CITRUS ROOT DAMAGE AND THE SPATIAL DISTRIBUTION OF EGGS OF *DIAPREPES ABBREVIATUS*[1]—(*Note*): The sugarcane rootstalk borer weevil, *Diaprepes abbreviatus* (L.), is an introduced insect that is destructive to Florida citrus. The adult female deposits eggs on mature leaves and subsequently cements the leaves together. Neonate larvae fall to the ground, enter the soil, and feed on roots. Insecticides incorporated into the surface of the soil could be used to prevent larvae from entering the root area, and the toxicant should be placed where it is most effective in preventing major root damage to minimize the amount of insecticide required. We therefore investigated the spatial distribution of eggs in the tree canopy relative to the potential for damage to the host tree.

The trees used in the study were 6-year-old grapefruit, *Citrus paradisi* Macf., grafted on rootstock of sour orange, *Citrus aurantium* (L.). The trees were ca. 2 m high, crown diam 1.5 m, and were planted 3 m apart. Neonate larvae from field-collected *D. abbreviatus* were placed on the soil adjacent to the trunk (10 trees); on the soil 20 cm from the trunk (10 trees); and on the soil at the crown drip line about 1 m from the trunk (10 trees). Each of the trees was treated in this way with 100 larvae/week for 10 weeks between August and November 1975. (This number represented the probable number of larvae produced by a single female weevil feeding on citrus.) Six months later all trees were removed, and the root systems were examined. A numerical classification of tree damage was made independently by 2 members of our laboratory, and data were subjected to an analysis of variance. Damage classifications were: Light = larval feeding confined to lateral roots, tree growth probably not affected (0–3); Moderate = larval feeding on the taproots and lateral roots, tree growth probably affected (4–6); Severe = larval feeding on taproot with lateral roots girdled, tree decline would probably occur (7-10).

The 3 treatments differed significantly (P 0.05) in the amount of tree damage. When larvae were placed at the base of the tree, the greatest feeding occurred on the taproot and the origin of major lateral roots: 8 of these trees had severe damage, and 2 had moderate damage. When larvae were placed 20 cm from the trunk, lateral root and taproot feeding decreased appreciably: damage was severe on 5 trees, moderate on 3, and light on 2. When larvae were placed at the tree drip line, the most distal area for oviposition, larval feeding was limited to lateral roots and there was little feeding on the taproot: 2 trees were damaged severely, 6 moderately, and 2 lightly.

Damage was clearly related to the spatial distribution of eggs in the canopy. Horizontal migration of larvae on lateral roots seemed to be limited, and root feeding usually occurred directly below the area of larval placement. Because larvae from a single female can cause sufficient root feeding to debilitate a young tree, any soil insecticides used to protect young trees should be applied to the area adjacent to the trunk. This would provide protection for the taproot and origin of major lateral roots, and the amount of insecticide required would be minimized. W. J. Schroeder and R. A. Sutton, U.S. Horticultural Research Laboratory, Agr. Res. Serv., USDA, Orlando, Florida 32803.

[1]Coleoptera: Curculionidae