

Sports Turf Manager

for safe, natural sports turf

Spring 2009

VOLUME 22, NUMBER 1

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NEW MULTI-PURPOSE STADIUM, MONCTON, NB

Ontario Turf Seeds

Yes, we've done your homework for you! See pages 19-20 for a comprehensive list of turf seed available from Ontario suppliers. STA publishes this information every two years as a valuable member reference.

Construction of a Multi-Purpose Stadium in Moncton, NB

DR. R.W. DANIELS, DEP'T ENVIRONMENTAL SCIENCES, NS AGRICULTURAL COLLEGE (RETIRED)

A 2009 OTS Highlight Article. The City of Moncton, New Brunswick has been awarded the 2010 International Athletic Association Federation (IAAF) World Junior Championships. In order to host this event, they are required to construct a facility, consisting of a grass infield and an eight lane track with locations for jumping and throwing events. All facilities are to meet the specifications as set out by the IAAF. This article deals with the specifications, planning, construction, grow-in, and maintenance of the infield during the period of its initiation, which began in Winter 2008.

In July of 2010, over 2,000 athletes, coaches and officials representing 170 countries will be on campus at the Université de Moncton to participate in these championships. The athletes will be ages 19 and under, many of whom will compete in the 2012 Olympics in London. This seven-day event will be the largest sporting event ever held in Atlantic Canada. During this time period, a total of 44 events (22 each for women and men) will be held. It is anticipated the championships will be seen by millions of viewers with media coverage ex-

tending to 134 countries around the world. It will leave a \$500,000 financial legacy for the region.

Upon its completion, the athletic infield will be one of the best in Canada. Our goal is to exceed the standards as set out by the IAAF. To comply with IAAFF standards, the surface of the infield must be almost flat, with only a 0.3 percent surface grade being acceptable. The D zones will be made with track synthetic surface for jumping and throwing events. D zones are the rounded space at the two ends of the infield, i.e. the... **→ page 9**



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telephone number with area code, and time of
calling. The office may be reached at any time by
faxing (519) 766-1704 or via e-mail.

The President's Desk – Gord Dol

Spring is here, and it's time to get back to the business of sports turf management.

This year's Ontario Turfgrass Symposium was again a great success with a first class slate of speakers and a great venue. The OTS is and continues to be the premier turf education forum in Ontario. Many thanks to the OTS Committee for another job well done. Look inside in this and future editions for 2009 OTS highlight articles.

The STA's Annual General Meeting and board elections were held February 18th during the symposium. We would like to welcome Bruce Carman from the Country Day School, Jason Inwood from the City of Vaughan, and Tennessee Propedo from the City of Hamilton to the Board of Directors. We also say good-bye and thank-you to Cam Beneteau, Paul Cooper and Rob Field who chose not to stand for re-election. A photo of your 2009 Board of Directors is in this issue.

Along with the other formalities of the AGM, a motion was brought forward to reduce the number of board members required for a quorum from 2/3 to 1/2 attendance. With everyone's hectic work and personal lives, meetings are challenging to schedule, and it has been getting increasingly difficult to obtain a quorum. This motion, which was passed, follows along the same lines as many similar industry organizations.

As I write this, Environment Minister John Gerretsen has just announced that Ontario's cosmetic pesticides ban will take effect on Earth Day, April 22, 2009. Visit www.Ontario.ca/pesticideban for the details. Questions should be directed to the ministry's Public Information Centre at 1-800-565-4923 or 416-325-4000.

The STA has coordinated presentations by Violet van Wassenaer, Pesticides Regulatory Scientist with the Ontario Ministry of the Environment, together with Pam Charbonneau, Turfgrass Specialist with the Ontario Ministry of Agriculture, Food and Rural Affairs, for the Parks and Open Space Alliance (POSA) Summer Opera-

tional Forum in June at Lakeview Park, Oshawa, Ontario. Violet will further update us on what, where, when and how pesticides can be used and Pam will outline a holistic approach using cultural best practices and the use of allowed pesticides to maximize turf quality and minimize pest damage.



Above: Gord Dol/President (left) expresses appreciation to Rob Field for his contribution to and support of the association. Rob, who served as director in 2007 & 2008, continues to assist with the Sports Turf Management & Maintenance Course.

While on the topic of POSA, the first offering of the new Parks and Open Space Professional Training Program – Level 1 will be in April at the University of Guelph. See inside for further details on both of these educational initiatives.

At the OTS, I once again had the pleasure of presenting Kevin Falls, President of the Ontario Turfgrass Research Foundation, with our annual donation. The OTRF funded and recently released the *2007 Economic Profile of the Ontario Turfgrass Industry*. There are more details in this issue and on the OTRF website at www.otrf.ca. Have a safe sports turf season! ♦

EVENT CALENDAR

April 26-May 1

Ontario Recreation Facilities Association 54th Annual Professional Development Program
University of Guelph, ON
www.orfa.com

April 27-30

POSA Parks and Open Space Professional Training Program – Level 1, Sports Turf Management & Maintenance Course
University of Guelph, ON
Info: 519.763.9431
www.sportsturfassociation.com

June 24

POSA 3rd Annual Summer Operational Forum
Oshawa, ON
Info: 519.763.9431
www.sportsturfassociation.com

★ SEPTEMBER TBA ★

**Sports Turf Association
22nd Annual Field Day**
Watch for details!

www.sportsturfassociation.com

September 14

Ontario Turfgrass Research Foundation Fundraising Golf Tournament
The National Golf Club of Canada
Woodbridge, ON
www.otrf.ca

September 28 to October 1

POSA Parks and Open Space Professional Training Program – Level 1 Sports Turf Management & Maintenance Course
Petawawa, ON
Info: 519.763.9431
www.sportsturfassociation.com

★ NOVEMBER 1 ★

**Sports Turf Association
Robert W. Sheard Scholarship
Application Deadline**
Info: 519.763.9431
www.sportsturfassociation.com

Contact the STA office if you have an event you'd like to advertise in the *Sports Turf Manager*.

Parks & Open Space Alliance 2009 Educational Opportunities

Parks & Open Space Professional Training Program – Level 1: April 27-30

The first offering of the Parks and Open Space Professional Training Program – Level 1 in its entirety is at the University of Guelph from Monday, April 27 to Thursday, April 30 during the Ontario Recreation Facilities Association Professional Development Program.

The program consists of three, four-day courses: Parks Maintenance and Operations; Parks Equipment Safety Operation and the STA's *Sports Turf Management and Maintenance*. It has been designed for seasonal workers as well as full-time parks and open space personnel.

For further details & registration information on any of these sessions, visit www.sportsturfassociation.com and click on the POSA link in the left sidebar.

In order to successfully complete the program, participants must also have a minimum Grade 12 education; be a member of the OPA, the ORFA or the STA; maintain current WHMIS and Standard First Aid training; and have a minimum 24 months related practical work experi-

ence affirmed by an immediate supervisor.

All three courses will again be offered in Petawawa from Monday, September 28 to Thursday, October 1, 2009.



Summer Operational Forum Wednesday, June 24

See you at Jubilee Pavilion, Lakeview Park, Oshawa. Sessions include:

- Ontario Cosmetic Pesticides Ban
- Horticulture for Municipal Parks
- Understanding Security Needs and Regulations

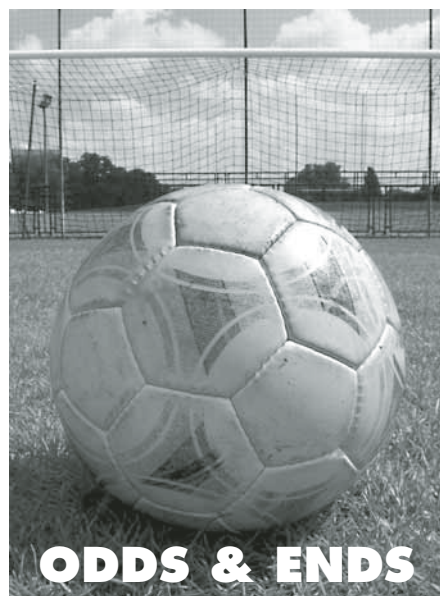
Outdoor Program

- Beach Maintenance Best Practices
- Soccer Pitch Maintenance Best Practices

Indoor Program

- Understanding Your Parks Budget
- Recycling and Waste Management
- Scuba Divers Can Place You at Risk

PARKS AND OPEN SPACE ALLIANCE



ODDS & ENDS

STA Membership Plaques

Display membership plaques are available in executive engraved walnut for \$50 plus S&H and gst. To order, contact Lee at the STA office.

Summer 2009 Submissions

If you have something you'd like to submit for the next issue, please forward it to the STA office by May 15, 2009.

Editorial Content

Opinions expressed in articles published in *Sports Turf Manager* are those of the author and not necessarily those of the STA, unless otherwise indicated.

Ontario Turfgrass Industry Economic Profile Results Are In

The Ontario Turfgrass Research Foundation (www.otrf.ca) has released a detailed report of the economic size of the Ontario turfgrass industry incorporating data collected from the sports turf industry. This commissioned study measures the scale and the breadth of the industry both in physical terms (acreage, employment) as well as in economic terms (gross revenue, expenditures on operating and equipment). The Ontario turfgrass industry consists of diverse segments, such

Operating expenses well exceeded equipment expenditures with payroll of \$129 million topping the largest expenditure item. The area of maintained turfgrass by municipalities has doubled in the last 25 years with an estimated 93,000 acres of turfgrass in municipalities of over 5,000 residents. To maintain these parks and fields, approximately 73,000 full and seasonal workers were employed in the surveyed year of 2007. Overall, the completed economic study shows that the financial

According to the 2007 Economic Profile of the Ontario Turfgrass Industry:

The Ontario turfgrass industry maintained 390,000 acres of turfgrass in 2007 while generating \$2.6 billion in revenue to the economy. The industry also provided 33,000 full time jobs while spending an additional \$1.75 billion on operating and equipment expenditures.

as golf courses, municipal parks and sports fields, sod farms, and lawn care companies. Surveyed industry professionals and selected turfgrass industry segments, along with other data sources, provided an in-depth analysis of the value of Ontario turfgrass industry. The results of this study emphasize its importance to the economy of Ontario.

