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TPI was the first to break the story in *Athletic Turf News* (Click here to see article)

Flawed Turfgrass Research Report Gets Mass Media Attention . . . Now What?



TPI's column featured in *Athletic Turf News* in early February, (initially drafted on January 31 and revised Feb 10) was the first article to go public and break the story regarding the controversial study about turfgrass and carbon sequestration that was released to the media by the University of California (Irvine). The study in question (containing acknowledged miscalculations after its release) got extensive media coverage because of the negative conclusions it presented.

According to Amy Townsend-Small, Earth System Science post-doctoral researcher at University of California (Irvine) and the lead author of a study that was accepted for publication in *Geophysical Research Letters*, a journal of the American Geophysical Union (AGU) it was suggested that the carbon-storing benefits of lawns were counteracted by fuel consumption.

Turfgrass provides numerous environmental benefits and its ability to store carbon is just one of them.

When a recently published and peer reviewed research study regarding the ability of turfgrass to store carbon reached the opposite conclusion of previous studies, more than a few turfgrass researchers and green industry experts were scratching their heads and asking why?

Focusing on four parks and lawns in Southern California, the Townsend-Small/Czimczik study found that greenhouse gas emissions from fertilizer production, mowing, leaf blowing and other lawn management practices were four times greater than the amount of carbon stored by grass in parks and lawns.

The UCI study was supported by the Kearney Foundation of Soil Science and the U.S. Department of Agriculture.

The reported conclusion reached by the Townsend-Small/Czimczik study was fundamentally the opposite of previous research findings regarding carbon sequestration in turfgrass and the amount of carbon resulting from the care and maintenance of turfgrass.

The study generated plenty of press coverage by way of the American Geophysical Union (AGU) and a press release distributed by the University of California (Irvine).

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Flawed Turfgrass Research Report Gets Mass Media Attention . . . Now What? (Cont'd from Page 1)

Publications and websites such as *USA Today*, *National Geographic's Green Guide*, *Science Daily*, *China Meteorological Administration (CMA)*, *First Science*, *Discovery News*, *Yahoo News India*, and just about every science publication, newspaper, green industry website and various blogs carried assorted headlines that read:

"Urban Green Space May Aid Global Warming"
"Green Spaces (Lawns) Are Not So Green"
"Urban Lawns Contribute to Climate Change"
"The Grass Isn't Always Greener"
"Pollution From Keeping Lawns"

There was only one problem: The authors of the Townsend-Small/Czimczik research report later acknowledged their study contained errors and miscalculations.

So how did the errors in the study come to the surface? Dr. Thomas Rufty, Bayer Distinguished Professor, Environmental Plant Biology, North Carolina State University questioned the findings based on previous research models and proceeded to point out several discrepancies in the Townsend-Small research report.

Rufty commented, "Regarding 'Carbon sequestration and greenhouse gas emissions in urban turf' by Townsend-Small and Czimczik, we suspected an error in calculations because their numbers were so different from the models we are developing." Rufty was challenged to find out why there was a discrepancy. He reported that two of his Ph.D. students took apart all of the assumptions and calculations in the Townsend-Small paper and found mistakes. When asked to provide a complete analysis of the situation they immediately presented their findings which he reviewed and confirmed errors had been made.

Rufty then emailed the authors and they confirmed there was a mistake in their spreadsheet that no one had caught during the writing or peer review. The authors said 'someone' had informed them of the mistake and a correction was sent to the journal. Their corrected calculations showed that CO₂ generation was 122 g m⁻² yr⁻¹ rather than 1238 g m⁻² yr⁻¹ in the paper.

"This is important, because it makes the situation with 'ornamental lawns' carbon neutral to positive, depending on some of their other assumptions about fertilization. The students also argued that the authors made another mistake that will result in decreasing the estimated CO₂ further – they did not take into account C speciation during combus-

tion. Depending on the kind of mowers used, this will lower levels by another 15 to 50%," according to Rufty.

