2008 Annual Meeting
NE-1025, Multistate Research Project

Biology, Ecology and Management of Emerging Pests of Annual Bluegrass on Golf Courses
118 Ag Sciences and Industries Bldg.
University Park, PA
2-3 April 2008

Minutes

Wednesday, 2 April 2008

In Attendance: Stan Swier, Jim Murphy, John Inguagiato, Rick Meyer, John Kaminski, Peter Dernoeden, Lane Tredway, Ben McGraw, Tom Hsiang, Peter Landschoot, Frank Rossi, Vera Krischik, Dan Peck, Stan Zontek, Frank Wong, Paul Heller, Daryl Ramoutar, Steve Alm, Bruce Clarke, Joseph Roberts, Rich Cowles, Dave Huff and Jonathan La Mantia.

Meeting called to order at 12:20 PM on 2 April 2008

Peter Landschoot welcomed us to the meeting. Special guest Stan Zontek from the USGA was introduced.

A slate of officers was presented:

Chair	Peter Landschoot
Vice Chair	Rich Cowles
Secretary	John Kaminski
Outgoing Chair	Dan Peck
Administrative Advisor	Rich Rhodes
Administrative Liaison	Rick Meyer

Rick Meyer, administrative liaison, was introduced and presented an update from CSREES.

Presented **Presidents budget** for 2009.

- Expand competitive peer reviewed allocation for research
- Maintain support for integrated research education and extension under the NRI
- Information education for pest risk management
- Minority and insular institutions and improve outreach to underserved communities
- Utilize new technologies for agricultural extension
- Promote the training of scientists and professionals in food and agricultural sciences

There is an effort to redirect current Hatch funding towards competitive funding. The plan is to redirect 42% to competitive over next 4 years. This would also impact McIntyre-Stennis.

eXtension: http://about.extension.org: Dr. Meyer suggested that the group consider how they can play a larger role in eXtension. *If interested, the group should consider inviting someone to speak about it at the next meeting.*

Another area of support includes the **National Plant Diagnostic Network**.

Integrated Research, Education and Extension Activities. CSREES would like to move beyond water quality to water availability, reuse and conservation. A goal is to broaden **National Integrated Pest Management** beyond cropping to include other important groups including turf. CSREES proposes an increase of $2,097,000 for the National IPM Initiative.

The group should also consider what the critical issues are in turf. With this information, CSREES will put it into their goals which can lead to seed grants for initial research.

The importance of developing and posting impact statements on the NIMS website was stressed. *Whenever they are ready to post, send to Rick and they will be "massaged" into a meaningful and attractive format.*
Time:12:29 to 12:48 p.m.

The meeting proceeded with individual State Reports:

Connecticut
Rich Cowles, (12:49): Small plot screening trials for annual bluegrass weevil (ABW). Adulticide applied on 10-11 May, 22 May, 5 June. "Effective" treatments included Aloft (high dose), Conserve, Arena (high dose), Allectus. Ineffective were Dimilin, Pedestal, Provaunt. Larger-scale onsite trials were conducted on golf course putting greens. Provaunt worked well in larger scale area. Filter paper resistance evaluated. Piperonyl butoxide (Exponent, PBO-8, and Kicker) caused pyrethroid resistant ABW to be killed by Scimitar. Resistance to pyrethroids is due to at least 2 mechanisms. The mechanisms jeopardize the effectiveness of other unrelated insecticides. Rich handed out his report, which can be referred to for more information. A refereed journal manuscript is scheduled to be submitted in 1 to 2 months.
End 1:01 (Questions)

John Kaminski (presented during Ad-hoc Survey report on 3 April): Fungicide evaluations were performed again in 2008. Preventive treatments in Greenwich revealed that although QoI resistance is likely dependent on use at individual golf courses. Two trials initiated at golf courses only a couple of miles apart had varying levels of control with the QoI fungicides. Lynx continued to perform well in trials, but it is now unlikely that it will make it to the market.

