CHIPS & PUTTS

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October Meeting
Glen Oak Country Club
Host: Gino Marchetti, GCS
Speaker: Darin Bevard, USGA Year in Review

Our final meeting of the season brings us to Glen Oak C.C. in Clarks Summit where we will hold the Association Championship. It's been a few years since we've visited Glen Oak, and a few things have changed; namely our host superintendent, Gino Marchetti. Gino, a native to Northeastern PA, is a 2001 graduate of Penn State. After graduation he went to Fieldstone C.C. as the assistant there from 2001-2005. When the opportunity arose to return to the area as the assistant at Glen Oak he jumped on it. He served as the assistant until 2008, when former superintendent Greg Boring (our host for the August meeting) moved across town to The Country Club of Scranton. Gino then stepped right into the superintendent position at Glen Oak, where he has continued to keep Glen Oak in fantastic condition. In his task of maintaining these primarily poa greens, bent/poa fairways, and rye tees, Gino is assisted by Drew White (a Fieldstone alum), and Pat Moran (who came from Berwick C.C.). The in season crew of 22 is whittled down to 6 full time members over the winter months.

Originally called The Excelsior Club, Glen Oak was first opened in 1951. Designed by James Harrison, an understudy of Donald Ross, this track plays to just over 6,600 yards from the tips, but don't let the length fool you

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President's Message.....

Editor's Notes.....

The leaves are changing and the deer are starting to run around (just ask Drew at our host course for this month's meeting...nice buck for opening day archery!!). Soon show season will be upon us with much needed time away from the courses.

Many thanks to Dr. Olga S. Kostromytka and Dr. Albrecht M. Koppenhöfer from Rutgers for the article this month. Olga was our speaker at last month's meeting and their research is a result in part of the Association's support.

Hope to see everyone at Glen Oak.

As always, I'm looking for pictures or contributions from anyone interested in sending information to this newsletter.

Brian Bachman

Host Plant Resistance for ABW Management

Olga S. Kostromytka and Albrecht M. Koppenhöfer
Department of Entomology, Rutgers University, New Brunswick, NJ

Annual bluegrass weevil (ABW) (Figure 1) is a serious and expanding pest of short cut turfgrass. ABW larvae feed inside the stem (1st to 3rd instar) and on the grass crown (3rd to 5th instar), causing severe damage on highly maintained turf (Figures 2). Effective management of ABW is challenging, requiring close pest monitoring and precise timing of management activities. Presently, chemical control is the only effective and commonly used management strategy. Targeting adult ABW with pyrethroid insecticides has been a particularly effective and therefore overused strategy. Not surprisingly, incidences of reduced pyrethroid efficacy have been on the rise, and an increasing number of pyrethroid resistant ABW populations have been documented. To make matters worse, ABW populations resistant to pyrethroids seem to be less susceptible to most other presently available insecticides and overuse of any remaining effective active ingredients is likely to reduce their efficacy, too (Koppenhöfer et al. 2012). With resistance on the rise and few management tools available, searching for alternatives is crucial. New strategies are necessary to improve management of already resistant ABW populations and to prevent the development of resistance in still susceptible populations.

Host plant resistance is a powerful management tool and is relatively cheap, highly compatible with other management strategies, and environmentally friendly. Host plant resistance has two major components: 1) tolerance and 2) true resistance due to antibiosis (detrimental effect of plant characteristics on insect survival, development and reproduction) and/or antixenosis (non-preference). Tolerant plants may sustain the same pest density as a susceptible plant but overcome the feeding stress and not show damage. In contrast, resistant plants

Figure 1. Annual blue grass adult, eggs, and larva feeding inside *P.annua* stem.

significantly reduce pest development, growth, survival, and reproduction, and/or are less attractive and suitable for oviposition; consequently, they suppress population build up.

While field observations indicate that annual bluegrass, *Poa annua*, is a preferred host of ABW and/or particularly susceptible to it, ABW infestations also occur in and can be damaging to creeping bentgrasses. Several studies demonstrated that similar larval densities may occur in *P. annua* and bentgrass in the field, but damage becomes apparent sooner and tends to be more severe in *P. annua*. It remains unclear whether bentgrasses are resistant to ABW or just more tolerant than *P. annua*. Mere tolerance is not an ideal scenario for ABW management because population build up can still occur and result in damage in adjacent *P. annua* patches and occasionally even in bentgrasses.

The overall goal of our research (supported by the GCSAA, the PTGA, and six other GCSAA chapter and turfgrass associations in PA, NJ, and NY) is to study ABW host plant interactions with the practical goal of selecting the most ABW resistant among available bentgrass cultivars (cvs.). Creeping bentgrasses are widely used in short cut golf course areas, and a wide variety of cvs. with improved qualities are available to superintendents.

