

# Value of hands-on education

**S**TUDENTS THAT PURSUE AN EDUCATION IN TURFGRASS MANAGEMENT have multiple choices on what type of education they will receive, and how they want to receive their education. Traditionally students may start learning about turfgrass management in a high school horticulture program, through family members involved with the business, or participation in a community activity. These introductory programs are extremely beneficial to students that see an interest in some type of horticulture field, specifically in turfgrass management.

Students that choose a career in horticulture have many educational options, including 1-year diplomas; 2-year Applied Science degrees; 4-year bachelor's degrees, master's degrees; and, doctorate degrees—along with a

multitude of continuing education courses. The unique part about education is that each and every student is different and may decide to attend college for factors such as location, expense, reputation, and educational course work.

Students who decide to attend institutions that offer Applied Science degrees or hands-

on learning opportunities are the students with whom I have the most interaction in my position as Assistant Professor, Golf Course and Athletic Turfgrass Management at Kirkwood Community College, a 2-year community college located in Cedar Rapids, IA. The college offers a competitive turfgrass management program, along with landscap-



It is interesting to note that **95% of the students** self-identify by recalling an outdoor lab activity that inspired them to want to learn more, or provided an opportunity for learning that they will never forget.

- » **Above:** Students work on residential irrigation installation around the horticulture building. Students take an irrigation installation and repair course that allow them to install, maintain, audit and troubleshoot all irrigation systems.
- » **Below:** Students work on pitching mound repair at the Kirkwood Baseball Field.



ing, and parks and natural resources programs. All three programs are offered in the Horticulture department and serve around 275 students total.

Kirkwood recruits students that enjoy learning through hands-on education practices and see their future in the turfgrass profession. Kirkwood serves seven counties located in eastern Iowa (Benton, Cedar, Iowa, Johnson, Jones, Linn (Main Campus), and Washington counties. Most students that attend Kirkwood's programs are from the state of Iowa, with a heavier concentration of students in eastern Iowa. Kirkwood students reach throughout Iowa's 99 counties, and in fall of 2009 the college's International program included 532 students from 86 countries.

Kirkwood students enrolled in the 2-year Golf Course and Athletic Turfgrass Management program take a multitude of courses and upon graduation will have 68 credits resulting in an Associate of Applied Science (A.A.S.) degree. During students' first year of study, they will enroll in horticulture common courses which include the general course requirements like Soil and Water Conservation, Plant Material Maintenance, and Introduction to Turfgrass Management.

Once a student has completed 32 of their 68 credits, they will conduct a paid spring/summer internship after their freshman year and before they begin their sophomore year of studies. Upon return of their sophomore year, students then take second year specialty courses including: Athletic Turfgrass Maintenance, Irrigation Installation and Repair; and Advanced Turfgrass Management. These programs have proven to be successful for students to achieve their educational objectives and the course work is based on individual student success, while meeting local industry's expectations; and, focuses on the important

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In my opinion, knowing what is expected of an employee in the field needs to be reflected in the classroom and embraced as the student moves forward into their new career.



» Students get an opportunity to fertilize soccer field with walk-behind spreaders. Before fertilizing students had to select the product, budget for the application and calibrate the spreaders.

directions provided by the advisory council and their unique industry needs and perspectives they provide to the college and the students.

Kirkwood Golf Course and Athletic Turfgrass Management graduates are ready to enter the workforce. Most build their resumes and begin job seeking months before graduation. Others will transfer to attain their 4-year degree in turfgrass management or related fields. The statistics of students finding careers in the turf field have been successful; however, just like anything as the economic situation changes, so do job possibilities for students that graduate with an Applied Science degree in a specific field like turfgrass management.

Lately Kirkwood faculty has begun to encourage the students to consider other educational endeavors and pursue more education outside of their 2-year degree. Students have risen to the challenge and are considering more than ever the importance of transferring to complete their 4-year degree.

## STUDENT BENEFITS

Now that you have an idea how this hands-on education curriculum works, I want to share how, from a classroom perspective, students benefit from hands-on education. As the semester begins to wind down and the course work comes to a conclusion, I ask each student to provide a "self-reflection" that discusses one hands-on lab exercise that benefited them the most during their course of studies. It is interesting to note that 95% of the students self-identify by recalling an outdoor lab activity that inspired them to want to learn more, or provided an opportunity for learning that they will never forget. Here are two comments from former students that accurately represent a great majority of students in this program:

"I thought that the residential pipe installation irrigation lab was the most beneficial. I had no idea that pipe can go into the ground that smoothly."