What does this economic study mean to the sports turf industry? Survey results reveal that turfgrass from sports fields to parkland contributes significantly to the overall turfgrass economy. Municipal expenditures associated with maintaining turfgrass totaled over \$205 million in 2007.

value of turfgrass in sports fields and municipal parks is significantly increasing and providing Ontario with increased employment and revenue.

Strategic growth is expected in all industry segments with population growth, urbanization and retirement trends to benefit the industry over the next five to ten years. The report indicates that some of the impediments to industry growth include water use policies, cost of labour and availability of qualified labour. ♦

George Morris Centre Economist: *"This well researched study provides a defensible and conservative measure of the Ontario turfgrass segment."*



NEW MEMBERS

Welcome to the STA!

Jeff Moak

SGLC Property Services, Ajax, ON

Francois Hebert

DSSS Design Solutions
for Sports Surfaces, Montreal, QC

Rob Sarson

University of Toronto (Scarborough)
Scarborough, ON

Jason Inwood

City of Vaughan, ON

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Industry News

Turf Care Exclusive Distributor of Progressive Turf Equipment

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- 3) Tri-Deck Rotary Finishing Mower, designed to maintain all large mowing areas. By utilizing your own tractor, the Tri-Deck can mow from 50-75 acres in an eight hour day, at speeds up to 6 mph.



Please call Paul Cooper at 905-715-6797 for more information or visit us at www.turfcare.ca.

KEEPING TO TRADITION, OTS 2009 IN GUELPH ANOTHER SUCCESS

The 18th Annual Ontario Turfgrass Symposium (OTS) was held at the University of Guelph, February 18 & 19, 2009, offering leading edge seminars to hundreds of delegates. The OTS is a two-day conference that allows turf experts from both academia and industry to share insight and research regarding best practices for turf care.

"Feedback from delegates suggested that sessions were very informative and engaging. These lectures allow for new ideas to be taken back to the workplace for discussion and implementation," says Steve Fleischauer, Manager of Program



Development, Office of Open Learning.

Delegates from a variety of provinces were in attendance to gain practical and applied knowledge from over 25 training sessions.

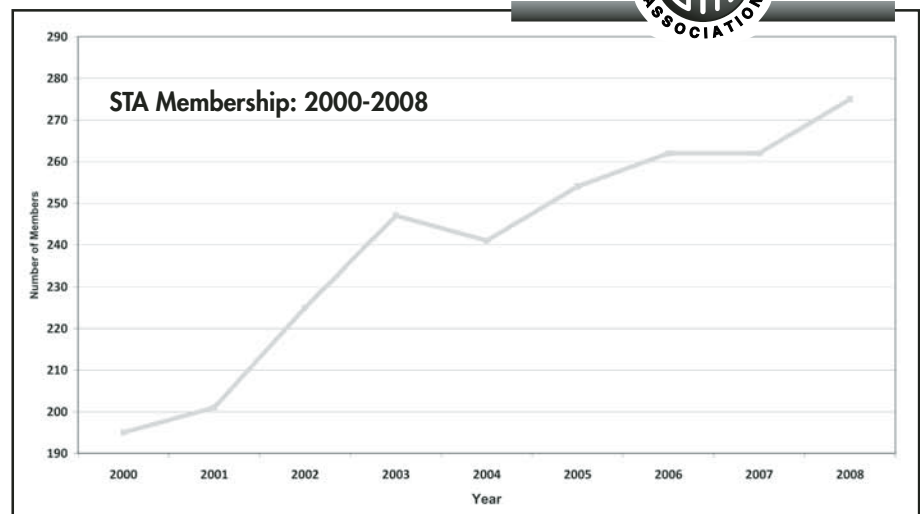
"This year's topics generated a lot of discussion," commented Paul Turner, OTS

Executive Chair. "This kind of training opportunity can really have a huge impact on the skill set of turf industry management and staff."

Details for OTS 2010 will be available later this year. Interested individuals are invited to visit www.open.uoguelph.ca/OTS or call 519.767.5000 for more information.

STA Membership Trends

On December 31, 2008 membership in the STA numbered 275. A historical graph of our membership numbers since Y2K illustrates the slow, steady growth we continue to experience. 56% of our membership was from the municipal sector, 27% were industry suppliers of products/services, and 11% were from the college/university and public/private school board sector. 53% were initial members and 47% additional members from the same municipality/organization/company. 91% of our members are in Ontario with 4% in the western provinces of British Columbia, Alberta and Saskatchewan, 3% are in Quebec, and 1% in the eastern provinces of New Brunswick, Nova Scotia and Newfoundland/Labrador. 1% of our membership is international, based in the USA.



NATURAL GRASS & ARTIFICIAL TURF: SEPARATING MYTHS & FACTS

Latest Release From The Turf Resource Center

Natural Grass and Artificial Turf: Separating Myths and Facts is the newest booklet published by The Turf Resource Center to help decision makers and the general public make informed decisions regarding the installation of natural grass or artificial turf in their communities. The 32-page booklet is based upon information from some of the industry's most highly respected research scientists, sports field managers, contractors and other professionals.

the NFL club's playing surfaces of natural grass compared to artificial turf. A total of 1,511 active NFL players from all 32 teams voluntarily completed a survey form. Their professional opinions should be of significant interest to any decision maker before selecting a natural grass or artificial turf installation in their community.

Subsequent chapters discuss "Cost Analysis of Various Types of Sports Fields," "Problems with Wear, Durability and Maintenance Studies," "Safety and



Throughout the booklet, readers will find commonly heard myths followed by scientifically documented facts about artificial turf and natural grass. The book points out, "While there are situations when artificial turf might be appropriate, scientific research documents the significant environmental, health and safety benefits of natural grass should logically be the first consideration."

A downloadable version of *Natural Grass and Artificial Turf: Separating Myths and Facts* is available at www.TurfResourceCenter.org. Also posted is an order form to request 10 or more free hardcopies of the booklet with a nominal charge for shipping and handling, subject to approval of The Turf Resource Center. For more information, contact The Turf Resource Center at 847-649-5555.

A total of 1,511 active NFL players from all 32 teams voluntarily completed the survey. Their professional opinions should be of significant interest to any decision maker before selecting a sports field surface.

Natural Grass and Artificial Turf: Separating Myths and Facts has an easy-to-read format, providing answers to questions that decision makers must address as their decisions have significant short and long-term health and safety, fiscal and environmental impacts on the constituents within their communities.

The booklet's first chapter presents findings from the National Football League Players Association survey that determined their experiences and thoughts concerning

Human Health Issues," "Environmental and Cultural Benefits," and "Safety and Health Questions to be Asked." Each chapter presents credible information about the differences in natural grass and synthetic turf, with a comparison of advantages, benefits and disadvantages. Case studies, detailed references and in-depth scientifically-documented information by renowned scientists present the true costs, environmental, safety and other differences between these surfaces.



STA 2009-2010 BOARD

The Sports Turf Association elected its 2009/2010 officers and directors at the Annual General Meeting held during the Ontario Turfgrass Symposium on February 18. Front left to right: Paul Turner, Lee Huether (Executive Manager), Paul Gillen, Andrew Gaydon. Middle left to right: Gord Dol, Grant Mckeich, Bruce Carman, Rick Lane, Jason Inwood. Back left to right: Murray Cameron, Bob Kennedy, Bill Clausen. Absent from photo: Jane Arnett-Rivers, Dave Chapman, Tennessee Propedo. See Gord Dol's column on page 3 for further details.



TAKING CHARGE OF OUR ENVIRONMENT

URBAN FERTILIZER COUNCIL EDUCATES ON RESPONSIBLE FERTILIZER USE

Protecting the environment is a priority for Canadians. The fertilizer industry wants to show them how they can do that and at the same time enjoy bountiful gardens, healthy green yards and sports fields. The Canadian Fertilizer Institute and the companies that sell plant nutrient products designed for use around residences, parks and golf courses have created the Urban Fertilizer Council to help homeowners and turf management professionals understand how to look after their properties safely and properly.

The Council's emphasis is on promoting stewardship of the environment and providing homeowners, park managers, groundskeepers and municipal leaders with science-based information so they can make decisions on the best kind of fertilizer to use and other landscaping practices, says Clyde Graham, Vice-President of the Canadian Fertilizer Institute.

"We all have a responsibility to protect our environment and our waterways," Graham says. "Almost everything we do and the choices we make can affect the world we live in. Fertilizer use is no exception. Using fertilizer to create healthy lawns and parks is consistent with protecting the environment."

In the ongoing debate about protecting the health of backyards, parks and golf courses, professional turf managers often

find themselves looking for handy and reliable information to counter critics of fertilizer use.

There are plenty of sources of science-based data that turf managers can turn to. The Urban Fertilizer Council aims to make it easier to quickly access the kind of information they need when fielding queries about their use of fertilizers on city green spaces or responding to calls for banning lawn and garden fertilizers.

The Council was formed by companies that supply lawn fertilizers with the intention of proactively communicating to consumers about the responsible use of fertilizers and protecting the urban environment as well as lakes and rivers. It sees turf managers as key players in delivering the message about responsible fertilizer use because their job puts them at the centre of the debate and their education and

experience is connected with how best to care for green spaces.