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Figure 2. Damage caused by ABW larvae feeding on the collar of a putting green.

Thus, we tested two older cvs. ('L93', 'Penncross'), and two newer high quality cvs. with improved dollarspot resistance ('007', 'Declaration'). In addition, two colonial bentgrass cvs. ('Tiger II', 'Capri' [a new cv. with better quality and improved brown patch resistance]) and two velvet bentgrass cvs. ('Greenwich', 'Villa') were tested. The main advantages of velvet bentgrass are low fertility requirements, exceptional drought tolerance, shade tolerance, and fine texture improved dollarspot resistance ('007', 'Declaration'). In addition, two colonial bentgrass cvs. ('Tiger II', 'Capri' [a new cv. with better quality and improved brown patch resistance]) and two velvet bentgrass cvs. ('Greenwich', 'Villa') were tested. The main advantages of velvet bentgrass are low fertility requirements, exceptional drought tolerance, shade tolerance, and fine texture (Torello and Lynch 2001). Colonial bentgrass is more disease resistant and requires lower maintenance input than creeping bentgrass (Bonos and Murphy 2008).

In a series of laboratory and field experiments conducted to determine ABW egg-laying preferences *Poa annua* was clearly preferred over all tested bentgrasses. In no choice tests the highest number of eggs was recovered from *P. annua* (on average 28-36 eggs per 2" plug). Among bentgrasses, the fewest eggs were found in 'Villa' (on average 0-4.6), 'Greenwich' (on average 0-3.6 eggs), and 'Tiger II' (on average ≥ 1 egg per plug) and the most in cvs. 'Penncross', 'Capri' and 'L93'. When females were given a choice between three bentgrass cvs. and *P. annua*, 63-88% of the total number of eggs was laid in *P. annua* while the lowest number of eggs was found in the bentgrass cvs. 'Declaration' and 'Greenwich' (Figure 3).

Attractiveness of *Poa* diminished when the antennae of ABW females were blocked so that no olfactory cues could be received. Thus, host plant volatiles are important for ABW host recognition and non-preference is at least partially involved in the lower susceptibility of bentgrass, suggesting resistance rather than just greater tolerance. This finding was confirmed in the series of choice experiments in which we observed distinct attractiveness of *P. annua* and non-preference or even repellency (cvs. 'Declaration' and 'Villa)' of bentgrasses.

In greenhouse pot experiments, *Poa annua* was the most suitable host for ABW larval survival, growth and development among all grass types tested with consistently high numbers of ABW life stages (equivalent to 380-450 larvae per sq. foot). Larvae grew better and developed faster in *P. annua* than in most of the bentgrasses. Larval densities were also very high in cvs. 'Villa' and 'Capri'. In contrast, all creeping bentgrass cvs. had relatively low larval densities (less than 120 per sq. foot), larval development was delayed ('L93', 'Penncross'), and larvae weighed less (all creeping bentgrasses).

To determine tolerance to ABW larval feeding, all bentgrass cvs. and *P. annua* were exposed to a range of larval densities (0, 6, 12, and 24 larvae per pot; equivalent to 0-284 larvae per sq. foot) and feeding damage was rated after 7 and 14 days of exposure. Overall, bentgrasses were more tolerant to ABW feeding than *P. annua*. In *P. annua* damage became apparent after 7 days at 12 and 24 larvae per pot (28% and 53%, respectively) and reached as high as 64% at 24 larvae per pot after 14 days. In contrast, it took the highest larval density and 14 days to express damage in creeping bentgrasses ('L93', 31%; 'Declaration', 23%;

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'Penncross,23%). No visible damage was observed in cv. '007'. Other bentgrasses were less tolerant with cvs. 'Capri' and 'Villa' being the least tolerant. Our data model predicts that bentgrasses generally can tolerate 2-3 times higher densities of ABW larvae than *P. annua* before sustaining the same damage level (20%).

To summarize, *P. annua* 1) was the most suitable host for ABW survival, growth, development, and reproduction among all grasses tested, 2) was clearly preferred by ABW females for egg-laying; and 3) was most susceptible to ABW larval feeding. However, ABW females laid eggs in the bentgrasses even if *P. annua* was available and ABW could develop from eggs to pupae on all bentgrasses tested. All bentgrasses, but especially creeping bentgrasses, were more tolerant to ABW larvae feeding. Considering the low egg number (compared to *P. annua*) and poorer larval survival, growth and development observed in creeping bentgrasses, it is apparent that creeping bentgrasses are not only more tolerant than *P. annua* but also are most resistant among the tested species. Additional experiments are being conducted to confirm and expand these findings to ultimately develop recommendations on which bentgrasses are most susceptible to ABW damage and which are most suitable for the replacement of *P. annua* in area with established ABW populations.