He added, "The Townsend-Small and Czimczik paper is being viewed as an important publication for the carbon sequestration debate. I'm hoping our efforts will help correct this misperception."

The flawed research has received broad distribution worldwide and as of this writing (2/23/10) is still posted on the three University of California websites despite requests from Turfgrass Producers International (TPI), National Turfgrass Federation (NTF), USGA Green Section Research, National Turfgrass Evaluation Program (NTEP) and others to have it removed until the corrected information is peer reviewed and approved.



Photoshop image: Jim Novak

The question now is, how do you get the same media coverage for the corrected version of the research report which shows that turfgrass has a positive impact on the environment when it comes to carbon sequestration?

Such a challenge is like getting the genie back in the lamp . . . or trying to get **spilled coffee back in a cup.**

The Outdoor Power Equipment Institute (OPEI)

OPEI responds to the Amy Townsend-Small "Carbon Sequestration and Greenhouse Gas Emissions in Urban Turf" research results released to the media.

Carbon sequestration benefits of turfgrass reaffirmed

"With the error corrected, ornamental grass is in fact shown to be a net sequester of carbon even when inputs are accounted for in grass maintenance."

ALEXANDRIA, VA — The [Outdoor Power Equipment Institute](#) (OPEI) announced that Dr. Amy Townsend-Small of University of California – Irvine (UC – Irvine) acknowledged a computation error of carbon used to maintain turf in the recently released UC-Irvine study published Jan. 19, 2010, titled "Carbon Sequestration and Greenhouse Gas Emissions in Urban Turf."

With the error corrected, ornamental grass is in fact shown to be a net sequester of carbon even when inputs are accounted for in grass maintenance. The correction has been submitted to the [American Geophysical Union](#) (AGU) who published the paper.

Upon review of the report, various flaws were discovered, including one significant math error that was made in computing the carbon consumed during mowing, said a news release from the OPEI. The carbon from fuel consumption was multiplied by 12, one too many times, to convert from monthly to annual data. The error was not caught during the peer review process prior to publication of the paper by the AGU.

When the computation is corrected, turfgrass actually is a net sequester of carbon dioxide, reversing the conclusions of the original report that was widely reported in the media. "Blaming grass for contributing to global warming is a non-starter when you look at the facts. The grass in your backyard is working hard to keep us cool, soak up carbon, capture particulates, produce

oxygen, capture rain water and reduce run-off. We need to focus on the right plant in the right place and on management practices that maximize the environmental benefits potential of turfgrass," said Kris Kiser, Executive Vice President of OPEI.

Kiser added that, "While the UC-Irvine study, rightly so, highlights that mismanagement of turfgrass can occur via excessive fertilization and irrigation, and inefficient maintenance practices, the focus should be on proper management techniques."

OPEI stressed that proper management techniques can minimize carbon emissions and maximize the benefits of carbon sequestration in turfgrass; for example, proper selection of turf based on climatic region (drought resistant species) and leaving grass clippings on the grass to serve as a natural nitrogen fertilizer.

OPEI also noted that the UC-Irvine study did not acknowledge the dramatic reductions of emissions and fuel use profile for today's gasoline and diesel equipment, nor did the study disclose what model equipment and corresponding fuel use numbers were used.

Mowers and outdoor power equipment today are the cleanest in history and fully regulated by the U.S. EPA and California's Air Resources Board since 1997. EPA Phase 3 and CA Tier 3 compliant product are 90 percent cleaner than pre 1997 models. Coupled with improvements in emissions, there have been substantial improvements in mower fuel efficiency. Additionally, outdoor power equipment manufacturers have introduced a number of electric, battery, biodiesel, gasoline-electric and diesel-

electric hybrids, propane, CNG, solar and other alternative fueled products with corresponding reductions in carbon output.

