Sports Turf Manager
FOR BETTER, SAFER SPORTS TURF. SPRING 2013. VOL. 26. NO. 1.

Which Kentucky Bluegrass Cultivars Perform Better with Less Water?

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Field research at Kansas State University indicates that water requirements may differ significantly among cultivars of Kentucky bluegrass *(Poa pratensis* L.*)* (KBG), depending upon desired turfgrass quality. Given the certainty of periodic drought, limited water availability, and increasing irrigation costs, having choices of KBG cultivars that may maintain better quality with less water is an attractive option. Ideally it would be helpful to select a turfgrass that can perform well with less water.

A helpful concept when discussing KBGs is their classification into phenotypic groups. Individual cultivars of KBG are classified into phenotypic groups based on common growth and stress performance characteristics gathered from field trials (Bonos et al., 2000). Previous research has indicated that such groupings may be useful in predicting drought tolerance. Because cultivar turnover is rapid in the turfgrass industry, determining the relative irrigation requirements of phenotypic groups may enable researchers to predict irrigation requirements of cultivars not included in any particular study.

IDEALLY IT WOULD BE HELPFUL TO SELECT A TURFGRASS THAT CAN PERFORM WELL WITH LESS WATER.

Using a rainout shelter (Fig. 5), we compared seasonal irrigation amounts among 28 KBG cultivars for two growing seasons. By shielding plots from rainfall, water could be withheld until wilt symptoms were evident. Our objectives were to identify KBG cultivars and phenotypic groups that maintain better visual quality with less irrigation, using wilt-based irrigation. We hypothesized that if visual quality was good at the beginning of the season, we could maintain minimally

OTS HIGHLIGHT
Continued inside on pages 7-10.

Inside Features

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Sports Turf Manager

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In the spring, at the end of the day, you should smell like dirt. ~Margaret Atwood

Inside this issue...

REGULAR COLUMNS, DEPARTMENTS & SMALL FEATURES

Deadline for Summer 2013 Sports Turf Manager: May 24

SPORTS STA TURF ASSOCIATION

WHAT'S ONLINE

www.sportsturfassociation.com

Your email address must be registered with us to log-in to the Members Only Section

- STA Membership Directory
  Like changing your clocks in Spring, routinely check to see if your contact information is up-to-date.
- STA Highlights 2012 presented at the Annual General Meeting February 20, 2013
- Michael J. Bladon Educational Link – Search the Michigan State University's Turfgrass Information Centre

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President's Desk

BY PAUL GILLEN

As I write this, according to the calendar tomorrow is the first day of Spring. It sure doesn't look or feel like it! Does anyone else feel like a great big pot of groundhog stew? I must admit, though, that your association activities have certainly made the time pass quickly.

We've just concluded the annual Ontario Turfgrass Symposium and the program was excellent. If you weren't able to make it this year, we are pleased to bring you some of the highlights in this and upcoming issues of your magazine. Take the time to read the articles as they are both interesting and educational.

During the conference, we were pleased to announce the establishment of the association's Sports Turf Manager of the Year Award sponsored by the Guelph Turfgrass Institute and the GTI Solutions Group. See all of the details in this issue and start thinking about your nominations for submission before the December 1 deadline.

Supporting OTRF.
STA Vice President Tennessee Propedo presents our annual donation to the Ontario Turfgrass Research Foundation's Brenda Nailor at the Ontario Turfgrass Symposium.

We also held our Annual General Meeting during this time. For those of you unable to attend this year, the details are contained in the "members only" section of the website. During the meeting we recognized and said goodbye to Dennis Wale, our long serving member and director now retired from the City of Brantford. Thank you, Dennis, for all of your valuable input and contributions during your time on the Board of Directors. At the same time we welcomed Tab Buckner, Past President of the Western Canada Turfgrass Association and Manager of Parks Operations and Cemetery Services for the Township of Langley, BC as a new member of the Board of Directors. Your Board now has representation from coast to coast across Canada.

There will be two presentations of the Sports Turf Management and Maintenance Course this Spring, one for the Town of Midland April 15 to 18, and the second during ORFA's Annual Professional Development Program April 29 to May 2 at the University of Guelph.

The initiatives that we're working on include a complete review and revamping of our branding and marketing effort. This is a huge undertaking, but absolutely necessary and you should start to see some of the results later in the year. As well, work is progressing on Field Days in Halifax, Nova Scotia, Langley, British Columbia and Mississauga, Ontario this year. Details will be released as they become available. The committee is also making good headway on the Synthetic Turf Maintenance Course. Watch for the release of this new program.

As you can appreciate from all of the above, the workload on our association directors and staff is huge, and it's not getting any easier. If any of you have any interest in working on one of the committees, please contact Lee Huether. We could sure use the help.

That's it for me for now. Like all of you, I'm looking forward to the end of the cold weather and getting back on to some green grass.

2013-2014 STA Board of Directors

Back row (L-R) Dave Warden, Ken Pavely, Bill Clausen, Tennessee Propedo, Jason Inwood, Gord Dol, Gord Horsman, Terry Henderson, Tab Buckner, Bob Kennedy.
Seated (L-R) Ben Tymchyshyn, Lee Huether (Executive Manager), Andrew Gaydon, Paul Gillen, Paul Turner.
Absent from photo: John D'Ovidio.

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Event Calendar

ASSOCIATION EVENTS ARE HIGHLIGHTED IN GREEN

April 29 – May 2
Sports Turf Management & Maintenance Course
University of Guelph, ON
www.sportsturfassociation.com/STMMCourse

May 1
Robert W. Sheard Scholarship
Application Deadline
www.sportsturfassociation.com/Awards&Scholarship

June 10 – 11
Canadian Recreation Facilities Council
National Leadership Forum
Toronto, ON www.crfc.ca

2013 Field Days

June 18
Sports Turf Field Day
Dartmouth Sportsplex and Dartmouth Commons
Halifax, NS
www.sportsturfassociation.com/Events/FieldDays

August 29
Sports Turf Field Day
Willoughby Community Park
Langley, BC
www.sportsturfassociation.com/Events/FieldDays

September 19
Sports Turf Field Day
Mississauga Valley Community Centre
Mississauga, ON
www.sportsturfassociation.com/Events/FieldDays

December 1
Sports Turf Manager of the Year Award
Nomination Deadline
www.sportsturfassociation.com/Awards&Scholarship

Sports Turf Association Elects 2013/2014 Officers and Directors

Members of the Sports Turf Association elected the 2013/2014 officers and directors at the annual general meeting held during the recent Ontario Turfgrass Symposium.

Returning to the board for a new term are vice president Tennessee Propedo/City of Hamilton, treasurer Ben Tymchyshyn/MMM Group and directors Bill Clausen/University of Guelph, John D'Ovidio/City of Mississauga, Gord Horsman/City of Moncton, Jason Inwood/City of Vaughan and Dave Warden/City of Mississauga. Joining the board is Tab Buckner/Township of Langley, past president of the Western Canada Turfgrass Association. Continuing to serve the association are president Paul Gillen, past president Gord Dol/Dol Turf Restoration, secretary Andrew Gaydon/Vanden Bussche Irrigation, together with incumbent directors Terry Henderson/City of Guelph, Bob Kennedy/Sports Turf Management Solutions, Ken Pavely/Lawn Life, and Paul Turner/G.C. Duke Equipment.

Sports Turf Manager of the Year Award Introduced

The Sports Turf Manager of the Year Award, launched with the cooperation and sponsorship of the Guelph Turfgrass Institute and the GTI Solutions Group, was introduced at the recent Ontario Turfgrass Symposium. The award is intended to recognize a sports turf manager for his or her professional ability and contribution, and show appreciation for their proactive and progressive efforts within the profession and the industry in one of many key categories including community outreach, environmental stewardship, professional development, health and safety, sports turf management techniques, project management, promotion of the profession, stewardship of interns or students, and workplace improvements or innovations.

