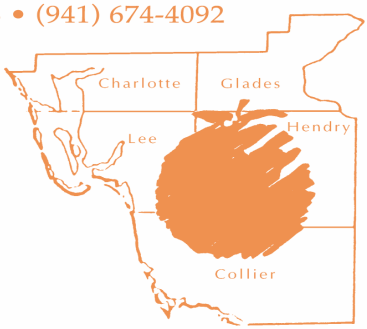
UNIVERSITY OF FLORIDA | EXTENSION
Institute of Food and Agricultural Sciences

Hendry County Extension • P.O. Box 68 • LaBelle, Florida 33975-0068 • (941) 674-4092

Flatwoods Citrus



Vol. 4, No. 10 October 2001

Dr. Mongi Zekri, Multi-County Citrus Agent

UPCOMING EVENTS

Special Seminar!

Spanish Production, handling and marketing of Clementines

Speaker: **Mr. Benito Orihuel, Valencia, Spain**
Date: Thursday, October 4, 2001, 11:00 AM –12:00 Noon
Location: Immokalee IFAS Center

Weather 101–What makes weather and why does it do what it does

Date: Tuesday, October 16, 2001, 10:00 AM – 12:00 Noon
Location: Immokalee IFAS Center
Speaker: Jim Clarke, meteorologist, NBC-WBBH TV, SW Florida
Sponsor: Chet Townsend, Agrilink Florida Inc., Florida, USA
2 CEUs for Certified Crop Advisors
Following the seminar, we are planning a free lunch (Compliments of Agrilink Florida Inc.) for only who call Sheila at 863 674 4092 no later than Thursday, 11 October.

Weather seminars continue

-Tuesday, October 23, 2001, 10:00 AM – 12:00 Noon
Tropical meteorology and severe weather
-Tuesday, October 30, 2001, 10:00 AM – 12:00 Noon
Forecasting – The long range outlooks
-Tuesday, November 13, 2001, 10:00 AM – 12:00 Noon
Short term forecasts – weather by the seat of your pants
Speaker: Jim Clarke, meteorologist, NBC-WBBH TV, SW Florida

Participants with disabilities seeking accommodations, please inform us at least five working days prior to the program

Tuesday, November 20, 2001, 10:00 AM – 12:00 Noon
Scott's controlled release fertilizer, dry application of fertilizers and methods to reduce ammonia volatilization
Speakers: Drs. Tom Obreza, Bob Rouse, and Andree-Ann Couillard
Sponsor: Dr. Andree-Ann Couillard, The Scotts Company
2 CEUs for Certified Crop Advisors

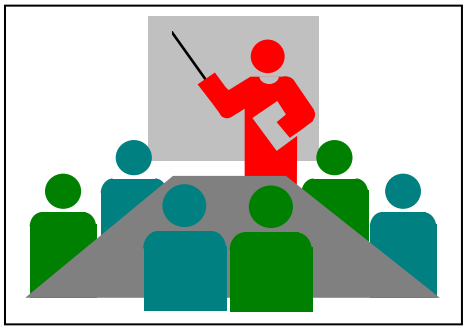
Hendry County Extension Ag Tour
Date: December 8, 2001
For more information, call Inez at 863 674 4092

Tuesday, December 18, 2001, 10:00 AM – 12:00 Noon
BMPs-What has been done and what to expect?
Speakers: Stan Carter and others
Sponsor: Robert Murray, Florida Favorite Fertilizer
2 CEUs for Certified Crop Advisors

Tuesday, January 15, 2002, 10:00 AM – 12:00 Noon
Thrips, citrus psyllid, and citrus greening
Speakers: Drs. Carl Childers and Pam Roberts
Sponsor: Sam Nifong, Dow AgroScience
2 CEUs for Pesticide License Renewal
2 CEUs for Certified Crop Advisors

Tuesday, February 5, 2002, 8:30 AM – 4:00 PM
Workshop on scouting for pests and diseases
Speakers: John Taylor and Drs. Pam Roberts and Mongi Zekri
Sponsor: Robert Gregg, Syngenta
6 CEUs for Pesticide License Renewal
6 CEUs for Certified Crop Advisors

Tuesday, February 19, 2002, 10:00 AM – 12:00 Noon
Water management and issues related to water regulations
Speakers: Mary N. Gosa and Drs. Larry Parsons and Sanjay Shukla
Sponsor: Donna Muir Strickland, Monsanto
2 CEUs for Certified Crop Advisors



Tuesday, March 19, 2002, 10:00 AM – 12:00 Noon
Precision Ag and application technology
Speakers: Neal Horrom, Mike Roberts and others
Sponsor: Keith Hollingsworth, Chemical Containers
2 CEUs for Pesticide License Renewal
2 CEUs for Certified Crop Advisors

Tuesday, April 16, 2002, 10:00 AM – 12:00 Noon
Grove replanting and resetting strategies and Diaprepes and canker update

Special Thanks to the following sponsors of the Faltwoods Citrus Newsletter for their generous contribution and support. If you would like to be among them, please contact me at 863 674 4092.