The baseball mound bricking lab was great. This activity is something I am planning on helping with at my hometown field now that I have the experience."

I know from many other student self-reflections that the hand-on activities not only provided in the classroom, but from other hands-on opportunities, including: internships, workshops, and on the job experience are beneficial hands-on activities that foster a tremendous learning environment.

I provide this challenge to you: think back to an activity that influenced your career, or an activity is engraved in your mind. These education scenarios are among the most effective methods of training individuals and in addition to their use in schools, many organizations use these types of learning activities for employee orientations and other training opportunities. Research shows that teachers, curriculum developers and other experts agree that educational experiences that actively involve people manipulating objects give students knowledge and understanding about their education.

The emphasis behind hands-on education is that students are able to realize that the jobs they will pursue will not require them to be behind a desk all day; rather, provide understanding that they are expected to maintain an active part in all the daily operations and generally require manual labor to accomplish these tasks. In my opinion,



knowing what is expected of an employee in the field needs to be reflected in the classroom and embraced as the student moves forward into their new career.

For example, in this industry, an employee will routinely find themselves mowing, so in the classroom and during hands-on learning activities, the college operates, troubleshoots, and maintains both reel and rotary mowers, along with different manufacturers and configurations for these machines. Active learning allows students to be familiar with these practices, preparing them for what may happen in their field of work. This is something that no book can give anyone that level of hands-on experience. Students will often say that there is no better feeling than having their boss trusting them and having confidence to perform a task that you have experienced hands-on during your college career. It is how students can be most effective when they enter the workforce fully prepared and ready for success!

Students feel confident with their knowledge about the turf industry and have given their employer a sense of security knowing that they understand what is going on and how to work within the task assigned. Graduates from these programs have been able to successfully obtain full time turf management positions and move through the ranks just like every other student enrolled in a college program.

Overall, people are beginning to understand that education is becoming even more important for today's industries. While education comes in many different forms, there is an increasing value being dis-



» Students get every opportunity to run various turf related equipment. Students are sweeping cores following ¾-in. core aerations on a baseball field.

covered through use of hands-on. This delivery method has made a lasting impression on today's turf managers and will continue to be an avenue for interested students to pursue. ■

*Troy McQuillen is assistant professor, Golf Course Athletic Turfgrass Management Program, Kirkwood Community College, Cedar Rapids, IA.*

  
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## Dirty dozen, plus two, tournament tips

**T**OURNAMENT PREP starts days and weeks before the first pitch of your tournament. As we all know, most tournaments are 20 minutes of work and 2 to 3 hours of waiting for the work to start again. We have tried to put together some tips for use during your tournaments to make them go smoother and to make your job easier. These are just some of the tips that we have thought about and hopefully, they can be some that you can use during your tournaments this year.

**Time your fertilizer schedule to build up to the tournament and beyond.** Turf needs to be durable as well as green. The Tournament Schedule should be incorporated in your year long program/plan that you follow. You will be building toward the tournament to make it look the best and be healthy to withstand the increased amount of traffic

that your fields will have over the course of the tournament. Also, the schedule should allow for adequate time for your field to recover and your plan should have enough maintenance practices in place after the tournament to help your field recover.

**Out of Gas? Equipment in good repair?** Has the oil been changed, tires properly inflated, reels sharpened/backlapped, grease fittings lubricated, fluid levels checked, daily fill all machines with fuel. There is nothing worse than running out of gas on the infield groomer while trying to drag an infield before the games.

**Under Cover?** Arrange ahead of time where the crew will be located during the “downtimes.” A tent, pavilion or some other place that is covered where the crew can relax and be during the games is essential. Taking care of the crew should be a top priority! If you are the head groundskeeper, taking care of your crew is

## Facility & Operations

By **Bill Marbet, Brad Essary, Glenn Lucas, and Waldo Terrell, CSFM**

important due to the fact that they are a reflection of you and your work during the year. If they feel well and properly hydrated, fed and not sunburned, then they will put forth their best effort during the tournament. Also, during the long days, a relaxing chair/chaire lounge is a great place to rest during the downtimes.