According to the OPEI, other issues found with the UC-Irvine urban turf study:

- The paper uses a technique (passive flux chambers) that is often inaccurate in measuring surface flux because it is not clear that what is being measured is at equilibrium.
- The UC-Irvine study focused on one urban center in Southern California. Management techniques across the country are variable and therefore, can't be applied broadly. Future studies should look at sites in other parts of the country.
- The UC-Irvine study did not measure actual inputs of water and nutrition but made estimates based upon standards or agriculture averages. Future studies should measure actual inputs or use the best available technology to estimate inputs of water and fertilization.

To learn more about the carbon sequestration benefits of turfgrass access the article ["Technical Assessment of the Carbon Sequestration Potential of Managed Turfgrass in the United States"](#) by Dr. Ranajit (Ron) Sahu



TORO responds to the Amy Townsend-Small "Carbon Sequestration and Greenhouse Gas Emissions in Urban Turf" research results.

"Corrected" UC-Irvine Study Shows Turfgrass to be Positive Sequester of Carbon

"As the corrected UC-Irvine study points out, turf can be a net sink for atmospheric carbon and can, therefore, help reduce greenhouse gas emissions. Turfgrass can be part of the solution."

BLOOMINGTON, Minn. - (Business Wire) Scientists from the Department of Earth System Science at the University of California – Irvine recently published a paper in the journal **Geophysical Research Letters** on January 22, 2010 titled, "Carbon Sequestration and Greenhouse Gas Emissions in Urban Turf." This study adds significantly to the body of knowledge documenting the carbon benefits of turfgrass.

Upon initial release, the UC-Irvine paper was carefully studied by scientists in The Toro Company's Center for Advanced Turf Technology (CATT) and its conclusions were recognized as inconsistent with research conducted by the company. In particular, the CO₂ emissions reported for fuel use by turf maintenance equipment was an order of magnitude higher than work done by Toro's research team.

Upon recalculation, Toro scientists uncovered the math error made in computing the carbon produced as CO₂ during mowing. The error was missed during the peer review process prior to publication of the paper by the American Geophysical Union (AGU).

Toro scientists contacted Dr. Amy Townsend-Small, the lead author on the paper, with their research and observations back in late January. Appropriate changes have since been made and sent to the AGU for correction.

"With the error corrected, turfgrass is actually found to be a net positive sequester of carbon," said Dana Lonn, managing director of Toro's CATT group. "In other words, properly maintained turfgrass actually traps and utilizes carbon thus removing it from the atmosphere. We credit the authors for tackling a complex and comprehensive issue. Consistent with what we have found in working with leading research institutions, this study provides a solid foundation for future work. With further improvements in technology to increase efficiency and reduce fuel consumption, grass can become an even greater asset."

The objective of the UC-Irvine study was to comprehensively examine the balance between greenhouse gas emissions incurred in turf maintenance and carbon sequestered in the soil. It also highlights the importance of optimizing the use of all resources in turf management including water, fuel, fertilizers and electricity to maximize the storage potential of plant-soil systems.

"Toro recognizes the importance of this issue for the environment and for the industry," Lonn added. "As the corrected UC-Irvine study points out, turf can be a net sink for atmospheric carbon and can, therefore, help reduce greenhouse gas emissions. Turfgrass can be part of the solution."

THE BACKSTORY — Putting out a fire!

How **Turfgrass Producers International (TPI)** collaborated with other green industry associations, organizations, companies, turfgrass extension specialists, turfgrass research scientists and others to respond swiftly to the University of California (Irvine) research study is in itself an interesting story.

The following time-line provides insight into an unparalleled collaborative effort. Although this information is not all inclusive (for reasons of privileged information) it provides an interesting overview of how events escalated between January 19 through February 26, 2010.

Jan 19, 2010 — University of California (Irvine) and American Geophysical Union (AGU) post and circulate a joint press release based on a research study conducted by Dr. Amy Townsend-Small and colleague Claudia Czimczik titled, "Carbon Sequestration and Greenhouse Gas Emissions in Urban Turf" (see below).

