J.HAW.PAC.AGRI. 5:67-71(1994)

NOTES:

IDENTIFICATION AND CONTROL OF THE CHINESE ROSE BEETLE, *ADORETUS SINICUS* BURMEISTER

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KEYWORDS: *Chinese rose beetle, Adoretus sinicus Burmeister, Control*

The Chinese rose beetle (Fig. 1), (Order: Coleoptera, Family: Scarabaeidae), has been recognized as a serious pest of many agriculturally important crops in the Hawaiian Islands since its accidental introduction in the late 1890's (Habeck 1963). Presently, this beetle is found on all major islands and utilizes a large number of crop and noncrop plants as a food source. The list of (host) plants used is estimated to be over 500 and includes such crops as corn, taro, and beans.

The adult beetle causes damage to plants by feeding on leaves at night. The damage pattern left on the leaves after Chinese rose beetle feeding is very distinct. Feeding is concentrated in the area between the major veins resulting in leaves that have a lace-like appearance (Fig. 2) (Marsden 1979). This feeding damage can be significant enough in plants as to reduce fruit yield (Furutani et al. 1990). The immature Chinese rose beetle larvae are usually found under the soil surface near the base of plants. The larvae does not appear to cause any damage to the root system of plants as seen in many other types of foliage feeding scarab beetles.

DESCRIPTION OF DEVELOPMENTAL STAGES

This insect has four different stages of development (Fig. 3) (Habeck 1964). The egg hatches into the larva or grub which in turn develops into a non-feeding pupa, all of which can be found in the soil. The adult beetle emerges from the pupa. During the day the adult can be found resting in the soil while at night the beetles are observed feeding and mating on plant leaves (Fig. 4).

The female Chinese rose beetle lays her eggs directly into the soil. The eggs are white in color, oval in shape and are approximately 1.5 to 1.7 mm (1/16 to 1/14 inch) long.

The larva has an opaque white body with a brown head and short well-developed legs. Usually larvae are found in the soil in a curled (C-shape) position but when disturbed can move with the assistance of their legs; moving the front half of body and dragging back half of body. The size of the grubs during this stage is between 3 to 21 mm (1/12 to 3/4 inch) long from the

time it first emerges from the egg to the time just before it pupates. This stage lasts about 3 to 4 weeks. The larvae feed on decaying organic matter found in the soil.

The pupa is light brown in color which turns darker just prior to the emergence of the adult. The pupa can be found in the soil and averages about 13 mm (1/2 inch) long.

The adult ChinesE rose beetle is dark brown in color and approximately 13 mm (1/2 inch) long. The beetle is only active at night to mate and feed. In Hawaii, large numbers of adult beetles can be observed flying into fields about 30 minutes after sunset where mating and feeding takes place until the early morning hours (Tsutsumi et al. 1993). The beetles will leave the fileds before the daylight hours. During daylight, the adults can be found buried just below the surface of the soil in a resting state.

CURRENT CONTROL METHOD

The only recognized control method for this beetle, to date, is a series of insecticides which include; carbaryl, methoxychlor, diazinon, and malathion. Please check with your cooperative extension agent for the insecticides cleared for your crop.

FUTURE CONTROL METHODS

Testing is currently underway to develop additional control methods for this insect pest. Since all methods are currently undergoing research studies, none of the following methods are available for use at the preent time. Please check with your cooperative extension agent for more information on these non-insecticidal control methods. These methods include:

Chemical lures. Synthetic lures including food and sex lures are being tested for attractancy. Successful ones will be field tested on the borders just outside of field crops to see if the numbers of beetles feeding in the field can be reduced due to attract is underway (Hara et al. 1989, Arita et al. 1993).

Trap cropping . Preference for certain plant types by thise beetles has been observed (Arita et al. 1988, Furutani & Arita 1990, Furutani et al. 1993). Isolation of these plant products is being conducted. Once isolated, these products will be applied onto border crops thus reducing damage on the field crops.

Microbial agents. Screening of different microbial agents such as fungi, bacteria, nematodes is underway (Hara et al. 1989, Arita et al. 1993) Those microbials that show promise will be field tested.