"With our continuing education programs, sports turf focused research, and outreach through the GTI Solutions Group we are most pleased to forge this new partnership with STA," suggested Rob Witherspoon, Director, GTI.

The nomination deadline is December 1 with announcement of the first Sports Turf Manager of the Year in early 2014. Additional information is available at www.sportsturfassociation.com.

Which Kentucky Bluegrass Cultivars Perform Better with Less Water?

Continued from page 1

OTS HIGHLIGHT
Presented February, 2013
Guelph, Ontario.

Table 1. Phenotypic groups and cultivars of Kentucky bluegrasses and hybrid bluegrasses.

Group†	Cultivar
Aggressive	Limousine Touchdown
BVMG‡	Baron Envicta Abbey
Common	Kenblue Wellington Park
Compact	Diva Skye Moonlight
Compact America	Langara Bedazzled Apollo Unique Kingfisher
Compact Midnight	Midnight Midnigt II Blue Velvet Nu Destiny Award
European§	Blue Knight Bartitia
Hybrid Bluegrasses	Thermal Blue Blaze Longhorn
Julia	Julia
Mid-Atlantic	Eagleton Preakness Cabernet
Shamrock	Shamrock

† Kentucky bluegrass classification groups as described in Bonos et al. (2000).
‡ BVMG, Baron, Victa, Merit, and Gnome.
§ Blue Knight and Bartitia have since been reclassified as "Other Type".

acceptable quality in KBG (for example, for a moderately-maintained lawn or golf course rough with in-ground sprinklers) by irrigating when at least 50% of a given cultivar showed signs of wilt. Two hybrid bluegrasses (P. *arachnifera* Torr. x P. *pratensis*) were also included in the study.

Methods

This study was conducted at the Rocky Ford Turfgrass Research Center near Manhattan, Kansas, USA. Data were collected for 105 days in 2007 (June 19 – October 1) and 108 days in 2009 (June 22 – October 7). Turfgrasses included 28 KBG cultivars and two hybrid bluegrasses (Table 1). Commercially available cultivars of KBG were selected to include representatives from major KBG phenotypic groups (Note: In the results section, only groups with three or more cultivars were used when comparing groups). Also, because visual quality was of interest, cultivars were selected based on performance in National Turfgrass Evaluation Program (NTEP) trials.

The plots were maintained well watered until the study began each year. Thereafter, water was withheld until 50% or more of a plot displayed drought stress. Water (2.54 cm) was then applied by hand to the individual plots. Turfgrass quality and drought stress symptoms were evaluated daily. This process continued until the end of the study, after which all plots were re-watered and allowed to recover. Plots were mown weekly at 7.6 cm.

Turfgrass quality evaluations, based on colour, density, and uniformity of the canopies, were made using a visual rating scale of 1 to 9, with 1 = brown turf, 6 = minimally acceptable for a home lawn or golf course rough, and 9 = optimum turf. Drought stress was defined as the turf displaying wilting, failure of the canopy to remain upright after foot traffic, and a general darkening colour of the turf. Because changes in drought stress were sometimes rapid from day to day, particularly under conditions of high temperatures, it was not unusual for irrigation to be applied when greater than 50% of a plot (for example, up to 70 or 80%) displayed drought stress.

Results

Total Water Applied and Days to Wilt between Irrigation Cycles

Water applications, averaged over the

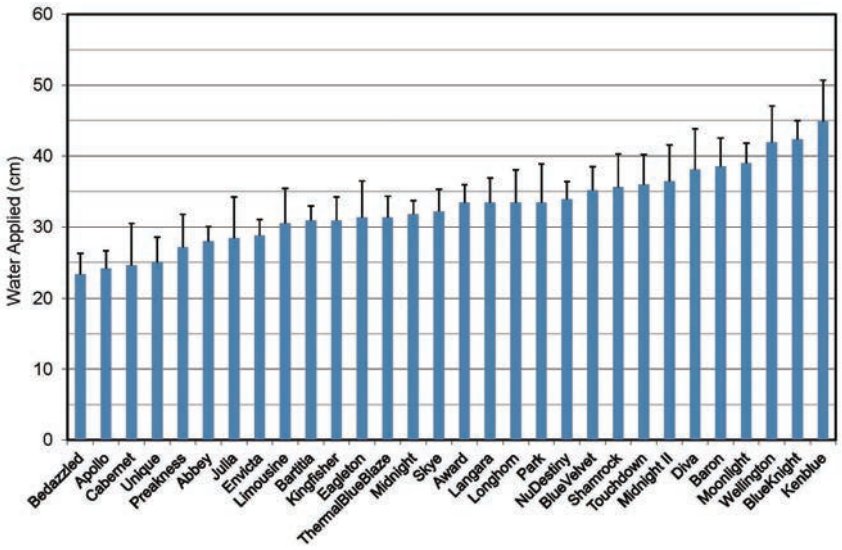

Figure 1. Water applied to Kentucky bluegrass cultivars and hybrid bluegrasses, averaged over the periods 19 June to 1 Oct. 2007 (105 days) and 22 June to 7 Oct. 2009 (108 days), at Manhattan, Kansas. Error bars denote standard error.

~3.5 month period in each year of the study, ranged widely from 23.3 cm (mean=2.2 mm/day) in Bedazzled to 44.9 cm (4.2 mm/day) in Kenblue (Fig. 1). In Bedazzled, Apollo, Cabernet, and Unique, 25.0 cm (2.3 mm/day) or less of water was applied, which was significantly less than Kenblue, Blue Knight, Wellington, Moonlight, Baron, Diva, Midnight II, Touchdown, Shamrock, and Blue Velvet; in the latter 10 cultivars, 35.1 cm (3.3 mm/day) or more of water was applied. However, there were no statistical differences among the 15 cultivars that received the least amount of water (Fig. 1, Bedazzled through Skye).

Days to wilt between irrigations, which was roughly inverse the amount of water applied (r=-0.91), ranged from 6.4 d in Kenblue to 13.1 d in Cabernet, a difference of nearly one week (Fig. 2). Days to wilt was greater in Cabernet, Bedazzled, Unique, and Apollo (11.9 to 13.1 d) than in the 18 bluegrasses with the least days to wilt (6.4 to 9.0 d; Kenblue through Park in Fig. 2). These intervals provide the practitioner with an estimate of irrigation frequency required to maintain the various KBGs at a performance level similar to this study, at least in the transition zone of the U.S. In addition to less frequent irrigation, cultivars with more days to wilt have a greater likelihood of receiving rainfall between irrigations; this could result in further water conservation and reduced irrigation costs.