**Readiness; prepare for worst case, hope for the best case.** Be prepared for weather. A meeting a few weeks in advance of the tournament to devise an action plan as to whose call is it to tarp or not. Once the game starts, if you have a tarp, it usually rests on the shoulders of the umpires along with the groundskeeper. You need to have a reliable weather forecaster on your team to call for updates. Also, let him know that he is just as important as the person tamping the mound, and he can feel a part of the tournament. He can even alert you to changing weather patterns/forecasts.

**Not Hungry? If you have a chance to eat, eat.** Hunger can cause short tempers, especially in tense situations which will happen during long hot days of tournaments. Eat foods that are not very heavy on your stomach. Pizza is easy, but not always best. If food is not easily accessible at your venue, plan ahead and pack a cooler with sandwich meat, cheese, bread and condiments for the crew.

**Always Look Professional.** Shirts tucked in, a crew that looks uniform looks professional when on the field. The crew is just as important as the teams taking the field for play. Look like a team, act as a team. In order for you to be taken seriously as a groundskeeper and as a crew, you need to present yourself in a professional manner. If you look professional, then you will automatically earn the respect of the umpires and tournament coordinators.

**Manage Your Crew.** Have a plan for each crew member pre and post game. Delegate duties, making sure you have qualified people (full timers in position to get the job done in a timely manner. Use volunteers, which are very important keys to success, alongside full time people so they can be better equipped to help with future tournaments.

**Everybody's Job is Safety.** Everybody's ultimate job is making the field safe and playable. This is not just limited to the field; make sure the shop area and equipment are safe for the crew to use and be around. Be sure to remove all items from the field that are not needed for play. The last thing you want to do is leave nails or hand tools (chalk, rake, tamp, shovel, spool of twine, etc) on the field for a player to find later. Do not leave anything behind and the last person leaving the field should be responsible for checking the playing area to make sure that all items are removed.

**Never leave home without a change of clothes.** The bag that you pack should include socks, shoes, shorts, shirts, toiletries, towel, pullover for night time and rain gear. Two pair of shoes is important, one for morning prepping time of the field and one pair for the pre game and post game work. Dew will make your shoes just as wet as rain.

**Take time to drink plenty of water or sports drink.** Dehydration can lead to serious health problems that can put you



in the hospital if not careful. Be sure to avoid the drinks with lots of caffeine and carbonated water during the tournament, or any other drink that might dehydrate you. Staying hydrated with water or sports drinks can make you more effective when working on the fields and make your time spent at the tournament more enjoyable and rewarding.

**Togetherness.** As a Charles Bloom, SEC Baseball tournament director once said, “The grounds crew is the glue that holds Tournaments together.” The entire crew needs to understand that one part of the crew is just as important as the other. If you are repacking bullpen areas, dragging the field or chalking, they are all important duties that need to be completed to the best. We all want to give the team that plays in the championship game the same field as the first teams to play in the tournament.

**Inventory All Materials and Hand Tools.** Some items you need to have on hand as you prepare for the tournament: field conditioners, drying agents, mound clay, marking

chalk, and enough tools to accommodate your crew, e.g., rakes, tamps, drag mats, etc. The list of tools needed vary depending on the size of your tournament crew and the facility being maintained. A backpack blower is often overlooked as a tool used for fields. It can be used at night or early mornings for cleaning dugouts, blowing out your lips from the day of play. It is a time saving tool. Try not to use the backpack blower during the day as it disrupts other fields or coaches trying to prep his team for the game.

**Pre and Post game entrance exit, where does the crew enter the field?** Do we have easy access to the tarp? Who is responsible for opening the gate for field access? Is the way we enter the field also going to be used for emergency vehicles? If so, don't block the gate with equipment. Who is responsible for closing the gates and securing it before game?

**Sunscreen for Use.** Waterproof/sweat proof sunscreen SPF 30 or greater is ideal. Bullfrog works great too for prevention of sunburn. We also recommend using a straw

hat, with a wide brim on it to prevent any unnecessary sunburn on the forehead. Some aloe might be nice to have in the refrigerator just in case someone does get a little sun burned.

