International Turfgrass

The Newsletter of the International Turfgrass Society

February 2012 Edition

Last call for Papers - 12th International Turfgrass Conference in Beijing, China, 2013

by Mike Fidanza, Editor-in-Chief
Pennsylvania State University, USA

The International Turfgrass Society announces the second call for papers to be presented at the 12th International Turfgrass Conference in Beijing, China from July 14-19, 2013. The "author information" website for the International Turfgrass Society Research Journal is now available at http://itsrj-volume12.org Please complete the Title-Summary Form available at (http://itsrj-volume12.org/title-summary-form.pdf) and e-mail it to Mike Fidanza at fidanza@psu.edu. The title, summary, and choice of discipline area determine the appropriate Co-Editor who will be responsible for working with authors and reviewers. The Title-Summary forms will be acknowledged with further instructions to authors and instructions for corresponding with the assigned Co-Editor.

Time for oral presentations will be limited and strong consideration will be given to poster presentations. The final decision on oral presentations will be made by the program committee and if changed you will be notified. Check the International Turfgrass Society website (http://www.turfsociety.com/) for more details as they become available.

At least one author of each paper presented to the 12th ITRC must be a member in good standing of the International Turfgrass Society. The author cannot be the sole member on more than one paper submission. When papers are accepted, you will be required to sign-off assigning copyright to the ITS. This will allow the ITS to give the Turfgrass Information File at Michigan State University permission to make the journal available electronically 2 years after publication (i.e. in 2015 for Volume 12). This does not a transfer of copyright to MSU. See http://www.turfsociety.com/ for information about on the International Turfgrass Society and membership or click here to join.

Hopefully, everyone had a very good 2011. It was a year characterized by weather extremes in Oklahoma. We had record breaking: 1) snow -- 68.6 cm (27 inches) in 24 hours; 2) cold -- -35 C (-31 F); at one location over a 7 day period, the low and high temperatures differed by 43.3 C (110 F); 3) extreme drought -- one location received only 15.7 cm (6.2 inches) of rain all year; 4) heat -- the hottest summer for any state in the U.S. since record keeping began with the average state temperature in July at 30.5 C (86.9 F); one location in the state had 101 consecutive days above 37.8 C (100 F); 5) wind -- the fastest ground wind speed 243 km/h (151 mph) ever recorded for the state which was associated with an EF-5 category tornado; and 6) hail --the largest hail ever record in the state at 15.2 cm (6 inch) in diameter. It was a tough year to grow turfgrass in Oklahoma to say the least.

I hope you enjoy the very good articles in this edition.

Sincerely,

Nathan R. Walker

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In this Edition

Timeline for RESEARCH, REVIEW, ISSUE, and CASE STUDY Manuscripts	
15 Feb 2012	LAST DATE for receipt of TITLE-SUMMARY FORM.
1 March 2012	Preliminary deadline for receipt of first draft of research manuscript.
1 May 2012	LAST DATE for receipt of first draft of research manuscript.
1 July 2012	REVIEW of first draft of research manuscript completed.
1 Sep 2012	LAST DATE for receipt of revised draft of research manuscript (if necessary).
1 Nov 2012	REVIEW of revised draft of research manuscript completed.
1 Feb 2013	LAST DATE for receipt of final version and correctly formatted research manuscript.

Publication of International Turfgrass Society Research Journal, volume 12,
by the XIIth International Turfgrass Research Conference, Beijing, China, in July 2013

2011 Rugby World Cup in New Zealand

by Richard Gibbs
Sports Surface Consultant, Sports Surface Design & Management
Auckland, New Zealand

The 2011 Rugby World Cup (RWC2011) took place in New Zealand between 9th September and 23rd October 2011. It was the biggest sporting event ever held in the country. During that time 12 stadiums were used for the 48 tournament games along with over 40 training fields located over the length and breadth of the country in 24 towns and cities. Originally 13 stadiums were to be used for the tournament but the devastating earthquake in Christchurch in February 2011 caused irreparable damage to the city's stadium and infrastructure. The RWC2011 was a truly nationwide event – New Zealand was promoted as a 'Stadium of Four Million' and there is no doubt that this concept worked extremely well, with local towns and cities enthusiastically 'adopting' visiting teams. Even flocks of sheep were painted in the different team colours!

From a turf perspective, the tournament sailed through without a hitch. New Zealand has a strong turfgrass consulting industry and an early setting of pitch expectations and playing quality standards for the training and match venues

Fig. 1. Northland Events Centre, Whangarei – the only pitch with a warm season turfgrass base (oversown with perennial ryegrass for the tournament).