AGU Release No. 10-02

19 January 2010

For Immediate Release

Urban 'green' spaces may contribute to global warming, UCI study finds
TURFGRASS MANAGEMENT CAN CREATE MORE GREENHOUSE GAS THAN PLANTS REMOVE FROM ATMOSPHERE

The UCI study was supported by the Kearney Foundation of Soil Science and the U.S. Department of Agriculture. The release quotes Townsend-Small as stating, "It's unlikely for these lawns to act as net greenhouse gas sinks because too much energy is used to maintain them."

Jan 19 - USA Today.com reports: (based on Townsend-Small press release)

Urban "green" spaces not so environmentally friendly. Within 48 hours similar stories are carried by the media and begin to appear worldwide.

<http://content.usatoday.com/communities/sciencefair/post/2010/01/620007120/1>

Jan 21 – TPI and other National Turfgrass Federation members become aware USA Today report and the Townsend-Small study.

Jan 22 - Geophysical Research Letters (GRL) Officially Publishes **TOWNSEND-SMALL AND CZIMCZIK: GLOBAL WARMING POTENTIAL OF LAWNS — GEOPHYSICAL RESEARCH LETTERS, VOL. 37, L02707, doi:10.1029/2009GL041675, 2010**

Jan 27 – Dr. Van Cline (TORO) send emails to Dr. Townsend-Small suggesting possible miscalculations in research report. (TPI becomes aware of this on February 17th from a third party but could not get a confirmation from TORO until Monday February 22nd).

Jan 28 - TPI learns that Dr. Thomas Rufty, Bayer Distinguished Professor, Environmental Plant Biology, North Carolina State University reports that he cannot comment on the Townsend-Small "ground breaking" paper, because he suspects errors in their calculations. As a professional courtesy, he plans to send an email to the authors to find out exactly how they got the numbers for CO² generation.

– Prior to departing for the TPI Midwinter Conference and in an effort to get media coverage on conflicting turfgrass carbon sequestration research studies. TPI drafts a column for *Athletic Turf News* titled, "**When it comes to natural turfgrass and carbon sequestration do we really know the FACTS?**" The article addresses the conflicting research results between the Dr. Ranajit (Ron) Sahu and Townsend-Small studies.

Jan 29 – Dr. Townsend-Small receives a follow-up to e-mail of the 27th from Dr. Cline to discuss miscalculations. TPI learns that Townsend-Small expresses her appreciation for bringing the matter to her attention.

– TPI learns (on February 1) that Dr. Thomas Rufty sent an email to Dr. Townsend-Small on January 29 addressing miscalculations in the research report over the signature of Laura Vance, Ph.D. student, crop science North Carolina University working with Dr. Rufty in collaboration with fellow Ph.D. student Shannon Sermons.

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THE BACKSTORY — Putting out a fire! (cont'd from page 5)

Feb 1 – Tom Delaney, Director of Government Affairs, Professional Landcare Network (PLANET) shares comments he received from Dr. Charles H. Peacock, Professor and Extension Turfgrass Specialist, Dept. of Crop Science, NC State University with TPI and other members of National Turfgrass Federation (NTF) in which Peacock comments “Serious errors in this one”, regarding the Townsend-Small study.

Feb 5 – **1 WEEK** after being notified of errors in their report the UCI Website remains unchanged.

Feb 8 – TPI requests permission to quote Dr. Thomas Ruffy’s comments on the Townsend-Small report in order to update the column that has already been submitted but not yet printed by *Athletic Turf News*.

Feb 10 – TPI drafts revision of *Athletic Turf News* article that includes UPDATE section titled, **“How do you get spilled coffee back in the cup?”** As a courtesy, TPI submits updated text to Dr. Ruffy for his approval. Ruffy responds immediately and approves the text. TPI submits the revised article to Ron Hall, Editor-in-Chief of *Athletic Turf News* and requests he consider printing the updated story in its entirety. Hall agrees to carry the extended story as written and submitted and as a result of Ron’s cooperation TPI breaks the story with the article **“Flawed Turfgrass Research Report Gets Mass Media Attention . . . Now What?”**

TPI drafts a letter to Jennifer Fitzenberger - Media Contact *UCIrvine Today NEWS* requesting they remove their news release from their website until recalculations are completed, reviewed and approved. Fitzenberger acknowledges UCI is aware of the errors but states they will update their story as the appropriate changes have been accepted by the journal.

