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PEST ALERT

Florida Department of Agriculture and Consumer Services, Division of Plant Industry
Adam H. Putnam, Commissioner of Agriculture

The Mediterranean Fruit Fly, *Ceratitis capitata* (Wiedemann) (Diptera: Tephritidae)

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INTRODUCTION: The Mediterranean fruit fly, *Ceratitis capitata* (Wiedemann), is one of the world's most destructive fruit pests. Because of its wide distribution over the world, its ability to tolerate colder climates better than most other species of fruit flies, and its wide range of hosts, it is ranked first among economically important fruit fly species.

Its larvae develop and feed on most deciduous, subtropical, and tropical fruits and some vegetables. Although it may be a major pest of citrus, often it is a more serious pest of some deciduous fruits, such as peach, pear, and apple. The larvae feed upon the pulp of host fruits, sometimes tunneling through it and eventually reducing the whole to a juicy inedible mass.

In some of the Mediterranean countries, only the earlier varieties of citrus are grown, because the flies develop so rapidly that late season fruits are too heavily infested to be marketable. Some areas have had almost 100% infestation in stone fruits. Harvesting before complete maturity also is practiced in Mediterranean areas generally infested with this fruit fly.

In this age of jet transportation, the "medfly" can be transported from one part of the world to some distant place in a matter of hours, which greatly complicates efforts to contain it within its present distribution. Once it is established, eradication efforts may be extremely difficult and expensive. In additon to reduction of crop yield, infested areas have the additional expense of control measures and costly sorting processes for both fresh and processed fruit and vegetables. Some countries maintain quarantines against the medfly, which could jeopardize some fresh fruit markets if it should become established in Florida.

DISTRIBUTION: Mediterranean fruit fly infestations in the United States have occurred in Hawaii since 1910, in Florida from April 1929 to July 1930, April 1956 to November 1957, June 1962 to February 1963, June to August 1963, and 3-14 August 1981, in Texas from June to July 1966, and in California since September 1975. Other infested countries (an asterisk indicates occasionally infested) are Albania, Algeria, Angola, Argentina, Australia, Austria*, Azores, Balearic Islands, Belgium*, Bermuda, Bolivia, Botswana, Brasil, Burundi, Cameroon, Canary Islands, Cape Verde Islands, Chile, Colombia, Costa Rica, Crete, Cyprus, Dahomey, Ecuador, Egypt, El Salvador, Ethiopia, France, Germany*, Ghana, Greece, Guatemala, Guinea, Honduras, Hungary*, Israel, Italy, Ivory Coast, Jamaica, Jordan, Kenya, Lebanon, Liberia, Libya, Madagascar, Madeira Islands, Malagasy Republic, Malawi, Mali, Malta, Mauritius*, Mexico* (near Guatemalan border), Morocco, Mozambique, Netherlands*, Nicaragua, Niger, Nigeria, Panama, Paraguay, Peru, Portugal, Reunion, Rhodesia, Rwanda, Saint Helena, San Miguel (Azores), Sardinia, Saudi Arabia, Senegal, Seychelles, Sicily, Sierra Leone, South Africa, Southern Rhodesia, Spain, Sudan, Switzerland*, Syria, Tanzania, Tasmania, Togo, Tunisia, Turkey, Uganda, Upper Volta, Uruguay, Venezuela, Yugoslavia, Zaire, and Zambia.

HOSTS: The Mediterranean fruit fly attacks more than 260 different fruits, flowers, vegetables, and nuts. Thin-skinned, ripe succulent fruits are preferred. Host preferences vary in different regions. Although several species of cucurbits have been recorded as hosts of the medfly, they are considered to be very poor hosts. Some hosts have been recorded as medfly hosts only under laboratory conditions and may not be attacked in the field. Knowledge of the hosts in one country often aids in correctly predicting those which are most likely to be infested in a newly infested country, but what may be a preferred host in one part of the world may be a poor host in another.

IDENITIFICATION: The medfly has no near relatives in the Western Hemisphere. Adults are slightly smaller than a house fly and have picture wings typical of fruit flies (fig. 1). They can be distinguished fairly readily from any of the native fruit flies of the New World.

