ft^2. The extreme values in this case are the ones on the outside of the equation and the means are those near the = sign. And 218 fl oz x 57,600 ft^2 does equal 43,560 ft^2 x 288 fl oz. (If you multiply these out there is a small discrepancy due to rounding.)

One of the most import calculations a turfgrass manager makes is the determination of how much of an input to apply to an area of turfgrass. Every calculation of this type comes down to the same principle applying an amount of a product over an area. Most discussions of turfgrass mathematics spend some time discussing the determination of areas of different shapes and even how to determine the areas of oddly shaped features such as golf greens and sand bunkers. When I think of athletic fields I don't see many of these odd shapes but mostly rectangles and quarter circle arcs of baseball and softball diamonds. For the rectangular shapes the areas are easily determined by multiplying the length by the width. Most field managers know the length and widths of their fields because at some point they have pulled a tape and measured them. With today's technology it is also fairly easy to determine areas of fields using smart phone apps such as Measure My Land, Planimeter, or Google Earth.

Nearly every product we apply to turfgrass is not in a pure form so we must determine application rates to allow for this. For example, if we are applying 21-0-0 fertilizer it only contains 21% N so even though we have applied 100 lbs. of product we have only applied 21 lbs. of N. Two applications that apply a product in a pure form are topdressing and irrigation. We will begin with some examples of those applications.

Example: How much sand topdressing is required to apply 1/4th inch of topdressing to an area of soccer fields that is 250 yards long and 75 yards wide?

A topdressing layer can be visualized as long, wide, and thin box; in this case 250 yards long, 75 yards wide and 1/4th inch thick. We have units of yards and inches so we need to convert the inches into yards.

$$\frac{1}{4}\ inch\ X\ \frac{1\ yd}{36\ inches} = 0.00694\ yds$$

$$250\ yds \times 75\ yds \times 0.00694\ yds = 130\ cubic\ yds$$

So we will need 130 cubic yards of sand for this application. Our sand supplier sells sand by the ton and a cubic yard of dry sand weighs 2700 lbs.

$$130\ \cancel{yd^3} \times \frac{2700\ \cancel{lbs}}{\cancel{yd^3}} \times \frac{1\ ton}{2000\ \cancel{lbs}} = 176\ tons$$

Now the sand is probably not totally dry depending on the weather. If I were buying sand for this application I would buy 15% extra to allow for this water.

$$176\ tons + (15\ \% \times 176\ tons) = 202\ tons\ of\ sand$$

So for this application I would order 202 tons of sand.

Example: How much water is needed to apply 1 inch of irrigation to a football field with the dimensions 130 yds by 70 yds? In this case it may be easier to work in cubic feet.

$$130\ yds \times \frac{3\ ft}{yd} \times 70\ yds \times \frac{3\ ft}{yd} \times 1\ in. \times \frac{ft}{12\ in.}$$

$$= 6{,}800\ ft^3 \times 7.5\ \frac{gallons}{ft^3} = 51{,}100\ gallons$$

Or we could do an internet search and ask "How many gallons are in an acre inch of water?"

Answer 27,152 gallons. The problem now is an equation of ratios.

$$130\ yds \times \frac{3\ ft}{yd} \times 70\ yds \times \frac{3\ ft}{yd} = 81{,}900\ ft^2$$

$$\text{so}\quad \frac{27{,}152\ gal}{43{,}560\ ft^2} = \frac{x\ gal}{81{,}900\ ft^2}$$

Solving for x we get 51,000 gallons.

Sand and water are some of the commodities that are "pure" in that the contain 100% of their ingredient.

CHEMICAL APPLICATIONS

With the exception of fertilizer, all of our chemical applications that are sprayed or spread on turfgrass almost always come with a label that gives of a rate of product to use per area of turfgrass.