The message for turf managers to deliver can be as simple as educating homeowners to follow directions on fertilizer bags and providing tips on spreading fertilizer that so it won't harm the environment.

The Council's approach is built around the Canadian Fertilizer Institute's trademarked *Right Product@Right Rate, Right Time, Right Place* system. Originally developed in connection with agricultural practices, the basic principles of the 4Rs applies to anyone using fertilizer. In other words, having the right fertilizer for what the soil on your property needs, applying it as directed when plants can absorb it and keeping it on the intended lawn or garden are guiding principles to follow.

The Urban Fertilizer Council believes that voluntary nutrient management programs based on sound science, expert advice and public education are the best approach. Applying too much fertilizer is simply wasteful and can harm the soil or cause losses to the environment. At the same time, too little fertilizer can leave plants and crops stunted for a lack of nutrients. But used in the right way, fertilizers keep lawns, parks, sports fields and golf courses green and healthy.

Let's focus on the facts: healthy grass produces oxygen and consumes carbon dioxide that contributes to greenhouse gases. Green spaces help absorb excess heat in urban areas and prevent soil runoff that clogs waterways. A good lawn or park absorbs rainwater and filters it through the soil rather than letting it run straight into water courses.

It's also important to tell the public that fertilizers are safe. As the Canadian Fertilizer Institute notes, "Air is about 78% nitrogen, but most plants can't use it directly. Nitrogen fertilizers, which are manufactured from the nitrogen in the atmosphere, supply this nutrient in a form that plants can easily use. Phosphorus comes from fossil remains found in phosphate rock, and potash fertilizers come from ancient seabed deposits."

Handy sources of information include: Urban Fertilizer Council, www.cfi.ca/urbanfertilizer.asp; Canadian Fertilizer Institute, www.cfi.ca; International Plant Nutrition Institute www.ipni.net. ♦



PREPARING FOR THE 2010 IAAF WORLD JUNIOR CHAMPIONSHIPS

DR. R.W. DANIELS, PROFESSOR (RETIRED), DEPARTMENT OF ENVIRONMENTAL SCIENCES, NOVA SCOTIA AGRICULTURAL COLLEGE

Continued From the Front Cover. ... rectangular turf area, between the infield and eight lane perimeter track where athletes stand and get a proper footing for throwing the javelin, etc. This area has to be “hard” to provide proper traction for individual athletes and prevent slippage.

Additional event locations for the horizontal jumps (long jump and triple jump) will be constructed between the track and the spectator seating to avoid narrowing the width of the infield in order to comply with FIFA rules for international soccer matches. In the event that the owners may want to install artificial turf at a later date, the sub-base was prepared with this in mind.

Another feature incorporated into the design were provisions to hold future outdoor concerts. In preparation, appropriate electrical cables were placed under the infield to minimize future obstructions on the surface of the infield. In addition to meeting IAAF specifications, the established turfgrass playing surface of the infield must have the capability of holding 10,000 concert spectators as well as those sitting in the stands.

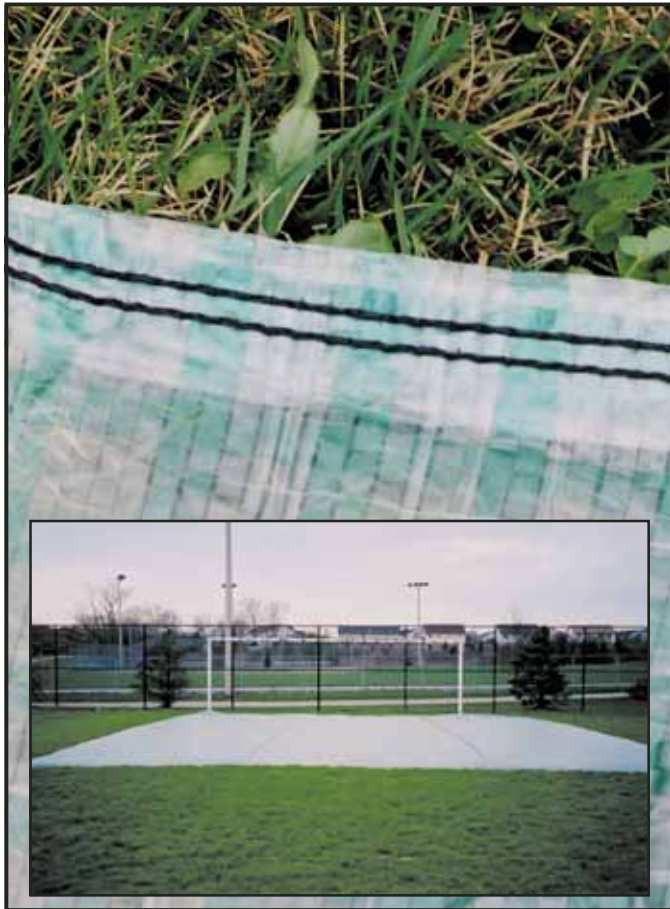
Fields Already in Place

Specifications for the infield conform very closely to those of a category 1 field as specified in the *Athletic Field Construction Manual* published by the Sports Turf Association (Ontario). Prior to the construction of this infield, a recreational complex known as the Moncton Sportplexe was built in 2000 consisting of six soccer fields and ten ball fields constructed of a similar all sand base. Additional and similar all sand-based soccer fields were later built at Mount Allison University in Sackville, New Brunswick and St. Francis Xavier University in Antigonish, Nova Scotia.

In the construction of each successive field, knowledge gained from previous projects was used in refining and upgrading the specifications and construction techniques. Seasonal usage of these fields has been monitored throughout the years and in all instances, individual fields have exceeded the expectations of all involved. Most impressive has been the number of seasonal hours of play that each field has had while still maintaining an acceptable cover of turf.

During periods when turf has been injured, the playing surface recovered quickly and seldom if ever has an activity been cancelled due to heavy rain. Some of these fields have recorded over 400 hours of usage per year and still maintained a satisfactory turf cover. Being situated on college campuses, these hours of play have been condensed to a relatively short time period (September to late November). This time period coincides with seasonal heavy rainfall. Simply put, because of the relatively short period of use, we do not know the limitations of these fields in terms of maximum number of playable hours per year.

One additional point that cannot be over-emphasized is the importance of quality control when selecting materials and during construction. Experience has shown clearly that an improperly constructed field can never be improved to the level of original specifications after it has been built. In overseeing quality control, only individuals knowledgeable in both the science and art of agronomy and athletic field construction should be in-



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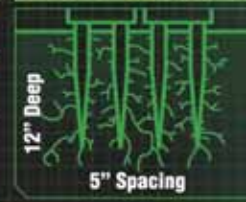



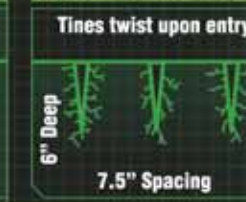
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EECI9107-501-01

volved. For optimum playability, once construction is complete, individuals managing the field must be given the knowledge, equipment and adequate seasonal maintenance budgets for the field.

Defining Sand-Based

To properly define this infield and the previous ones mentioned, a definition of sand-based or all sand sport fields must be made. The claim to construct a “sand-based” field is often abused and misunderstood. All media used in field construction contains some sand, and in some instances, a selected medium is modified by adding additional sand and referred to as a “sand field.” In these instances, the sand used varies greatly in quality and particle size.

For the purpose of this discussion, a sand-based field is one that contains a

converted to artificial turf at a later date. The sub-base was graded and drainage gravel added to facilitate any future installation of artificial turf. Depth of growing media was 275 mm, allowing for 25 mm of settling, once it was applied to the future surface of the infield. The infield was established to turf by seeding to avoid any “media layering” effect.

Turf established on the future playing surface consisted of a blend of 90% improved Kentucky bluegrass and 10% improved perennial ryegrass. The Kentucky bluegrass component consisted of three separate improved varieties in equal proportions. The original intention was to seed the infield during Fall 2008, with grow-in during the following year (2009).

Due to a delay in constructing the drainage system immediately adjacent to the infield, seeding was delayed beyond Sep-



Top: Final infield preparations. **Above:** The perimeter of the infield will be completed in 2009 when the running track is installed.

What is a sand-based infield? For the purpose of this discussion, a sand-based infield is one that contains a minimum of 80% sand, has a specific amount of defined sand particles, a minimum stipulated internal water drainage capacity and a defined range of both micro and macro pores. The media must also be tested in a recognized laboratory.

minimum of 80% sand, has a specific amount of defined sand particles, a minimum stipulated internal water drainage capacity and a defined range of both micro and macro pores. The media is tested in a recognized laboratory. When a given sample does not meet specifications, amendments are added and the final product is re-tested. Samples for final testing are taken on site when the media is being prepared. In this way, the actual sample being tested will best represent the actual material that will be used. Experience has shown that once a prepared media has been handled (taken from source to field and installed), its internal drainage will in all likelihood be changed. Project specifications therefore stipulate that the media must meet all recommended criteria during its final preparation.

Field Construction

Following are some of the infield specifications, which also outline the specific provisions followed should the infield be

tember 15 – the day that had been established as the last “safe” date for fall seeding. A decision was made that the infield would only be seeded if a period of up to ten days of temperatures above 12° C were forecast, as it was determined that this would be the minimum amount of time required to get a satisfactory germination of the seed mix.

