Penn State Turfgrass Entomology Newsletter

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ISSUE HIGHLIGHTS

***TURFGRASS INSECT SCOUTING UPDATE – ANNUAL BLUEGRASS WEEVIL, ARMYWORMS, BLUEGRASS BILLBUG AND MAY/JUNE BEETLES!**

*** WARM WEATHER TREND COMMENTS!**

*** USGA FOR REGIONAL UPDATES!**

*** LYME DISEASE WEB SITES!**

*** AUDUBON SANCTUARY PROGRAM**

ANNUAL BLUEGRASS WEEVIL: Late first instar larvae were collected from a golf course fairway in Dauphin County during the week of May 11. Adults were also collected from Dauphin County. The predicted warming trend over the next several weeks will encourage development of this significant pest of annual bluegrass.

ARMYWORMS (*Pseudaletia unipuncta*): Last year we received calls from golf course superintendents located in SW Pennsylvania who encountered major turfgrass damage in June from armyworm larvae. These insects 'pop in' and frequently go unnoticed until considerable damage has occurred. They enjoy wet spring weather so keep alert regarding this pest. A black light trap or a pheromone trap can assist you in monitoring adult activity. Please note that armyworm populations are erratic so you need to rely on the Keystone of an IPM program – consistent frequent monitoring throughout the year.

Armyworms usually don't overwinter in Pennsylvania. Instead they migrate into the Commonwealth from the southern states in April and May. During daylight hours adults remain hidden in grassy vegetation. Adult moths feed on nectar, and mating and searching for oviposition sites occurs during the evening hours. Adult female moths deposit their eggs in rows or clusters on the lower leaves of turfgrass and/or at the base of the plant. Eggs hatch in 1 -2 weeks. Larvae complete six instars prior to pupating just below the soil surface. Adults emerge in 1 – 2 weeks. A second and third generation is possible.

You can view significant damage and late instar armyworm larvae from 2008 via Images 1 and 2. These images are provided as a courtesy of Mr. Ed Lach who is an excellent photographer. You can observe the image of an armyworm larvae by accessing two websites: U CA at http://www.ipm.ucdavis.edu/PMG/P/I-LP-PUNI-LV.003.html or the U NB Turfgrass web site at

http://entomology.unl.edu/images/smgrains/armyworm/armyworm.htm &
http://entomology.unl.edu/charts/armywcht.shtml

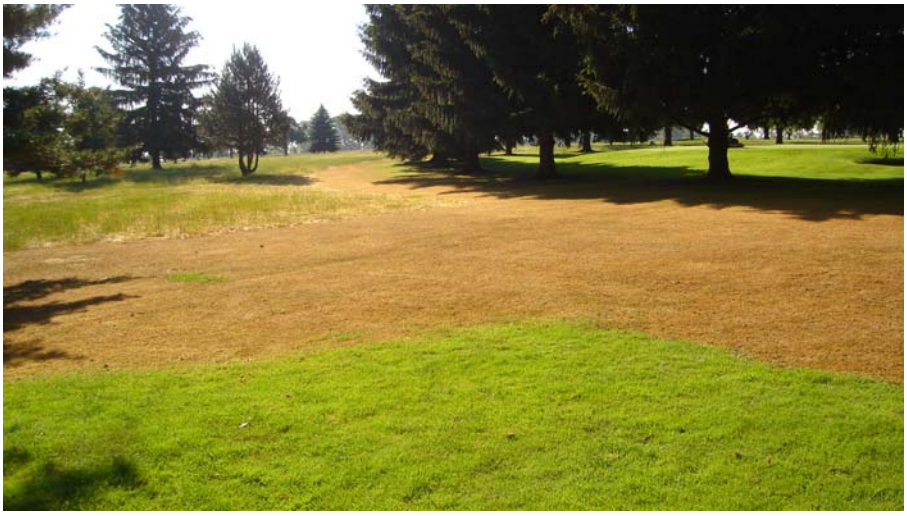

Image 1: Armyworm larval feeding damage on turfgrass.

Image 2: Late instar armyworm larvae on damaged turfgrass.

BLUEGRASS BILLBUG: Adult bluegrass billbugs were collected from pitfall traps located at the Valentine Turfgrass Research Center during the week of May 11. We also collected billbug larvae which we believe are hunting billbugs.

A considerable amount of research is available on bluegrass billbug but minimal research is available on hunting billbug. You can locate information on the growing degree day model for Bluegrass Billbug by going to the following Ohio State Ohioline bluegrass billbug document located at http://ohioline.osu.edu/hyg-fact/2000/2502.html

Billbug species continue to cause major damage to commercial and recreational turfgrass areas. Over the past three year interval we have observed hunting billbug take over the former range of bluegrass billbug in Pennsylvania. Although both species are present hunting billbug dominates ca. 96-98% of the time based on previous pitfall data. Hunting billbug has become a major pest on athletic fields and frequently goes undiagnosed as drought damage. You can distinguish adult bluegrass billbugs from hunting billbugs by examining the adult's pronotum. Numerous insecticides are registered to suppress billbug species.