Example: We have an adult softball 4-plex with full skin infields, 65 ft bases and 275 ft to centerfield. Each field has 61,450 ft^2 of grass area. Each field is grassed with MS-Pride bermudagrass and we need to apply Primo-MAXX to tighten up our canopy and cut down on our mowing. We are treating 61,450 ft^2 x 4 = 245,800 ft^2 of grass area. The rate of Primo Maxx for athletic field height (1/2 inch) hybrid bermudagrass is 11 oz per acre.

$$\frac{11\ fl\ oz}{43{,}560\ ft^2} = \frac{x\ fl\ oz}{245{,}800\ ft^2} = \frac{11\ fl\ oz \times 245{,}800\ \cancel{ft^2}}{43{,}560\ \cancel{ft^2}}$$

$$= 62\ fl\ oz\ Primo\ Maxx$$

FERTILIZER APPLICATIONS

Fertilizers are a bit different than other chemical applications in that they are made in response to a soil test or fertility plan, and we must take into account the percent element of interest (usually N) in the fertilizer.

For example we have 233,000 ft^2 of bermudagrass soccer fields on soils modified with shallow sand cap. Our fertility plan calls for 1.5 lbs of N per 1000 ft^2 for the months of June, July, August and September. Our soil test also indicates we need to apply some potassium per our soil test so we choose a 20-0-20 fertilizer. How much 20-0-20 do we need to purchase?

$$\frac{1.5\ lbs\ of\ N}{1000\ \cancel{ft^2\ month}} \times 233{,}000\ ft^2 \times 4\ months$$

$$= 1{,}398\ lbs\ of\ N\ are\ needed\ for\ the\ summer$$

To supply this we are using 20-0-20 which is 20% by weight N. In this case we **divide** the amount of N we need by the percent N in the fertilizer expressed as a decimal.

$$\frac{1.398\ \cancel{lbs\ of\ N}}{\frac{0.2\ \cancel{lbs\ of\ N}}{1\ lb\ of\ fertilizer}} = 6{,}990\ lbs\ of\ fertilizer$$

Whether we choose to buy the fertilizer in seven 1000 lb bulk bags or 140 50 lb bags we will need to buy 7000 lbs of fertilizer. How much product will we need to apply per 1000 ft^2?

$$\frac{1.5\ \cancel{lbs\ of\ N}}{\frac{0.2\ \cancel{lbs\ of\ N}}{1\ lb\ of\ fertilizer}} = \frac{7.5\ lbs\ of\ fertilizer}{1000\ ft^2}$$

One last problem. We have a 2 youth baseball fields with 140,000 ft2 of tall fescue that have become infested with chickweed and shepherds purse. We have chosen to apply a 19–0–10 fertilizer product impregnated with Confront herbicide at the rate of 0.68% active ingredients (aI). Our crew applies 8 50 lb bags of the product to the area while the foliage is moist to be most effective. To be effective in killing these weeds Confront needs to be applied at a rate of 0.75 lbs of aI per acre. Was enough Confront applied to be effective?

We applied 8 bags X 50 lbs/ bag = 400 lbs of fertilizer. The fertilizer contained 0.68% aI. So we applied

$$400\ \cancel{lbs\ fert.} \times \frac{0.68\ lbs\ of\ aI}{100\ \cancel{lbs\ fert.}}$$

= 2.7 lbs aI applied, but does this meet or exceed 0.75 lbs aI per acre?

$$\frac{0.75\ lbs\ aI}{43{,}560\ ft^2} = \frac{x\ lbs\ aI}{140{,}000\ ft^2}$$

= 2.4 lbs of aI needed so we have applied enough Confront to be effective.

Our fertility program recommends that we apply 1.5 lbs of N/1000 ft^2 to the fields as well.

$$\frac{1.5\ lbs\ N}{1000\ \cancel{ft^2}} \times 140{,}000\ \cancel{ft^2} = 210\ lbs\ N$$

Have we applied enough N?

We applied 400 lbs of fertilizer that contained 19% N or 400 lbs X 0.19 lbs N/lb = 76 lbs N so no we did not apply enough N. In fact we need to apply 210 lbs N – 76 lbs of N = 134 lbs N short. We have some 30-0-0 in the shop. How much 30-0-0 will we need?

$$\frac{134\ lbs\ N}{\frac{0.3\ lbs\ N}{1\ lb\ fertilizer}} = 447\ lbs\ of\ 30-0-0$$

For practical purposes we would apply 450 lbs of 30-0-0 or 9 50 lb bags.

Now to make these applications we need to calibrate our equipment. Calibration is a separate process from these mathematic problems and should be the subject of a future article. Errors are often made when these processes are combined. They are best uncoupled in my opinion. A very efficient turf manager I know has his crew spend time in the winter calibrating their fertilizer spreaders with all the products they plan to use in the upcoming year.

