INSECT REFERENCE

May and June beetles (2 and 3 year grubs), Phyllophaga spp.

DESCRIPTION OF INSECT

Immature stage:

Difficult to identify to species.

C – shaped larvae with 3 pairs of well developed legs

Large brown head capsule with well developed mandibles.

Distinguished from other white grubs by the broad Y-shaped anal slit and two rows of parallel bristles that point toward each other on the raster (bottom side of rear end near anus).

Range from 6.3 mm – 38 mm (3/16 – 1 ¼ inches) fully grown.

Mature stage:

Adults vary in color from light brown to almost black depending upon species.

There bodies support different amounts of hair from none at all to dense stands.

Size varies from 10.5 mm – 30 mm (3/8 – 1 1/8 inches).

Damaging stage(s):

mainly larvae damage turf but adults maybe found feeding on foliage of certain grasses, trees, and shrubs.

Predictive models (degree day, plant phenology, threat temperatures, other)

No degree day model exists for predicting flights of May/June beetles. The adults are dependant upon soil moisture along with warmer temperatures and large flights of beetles may be noted with in days of a large rain.

A black light trap may be used to help monitor for adult flights to help determine when egg lay will occur.

Life cycle:

1 – 3 years from egg to adult.

Females lay eggs individually in earthen cells usually during the nighttime, although there are a few daytime active species.

Eggs are small white ovals that become more round with age. 2 mm in size (5/64 inch).

Larvae develop through three instars in the ground and feed on organic matter and available roots.

They proceed through the first two instars and pupal stage rather quickly, spending most of their lives as 3rd instars

Larvae will migrate deeper into the soil profile to over winter and migrate back up to the surface in the spring.

INSECT REFERENCE

Depending upon the species and the year of development the larvae will over winter as 2nd or 3rd instars, in some cases as pupae or adults.

Adults typically emerge from April-June to mate, although in the southern regions some species can be found flying into the fall.

Conducive environmental conditions:

Adult mating flights are dependant upon warming temperatures and adequate soil moisture.

Geographic distribution:

North and South America

DAMAGE CAUSED:

Plants attacked:

Root systems of cool-season and warm-season grasses on greens, tees and fairways.

Symptoms of damage:

Damaged turf wilts under drought stress and eventually dies in uneven patches.

In cases of a high density grub population the sod maybe lifted free from the root system.

Mammals also cause severe damage when searching for white grubs. They root up and dig unsightly holes in turfgrass.

Timing of damage:

Damage is most obvious during the hottest days of the summer when the lack well developed root system stresses the grass.

Damage due to mammals usually noted in last half of summer or in fall when larvae are larger.

Links to photographs, illustrations of damage

http://www.oznet.ksu.edu/dp_hfrr/TURF/insects%20grub%20damage%20on%20soccer%20field%202.jpg

• http://hcs.osu.edu/images/cd0005/cd0005-06.jpg

Insects that look similar; Pests that cause similar damage:

All white grubs look similar in appearance this includes; Japanese beetle, masked chafers, green june beetle, oriental beetle, black turfgrass ataenius.

Some of these maybe ruled out according to geographic location.

Adult beetles of each of these larvae can be more easily identified from each other.

MONITORING TECHNIQUES:

Black light trapping of adults can give an indication of oviposition.

Pheromones are not currently available but may be available in the near future.

INSECT REFERENCE

THRESHOLDS:

There are no thresholds supported by experimentation. Depending upon the turf type, region, and moisture availability thresholds can range from 4-12 per 0.1 m^2 (1 ft^2) for direct damage from the larvae.

In the case of mammal damage the threshold is 0.

MANAGEMENT STRATEGIES:

Follow resistance management guidelines by rotating products as outlined in IPM Template Reference “Insecticide Resistance Management Groups.” Always consult the most recent version of all product labels before use.

May and June beetle management strategies				
TYPE	TIMING/ THRESHOLD	PRACTICE		COMMENTS
Chemical	Target young larvae (grubs) in late spring	**Active Ingredient (Product)**	**Label signal word**	
		Clothianidin (Arena)	Caution	
		Halofenozide (Mach 2)	Caution	
		Imidacloprid (Merit)	Caution	
		Thiamethoxam (Meridian)	Caution	