

variety of rootstocks have been used on avocados in Florida. There is a bare possibility that some of these may be tolerant or even resistant to attack by these nematodes; this would explain the occurrence of healthy trees frequently found among declining trees. If there is reason to do so after the initial inoculation tests on avocados are conclusive, the next logical step in this problem will be to run rootstock trials, using the same inoculation technique.

It will be of interest to mango and lychee growers that there is no evidence yet that either of these is subject to severe infestation by these nematodes. Nevertheless, mango seedlings are being tested at the Sub-Tropical Station in the same manner as avocados with *burrowing* and meadow nematodes. The Citrus Station has a limited amount of evidence that lychees are not susceptible to burrowing nematodes. They are testing this further by inoculation under controlled conditions. If

avocados should prove to be susceptible to decline from nematodes, it is possible they could be replaced safely with mangos or lychees where desirable.

While there is a question at present whether burrowing and meadow nematodes, either alone or in combination, cause a decline that is readily recognizable as such, there is no question but that they have an adverse effect on the trees. It is hardly conceivable that the extensive root damage observed does not reduce growth and yield. This can be an insidious sort of thing, without distinct above-ground symptoms, that over a period of years may be almost as costly as a definite decline. As information increases on host plants, means of dispersal, natural enemies and conditions under which the burrowing and meadow nematodes may become epidemic to the point of causing definite decline, it is possible that satisfactory control measures will be developed.

MANGO VARIETIES

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Mango varieties in Florida are either "horticultural varieties" propagated vegetatively, or seedling "races" or "types." Regardless of this distinction, they can conveniently be classified into four groups, as follows:

1. Varieties introduced from India. These are known as the Indian mangos and include the Mulgoba, Amini, Paheri, and Sandersha. The plants or grafting material were originally brought to this country many years ago by the United States Department of Agriculture. These varieties have never performed well in commercial plantings and today they are found mostly in collections. The seeds are typically monoembryonic.

2. Varieties or types that were introduced either directly from the Philippines and French Indo-China, or from some other country, but because the fruit possesses certain characters in common, they are listed in this group regardless of place of origin. They

are referred to as the Philippine and Saigon mangos. Some, like the Caraboa and Pico, are well-known varieties in the Philippines. Others, like the Manila, Cecil, Cambodiana, and Saigon, were introduced to Florida as seeds, the Manila from Mexico, Cecil from Cuba, Cambodiana and Saigon from Indo-China. They are polyembryonic and are frequently propagated from seed. Because of this they are generally referred to as types rather than varieties. The Cambodiana and Cecil, however, are horticultural varieties and are propagated vegetatively. The Philippine mangos are principally found in collections or as dooryard trees.

3. Varieties or types introduced from the West Indies and South America. The types known as Turpentine and No. 11, which were the first mangos brought into Florida nearly a century ago, are typical of this group. They are polyembryonic and propagated from seed. They are not planted commercially but are common trees scattered throughout South and Central Florida. Because they usually produce an abundance of fruit, they serve as a source of seed for root stock. Other varieties propagated vegetatively and quite unlike Turpentine and No. 11, are included in this group

because they came from the West Indies or South America. Three of these are the Julie from Trinidad, Madame Francis from Haiti, and Itamaraca from Brazil.

4. Varieties originating in Florida as first generation seedlings of Indian varieties (such as Brooks, Haden, Kent), or as second generation seedlings (such as Fascell, Irwin, Lippens, Smith). This group also includes three varieties (Edward, Samini and Simmonds) that are considered to be crosses between Indian and Philippine mangos, and one (Davis-Haden) that is considered as a mutation or sport of the Haden. Twenty-nine of these varieties have been officially named and described (see Table 1). The old varieties, such as the Haden, Brooks, and Springfels, have been planted commercially for several decades. But during the past 15 years an intensified search has been made for varieties that will bear with greater regularity and produce good yields of fruit of high quality and good eye appeal. It is considered by many that from this group of new varieties originating in Florida will come mangos that will hold more promise for the future of Florida's mango industry. The Mango Forum and its variety committee has helped to bring some of these newer varieties before the public. The University of Florida Sub-Tropical Experiment Station, the University of Miami Experimental Farm, nurserymen, and many individuals have aided this work in searching for better varieties. Nearly 75 varieties are on test at the Sub-Tropical Experiment Station to determine yield, performance, susceptibility to anthracnose, etc., and since 1948 yield records have been maintained.