New Jersey
John Inguagiato (1:06): Discussed results of seedhead and growth regulation and topdressing. There was no positive or negative influence of Primo on anthracnose basal rot (ABR) severity (2007). The use of PGR's will not enhance the disease. Topdressing caused a reduction in disease severity (0.6 L per sq m). Slight reductions in disease severity were observed when applied every 7 days when compared to 14 or 21-d intervals. The greatest reduction in ABR was observed when more snad was applied. Topdressing every 28 days was not enough to reduce

disease (or at least not until a considerable level of sand was established). No differences in incorporation method in 2006 or 2007. There was a slight reduction in ABR using sub-angular sand, but both round and sub-angular sand reduced ABR severity when compared to no topdressing.
End at 1:28 (Questions)

Joseph Roberts (1:31): Foot traffic reduced ABR severity throughout the season. Initially saw a negative effect in the first year with the use of topdressing (similar to previous study at Rutgers). Once a beneficial layer accumulated, the disease began to reduce in the topdressed plots. Irrigation practices showed that there was a linear reduction in ABR severity with increased irrigation. Plots receiving 100% ET had the least ABR (~20% at peak), but caused an increase in other problems such as algae. Deficit irrigation increased anthracnose. Rolling reduced disease severity and on select dates the "sidewinder" roller had less ABR when compared to the vibratory roller (associated with weight of sidewinder). No differences were observed between center and perimeter cut evaluations. Nitrogen rates, application timings and frequency to be evaluated in 2008.
End at 1:49 (Questions)

Ben McGraw (1:52): Entomopathognic Nematodes (EPNs) *S. carpocapsae* and *H. bacteriophora* found to be colonizing ABW on golf courses in NJ. EPNs tested were not highly virulent against the adult. Lab studies suggest decreased efficacy with later stages. Split applications and mixed EPN species treatments warrant further investigation.
End at 2:06 (Questions)

Bruce Clarke (2:12) for Stacey Bonos: A range in susceptibility can be found on bentgrasses infected by *C. cereale*. Velvet bentgrass was more tolerant than colonial but few entries were included in the trial. The least ABR damage was observed in creeping bentgrass cultivars Penneagle II, Penn A-1, and Shark. The greatest ABR severity was observed on Viper, Penncross and Brighton. *Poa* screening continues. Clones have been identified and provided to Penn State for use in their breeding program. Future work will be conducted at NC State to evaluate ABR severity under more severe environmental conditions.
End at 2:17 (Questions).

Bruce Clarke (2:18) presenting for Jo Anne Crouch and Brad Hillman: Isolates of *Colletotrichum* have been collected from 12 countries. *C. cereale* is limited to C3 plants while other *Colletotrichum* species are being identified on C4 plants. To date, nine new species of *Colletotrichum* have been identified (5 formally described) on warm-season grasses. An identification key was developed to assist in the differentiation of the species using appressoria morphology. Molecular evaluations were used to identify 96 unique haplotypes. This information gives evidence of sexual recombination in *C. cereale* at least somewhere back in the history of the fungus. Turf isolates fit into 4 of 11 total groups identified. Within the four turf groups, isolates generally are associated with host species and not geographic distribution.
End at 2:32 (Questions)

Canada

Tom Hsiang (2:36): The *Colletotrichum graminicola* sequence recently posted on the web was utilized to compare the similarity of genes within other fungi. Alignments showed a lot of commonality between *C. graminicola* and select other fungi. *Coprinus cinereus* shared the lowest number of similar genes with *C. graminicola*. The ascomycete pathogen of turf *Magnaporthe grisea* showed the greatest gene similarity with *C. graminicola* (based on the fungi evaluated).
End at 2:50 (Questions)

North Carolina
Lane Tredway (2:52): Anthracnose is a decreasing problem in North Carolina due to the transition to newer bermudagrass or bentgrasses on greens. Resistance to commonly used fungicide classes including QoI, benzimidiazole and DMI has been identified. This resistance has been identified as the similar to that found in the gray leaf spot pathogen (*Magnaporthe grisea*). Variation in DMI efficacy continues to be observed from the specific products evaluated.
End at 3:04 (Questions)

Break at 3:15

California
Frank Wong (3:38): Presented an update on *Waitea circinata*. For *C. cereale*, California isolates have only been identified to have E198K resistance. Fungicide evaluations showed varying performance with the DMI fungicides. Future plans include work with metconazole (Tourney) and triticonazole (Triton and Trinity) and identifying molecular basis of DMI-resistance.
End at 3:57 (Questions)