We encourage hosting tournaments to be able to spotlight your facility not only locally, but regionally and nationally also. It is a great opportunity for people to view all the hard work that goes into making tournaments a success. ■

*Bill Marbet is President of Southern Athletic Fields; Brad Essary, Waldo Terrell, CSFM, and Glenn Lucas are all in sales and/or marketing with the company. Southern Athletic Fields, Columbia, TN, has served as the grounds crew provider for the SEC Baseball tournament (1999-present), TSSAA Spring Fling Championships, Tennessee Junior College Baseball/Softball Tournaments, Atlantic Sun Championship, and Sunbelt Conference among many others. Photos used by permission of Southeastern Conference.*

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# Synthetic field bases 101

**S**O YOU'VE MADE UP YOUR MIND that you are going synthetic. You were a bit panicked when the idea was first proposed, but now you have studied your current field use programming, maintenance levels and available space options. You have explored all of the known heat, recycling and sustainability issues. You have worked with a qualified design professional to determine the highest and best use of the land and budget available. You are fully versed in the latest materials, methods and manufacturers all the while paying attention to every detail imaginable. From ASTM test to insured warranties, you have considered it all. Well, almost all. What about the field's base? You might ask, "Doesn't that come as part of the synthetic turf?"

Of course you do need a base under any synthetic turf field but no, fields do not typically come with a base or composite base materials as part of the system although a few offer it as an option. The base under any synthetic turf field serves two distinct functions, neither of which are typically considered in natural turf fields: a structurally sound base for field construction and a media for drainage of the field.

The structural component of any synthetic turf base is designed to ensure that once the field is in place, it never moves. Differential settlement, expansive soils, saturated subgrades or an inability to drain water are all disastrous to a new synthetic turf field. Unique to this type of project, it includes a 360'+ straight edge by which the quality of construction will be judged for life. While a 1/2-inch settlement on a natural turf field may go unnoticed, it will stick out like a sore thumb on synthetic turf. With that in mind, any synthetic turf field installation should begin with a geotechnical report.

A good geotechnical report will contain information essential to providing a firm and unyielding base for the field. Existing soil conditions should be examined and recommendations for mitigation of existing sub grade conditions included. By requesting an expansion index as part of the report, you get an immediate idea of the potential for movement if the subgrade is exposed to moisture or freeze-thaw cycles.

Recommendations for treatment of the subgrade conditions typically range from removal of topsoil and compaction to lime or cement treatment and can greatly impact the overall cost. Achieving an initial value of

92%+ compaction at the sub grade level will typically ensure stability throughout the life of the field.

Based on the existing subgrade conditions, consideration for a geotechnical fabric should be included as part of the initial soil investigation. In highly expansive soils a woven geotechnical fabric can prevent penetration of water into the compacted sub grade to avoid expansion. In less severe conditions, a non-woven geotechnical fabric may help insure that the specified stone base does not

migrate while still allowing some measure of water in to the sub grade. In the most severe conditions, a PVC or other impermeable material may be used as a liner to ensure that no surface water ever reaches the subgrade. These fabric options should be explored with the geotechnical engineer before design ever begins.

## BUILDING THE FIELD

We are now ready to begin building the field section. Drainage is the second critical component. Based on



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### Engineering of a good stone base is just the start. A perfect mix of aggregates can be ruined by a bad installation.

the findings of the geotechnical report we may be able to allow some water to percolate in to the subgrade, but that is the exception and not the rule. If you have an existing subgrade that can be compacted, with a high percolation rate and a low expansion index, you are extremely fortunate. Typically, most if not all of the surface water that penetrates the synthetic turf will need to use the base as a transportation medium to the storm water drainage system.

Generally, there are at least two base options for consideration when building a synthetic turf field section: a stone base or drainage mats. Both are used today with a preference that is often based on regional availability of materials, native soil conditions and experience of the construction team. The first synthetic turf fields used a combination of aggregates to achieve the structural stability required while maintaining the drainage characteristics to keep the field playable in the worst conditions. This method is still often referred to as a “traditional” stone base.

The stone must be angular enough to allow pore space for drainage, the sieve size varied enough that it will interlock to form a stable surface without settlement, and the material strong enough that it will not turn to dust when compacted. A final layer of stone is often required with the same characteristics in a size that can be fine graded to meet strict tolerances for planarity.

Engineering of a good stone base is just the start. A perfect mix of aggregates can be ruined by a bad installation. Best practices require testing of materials at the source and upon delivery to the site. Continual testing for compaction and porosity should be scheduled regularly as the aggregate is being installed. An experienced contractor or subcontractor is key. A low-bid environment may not achieve the best results.

Drainage mat systems underlay the synthetic turf and come in a variety of materials. Cost of raw materials and petroleum, concerns for safety, and the occasional failed flood test have resulted in the design of multiple systems. The intent is for easier construction, predictable drainage and in some cases a tertiary benefit of increased or consistent shock attenuation.