I hope I have given you some problems that you can follow. Now, go practice. ■

Barry Stewart, PhD, is an associate professor in the Department of Plant and Soil Sciences at Mississippi State University whose specialty is sports turf science.

John Mascaro's Photo Quiz

Answers from page 17

John Mascaro is President of Turf-Tec International

This municipal golf course in Kansas experienced a severe thunderstorm last May where they received almost 5 inches of rainfall within a 2-hour period on the golf courses and their athletic fields. The dark green lines on turf are a telltale sign of a lightning strike with the strike in the center and the finger-like lines of where the electricity spread out. If a golfer or maintenance worker were present during this storm, the photo would have a whole different ending. A couple days later, the turf turned brown in these dark green areas. There was also extensive flooding on the golf course and sports facility. The city's synthetic fields received enough rainfall that the surface "wrinkled" but went down so fast that the parks supervisor was unable to get a photo.

Photo taken by Terry Rodenberg, superintendent for recreation services, City of Overland Park, at the St. Andrews Golf Course.

If you would like to submit a photograph for John Mascaro's Photo Quiz please send it to John Mascaro, 1471 Capital Circle NW, Ste # 13, Tallahassee, FL 32303 call (850) 580-4026 or email to john@turf-tec.com. If your photograph is selected, you will receive full credit. All photos submitted will become property of SportsTurf magazine and the Sports Turf Managers Association.