Fig. 2. Eden Park, Auckland – the main venue for the tournament. Samoa and Fiji challenge each other with a 'haka' prior to the game commencing.

Continued on next page

coupled with regular monitoring and a skilled turf manager base helped to ensure that turfgrass conditions were as uniform as they could be.

Of the 12 stadium venues, only one stadium was built completely from scratch. This was the unique Otago/Forsyth Barr Stadium in Dunedin, the world's first permanently closed-roof stadium to boast a permanent natural turf playing surface . Most other stadiums had varying degrees of upgrades prior to the event, including to their playing surfaces (Table 1).

Three stadiums used turf reinforcing. Out of the main centres, the most common pitch design was the slit drain/sand carpet approach, the 'work horse' of sports field design in New Zealand. In another innovative upgrade, one stadium (Trafalgar Park) used recycled glass sand derived from crushed bottles for the sand carpet component of its pitch upgrade. Perennial ryegrass surfaces were used throughout all stadiums, although the northernmost stadium, the Northlands Events Centre in Whangarei, did contain a Bermudagrass base.

Fig. 3. Onewa Domain No.1 field, Auckland – an upgraded slit drain/sand carpet field used as a training venue for the tournament. Field conditions needed to replicate as closely as possible those found in the stadiums.

Table 1. 2011 Rugby World Cup Stadiums.

Stadium name	Location	Grass type	Drainage/profile type	Turf reinforcement	Construction summary
Arena Manawatu	Palmerston North	Perennial ryegrass	Slit drain/sand carpet	None	Pitch was originally slit drained/sand carpeted in the summer of 1993/94; the pitch was re-surfaced with a new sand carpet in 2006 and new slit drains were installed in April/May 2010
Wellington Stadium	Wellington	Perennial ryegrass	Sand profile over gravel raft (USGA-type)	None (except 'Motz' stabilised turf over centre of pitch where portable cricket tray installed)	Pitch was constructed in 1999 (stadium opened in January 2000); originally built with a 5-pitch cricket block in the centre of the oval but this has since been replaced with a single portable cricket pitch tray (cricket pitch tray replaced with sand-based tray in winter); 'Motz' stabilised turf was installed in approx. early May 2011 over the cricket pitch tray area and immediate surrounds
Trafalgar Park	Nelson	Perennial ryegrass	Slit drain/sand carpet	None	Pitch was slit drained/sand carpeted in the summer of 2009/2010; sand carpet is constructed out of recycled glass sand
Otago Stadium (Forsyth Barr Stadium)	Dunedin	Perennial ryegrass	Sand profile over drained sub-base (California-type)	'Desso GrassMaster'	Pitch was constructed between September 2010 and January 2011 and opened for play on 1 August 2011; 'Desso GrassMaster' was installed in April 2011; top part of the profile is a blended sand/topsoil/compost rootzone; contains both sub-surface and automatic irrigation systems
Rugby Park	Invercargill	Perennial ryegrass	Soil-based with lateral pipe drainage system	None	Soil-based pitch with lateral drains; topsoil has gradually turned into a sandy loam material from a combination of repeated sand topdressings, earthworm activity and physical treatment
Northland Events Centre	Whangarei	Bermudagrass oversown with perennial ryegrass	Sand profile over drained sub-base (California-type)	None	One of the first sand-based pitches in NZ; originally built in 1984, the pitch was reconfigured between January and May 2010 to accommodate a new grandstand; much of the existing sand rootzone material was re-used; pitch was established with ryegrass for the 2010 winter season and then re-established with Bermudagrass over the summer of 2010/2011 and oversown with ryegrass for the RWC 2011
North Harbour Stadium	Auckland	Perennial ryegrass	Slit drain/sand carpet	None	Originally constructed in 1995 as a slit drain/sand carpet pitch with the stadium built around the pitch (stadium opened in 1997); the pitch has received various drainage and irrigation upgrades over the years including resurfacing in 2002, new lateral and slit drains in 2004, sand banding in 2006 and gravel banding in 2010
Eden Park	Auckland	Perennial ryegrass	Sand profile over gravel raft (USGA-type)	'Motz' stabilised turf	Pitch was completely reconstructed between January and March 2003 using 'Motz' stabilised turf (had originally been slit drained and sand carpeted in the early 1990s); 'Motz' stabilised turf was grown off-site; the turf surface was shaved off to the 'Motz' fibres and re-established with new turf from seed in December 2009
Waikato Stadium	Hamilton	Perennial ryegrass	Sand profile over gravel raft (USGA-type)	'Motz' stabilised turf	Pitch was completely reconstructed in 2001/2002 ; the original pitch construction used 'Loksand' turf reinforcement but in 2010 the 'Loksand' was removed and replaced with 'Motz' stabilised turf (grown off-site)
Rotorua Stadium	Rotorua	Perennial ryegrass	Slit drain/sand carpet	None	Pitch was originally slit drained/sand carpeted in the mid-1990s; the pitch was re-surfaced with a new sand carpet and some additional slit drains in the summer of 2009/2010
Stadium Taranaki	New Plymouth	Perennial ryegrass	Slit drain/sand carpet	None	Pitch was originally slit drained/sand carpeted in the mid-1990s; the pitch was re-surfaced with a new sand carpet and slit drains in the summer of 2009/2010
McLean Park	Napier	Perennial ryegrass	Slit drain/sand carpet	None	Pitch was originally slit drained/sand carpeted in the mid-1990s