On September 26, favourable weather was predicted and therefore the infield was seeded. Fortunately this was accompanied by significant rainfall and above average seasonal temperatures prevailed for the next two weeks. A seeding rate of 4.0 lb per 1000 sq ft was used. This was a heavier than anticipated rate but we felt it was warranted considering the possibility of cool temperatures which would limit the germination rate. This proved to be a wise decision as the perennial ryegrass component emerged in seven days followed by the Kentucky bluegrass on day 12. The resulting turf stand was such that it adequately covered the surface, stabilized the

media so that little disturbance occurred and allowed seedlings to grow and develop into strong turfgrass plants. On November 28, by the time the project was closed for the season, Kentucky bluegrass seedlings were approximately 1.25” high and had a sufficient root system to stabilize the media, thus little erosion and displacement should occur over the winter period.

Other Considerations

During the championships, there will be many television cameras positioned at various locations around the perimeter of the running track, all of which will show a background of turf. To ensure that all turf is of identical colour, turf established in the immediate areas off of the infield will be of the same mixture and receive an identical management program to that of the infield. As a back-up in the case that additional turf may be needed, an area, containing a similar growing medium and turfgrass cover, will be established to turf and maintained exactly to the standards of the infield.



Above: All vehicle surface tracks were removed by hand to ensure a proper finished grade on the playing surface.

Once constructed, the contractor has the responsibility of maintaining the infield for the following 12 months. To ensure that the turf matures properly, the contractor will be given a very specific management program to implement. In addition, the selected maintenance staff responsible for the infield during the championships will closely monitor the infield. This will ensure a smooth transition when these individuals take complete responsibility for the infield.

This event requires that the infield and all areas encompassing the site meet the highest possible standards. This is a great challenge with no provision for any “practice.”

MEDIA SPECIFICATION Recommended vs. Actual

Particle Class	% by Volume Recommended	% by Volume Actual
Gravel	<10%	0.0%
Very Coarse Sand	<10%	14.9%
Coarse + Medium Sand	50-75%	57.0%
Fine Sand	<25%	14.0%
Very Fine Sand	<10%	6.4%
Silt + Clay	<15%	7.2%

MEDIA Infiltration, Porosity, Bulk Density, Organic Matter, pH

Characteristics	Recommended	Actual
Water Permeability (in/hr)	5 to 10 in	7.6 in
Total Porosity	35 to 55%	40.4%
Air Filled Porosity	15 to 30%	23.1%
Water Filled Porosity	15 to 30%	17.3%
Bulk Density (g/cubic cm)	— — —	1.58
Organic Matter	1 to 4%	1.81%
pH	6.0 to 7.0	5.50

Industry News: Rittenhouse's Unique Alternative to Pesticides

The Green Steam

St. Catharines, ON – Restrictions on pesticide use are becoming an issue across North America when it comes to maintaining lawns and other weed prone areas. Rittenhouse offers a unique solution.

Using patented technology, the Green Steam produces super-heated steam to 650° F to quickly and effectively kill weeds without chemicals. The Green Steam unit uses a standard 20 lb propane tank that will last for approximately eight hours of continuous operation, while the 10-gallon water tank provides three hours of constant operation. The unit uses a deep cycle 12 volt battery to operate the diaphragm pump. The Green Steam can be outfitted with an optional hose reel including 25' of hose. The reel swivels and features an automatic re-

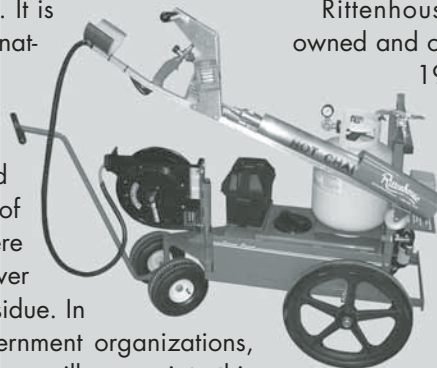
wind for ease of operation. The compact design of the machine also increases usability – at only 60 lb, the Green Steam can be transported easily from site to site. A skid mount version is also available for placement in the back of a truck or utility vehicle.

Cities and municipalities will find the Green Steam to be a very useful tool as part of their regular maintenance programs. It is perfect for eliminating weeds in sidewalks, parking lots and other hardscaped areas. The use of steam means there is no concern over spray drift or residue. In addition to government organizations, private landscapers will appreciate this

convenient alternative to chemical weed control.

The Green Steam provides a unique opportunity to be ahead of the curve and ahead of the competition when it comes to implementing a green care program. Visit www.rittenhouse.ca or call toll free 1-800-461-1041 to inquire further about the Green Steam and other great landscaping products.

Rittenhouse has been a family owned and operated company since 1914. We have extensive knowledge serving the green care industry as well as other horticultural and agricultural related sectors. Go to www.rittenhouse.ca to learn more about Rittenhouse and the products we offer.





SYNTHETIC TURF – A RISING PHENOMENON

FRANÇOIS HÉBERT, LANDSCAPE ARCHITECT, CSLA, OALA, AAPQ, DESIGNER & CONSULTANT, DSSS DESIGN SOLUTIONS FOR SPORTS SURFACES

At the 18th Annual Ontario Turfgrass Symposium, we were treated to a talk on synthetic turf. The speaker, Mark Nicholls, presented the audience with some facts that he feels people need to know about this technology. One thing worth noting about this presentation is that after being present on the market for many years, synthetic turf has finally managed to pop up on the radar of the Canadian sports turf industry. This invariably heralds an upcoming rise in the number of synthetic installations in the very near future.

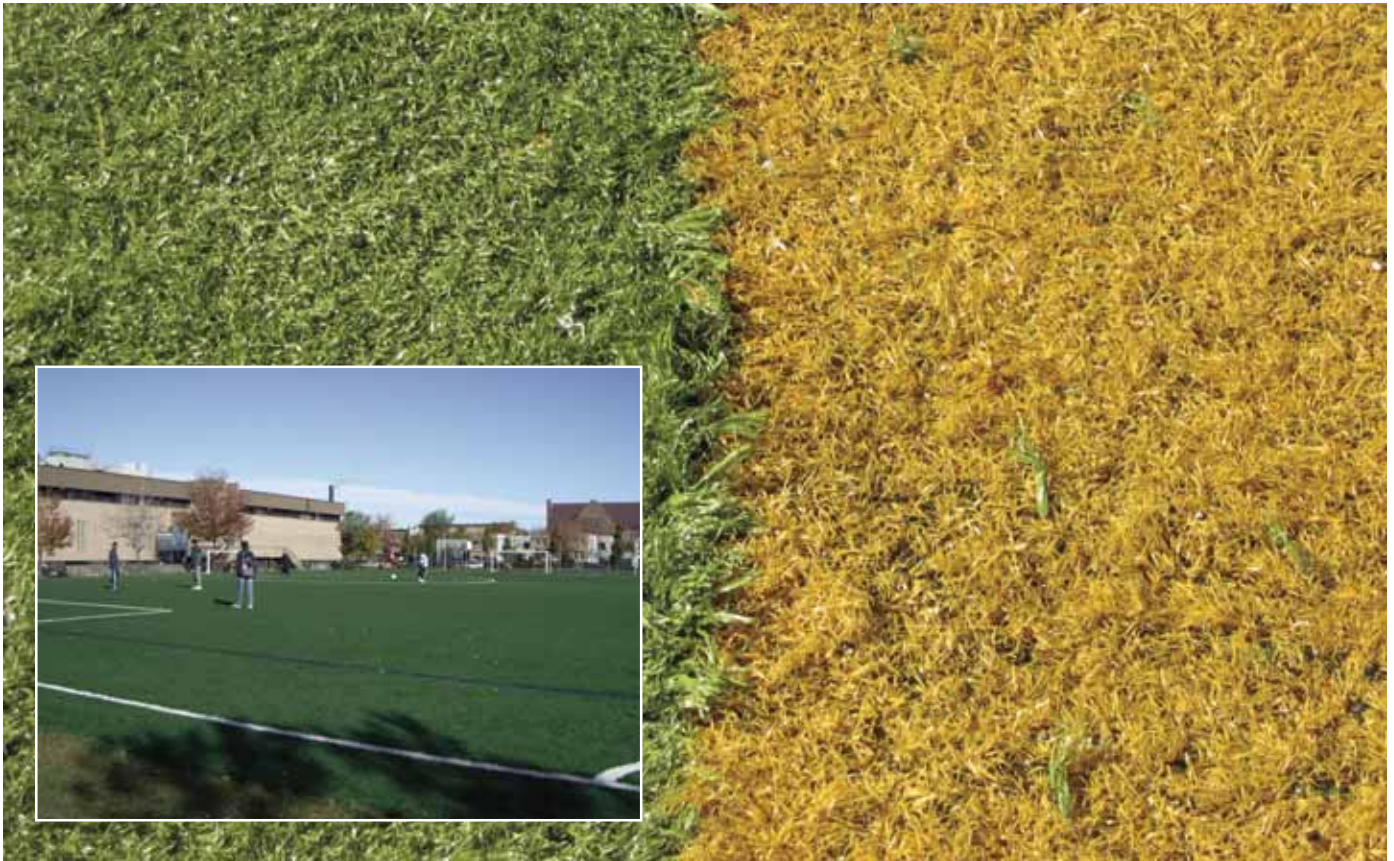
In one form or another, synthetic turf has been around for a long time. But it is only with the advent of infilled polyethylene turf that this technology started to take serious hold and grow at an increasingly accelerated pace. Invariably, wherever it appeared, synthetic turf was met with strong resistance from many, the most vocal objections being expressed by members of the turfgrass industry. I remember the 2004 STMA Annual Conference when synthetic turf first won

recognition by being the topic of the main session. Mark Nicholls was also one of the speakers at that session. I can still hear some of the speakers in other sessions cutting short their talks to warn the audience of the impending doom of their industry and loss of their livelihood if this menace was allowed to establish itself.