Feb 11 – TPI drafts a letter to Kevin Morris, Executive Director, National Turfgrass Evaluation Program and President, National Turfgrass Federation and others stating that amid such a controversy and an admission of errors on the part of the authors’ of the Townsend-Small study that the University of California (Irvine) should pull the existing news release from their website. Recipients are advised by TPI that UCI offered no explanation as to why they would not do so. TPI drafts a press release stating our position on the Townsend-Small research controversy and submits it to coalition members and others for their review. The press release is modified based on feedback and copies are sent to all those who have been involved in the reviewing process for distribution.

– Kevin Morris sends a follow-up email to Jennifer Fitzenberger at UCI requesting their incorrect news release be removed from their website. Morris receives a somewhat firm reply declining his request.

– TPI drafts a letter to all NTF coalition members and others stating UCI has, for whatever reason, declined requests from Turfgrass Producers International, the National Turfgrass Evaluation Program and the National Turfgrass Federation to remove the news item from their website.

– After seeing UCI’s response to both TPI and Kevin Morris, Dr. Mike Kenna, Director United States Golf Association Green Section sends an e-mail to Ms. Fitzenberger, assistant Media Relations Director at UCI stating in part, “... the research is flawed and the article needs to be removed. Today!”

NOTE: To our knowledge Dr. Kenna never received a response.

Feb 12 – **2 WEEKS** after being notified of errors in their report and repeated requests to remove misleading information the UCI website remains unchanged.

Feb 15 – Kris Kiser, Executive Vice President, Outdoor Power Equipment Institute, notifies TPI that the OPEI, “... In an effort to support and build upon TPI’s press statement on the Townsend-Small study”, issued a release of their own calling for public disclosure of the errors and corrections” in the study.

Feb 16 – TPI drafts a letter to University of California, President, Mark G. Yudof and UC Irvine Chancellor, Michael V. Drake over the signatures of **Kirk Hunter**, Executive Director, Turfgrass Producers International (TPI); **Kevin Morris**, Executive Director, National Turfgrass Evaluation Program (NTEP) and President, National Turfgrass Federation (NTF) and **Tom Delaney**, Director of Government Affairs, Professional Landcare Network (PLANET) and **Dr. Michael Kenna**, Director, United States Golf Association (USGA) Green Section. The letter requests that they “... please remove the misinformation from the UCI website immediately.”

NOTE: To our knowledge no response was ever received from President Yudof or Chancellor Drake.

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THE BACKSTORY — Putting out a fire! (cont'd from page 6)

Feb 17 – 3 WEEKS after being notified of errors in their report and repeated requests to remove misleading information from the UCI website it still remains unchanged.

– TPI receives a call from one of the world's leading turfgrass scientist informing us that the UCI press release has generated calls to him from throughout the United States, Japan, Australia and Canada. He commends TPI for responding so quickly.

– TPI learns that another Turfgrass Extension Specialist (unaware of all the events that have been put into motion) drafts letter to Townsend-Small/Czimczki and copies select UCI personnel regarding the extensive correspondence he has received on the research study from representatives of the green industry, turfgrass extension specialists and researchers on differences of opinions and the magnitude of the error. He receives a reply in which UCI stands by its conclusion although they regret the error. He is also advised that an updated press release is scheduled to be released on February 18th from UCI.

Feb 18 – TPI sends a letter to Turfgrass Producers International Advisors, The Lawn Institute Research Advisors and select turfgrass research scientists requesting they review all data and offer their comments. Documents included PDF's of the original report, the correction to miscalculations that was finally released and a partial assessment provided by The Lawn Institute that questions other particulars of the Townsend-Small/Czimczik report.