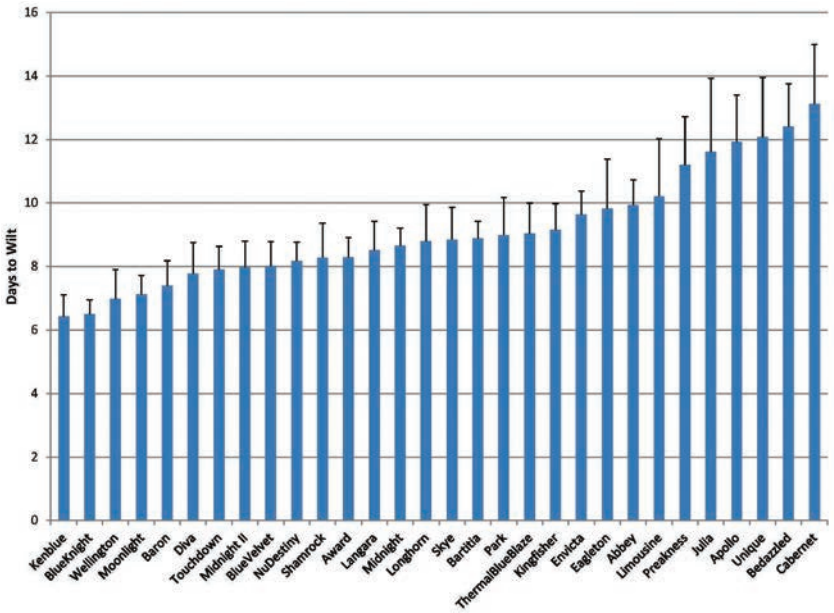

Figure 2. Days to wilt between irrigations among Kentucky bluegrass cultivars and hybrid bluegrasses, averaged over the periods June 19 - Oct. 1, 2007 (105 days) and June 22 - Oct. 7, 2009 (108 days), at Manhattan, Kansas.

Notably, all cultivars in the phenotypic group Mid-Atlantic (Cabernet, Eagleton, and Preakness) and four of five in the Compact America group (Apollo, Bedazzled, Kingfisher,

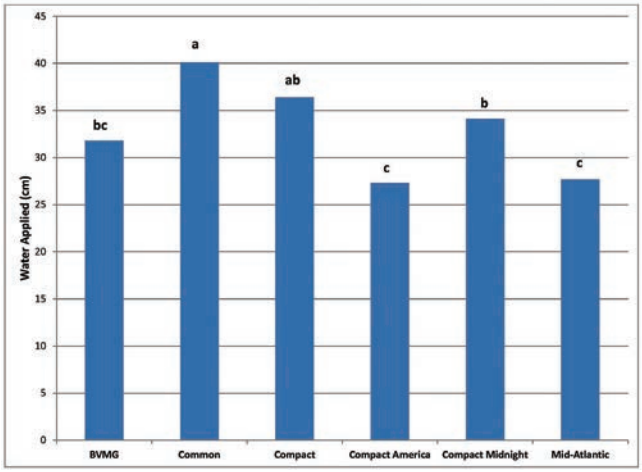

Figure 3. Water applied to Kentucky bluegrass phenotypic groups, averaged over the periods 19 June to 1 Oct. 2007 (105 days) and 22 June to 7 Oct. 2009 (108 days), at Manhattan, Kansas. The same letter above bars denoting different phenotypic groups indicates no significant difference.

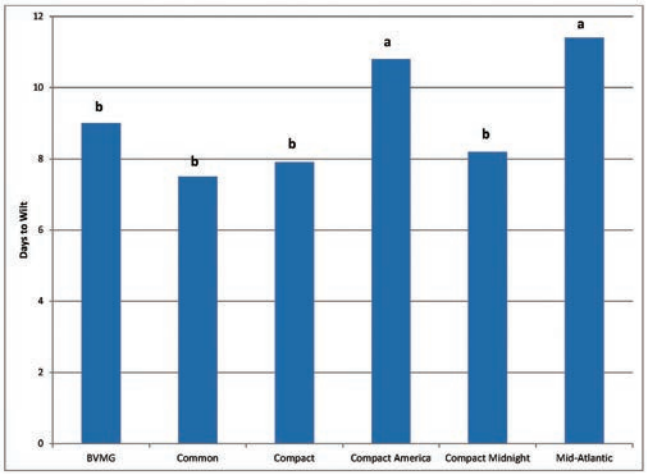

Figure 4. Days to wilt between irrigations among Kentucky bluegrass phenotypic groups, averaged over the periods 19 June to 1 Oct. 2007 (105 days) and 22 June to 7 Oct. 2009 (108 days), at Manhattan, Kansas. The same letter above bars denoting different phenotypic groups indicates no significant difference.

and Unique) were among the 15 cultivars that received the least amount of water (Table 1; Fig. 1). When averaged over all cultivars within each phenotypic group, 27.3 cm of water was applied to Compact America types and 27.7 cm to Mid-Atlantic types (both about 2.6 mm/day), which was less than the Common, Compact, and Compact Midnight groups (Fig. 3). The Common types received more water (40.1 cm, 3.8 mm/day) than all other groups except Compact. Days to wilt was also greater in Mid-Atlantic and Compact America than in all other groups (Fig. 4), indicating cultivars in Mid-Atlantic and Compact America could generally go longer without irrigation.

Visual Quality

With the exception of the Common types in 2007, the visual quality of all bluegrasses was acceptable (>6) at the beginning of the study in each year (Fig. 5). In all bluegrasses and in both years, however, visual quality declined to below what was considered minimally acceptable (Fig. 5). This indicates waiting until 50% wilt to apply irrigation was insufficient to maintain acceptable visual quality in KBG, at least for homeowners or superintendents who desire a moderate standard of quality in the stressful climate of the transition zone. Perhaps visual quality could have been maintained at acceptable levels by applying water when only 25% of the plot exhibited symptoms of drought stress; further research is required. Our method may be appropriate, however, for the typical homeowner with no in-ground sprinklers or superintendents with low-maintenance roughs on their golf courses, or where the primary concern is water conservation and some dormancy is acceptable. Visual quality in all bluegrasses generally remained above four and recovery was rapid in the fall after resuming irrigation (data not shown).

Although visual quality declined to less than six in all cultivars, the time required to do so ranged widely from 8.1 d in Kenblue to 44.8 d in Blue Velvet (data not shown for all cultivars; see Bremer et al. or Lewis et al., 2012 for greater detail). The decline was slower in Blue Velvet, Award, Midnight, Cabernet, Unique, and Nu Destiny (36 to 44.8 days) than in Park, Baron, Wellington, and Kenblue (8.1 to 14.2 days). Thus, four of five cultivars in the Compact Midnight group maintained quality longer than all cultivars in the Common group (Table 1). As a group, the Compact Midnight types remained above a quality of six for longer than the Common as well as the BVMG types, but also received more water than the Compact America and Mid-Atlantic groups (Fig. 3).

Relationships between Water Applied and Visual Quality

Ideally, cultivars or groups that require the least water would also have the highest visual quality. Those relationships are illustrated in the scatter biplot in Figure 6, in which cultivars with the most favorable characteristics appear in the lower right section. In general, irrigation applications were greater in bluegrasses with poorer quality (Fig. 6). This pattern probably resulted from improved cultivars with morphological properties that both enhanced turf quality and reduced evapotranspiration (water use). Such improved properties include compact or dwarfed growth habits, horizontal leaf orientation, and greater shoot density.