Luckily, in Guelph this year, we were spared such displays and the audience seemed attentive, even if there were some signs of skepticism. But one was able to

Main Photo: The definition of the lines in a synthetic turf surface will always be a little low. But in this case, the lines were put in so badly that they cannot be corrected. Poor workmanship is not an option in a product that is meant to last over 10 years.

Inset: Synthetic turf can be used in all weather. Here, snow covers this soccer field and the kids can play – even if the snow is still many feet deep around the field. Synthetic fields allow considerable lengthening of the playing season, helping to lighten the load on a municipality's natural turf fields.



tell that the prevailing sentiment was that this phenomenon is something that is here to stay and the audience displayed a healthy appetite for information.

Today, synthetic turf has come to be seen by many not as a substitute to natural grass, but as a necessary tool in the sports field manager's arsenal to provide the public with quality playing surfaces. Faced with an unbridled rise in usage figures and user demands for playing surfaces that are both safe and aesthetic, it is only normal that the claims of the synthetic turf industry attract attention and interest.

The Downside of Market Growth

Over the last few years, synthetic turf companies have experienced formidable growth. With the generalized acceptance of this technology and growing demand for safe quality surfaces, their business has grown exponentially.

Unfortunately, high market growth and volume have the nasty habit of also attracting some who see this as a chance at making easy money. Sadly, the synthetic turf industry has its lot of less-than-respectable operators peddling cheap products.

As long as the market lies dormant, the efforts of such entrepreneurs are concentrated elsewhere. But when market growth becomes imminent, attention turns towards this new business potential and the market operators become feverish. This is when those entrusted with putting together these projects for their communities are the most vulnerable. The Canadian market is presently at this juncture.

Pitfalls of Synthetic Turf Projects

When considering a system for his/her municipality, school or sports complex, one of the main dangers looming over today's sports turf manager is to discount the technical nature of this technology and to focus solely on price as a factor to consider. Prices can vary considerably from one installer to another – from roughly \$40 a square metre to over \$60 and well beyond for more elaborate systems. For a 10,000 sq m playing surface, this translates into a price difference that can exceed \$200,000 for what can appear to the uninitiated as similar products. Faced with such a decision, one may naturally opt for the cheaper option, confident that the huge savings will potentially offset whatever

Main Photo: Over brushing has totally ripped up these slit film fibres. Thus, they become extremely fragile and their wear resistance is decreased considerably. We see that the yellow line was cut out and glued in place. The joints are coming apart.

Inset Photo: Small, accessible playing surfaces can be installed in neighbourhood parks to relieve the user pressure on the bigger natural fields. Informal pickup games are organized on these surfaces and the kids do not feel the need to go onto the regular fields, allowing greater accessibility for maintenance.

slight disadvantages a “cheaper” surface may present.

This is a trap in which all new markets risk falling. Some manufacturers will try to dazzle their customers with the technical aspects of the products, which tends to become confusing. Others will try to downplay technicalities by emphasizing the price gaps between their products and others. They use this gap as a selling point. The novice will inevitably be attracted by this second approach, because it is appealing and it has the advantage of being easy to understand.

Cheaper is Not Necessarily Better

The history of infilled synthetic turf is strewn with horror stories and failed projects. These can be attributed to many factors such as poor design, cheap products, bad workmanship or even outright fraud and false representation.

Independent of price, when synthetic turf systems are considered, all projects are required to meet certain requirements that are generally considered to be industry standards. For instance, an eight year warranty is one such industry standard, which means that clients will usually expect their surface to be usable for a minimum 10-year period or more. No installer will dispute this. Unfortunately, countless projects have performed poorly and it is not unusual to see some playing surfaces present serious defects after five years of use or less. Some poor installation work can even result in extreme aging of the surface – in some cases, before it is even used!

Consider a 10,000 sq m surface expected to be used for an average of 1,000 hours a season. The initial cost of a \$40/sq m playing surface amounts to \$400,000. At \$60/sq m, the surface costs \$600,000. Over a 10-year period, the hourly usage cost would be respectively \$40 and \$60. But, if the cheaper surface should need to be replaced after only five years because of poor quality or poor workmanship, its relative hourly usage would then be \$80 and the added cost of replacing the surface would also need to be factored in. This would mean that what was initially seen as \$200,000 in savings could end up being \$250,000 in extra costs once the expense of replacing the turf before its time has been added.

This example does not mean that low cost solutions must be shunned. Although some products may be less resistant to wear, they can be appropriate when the anticipated use may be light, such as in some schools or other instances. Other lower cost products can perform just as well as the flashier brands, but are just not promoted as actively by the suppliers. Most companies propose a range of products that address different applications or needs. In cases where lower cost products can meet the needs, it becomes important not to fall for forceful marketing pitches that inevitably favour more expensive solutions.

But on the other hand, it is important to bear in mind that in all cases, quality needs to remain the principal concern in choosing a given product or system. When choosing a system or a supplier, one must always focus on three main aspects: the actual carpet and different components composing the system; the quality of the installation of the system; and the support the supplier and installer will provide throughout the surface's life cycle.

Striving for Product Quality

Synthetic turf products are typically comprised of three main components: the actual turf fibers, the primary backing into which they are tufted and the secondary backing, which is the coating that is applied to the underside of the carpet to hold the fibers in place. This creates a "carpet" that is but one part of the actual system. When put in place, the carpet is filled in with different materials such as rubber granules and/or sand.

Like anything else, all these components come in varying shapes and sizes, but most importantly, levels of quality. In most cases, an untrained eye could not tell cheap, low grade fibers from the highest quality products. But if visual examination cannot distinguish between qualities, the differences can be dramatic. For instance, extensive research has gone into creating fibers that can resist the devastating effects of UV rays that can break them down in a matter of a few years. They literally turn to dust. Considering the huge amount of fibers that go into a playing

surface, substituting cheap fibers for higher quality ones can be attractive for some suppliers.

The same goes for the other components that go into the system. For instance, the secondary backing coats the underside of the carpet, virtually binding the fibers in place, creating what is called the "turf bind." If this is not done right, or if not enough is used, or the polyurethane is not adequate, the fibers can pull out of the backing causing the turf cover to thin out rapidly. This is especially important with the new monofilament products which typically have lower turf bind. Inadequate undercoating or the use of low grade fibers can result in failing systems. Also, in many cases, the quality control procedures in the production plants (most manufacturers outsource their production – tufting and undercoating) are less than stringent and the delivered products can vary in quality from one job to another, which can result in defects that are not easily detectable.

Fortunately, there are specialized labs that can test the products that are put in place to ensure that: the product that is delivered on site is the one that was agreed upon; the components (fiber, backings, infill materials) are compatible with the specified system, and they perform according to specs (turf bind, fiber density, etc.).

Below: The slightest movements in the stone base are directly translated in unsightly waves in the lines and graphics.



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Even lower priced products can provide great performance if the component and manufacturing quality are there. A low price doesn't necessarily mean a low quality product just as high price doesn't automatically guarantee a high quality product. In every instance, the client must take the necessary measures to ensure that the expected quality levels are met by the supplier. When you install something for a 10 year life span, cheap quality can prove to be expensive.

Installation Quality is Also Essential

Using the best products does not necessarily translate into a well installed system. Installation of an infilled turf surface involves many operations and techniques that can have a devastating effect on the finished project if they are not conducted properly. The use of inappropriate tools and equipment can virtually destroy the fibers before the playing surface is even used. Uneven or insufficient infilling can also cause accelerated surface wear.

Carpet assembly can either be done by gluing the fabric onto a seaming tape with

In order to incorporate the infill material into the surface, the contractor must brush it into the carpet pile, lifting the fibers before laying the infill material between them. Some contractors are not equipped with the proper brushes, either because they do not know better or because they rent their equipment and do not have access to the right equipment. Overbrushing can split and break the fibers, especially the slit film type that is extremely delicate during this operation. This results in a splitting of the fibers which causes them to lose their long-term resistance to wear. Overbrushing can also pull out the fibers when the product has a low turf bind because of faulty design and improper or insufficient coating of low quality fibers.

There are a few ways for project managers to protect themselves from unscrupulous or even incompetent contractors. The first line of defense is to require an extensive list of references with names and contact information so a background check can be made. There are contractors on the market today who have extremely

testing labs to do this for them. Other labs are not registered with this organization, but can apply the standards and conduct the tests.

Such a quality control process should be an intrinsic part of a project and be presented clearly as such in the construction documents. In a new, less informed market, some installers may count on the relative inexperience of prospective clients to try to get away with some corner cutting that can have detrimental effects on the finished projects. With time, information, experience and with the implementation and application of such measures, the more respectable and qualified manufacturers start to gain ground over the cost cutting fly-by-night operators.

A Maturing Market Naturally Tends Towards Better Quality Projects

With the exception of a few specific regions that have experienced very active synthetic turf markets in the past years, the Canadian infilled turf market as a whole is relatively young. Most informed observers agree that Canada is on the verge of a surge in the number of playing surfaces that will be built in the next few years. Industry professionals are feverishly preparing for this anticipated boom.

Typically, the early stages of such a period are characterized by a great number of projects designed around tight if not insufficient budgets that are justified by the general perception that this technology is grossly too expensive. After a while, some playing surfaces start presenting problems that can be attributed to some of the pitfalls that have been described. Then there is a shift towards greater care being given to ensuring better quality both in the products that are used and the installation work that is provided by the suppliers.