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Rugby Union would probably be one of the toughest tests of a natural turf surface and a key requirement is for the surface to remain stable and safe for play – this in turn requires a mature root system to provide the necessary anchorage. Flying divots of turf and an unstable surface causing scrums to collapse and players to lose their footing generally make for poor media coverage as well as increase the risk of player injury. It is therefore with some satisfaction that all surfaces performed with distinction during this tournament, especially the intensely-used Eden Park and challenging Otago Stadium playing surfaces – a good news story for the New Zealand turf industry, but one which didn't feature in the national headlines of course because there was no bad news story to report!

Fig 4. Otago/Forsyth Barr Stadium, Dunedin – a reinforced natural turf surface under a permanent ETFE roof – completed only a few weeks before the Rugby World Cup.

Tropical Grassland Society Wound Up

by Don Loch
The University of Queensland, Australia

The winding up of the Tropical Grassland Society of Australia (TGSA) in December 2010 after less than 50 years in existence serves as a salutary reminder of how areas of scientific activity can wax and wane quite quickly.

The Society was officially formed in 1963 to promote the practical application of research information on pasture management and improvement in tropical and sub-tropical environments. This was an exciting era when the knowledge and application of tropical pasture science were expanding rapidly across northern Australia driven by research and extension conducted by growing numbers of scientists in CSIRO, state departments of agriculture, and universities. In this scenario, the TGSA through its newsletter and its regular and well-attended field meetings provided an important forum for interaction between graziers and scientists. Allied to this, the Society's journal, Tropical Grasslands (started in 1967), provided a medium for the publication of research results that had a practical focus.

The TGSA membership covered wide interests across the many aspects of tropical grasslands, including primary producers, private companies and government research and extension personnel in Australia and from overseas. However, as research activities dwindled through lack of industry and public funding and as many of the scientists originally involved retired without replacement during the 1990s and 2000s, membership declined and it became apparent that the Society no longer had the continuity of younger office bearers to remain viable, hence the decision to wind up the TGSA in December 2010.

Nevertheless, TGSA's legacy continues through the 44 volumes of Tropical Grasslands journal now archived and freely available on the web (through http://www.tropicalgrasslands.asn.au/). These contain more than 1000 research and review papers, conference proceedings, cultivar descriptions and book reviews by authors from Australia and 54 other countries. While the majority of these will be of interest only to forage researchers, there are quite a few publications of direct and indirect relevance to turf researchers, including papers on dual-purpose turf species (e.g. *Axonopus fissifolius, Cynodon dactylon, Eremochloa ophiuroides, Paspalum notatum, Pennisetum clandestinum, Zoysia* spp.) and turf book reviews. We are currently working with the Turfgrass Information Center (TIC) to ensure that any such papers of interest are abstracted and made more readily available to turf researchers through the TIC's database.

DESCRIPTION OF SPONSORSHIP OPPORTUNITIES

The International Turfgrass Society (ITS) is a not-for-profit, non-commercial organisation that exists for charitable, educational and scientific purposes for the advancement of turfgrass science. International Turfgrass Research Conferences (ITRCs) are organised on behalf of the ITS for the dissemination of results of independent, scientific turfgrass research trials and case studies around the world. Papers presented at the conference are subject to independent peer review by an international community of turfgrass researchers for scientific, technical and intellectual content. Sponsorship packages are now being made available to the commercial sector as an opportunity to show support for the ITRCs.

The 12th International Turfgrass Research Conference is being organized by the Beijing Forestry University and will be held in Beijing, the capital of the People's Republic of China from 14-19 July 2013.

