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RECENT OBSERVATIONS ON SOME AVOCADO PESTS IN MEXICO AND EL SALVADOR

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Many insect pests affect the avocado. Thirty six species were listed by Bruner, *et al*., (1945) in Cuba. Forty-two species were given by Ebling (1950) as present in California, Florida Mexico or Central America and 376 as avocado pests of the world (1959). Twenty-five insect pests were reported by Capeo (1956) as present in the Philippines. Thirty-four insect pests were given by Wolfenbarger (1958) in Florida. Fourteen species were listed in the West Indies by Wolcott (1933).

Knowledge of these pests and the injury they cause would be needed if any of the exotic ones should become established in Florida. These pests should be prevented from entering Florida, if possible, because some of them are capable of causing severe damage to avocado trees and fruits.

Trips into Mexico in recent years and a recent trip into El Salvador made possible some observations under field conditions.

AFFECTED PARTS

Injuries observed may be divided into four categories depending on part or parts of trees affected. These are fruit, twigs, seed and leaves.

Fruit Infestations.— A stenomid moth, *Stenoma catenifer* Wlshm., damaged most of the fruit in Ecuador according to Busck (1919) who repeated a report that it was almost impossible to buy an uninfested fruit on the market. The species, as reported by Lima (1945) in Brazil, was very damaging to the fruit.

Nearly all of the fruit observed in a grove in El Salvador was infested with a borer, Figure 1, specimens of which submitted to G. W. Dekle, Florida State Department of Agriculture, Division of Plant Industry, were classified as *S. catenifer.*

Eggs appeared to have been laid on or in the fruit. Larvae hatch and burrow into the fruit to the seed, Figure 3, where they feed on the seed surface or burrow into it. Scarred seeds were observed as if the larvae had fed thereon, Figure 4. Larvae in some instances were almost an inch in length. They had greenish-white or grayish-colored bodies and they had brownish-or blackish-colored heads. Uncovered, disturbed larvae Figures 2 and 3, moved suddenly, rapidly toward darkened areas. Pupation apparently occurs outside of the fruit; none was seen.

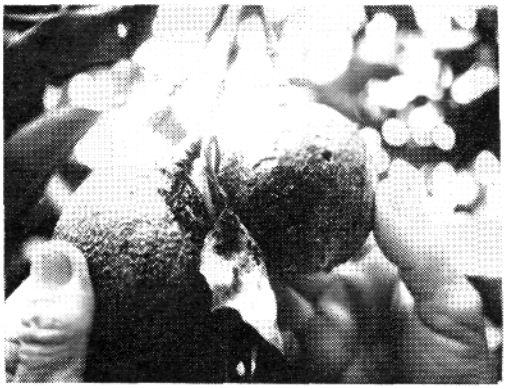

Fig. 1.—Fruit on tree, contact surfaces separated, showing stenomid moth infestation. Fruit on left has much larval excrement, as do darkened stains on the leaf. Hole in fruit on right.

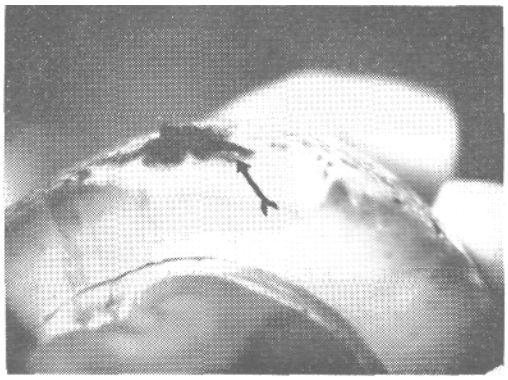

Fig. 2.—Stenomid moth larva feeding, at arrow point, in outer part of fruit before burrow to seed.

Much larval excrement was in evidence in and about holes in the fruit. Small holes in the fruit and amounts of excrement indicated that some larvae had entered the fruit recently. Other holes were considerably larger, suggestive of the original holes which had been enlarged.

Each infested fruit is obviously a cull, Figure 2. Such fruit becomes soft, mushy and eventually falls and becomes completely decayed.

Twig Borers.—Larvae of the stenomid moth were reported by Ebling (1959) to bore into the twigs of avocado trees. Observations showed many dead branches or twigs on trees and on the ground. Some terminal twigs were wilting, Figure 5. Reduced numbers of terminal branches, Figure 5, indicated previous or long-time infestations. Entrance into the twigs is evidently initiated in crotches since no other hole was observed and since much excrement was observed in such places. Although the insects involved were not positively identified as *Stenoma catenifer* the larvae were probably of that species. Losses of the twigs and small branches undoubtedly reduce yields in current and future crops.

