



Figure 1. Adult pickleworm moth, with wings spread.

Pickleworm

Diaphania nitidalis Cramer

(Lepidoptera: Crambidae)

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Introduction. In November 2003, specimens of a caterpillar previously not known to occur in Hawaii were found damaging cucumber fruits in central Oahu by members of the University of Hawaii (UH), College of Tropical Agriculture and Human Resources (CTAHR). Subsequent surveys revealed additional damage by this insect on zucchini and kabocha squash (pumpkin) in the central Oahu area. Specimens were tentatively identified as the pickleworm, *Diaphania nitidalis* Cramer by D. Tsuda, UH CTAHR and confirmed by M. Alma Solis, Research Entomologist with the USDA Systematic Entomology Laboratory in Beltsville, Maryland.

Distribution and Hosts. Pickleworm is a tropical insect and is known to invade much of the southeast U.S. each summer (Capinera 2000). On Oahu, the pickleworm has been found widely dispersed throughout the island. In September 2004, it was found infesting Japanese cucumber at Kalaheo, Kauai. In December 2004, specimens were obtained from pumpkin at Kainaliu, Kona, on the island of Hawaii. In late March 2005, it was also found infesting cucumber at Ulupalakua on Maui. Pickleworm

caterpillars feed on cucurbits such as squash, pumpkin, cantaloupe, and cucumber, but rarely watermelon (Webb 2003). In Hawaii, the pickleworm has been found feeding on cucumber, zucchini, and kabocha squash.



Figure 2. Pickleworm eggs.



Figure 3. Third and fifth instar pickleworm caterpillars.



Figure 4. Pickleworm pupa (left) and adult moth (right).

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Life History. According to Webb (2003) and Sorenson (1996), pickleworm moths are active only at night. They lay tiny eggs (Figure 2) singly or in small clusters on buds, flowers, and other actively growing plant parts. Each moth can deposit 300 to 400 eggs. Young larvae are light-colored with many dark spots and are typically found in flower buds. Spotting fades as the caterpillar reaches the final fifth instar stage (Figure 3). Pupation usually occurs outside of fruit, on leaf surfaces and leaf folds. The adult moth is yellow and purplish (Figure 4).

Damage. Young pickleworm caterpillars tend to feed in blossoms (Figure 5), destroying the plants capacity to produce fruit (Capinera 2000). Caterpillars also tunnel into fruits leaving a distinct circular hole. In some instances, caterpillars will excrete frass outside of the tunnels, which provide additional evidence that the pest is feeding within the fruits (Figure 6).



Figure 5. Pickleworm damage to kabocha squash bud (upper left) and flowers (lower left and right).



Figure 6. Pickleworm damage to cucumber fruit.

Management. Commercial growers should carefully monitor their cucurbit crops. At first sign of an infestation, treat with approved insecticides. Consult with the Cooperative Extension Service for latest recommendations. Insecticides with minimal residual activity should be used and applied late in the day to

lessen the impact on honeybees which are necessary for crop pollination.

Biological Control. Natural enemies such as generalist predators and specific parasitoids are recorded to occur elsewhere, but have not reliably suppressed damage (Capinera 2000). In Hawaii, no parasitoids have been recovered, although predators such as lacewings have been observed attacking pickleworm caterpillars (Figure 7). The Hawaii Department of Agriculture (HDOA) is investigating the possibility of importing tiny parasitic wasps for added biological control of this insect.



Figure 7. Predaceous lacewing attacking pickleworm caterpillar.

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