Proc. Fla. State Hort. Soc. 134:135–136. 2021.

—Scientific Note—

Population Dynamics of Pepper Weevil, *Anthonomus eugenii* Cano (Coleoptera: Curculionidae) in Jalapeño Pepper under Field Conditions in South Florida

Victoria O. Adeleye*, and Dakshina R. Seal

Tropical Research and Education Center, University of Florida, IFAS, Homestead, FL

Additional index words. jalapeño, marking pheromone, pepper weevil

Pepper, *Capsicum annuum* L. is in Solanaceae. It is one of five most-cultivated species in tropical and subtropical regions. There are different types and varieties of pepper which are cultivated worldwide, including sweet and hot types. Characteristics like pungency, flavor, and aroma make them important ingredients in many people's daily diet. Jalapeño pepper is in the hot pepper group. It is one of the common hot peppers for cooking.

Pests and diseases are constraints to pepper production. Pepper weevil (PW), *Anthonomus eugenii* Cano (Coleoptera: Curculionidae), an economically important pepper pest, originated in Mexico. It was first reported in Florida in 1935. The female lays eggs in fruits, flowers, and buds. The life cycle is 20–30 days; there are 3–5 complete generations per year depending on temperature, host, and availability of food.

Different insects in various orders deposit marking pheromones after oviposition, mostly under conditions with limited resources for growth and survival (Addesso et al. 2021). Laboratory studies show that PW uses these marking pheromone to signal conspecifics and prevent additional oviposition. This reduces competition for available resources among larvae, as well as increasing host-finding efficiency. It is important to evaluate the significance of marking pheromones under field conditions. The objective of this study was to validate the idea that PW conspecifics use the same strategy under field conditions as they do under laboratory conditions. We determined PW density in infested jalapeño fruits, fruit size preference for oviposition and did a correlation between fruit length and PW density.

Materials and Methods

One hundred and fifty infested jalapeño peppers were collected randomly from an infested field for different growing seasons, Fall 2019, Spring 2020, Summer 2020, Fall 2020, and Spring 2021 to evaluate PW density. They were dissected in the lab where the number of PW per fruit were counted and recorded by fruit size. We measured the fruit length (cm) to see if there was a correlation between PW density and fruit length. We used the following range of fruit sizes: small (≤ 1.5 cm); medium (1.5–3 cm); large (3–5 cm) and extra-large (> 5 cm).

Results and Discussion

The result shows that there is no real correlation between fruit size and PW preference (density/fruit) under field conditions. Small fruits ≤ 1.5 cm generally had only 1 PW/fruit. This could be a way to minimize competition when resources are limited and fruit too small to feed more than one PW. More than 70% of larger fruits had more than two larvae, at least in the fall seasons. In the field, all fruit sizes were infested (Fig. 1a). Lower infestations were recorded in small fruits ≤ 1.5 cm. Most (> 80%) medium, large, and extra-large fruit had higher rates of PW across the seasons, except in the summer (Fig. 2).

Conclusion and Future Directions

Pepper fruit need to be protected from PW damage at all stages up to harvest. PW does not discriminate among different fruit sizes, but per fruit density is lower in small fruit. There have been cases of fruit with over 3 larvae (Fig. 1b), but their survival to the adult stages is uncertain. It is important to develop effective strategies to delay the infestation and establishment of

Fig. 1. (**A**) Different sizes of infested jalapeño pepper fruit. (**B**) Infested jalapeño fruit with larval and pupal life stages.

*Corresponding author. Email: vadeleye@ufl.edu

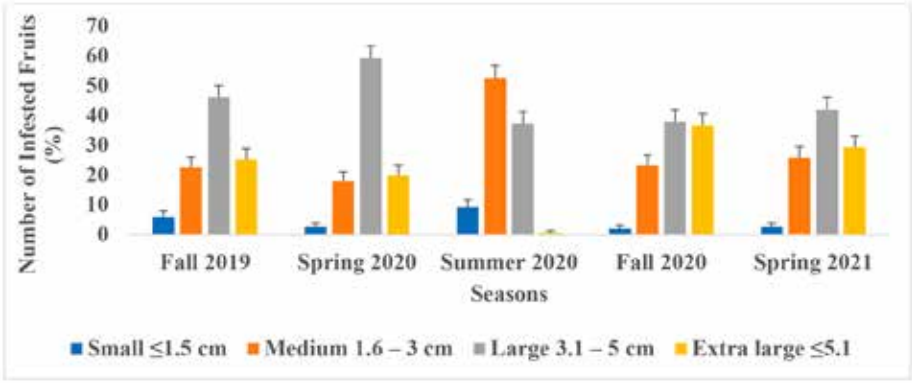

Fig. 2. Percentage of pepper weevil infested fruits by fruit size.

PW in fields because, once they become established, it is difficult to manage them. Having a better understanding of the nature of the PW host marking pheromone under field conditions could be a useful IPM tool. It will require a lot of work to isolate and identify the active components in female frass and oviposition plugs in PW.

Literature Cited

Addesso, K.M., H.T. Alborn, R.R. Bruton, and H.J. McAuslane. 2021. A multicomponent marking pheromone produced by the pepper weevil, *Anthonomus eugenii* (Coleoptera: Curculionidae). Chemoecology. 31:247–258.