The importance of 2-year turfgrass programs

Editor's note: We asked some of the people in charge of 2-year turfgrass programs at colleges and universities across the country to update us on those programs. Here are the responses:

- What have been some significant changes in your program over the past 5 years?
- What are the biggest challenges facing 2-year programs in the next 5 years?
- How does your internship program operate?
- How can the sports turf industry best support 2-year turfgrass programs?

MT. SAN ANTONIO COLLEGE, Walnut, CA

From Brian Scott, Professor of Horticulture & Agricultural Sciences Department Chair:



A Brian Scott, Mt. San Antonio College

We offer a 2-year degree in Park and Sports Turf Management, which is a comprehensive program for both industries. Along with Park Management, Turf Management and Sports Turf Management classes, students also are required to take other courses including IPM, Landscape Design, Plant ID, Soil Science, Landscape Equipment Operations, Irrigation Design and Installation, Arboriculture and Landscape Construction, as well as work experience classes. The core course requirement is 46-49 semester units (we are on 16-week semesters).

We also offer a Certificate in Sports

Turf Management which consists of 18 semester units (6 courses). These are Turf and Sports Turf, IPM, Soils, Irrigation Design and Installation and Irrigation Management.

I would say the most significant change has been overhauling our certificate system. Most of our certificates in the past have been 24-30 units (8-10 courses). Our Advisory Committee (made up of industry professionals) recommended that we make our certificates fewer units and more specialized. As a result, we went from offering 9 certificates to 12 certificates, all of which are 18 units (6 courses). They are all very specialized now.

Specifically in the Turf Program we are starting to see more students who are recently out of high school becoming interested in Sports Turf Management as a career. Up until about 5 years ago the majority of the turf students were already working in the industry and trying to increase their knowledge base in order to promote to more prominent positions.

One of the biggest challenges in California is the Student Success Initiative. There has been a recent mandate to look at student success primarily on completion of certificates and degrees, which is reasonable. The issue for us is that many students tend to 'job out' one or two classes short and never come back to finish, but they have been very successful at meeting their educational goals. We also have students who finish certificates but do not apply for them for unknown reasons. We have been working diligently to do educational plans and orientations to make sure students complete and apply for the degrees and certificates they have earned.

The other challenge is always the budget, just like anywhere else. We are asked to keep students on the cutting edge of technology and information, which can be expensive. Updating tools and equipment on a regular basis is costly, and there is no ongoing budget line to replace aging tools and equipment. Therefore we have to be aggressive in pursuing outside sources such as industry partners, grants and donations.

One final challenge is how long it takes to get a new course added, or existing courses, certificates and degrees modified. Even if all goes well, it can take 2 years to get changes approved. That is an internal issue that will probably never go away.

[Our internship program] is where we can make big improvements. Currently we have no specific internships set up. Students sign up for work experience and then they work here on our sports turf lab or at our nursery. Recently several have gone to UCLA to work with Chris Romo at Jackie Robinson Stadium, but that is quite a ways from campus. I would like to develop more opportunities close to campus, or even on campus.

We get great support from our local STMA chapter who help students find part-time work and donate to the Turf Team. It would be great to have companies who could possibly loan us equipment for demonstration purposes for a semester or year at a time. This would keep our costs minimal and keep the most updated equipment available. Offering scholarships for students is another great way to support the program. Be available and flexible to start internship programs in order to give students hands on opportunities.

MICHIGAN STATE, East Lansing, MI

From Dr. John N. Rogers, III, Professor of Turfgrass Management, Department of Crop and Soil Sciences:

The 2-year Sports and Commercial Turf program at MSU is an 18-month, 54-credit program that is on campus only. Students attend classes for the first fall semester (15 weeks), then a short 10-week spring semester. From April through August they conduct an internship. The second year is the same as the first, with students graduating in late March.

Classes are oriented to a career in turfgrass management, covering all aspects of turf (13 classes with turfgrass in the title). All ancillary subjects have direct preparation for the career as well, such as computers, Spanish, botany, and soils.

There have been no real program changes in past 5 years; most changes were in place before that. However, this year we began to allow students to take the online course offered at MSU taught by David Gilstrap (CSS 202 World of Turf), to better prepare them for school and introduce them to the subject. This may help stoke a passion but it is too early to tell results.