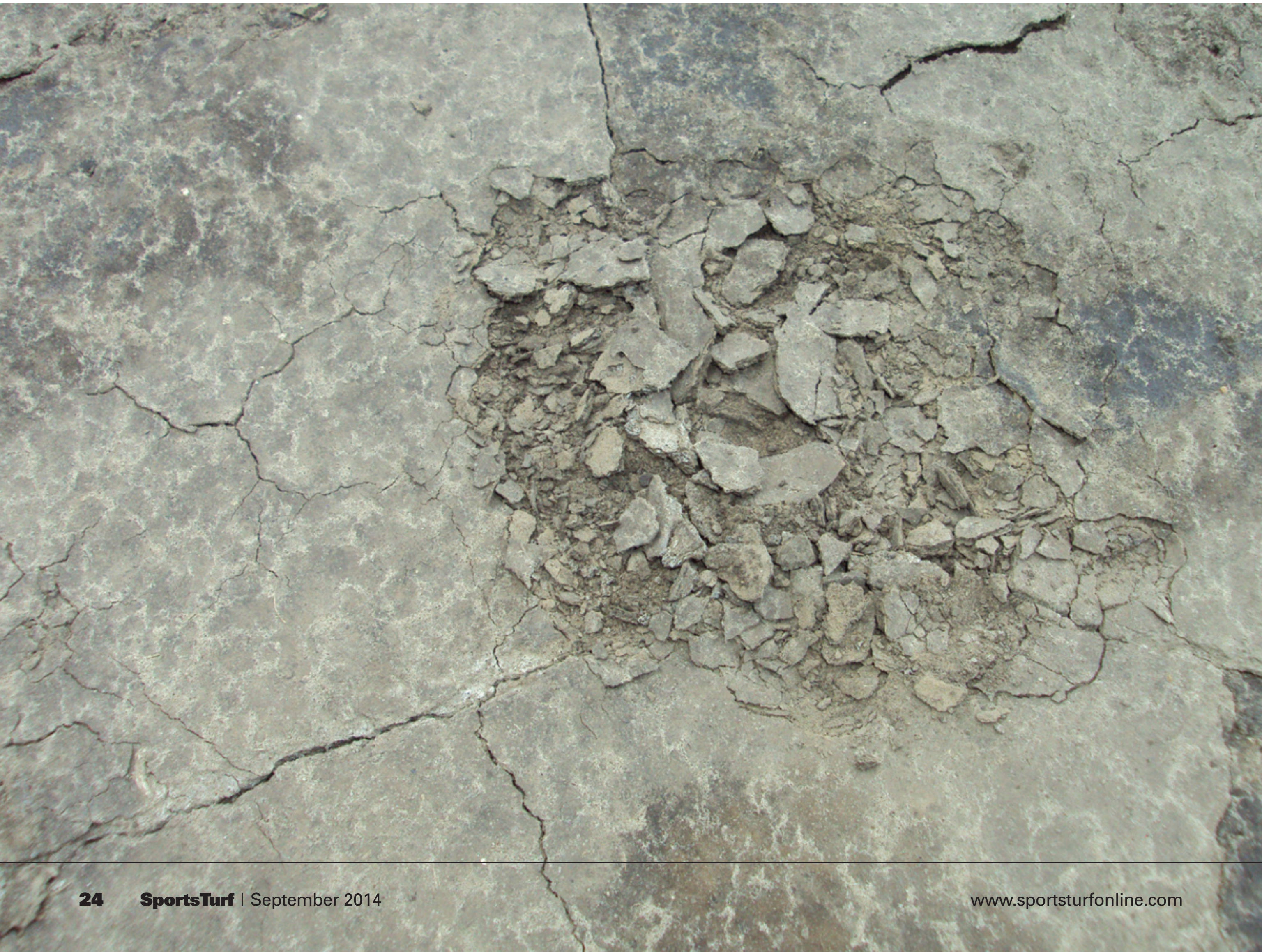
CALCIUM AND CALCIUM -BASED SOIL AMENDMENTS IN TURFGRASS

Editor's note: *The author is director of research and development for Calcium Products, Ames, IA.*

▼ **Dispersed, sodic soil** with classic surface crusting. Poor infiltration and seedling emergence can be expected.

The importance of calcium in any plant/ soil system cannot be overstated. It is both a vital nutrient for plants and essential cation in soil, found in great quantities in both environments, making it somewhat unique in comparison to other elements. Although technically considered a secondary macronutrient, its level in turfgrass plants ranks third after nitrogen and potassium. Despite the relative importance of calcium, it is often ignored or simply taken for granted by those managing the plant/soil system.

Calcium plays many roles in plant health, the most recognizable being its role in strengthening cell walls and within cells to maintain osmotic balance, thereby stabi-



lizing cell membranes. Since calcium is an important component of cell walls, its presence is also important in the presence of plant stressors as cell walls are normally one of the first areas invaded by pests. Calcium binds to pectin chains in turf cell walls, giving them stability and rigidity and also is necessary for the secretion of lubricating mucilage at root tips to aid in penetrating the soil. With a healthy root system and strong cell walls being important components of traffic tolerance, you can see how important calcium is on a highly trafficked athletic field. Calcium also plays an important part in the uptake of potassium and magnesium, which are both regulated by the amount of calcium ions found within the plant; a calcium deficiency results in increased susceptibility to red thread and *Pythium* blight.

The main reason that calcium is generally ignored in the turfgrass arena is that true calcium deficiency in grasses is rare. Monocots such as turf have a relatively low requirement for calcium when compared to dicots, with typical ranges from 0.3 to 1.25% and 0.5 to 2.0% and higher, respectively. Due to low cation exchange capacity and higher leaching potential, sand-based athletic fields may be one area that turf managers should monitor calcium levels in the plant and apply supplemental applications as necessary to ensure strong, healthy turf that will resist disease and traffic pressure. If deficiency does show up, it is displayed on new leaves that appear distorted, reddish-brown in color, and may wither and die; shortened and stunted roots may also result and are the predominant deficiency symptom in soils that contain toxic levels of aluminum, magnesium, hydrogen, and sodium that outcompete calcium on cation exchange sites.

Many soils in the United States contain sufficient calcium, which makes it easy to ignore. Soils in the Midwestern US routinely contain upwards of 80% calcium on base saturation in soil tests. However, turf mangers who deal with soils that are aided by calcium-based soil amendment applications know well the importance of them in their management programs. Soils in the both the western and SE United States are ones traditionally associated with benefitting from calcium-based soil amendment applications. In the west, sodic soils are a widespread problem, and in the SE, low pH and subsequent aluminum toxicity are widespread. The mechanisms in which calcium solves these problems are different, but similar. In sodic soils, calcium is applied to replace sodium on cation exchange sites, allowing the sodium to be leached from the soil profile. Removing the sodium improves soil structure via flocculation, or 'bringing together' of soil colloids, which create aggregates, which are partially responsible for creating pore space in soils. Sodium is considered a dispersive cation and will create problems with infiltration, crusting, and seedling emergence. In soils with high levels of exchangeable aluminum, calcium sulfate (gypsum) applications help to suppress the aluminum by forcing it to react with the sulfate, creating aluminum sulfate and other compounds which are less toxic or not available for plant uptake.

