Yellowmargined Leaf Beetle, *Microtheca ochroloma* Stål (Order Coleoptera, Family Chrysomelidae)

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Target plantings and damage:
Brassicas are the primary hosts, with the beetle preferring plants with thin leaves (e.g., turnips, radish, arugula, mustards) over those with thick leaves (e.g., cabbage, broccoli, collards). Adults and larvae damage mostly leaves, chewing holes in the leaf margins and interiors (figure right – larva circled and below left). Leaf damage can be extensive (figure below left). However, when foliage is depleted, larvae can move down to the ground to feed on exposed tubers of turnips and radishes (figure below right).

Life Stage Descriptions and Biology:
Eggs: Eggs are bright orange and cigar-shaped, and are deposited on the foliage individually or in small clusters. The eggs resemble those of lady beetles, but whereas lady beetles tend to place their eggs in masses with the eggs closely placed together and standing on end, yellowmargined leaf beetles commonly place their eggs individually, or in loose clusters with eggs rather haphazardly placed.

Larvae: Larvae tend to be brownish-grey to charcoal, are slug-like in appearance, but have three distinct pairs of legs and have hairs on the body (see figures above). The insect passes through three larval stages (called "instars"), and are most easily detected in the later 2nd and 3rd instars when they are larger and cause significant damage.

Pupae: At the end of the 3rd larval instar, the larva spins a loose, usually brownish, cocoon on the plant and pupates within. Adults emerge from the cocoons about 7-9 days after the pupa is formed, typically remaining within the cocoon for about two days after becoming an adult.

Adults: Adults are 4-6 mm long (males typically being somewhat smaller than females), and are dark bronze to black (figure at right). The common name of the beetle derives from the color along the edge of the hard wing covers (termed "elytra") on the abdomen of the beetle. The margins are typically yellow, but also may be brown or clay red (as in the image). The length of the elytra is also striated with longitudinal rows of punctures, with four rows on each elytral side.

General Biology: Beetles are active during the cooler portions of the year in Georgia, typically from late September until late May. During the warm months, they are believed to be on wild Crucifers, possibly in a state of aestivation, or summer dormancy. Both adults and larvae feed on plants, with adult feeding preceding the appearance of larvae. When initial feeding damage is observed, close attention should be given to the crop for the presence of adults. Initial damage is frequently highly localized within a field or garden. Early detection and management of this pest should help prevent spread.

Organic Management:

Natural Enemies: Although there are some predators (such as the predatory stink bugs *Stiretrus anchorago* and *Podisus maculiventris*) that attack larvae and adults of the beetle, when beetles occur in high numbers they can overwhelm biological control agents.

Cultural Practices:

- Use of straw mulch is not recommended where the beetles have occurred historically, as this can increase beetle abundance and damage (Manrique et al. 2010).

-Row covers can prevent additional beetles from getting on the plants after colonization begins.

-The use of trap crops has not been explored, but may provide a management option. The beetles appear to have a marked preference: turnips>mustards>radish>collards>cabbage (Ameen and Story 1997). Turnips being highly preferred, they could potentially be used as a trap crop for other brassicas, drawing the beetles away from leafy crops to be destroyed mechanically or through use of treatments.

Therapeutic Tools:

- Oil or insecticidal soap applied to the larvae may reduce their activity, but will have limited effect. Oils and soaps will have little or no effect on the adult insects.

- Other options include neem products, pyrethrins, and spinosad. Most of the treatment options, with the exceptions of pyrethrum and spinosad, will have much better success against larvae than against adults; and generally, the smaller the larvae, the more easily they can be controlled. Balusu and Fadamiro (2012) reported that spinosad and pyrethrum provided good control of larvae and adults, with the former being somewhat more effective. These products should be applied in the late evening if possible to give them time to dry before morning. Although they are derived from natural sources, spinosad and pyrethrum are broad spectrum insecticides and can harm native bee populations. Whereas spinosad and pyrethrum are effective on adults and larvae, neem has little activity on adults, but rather functions as a growth regulator disrupting development of larvae.

References and Additional Information:

Ameen, A. O., and R. N. Story. 1997. Feeding preferences of larval and adult *Microtheca ochroloma* (Coleoptera: Chrysomelidae) for crucifer foliage. Journal of Agricultural Entomology 14: 363–368.

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Capinera, J.L. 2001. Handbook of Vegetable Pests. Academic Press, San Diego. 729pp.

Manrique, V., C.O. Montemayor, R.D. Cave, E.A. Svarch, B.W. Smith. 2010. Effect of straw mulch on populations of *Microtheca ochroloma* (Coleoptera: Chrysomelidae) and ground predators in turnip *Brassica rapa* in Florida. Florida Entomologist 93(3): 407-411.

http://bcrcl.ifas.ufl.edu/insect-lab/leaf-beetle/images.shtml

http://entnemdept.ifas.ufl.edu/creatures/veg/leaf/yellowmargined_leaf_beetle.htm

-Photos by John R. Ruberson, University of Georgia-