Of the 32 varieties that are listed in Table 1, those that are being planted commercially include the following in order of popularity: Kent, Zill, Irwin, Keitt, Palmer, Davis-Haden, Haden, Lippens, and Fascell. To a lesser extent the following varieties are being planted: Brooks, Springfels, Edward, Florigon, Smith, Carrie, Dixon, and Glenn.

Several other varieties are being planted; these include the Eldon, Jacquelin, Ruby, and Sensation. Since these have not been officially named, they are described in this paper for the first time. Also named and described are Adams, Earlygold, and Sunset, which have been under observation at the Experiment Sta-

tion for several years and seem worthy of varietal description.

ELDON

The Eldon originated on the property of W. B. Eldon, 1055 S. W. 12th Ct., Miami. The seed, reported to be from a Haden tree, was planted in 1939; it first bore fruit in 1942. It was first propagated about 1948 by J. W. Chafer and Lawrence Zill. The tree is of moderate vigor, upright with a dense head of light-green foliage; the new leaves are a pale brownish-red. The fruit is of medium size with an attractive variegated color which upon ripening becomes a very bright tomato-red. Season is July.

Description of fruit (Fig. 1). Form oval; size medium; weight up to 18 ounces; length 4½ inches, width 3½ inches, thickness 3 inches; base flattened, the stout stem inserted squarely and slightly elevated, the cavity shallow; apex rounded; beak lateral and sometimes inconspicuous, 1 inch above apex; surface smooth; skin thick but easily separating; bloom gray and slight; ground color pale yellow with the blush a bright tomato-red; before ripe the coloring is variegated with pastel shades of yellow, orange, red, purple-red, and green; lenticels numerous, medium large, yellow; flesh pale yellow to deep yellow, firm, melting, juicy, sweet, with a pleasant aroma; fiber absent in flesh; medium long on seed; quality good to very good; seed monoembryonic.

JACQUELIN

The Jacquelin originated of unknown parentage in Lake Worth and has been propagated by nurseries since about 1950. The tree is vigorous growing, upright and spreading, with a dense head of dark-green foliage; the new leaves are brownish-red in color. The fruit is large, attractively colored and the flavor is very good to excellent. Season is June and early July.

Description of fruit (Fig. 2). Form round to reniform, asymmetrical, with the left shoulder high and the right shoulder sloping; size large; weight 22 ounces; length 5½ inches, width 4¼ inches, thickness 3¼ inches; base rounded, the stout stem inserted obliquely in the deep cavity; apex rounded; beak small and lateral, ¾ inch above apex; surface smooth but slightly undulating; skin thick but easily separating; bloom heavy, gray; ground color