All 15 bluegrasses with the lowest water applications were also ranked among those with the highest visual quality (Fig. 6; there were no statistical differences among cultivars with average visual quality greater than 5.5). The amount of water applied to these 15 cultivars with superior turf quality was also below the mean water applied to all 30 bluegrasses (32.8 cm). Similarly, visual quality in 12 of the 15 bluegrasses that received the least water

Figure 5. Well-watered plots at beginning of dry-down study (June 4, 2007)(left). Kentucky bluegrass plots at two months into the study (August 4, 2007), in which drought stress is evident (right). Plots were sheltered from precipitation by the rainout shelter (upper left in each photo), which automatically moved on the tracks to cover the plots during rainfall. (Photos by Jason Lewis)

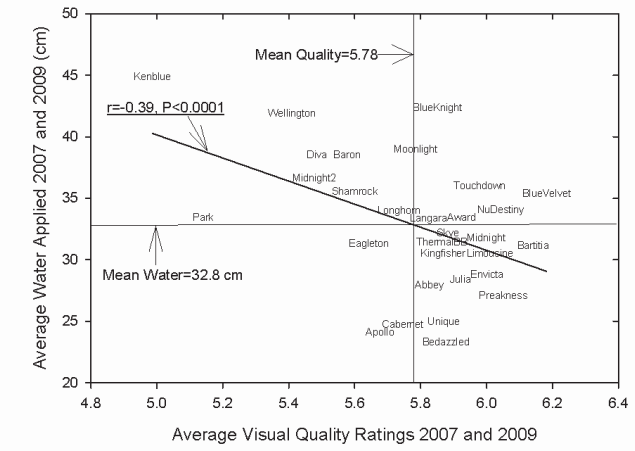

Figure 6. Water applied to Kentucky bluegrass cultivars and hybrid bluegrasses versus average visual quality ratings on a 1-9 scale with 9=optimum and 1=brown turf. Data were averaged over the periods June 19 - Oct. 1, 2007 (105 days) and June 22 - Oct. 7, 2009 (108 days).

was greater than the mean of all 30 bluegrasses (5.78), although all 15 were statistically similar.

In contrast to the 15 top performers, six cultivars were ranked within the group that received the most water and had the lowest visual quality (Fig. 6). Those six cultivars, which included Kenblue, Wellington, Midnight II, Baron, Diva, and Shamrock, had neither the high visual quality nor low water requirement traits we were screening for in this study.

Conclusions

Cultivar selection in KBG had significant impacts on water requirements and visual quality ratings. Among cultivars, differences in seasonal water applications were as great as 21.6 cm and differences in days to 50% wilt between irrigations were as great as 6.7 days (i.e., nearly one week). Based on statistical range tests, only 15 of the 30 cultivars were in the group that both received the least water and had the greatest visual quality. Results indicated that, under conditions similar to those in our study, KBG in the Compact America and Mid-Atlantic phenotypic groups can be selected for their lower irrigation requirements without sacrificing visual quality, and types from those two groups may represent the best selections for breeding efforts to achieve such goals. More detailed results from this study can be found in Bremer et al. (2012) and Lewis et al. (2012).

Acknowledgements

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Introducing the Turfco Triwave 40 Overseeder from G.C. Duke

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Turfgrass Seed Sources in Ontario

Advertising Supplement to the Sports Turf Manager, Spring 2013

The Sports Turf Association strongly recommends to athletic field managers that they use only improved cultivars that have been tested and found superior under local conditions.

SPECIES	SUPPLIER							
	Graham Turf Seeds Ltd.		Lawn Life	Master's Turf Supply Ltd.		Ontario Seed Company		
Kentucky bluegrass	Award Baron Bluechip Corsair Everest Full Moon Impact Jumpstart	NuDestiny NuGlade Rugby II Rush Skye SR 2100 SR 2284 Sudden Impact	Mallard Monte Carlo Oasis Ridgeline Wildhorse	Award Barrister Bedazzled Bonaire Brooklawn Diva	Everest Jumpstart Midnight Shamrock Wildhorse	Award Beyond Blue Chip Plus Freedom III Liberator Midnight Star NuBlue II NuDestiny NuGlade Perfection		
Texas/Kentucky bluegrass hybrid				Bandera				
Poa compressa	Reubens			Canada Blue		Canada Blue Reubens		
Poa supina	Supra Nova							
Poa trivialis	Maximum	Sabre III		Bartalon		Havana		
Fine fescue: Blue	SR 3200							
Fine fescue: Chewings	J-5 Jamestown IV King James	SR 5100 SR 5130	7 Seas Survivor	Ambassador Bridgeport II Culumbra II		J-5 Jamestown II		
Fine fescue: Creeping Red	Audobon Boreal Crossbow	SR 5210 SR 5250 Trapeze	Lustrous Penn ASC 295 Razor	Aberdeen Boreal	Miser Seabreeze	Aruba Audubon		
Fine Fescue: Hard	Bighorn GT Ecostar Soil Guard	SR 3100 SR 3150	Predator	Oxford Reliant IV	Reliant V Soil Guard	Ecostar		
Fine Fescue: Sheeps	Marco Polo	Quatro		Marco Polo		Marco Polo		
Tall fescue	Grande II Darlington	Talladega	RK4	Bighorn GT Coronado Gold Fury	Lexington Titan	Arid III Inferno		
Tall fescue: Spreading/ Rhizomatous	Speedway		Marauder	Falcon IV	Titan Ultra			
Perennial ryegrass	Accent Arctic Caddyshack Calypso III Champion Extreme	Harrier SR 4220 SR 4420 SR 4500 SR 4600 Top Gun	Applaud II IG2 Integra Shining Star	Affirmed Charismatic II Dominator Doubletime IQ	Manhattan 5 Passport Plateau Trifecta Wind Dance 2	Evolution Revenge Top Gun II		
Perennial ryegrass: Creeping/Regenerating	CSI		Insight Sienna	Baralpha		CSI		
Weeping alkali	Fults	Salty		Fults		Fults		
Contact Information	**Graham Turf Seeds Ltd.** 1702 Elm Tree Road, RR 1 Lindsay, ON K9V 4R1 P:795.878.8822 F:705.878.1978 graham@grahamturf.com www.grahamturf.com		**Lawn Life** 935023 Airport Road Mono, ON L9W 6C6 kpavely.lawnlife@xplornet.ca lawnlifenaturalturfproducts.com	**Master's Turf Supply Ltd.** P.O. Box 629 80 William Street West Harriston, ON N0G 1Z0 P: 519.510.8873 F: 519.510.8875 mastersturf@wightman.ca		**Ontario Seed Company** 77 Wellington Street South Kitchener, ON N2G 2E6 P:519.886.0557 F:519.886.0605 richard@oscseeds.com www.oscturf.com		

Turfgrass Seed Sources in Ontario

TURF SEEDING RATES The following are seeding rates per 100 m^2 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