Low pH is another area where calcium-based soil amendments are helpful in turfgrass. Calcitic limestone (calcium carbonate) is the predominant material used in most of the US to ameliorate low pH soils to help improve nutrient use efficiency and overall growing conditions. Although most turfgrasses tend to grow in a wide range of pH, it's an important agronomic principle for turf managers to keep an eye on and maintain in acceptable range. Dolomitic limestone (calcium/magnesium carbonate) should be used where magnesium is deficient.

▲ **Supplemental calcium application,** resulting in less winterkill.

Increasingly, more turf managers are using effluent water for their athletic fields, which can contain appreciable amounts of sodium, leading to problems where calcium-based product applications (i.e. gypsum) may become necessary. Similarly, as usage and weather patterns change across parts of the upper Midwest, sodic soils are becoming more widespread. Researchers at Colorado State University are examining the beneficial use of calcium-based soil amendments to reclaim soils that receive heavy sodium loads from effluent water. It is important to have water tested before using so you can develop a plan to combat any potential problems the water may cause.

Many people are confused as to the difference between saline and sodic soils, and this is an important distinction when it comes to gypsum soil amending. Sodic soils are exactly that, containing appreciable sodium, and saline soils can contain a wide variety of salts that need to be leached, not necessarily displaced by the calcium in gypsum. Soil testing should form the foundation of your maintenance program in these situations and contacting your local university extension service or fertilizer dealer can help you differentiate between these difficult soil types and where amending is appropriate.

Calcium is an extremely important element in any turfgrass environment, and its abundant presence, absence, or being overshadowed can make it easy to ignore or in high demand. Being able to identify where calcium-based products are needed is an important part of providing suitable growing conditions for your fields. ■

MAINTAINING SCHOOL ATHLETIC FIELDS ON LIMITED BUDGETS

Secondary school athletic administrators today face great challenges in maintaining sports fields. One of the 14 legal duties of coaches and athletic administrators is to provide a safe environment for student athletes that includes playing fields, yet athletic administrators are facing budget cuts that challenge the ability to do so. In an effort to maintain playing fields, the athletic administrator must be creative in field management and must develop ways to acquire the needed resources with less money.

▲ **Bruce Whitehead**, CMAA

The limited resources experienced by most athletic administrators fall in one or more of the following areas: (1) Knowledge—a large number of athletic administrators do not have the knowledge or training relative to the care and maintenance of natural or synthetic turf fields. In addition, a growing percentage of principals and superintendents have little or no background in athletics and do not realize the importance of supporting the athletic administrator in maintaining safe playing fields; (2) Finances/Resources—many athletic administrators are being asked to cut budgets in these challenging financial times for school districts; (3) Personnel—in many situations, the athletic administrator may not have a grounds manager for the sports fields or at best there may be a grounds manager for the entire school district of which the athletic fields would be a part of that person's responsibility.

The NIAAA has made strides in addressing the limited knowledge of some athletic administrators. The NIAAA Sports Turf Committee composed of both athletic administrators and individuals from the industry corporate side has developed a number of programs to educate athletic administrators relative to management of sports turf fields. Four courses have been written on the care and management of both natural and synthetic fields. These 4-hour seminar classes are taught across the country by the NIAAA. In addition, the committee writes articles for the NIAAA's quarterly publication, *Interscholastic Athletic Administration*.

A third education program created by the committee is the annual sports turf seminar conducted at the National Athletic Directors Conference. All of these initiatives provide training for the athletic administrator in the area of care and maintenance of sports turf fields. Athletic administrators are encouraged to take advantage of other educational opportunities such as seminars or field days conducted by regional STMA chapters, by university agronomy departments or by companies in the turf industry. The NIAAA encourages its member State Athletic Administrator Associations to partner with an STMA chapter in their state to conduct sports turf seminars at state athletic administrator conferences.

It is not easy to address the limited personnel available to maintain the fields. If the athletic administrator is faced with a lack of staff to properly maintain the fields, there are some options. One is to designate funds in the athletic budget to hire personnel. This is usually not a viable option because the athletic budget is already stretched far too thin.