Table 1. FLORIDA MANGO VARIETIES

VARIETY	YEAR SEED PLANTED	YEAR FIRST FRUITED	YEAR PROPAGATED COMMERICALLY	YEAR NAME FIRST PUBLISHED	PARENT TREE	WHERE ORIGINATED
Alice	1935	1940	--	1950. Lynch & Mustard	Saigon	South Miami
Anderson	1926	1931	--	1948. Lynch & Krome	Sandersha	Miami
Brooks	1910, ca.	1916, ca.	1924	1923. Beach 1942. Wolfe & Lynch	Sandersha	Miami
Cambodiana	1902	--	--	1915. Rolfs	Seed from Saigon	Miami
Carrie	--	1940	1940, ca.	1950. Lynch & Mustard	Sophie Fry	Delray Beach
Cecil	1900 or 1902	1907	(1910)	1910. Taylor	Seed from Cuba	Miami
Davis-Haden	--	1942	1945, ca.	1948. Lynch & Krome	Mutation of Haden	Miami
Dixon	1930, ca.	--	1949	1950. Lynch	Unknown	Coconut Grove
Edward	1923-287	--	1948, ca.	1944. Sturrock & Wolfe 1944. D. R. Sturrock	Haden X Carabao	Miami
Fascell*	1929	1936	1942	1942. Wolfe & Lynch	Brooks	Miami
Florigon	1932	1938	1947, ca.	1947. Ruehle	Unknown	Ft. Lauderdale
Fragrance**	--	1930	(1935)	1942. Wolfe & Lynch	Unknown	Naples
Gibbons	1921	1931	--	1934. Krome 1950. Lynch & Mustard	Unknown	Miami
Glenn	1940	1945	1950, ca.	1948. Lincoln & Cobin	Haden	Miami
Golden Brooks	1936	1942	--	1948. Lynch & Krome	Brooks	South Miami
Haden	1902	1910	1910-12	1912. Cellon 1915. Rolfs	Mulgoba	Coconut Grove
Heinlein	1938, ca.	--	--	1948. Lincoln & Cobin	Mulgoba?	Redlands
Herman	1934	1940	--	1948. Lynch & Krome	Saigon	South Miami
Irwin	1939	1945	1949, ca.	1949. Lynch & Krome	Lippens	Miami
Keitt	1939	--	1946, ca.	1947. Ruehle	Mulgoba?	Homestead
Kent	1952	1938	1944	1945. Ruehle	Brooks	Coconut Grove
Lippens	1931	1938	1945	1947. Ruehle	Haden	Miami
Lucille	1936, ca.	--	--	1948. Lincoln & Cobin	Haden?	South Miami
Palmer	1925	--	1945	1949. Lynch & Krome	Unknown	Miami
Pettigrew	--	--	--	1950. Zill	Unknown	Palma Solo
Saigon (type)	1904	--	--	1944. D. Sturrock	Seed from Saigon	Miami
Samini	1923-287	1930	--	1944. Sturrock & Wolfe 1944. D. Sturrock	Saigon X Amini	Miami
Simonds	1923-287	1934	--	1942. Wolfe and Lynch 1944. D. Sturrock	Haden X, Carabao	Miami
Smith	--	1938	1946, ca.	1948. Lynch & Krome	Haden	Ferrine
Springfels	1919	1925	1930	1942. Wolfe & Lynch	Haden	West Palm Beach
Strothman	1918, ca.	--	--	1947. Ruehle	Unknown	Miami
Zill	1922	1930	1940	1945. Ruehle	Haden	Lake Worth

* Plant Patent No. 451, 1941

** Plant Patent No. 119, 1934

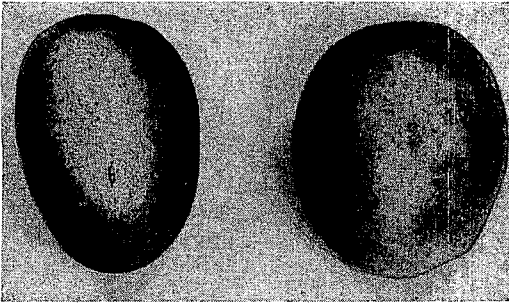


Fig. 1. Eldon

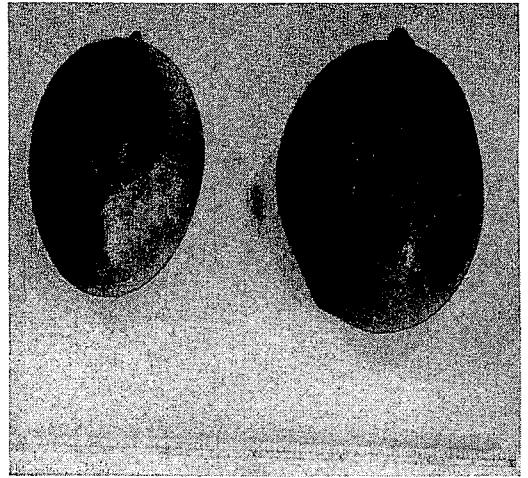


Fig. 3. Ruby

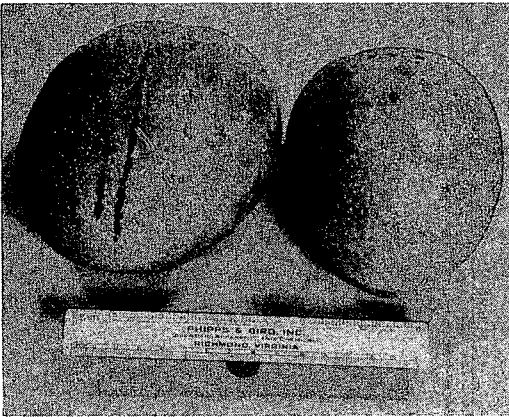


Fig. 2. Jacquelin

greenish-yellow to yellow-orange, with a dark red blush, but before ripe the coloring is variegated with pastel shades of red, purple, green, yellow, and orange; lenticels numerous, large and yellow; flesh color orange, tender, melting, juicy, sweet, and with a pleasant aroma; fiber absent in flesh, short on seed; quality very good to excellent; seed monoembryonic.

