

Project title: Encouraging adoption of trapping and monitoring techniques as a component of IPM practices for managing a key desert turfgrass insect pest.

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Location of project: Maricopa County

Critical issue:

Turfgrasses grown in the desert on golf courses, sports facilities, and landscaping contribute significantly to major economic tourist and recreational attractions. Turfgrass on the nearly 200 golf courses in the Phoenix/Scottsdale area is often adjacent to the desert and/or at an urban interface; therefore, pest management decisions that are to be implemented must take into account human health, watershed management, and wildlife. The development and implementation of effective science-based integrated pest management (IPM) programs for identified pest problems in turfgrasses can help to optimize and/or reduce pesticide use and lessen their associated impacts on the surrounding urban and desert environments.

For turfgrass pest management in Arizona, the occurrences and observations of insect pests as adults or immature growth stages have not been scientifically documented and quantified. Threshold levels for damage to turf by insects have not been established. Tolerance levels or action thresholds to execute pest management strategies for turf pests have not been determined. Economic damage thresholds that weigh costs versus benefits of control options for varying populations of pests in turf are unknown. Many golf course superintendents routinely use insecticides for preventative white grub control in turfgrass while the species that causes visual damage has not been fully determined. Adult beetles representing non-pest species are commonly suspected of causing damage and are often mis-identified. The immature white grub of one or more of the several masked chafer beetle species (*Cyclocephala* spp., southwestern or western masked chafer) are the primary causes of concern for golf course superintendents in central Arizona. Masked chafers were identified as a key pest during our trapping and monitoring program initiated in 2004 through 2005. Other beetles such as black turfgrass ataenius (*Ataenius spretulus*, BTA) were also prevalent and may be of concern in the future after issues targeting the masked chafers are addressed by this project.

The 2004-05 trapping and monitoring project was partially supported by the University of Arizona Cooperative Extension IPM enhancement grant programs. Funding provided operational supplies and partial salary support for monitoring six sites in 2004 and eight sites in 2005. The scientific results of the two years of trapping and monitoring have yielded the following:

- 1) identification of masked chafers (*Cyclocephala* spp.) as the primary key pest beetles in turfgrasses in Maricopa County;
- 2) determined that masked chafers occur at very different population levels among the 6 and 8 sites around Maricopa County;
- 3) determined that masked chafer peak flights occur at two times during the summer and fall;
- 4) determined that possibly more than one species of masked chafers occurs in desert region turfgrasses;
- 5) need for reassessment of the timing and/or number of applications of insecticides for multiple occurrences of beetle flights that occur in the summer and late fall seasons.

The results of the technology transfer to golf course superintendents have been:

- 1) adoption of trapping and monitoring techniques by an additional five superintendents;
- 2) enhanced awareness and knowledge of masked chafers as a key pest by superintendents after several presentations at seminars and workshops;
- 3) improved knowledge of masked chafer seasonal occurrences to optimize timing of insecticide applications based on website presentation of insect trap collection data. A Turfgrass Insect Identification Workshop over 2 days during 2005 had 12 participants. All respondents to an exit survey indicated high relevance and timeliness of the workshop. 86% of respondents learned to identify turf pests at the workshop, 57% indicated that they would use trapping techniques to monitor pests in the future, and 100% use our website monitoring data that is presented and all respondents rated the quality of the IPM training as good to excellent.

The proposed project is the progression of technology transfer to empower golf course superintendents to adopt a critical IPM technique. The adoption of trapping and monitoring by superintendents will enhance their decision-making processes. Their contributions to a shared database will enable us to refine and confirm previous findings about the species composition and occurrences of beetles throughout Maricopa County. Our project fits nicely within the national IPM goals for professionals to adopt IPM practices to enhance decision-making processes. Within the APMC priorities, our project goal implicitly improves and achieves economic and environmental concerns by optimizing or reducing insecticide use for grub control. Adopters of the trapping and monitoring techniques will improve timing of application of insecticides when necessary that will result in maximizing the length of time for product efficacy and reducing the potential need for multiple applications and expenditures.