Another option is to ask the school district to allocate more funds to employ necessary grounds maintenance personnel. This is also a challenging option because of tight school budgets and the need to hire academic staff first. There is also the educational gap in many districts where the superintendent and/or school board does not understand the importance of maintaining safe fields. Unfortunately, too many school leaders learn the importance of safe fields the hard way when facing litigation due to an injury on an unsafe field. School districts then realize the cost

» In many communities a partnership between the school district and the park department or golf course can result in **a sharing of the equipment to meet the needs of all entities.**

▲ **School districts** should realize the cost of [professional] grounds maintenance personnel can be far less than the cost of settling injury litigation.

of an additional grounds maintenance person would have been far less than the cost of settling the injury litigation.

The third option for the athletic administrator to address this need is to seek in-kind labor from either the booster club or companies in the community who specialize in turf products or services. In many schools, the booster club can be called upon to provide labor and companies in the community can provide the expertise.

Acquiring the resources necessary to maintain safe fields does not have to be directly related to the athletic department or district finance available. Yes, it would be optimal if the athletic department or school district budget allocated necessary funds to purchase the required products, equipment and services but that does not always happen. In many communities a partnership between the school district and the park department or golf course can result in a sharing of the equipment to meet the needs of all entities. Partnerships between the school district and local businesses can also be developed. The school district might offer some advertising opportunities to local businesses in the event programs, on the public address during events or on signage at the venues in exchange for products or services.

Athletic administrators face a greater challenge today to provide safe athletic fields, but it is something we owe to the students participating in our athletic programs. It is a challenge that can be met if the school, the community and the sports turf companies come together in partnerships.

Bruce Whitehead, CMAA, has 33 years in public education as a teacher and coach, and for the final 25 years was Director of Athletics at Crawfordsville (IN) High School. While an athletic administrator, Bruce was a member of the IIAAA board (Indiana Interscholastic Athletic Administrators Association), the IHSAA Board (Indiana High School Athletic Association) and the NIAAA Board. Bruce has been employed by the NIAAA for 13 years and has been the executive director for the past 9 ½ years.

ABOUT NIAAA

The NIAAA is located in Indianapolis and is the national organization for high school and middle school athletic administrators with 9,000 individual members. The membership includes athletic administrators from organizations in the 50 states, the District of Columbia and internationally. The NIAAA champions the profession of athletic administration through education opportunities, advocating ethics, developing leaders and fostering community. ■

Wessen Lawn & Tennis Club Owner & Founder Bill Massie with his convertible Mercedes that serves as the marquee for his new tennis complex in Pontiac, MI.

One of Wessen Lawn & Tennis Club's 24 natural grass courts with the clubhouse in the background. The original building was constructed in 1919 and served as the Pontiac waterworks.

Just like at Wessen's inspiration, Wimbledon, players must wear all white.

The clubhouse of Wessen Lawn & Tennis Club features an open and airy layout with abundant seating.

Wessen Lawn & Tennis Club uses a Jacobsen SLF-1880 large-area reel mower to maintain its 24 natural grass courts.

ARCHITECT BUILDS *NATURAL GRASS* TENNIS COMPLEX

Editor's note: *This article was written by Jacobsen's public relations staff*

What started as an afternoon musing during a tennis tournament turned into an obsession for Bill Massie.

"In 2008, while watching my 13-year-old son play in a tennis tournament at the beautiful Longwood Cricket Club outside of Boston, I thought to myself, 'I'm going to go back and build something like this in Pontiac'," recalls Massie, an architect by trade.

The first thing Massie did upon his return was build a perennial rye test court. Other than mowing fairways on a golf course for one summer during his youth, Massie had no experience or training in growing grass.

"I leaned heavily on Joe Vargas, professor of turfgrass science at Michigan State University," said Massie. "We threw the traditional golf-centric, sand-based agronomics out the window because this is literally a whole different ball game. A sand-based grass surface would never hold up to the rigors of tennis."

After mastering his ryegrass skills, Massie decided to take it to the next level. He purchased an abandoned recreation center and 50 acres of surrounding property in Pontiac, MI just outside of Detroit.

“It was an ideal site for what I wanted to do. There was an existing pool and clubhouse that we renovated extensively,” said Massie.