SPECIES	SUPPLIER									
	Pickseed Canada Inc.		Plant Products Co. Ltd.		Quality Seeds			Speare Seeds	
Kentucky bluegrass	America Appalachian Armada Blue Velvet Crest Explorer	Granite Langara Mercury Quantum Leap Touchdown Touche	America Appalachian Armada Bandera Blue Velvet Bordeaux Cabernet Champagne Crest Granite	Langara Mercury Merit Moonshadow Quantum Leap Shiraz SR 2100 Touchdown Zinfandel	Abbey Alene Avalanche Aviator Barduke Barimpala Barinque Bariris Baron Baroness	Barrister BlackJack Blue Angel Blue Note Blue Sapphire Cadet Corsair Courtyard Everglade Gaelic	Hampton HGT Midnight Midnight II Princeton 105 Prosperity Raven Rubicon Rugby II	Award Barrister Bedazzled Bonaire Brooklawn Diva	Everest Jumpstart Midnight Shamrock Wildhorse
Texas/Kentucky bluegrass hybrid	Bandera	Spitfire			Farenheit 90	SPF 30		Bandera	
Poa compressa					Reubens			Canada Blue	
Poa supina	Supernova				Supranova				
Poa trivialis	Colt Darkhorse	Racehorse	Darkhorse		Laser Sabre IV	Sun-Up		Bartalon	
Fine fescue: Blue	Azay				Blue Heron	Little Big Horn	MX 86		
Fine fescue: Chewings	Silhouette Victory II Windward		Silhouette Victory II Windward		Fairmont Jamestown IV	Longfellow II		Ambassador Bridgeport II Culumbra II	
Fine fescue: Creeping Red	Boreal Garnet Jasper II	Mystic Sea Link	Boreal Crossbow Garnet	Jasper II Mystic Pathfinder	Boreal Crossbow Kent	LiFine Navigator II Trapeze		Aberdeen Boreal	Miser Seabreeze
Fine Fescue: Hard	Bornito	Spartan II	Bornito Oxford Spartan II		Aurora II Chariot Firefly	Heron Rhino Ridu		Oxford Reliant IV Soil Guard	
Fine Fescue: Sheeps	Azay		Azay		Little Big Horn	Quatro		Marco Polo	
Tall fescue	Cayenne Crossfire 3	Mustang 4	Monet Mustang 3 Team Jr.		Darlington Lexington Sitka	Tahoe II Talladega		Bighorn GT Coronado Gold Fury Lexington	
Tall fescue: Spreading/ Rhizomatous	Blade Runner II	Team Blend			RTF Rhizomatous			Falcon IV	Titan Ultra
Perennial ryegrass	Arctic Green Cutter II Dasher 3 Edge II Express III Fiesta 3	Karma Mighty Nightsky Quebec Transist 2600 TXR Annual	Cutter Dasher III Edge II Exacta II	Fiesta IV Quebec Secretariat II	Amazing GS Apple GL Ecological Home Run Palace	Pillar Premium Presidio Primary Prominent		Affirmed Charismatic II Dominator Doubletime IQ	Manhattan 5 Passport Plateau Wind Dance 2
Perennial ryegrass: Creeping/Regenerating	Blazer 4	Fiesta 4			RPR Regenerating			Baralpha	
Weeping alkali	Fults	Salty			Fults II			Fults	
Contact Information	**Pickseed Canada Inc.** P.O. Box 304 1 Greenfield Road Lindsay, ON K9V 4S3 P:705.878.9240 F:705.878.9249 pstevens@pickseed.com www.pickseed.com		**Plant Products Co. Ltd.** 314 Orenda Road Brampton, ON L6T 1G1 P:905.793.7000 F:905.793.9632 www.PlantProd.com		**Quality Seeds** 8400 Huntington Road Vaughan, ON L4L 1A5 P:905.856.7333 support@qualityseeds.ca www.qualityseeds.ca			**Speare Seeds** P.O. Box 171 99 John Street Harriston, ON N0G 1Z0 P:519.338.3840 F:519.338.2510 info@speareseeds.ca www.speareseeds.ca	

OTS HIGHLIGHT
Presented February, 2013
Guelph, Ontario.

Rhizomatous Tall Fescue and Regenerative Perennial Ryegrass Performance in Ontario: Year 1

Pam Charbonneau, Ontario Ministry of Agriculture and Food and Ministry of Rural Affairs, Turfgrass Specialist
Dr. Michael Brownbridge, Vineland Research and Innovation Centre

Background

I think it is safe to say that with the passing of the Cosmetic Pesticides Ban it has been more challenging to manage turf. Many of the pests that either attack or infest turf are more difficult to control using a one product – one pest approach. We must really integrate all of our tools, including cultural practices, turf species selection and bio-pesticides for success. In addition, the last few growing seasons have been very dry, increasing pressure on water supplies and necessitating watering bans in many municipalities. Ideally we are looking for pest tolerant grass species that are also drought tolerant.

With that in mind we started to investigate the potential use of novel grass species that may not only be drought tolerant, but are also able to resist weed invasion and are less susceptible to insect feeding. Cue the arrival of rhizomatous tall fescue (RTF) and regenerative perennial ryegrass (RPR) into the market place. Rhizomatous tall fescue is purported to grow better in summer and late fall than tall fescues that are currently on the market. They have endophytes that are different from other tall fescues currently on the market. They require less water because of their deep roots and have rhizomes which should give them the ability to fill in on their own if the turf stand thins due to wear, pest damage or any other stress for that matter. There is an excellent article that explains the origins of rhizomatous tall fescue and how it differs from the Continental tall fescue morphotype (a morphotype is the same species but it differs significantly morphologically, genetically, physiologically and geographically) than the tall fescue that the majority of the turf varieties on the market originate. The article can be found in Sports Turf Manager, Summer 2012, Vol. 25. No. 2. In this article there are data documenting the rhizomatous habit of this morphotype as well as some information on the performance of RTF under intense traffic. RTF plus Kentucky bluegrass and Kentucky bluegrass sod performed the best in the traffic performance trials and based on this RTF/Kentucky bluegrass sod is now being produced and marketed for sports fields in Ontario.

What does regenerative perennial ryegrass have to offer that is novel? RPR is a subspecies of perennial ryegrass that produces stolons. It is also referred to as stoloniferous perennial ryegrass. Until now, the cultivars of perennial ryegrass that have been marketed in Ontario have been bunch type. In addition to having stolons, RPR was selected under intense traffic stress for its ability to survive traffic and recover. RPR also contains endophytes, which is not novel for perennial ryegrass cultivars.

There is some research information on these two novel types of grasses, but apart from some sod production of these, there is not a lot of information on them and how they perform in Ontario, especially when established from seed. My colleague and I were interested in seeing for ourselves how these species performed. Because tall fescue is supposed to be drought tolerant, we thought it would be interesting to look at RTF, RPR and a standard home lawn mix (HLM) (50% Kentucky bluegrass, 20% perennial ryegrass and 30% fine fescue) under two irrigation regimes (irrigated vs. non-irrigated).

Experiment

A plot area was worked and prepared for seeding at the Guelph Turfgrass

Institute. The experimental plots were arranged in a two by three factorial design (two irrigation regimes and three species/mixture) with four replications of each treatment. Plots measured 2 m x 2 m (4 m^2) and were seeded on September 21, 2011 using a hand held shaker. Treatments and seeding rates are as indicated in Table 1.

Table 1. Treatments and seeding rates

Treatment Number	Turf species/ mixture	Irrigation regime	Seeding rate
1	Rhizomatous tall fescue (RTF)	Irrigated	2.5 kg/100 m^2
2	Rhizomatous tall fescue (RTF)	Non-irrigated	2.5 kg/100 m^2
3	Regenerative perennial ryegrass (RPR)	Irrigated	3.0 kg/100 m^2
4	Regenerative perennial ryegrass (RPR)	Non-irrigated	3.0 kg/100 m^2
5	Home lawn mix1 (HLM)	Irrigated	2.0 kg/100 m^2
6	Home lawn mix (HLM)	Non-irrigated	2.0 kg/100 m^2

All plots were mowed on a weekly basis (beginning in May 2012) at a height of 5 cm and were fertilized May 25, August 10 and September 14, 2012 with a 25-5-10 fertilizer applied at a rate of 0.5 kg of N/100 m^2.

Irrigation

Irrigated plots were individually watered to supply 25 mm of water in a one week period during June, July and the first two weeks of August using a hose-end sprinkler. A flow meter was used to ensure that a precise volume of water was delivered to each plot (Fig. 1). If rainfall was equal to 25 mm of water, no irrigation was applied. If rainfall was between 0 and 25 mm of water, irrigation was applied to bring the total water applied up to 25 mm for that one week period. Non-irrigated plots received rainfall only.

Figures 2, 3 and 4 show the amount of rainfall and irrigation applied per week to the irrigated plots in June, July and the first half of August. The blue bars represent the amount of rainfall that the non-irrigated plots received per month. On July 18, 2012, all irrigated and non-irrigated plots received 25 mm of irrigation. This was done because there was a fear that all of the non-irrigated plots would die due to lack of water.