The challenge is having enough students to fill demand. This is still a very hands-on vocation that you cannot know if you like until you get experience. The beauty of this vocation is that you can get entry level jobs to begin to explore the business. It is here and only here where you will gain heart and passion for the job. School is interesting and fun at this point, as the students are quite successful. The issue is finding the people at the beginning and employing them so they catch the passion

Re internships, our students work closely

with advisors to determine their needs and then we find the right spot for them. We stay involved the whole way. We visit the student during the internship and this gives us valuable information to pass on to the next classes as well as forges relationships with employers.

The industry can best support 2-year turfgrass programs by employing young people to give them the heart; 15-20 hours per week, as this is often all the time they can and will give. Contact athletic directors and coaches and let them know you are willing to hire and mentor. This will go a long way.

HORRY GEORGETOWN TECHNICAL COLLEGE, Conway, SC

From Ashley Wilkinson, Professor, Golf & Sports Turf, and Golf Course Management:

HGTC has had a 2-year associate degree program in turfgrass since 1972. Our initial goal was to offer an education for the expanding golf course market here in Myrtle Beach and the



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Ashley Wilkinson, Horry Georgetown Technical College

Carolinas. The Golf Course Management program quickly found favor with employers which led to students, like me, coming from around the United States and other countries. Today, our alumni can be found around the country and world.

We have placed a strong emphasis over the past 10 years in

the expanding market of sports turf. HGTC created a new major, Sports Turf Management, to ensure that our students who desire a career in sports turf will receive the knowledge and experience needed to quickly be successful in this rapidly expanding market. Our graduates have found excellent opportunities in numerous major league sports facilities, which only excites the next class of incoming students. Our graduates can also work on dual turf degrees while at HGTC. We can modify the curriculum to help students pursue both degrees in golf and sports turf with minimal disruption to the goal of finishing in 2 years.

Perhaps the greatest strength of HGTC is the amount of on the job training that can be found in the area. We have excellent relationships with both golf and sports turf facilities along the Grand Strand. This is something that brought me here as a student and what so many of our graduates say has given them an edge in the work place. To be sports turf specific, we have classes at the Myrtle Beach Pelicans facility, a Texas Rangers affiliate. The Sports Turf Manager and adjunct faculty member, Corey Russell, shares both introductory and advanced field management strategies with HGTC students. Being part of the real deal helps HGTC students in ways that classroom lectures can't mimic.

Our biggest change at HGTC has been the opening of a new state of the art building for turf study that allows us to expand both scientific and collaborative learning outcomes. We have also invested in new turf specific technology to expand the students understanding of how advances in technology will improve management strategies. Things like geothermal cameras, advanced salinity and moisture monitoring devices, and GIS technology are just some of

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the new gadgets that students will be exposed to in an effort to put them at the front of the line come hiring time.

Our biggest challenge, simply put, is awareness. As a high school graduate I had no idea I could find a 2-year program that could teach me so much in a specific field. I took classes at a university not knowing where to turn. Luckily, I found a summer job in parks and recreation that exposed me to turfgrass and later HGTC. There are so many excellent 2-year programs but we need to get the word out to the high school students that a career in what they love can be found without amassing tens of thousands of dollars in debt. And we can create better success for students interested in 4-year institutions due to the level of intense study at the 2-year level. I found that my Bachelor's degree was a cakewalk after 2 years of intense study in turfgrass and horticulture at HGTC. That's probably why I was so honored to get back here after a career in turf management. I knew I could change students' lives whether they wanted to go straight to work or if they wanted to get ready for more education.

Our internship is an integral part of our education. We expect, and help, students work while in school. Our students must work while in school for at least one semester. This helps us study the student's strengths and weaknesses and allows us to build on what they need. We also have a summer internship where students work for industry leaders around the country and world. We try to help the student work in an area that may interest them upon graduation or for mentors who will continue the student's education. I personally monitor all internships. The internship program requires numerous reports involving soils studies, management strategies, chemical awareness, and irrigation methodology just to name a few. By the time our students are finished with their internships they have a new appreciation of the business of turf management and the time management that is required to reach the pinnacle of the profession.