We invite you to become a sponsor for this exciting international conference. This conference will provide an opportunity to showcase your company to conference attendees. The conference will bring together researchers, technical experts, consultants, high level turfgrass managers, top industry delegates and government officials.

- 500 to 750 expected participants from 21 countries
- International attendees from all continents : Africa, North and South America, Asia, Australia, and Europe
- A perfect mix of academic and company delegates
- Printed proceedings available at the start of the event
- Excellent press and newsletter coverage
- A who's who of the International Experts from throughout the turfgrass world

Meet your current and future colleagues, partners, and customers face to face at one of the largest and most comprehensive gathering of turfgrass professionals in the world.

Position your organization as a leader by becoming a conference sponsor today!

Don't miss out on the #1 marketing
and networking opportunity
for the International turfgrass research community
and industry in 2013!

Click here to obtain a pdf copy of
the sponsorship opportunities

SPONSORSHIP PACKAGES

The following sponsorship opportunities are available for the 12th International Turfgrass Research Conference in Beijing, China:

A) GRAND MAJOR SPONSOR: US $ 25,000 (excluding taxes and duties, if any)
This is the premier sponsorship opportunity for the conference and is limited to just 1 sponsor. As the Grand Sponsor, your company will receive the following special recognition:

- Your company logo on the Conference Website Homepage as the Leading Conference Sponsor (*)
- Your company logo on all Conference Registration Panels (*)
- Your company logo on the Conference Entry Panel to all Education Sessions(*)
- Logo listed on the Conference Entry Panel to the Poster Session as a major sponsor (*)
- Your company logo on the Conference Proceedings identified as the Leading Sponsor (*)
- Opportunity to present a 3 minute company movie at the opening session of the Conference
- Conference bag handed to all attendees with your company logo on the outside of the bag
- Your company leaflets, CD-ROM and other informational material in the conference bag
- Free conference attendance for up to three delegates (inc. registration and conference banquet)

B) MAJOR SPONSOR: US $ 15,000 (excluding taxes and duties, if any)
This is one of the top sponsorship opportunities and is limited to just 5 sponsors. As a Major Sponsor, your company will receive the following special recognition:

- Your company logo on the Conference Website Homepage recognized as a Major Conference Sponsor (*)
- Your company logo on all Conference Registration Panels (*)
- Logo listed on the Conference Entry Panel to the Poster Session as a major sponsor (*)
- Your company logo on the Conference Proceedings identified as a Major Sponsor (*)
- Opportunity to present a 1 minute company movie at the opening session of the Conference
- Conference bag handed to all attendees with your company leaflets, CD-ROM and other informational material in the conference bag
- Free conference attendance for up to two delegates (including registration and conference banquet)

C) CONTRIBUTING SPONSOR: US $ 10,000 (excluding taxes and duties, if any)
This sponsorship opportunity is limited to just 10 sponsors. As a Contributing Sponsor, your company will receive the following special recognition:

- Your company logo on the Conference Website Homepage as a Contributing Sponsor (*)
- Your company logo on all Conference Registration Panels (*)
- Logo listed on the Conference Entry Panel to the Poster Session as a Contributing sponsor (*)
- Your company name on the Conference Proceedings identified as a Contributing Sponsor (*)
- Conference bag handed to all attendees with one leaflet from your company in the conference bag
- Free conference attendance for 1 delegate (including registration and conference banquet)

D) ADDITIONAL EXCLUSIVE SPONSOR OPPORTUNITIES:

1) ID CARDS - US $ 5,000 (excluding taxes and duties, if any)
Exclusive sponsor information on the back of all attendee ID cards

2) DINNER Sponsor - US $ 5,000(excluding taxes and duties, if any for each dinner.)
This sponsorship opportunity is for one of the two gala dinners' and limited to just 2 sponsors.
As a Dinner Sponsor, your company will receive the following special recognition:
- Your Company Logo will be placed on the dinner menu.
- Each table will also have a mini table-stand-flag with your logo next to the ITRC Conference Flag.

3) SESSION SPONSOR - US $ 5,000 (excluding taxes and duties, if any)
This sponsorship opportunity is limited to the numbers of sessions.
- As a Session Sponsor, your company name and logo will be placed at the entrance to and all signage for the sponsored session.

4) STUDENT SPONSOR - US $ 2,000 per student (excluding taxes and duties, if any)
Sponsor a Student at the ITRC and help support a future leader in the turfgrass industry!
Each sponsorship will pay for a student's travel to the Conference, registration for the meetings, and their ITS Student Membership.
Many students cannot afford the expense of attending an ITRC meeting. With your support, a deserving student(s) will be able to experience the outstanding benefits associated with attending the ITRC in Beijing.
- Your company will be recognized on a special conference panel at the registration area indicating your company name and the number of students supported.