The Canadian market is lucky in that forerunners in the users of this technology have made it possible to identify many of the pitfalls that can be encountered in these projects – and some have done so at great personal cost. This acquired experience can now be drawn upon in order to avoid repeating some of the costly mistakes that have been made by others. ♦

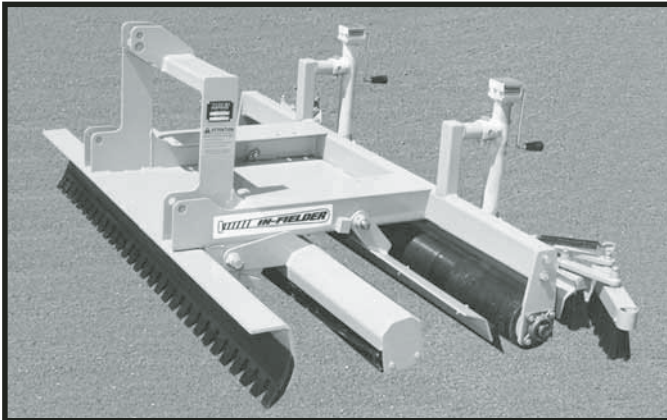
— *fhebert@dsssconsultants.com*

The Canadian infilled turf market is relatively young. Most informed observers agree that Canada is on the verge of a surge in the number of playing surfaces that will be built in the next few years.

special glue, or by stitching the strips together. In Canada, most installers will stitch the seams. But worldwide, more than 80% of turf assembly is done by gluing methods. When the work is well done and proper materials are used, both methods can produce good results. But both methods can also produce disastrous results when they are not done properly. The special glue that is used in this type of assembly is extremely expensive and difficult to manipulate. It can be very tempting for an installer to use a cheap glue because this can mean important savings for him, even if this invariably results in grave problems for the user. Temperature constraints are also very severe, which probably explains why stitching is preferred over gluing in Canada. But improper stitching can also lead to problems, especially if stitching is done on a carpet that was not designed to be sewn.

long lists of finished projects but who have left an incredibly bad track record behind them. The only way to guard oneself against this is to call and ask around. With the number of projects increasing in the near future, people will become more aware of whom the disreputable contractors are and the information will get around. Until then, the onus is on individual clients to inform themselves.

Just as with the products and the different system components, there are specialized firms that can monitor and validate the installation work. Using recognized standards and methods, they can check the work as it is being conducted or just before it is completed so that the client can be assured that the work is done according to specs. Contact information on these firms can be found on the websites of certain international governing bodies, such as FIFA, which certifies



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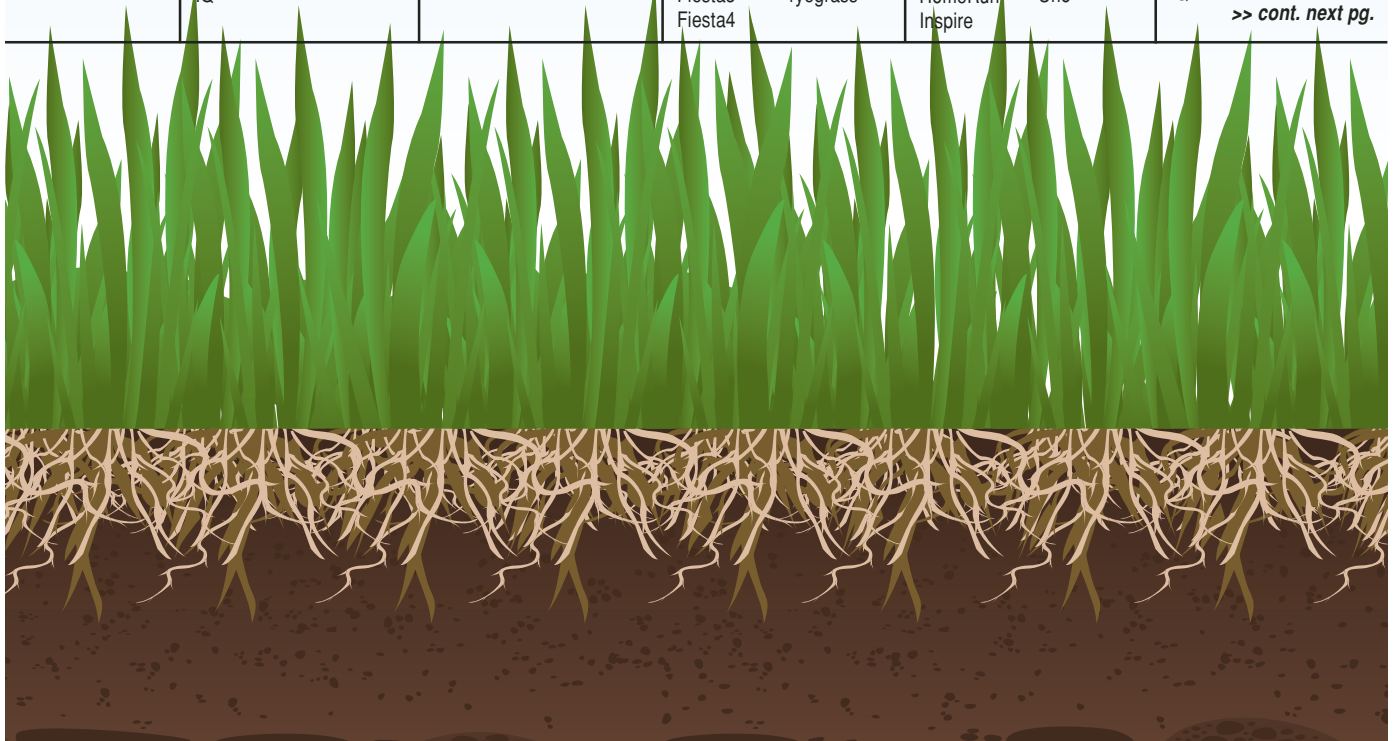
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Kentucky Blue	Amazon Brooklawn Liberator Minnfine Nuglade Shamrock	Award Beyond Chicago II Liberator NuBlue NuDestiny NuGlade	Alpine America Blue Velvet Cannon Crest Explorer Granite Langara Mercury Moon Shadow Quantum Leap Touchdown	Abbey Alene Avalanche Arrow Arrowhead Barrister Blue Sapphire Blueumax Bluestone Cadet Corsair Courtyard Denim Gaelic Juliet	Kelly Midnight Midnight II Midnight Star Moonbeam Moonlight Moonlight SLT Moonstruck Northstar Princeton 105 Prosperity Raven Rugby II Yankee	Amazon Brooklawn Liberator Minnfine Nuglade Shamrock
Texas/Kent. Blue Hybrid			Bandera	Longhorn Solar Green	SPF 30 Thermal Blue	
Poa trivialis	Bariviera	Laser	Darkhorse Racehorse	Sabre II & III Winterplay		Bariviera
Poa supina			Supernova	Supranova		
Poa compressa	Canada Blue	Canada Blue Reubens	Poa Reptans True Putt	Reubens		Canada Blue
Ryegrass	Accent Barclay Citation III Goalkeeper II IQ	Evolution Extreme Top Gun	Blazer 4 Cutter Cutter II Edge II Fiesta3 Fiesta4	Futura 3000 Quebec Transist 2200/ intermediate ryegrass	All*Star 3 Palace Apple GL Presidio Dart Primary Grand Slam II Stellar GL HomeRun Uno Inspire	Accent Barclay Citation III Goalkeeper II IQ

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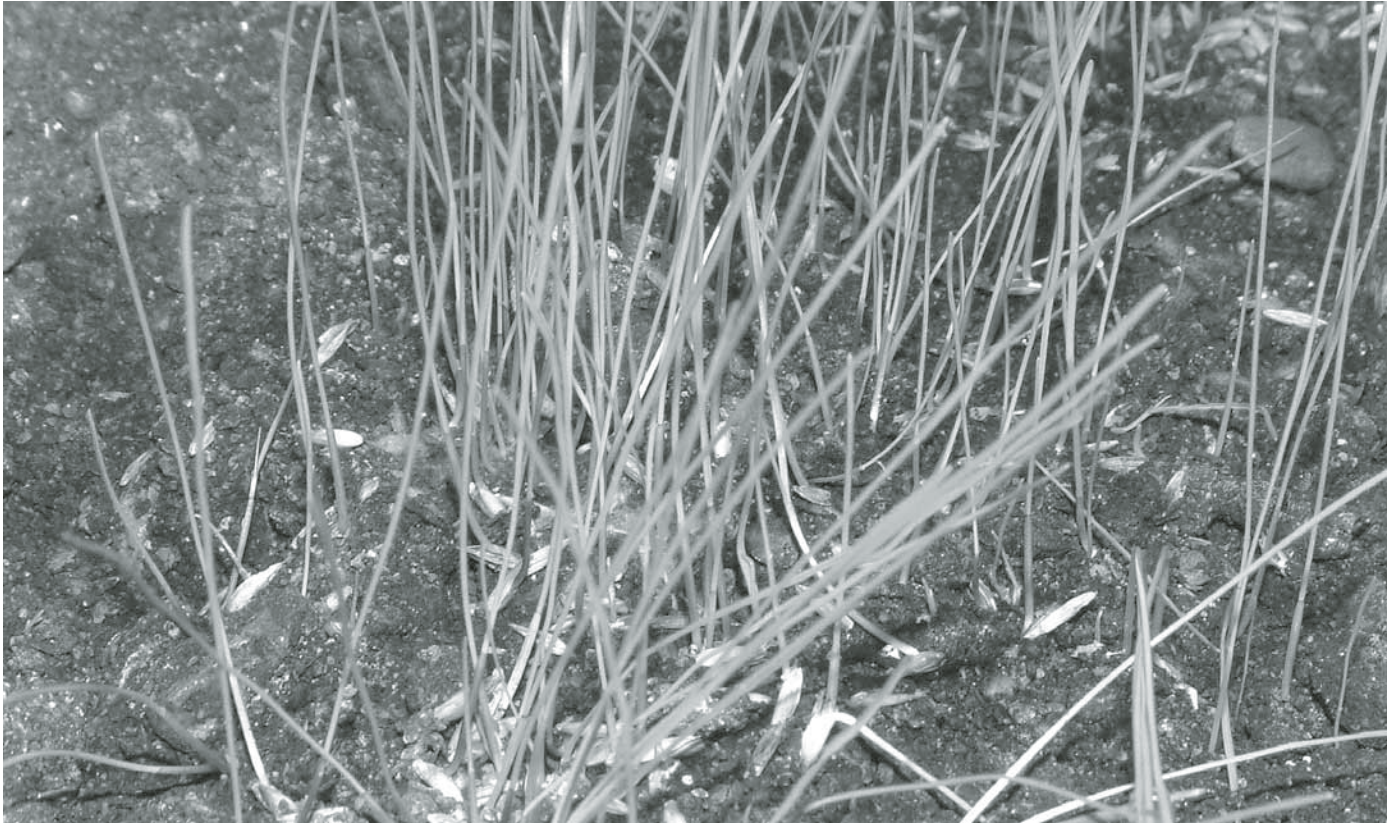