We put all the seed down and almost on cue, it rained. And it never stopped. **It rained an inch and a quarter in one hour** and washed every last bit of seed into the river.”

With his architecture background and experience, Massie was able to prepare the site for tennis courts himself, doing much of the laser leveling and drainage work.

“I built a 14 x 80-foot trench that’s about 10 feet deep and filled it with crushed concrete from the old building foundations. When it rains, the water runs off these courts almost immediately,” said Massie. “I put a slight grade on the whole thing but it’s a perfect plane so you would never notice. From one side of the property to the other, the turf actually drops a total of 18 inches.”

The attention-to-detail can be seen all over the property. From the etched metal water fountain to the vintage tennis ball cans inlaid into the clubhouse bar, every inch of Wessen Tennis club has been meticulously and thoughtfully planned.

But as Massie will tell you, not all the Wessen plans went smoothly.

“It was the second week of September last year and we were sitting on $6,000 worth of grass seed,” says Massie. “Conditions were ideal and there was just a small rain shower in the forecast for that evening. We put all the seed down and almost on cue, it rained. And it never stopped. It rained an inch and a quarter in one hour and washed every last bit of seed into the river.”

Heartbroken but not defeated, Massie knew the window was closing on the chances for a 2014 opening. He had new seed shipped from Oregon in just 3 days and had full turf growing by October.

“We dodged one bullet but got hit with another as the worst winter in decades followed,” said Massie. “I thought we’d be able to do more to prepare for the cold but it came so quickly we couldn’t do much of anything. We had record snowfall and record cold but as you can see, the ryegrass survived quite nicely.”

“People tried to convince me to try other grass varieties but I knew ryegrass was the right choice, especially with the wear patterns and toughness,” said Massie. “You could use bentgrass, but it would get very stressed from the wear. Also, ryegrass has no thatch, so you really get a good ball bounce. And it’s no secret that these courts are really modeled after Wimbledon, which is also ryegrass.”

To maintain the ryegrass on the 24 courts, Massie and his crew use a Jacobsen SLF-1880 large-area reel mower. They keep the grass at a height-of-cut of .375 inch, which would be considered fairway tournament height for a golf course.

“I love to get out there and mow, but there’s a lot of pressure to finish the clubhouse and the pool, so I’ve been very busy with that,” says Massie. “But I do look forward to getting back to working on the turf side of things, that’s fun for me.”

Massie already has 105 members with a goal of 150 founding members by the end of summer. Like Wimbledon, players must wear all white on the courts.

Massie’s plans for the future include bringing an ATP-level tournament to Wessen and have junior and pro players train for grass tournaments like Wimbledon.

“When people come out here and play, it’s something completely new for them,” said Massie. “And that was the vision all along of Wessen Lawn & Tennis Club: to give people a truly unique tennis experience on natural grass.” ■

DEVELOPING & IMPLEMENTING BMPS for sports field water conservation

WATER CONSERVATION is not all about irrigation. It is primarily about the plant and doing the correct agronomic practices that allow the plant to survive periodic dry periods. Research has shown that a properly planned landscape that has been carefully installed and properly managed will be healthier, less prone to insects and diseases, and will require less irrigation.

Water is essential to human life, the health of ecosystems, and economic development. However, summer drought is common for much of the US when significant rainfall amounts may be 30 or more days apart. These periods of limited rainfall increase demand on pubic water supply systems. During the summer months, municipal water use increases between 30% and 50% generally for outdoor recreational purposes (e.g. swimming pools), utility purposes (e.g. car washing and pressure washing) and, for lawns and landscapes. No doubt, water conservation is a concept which must be adopted as water resources become more limited.

Turfgrasses are the primary vegetative covers on airports, athletic fields, cemeteries, churches, commercial buildings, golf courses, home lawns, schools, parks, and

Two quick and simple practices to improve turfgrass water use:

1. Raise the mowing height. There is an optimal height range for each turfgrass species, during periods of drought raise the mowing height to upper end of the range. This helps increase the rooting depth and ability of the grass to extract water from greater depths.

2. Decrease the nitrogen rate. Each turfgrass species has an optimal nitrogen fertility range; during periods of drought reduce the amount of nitrogen to the lower end of the range. This avoids overstimulating the grass during periods when water resources are limited.