Pennsylvania
John La Mantia (4:01): The transition from annual to perennial is likely the result of a single gene. Mowing may cause a change in the single gene to result in a shift from annual to perennial. This epigenetic shift may be associated with the plant hormone auxin. Following crosses, he now has a stable F7 greens type poa annua. This discovery will set the stage for future research on the development of annual bluegrass lines suitable for production.
End at 4:19 (Questions)

Paul Heller (4:23): Annual bluegrass weevils have been increasing since 1984. He is currently working at sites with a long history and also recent history of ABW. Average populations of larvae were ~90 per sq ft in 2006 vs ~390 per sq ft in 2007. When plants in first bloom (forsythia, amelenchier, others) there is the first activity of ABW. Limited success has been observed with the insecticides Arena and Meridian. Nicitinoids have not shown good success in their studies. Highly variable control is often observed among trials and within replications. In 2008, they will collect from 7 or 8 sites to see what is happening regarding resistance.
End at 4:29 (Questions)

United States Golf Association
Stan Zontek (4:39): The USGA found ABW on bentgrass stand in fairways and tees at South River Golf Course in Maryland in 2002. The problems continue to appear on golf courses

throughout the mid-Atlantic and Northeast. Problems are not confined to annual bluegrass and are being found on newly established bentgrass stands.
End at 4:46 (Questions)

Meeting ended at 4:54.

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Day two of the meeting began at 8:15 on 3 April 2008.

In Attendance: Stan Swier, Jim Murphy, John Inguagiato, Rick Meyer, John Kaminski, Peter Dernoeden, Lane Tredway, Ben McGraw, Tom Hsiang, Peter Landschoot, Frank Rossi, Vera Krischik, Dan Peck, Stanley Zontek, Frank Wong, Paul Heller, Daryl Ramoutar, Steve Alm, Bruce Clarke, Joseph Roberts, Rich Cowles, Dave Huff, Jonathan La Mantia, Geunhwa Jung and Jason Dowgiewicz.

Reports from individual states continued.

New York
Frank Rossi (8:20): Evaluated the effect of various mowers and mowing frequencies on ABR. Preliminary data suggests that frequency of cut should be equal to or greater than the height of cut. More "aggressive" bedknife position resulted in increased ABR, but this was most apparent between the least and most aggressive settings. Soft surfaces are more prone to damage from the fixed head mowers due to increased scalping. Aggressiveness of bedknife was not associated with putting green performance. The term "aggressiveness" came in to question as to what this really meant. Dr. Rossi explained that this is a term that Toro uses in describing their setting.
End at 8:47 (Questions)

Dan Peck (8:49): Dan stated that a recent article by Simard and Vittum reported ABW in 20 states. Proposed model suggests that the ABW walks to the fairway in the spring and then fly back to defined treelines or some other fixed object to overwinter. There are two waves of emergence in the spring. The dates for this were 24 April and 16 May (varied by year). This wave of emergence may result in the reduced control of insecticides. A degree day model is being evaluated. Others suggested that the addition of another factor in addition to temperature may make the model more applicable in other regions outside of upstate New York. Location of feeding preference is not necessarily correlated with the number of ABWs. A wheat germ diet has been developed that allows for the sustained survival of ABW for extended periods of time. This information will be made available following further evaluation in 2008.
End at 9:12 (Questions)

New Hampshire
Stan Swier (9:13): Chemical management studies in New Hampshire. Resistance to the pyrethroids has not been observed in the field in New Hampshire and the general

recommendations for control of ABW include 2 pyrethroid sprays about 2 weeks apart initiated at forsythia flower drop. Provaunt may become the replacement of Dylox due to effectiveness on larva and reduced environmental impact.
End at 9:26 (Questions)