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CHART SUMMARIZING FACTORS AFFECTING CITRUS PRODUCTION AND FRUIT QUALITY

Do irrigation and nutrition impact citrus fruit production and quality? A new wall chart provides answers to this and many other questions. The chart is available for $10 at the University of Florida (UF) Institute of Food and Agricultural Sciences (IFAS) Citrus Research and Education Center (CREC) in Lake Alfred (tel.: 863 956 1151, fax: 863 956 4631). Proceeds from chart sales will help support the newly established Citrus Research and Education Foundation at CREC.

The poster-size chart, "Factors Affecting Citrus Production and Fruit Quality," outlines relationships between 32 influencing factors and 15 production quality elements. The 32 influencing factors are listed under 9 broad categories, including climate, rootstock, water, nutrition and pests and diseases. Production and quality elements include fruit yield, fruit size, juice content, ratio, soluble solids per acre and juice color.

The chart was developed with the goal of summarizing factors that affect citrus production and fruit quality, and represents a first attempt to compile the information distributed throughout the scientific literature. It is anticipated that updated information will be added over time. While the chart is geared primarily to Florida, much of the information is applicable to other citrus growing regions where interested individuals may also choose to modify the contents to more accurately reflect their specific conditions.

Authors are David Tucker, Graham Barry and Renee Goodrich. Tucker is an Extension horticulturist emeritus with UF/IFAS, Barry is a research horticulturist with Capespan International, South Africa, and Renee Goodrich is an Extension food scientist at CREC.

Special Thanks to these sponsors of the Flatwoods Citrus Newsletter for their generous contribution and support. If you would like to be among them, please contact me at Phone 863 674 4092, Fax: 863 674 4636, or maz@gnv.ifas.ufl.edu

CITRUS RESET MANAGEMENT

Replacement of dead, diseased, and declining trees in Florida citrus groves has always been an important part of the total production program. Today, tree replacement is more important than ever since overhead and production costs are getting very high and a full stand of productive trees is essential to maximize production and profits. Freezes, blight, tristeza, Phytophthora, Diaprepes, and other pests and diseases have been particularly troublesome to Florida citrus growers for the last two decades. Extensive tree losses coupled with the economic necessity of regular resetting have caused many growers to investigate ways to achieve new efficiencies in reset management.

NOT AN EASY TASK

Caring for young citrus trees is always troublesome because they require far more attention than larger, established trees. Florida's sandy soils, high summer temperatures, possible low winter temperatures, and scattered rainfall patterns complicate young tree care by forcing growers to water, protect, fertilize, and weed young trees regularly or face extensive losses.

Resets often present an even greater problem because trees are usually scattered throughout a block of larger trees, where they compete with large, full-grown trees for limited supplies of moisture, nutrients, and sometimes, sunlight. Scattered resets frequently have serious weed problems since removal of the previous tree allows the area to receive more sunlight and provides more favorable conditions for weed growth. Since resets are usually scattered throughout a block of much larger trees, they are often difficult to locate and may be accidentally overlooked, resulting in inadequate care.

Researchers, growers, and production managers are continually developing and improving methods of dealing with reset care.

PLANNING THE RESET PROGRAM

Grove managers should include tree removal and resetting as a routine part of the production program and often assign special times and special crews to deal specifically with this task. Planning ahead is very important because there is often a lag between the time replacement trees are ordered and when they are received. The wait for the desired rootstock and scion combination may be as great as 1 to 2 years, so replacement tree needs should be anticipated (when possible) and orders placed so they can be obtained when needed.

PURCHASING TREES

High quality trees are essential for resets. These young trees will be placed in an intensely competitive situation and may sometimes receive less than ideal care, so there is no room for compromising tree quality. Only healthy and in good shape trees from registered sources should be purchased since the initial cost is only a fraction of the total cost of bringing such a tree into production. The selection of bare-root or container-grown replacement trees is largely a matter of grower choice or availability. One can find proponents of either type of trees.