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Fescue: Creeping Red	Aberdeen Boreal		Aruba Audubon		Boreal Garnet Jasper II Sea Link		Boreal Cardinal Florentine GT Navigator Rose Seabreeze GT Trapeze Wendy Jean		Aberdeen Boreal	
Fescue: Chewings	Ambassador Bridgeport II		J-5 Jamestown II		Silhouette Victory II Windward		Bridgeport II Compass Jamestown IV Longfellow Shadow II		Ambassador Bridgeport II	
Fescue: Hard	Chariot Heron Oxford		Ecostar		Gotham Spartan II		Aurora II Aurora Gold Chariot Heron Rhino Ridu		Chariot Heron Oxford	
Fescue: Sheeps	MX86		Marco Polo		Azay Sheeps		Bighorn Little Bighorn		MX86	
Fescue: Tall	Firecracker Fury Millenium Tomcat		Arid III Inferno		Bladerunner Crossfire II Mustang 3 Team Jr.		Avenger Coyote II Darlington Raptor II Tahoe II Talladega Titanium		Firecracker Fury Millenium Tomcat	
Bentgrass: Creeping	18th Green A-4 Penn A2 Penn G2 Penn T1 Penncross		Dominant Plus L-93 Penn A-4 Penn G-6 Penn Trio Penncross Coated Penncross		Aggressor Pro Agressor Tournament Cato MacKenzie Mariner Penn A-4 Penn G-1 Penncross Pennlinks II		Independence Memorial Penn A-1 Penn G-2 Penncross Pennneagle II Pennlinks II Seaside II Shark		18th Green A-4 Penn A2 Penn G2 Penn T1 Penncross	
Bentgrass: Colonial	Highland		Highland		Exeter SR7150		Glory Highland		Highland	
Bentgrass: Velvet					Greenwich Vesper		Greenwich Legendary			
Weeping alkali	Fults		Fults		Fults Salty		Fults Salty		Fults	
Contact Info	Bishop Seeds 99 John St., P.O. Box 171 Harriston, ON N0G 1Z0 P: 519.338-3840 F: 519-338-2510 info@bishopseeds.ca www.bishopseeds.ca		Ontario Seed Company 330 Phillip St., P.O. Box 7 Waterloo, ON N2J 3Z6 P: 519.886.0557 F: 519.886.0605 dave@oscturf.com www.oscturf.com		Pickseed Canada Inc. 1 Greenfield Rd, P.O. Box 304 Lindsay, ON K9V 4S3 P: 705.878.9240 F: 705.878.9249 dmacmillan@pickseed.com psteven@pickseed.com www.pickseed.com		Quality Seeds 8400 Huntington Road, RR 1 Woodbridge, ON L4L 1A5 P: 905.856.7333 support@qualityseeds.ca www.qualityseeds.ca		Speare Seeds 99 John St., P.O. Box 171 Harriston, ON N0G 1Z0 P: 519.338-3840 F: 519-338-2510 info@speareseeds.ca www.speareseeds.ca	

TURF SEEDING RATES

The following are seeding rates per 100m² for specific species of grass seeds: creeping bentgrass, 0.5-1.0 kg; Kentucky bluegrass, 1.0-2.0 kg; perennial ryegrass, 2.0-4.0 kg; fine fescue, 1.0-3.0 kg; tall fescue, 2.0-3.0 kg; and velvet bentgrass 0.5-0.8 kg

Source: *Turfgrass Management Recommendations*, Publication 384, OMAFRA



UNDERSTANDING TURFGRASS SPECIES FOR USE ON ATHLETIC FIELDS & RECREATIONAL AREAS

PAUL STEVENS, MANAGER, PROFESSIONAL TURF, PICKSEED CANADA, INC. (A PRESENTER AT THE 2008 STA FIELD DAY)

Turfgrass selection is perhaps the most important part in developing and maintaining a healthy and vigorous turf stand. There are many choices available to us today and the planning process cannot be underestimated. Over the years, plant breeders have made significant advancements in the development of cultivars within cool season species like Kentucky bluegrass, perennial ryegrass, fine fescue and tall fescue. During this time, seed companies have consistently released varieties with improved growth characteristics, turf quality, resistance to drought, insects and disease, and other important benefits. Deciding which variety or varieties are right for the job at hand can be a daunting task.

In wading through the decision making process for new construction, renovation or maintenance (over-seeding), it is important to review all the elements in which the turf has to perform. The following points should be part of the planning and selection process of the appropriate species and cultivars for the intended use.

Species Selection: Environmental Factors

- Type of sport or use: football, baseball, soccer
- Physical characteristics: soil or sand, climate and environmental stresses and concerns, drainage

- Management issues: wear (goal mouth, centre of field, sidelines)
- Repair and maintenance: time of repair and renovation (during difficult times, during play)
- Maintenance budget
- Maintenance: number of staff, type and number of equipment, cultural practices, irrigation system
- Inputs: fertility, pesticides, irrigation, topdressing material, seed, etc.
- Other uses: concerts, events

Species Selection: Turf Characteristics

- Growing environment: full sun or low light (stadium facilities)

- Wear tolerance, recovery period
- Establishment, turf density
- Turf strength, lateral stability, stable footing
- Disease resistance and winter persistence
- Heat and drought tolerance
- Other: salt tolerance, weed control, etc.

An Insight on Variety Development

With ever increasing environmental, climatic and public demands while maintaining the need for high quality turfgrass athletic and recreational fields, contemporary seed varieties offer turf managers many benefits, agronomic stability and

SEED CHARACTERISTICS BASED ON IMPROVED TURF-TYPE CULTIVARS

Cool Season Species		Leaf Texture	Disease Resistance	Growth Habit	Establishment Rate	Nitrogen Requirements
Bluegrass	Kentucky	Moderate to fine	Good to excellent	Rhizome extensive	Moderate to high	Moderate to high
	Texas Hybrid	Moderate to fine	Good	Rhizome extensive	Slow	Moderate to high
Ryegrass	Perennial	Fine	Moderate to poor	Bunch grass	Very fast	Moderate to high
	Intermediate	Moderate to fine	Moderate to poor	Bunch grass	Very fast	Moderate to high
Fescue	Tall	Moderate to coarse	Moderate to good	Bunch grass	Moderate	Moderate to high
Fine Fescue	Chewings	Fine	Good to excellent	Bunch grass	Moderate to fast	Moderate to low
	Strong Creeping	Moderate to fine	Good to excellent	Rhizomes	Moderate to fast	Low to moderate
	Slender Creeping	Fine	Good to excellent	Rhizomes	Moderate to fast	Low to moderate
	Hard	Fine	Good to excellent	Bunch grass	Slow to moderate	Low to very low
	Blue	Fine	Good to excellent	Bunch grass	Slow to moderate	Very low

Cool Season Species		Water Use (ET Rate)	Drought Tol-Avoidance*	Salinity Tolerance	Shade Tolerance	Heat Tolerance
Bluegrass	Kentucky	Low to moderate	Good to excellent	Moderate	Poor to good	Moderate to high
	Texas Hybrid	Low to moderate	Good to excellent	Moderate	Poor to good	Moderate to high
Ryegrass	Perennial	Moderate to high	Good	Moderate to high	Poor to moderate	Good to excellent
	Intermediate	Moderate to high	Medium	Moderate to high	Moderate	Good
Fescue	Tall	High	Excellent	High	Excellent	Good to excellent
Fine Fescue	Chewings	Low	Good to excellent	Low	Excellent	Moderate to high
	Strong Creeping	Low	Good	Low	Excellent	Good
	Slender Creeping	Low	Good	Low	Excellent	Good
	Hard	Low	Excellent	Low to moderate	Excellent	Good to excellent
	Blue	Low	Excellent	Low to moderate	Excellent	Good

* Drought Tolerance Avoidance



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flexibility. Understanding the major and subtle differences between varieties within a species category is important in the selection process. For example, Kentucky bluegrass is highly apomictic, meaning that plant alteration and variety improvement is a difficult and complex process. This generally results in small differences in agronomic characteristics and range of genetic diversity within varieties categorized in the same 'type' such as Midnight, Aggressive, America and Compact to name a few. Other major cool season species such as perennial ryegrass and fescue (tall and fine) are also organized into types offering different characteristics for specific use.

When selecting a new seed variety from a proven seed company with a well established development and breeding program, you can be sure that the varieties have been thoroughly field tested and evaluated to produce a broad genetic base. NTEP (National Turfgrass Evaluation Program) testing conducted at multiple locations and through independent university sites across the US and Canada, confirms the improved qualities needed for producing a high quality turf. If the variety has no traceable testing history, then it is not worth looking at.