RUBY

The Ruby originated of unknown parents on the property located at 3623 S. W. 25th St., Miami, E. P. Davis named it and first propagated it in 1948. The tree is of moderate vigor, upright, slightly spreading, and with a somewhat open head; the new leaves are reddish-brown. The fruit is small and often produced in clusters; it is very attractively colored and of very good quality. Season is July.

Description of fruit (Fig. 3). Form long and relatively slender; weight 6-8 ounces; length to 5 inches, width $2\frac{3}{4}$ inches, thickness

$2\frac{3}{4}$ inches; base rounded and narrow with sloping shoulders, the stout stem inserted on a prominent elevated button; cavity absent; apex bluntly rounded; the beak small and lateral, $\frac{3}{8}$ inch above apex; surface smooth; skin thin and easily separating; bloom slight and gray; ground color yellow-orange, the blush a dark red to crimson color; lenticels numerous, pale yellow; flesh firm, deep yellow, sweet and melting, with a pleasant aroma; fiber absent in flesh, short on seed; quality good to very good; seed monoembryonic.

SENSATION

The Sensation originated in North Miami of unknown parentage. The seed was planted in 1935 and the first fruiting occurred in 1941. In 1949 the tree was moved to the Carmichael Groves and Nurseries near Perrine. It was named by J. B. Carmichael and has been propagated since 1949. The tree is a heavy producer. The fruit is medium to medium-small with an attractive plum-red color. Season is August.

Description of fruit (Fig. 4). Form oval; size medium to medium-small; weight 10 to 12 ounces but larger fruit will weigh as much as 20 ounces; length $3\frac{3}{8}$ inches, width 3 inches, thickness $2\frac{3}{4}$ inches; base flattened, the left shoulder elevated and the right shoulder sloping; the stout stem slightly elevated and inserted obliquely in a grooved cavity; apex rounded to bluntly pointed; beak lateral, often inconspicuous, $\frac{3}{8}$ inch above apex; surface

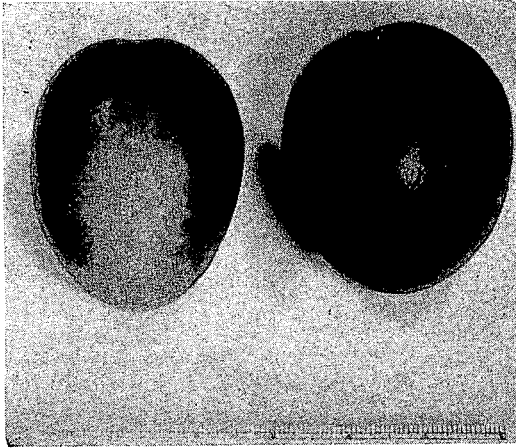


Fig. 4. Sensation

smooth to somewhat undulating; the skin thin, adhesive, but easily separating; bloom gray and moderate in amount; ground color bright yellow to yellow-orange, the blush dark plum-red; lenticels numerous, small and pale yellow; flesh firm, pale yellow, mild, slightly sweet, of a distinctive flavor and with aroma faint but pleasant; fiber scanty in flesh; quality good; seed monoembryonic.

ADAMS

The Adams originated at Frank Adams Grove on Pine Island, Lee County, of unknown parentage. Scions were obtained by the Sub-Tropical Experiment Station in 1942 and a grafted plant was set in the field the same year. It has been carried in the Station's records as Adams 23. The tree is of moderate vigor, upright with slightly spreading branches, forming a thin head of dark green foliage; the new leaves are a pale-red-dish brown. The fruit is small with an attractive color and of very good quality. The season is June and July.

