs for proper soil management. We have visited their research facilities to see just what goes on in their product research. They have helped us to maintain a careful cost control program for fertilizer needs and at the same time develop sports turf and landscape turf grass areas of the highest quality.

In dealing with the very severe problems of soil compactions that we have to work with we have tried several different techniques with our greatest success coming from two different sources. The first is the use of chemical amendment AQUA GRO-S. As a science teacher as well as a grounds director I am always interested in the testing of various products. This is exactly what happened with the case of this soil wetting agent. We had on our grounds areas where sod had been placed right over the clay subbase soil with no other topsoil. The grass in some of these areas need to be cut about once every 6 weeks. Virtually no substantial growth occurred. Even with the use of a good fertilizer program we could not seem to establish a healthy stand of turf grass. After the first application of Aqua Gro-S we had an almost instant and sustained growth of grass. We have since begun a complete program of the application of this material to all turf areas. Not only does this material increase the water permeability in the soil it also causes many of the nutrients that were otherwise unavailable to turf grass growth to be released by the soil for uptake by the turf grass. At the same time we have been able to also increase the effectiveness of our other fertilizers and chemical additives. A great cost savings.

The second method we have found very successful only recently, that is mechanical aerification. The reason for this is that until only very

recently have we been able to find a machine that could actually penetrate our compacted clay soils. We had tried all of the conventional machines available with no success. As an example we had one machine that we added 850 pounds of weight to an were only able to penetrate to a depth of 3/4".

The machine that we now use is called the VERTI-DRAIN. It is manufactured in England. Here in the United States, John Kirtland Enterprises is distributing the machine (at least in the Midwest). When this machine was brought to our grounds we were told that it could penetrate even the most compacted clay soils to depths of 16". We challenged the distributor to a lunch that there would be no way any machine could do that on our fields. The Verti-Drain not only penetrated our heavy compacted clay soil it also shattered and lifted the soil as well. Needless to say we have had a great deal of success now with soil aerification.

In our interest to learn more about how this type of deep soil aerification helps improve the soil conditions we are also helping a student at DCDS with his 1986 Metro-Detroit Science Fair Project entry. The title of his project is "DOES REDUCING SOIL COMPACTION IMPROVE THE SOIL CHEMISTRY AND INCREASE TURF GRASS GROWTH". He has taken a series of samples from aeriated and non-aeriated sections of our sports fields. He is examining these samples for their structure differences, the soil chemistry differences, and their ability to improve root growth of the turf grass. At this time the results are indeed very encouraging. We have found in all aeriated conditions that the soil has a more uniform structure. The almost instant difference between the comfort level of walking on the fields in really remarkable. When 91 sixth grade science students were asked to identify the place on the fields that was the most pleasant and comfortable to walk on, every single student choose the recently aeriated field portion. They had no prior training on what to look for.

We are very encouraged by these results. We feel now with the use of the Verti-Drain on a regular basis we should be able to have significant impact on changing our soil compaction. In one test plot we were able to topdress the area with about one inch of screened sand before aerification. The sand was then incorporated into the clay soil profile. We also expect that this type of mechanical treatment of the soil combined with our established chemical program will really help to develop a very thick, well rooted, dense growth of turf grass. It should be expected that under these conditions field injuries can be significantly reduced.

The CUTTING AND MAINTENANCE schedule that we have followed for the last four years has also had a significant impact on the quality of our athletic fields. This is the third part of our program. Different types of athletics can require different types of turf grass maintenance. We follow a very close grass cutting schedule. Sports such as women's field hockey requires a very close cut turf grass. We make use of specific cutting equipment in this case. The Locke lawn mower is solely used to maintain this condition. At other times we will make use of the Roseman hydraulic gang mowers for major cutting areas or the 104 inch Howard 727 mower.

All of the sports fields are cut every other day during the active growing season. One of the factors of improving the soil conditions is that it really does make the grass grow better. Therefore by necessity we must

follow our close maintenance schedule. We keep a very close watch on the cutting pattern. The direction of cutting changes with every cutting. The patterns move from primarily north-south to east-west to southwest-northeast and so on. With a variation in the cutting pattern we believe that you can stimulate the grass to grow its very best and at the same time provide the most sure-footed field conditions possible.

Throughout each field sport season we are constantly evaluating many aspects of the field playing conditions. This enables us to act very quickly at the end of the season to begin the field restorations. We have used a combination of techniques to restore our fields. Over the past four years we have stripped and laid about 75,000 sq. yds. of sod. In field areas where great undulations in the soil surface prevented proper drainage we stripped the field sod, using what we could in other locations and then placed topsoil and new sod. As a result of the limited amount of space available we often do not have the time to wait for seed to grow. In all other turf areas we topdress the soil then overseed using the Olathe thatcher-seeder combination. We have had great success with this method of improving the density of the turf grass on our playing fields.

The only other area of special concern is the condition of our Varsity baseball infield for the spring season. Over the past three years we have designed and constructed a new baseball diamond complete with step down dugouts. All aspects of this field conform to the exact rule book design. For the infield surface proper we have been able to obtain fine screened red sandy clay from Fletcher-Ritter, the suppliers for Tiger Stadium. We have a six inch base or this material for the base paths, home plate area, pitchers mound and the infield cut away. However, this material is very sloppy in rainy weather. As a result of this we make a lot of use of a commercial soil additive called Turface. We use the fine ground version of this material. It has great conditioning properties for this type of playing surface. It not only dries the clay, it also inproves the texture of the clay which improves footing.

Turface is extremely useful to all other fields in very wet conditions as well. Whenever we identify a serious water pocketing situation on a playing surface we will use Turface. This allows for the field to continue in play and at the same time dries up a potential injury problem. We have even mixed this material in with topdressing soil to improve a continuing water holding problem. In all field areas, when we identify a problem area we act as quickly as possible to first improve the playing surface for use, then we plan for complete restoration at the end of the season.

Finally, we have also installed automatic irrigation systems in all major turf areas around the entire school grounds. This makes up the final part of our program, PROPER APPLICATION OF WATER. Without the proper supply of water it is nearly impossible in the temperate northern environment to count on getting water when the plants need it most. In areas where water becomes a limiting factor the first plants to grow better are the deep rooted turfgrass weeds with proper irrigation the good turf manager is able to control many weed problems with just a good maintenance program.

Over the past four years we have felt a great deal of success with our field maintenance programs. As a result of the commitment that has been made at all levels of the school administration, the use of quality products that are represented by quality technical representatives to help you adjust and develop the proper soil chemistry program, a fine tuned cutting and maintenance schedule, and the addition of automatic irrigation, we have developed a Grounds Operations Department that really takes the time to address this serious problem of sports related field injuries.

As sports Turf managers we must all become more increasingly aware of the potential of field related injuries. With this type of concern you do involve all levels of the administration. The only possible outcome then are sports fields that are not only attractive and well maintained, but are safe to play on and can withstand intensive use. As is always the case we welcome any visitors to our campus to discuss our programs.