Rhode Island
Darryl Ramoutar (9:27): Resistance assay developed and used to determine varying pyrethroid resistance levels on golf courses in Connecticut. New procedures will use Rich Cowles filter paper Petri plate method. The impact of *Metarhizium anisopliae* F52 on ABW control was evaluated in the field using various formulations and combinations with traditional insecticides. When applied by alone in various formulations and at different rates, *M. anisopliae* provided about 20-45% control. When combined with Arena, it improved control to near 90%.
End at 9:47: (Questions)

Massachusetts
Geunhwa Jung (9:48): Intraspecific hybrids are being utilized for the development of velvet species to serve as a potential putting green species. The screening of ~600 simple sequence repeat (SSR) primers against various turfgrass species including *Poa annua* in currently underway. A goal is to identify approximately 200 primers to cross check resistance to various pathogens across host species. Lignin plays a role in the fungal disease defense mechanism, but these differences are seen in the field only and not in greenhouse studies. Dr. Jung reported that Michelle DaCosta is working on stress physiology of annual bluegrass.
End at 9:55 (Questions)

Break

Business meeting 10:15:

Ad-hoc Committee Reports

Survey Committee (Kaminski, Cowles, Landschoot, Peck, and Ruemmele)
John Kaminski (10:18): Provided state report (see Connecticut) and proceeded with Survey report. Survey information was collected between December 2006 and this meeting. A total of 367 responses were received. A majority of the responses were from states in the mid-Atlantic and Northeastern US, but surveys were received from a total of 28 states and Canada. Nearly 50% of the respondents indicated that they spend ≥ $20k on fungicides to control ABR. About 85% of respondents indicated that they spend ≤$20k to control all insects, but 28% reported that ≥21% of their total insecticide budget is used to control ABW. Similar to Dr. Peck's research, ABW damage was reported to be most severe fairway edges and collars and approaches.
End at 10:38

Survey Discussion (11:39): The short survey has provided limited but useful information. In a follow-up or future survey, Dr. Meyer suggested to consider the addition of questions that fit the form of a logic model. An example would be to find out what they know, show if it has helped and then gain insight into the next steps needed to answer future questions. We need a feedback

loop to gather information to continue doing what is needed…in the form of a logic model. Dr. Meyer stated, "You have this information so far from what we have done, but what do you need next?" John Kaminski will consolidate the long survey and Rich Cowles will take the ABW survey and after consolidation they will submit it to the group via email for review and additions or subtractions.

Best Management Practices Committee (Heller, Murphy and Wong)
Frank Wong and open discussion (11:03): Last May a draft was sent for the ABR section to the ad hoc committee. The Rutgers group has developed additional information on cultural practices. We will start to gather information to disseminate to publications of high profile such as GCM and the Record. Golf Course Management is the highest profile for the golf course superintendents. Debate on whether we have enough information to put out a BMP or a general summary of the NE-1025 project. Many think that there is currently enough information to produce a two-article series for GCM.

It was suggested that the final BMP manual be broken down into authored sections. To accomplish the task of writing the finalized BMP manual, our current results should be submitted to various media outlets such as GCM or the Green Section Record and then included in the finalized BMP. Careful consideration should also be given to media outlets such as individual College Newsletters or Announcements that will be seen by the experimental station directors. Frank Wong and Jim Murphy will work on the ABR article for GCM and Rich will put something together for the ABW. The appropriate article length for is about 1500 words (GCM) and 3500 words (Record).

Additional Agenda Items (11:38):
There was some question as to the length of last year's report (30,000 words too long). Rich Cowles offered to cut them down, but discussions following the meeting may have resolved the issue. Participants also should to provide impact statements for last year's report. This report would cover 9 May 2007 to 30 September 2007. The report for next year will then be on the proper schedule from 1 October 2007 to 30 September 2008. Word files are needed from each PI with their annual report so that Pete Landschoot and Rich Cowles can assemble each section. Send your report to the appropriate person (entomology to Rich and pathology to Peter). These should be submitted within 2 weeks of the meeting.

Next Meeting:
To be held at the Windsor Agricultural Experiment Station. End of March through early April is a good time to have the meeting so that it is before the start of the growing season. Rich Cowles will send out a date and get everyone to reserve this time when we return.

The meeting was adjourned at 11:57 a.m.

Respectfully submitted,

John E. Kaminski

John E. Kaminski, Secretary, April 5, 2008