You can access information on hunting billbug by going to the following FL web site at http://entomology.ifas.ufl.edu/creatures/orn/turf/hunting_billbug.htm

MAY AND JUNE BEETLE: Adult May and June beetles are now flying in Central Pennsylvania. These insects require multiple years to complete development and are active at night. I've observed this insect increasing in numbers over the past few years. Adult beetles will feed on the foliage of ornamental trees. Refer to Image 3 for the adult May/June beetle, while Image 4 displays the larval stage of this insect. Adults can be monitored with a black light trap. Larval stages consume the roots of grasses, vegetable and ornamental plants.

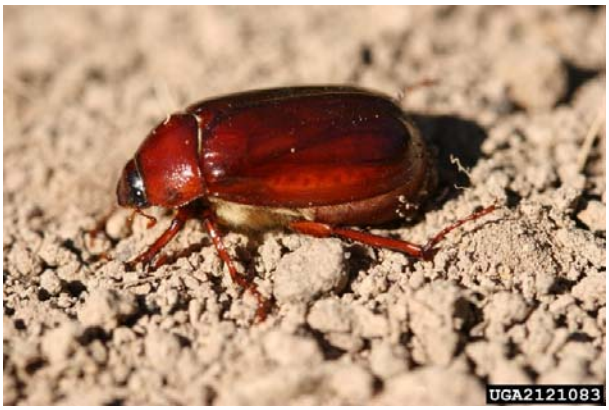

Image 3: Adult May/June beetle; courtesy Steven Katovich, USDA Forest Service, Bugwood.org.

Image 4. Larval stage of May/June beetles; courtesy Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org.

WARMING WEATHER TREND COMMENTS: I just reviewed the weather forecast for Central PA. It appears that temperatures will be increasing which will encourage movement of white grubs up to the soil thatch interface. The past several weeks we have observed white grub species primarily at 1 – 2 inches in the soil. Hence, keep sampling for these subsurface pests. Refer to Images 5 and 7 for grub-skunk damage and larvae. Also you need to examine the grub's raster pattern to determine which species is present. Image 6 demonstrates examining that area of the white grub. I would be actively searching for adult black turfgrass ataenius beetles. Black turfgrass ataenius first generation eggs are observed in the spring based on the following phenological plant indicators: Vanhoutte spirea, *Spiraea vanhouttei* (first full bloom) (Briot) Zabel; Horse chestnut, *Aesculus hippocastanum* L. (first full bloom); and Black locust, *Robinia pseudoacacis* L. (onset of blossom). The latter data is provided via the refereed publication: Wegner, G.S. and H.D. Niemczyk 1981. Bionomics and phenology of Ataenius spretulus. Annals of the Entomological Society of America, V. 74 (4): 374-384.

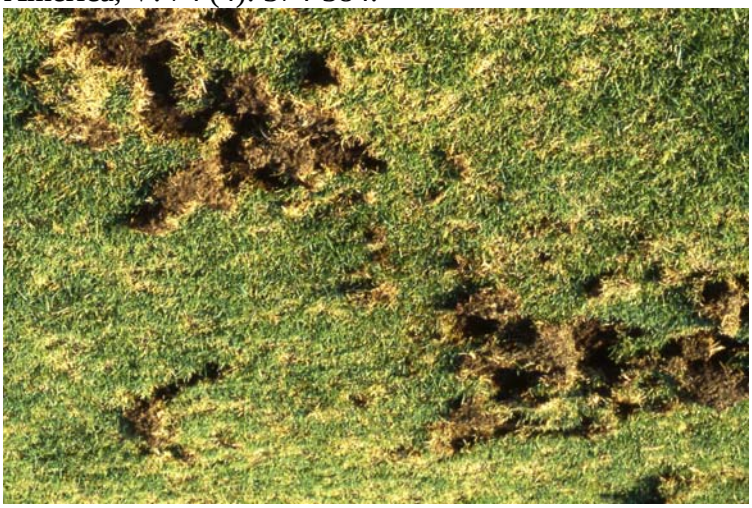

Image 5: Skunk and grub damage on turfgrass; courtesy of Paul Heller, PSU.

Image 6: Examining a white grub's raster.

Image 7: Late instar white grub species; courtesy of Paul Heller, PSU.

Likewise the predicted increasing temperatures will encourage development of annual bluegrass weevil larvae and movement of bluegrass and hunting billbugs adults from their overwintering sites. You might consider relying on a black light trap to monitor adult insects that are active at night. Otherwise in the case of armyworm, black cutworm or sod webworm adults…you can purchase and rely on a pheromone trap. Just enter insect pheromone traps on your search engine and you will observe quite a few distributors of these monitoring tools.

Please find below a chart that I use in my classes which describes the various species of turfgrass beetles.