The best support comes from the local associations. It's all about mentoring. We are blessed in South Carolina to have a very involved and dedicated group of sports turf professionals. Our sports turf professionals and industry leaders are welcoming to the many times I call upon them for a tour, lecture, or facility visit. Whenever I attend a meeting I always feel the energy the association has. If I can get students involved with the association then I know they will continue to grow professionally and personally. What I can teach may not always resonate as well as what I can show. A strong local STMA chapter can show the students the excitement, camaraderie, and fun that can be had in sports turf. For that, I am thankful to our STMA association partners.

PENN STATE, University Park, PA

From John Kaminski, Associate Professor, Turfgrass Management, and Director, Golf Course Turfgrass Management Program:

The Penn State 2-Year Turfgrass Program involves four 8-week terms and a 6-month internship. In class, students learn the basics of agronomy and turfgrass management, but we also focus a great deal on the business and communication side of the industry. We don't feel we can teach a student everything there is to manage turf, but we strive to give them the tools to become successful turfgrass managers. Our goal is not to teach students how to grow grass; it is to teach them how to become successful managers and leaders.

Re changes: Aside from hiring me, there haven't been any significant changes in the pro-

They also, however, take classes in math, communication, human resource management, business and even etiquette.

gram. Penn State has been a leader in producing successful turfgrass managers since the late 1950's. While we are always trying to stay ahead of industry trends, we also don't think that it's necessary to reinvent our successful program.

The biggest challenge facing all turfgrass programs is the declining numbers. Some schools with few students or limited faculty will likely be gone in the next 5 years. However, I think that this presents an opportunity for 2-year programs. As the cost of a 4-year degree increases well into six figures, 2-year programs have the ability to attract more students. When the salary



differences between managers with 4 year or 2 year degrees are marginal, it just makes sense for people to consider that as a factor in their decision of choosing a turfgrass program.

Penn State's 2-year program has four 8-week terms on the University Park campus. Students take a series of classes ranging from Botany, Soils, Turfgrass, Entomology, Pathology, Weed Science and others typical of an agronomic program. They also, however, take classes in math, communication, human resource management, business and even etiquette. A major part of the program is also the 6-month advanced internship. Students prepare during classes in the semester and then spend March through September learning the ins and outs of managing a sports facility or golf course.

In addition to the traditional classroom and internship experiences, students complete a lot of hands on projects related to construction, irrigation and others relevant areas. They are also exposed to numerous networking opportunities with industry professionals through conferences, turf bowl competitions and field trips.

How can the sports turf industry best support 2-year turfgrass programs? Good question. I think that one of things that the sports turf industry can do is to provide scholarships to assist students pay for the increasingly high cost of higher education. These scholarships not only provide financial assistance, but they also allow the students to build their professional resumes. Another critical area is the development of solid internship programs that look to train and mentor young people interested in turf as a career. Too often we see facilities that use interns as general summer labor. While we appreciate the need for this, the role of a supervisor should more in line with that of an educator and mentor. If supervisors keep this in mind they are usually able to attract the best students each year and help form the foundation for a student's success in his or her career.



▲ Troy McQullien, Kirkwood Community College

working with their hands. Following graduation most students find employment with-in the turf management industry or transfer onto a 4-year degree option.

Some of the most significant changes to the program have been adopting the Irrigation Associations educational resources for our Turf and



From Troy McQuillen, Golf Course and Athletic Turfgrass Management Assistant Professor:



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Landscape Irrigation Class. This class also carries a dual credit, where it can be transferred onto a University.

The second biggest change has been articulation agreements between the 2-year turf management programs and the state universities. These 2+2 agreements allow students to create a seamless transition after the hands-on 2-year experience into their bachelor's degree. Third, more hands-on lab spaces have been developed for the students involved in the program. Our Athletic Field Maintenance class works on the college's baseball and softball fields, along with maintaining the newer Intramural Field.

Some of the biggest challenges facing 2-year programs will be overall student numbers. When I started 8 years ago we had a turf student population of 60 and now our program is just over 45 full-time and part-time students. The delivery of education has changed. Students want more education delivered in online formats or hybrid coursework (class that are part face-to-face and part online). This online transition is difficult for hands-on programs, but we have been making unique curriculum changes to encourage more students into the turf management program.