Most importantly, parent plants for new varieties have survived the test of time growing in different locations. Over the years, well established breeding programs have selected turfgrass clones from hundreds of locations across North America and other regions around the globe. During a site visit, the plant breeder will identify and collect desirable turf samples. Plants identified for collecting have noticeable characteristics that would be beneficial to incorporate into breeding projects – leaf texture, density, vertical growth, specific disease and insect resistance, drought tolerance, salt tolerance, etc. Specific areas are targeted for collecting where plants have been growing and surviving for generations under harsh conditions.

Collected plants are brought back to the research farm for evaluation. Commonly referred to as "germplasm," they are added to the already established collection. After a few years of evaluation, only the best 1-2% of all plants collected will be con-

sidered for use in breeding a new variety; 98-99% are discarded. Typically, it takes 10-12 years to breed and commercially release a new improved variety for use on professional turf surfaces.

In the breeding and development of a new variety, existing plants from proven varieties are used. Additionally, new clones or germplasm are crossed with a selection of the new material that has been identified for improved agronomic qualities and characteristics (disease resistance, drought tolerance, vigorous growth, wear and recovery, uniformity, density etc.). Thus the new variety would have a broader genetic base developed using 20 parent plants and therefore be superior and less likely to suffer from catastrophic failure.

The detail and investment that go into the development of a variety gives turf managers confidence that there are significant agronomic advantages and benefits in working with an improved seed variety. NTEP.org and private independent research data is a good reference point for identifying proven new varieties in the Kentucky bluegrass, perennial ryegrass and fescue species.

Understanding Kentucky Bluegrass Cultivars

Kentucky bluegrass is the primary species for athletic fields and recreational turfgrass use in North America. With proper management, it forms a fine-textured, high quality, long lasting turf stand. The rhizomes of Kentucky bluegrass increase stability, improve traction and provide good recovery to damaged and bare areas. Kentucky bluegrass can be used as a monostand, but to maximize the genetic base, it is advantageous to select a polystand or blend of types.

It first must be understood that, in contrast to all other cool season turf grasses,

Kentucky bluegrass is highly apomictic. This means that almost every seed (usually over 95%) is an identical copy of the mother plant, which means that there is very little genetic diversity within a variety. This is because most varieties fall into similar groups or classifications. To maximize diversity, it is best to blend together similar varieties from different categories. For example, there is little agronomic benefit for an athletic field to be seeded con-



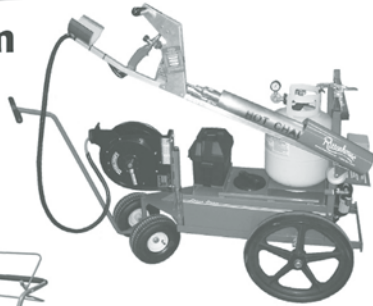
taining five varieties similar to Midnight. The best approach would be to blend top varieties able to tolerate very low cutting heights from within the Compact Elite, the America Elite, the Aggressive type and possibly within the Early Spring Greening categories.

Improved Drought Tolerance of Texas Hybrids

Recently, much attention has been given to the development of heat and drought tolerance in Kentucky bluegrass. Known as hybrid bluegrass (Texas hybrids), these new cultivars have proven to perform equivalent to tall fescue varieties in a number of different trial locations. Other studies have also concluded that under limited irrigation cycles, Texas hybrids perform better and maintain greater turf quality than tall fescue cultivars (which had higher water use). Along with improved heat and drought tolerance, other benefits include extensive rhizomes for improved wear and recovery, lower water usage and good performance under lower maintenance conditions.

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**Perennial/Intermediate Ryegrass:
A Good Companion to Kentucky Blue**

Perennial ryegrass is a fine textured species with the potential to develop into a high quality, hardwearing turf stand. Its fast establishing characteristics combined with high quality, colour, texture and close mowing tolerance make perennial ryegrass ideal for athletic sports field use. These qualities are why perennial ryegrass is best used in a sports field seed mixture as a companion to Kentucky bluegrass.

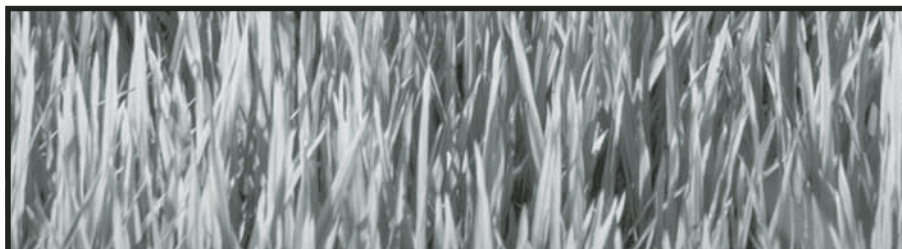
It is also important to remember that by blending the two species, genetic diversity is increased maximizing each species' strengths and weaknesses. Adding perennial ryegrass will speed up establishment, assisting with natural weed control. It is also resistant to different diseases than Kentucky bluegrass such as necrotic ring spot.

Perennial ryegrass is also endohypte enhanced which improves tolerance to insects such as bill bugs. Mixed with Kentucky bluegrass, the ryegrass component ranges from 10-50% dependent on application. The percentage of perennial ryegrass used in a mixture should be based on the desired time period from time of seeding to planned use. If the establishment period is limited, then a greater percent of ryegrass is recommended.

Intermediate ryegrass has been introduced over the last eight years and offers some excellent benefits. Based on the principals of an annual plant, intermediate ryegrass has been developed to produce a high quality turf stand similar to perennial turf type ryegrass. Characteristics include: germination under cool soil conditions, rapid establishment and improved turf quality over traditional annual ryegrass. Intermediate is an excellent overseeding tool for high traffic areas and is less competitive in a mixture with Kentucky bluegrass than perennial ryegrass.

Fescues Offer Alternatives To Environmental & Climatic Challenges

Turf-type tall fescue has traditionally been used on non-irrigated low-maintenance sports fields in transition zones and cooler climates. Tall fescue has two primary factors that need to be considered – improved disease resistance and poor establishment. Generally speaking, tall fes-



KENTUCKY BLUEGRASS CLASSIFICATIONS

Type	Description	Variety
Compact	Low, compact growth High quality turf for tees & fairways 1/2 inch cutting height Resistance to leaf spot	Alpine, Moonshadow, Explorer, Argos
Compact-Midnight	Very dark green color Good heat tolerance Characteristics of compact type Variable resistance to summer patch	Quantum Leap, Blue Velvet, Midnight
Compact-America	Fine leaf, high density High disease resistance Good shade performance Characteristics of compact type	America, Langara
Aggressive	Aggressive lateral growth High shoot density Very wear tolerant	Touchdown, Limousine, Orfeo
BVMG	Medium-good turf Medium low growth Medium leaf width Not ideal for tee or fairway use	Crest, Marquis, Cannon
Shamrock	Good resistance to leaf spot Good turf quality and sod strength Bill bug susceptible Strong rhizome development	SR2100, Shamrock, Moonshine, Brooklawn
Julia	High density Good summer performance Very high wear tolerance	Rampart, Ulysses, Avalanche, Julia
Texas x Kentucky Hybrids	Heat tolerant Extensive rhizomes Drought tolerant with good recovery Wear tolerant	Bandera, Spiffire, Fire and Ice, Longhorn

Note: This chart is for general observation only. Individual performance of varieties within each classification may vary widely and require comprehensive regional test results to determine the best performance. To see the chart in its entirety, please visit www.pickseed.com.

cue is very wear tolerant once fully established, but getting it established before traffic and wear is introduced is an issue. This characteristic also affects the ability of tall fescue to recover quickly after heavy wear. Recent developments have seen the introduction of tall fescue cultivars with rhizomes improving establishment and wear tolerance. Tall fescue performs best when combined with 5-10% of Kentucky bluegrass

Fine fescue cultivars offer some good alternatives for non-irrigated athletic fields and recreational turf areas. Chewings fescue, strong red fescue and slender red fescue can be utilized in low-maintenance situations. Improved Chewings and red fescue have seen recent advances in traffic tolerance, improved heat and drought tolerance, germination rate, cool temperature growth (spring and fall) and shady location performance. Improved fine fescue cultivars also have the additional benefits of endophytes and should be seeded in a blend with Kentucky bluegrass and perennial ryegrass for best performance.

Endophytes Offer Significant Benefits

The availability of endophyte improved turfgrass cultivars is an important part of Integrated Pest Management practices that can help reduce inputs. Endophytes are a fungi that have a symbiotic relationship with some grasses, spreading through seed infection. The presence of endophytes in turfgrass has been demonstrated to provide many benefits including resistance to surface-feeding insects, increased disease resistance and increased stress tolerance.

Currently, the species of turfgrass with endophytes that are available on the market include perennial ryegrass, tall fescue, Chewings fescue, strong creeping red fescue, slender creeping red fescue and hard fescue. In some of these species, most cultivars available will have high levels of viable endophytes. Attempts have been made to find or introduce endophytes into other turf species such as Kentucky bluegrass but so far these associations have not been stable and have not led to marketable cultivars.

There are many factors to be considered in the construction and maintenance of an athletic or recreation field. Seed cultivar selection is one of many inputs that can impact the long-term success and quality of the turf stand. As outlined, there are many different aspects that are critical in the selection of the proper turfgrass species and cultivar for each specific turf site. Proper selection of turf cultivars can be the most important decision you have to make! ♦

References: Articles Dr Leah Brilman, Ph.D. (Heat Tolerant Bluegrasses, The Importance of Endophytes, Versatile Red fescues).

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