Establishment, species composition and weed invasion

Percent cover of each grass species [tall fescue (TF), perennial ryegrass (PR), Kentucky bluegrass (KB) and fine fescue (FF), broadleaf weeds (BLW) and bare areas (bare)] was recorded on five dates (June 8, August 4, August 23 and October 18, 2012). The broadleaf weeds

Figure 1. Application method for irrigating individual plots with a flow meter and hose end sprinkler.

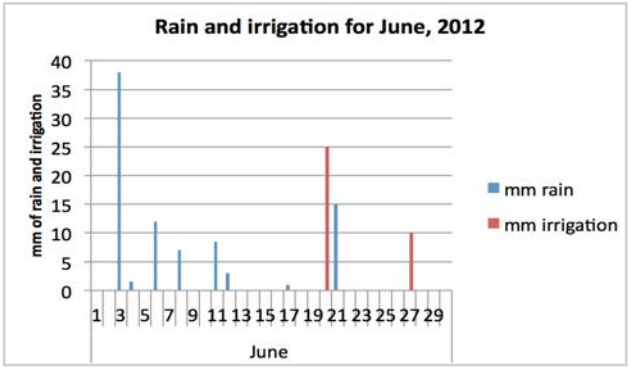

Figure 2. Millimeters of rain and irrigation for June, 2012.

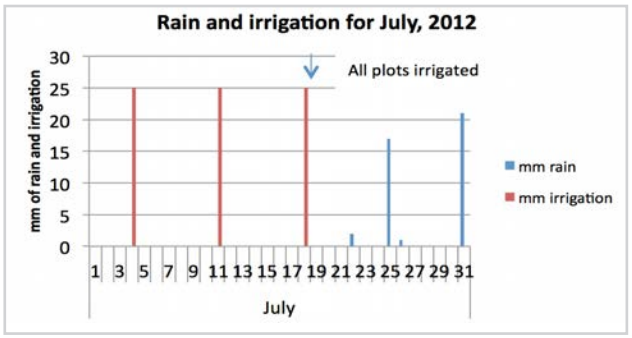

Figure 3. Millimeters of rain and irrigation for July, 2012.

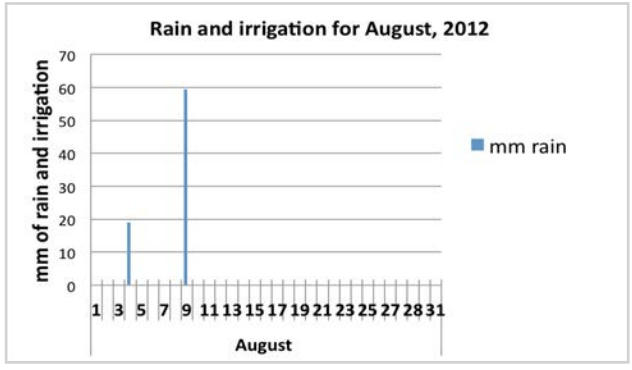

Figure 4. Millimeters of rain and irrigation for August, 2012.

found in these plots during the 2012 season were mainly annuals (i.e. black medick, whitlow grass, thyme-leaved sandwort, speedwell, purslane, chickweed, shepherd's purse, henbit, goldenrod and pineapple weed). Dandelions were also found in the plots but were one of the few perennial broadleaf weeds. Four randomized point quadrats measuring 60 cm x 60 cm with 25 points in each quadrat (points 10 cm apart) (Fig. 5) for a total of 100 points in each plot were used to determine percent species cover of each of the turfgrass species, broadleaf weeds and bare at each assessment date (Figures 6 and 9). A new category (dead/brown) was added on the August 4 and 23 assessment dates (Figures 7 and 8). All data were analysed using appropriate statistical methods.

Figure 5. Point quadrat used to estimate percent species cover in plots.

Figure 6 shows the species composition in the plots prior to the irrigation treatments and reflects how quickly each of the species established and how well they crowded out broadleaf weeds. Our main interest was the percent broadleaf weed cover and the percent bare. At this stage of the experiment, RPR and HLM provided good cover with very little bare area and were not significantly different from each other (11.75 and 13.625% bare respectively), while RTF had significantly more bare area (18.5%). Also, the three species treatments differed significantly from each other for broadleaf weed invasion with RTF having the most total BLW (47.75%), HLM having moderate weed invasion (31.25%) and the RPR having the least (23%).

Not surprising, these results show that RTF is slower to emerge and fill in than the RPR and HLM and that resulted in more BLW and more bare area with this slow to establish species. The RPR is very rapid to emerge and fill in and the perennial ryegrass in the HLM also provided quick establishment that helped to out-compete weeds and fill in the bare areas.

Figure 7 shows the status of the treatment plots after six weeks of irrigation or non-irrigation. The main differences were in the percent bare, dead/brown and total BLW. At this point in the season only the non-irrigated RTF had significantly more percent bare area than all of the other treatments (18.5%). The non-irrigated HLM and RPR had similar percentage of dead/brown (69.5 and 69% respectively) and they had more dead/brown percent area than the non-irrigated RTF (44%). Perhaps surprising was the percent BLW. The irrigated RTF had significantly more BLW (64.25%) than any of the other treatments. The irrigated HLM, irrigated RPR and the non-irrigated RTF did not differ significantly from each other for BLW (31.25, 31 and 30.25% respectively). The non-irrigated HLM and RPR had very few BLW.

At this date, when irrigation was added to plots that had lots of bare area, the result was an invasion of annual broadleaf weeds. On the non-irrigated plots, there were fewer weeds because there was not enough soil moisture for weed seed germination. In addition, the non-irrigated RTF had fewer dead/brown plants showing that it is superior at maintaining live non-dormant plants during prolonged periods without water.

The data represented in Figure 8 gives an indication of the ability of the non-irrigated turf species/mixture treatments to recover from drought and for the irrigated turf species/mixture treatment to recover from broadleaf weed invasion. The percent dead/brown decreased from August 4 – August 23, 2012 for all of the non-irrigated plots. The non-irrigated RPR had significantly more dead/brown plants (14.75%) than the irrigated RTF, non-irrigated RTF and the irrigated RPR (4.5, 4.25 and 2.75% respectively). Overall there was very good recovery of the dead/brown turf in most of the non-irrigated treatments, with the non-irrigated RPR lagging behind slightly.

Regarding the total BLW cover, the non-irrigated RTF and HLM had significantly more broadleaf weeds than any of the other treatments (74.25 and 69.5% respectively). The non-irrigated RPR and the irrigated RTF had the same amount of broadleaf weed cover (49.75 and 41% respectively) and the treatments with the

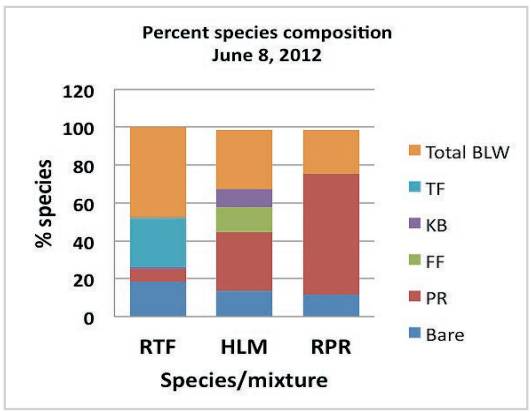

Figure 6. Percent species composition June 8, 2012.