Students are required to perform an internship between their first and second years. Internships start in early April and run through the summer until August. About 50% of the students will pursue out-of-state internship of all kinds and the other 50% in state or local. Students are required to complete daily logs, skills worksheets, and employer evaluations. When the students return to class they will give short presentations about their internship experiences to their peers.

The sports turf industry has already been an outstanding supporter of the 2-year turf programs, especially with the conferences, turf bowls, and education resources for all students. I would encourage the sports turf community to reach out to younger generations about the possibilities in this career field.

MINERAL AREA COLLEGE, Park Hills, MO

From Chad Follis, Horticulture Instructor:

Our program is typical of most community college (cc) programs. Heavier on plant and soils courses and lighter on general studies courses. We have 65 credit hours required for degree completion, with three specific courses.

[5 years ago] the program existed on paper but had no support; fundamentally it didn't exist. Getting this part of the hort program off that mat was part of why I was hired. We are making progress but [not yet] to the level I want in another 5 years.

Perception. We need to make it more clear that cc's are a viable hiring alternative and that our students are potentially more emerged in plant growth since two-thirds of their courses are in the world of plant growth and less in general studies. We also have a more diverse



▲ Chad Follis, Mineral Area College

Support. We are not doing research like a land grant so our students may have less exposure to cutting edge research since we don't have research centers, etc. So support comes in the form of in-class speakers and field trips. Help us put demo turf plots on campus; many cc programs manage their campus sports fields and need basic supplies (tools, fertilizer, etc). Think of your local FFA program, that is what your local cc

student population than most universities from a pure socio-economic perspective.

We require two internships, one in the summer the other during one of the four semesters. Students are responsible for finding their own internships with help as needed. We do a couple spot check follow ups during the internship and students have 30-hour reports. We try to get students into multiple locations so they can see various perspectives.

cepts. We need the same types of support. Make sure to invite the cc's to the summer and winter field days. Since most cc students are from lower socioeconomic backgrounds maybe the registration fees could be adjusted. In Missouri the Gateway Chapter of STMA and the state turf council have registration for \$30 for students. This allows me to take all our students to winter conference instead of just a few.



AIR-SUPPORTED STRUCTURES AND SYNTHETIC TURF FIELDS

Editor's note: Ian McCormick is business development manager, The Farley Group.



▲ Two full field seasonal domes (Downsview Park, Toronto, ON). All photos by Ian McCormick, The Farley Group synthetic turf field is an ideal playing surface for a wide variety of sports and activities—when it's not covered with a foot of snow. Fortunately, there's a building system that can allow for a synthetic turf field to be used during all seasons. Air-supported structures are lower cost alternatives to traditional buildings, particularly for facilities that require large, open, clear span interior space. But the most unique feature of these structures is their ability to be taken down and put back up seasonally. Many domes have been installed to cover sports facilities for the winter months and are taken down to allow for outdoor activity in the summer months. Of course, a dome can also be constructed for use as a permanent, year round facility.

With the exponential growth in participants in soccer and other field sports and the evolution of the synthetic turf industry, the past decade has seen a significant increase in the number of installations of synthetic turf fields with no signs of slowing down anytime soon. Unfortunately many of these fields are in areas that are affected by the cold and snow that winter weather brings, rendering them unplayable for several months every year. So, what's the solution for a field that can't be used during the winter months? Well, you can "bubble" it.

When air structures were first introduced to North America in the early seventies by industry pioneer Ralph Farley, covering a single tennis court for the winter season was an ambitious endeavor. The technology had already been established in Sweden, and Farley saw an opportunity to make use of these "bubbles" in areas in Canada and the United States where long, cold winters made it impossible for outdoor surfaces such as tennis courts to be played on after the warm season was over. So he teamed up with a tennis club in Toronto and imported one of these fabric structures from Sweden, specifically patterned and manufactured to cover one tennis court. The fabric membrane was attached to an anchoring system around the perimeter, an electric inflation fan pressurized the interior of the bubble, and that winter people played tennis on the same court that they enjoyed their favorite pastime on in the summer months. The dome was deflated the next spring,

rolled up and stored away, and the court was played on in the summer as usual.