5) BUS SPONSOR - US $ 2,000 (excluding taxes and duties, if any)
This sponsorship opportunity is limited to the number of bus tour groups and will be valid for the all-day technical tours
- As a Bus Sponsor, your company name and logo will be placed on the bus entrance and all signage relating to the all-day Technical Tours.

6) IMAGE CALENDAR - US $ 1,500 (excluding taxes and duties, if any)
This is a calendar with 12 pages (one for each month) with interesting pictures of turf applications.
One sponsor per month (= 12 sponsors).
The turf related image for each month is to be provided by each sponsor.
- Your company's logo will be included on the page of the month selected by the ITRC Committee

7) GIVE AWAYS - US $ 500 plus cost of the item (excluding taxes and duties, if any)
Greenkeepers CAP or a woolly HAT, pencils etc in specific quantity:
offered and produced with ITRC 2013 Logo and Logo of sponsoring institution or corporation.

SPONSORSHIP TERMS AND CONDITIONS

Payment conditions: Payments must be made by bank transfer in US dollars or local currency, including tax. Sponsorship payment must be received within 30 days of receipt of application acceptance unless other arrangements are made in advance with the ITS Treasurer.

Sponsorship acceptance: The Local Organizing Committee of the 12th ITRC in consultation with the ITS reserves the right to refuse a company's sponsorship application after evaluation of the relevancy of the applying company's core business to the conference's topics and objectives.

(*) Exact logo dimensions will be defined in accordance to panel, posters and display size and will depend largely on graphic requirements.

Invoicing:
Conference sponsorship will be invoiced in full by:

International Turfgrass Society
Dr. John Cisar
c/o University of Florida,
FLREC, 3205 College Avenue,
Fort Lauderdale, FL 33314-7799
USA

or

Beijing Forestry University
No. 35, Qinghua East Road
Haidian District, Beijing 100083
P.R. China

Cancellation policy: A cancellation fee of US $500 will be applied to all sponsor packages cancelled 60 days or more prior the conference. No refunds will be issued after 60 days prior to the conference. All cancellations must be in writing.

Enquiries and applications:
For all sponsorship applications, please fill in the attached form and send by fax or e-mail to:

International Turfgrass Society
Dr. John Cisar
c/o University of Florida, FLREC
3205 College Avenue,
Fort Lauderdale, FL 33314-7799
USA
Tel: +1- 954-577 6336
Fax: +1-954-475 4125

E-mail: John Cisar (ITS treasurer): jlci@ufl.edu
Han Liebao (ITRC org. committee 2013): hanliebao@163.com

SPONSORSHIP APPLICATION FORM

(please fill in and fax to +86 10 62322089 or email to itrc2013@163.com)

Company name:

_____

Company address:

_____

Country:

_____

Telephone: _____, Fax: _____

E-mail: _____, Website: _____

Company's core business(es):

_____

Company contact person:

_____

☐ We have read the "Sponsorship Package Proposal" you have sent to us.

☐ We agree with all the terms described in the "Sponsorship Package Proposal" and "Sponsorship Terms and Conditions"

We would like to participate to the 12th International Turfgrass Research Conference as:

☐	**Grand Major sponsor:**	US $ 25,000,- ex taxes and duties
☐	**Major sponsor:**	US $ 15,000,- ex taxes and duties
☐	**Contributing Sponsor:**	US $ 10,000,- ex taxes and duties
☐	**Additional Sponsor Package:**	_____

Please confirm the acceptance of your company's sponsorship application by sending:

1. Written confirmation of sponsorship application acceptance on your company's letterhead;
   Sponsorship contract signed by accompany representative and returned to:
   Dr. John Cisar
   C/o University of Florida,
   FLREC 3205 College Avenue,
   Fort Lauderdale, FL 33314-7799
   USA
2. Bank account details for sponsorship funds transfer.

Date: _____

Company's representative signature and business stamp:_____

The Opening of Seminar on Sino-Japan Golf Course Construction, Management and Golf Tourism Forum was held

by Han Liebao
Institute of Turfgrass Science
Beijing Forestry University

Golfing and the golfing industry started to develop in China less than 30 years ago. With the rapid social and economic development, the Chinese golf industry has become a rising star not only within Asia but also in the world. However, there is still a huge gap between the Chinese golf industry and those in the developed countries, which provides tremendous room for the development of the Chinese golf industry. The golf industry in Japan has a history of more than 100 years. Japan is experienced in the development and management of the golf industry and has a profound understanding and unique management experiences towards the relationship between the golf industry and national economy and social development.