It is worth taking a moment to talk about shock attenuation, i.e. Gmax. It is the most often used term when discussing the safety of synthetic turf fields. Drainage mat systems have been shown to influence the Gmax of a synthetic turf field, but few are sold as part of a synthetic turf system. The potential for future claims or disputes and the associated finger pointing, should the Gmax exceed safe limits during the warranty period, are real. For this reason, we strongly recommend that the Gmax performance of the synthetic turf alone be guaranteed to meet the specifications regardless of the base it is installed on. Any anticipated impact that a drainage mat

may have on the Gmax of the field should be considered a bonus and closely coordinated between the drainage mat manufacturer and the synthetic turf manufacturer to avoid warranty conflicts.

The most significant difference between a traditional stone base and a drainage mat system may be in how they handle water. Concerns about over compaction and porosity of the stone are not a factor in most drainage mat systems. If a stone layer is installed, its function can be structural only. This makes the task of providing a firm and unyielding base much more comfortable to most grading contractors. An aggregate base can be installed and compacted to fulfill the core requirements of structural stability and planarity.

Drainage mats may require an additional layer of geotechnical fabric to ensure that the horizontal surface flow under the synthetic turf does not erode the aggregate base. The unit flow rate of some drainage mat systems has tested at 26 gal/min/ft<sup>2</sup>. Translated, that's more rain than any 100-year event in U.S. history and far exceeds the limits of the synthetic turf above it. A layer of woven geotextile fabric can help distribute the water evenly and guarantee that the aggregate and/or subgrade below it are protected against erosion.

In instances where an existing sand-based field is being replaced, some of the existing system may be able to remain. Sand-based fields typically have a minimal potential for expansion. The geotechnical engineer will give recommendations about the stability of the subgrade and if any treatment would be required to modify the remaining sand base. Modifications will still be necessary. Most sand based fields are designed with the root-zone as the structural component to stabilize the playing surface. In the absence of living turf, most sand based fields feel more like beaches and less like athletic fields. If the sand base material is deemed stable, the potential for removal of the synthetic turf and reuse of the field base for a natural turf field remains.

Regardless of the base option chosen, a storm drain outlet is required. Pipe sizes and materials will vary based on regional and engineer's preferences, but all serve

## The potential for rainwater harvesting exists with any synthetic turf base option.

similar purposes and share similar problems. Often times the open graded stone used as drain rock around pipes is rounded and struggles to compact to specified levels. If lime or cement treatment was used to stabilize the subgrade, care should be taken in areas where the depth of the pipe exceeds the depth of the treatment. Lining of the trench with the woven geotextile fabric used below the drainage mat is a common practice. Locating the trenches that contain the drainage piping beyond the field boundaries helps ensure that differential settlement over the life of the field will not impact the use.

### SUSTAINABLE OPTIONS

Consider sustainable or “green” options. Many of the composite drainage products contain recycled materials or can be recycled themselves. The benefit of keeping the field section shallower with a drainage mat can minimize earthwork, off haul and equipment costs as well as the carbon footprint of the project. Most drainage mat systems can be delivered in a single load.

The potential for rainwater harvesting exists with any synthetic turf base option. In a traditional stone base, the storage capacity of the stone and the filtration of the water through the base and synthetic turf make an excellent start towards re-use of the rainwater for irrigation to cool the field or irrigate surrounding landscape areas. The same benefit is realized with any drainage mat option with the only limiting factors being storage capacity and required filtering of the water collected. Either system generates a water supply that is cleaner than most run off from natural turf fields. Compared to the potential contamination of silt, herbicides and pesticides commonly used to maintain natural turf fields at their peak the harvested rainwater is often cleaner than municipal recycled water sources.

Base systems are gaining their own importance in the life of a field. They now offer a warranty that meets or exceeds that of the synthetic turf manufacturers. One composite base provider has offered a 20-year warranty on their materials as standard. While no guarantee is iron-clad, that level of confidence in a system to perform provides a level of comfort that traditional stone base construction cannot match with a standard construction warranty of one year.

Once you have made the decision that synthetic turf is in your future, be sure that your selection of base materials provide the structural stability and drainage performance you need. Local landscape architects, geotechnical engineers and contractors with specific experience in this specialized field can help you with material selection, budgets, timelines, constructability and sustainability options. ■

*Tony Wood, a landscape architect with Beals Alliance, Sacramento, CA has completed hundreds of facilities in the past 21 years with a broad range of scope, budget, and program needs.*

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