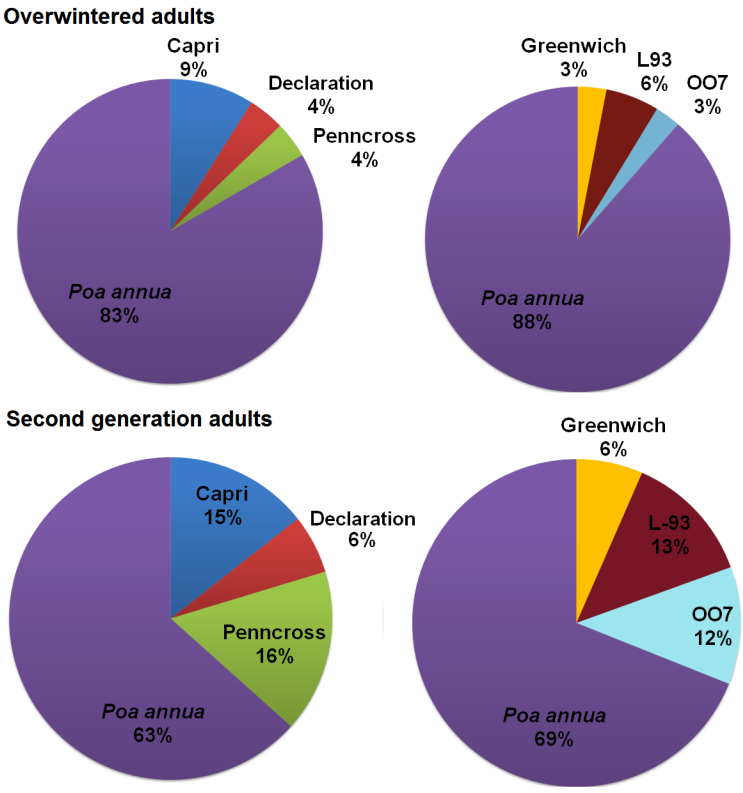

Figure 4. ABW females clearly prefer *Poa annua* to bentgrass cultivars for egg-laying in laboratory choice experiments: most eggs were laid in *P.annua* plugs . The older creeping bentgrass cvs. 'Penncross' and 'L93' and colonial bentgrass cv. 'Capri' tend to have higher numbers of eggs than other bentgrasses. Similar egg laying preferences were observed in field experiments.

References cited:

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Torello W.A., Lynch S. 2001. Velvet bentgrass management. Online. Seed Research of Oregon, Corvallis, OR, and hosted by Evergro Canada Inc., Delta, BC.

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The greens are devilishly fast, and as with many Pocono courses, there are plenty of trees and water features to challenge your game. With a strong golfing membership of 360, Glen Oak has continued to improve the course over the years by rebuilding #7 green and also installing XGD drainage on#9, #10, #12, and #14 greens. Additional plans to redo the 18th tee complex are in the works for the near future.

I hope you'll join us for what will certainly be a great day of golf with friends and peers.

As a service to our members and a way to say thank you…..all PTGA members will receive their own bag tag to proudly display.

Please pick up your tag at the meetings throughout the season.

Photo of the Month

We all see interesting things every day….wildlife (like bald eagles and bears), strange turf problems (like a lightning strike), an employee who stayed out too late the night before, etc. So if you have a great photo, send it to me (bbachman@genesisturfgrassinc.com) and share it for everyone to enjoy (or laugh at).

September Photo of the Month

This photo was submitted by Derrick Hudson, a former Pocono member who has been the superintendent at Bellewood CC for several years. This wasn't a staged picture….he actually had this on his head when Derrick drove by.

No explanation is needed, but we've all had crew members like this…..

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POCONO ROUNDUP

PLEASE NOTE!

If anyone should have any news concerning the PTGA membership; i.e., someone getting married, having a baby, changing jobs, or anything else of interest concerning the industry, please let us know.

PTGA SCHEDULE

Oct 15th	**PTGA Meeting @ Glen Oak CC** **Speaker: Darin Bevard** **USGA Year in Review**
Oct 18th	**MET Tournament** **The Stanwich Club**
Nov 13-15	**PSU Turf Conference**

Don't miss PTGA's last golf meeting of the year at Glen Oak Country Club!

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