The next project was even more ambitious, covering three outdoor tennis courts instead of just one. Since then, Ralph and his associates have been involved in hundreds of air-supported structure projects throughout North America and around the world. And today, a three-court tennis dome would be considered a relatively small project compared to the very large field house domes that can cover as much as 100,000 square feet of interior space.

THE TECHNOLOGY

An air-supported structure, also known as a dome or a bubble, is a truly unique building system. The entire structure is supported by maintaining a slightly higher air pressure within the fabric membrane than the atmospheric pressure outside. This is achieved by an inflation fan constantly introducing fresh air to the interior of the structure.

The inflation unit that maintains the internal pressure of the dome is also a furnace, keeping the interior of the structure at a comfortable temperature. To ensure that dome remains inflated at all times, a standby inflation system is always ready to take over the inflation requirements, even during a power failure.

The interior lighting system is either comprised of fixtures installed on stands around the perimeter or hung from the fabric membrane, or a combination of both. The industry standard for sports lighting is 1,000 watt metal halide fixtures. These fixtures require a ballast to drive them, which can be placed around the perimeter of the interior, at the base of the light stand poles if applicable, or can be housed in a remote cabinet or other storage building outside of the dome. Several other technologies are being introduced as sports lighting solutions, which hopefully will eventually lead to energy savings without sacrificing light levels required for competitive sports.

The fabric membrane is manufactured using architectural grade vinyl coated polyester fabric, and the pattern is specific to every project to create the shape of the structure. This outer material is backed by a 15 to 20 year prorated warranty, and can



A Main heat and inflation unit and standby inflation fan (Greenville, PA).

be expected to last anywhere from 18 to 25 years before needing to be replaced. A liner fabric is added to the interior of the membrane to improve thermal and acoustic qualities. Insulation material is placed between the outer structural fabric and the inner liner fabric to maximize energy efficiency, bringing the equivalent insulation value from R2 to R10. On medium to large-sized domes, structural cables are installed over top of the fabric membrane to help stabilize it.



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Interior view of fabric connections for mechanical equipment and vehicle airlock (King City, ON).



The shape of the dome's membrane adheres to certain design parameters, taking into consideration the wind loads and other climatic data of the site, and creating a curvature that promotes snow shedding off the sides and ends of the structure. If an air structure's height to width ratio is too low the top of the structure becomes too flat, allowing snow to accumulate and putting too much weight on the fabric membrane. To achieve the proper curvature, a dome's height at the peak typically needs to be 30% of the width of the structure, i.e., a dome that is 200 feet wide would be a minimum of 60 feet high at the curvature's apex.

Because this fabric membrane is supported by pressurizing the interior air space, a significant uplift load needs to be offset, which is accomplished by anchoring the membrane to a concrete grade beam around the perimeter of the dome. Soil friction and the weight of the concrete resist the uplift pressure that's created by inflating the dome. An aluminum channel is cast into the top of the grade beam, creating a profile that accepts the fabric membrane—that has a rope edge manufactured into it at the anchor point—and pressure treated lumber fits into the channel around the entire perimeter of the structure, locking the fabric membrane into the grade beam (Figure 1).

In order to maintain the internal air pressure, specially designed airlocks are installed to allow for easy access into the dome, including revolving doors, pedestrian airlocks for barrier free access, and vehicle airlocks for maintenance and lift equipment. Emergency exit doors are located around the perimeter of the structure in compliance with occupancy codes, and are only to be used during an emergency situation as they will allow the internal air pressure of the dome to escape.

CONSTRUCTION REQUIREMENTS

While overall project costs are indeed significantly less than a traditional building, site infrastructure costs, such as excavation and site preparation, parking lot requirements, storm water management, and the supply and distribution of electrical and natural gas utilities are required for an air structure just as they would be for any other type of building. Professional services required for site planning, such as architectural and engineering drawings and stamps, as well as the applications and approvals required with your local building department also need to be considered when planning your dome project.

One difference with the site infrastructure required for an air-supported structure is the installation of a concrete grade beam to hold the dome down, rather than a traditional foundation that supports the weight of the building on top of it. The design and engineering of the grade beam depends on the size of the dome and the wind loads of the site's location, as well as the soil conditions of the site. Once these factors are

determined, the air structure manufacturer will design the anchoring system accordingly, including requirements for equipment pads for mechanical units and entrance and exit components, and will provide a set of construction drawings stamped by a qualified structural engineer.