Description of Adult Beetles

Common Name/Etc	Description
Asiatic Garden Beetle (AGB) Single transverse row of spines in a crescent shape. One generation annually	Dull chestnut brown, slightly iridescent, velvety sheen, 3/8 inch long, abdomen protrudes slightly from beneath wing cover, and undersurface of thorax has irregular yellow hairs. AGB occasionally can create a medical problem to campers who sleep in an unprotected self enclosed environment. This beetle has been known to crawl into ears which can cause a problem. Pest was introduced from China and Japan. It was first identified in the U.S. in 1921 near Rutherford, NJ.
Black Turfgrass Ataenius (BTA) No distinct rastral pattern, but there are 40-45 irregularly placed hooked setae with the presence of two pad-like structures on the tip of the abdomen, which is posterior to the setae and the anal slit of the white grub. Two generations annually	Black-beetle, 3/16 inch long, rounded at both ends, with distinct longitudinal grooves on wing covers. In Canada this insect is commonly called the black fairway beetle. Adult activity frequently commences before dusk. BTA is native to the U.S. and was first observed causing damage to golf course turf in MN in 1932. In 1969 damage was recorded near Rochester, NY.
European Chafer (EC) Two sub parallel rows of straight pointed spines converging toward the anterior and outwardly curved toward the posterior. Grubs have a Y-shaped anal slit. One generation annually	Reddish brown, 1/2 inch long, rufous yellow head and pronotum, and anterior margin of pronotum has a narrow band of light yellow hairs. The hardened wing cover (elytra) is heavily striated and lightly punctuated. Occasionally EC adults are mistaken as May/June beetle adults since but do not have a tooth on the tarsal claw which is present on May and June beetle adults. EC is native to western and central Europe. EC was first discovered in the U.S. in 1940 around Newark, NJ.
Green June Beetle (GJB) One generation annually	Velvety green and yellow margined upper surface and shiny metallic green below, 3/4 to 1.0 inch long, with distinct, small, flat horn on the head, and while flying adults make a loud buzzing noise.

	GJB is native to the eastern half of the U.S.
Japanese Beetle (JB) Two conspicuous rows of six or seven straight pointed spines medially located to form a V. One generation annually	Brilliant metallic green, 3/8 to 1/2 inch long, bearing coppery brown wing covers, with five lateral spots with white hairs on each side of the abdomen, and short gray hairs covering the underside of the insect. JB is native to the main islands of Japan, They were first observed in the U.S. in southern N.J. in 1916.
May & June Beetle (MB/JB) Raster patterns are variable but are essentially two parallel rows of straight pointed spines that show a tendency toward converging at both ends. Requires multiple years to complete one generation.	Brown or black adults which are ca. 3/4 inch long, 1/2 inch wide. These insects are native to Canada, the U.S. and South America.
Northern Masked Chafer (NMC)* Raster pattern consists of an irregular pattern of bristles at the tip of the abdomen, differing from BTA in that the anal pads are missing. Transverse and arcuate anal slit. One generation annually	Chestnut brown, covered with fine hairs, resembles a small June beetle, and are ca. 1/2 inch long. Likewise the adults have dark chocolate brown heads that shade to a light brown clypeus (masked appearance). NMC is native to the U.S.
Oriental Beetle (OB) There are usually two parallel rows of 11 to 14 straight pointed spines, but the number may vary from 10 to 15. The anal slit of the OB is transverse. One generation annually	Adults vary in color ranging from straw colored to straw colored with black colored patches to black colored to black colored with straw colored patches on the thorax and wing covers, and adults are oval beetles ca. 1/2 inch long. OB probably is a native of the Philippines and reached New Haven, CT in 1920 via Japan.
Source Used: **Turfgrass Insects of the U.S. and Canada**; Vittum/Villani/Tashiro;Cornell U Press '99; Cornell web site describing this excellent publication at http://www.cornellpress.cornell.edu/cup_detail.taf?ti_id=3244	

*** USGA REGIONAL UPDATES:** An excellent location where you can acquire regional data on turfgrass insects, diseases, etc. for golf course superintendents is located on the USGA web site at http://www.usga.org/turf/regional_updates/regional_updates.html
These updates are provided by USGA agronomists and cover the entire USA.

*** LYME DISEASE WEB SITES:** This disease transmitted by the black legged tick continues to be a major concern to personnel employed by the turfgrass industry. A considerable amount of information is available on this disease at the following web sites: Penn State Entomology at http://www.ento.psu.edu/lyme/default.htm and the US CDC web site at http://www.cdc.gov/ncidod/dvbid/Lyme/

*** AUDUBON GOLF COURSE SANCTUARY PROGRAM:** Each year I direct my students enrolled in ENT317 (resident education or World Campus courses) to the Audubon's Sanctuary Program. If interested please go to the following web site for specific details on this excellent program at http://acspgolf.auduboninternational.org/

Note of Caution When Using a Website Mentioned in this Newsletter:
Please remember that pest control suggestions to suppress insect and mite pests will vary between states and countries. Likewise pest control suppression strategies and timing also will vary. Always contact your local county extension office or department of agriculture to acquire the most current pest control suggestions.