To better learn from the experiences of the Japanese golf industry, further develop the Chinese golf industry, and to advance communication and exchange between professionals in the golf industry in the two countries, the seminar of Sino-Japan Golf Course Construction, Management and Golf Tourism Forum was held from January 17 to 19, 2012 at the May Flower Golf Club in Hainan province of China. Distinguished guests invited to the forum included Professor Han Liebao, President of International Turfgrass Society, Director of Course Committee of China Golf Association, Director of Golf Education and Research Center of Beijing Forestry University, and Professor Masaru Ogasawara from Utsunomiya University, incoming President of Japanese Society of Turfgrass Science, and Mr. Takao Yamada, Vice President of Japanese Society of Turfgrass Science, President of Golf Course Branch of Japanese Society of Turfgrass Science, and Mr. Tetsuya Ono, General Manager of the famous Japanese tourist golf course, Kansai Karuizawa Golf Club, and other experts and scholars of golf course construction and turfgrass management and leaders in the golf industry of the two countries.

Subjects on golf course construction and management in China, Japan, and other Asian areas were discussed during the forum and it was agreed that the Asia Turfgrass Society and an international institution of golf course construction and turfgrass management should be established. Also, the guests exchanged their opinions about opening the Japanese tourist source market for the Hainan tourist golf resort.

This forum was the first official communication and exchange between the seniors of golf industry in China and Japan during the past decades. In the future, academic exchanges like this will be continued which will improve to a great extent the golf course construction and management level in both China and Japan and in other areas of Asia.

Professor Han Liebao, Beijing Forestry University providing an address for the seminar.

ITS Board Calling for Host of the 2021 ITRC

The ITS Board is calling for expressions of interest to host the 2021 ITRC. The Board tries to plan two conferences in advance. The requirements for hosting an ITRC are articulated in the bylaws as follows:

Section 5.13 Quadrennial Meeting Host Country Designation

The Board of Directors shall hear a formal in-person presentation from candidate host countries offering to host a future International Turfgrass Research Conference, not less than two (2) days prior to the quadrennial meeting of Members. The presentation shall be supported by a minimum of two (2) Members, each of at least four (4) years as Members in good standing. Presenters shall be required to supply written evidence of logistical support in the form of a letter of invitation from a relevant educational or research facility guaranteeing secretarial and editorial services for the production of the International Turfgrass Society Research Journal. Further, the presenters shall also supply letters of acceptance from the local proposed scientific review body responsible for assembling the proposed conference program, of which at least two (2) shall be from scientists or advisors actively working in the turfgrass industry. Candidate host countries meeting the required criteria shall then be invited to repeat their presentation to Members at the quadrennial meeting of Members whereupon a vote shall be taken by Members to select the next host country.

If you would like to register an interest, please contact Dr. James Murphy at murphy@aesop.rutgers.edu

Aerial Robotics offers Unique Perspective on Turf Research

by Scott Dworak, turfgrass science doctoral student and
Keenan Amundsen, assistant professor of turfgrass genetics
University of Nebraska-Lincoln, Lincoln, NE, United States

New technology is providing turf researchers a unique perspective. At the University of Nebraska-Lincoln, researchers are combining aerial robotics with turfgrass science to make research easier, faster, and more affordable.

Keenan Amundsen, assistant professor of turfgrass genetics in the Department of Agronomy & Horticulture, and Scott Dworak, a turfgrass science doctoral student, are using a robotic helicopter to collect imagery of their turf plots. The robotic helicopter, about the size of a large pizza, was developed by Vishal Singh, assistant professor of practice and senior instructional multimedia designer in UNL's Department of Agriculture Leadership, Education, and Communication, through his company, Pixobot. Outfitted with a video camera and GPS, the helicopter technology allows convenient imaging of large areas quickly, which saves time and money. In addition, imaging plots of an entire study with a single aerial shot eliminates variables such as sunlight, changing cloud conditions, and rating fatigue.

Until now, the UNL turfgrass science team has struggled with aerial imagery. Attempts were first made with 6-m long helium-filled blimp with remote-controlled cameras attached. It became cumbersome,

Scott Dworak's linear irrigation gradient irrigation system (LGIS) at the Agricultural Research and Development Center near Mead, NE, as imaged with a robotic helicopter.

though, as even gentle winds made for unstable image capture. Subsequent attempts with GPS-controlled autonomous aircraft were used, but occasional image blur problems occurred due to high speed of the aircraft. The robotic helicopter offers a lot more

Continued on next page

Nearly 1,800 successions were imaged of Keenan Amundsen's turfgrass research. Using a robotic helicopter for aerial crop scouting saves time and produces high-quality images for research.

stability and takes static pictures that produce high-quality images.