Inputs and Outputs:

Personnel. Area Agent and Research Specialist have enlisted three (3) “early adopter” cooperating golf course superintendents to host workshops and provide peer-to-peer presentations to share insect pest management experiences. Agricultural chemical industry representatives are being recruited and solicited to provide insecticide product label updates and partial financial support for workshop food and beverage expenses. Research Specialist will coordinate seasonal (May to October) trapping and monitoring activities to collect weekly data from individual golf courses. Weekly data will be compiled and collated to be presented on the turf.arizona.edu website to be shared with all Maricopa County turfgrass managers.

Operational. Three golf courses will host and provide a meeting room for conducting insect pest management workshops. It is anticipated that 20-30 superintendents and/or their designated insect trap monitor will attend and participate at each site. We will offer training to purchase and set up traps; identify immature and adult specimens of key insects; teach about masked chafer lifecycles; how to assemble and report trap collection data; discuss and deliberate control strategies. Images of adult beetles, grubs at various growth stages, charts, and graphs depicting key pest information will be printed in easy to use resource materials.

The budget described below provides for the partial salary of the Research Specialist coordinating the project for the adopting superintendents. The collated data will be managed by the Research Specialist and posted on the UA Turfgrass Education, Research, and Extension website regularly (<http://turf.arizona.edu>). Tentatively, three regional workshops are being planned around the Phoenix area to teach about masked chafers and identifying the beetles.

A seasonal budget request is for a total of \$6,450.00. Support for the project is being solicited from the agrichemical industry sales representatives to offset partial expenses for food and beverages at the workshops. Early adopter cooperating superintendents will provide a meeting site at their golf courses. The C & P GCSA has been solicited for similar support through a grant proposal.

	May to October 2006
Wages + ERE - partial salary of Research Specialist devoting 1 day per week for 26 week trapping season	4,550.00
Publications	1,000.00
3 Education workshops Travel, rental fees, food/beverage costs	900.00
Total	6,450.00

Outcomes and impacts:

The expected outcome will be that most golf course superintendents will adopt the practice of trapping and monitoring blacklight traps for masked chafer beetles to anticipate potential grub infestations in turfgrass. A complementary outcome will be that golf course superintendents and professional turfgrass managers will monitor masked chafer and anticipated grub infestations from our website that provides weekly up-to-date area-wide blacklight trap data. The monitoring technique for pest populations will enhance more accurate decision-making abilities of superintendents and turfgrass managers to apply timely insecticide treatments if they are even necessary. Mid- and long-term outcomes will be that superintendents and turfgrass managers will gain greater knowledge of most insect pests that occur in turfgrasses and optimally adopt routine IPM strategies to effectively manage turfgrasses within the context of its surrounding environment that may be residential, commercial, agricultural, or native desert. Annual database compilation will eventually enable the establishment of masked chafer beetle/grub threshold levels for IPM strategies. Action thresholds and economic thresholds need to be determined for superintendents and professional turf managers.

Recruitment of golf course superintendents to one of the three initial peer-to-peer workshops will be done by announcement at the annual meeting of the Cactus and Pine Golf Course Superintendents' Association (C & P GCSA) and email announcements utilizing this area agent's and C & P GCSA listserves. Knowledge and skills enhancement of IPM strategies and masked chafer biology will be measured by an exit survey at the workshops. Adoption of trapping and monitoring will be measured by individuals signing up at the workshops to participate in the data collection component of the project. Electronic communication via the website and email will constantly remind participants to submit weekly data.

Plan for evaluation:

The participants at the three workshops will be surveyed about the changes in knowledge and skills to identify and understand insect biology and the process to monitor and collect insects. Follow-up communications with individuals who attend the workshops will track the rate of adoption of the trapping/monitoring practice, rate of use of the website that provides area-wide survey results, and data contributions to the website to illustrate area-wide population trends. Insecticide use patterns will be surveyed of participants at the workshops throughout the summer and fall seasons by email, phone or direct mail surveys.