– **20 DAYS** after being notified of errors in their report the **University of California (Irvine)**, the **UCIrvine Today NEWS**, the **University of California UC Newsroom** and the **American Geophysical Union (AGU)** websites still remained unchanged.



Feb 19 thru 22 TPI sends out a follow-up release titled: *"FLAWED turfgrass research study gets mass media coverage ... now what?"* to the news media as well as all TPI members, green industry associations, turfgrass extension specialists, researchers, trade publications, etc., in an effort to bring attention to the questionable conclusions reached by the study that are now under further scrutiny for the methodology used.

Feb 22 - The TORO Company sends out a press release titled: *"Corrected" UC-Irvine Study Shows Turfgrass to be Positive Sequester of Carbon*".

More than **ONE MONTH** after being notified of miscalculations in their study, and acknowledging those errors, the websites of the University of California (Irvine), UCIrvine Today NEWS, the University of California UC Newsroom and the American Geophysical Union (AGU) remained unchanged and continued to feature the original press release of January 19, 2010 with known misinformation. As of **February 26** no rational explanation was ever provided to *Turfgrass Producers International*, the *National Turfgrass Federation* or the *USGA Green Section* by anyone associated with the University of California (Irvine) as to why they elected to disregard our requests.

As of this writing nearly two dozen leading turfgrass extension specialists, turfgrass researchers and green industry representatives from across the nation are currently reviewing the study and they have already indicated there are numerous concerns above and beyond miscalculations. Under independent and non-collaborated review they have reported they are not only questioning the methodology that was used, but the absence of critically important information. It is likely the authors can expect to receive numerous questions and valid concerns once these comments are reviewed and consolidated by *The Lawn Institute*. The authors as well as the University of California (Irvine) and the American Geophysical Union (AGU) can also anticipate a request to offer some valid explanations on the manner in which this entire matter was handled.

University of California

http://www.uci.edu/features/2010/01/feature_turfgrass_100119.php

UCIrvine Today NEWS

http://www.today.uci.edu/news/2010/01/nr_turfgrass_100119.php

University of California UC Newsroom

<http://www.universityofcalifornia.edu/news/article/22685>

American Geophysical Union (AGU)

http://www.agu.org/news/press/pr_archives/2010/2010-02.shtml

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TPI Turfgrass Forum A Great Way to Network With Other Turfgrass Professionals

If you would like to ask questions of your turfgrass industry peers, educators, suppliers or if you just want to bounce an idea off someone else, the new TPI *Turfgrass Forum* is the answer.

The *Turfgrass Forum* is an online discussion platform (for TPI members only) that allows turfgrass producers, as well as industry suppliers, manufacturers and educators to exchange ideas, find assistance, raise questions and discuss important issues.

The *Turfgrass Forum* has the following discussion topics:

- **Agronomy/Production**
- **Marketing/Office,**
- **Delivery/Installation**
- **TPI Association**
- **Other/Miscellaneous.**

Many members have already registered and started using the *Turfgrass Forum* and recent threads have addressed numerous issues, including different methods of employee compensation and whether producers charge deposit fees for their pallets; how to control *Poa annua* in cool season grasses; reducing fertilizer yet maintaining high quality sod; grub control solutions and more. Topics and content are sure to grow as more members register to use the Forum.

Once you are registered, you can indicate which topics you want to "watch." If you choose to "watch" a particular topic, you will be sent an email whenever there is new activity and information available on that subject.

During the 2010 TPI Midwinter Conference, TPI Executive Director **Kirk Hunter** demonstrated how easy it is to register for the Forum and post questions and/or comments online. "I was really glad to see Kirk's demonstration since I haven't been involved much in social media," says **David Millar**, president, Red Hen Turf Farm, New Carlisle, IN. "It was easy to do, especially after watching Kirk. I think the *Turfgrass Forum* is going to grow, especially with young producers."