Turfgrass imagery can provide information on many aspects of turf quality, including performance during drought and other stresses. The robotic helicopter is outfitted with a digital camera and one modified to detect near-infrared light. Near-infrared detection offers an alternate method of evaluation, as turf stress can be visible in the infrared prior to the appearance of visual symptoms. Combinations of imagery from both cameras provide normalized difference vegetation indices (NDVI) and other remotely sensed data. Addition of a thermal infrared camera is also in the works, adding additional stress-detection capabilities.

Dworak is using the aerial robotics to study drought stress. Under a linear irrigation gradient (LGIS) system, Dworak is studying effects of deficit irrigation on quality and function of nearly 30 turf species and cultivars. Without aerial robotics, it would take 960 individual images to evaluate plots, taking a significant amount of time. The robotic helicopter can achieve the same task by capturing the entire area in a single image in just a few minutes.

Amundsen is using aerial robotics in his buffalograss breeding program. The buffalograss germplasm collection at the University of Nebraska consists of more than 1,800 entries. Factors important for buffalograss improvement such as density, color, stress tolerance, and timing of winter dormancy are easily detected in images. The robotic helicopter can capture data for these traits on the entire germplasm collection in a few images, a task that previously took several days. The use of aerial robotics accelerates phenotyping and greatly improves the efficiency of turfgrass breeding.

Native-invasive plant issues by Dr. James B. Beard

submitted by James Murphy
Rutgers University
Dept of Plant Biology and Pathology

An important paper concerning the native-invasive plant issues being promoted has been published by Dr. James B. Beard. It documents recent science-based changes in the dating and biogeographical analyses of grass migration, including the fine-leaf fescues. This may be of interest to your national and regional turfgrass leaders and government decision makers. The article can be viewed at http://agbioresearch.msu.edu/pdf/SE-132%20Turfgrass-12-8-11.pdf Feel free to share.

Also:

Dr. James B. Beard received the European Turfgrass Society Award for significant contributions to the development of Turfgrass Science in Europe presented by ETS President Marco Volterrani on November 23, 2011 at Pisa University, Italy.

Correction to last article about ITS Website has a new home

In the last Newsletter, we mentioned that ITS members have free access to the Michigan State University TGIF (Turfgrass Information File), but the free access is only to the ITS members section of TGIF. Specifically, "ITS members have access to these pages, which provides access to the ITS Research Journal and Proceedings online at Michigan State University Turfgrass Information Center where authors have given such permission."

Turf News from Germany

by Wolfgang Praemassing,
DEULA Rheinland Bildungszentrum, Kempen, Germany,

One Thousand Greenkeepers Certified by DEULA Rheinland

In December 2011, DEULA Rheinland and Chamber of Agriculture Nordrhein-Westfalen approved their one thousandth certified golf course Greenkeeper after more than 20 years of Educating Greenkeeping Professionals in Germany. Three days before Christmas it was a big surprise for Thomas Lepping to be honoured as the one thousandth recipient. For the 48 –year old head gardener this advanced vocational training certificate means a lot to him for his career in golf course greenkeeping and paved the way to the position as Head-Greenkeeper at the Golf & Country Club Ahaus/Germany.

Further education as it is applied in greenkeeping at DEULA Rheinland is based on regulations by the Chamber of Agriculture Nordrhein-Westfalen, which establishes content, aim, requirements, procedure and admission conditions for further training and examinations in line with the demands of the Vocational Training Committee and with the promoting organisations. The further vocational education in golf course maintenance takes place within a framework designed to order qualifications in such a way that all forms of progression which develop the individuals competence from basic to supervisory knowledge in employment are encouraged.

Thomas Lepping and his fellow students completed three courses (block release, in total 10 weeks) held during a period of two years in the winter season, except one practice week in summer. In addition the participants have to pass at least two practice seasons on the golf course in practical golf course maintenance. Between the three courses, participants have to work out correspondence training units.

Johannes Frizen, President of Chamber of Agriculture (right) and 1000. Certified Golf Course Greenkeeper Thomas Lepping (left).

Thomas Lepping (left) and two fellow students, Katja Lehman (middle) and Roman Vierhaus (right) with best exams.