With new projects, the concrete grade beam and other infrastructure required for the dome, including electrical and natural gas service and distribution are planned and constructed in conjunction with the rest of the site development. Whether or not the dome will be seasonal or year round will need to be considered during the planning stages of the project. There are some subtle changes to the design of the dome and its anchoring system between seasonal and permanent structures. Outside of the scope of the air structure and its related construction, however, is the requirement for field drain-



Fabric membrane being locked into anchoring system (Greenville, PA).



▲ **Dome spread out** and connected to the grade beam, beginning inflation (Greenville, PA).

age. Simply put, if the dome is going to be seasonal, field drainage will be required because the field will be open to the elements for part of the year; if the dome is going to stay up year round the field won't require this drainage infrastructure. When the dome and field are being constructed together in new developments, the final installation of the synthetic turf is typically completed after the air structure has been installed. The installation process with for the dome typically involves driving around the interior with heavy lift equipment, potentially damaging the brand new field. Of course, plywood can be laid down for the lift equipment to drive on if the field is installed first, or in the case of installing a dome on an existing field. For existing fields, where the grade beam is installed around the outside of the field, the turf typically needs to be disturbed around the perimeter of the field to install the grade beam. Once the grade beam is completed, the turf is repaired and shored up to the edge of the new concrete, which is flush to grade for seasonal domes, leaving little evidence of it being installed, or it can be raised for permanently installed domes to create a curb on the outside that can be useful for a guideline when clearing snow in the winter time. The grade beam can also be installed across an existing turf field if the plan is to have a seasonal dome cover a portion of the field. Turf fill-in pieces can then be created to cover up the grade beam and allow for regular use when the dome is taken down for the summer.

INSTALLATION

Once the grade beam construction and all other site work is complete, the air-supported structure and its related components are ready to be installed. Depending on the size of the dome, the fabric membrane will be manufactured in as few as two to three or as many as eight to ten sections, which are folded and rolled up into bundles for shipping and ease of handling on site. These sections are unfolded, spread into place and connected to one another using aluminum joint plates.

The fabric membrane is then connected to the grade beam around the perimeter and locked into the anchoring channel. If applicable, the structural cables are laid in place and connected to their anchors in the grade beam. The furnace and inflation equipment are connected to the duct work for the dome, which is either a fabric connection through the side of the dome or underground ducts from the equipment pad to floor grates inside the dome. Flip the switch to the inflation equipment and 1 to 2 hours later the dome is fully inflated.

The rest of the installation process includes placing and connecting all of the entrance and exit components to their fabric curtains on the dome, and installing the insulation material, interior lighting system, and divider netting or curtains. All in all, the initial installation process usually takes anywhere from 1 to 3 weeks, depending on the size and complexity of the air structure package.

Seasonal domes that are taken down in the spring and reinstalled in the fall basically go through the reverse of the process outlined above every spring and then repeat the process every fall. Of course, the seasonal ups and downs are more efficient than the initial installation, taking about a third of the time. The furnace and inflation equipment typically stays in place while the dome sections and the other attached components are stored away for the summer months. The cost associated with these seasonal take downs and reinstallations can add up for large full-field structures, given the man power and rental equipment required to accomplish the task.

OPERATING AND MAINTENANCE

Operating costs for an air-supported structure include electrical costs for the inflation equipment and the interior lighting system, and heat fuel costs for the furnace. Although air structures have a lower capital cost than traditional buildings and have the unique ability to be removed and reinstalled seasonally, they do require a slightly higher operating budget for utilities than other buildings that can be better insulated and don't require an electric fan for inflation. That being said, significant improvements have been made in the way of insulating the fabric membrane of an air structure with further innovations to this technology on the horizon.

A very important maintenance consideration is snow clearance around the perimeter of the dome. Because an air-supported structure is designed to shed the snow off the fabric membrane, the snow accumulates around the perimeter once it does. It's extremely important that the snow gets cleared away from the fabric membrane so it doesn't jeopardize the structural integrity of the dome.

Other maintenance required includes regular checks on the backup inflation equipment to ensure a seamless transition in the event of a power failure, as well as regular maintenance for all mechanical equipment associated with the air structure.