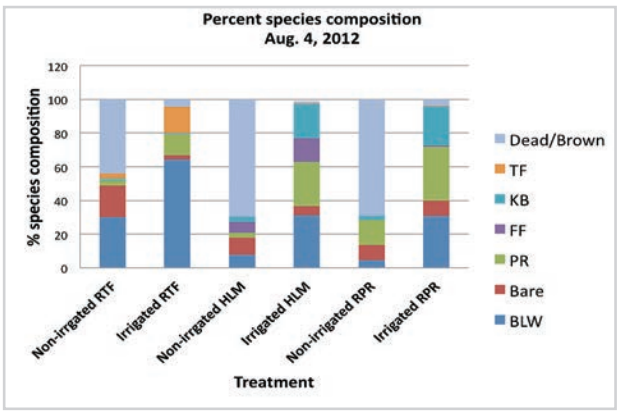

Figure 7. Percent species composition Aug. 4, 2012.

fewest broadleaf weeds were the irrigated HLM and RPR (26 and 24.25% respectively).

With the onset of timely rains during August, 2012 the bare areas in the non-irrigated plots were quickly populated by weeds as indicated by the total BLW cover in the non-irrigated RTR, HLM and RPR. Because the irrigated RTF also had a high percentage of bare areas, it also was invaded by broadleaf weeds when the late summer rains came.

The data in Figure 9 represents the percent species composition of the treated plots at the end of the first treatment year. Non-irrigated RTF had the most total BLW of all of the treatments (46.25%). The percent bare areas in the non-irrigated treatments increased from the August 23, 2012 to October 18, 2012 because many of the broadleaf weeds were annual weeds that died off after the first frost leaving bare areas. These bare areas could also be a result of some of the plants categorized as dead/brown actually being dead.

Another interesting observation at the end of the season was the species composition of the irrigated and non-irrigated HLM. The non-irrigated HLM had almost no Kentucky bluegrass plants in it (<1%) where the irrigated HLM had 11.5%, in spite of it comprising 50% of the seed mixture at seeding. There was significantly more FF in the irrigated HLM, which is not surprising because of FF's reputation for being drought tolerant.

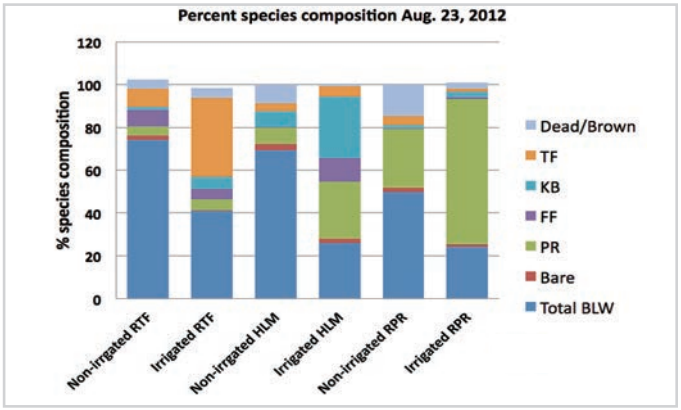

Figure 8. Percent species composition Aug. 23, 2012.

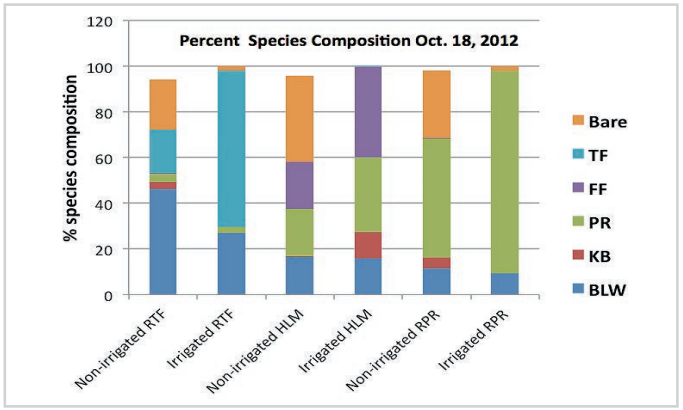

Figure 9. Percent species composition Oct. 18, 2012.

Serendipity

While walking past these plots in late October, a very interesting phenomenon was observed. One plot in each block of the experiment had been disturbed by an animal digging for grubs. When the plot map was consulted, it turned out that the plots that were dug up were all the irrigated HLM. There was clearly something different about these plots. The questions were:

1. Were there more grubs in the irrigated HLM than the other plots?
2. Was there the same number of grubs in all of the plots, but did the animal prefer digging in the irrigated HLM plots?

To answer this question, six cup changer plugs of turf per plot were examined for the presence of grubs in all plots.

The data presented in Figure 10 shows the irrigated HLM and RTF had the same number of grubs per 0.1 m^2, whereas the irrigated RPR plots contained approximately half the number of grubs per unit area. All of the non-irrigated plots regardless of the species/mixture had significantly fewer grubs per given area. What was interesting was the fact that even though the irrigated HLM and RTF had the same number of grubs, the animal digging for the grubs was only digging in the irrigated HLM. Figure 11 shows the irrigated HLM and non-irrigated HLM showing the animal digging in the irrigated HLM only. What we don't know is:

1. Did the grub eggs survive better in the irrigated HLM and RTF or did the female European chafer adults prefer laying their eggs in those plots?
2. Why is the animal digging the irrigated HLM and not the RTF plots which both contain grubs?

With the help of Dr. Michael Brownbridge, VRIC, we hope that we can answer these questions next year.

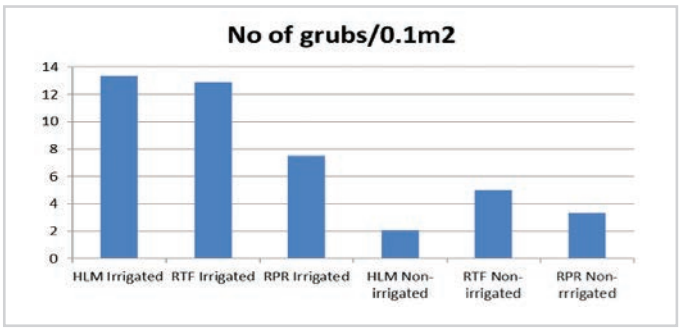

Figure 10. Number of grubs per 0.1/m^2

Figure 11. Plot on the left shows the non-irrigated HLM and the plot on the right shows the irrigated HLM with animal digging.

Going forward

We now have RTF and RPR plots that have significant bare areas in which we can evaluate their ability to spread. In addition, we will also have data in the spring of 2013 to evaluate their ability to overwinter in Ontario (for one winter). We have established similar plots for 2013 with more cultivars of these spreading species to continue our evaluation of their performance in Ontario. Here is hoping for another extremely dry season so that we can evaluate another year of their performance in drought conditions, evaluate their ability to spread and resist insect and weed invasion. •

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Ryan Streatch, RTF Water Saver

Member and Facility Profile

TAB BUCKNER, MANAGER, PARK OPERATIONS AND CEMETERY SERVICES TOWNSHIP OF LANGLEY, BC

Interview with Tab Buckner

What is your role with the Township of Langley? Manager of Park Operations and Cemetery Services for the Township of Langley. The Township of Langley is located in the southwest corner of the province of British Columbia. We are 45 kilometers east of the City of Vancouver in the beautiful agriculture-rich Fraser Valley. The Trans-Canada Highway runs through it dissecting the northern part of the municipality from the south. The municipality has a land mass of 316 square kilometers and a population of approximately 104,000. 70% of the Township land mass still resides within the BC Agricultural Land Reserve and is not available for land development.

What kind of team do you work with? The Township has a dedicated parks crew of 21 full time staff ("FT") and 12 temporary full time staff ("TFT"). Four of those full time staff are administration, tasked with the following duties: park management, clerical, park bookings, facility allocations, special events, managing contracts, and asset maintenance. The remainder of the staff are outside employees and they work in three separate work groups: 1) Turf management: 8 FT's and 8 TFT's, 2) Park facilities and infrastructure (which includes sanitation, trails, playgrounds, sport courts, etc.): 6 FT's and 4 TFT's, and 3) Cemetery services: 3 FT's.