In the final exam candidates have to prove their knowledge in three sections:

1. Golf course, the place of sportive activities as well as the place of incorporating landscape architectural elements
Requirements as well as ecological and legal subject matters, turfgrass science and soil science.
2. Golf course maintenance
Turfgrass culture, operation and maintenance of technical equipment, pesticide application.
3. Golf course supervisory/management
Organizing, planning capital and equipment and guide personnel, teamwork, communication, preparation of tournaments.

Candidates passing the exams successfully obtain the Chamber Certificate in Golf Course Greenkeeping (Certified Greenkeeper). Johannes Frizen, President of Chamber of Agriculture Nordrhein-Westfalen handed the certificates over during a ceremony and appreciated in his speech the efforts of all successful candidates and encouraged them not to stand still but to further their learning and development in their career and responsibility on the golf course and its environment.

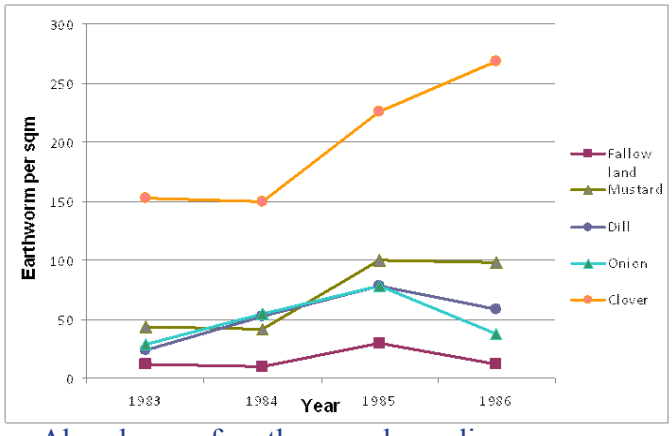
Research Projects of the Rasen-Fachstelle Hohenheim, University of Hohenheim

by Wolfgang Praemassing,
DEULA Rheinland Bildungszentrum, Kempen, Germany,

Aside from the turf variety testing for the Bundessortenamt, two main projects have been realised at the Rasen-Fachstelle Hohenheim during 2011:

- a literature review about earthworms and their castings on golf courses throughout Germany, and
- a field trial evaluation of turf seed mixtures for lawns.

Golf ball beside an earthworm casting (Hohenheim, Oct. 2011)



Abundance of earthworm depending on crops (Westernacher-Dotzler, 1988)

Plenty of research abstracts can be found about managing the problems occurring with earthworm on golf courses, but not all of the ideas can be realised due to legal restrictions in Germany. The aim of the study was firstly to identify the species which are mainly producing the castings and secondly to search for relevant methods to reduce earthworm activity of the relevant species on the surface, and therefore the castings, too, without killing the worms.

In middle Europe *Lumbricus terrestris* is mainly causing the problems with castings. During the literature study it was found that mechanical maintenance can be helpful, but is not solving the problem at all. Some researches found that acid fertilisers may reduce surface activity of earthworms, as well as surfactants which reduce surface humidity. Mustard, pepper, onion and garlic are plants which reduce earthworms in the soil and lead to reduced castings.

Based on the results of the literature study an experimental design for a field trial was developed using different agents to reduce surface castings from earthworms. The field trial is planned for spring 2012.

Nearly every do-it-yourself store offers a range of turfgrass seed mixtures with big differences in price and quality. During a field trial 15 different mixtures have been sown and the lawns evaluated by optical aspects and therefore their suitability for home lawns. Additionally the mixtures have been proved by blending the single varieties in the contents of the labels, seeding the blends directly alongside the original mixtures.

During the first year only minor variations have been found between the originals and the blends, showing that the labels seem to be correct. The quality range between the mixtures was enormous with specially low price mixtures, containing high amounts of agricultural grass species

Field trial for DIS-store lawn mixtures (Hohenheim, Jan. 2012)

Continued on next page

and varieties, leading to high mass growth and less sward density, and mainly light green colour. Medium priced mixtures contained mainly turfgrass varieties, but showed often patchy proportion of the different grasses, leading to uneven growth and a patchy coloured sward, whereas expensive mixtures mainly contain high performance grasses and therefore showed mainly very good aspects. But, none of the mixtures was in accordance with the German Regel-Saatgut-Mischung (recommended list of turf mixtures).

Quite clearly visible quality differences between budget price lawn mixture with uneven mass growth an bright colour (left) and high quality lawn mixture showing a uniform sward (Hohenheim, Jan. 2012)

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The deadline for submissions for the next newsletter is August 15, 2012