Description of fruit (Fig. 5). From oval to oblong; size small; weight 6 to 10 ounces; length $3\frac{3}{4}$ inches, width 3 inches, thickness 3 inches; base flattened with the left shoulder slightly elevated, the stout stem inserted squarely; cavity absent; apex rounded; beak small and lateral, $\frac{1}{2}$ inch above apex; surface smooth, the skin thick but easily separating; bloom gray and moderate in amount; ground color bright yellow with a crimson blush; lenticels few, small and yellow; flesh firm, deep yellow to orange, slightly sub-acid, tender, melt-

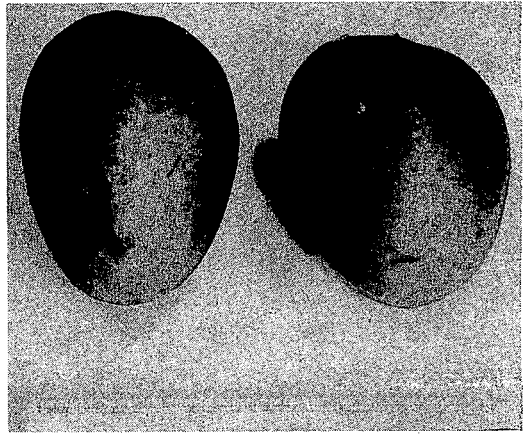


Fig. 5. Adams

ing, juicy, rich, sweet, and with a pleasant aroma and of very good quality; fiber absent in flesh, short on seed; seed monoembryonic.

The yield records of the tree planted in the field in 1942 are as follows:

Age of tree (Years)	No. of fruit	Weight (lbs.)	Season
6	136	67	June 1-June 16
7	100	58	July 15-July 30
8	99	44	May 27-July 8
9	134	59	June 15-July 20
10*			
11	341	136	June 3-June 16
12	205	127	July 16-July 30

* No yield records taken as the crop was very light.

EARLYGOLD

The Earlygold originated at Frank Adams Grove on Pine Island, Lee County, of unknown parentage. Scions were obtained by the Sub-Tropical Experiment Station in 1940 and a grafted tree was set in the field in 1942. It has been carried in the Station's records as Adams 22. The tree (Fig. 6), is of moderate vigor, upright with a thin head of light green foliage; the new leaves are brownish-red. The fruit is of medium size with an attractive yellow-orange color and pink blush. The quality is very good to excellent. Season May and June.

Description of fruit (Fig. 7). Form oblong; size medium; weight 8 to 12 ounces; length $4\frac{3}{4}$ to $5\frac{1}{4}$ inches, width $2\frac{1}{2}$ to $3\frac{3}{4}$ inches, thickness 2 to 3 inches; base rounded, the stout stem inserted obliquely in a slightly shallow cavity or sometimes elevated and cavity absent; the left shoulder elevated; apex bluntly pointed; beak small and lateral, from $\frac{1}{2}$ to $\frac{3}{4}$ inch above the apex; surface smooth, the skin

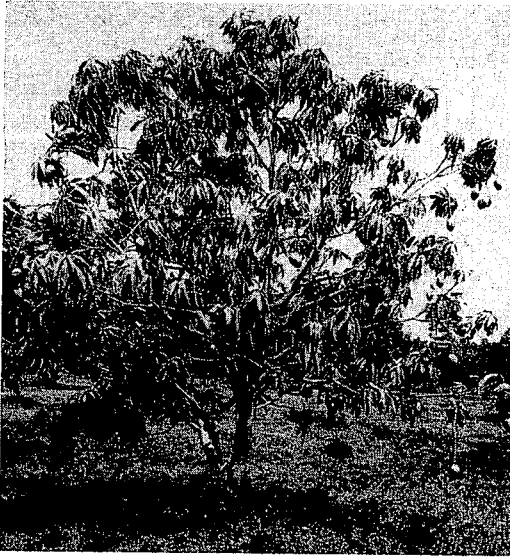


Fig. 6. Eight-year old Earlygold tree.

somewhat thick and adhesive; bloom gray, slight; ground color yellow-orange, with an orange-red or orange-pink blush when fruit exposed to the sun; lenticels small, yellow to white; flesh deep yellow, soft to medium firm, juicy, sweet, rich, melting, and with a pleasant aroma; fiber absent in flesh, short on seed; quality very good to excellent; seed polyembryonic in most cases, but a high percentage of stones contain abortive seeds.