Adult length: 3.5-5 mm. Yellowish with brown tinge, especially on abdomen, legs, and some markings on wings. Lower corners of face with white setae. Eyes reddish purple (fluoresce green, turning blackish within 24 hours after death). Ocellar bristles present. Male has pair of bristles with enlarged spatulate tips next to inner margins of eyes. Thorax creamy white to yellow with characteristic pattern of black blotches. Light areas with very fine white bristles. Humeral bristles present. Dorsocentral bristles anterior of halfway point between supraalar and acrostichal bristles. Scutellum inflated and shiny black. Abdomen oval with fine black bristles scattered on dorsal surface and 2 narrow transverse light bands on basal half. Extended ovipositor 1.2 mm long. Wings, usually held in a drooping position on live flies, are broad and hyaline with black, brown, and brownish yellow markings. Wide brownish yellow band across middle of wing. Apex of anal cell elongate. Dark streaks and spots in middle of cells in and anterior to anal cell.

LIFE HISTORY AND HABITS: The length of time required for the medfly to complete its life cycle under typical Florida summer weather conditions, and upon which eradication schedules in Florida are based, is 21-30 days. A female medfly will lay 1-10 eggs in an egg cavity 1 mm deep, may lay as many as 22 eggs per day, and may lay as many as 800 eggs during her lifetime (usually about 300). The number of eggs found at any time in the reproductive organs is no indication of the total number of eggs an individual female is capable of depositing, as new eggs are being formed continually throughout her adult life. Females usually die soon after they cease to oviposit.

Eggs are deposited under the skin of fruit which is just beginning to ripen, often in an area where some break in the skin already has occurred. Several females may use the same deposition hole with 75 or more eggs clustered in one spot. When the eggs hatch, the larvae promptly begin eating, and at first tunnels are formed, but may keep close together in feeding until nearly full grown. Fruit in a hard or semiripe condition is better for oviposition than fully ripened fruit. Ripe fruit is likely to be more juicy, and such fruits often are associated with a high mortality of eggs and young larvae.

Females will not oviposit when temperatures drop below 60.8°F (16°C) except when exposed to sunlight for several hours. Development in egg, larval, and pupal stages stops at 50°F (10°C). Pupae carry the species through unfavorable conditions, such as lack of food, water, and temperature extremes. During warm weather eggs hatch in 1.5-3 days. The duration of the egg stage is considerably increased by lower temperatures. Larvae pass through 3 instars.

Larval life may be as short as 6-10 days when the mean temperatures average 77-79°F (25-26.1°C). The kind and condition of the fruit often influence the length of the larval stage. In citrus fruits, especially limes and lemons, it appears to be longer. Thus larvae require 14-26 days to reach maturity in a ripe lemon, as compared with 10-15 days in a green peach.

Larvae leave the fruit in largest numbers at or just after daybreak and pupate in the soil or whatever is available. Minimum duration of the pupal stage is 6-13 days when the mean temperature ranges from about 76-79°F (24.4-26.1°C). Back and Pemberton (1915) noted that this period may be increased to at least 19 days when the daily temperature means drop to about 69-71°F (20.6-21.7°C).

Adults emerge in largest numbers early in the morning during warm weather and emerge more sporadically during cool weather. They can fly short distances, but winds may carry them a mile or more away. Copulation may occur at any time throughout the day. Newly emerged adults are not sexually mature. Males often show sexual activity 4 days after emergence, and copulation has been observed 5 days after emergence. Both sexes are sexually active throughout the day. When the daily mean temperature averages from 76-78°F (24.4-25.6°C), most females are ready to mate from 6-8 days after eclosion.

Oviposition may take place as early as 4-5 days after emergence during very warm weather, but not for about 10 days when temperatures range between 68-72°F (20-22.2°C) (Back and Pemberton 1915). Adults die in greatest numbers within 2 days after emergence, or within 4 days if they cannot obtain food. Usually about 50% of the flies die during the first 2 months after emergence.

Some adults may survive up to a year or more under favorable conditions of food (fruit, honeydew, or plant sap), water, and cool temperatures. When host fruit is continuously available and weather conditions favorable for many months, successive generations will be large and continuous. Lack of fruit for 3-4 months reduces the population to a minimum.

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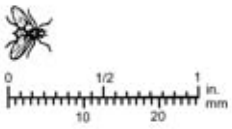
Adult mediterranean fruit fly.

The adult medfly is smaller than a house fly.



Female medfly ovipositing into fruit.

Medfly larvae on fruit.

Adult medfly.

Medfly larvae.

Medfly life stages.

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