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What 3-4 factors do you consider most important for efficient and successful field and logo painting? What is the worst painting disaster you've ever been involved with or seen happen?

TODD TRIBBLE, Athletic Field Superintendent **Oklahoma State**

I think using high quality paint, that is mixed correctly, has to be the most important step in having successful logos and lines. We use a national brand and dilute our white to a 50/50 ratio of water to concentrate which allows us to achieve 10 gallons of paint per 5 gallons purchased. I have found on our orange that it needs to be mixed with a bit more concentrate than a 50/50 or our logos come out a bit muted. We stir our paint using a cordless drill along with a paint paddle (~10\$) available at most home improvement stores.

Strings and meticulous operators can really make your paint stand out for the right reasons. We string out every line we paint regardless of its visibility; this helps us ensure that our dimensions are not changing. I make sure our strings are pulled tight before a line is painted which helps prevent strings from "walking" or bowing on us. We generally have the same operators paint the soccer field and football fields as they know where any undulations are and can account for those areas as the painter is being pushed during the painting process. We always have a water source being either a 5-gallon bucket of water or a hose and coupler nearby in case of a spill, wind drift, or a poorly painted area.

As far as painting actual logos I feel like you are going to need two coats for the initial painting before fans see it. We will paint the first coat on a Thursday if we play on Friday at soccer and the second coat on game day. I have always felt like an initial coat of white as a base helps our orange appear brighter vs. using back to back coats of orange. If we play at home the following week we can usually get away with one paint application instead of two as a base coat is already down. When the team goes out of town we always paint the outline of the logo in white (using strings since our logo has straight edges) just to keep our edges crisp and dimensions where they were intended to be.

Lastly, we always make sure we are looking at the weather forecast 48 hours in advance if we know there is painting that needs to be done. Stillwater tends to be a very windy place so if we know our game is Friday and the wind will be blowing 20-30 mph we will avoid those types of days and paint the day before. We have the same outlook obviously with rain that may be in the area. We have used plywood to block the wind on days we have to paint foul lines and coaches boxes at baseball.

I think if you plan beforehand and have a routine in place before you set up your painters most problems can be avoided. The final process in field preparation is lining and logos and will most often be what your fans, coaches, and administrators notice before anything else. Paint applications are really the finishing touches on your field so we try and nail this portion of the set-up each and every time.

KEVIN MALONE, CSFM The LandTek Group

I've only done a small amount of line painting and logos. But I can say that these would be most important to me:

Using a quality sprayer

Keeping the spraying clean after EVERY use

Using high quality paint

Operator experience-practice makes perfect

KEVIN YEISER,

Director of Grounds & Athletic Facilities Lebanon Valley College (PA)

Using quality paint

Use good application equipment. Line painters aren't always the best to use for logo work.

■ Staff that pay attention to detail and take pride in what they're doing. Those two things always show in the end result, especially with logos. No logo is better than a poorly painted one.

We haven't had too many disasters but I talked to a colleague at another college where an entire 5-gallon pail of paint was spilled on a synthetic field. It occurred during the hot quick drying days of late summer. Even after cleaning numerous times a shadow could be seen for quite a while.

JEFF HAAG, Sports Turf Specialist John Carroll University (OH)

Make sure the painter you use has been thoroughly cleaned,

spray tips, filters, and hoses prior to each use, and after the painter has been used. I go by the same method in rinsing out the machine as we are required by pesticide containers; I triple rinse my machine with water.

When painting logos, start from the inside and work your way out.

One cost effective way to save money on small logos that are no larger than 48 inches by 40 inches is to use cardboard. I save our cardboard that is shipped with our pallets of salt we use in the winter on our campus sidewalks. All you need is a ruler to measure the logo and a utility knife. I use them to make my logos on the softball outfield. The best part is that it costs you nothing, just your time. They could possibly be used for football fields as well if you use small logos near the 20 yard lines or in other areas of the field.

Fortunately, I have never had a major bad experience. When I was at Bowling Green State University we used to paint the numbers white and border them with orange by using a 2-inch roller and roll the paint around the numbers. Sometimes we used students to help us do this, and one time they knocked over the bucket of paint. Because of that I would suggest to always have a bucket of clear water and rags on hand to help dilute and clean up any spills.



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