ACKNOWLEDGEMENT

This bulletin was supported by a grant from the Agricultural Development in the American Pacific, Pacific Land Grant Program. We are grateful for the technical support of R. Hession, D. Sakai, and B. Tamura. We also appreciate the media assistance of S. Yugawa and D. Igawa.

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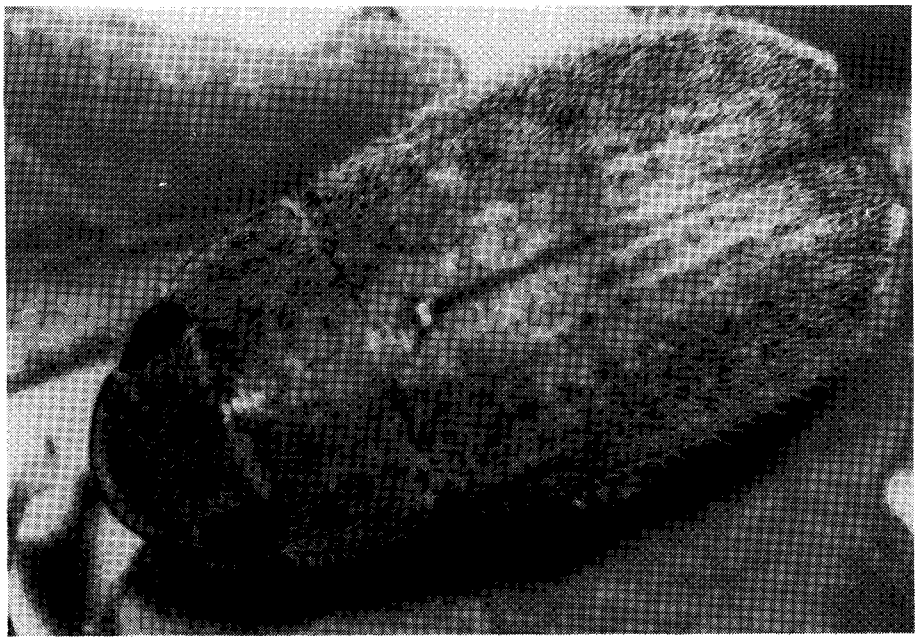