The yield records of the tree planted in the field in 1942 are as follows:

Age of tree (Years)	No. of fruit	Weight (lbs.)	Season
6	46	28	May 21-June 19
7	59	44	June 3-July 23
8	124	68	April 30-June 10
9	43	21	June 9-July 7
10	220**	149	June 9-July 5
11	98	67	April 18-June 12
12	140	123	June 3-July 9

** This is considered an exceptional yield, since this season, 1952, was an "off" year for most varieties.

SUNSET

The Sunset originated at Frank Adams Grove on Pine Island, Lee County, of unknown parentage. Scions were obtained by the Sub-Tropical Experiment Station in 1946 and a grafted plant was set in the field in 1947. It has been carried in the Station's records as Adams 9. The tree is a vigorous grower, upright but somewhat spreading, forming a thin head of medium green foliage; the new leaves are brownish in color. The

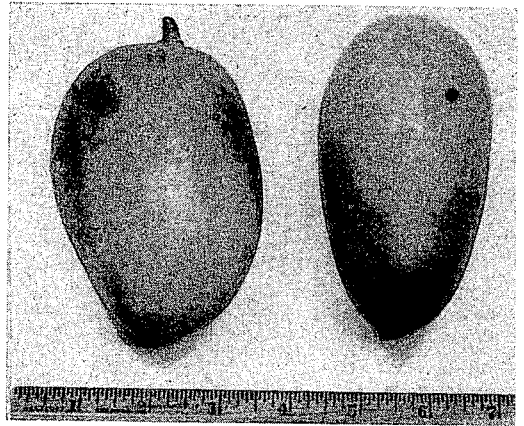


Fig. 7. Earlygold

fruit is medium-small in size, with an attractive color and of good to very good quality. Season is June to July.

Description of fruit (Fig. 8). Form oval to oblong; size medium-small; weight 10 to 12 ounces; length $4\frac{1}{2}$ inches, width $3\frac{3}{4}$ inches, thickness $2\frac{1}{4}$ inches; base rounded, the stout stem inserted obliquely in a shallow cavity or sometimes elevated on a button; apex rounded to bluntly pointed; the beak usually absent but if present small and lateral, one inch above the apex; surface smooth with a slight bloom; skin thick, easily separating; the ground color yellow-orange with a bright orange-red blush; lenticels small, numerous, yellow; flesh deep yellow, firm, juicy, melting, sweet to somewhat acidulous, with a pleasant aroma; fiber absent in flesh, fine on seed; quality good to very good; seed monoembryonic.



Fig. 8. Sunset

The yield records of the tree planted in the field in 1947 are as follows:

Age of tree (Years)	No. of fruit	Weight (lbs.)	Season
3	31	28	June 10-July 9
4	37	26	June 20-July 20
5***			
6	53	48	June 10-July 9
7	142	97	June 21-July 19

*** No yield records taken as the crop was very light.

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THE GUAVA FRUIT MOTH, ARGYRESTHIA EUGENIELLA BUSCK.

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An insect infesting guava fruit was first recognized as an important pest early in 1945. There were severe infestations at this time and many fruit contained two or more larvae of a small moth having the scientific name of *Argyresthia eugeniella* Busck. Guava fruit moth is a name used locally and is the common name hereby suggested for this insect. Moths were originally obtained by E. A. Schwarz from the fruits of a native plant, the Spanish Stopper, *Eugenia myrtooides* Poir., in Key West, Florida, in March 1912. A description of the species was given by Busck in 1916 (*Proc. Ent. Soc. Washington XVIII* (3): 153).

The insect has been taken in guava fruit near Stuart, Auburndale, and throughout Dade County. It is, therefore, widely, if not universally, distributed in southern Florida wherever guava plants grow. It is not known, however, to exist in Mexico, or in the West Indies.

Infested fruit are sometimes flattened on one side but many fruit that contain larvae are not deformed, nor do they give any external evidence of infestation. Wherever there is an abundance of infested fruit, however, many fruits will have many external scars symptomatic of insect attacks. These scars occur in and about depressions or burrows in the outer part of the fruit, Fig. 1.

Larvae at first make such narrow burrows in the fruit that the burrows are practically invisible. As the larvae increase in size, the burrows they make become larger. In addition to the larger burrows there is more frass and discolored flesh and the discoloration becomes more prominent. The fruit becomes distinctly "wormy," Fig. 2. Some larvae evidently perish in attempting to burrow into guava fruit. Other larvae appear to have perished inside the fruit in their attempts to develop. More extensive feeding is done among the seeds than elsewhere, Fig. 2.

The smallest larvae are whitish in color with a black head. As the larvae approach maturity a pink color develops and increases until mature larvae are sometimes almost ruby red