What is the biggest challenge in your job? Dealing with multiple personalities that exist both internally and externally of the organization. You walk a fine line trying to keep most people happy most of the time. When allocation of sports fields was part of my responsibilities I used to comment to my Director that if all the user groups were unhappy with their allocation hours……then I got it right!

What is the most satisfying part, what makes the job worthwhile for you? I enjoy servicing the community that I reside in. Also, I get great satisfaction when I tour around the Township's park system and get to see the great park infrastructure that has been constructed and maintained to a high standard.

What is the biggest misconception about your job? That individuals think it is just seasonal work. What I mean is that people assume the winter months are a slow period for parks departments. Which is correct in terms of growing season but staff are busy; maintaining both natural and synthetic turf fields, baseball prep, finalizing the budget, allocating sports fields for the next season, facility maintenance and hiring seasonal staff for the spring.

What is your educational/employment background? I have a BA in History from the University of Victoria, Diplomas in Horticulture (Turfgrass Management) and Business from Kwantlen Polytechnic University. I have been in this industry for 25 years; 18 years with Langley School District Grounds Department and the past seven years with the Township of Langley.

What are you and your team responsible for? In the Township of Langley there are over 101 active and passive parks, 3 cemeteries, greenway and trails which adds up to 607 hectares to manage. The largest park is McLeod Athletic at 42 hectares and the smallest is Jubilee Park at 250 square meters.

The Turf Management crew is responsible for 63 natural turf and 6 synthetic turf sports fields in total:

Sand Based Sports Fields
- (1) Combination Soccer, Rugby and Ball
- (26) Combination Soccer and Ball
- (1) Stand Alone Rugby
- (6) Stand Alone Soccer
- (6) Stand Alone Ball

Soil Based Irrigated Sports Fields
- (1) Combination Soccer, Ball and Cricket
- (5) Combination Soccer and Ball
- (2) Stand Alone Soccer
- (5) Stand Alone Ball

Soil Based Non-Irrigated Sports Fields
- (3) Combination Soccer and Ball
- (1) Soccer Stand Alone
- (6) Stand Alone Ball

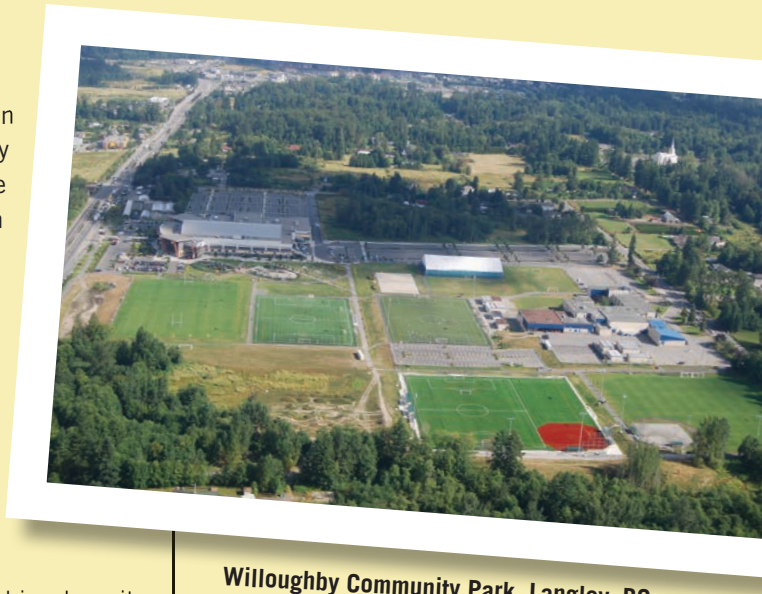
Synthetic Turf Fields
- (1) Combination Soccer, Field Lacrosse and Ball
- (1) Combination Football and Soccer
- (3) Combination Soccer and Field Lacrosse
- (1) Stand Alone Soccer

The Park Facilities and Infrastructure crew are responsible for:

- (1) 2200 seat Stadium
- (1) 400 m Track
- (9) Fieldhouses
- (1) Dock with 2 Boathouses
- (30) Tennis Courts
- (5) Skateparks
- (5) Sprayparks
- (56) Playgrounds
- (6) Sportboxes
- (2) Mountain Bike Parks

Tell us about your family. My family lives in the Township of Langley in the community of Brookswood. My wife Christine is employed by Surrey School District as a Special Educator. Christine and I have two teenage daughters. The oldest one graduates from high school this year and then is off to university and my other daughter is in grade nine and plays both school and club volleyball.

What do you enjoy doing outside of the workplace? I enjoy sailing, skiing, gardening, travelling, golf and a good cigar with a dry gin martini on my back sun deck.



Willoughby Community Park, Langley, BC

How has the industry changed and in what direction(s) would you like to see the industry, as a whole, move towards? Synthetic turf fields are providing sports field managers with another tool in their tool box especially in the Lower Mainland and on Vancouver Island out here in British Columbia where it rains, rains, rains and rains, some more! The only other all-weather field option was gravel before synthetic turf became reasonable to afford and user groups no longer are willing to use those gravel fields… expectation levels have been raised! Some cities in BC are converting the all-weather gravel fields to synthetic turf fields. The Township of Langley completed a conversion in 2012.

What do you consider to be the biggest benefit of being a member of the STA? It is the network of people that I have been able to meet over the past couple of years. I enjoy reading the Sports Turf Manager and I find the articles most informative.

What percentage of the acreage of sports fields are irrigated? 84%

What is the percentage of sand based sportfields in the Township of Langley? 64%

What is the primary type of turfgrass? Perennial ryegrass

Is yearly overseeding part of your sports turf maintenance program? Yes, the Township overseeds twice a year using a 4-way perennial ryegrass mixture (the varieties vary each year depending on the NTEP trials/cost) with a slit seeder at a rate 10 – 12 lbs/1000 square feet on high use areas and 8 – 6 lbs/1000 square feet on low use areas of the field.

How many times do you fertilize? Sand based sports fields receive 6 lbs of N/year, irrigated soil sports fields 4 lbs of N/year, and non irrigated soil sports fields 2 lbs of N/year.

Do you aerate? Topdress? Twice a year; pull cores in the spring and solid tines in the fall. All sports fields are topdressed annually with ¼-inch of 3 ml washed sand.

What is your maintenance regimen for synthetic turf? The high wear areas are topdressed every two weeks, baseball home plate and pitcher mound are topdressed 3 times a week during ball season, the fields are groomed every two weeks and the fields are swept/vacuumed every four months. Gmax, Head Injury Criteria (HIC) and Depth Infill are tested annually by an independent firm.

How many hours per year are the fields permitted? Who permits them? Are the fields ever closed during the season to give them a rest? How much input do you have in the amount and timing of use? Natural turf during fall/winter season, 6 hours of play area allowed Saturday and Sunday for a total of 12 hours per week. During spring/summer season 20 hours of play are allowed per week. The Township of Langley permits the sports fields and makes the final decision if a sports field is to be closed or not. Generally, the sports fields are never closed during the season to give them a rest. The only break sports fields receive is during the month of August when there is very little activity occurring on them. Last year I did remove one sand sports field from the fall/winter inventory because it was constantly failing prematurely into the season. This sports field will be reopening this fall/winter season to see if its playability conditions have improved due to a rest. Synthetic turf fields are permitted 60 hours/week within the Township. •

If you are interested in being featured in this column, please contact Lee Huether at the STA office.

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