You can access the *Turfgrass Forum* on the TPI website (www.TurfgrassSod.org) in the "Members Only" section under the "Community" tab. Register and start networking today!



Millar is thinking about starting a thread in the Forum to generate more discussion about production costs.

Dave Slater, Slater Turf Farm, Tryon, NC, who has participated in other online forums, recently registered on the *Turfgrass Forum* as well. "It looks like a great tool that producers can use, and I'm glad it's a member's only benefit," he says. He sees great value in being able to converse with other TPI members.

As of this writing over 25 users have already registered for the *Turfgrass Forum* to exchange information with their peers. Why not join them and sign up today!

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A Note of Thanks

Summit Seed in Manteno, Illinois has been a long time member of Turfgrass Producers International and their support over the years, like that of our other supplier members has been greatly appreciated. However, their latest show of support to the association and its members even caught us by surprise.

Turfgrass Producers International was recently advised by **Ron Edwards** of **Summit Seed** and President of **Ignitra Marketing Group, Inc.** that he was going to place some TPI ads on one of their websites to promote the efforts of the association and provide a new market of exposure and heightened visibility for the association.

In Ron's letter he mentioned that both he and **Ed Lee** are involved in the erosion control business. He went on to add that this group uses a lot of turfgrass sod in their Best Management Practices. In addition, TPI members are encouraged to take advantage of this site for a **FREE** posting of their sod business in the links section of the site under: **LINKS — PLANT MATERIALS – SOD**

The site currently has 45,000 members which provides exceptional exposure for TPI and any turfgrass sod farm that wants to take advantage of the **FREE** listing. Engineers and specifiers across the country use the site as resource tool and or product locator.

If you would like to participate in the FREE listing under Sod Farms visit the site at www.erosioncontrolnetwork.com



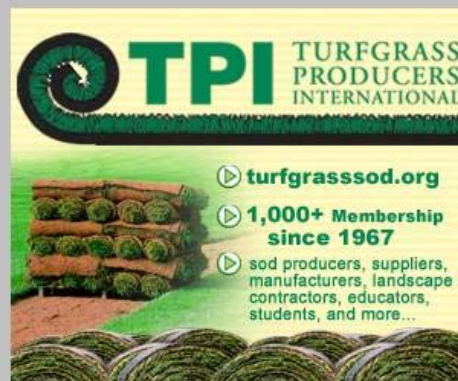
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Guest speaker at the TPI Midwinter Conference receives recognition from the Minnesota Department of Agriculture

Dr. Brian Horgan Recognized for Turfgrass Phosphorus Fertilizer Training Program

Dr. Brian Horgan, Associate Professor at the University of Minnesota and Turfgrass Extension Specialist was recently recognized by the Commissioner of the Minnesota Department of Agriculture for his dedicated service to the Turfgrass Phosphorus Fertilizer Training Program.

Just last month Dr. Horgan was a guest speaker at TPI's Midwinter Conference in Hawaii.

In addition to Dr. Horgan, University of Minnesota Professor, Carl Rosen, Mr. Rick Traver, Jr., CGCS and Mr. Scott Turtinen of the Minnesota Golf Course Superintendents' Association, were also honored for their dedicated service to the Turfgrass Phosphorus Fertilizer Training Program.

The May/June issue of *Turf News* will feature a detailed article on Dr. Horgan's presentation at the TPI Midwinter Conference.

TurfSide-UP

If a teenager down the block wants to cut your lawn and get paid by the hour . . . you might want to ask him about his equipment.



And while you're at it . . . you might ask that new landscaper about his equipment too!



TurfSide-Up is a satirical feature of the TPI E-Newsletter. Any similarity to persons living or dead is purely coincidental except in the case of prominent public figures, where actions and characteristics are used for the purpose of parody and satire. *TurfSide-Up* does not necessarily reflect the opinions, beliefs and viewpoints of Turfgrass Producers International or its members. It is the satirical viewpoint of Jim Novak.

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