Seed Weevils.—There appears to be at least four species of avocado seed weevils according to Ebling (1950) but none is known in Florida. Wolcott (1933) reported none was recognized in the West Indies. *Heilipus lauri* Boh., *H. pittieri* Barber, H. *perseae* Barber and *Conotrachelus perseae* Barber were listed by Ebling (1950) as seed weevils present in Mexico or Central America. The broad-nosed grain weevil, *Caulophilus latinasus* (Say), was recognized by Ebling (1959) as one to infest fallen fruits in California. It was recognized as present in Cuba but was not observed by Bruner, *et al*., (1945). *C. latinasus* may be present in Florida but one or more species of *Xyleborus* sp. termed ambrosia beetles are present and infest avocado seed. Ambrosia beetles enter seeds after the flesh has decayed or been removed. Entrance is followed by the construction of galleries for rearing of young.

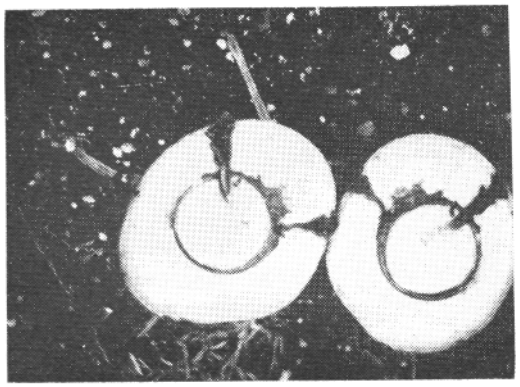

Fig. 3.—Sectioned fruit showing two stenomid moth larval burrows to the seed. Larva partly in seed in left section, other larva burrowed on outside of seed.

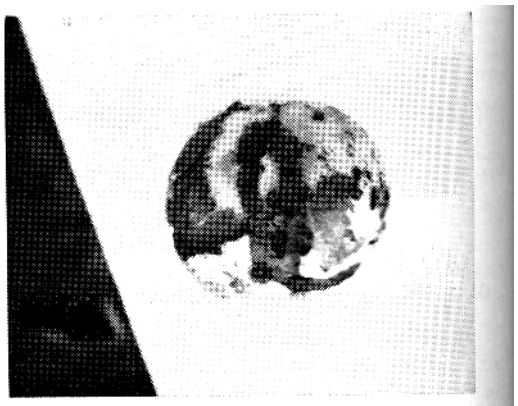

Fig. 4.—Seed showing shallow feeding by stenomid moth larvae.

Fig. 5.—Partially defoliated tree showing paucity of twigs in relief against sky, from infestation of burrowing larvae. Arrow points to wilting twigs.

Examination of seed in Mexico and El Salvador showed that few seeds were infested in some areas and that many seed were infested in other areas. Burrows of the larvae intertwine in the seed where the larvae develop and which the larvae fill with excreta, Figure 6.

Leaf Galls.—Galls, growths or malformations on leaves are common in Mexico and Central American countries, according to Ebling (1959). These are spectacular tubular outgrowth on the upper surfaces, Figure 7, averaging near an inch in length. Nymphs of a psyllid, Trioza *naceps* Tuthill, develop in the galls. Although many galls develop on the leaves, trees are not killed but may be stunted or reduced in growth ending in reduced yields.

Fig. 6.—Avocado seed weevil burrows into seed.

Fig. 7.—Galls on upper surfaces of leaves.

DISCUSSION

Some insects of the same species exist in Florida, Cuba and other nearby areas. The red banded thrips, *Selenothrips rubrocinetus* (Giard.), for example, is present in all countries but was not listed in Mexico or Central American countries by Ebling (1959). As distances from Florida increase dissimilarities in the species or kinds of insects increase. This is suggestive that quarantine measures may be more important on more distant lands.

Quarantines and other restrictive measures have retarded or barred the successful entry of some or most of these would-be invaders. Their absence is evidence of the effectiveness of such protection. Breaches have occurred, however, as evidenced by the invasion of the Mediterranean fruit fly, *Ceratitis capitata* (Wiedmann). Constant vigilance is needed, therefore, to prevent entry or establishment of other harmful or likely-to-be harmful pests in Florida.

Native plants usually endure native pests over the course of time. The avocado, a native to Central America and adjacent countries has undoubtedly endured its insect pests over many years. Movement of a plant to a distant area, such as the United States, however, exposes it to new conditions and new pests which may or may not attack it. A change of pests to a new area may or may not increase nor prevent attacks. The abundances of stenomid larvae in the fruit and in the twigs appeared to be more ravaging than may be expected for a native pest on a native plant.

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