Figure 1. Chinese rose beetle adult

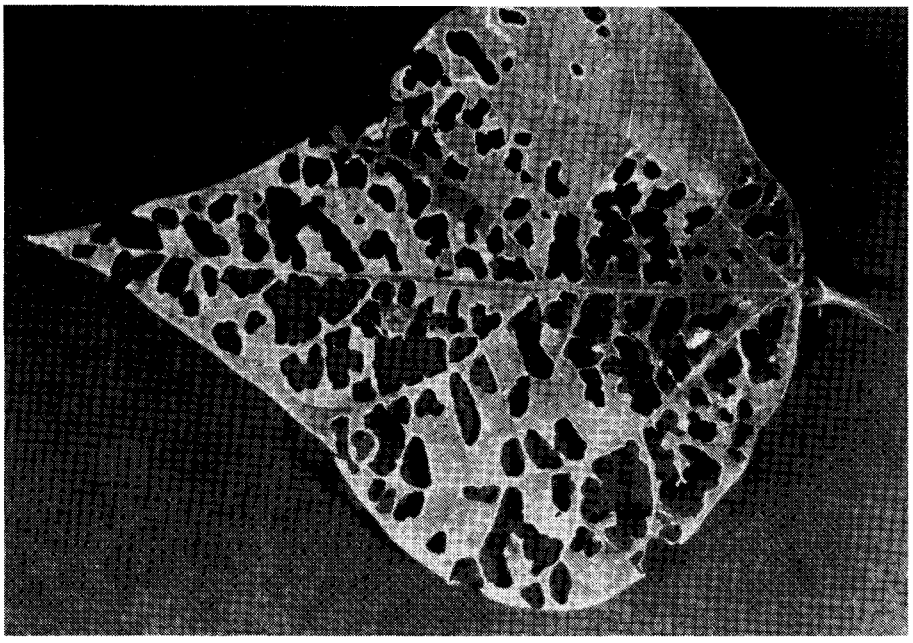

Figure 2. Chinese rose beetle feeding damage on snap bean leaf

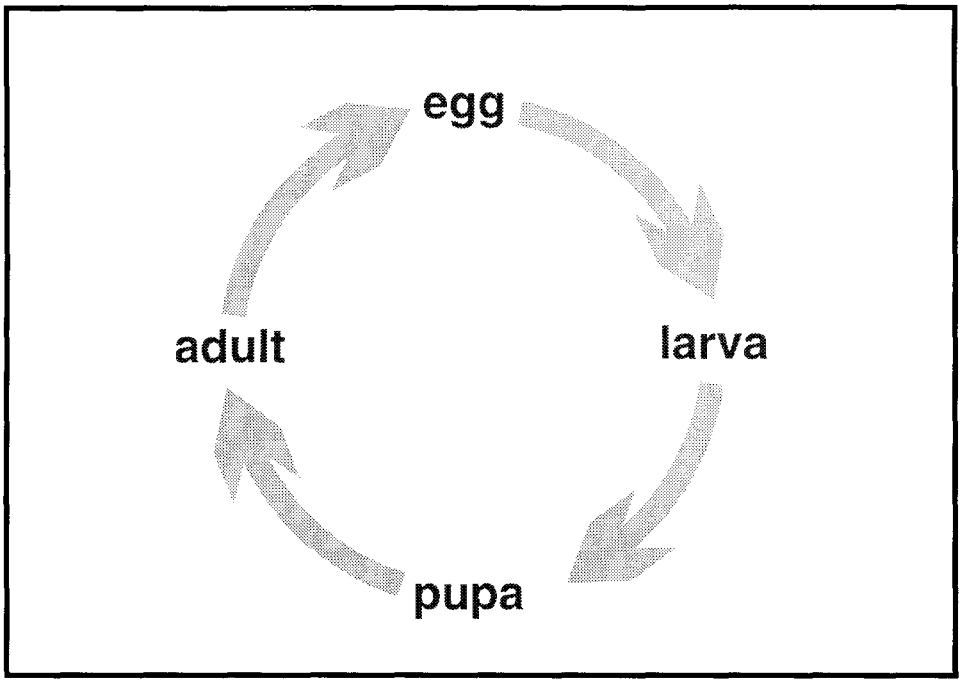

Figure 3. Chinese rose beetle life cycle

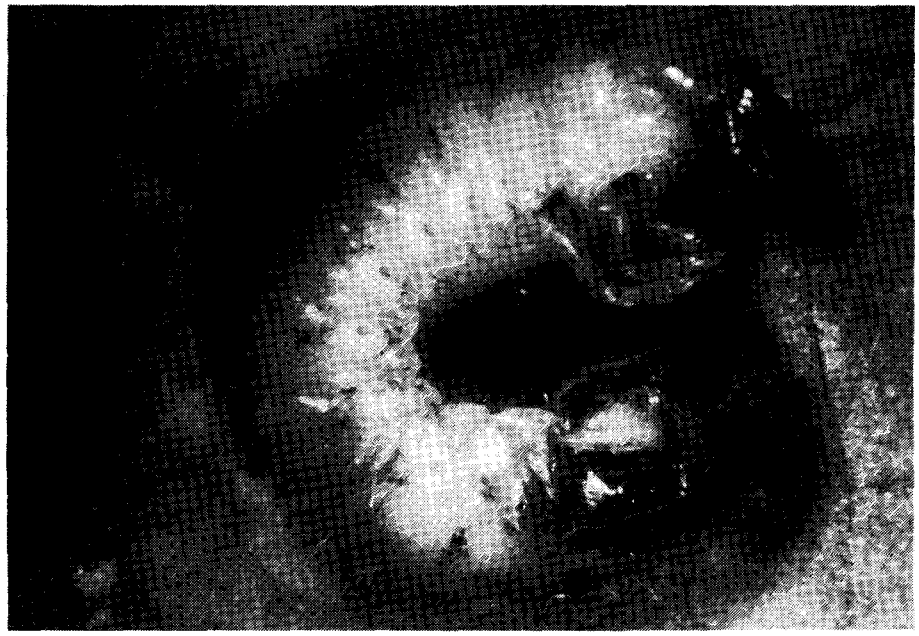

Figure 4. Chinese rose beetle larva