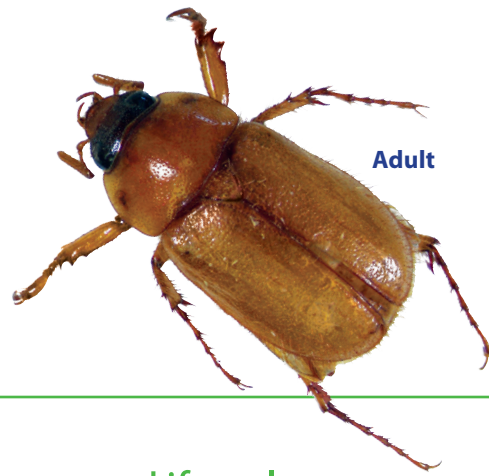


# Northern Masked Chafer



Adult

R. Chris Williamson

The northern masked chafer, *Cyclocephala borealis* Arrow, is a beetle species native to North America. It is widely distributed from the Atlantic seaboard westward to the Rocky Mountains and expands from southern New York to South Carolina. Most recently, it has been reported in two southern Wisconsin counties (Rock and Walworth).

The northern masked chafer is among the most destructive insect pests that cause turfgrass damage from feeding grubs. In addition to direct damage caused by grubs, significant indirect turf injury often occurs as predatory vertebrates scavenge for grubs.

## Identification

### Adults

Northern masked chafer adults (males and females) are relatively dull yellow-brown beetles approximately  $\frac{1}{2}$  inch long and  $\frac{1}{4}$  inch wide. Adult northern masked chafers have a dark, chocolate-brown band across the head and eyes that distinguish them from other scarab (white grub) beetles that are similar in size and color (e.g., the European chafer). In addition, northern masked chafer adults have dense hair on the ventral side (underside) of the thorax, as well as a scattered arrangement of erect hair on the wing covers (elytra).

### Larvae (grubs)

Newly laid eggs are pearl white, oval, and approximately  $\frac{1}{10}$  inch long. Emerging grubs are about  $\frac{1}{4}$  inch long and translucent white, becoming grayish after feeding. The larvae are common white grubs that have a C-shaped body and six joined legs. Unfortunately, northern masked chafer grubs do not have a discernable raster pattern (the arrangement of coarse hair located at the tip of the abdomen near the anal slit). Their raster pattern exhibits an evenly spaced, nonuniform arrangement of approximately 20 to 30 stout hairs.



Larva

The northern masked chafer has three larval stages (instars). Fully developed, mature (third instar) grubs are considerably larger and more robust than Japanese beetle larvae, ranging in length from  $\frac{5}{8}$  to  $\frac{7}{8}$  inch. Northern masked chafer grubs have a reddish-brown head capsule while Japanese beetle grubs have a yellowish-brown head capsule. Pupae are approximately  $\frac{1}{2}$  inch long and are initially creamy in color, later becoming reddish-brown as they mature.

## Life cycle

The northern masked chafer has a one-year life cycle. Adults are active in June and July with peak activity occurring in late June through early July in the Great Lakes region. Northern masked chafer adults are mostly active after midnight; they swarm over the turf surface on warm, humid nights, especially after heavy rain, in search of mates.

After mating, females burrow into the turf canopy to lay eggs in the soil. Eggs are laid singly or in small clusters in the top two inches of soil. The gestation period is 14 to 18 days depending on the temperature; most eggs hatch by late July to mid-August. When soil moisture is adequate, larvae grow relatively quickly, developing (molting) into second instar grubs in approximately 3 weeks. By early September, larvae molt into third instar grubs while continuing to feed and grow until mid- to late October.

Cooler soil temperatures or a measurable frost will move grubs deeper into the soil profile to overwinter in earthen cells just below the frost line. When spring temperatures surpass 50°F, grubs move upward into the root zone to resume feeding until fully mature in mid- to late May.

Thereafter, grubs descend 1 to 3 inches into the soil profile to form earthen cells and pupate. The pupation process takes 3 to 4 weeks to complete. Adults typically emerge from the soil in mid- to late June.

## Damage

Northern masked chafer grubs feed on and destroy the roots of most turfgrasses including endophyte-enhanced cool-season species. They also feed on decaying organic matter and are frequently found in mulched plant beds, heavier organic soils, and compost heaps. Grub damage is much like that of other white grub species—turfgrass roots are destroyed (consumed) and measurable turf decline or loss occurs. Northern masked chafer adults do not feed or cause damage to turf or other ornamental plant material.

## Control

The presence of 5 to 10 grubs per square foot of low maintenance turf is the estimated threshold at which damage is noticeable and treatment may be necessary. The threshold is slightly higher (15 to 20 grubs per square foot) in irrigated turf, as watering helps the turf recover from grub damage.

## Chemical control

An effective management strategy for the northern masked chafer is to apply a preventive insecticide prior to or near egg hatch (May to late July). Preventive insecticides include products that contain one of the following active ingredients: chlorantraniliprole, clothianidin, dinotefuran, imidacloprid, or thiamethoxam. These preventive insecticides are most effective against newly emerged, young grubs and are not effective on older, larger (second and third instar) grubs. Clothianidin is the one exception; it is also effective as a corrective or curative (rescue) treatment.

Products containing carbaryl, clothianidin or trichlorfon can be used for corrective or curative management. These products are most effective when applied in August when grubs are relatively young; their effectiveness declines when they are applied to larger, older grubs in September, October, early November, or the following spring.

Spray (liquid) and spreadable (granular) formulations of preventive and curative insecticides are available. Regardless of the active ingredient or product formulation, all products must be watered-in with a sufficient amount of post-treatment irrigation or rainfall (at least  $\frac{3}{8}$  inch) to move the insecticide through the turf thatch and into the soil where the grubs are located. Granular formulations are often more appealing and practical for homeowners and lawn care operators as they tend to be more stable in the turf environment until sufficient rainfall occurs. However, any insecticide treatment for white grubs should be watered-in as soon as possible.

Insecticide treatments directed at controlling the adult beetle or applied while it is a pupa are not effective.



Pupa



University of Wisconsin-Extension

**Copyright** © 2017 by the Board of Regents of the University of Wisconsin System doing business as the division of Cooperative Extension of the University of Wisconsin-Extension. All rights reserved.

**Author:** R. Chris Williamson is a professor and turf and ornamental specialist in the Department of Entomology at the University of Wisconsin-Madison and the University of Wisconsin-Extension, Cooperative Extension.

**Photo credit:** Adult, larva, and pupa, Mike Reding and Betsy Anderson, USDA Agricultural Research Service, Bugwood.org.

**University of Wisconsin-Extension, Cooperative Extension**, in cooperation with the U.S. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914, Acts of Congress. An EEO/AA employer, the University of Wisconsin-Extension, Cooperative Extension provides equal opportunities in employment and programming, including Title VI, Title IX, and ADA requirements. If you have a disability and require this information in an alternative format, or if you would like to submit a copyright request, please contact Cooperative Extension Publishing at 432 N. Lake St., Rm. 227, Madison, WI 53706; [pubs@uwex.edu](mailto:pubs@uwex.edu); or (608) 263-2770 (711 for Relay).

**This publication is available** from your county UW-Extension office ([counties.uwex.edu](http://counties.uwex.edu)) or from Cooperative Extension Publishing. To order, call toll-free 1-877-947-7827 or visit our website at [learningstore.uwex.edu](http://learningstore.uwex.edu).