SITE PREPARATION

The planting site should be well-prepared. Weeds and roots should be removed before planting. At the very least, a non-residual herbicide should be applied to the reset area to get weeds under control before the young tree is set. The use of most residual herbicides prior to planting is discouraged unless extremely low rates are used since young trees are particularly susceptible to herbicide injury.

Planting sites should be prepared well in advance of receipt of the trees. This is particularly important for bare-root trees, which should be planted as soon as possible after they are received. Ideally, trees should be planted on the same day they are received. Under no circumstances should bare-root trees be allowed to dry out. To minimize root desiccation and damage, they should be kept cool and moist until they are planted.

PLANTING THE TREES

Inspect bare-root trees for broken or damaged roots and remove them by clipping near the damaged area. Since the fibrous root system of bare-root trees is usually severely cut back when they are dug, it will be necessary to remove some of the leaves and branches in order to balance the top with the root system. Most often this is done about the time the trees are dug by removing from a third to a half of the top of the tree. This is best accomplished by partially cutting back individual branches, rather then removing entire ones.

Container-grown trees should be removed from the container and inspected for evidence of pot-binding. Make several vertical slashes about one inch deep through the root ball to encourage root branching. These slashes also allow the potting soil and roots to interface more closely with the soil in the planting site. It may be easier to cut some of the roots with pruning shears and pull them so they protrude from the ball.

A common problem with container-grown plants is that the potting mixture is often highly organic. Such materials form areas which are difficult to permeate with water after the young tree is planted in sandy soils and irrigated. The outer third or more of the organic ball should be removed by pulling or washing so that the roots can extend into the soil in which the tree is planted. Otherwise, the tree may not grow off satisfactorily.

WEED CONTROL

Weeds compete with young citrus trees for moisture and nutrients and they must be controlled. Weed control around a reset site should be considered at pre-plant, early post-plant, and after the tree is established. Control of weeds prior to planting should be provided. If residual herbicides are used, they should be used in greatly reduced rates and well in advance of planting so that harmful residues do not remain which might damage the reset. Contact or growth regulating herbicides are usually preferred since they do not leave residual effects.

Weed control during the establishment period or approximately the first year is frequently quite difficult. Hand labor is scarce and expensive. Trunk damage by hoes or other cultivation equipment further compounds the problem. Chemical weed control provides at least a partial solution to the problem during this establishment period. There is now a fairly wide selection of residual herbicides available which can be used on young trees. Most of the compounds will require reduced rates of materials with greater frequencies of application. Be sure to read labels carefully for restrictions on the use of herbicidal materials.

After the reset has been planted for a year or more, modifications of the weed control program can be considered. Labels of materials under consideration should be checked carefully for hazards or restrictions prior to use. Reduced rates of residual herbicides for young trees are required to assure that no harm will come to resets planted among older trees. Specially modified herbicide applicators are available which enable the equipment operator to deliver a half-rate of material at his discretion.

FERTILIZATION

Frequent reset fertilization requires extra effort beyond the needs of the bearing grove. Application of water-soluble fertilizers with irrigation water (fertigation) can increase fertilizer efficiency. Great care must be taken to ensure that proper rates of fertilizer materials are dispensed to prevent nutritional deficiencies or toxicities. Frequent light applications usually produce best results and lessen the danger of leaching but these practices need to be evaluated for cost effectiveness. Highly organic or controlled-release fertilizers that release nutrients slowly may reduce application frequency.

IRRIGATION

Young citrus trees require frequent but moderate water application for survival and proper growth. Competition for water is accentuated by nearby older trees or if weeds are allowed to grow close to the young trees. Anything that can be done to discourage competition for available soil moisture should be beneficial to the young tree. Irrigation systems should be in place before planting trees. Special modifications can sometimes be made to supply water for resets. However, the irrigation frequency necessary to sustain a mature grove is rarely adequate for good growth of newly-set trees and young trees should be checked frequently to be certain they are receiving sufficient water.

Drainage is as important as irrigation. Excess water must be removed from the rootzone. The concept of total water management must be practiced. If either system—irrigation or drainage—is not designed, operated, and maintained properly, then the maximum profit potential of a grove cannot be achieved. In southwest Florida, both surface and subsoil drainage is necessary to obtain adequate root systems for the trees.

SPROUTING

The use of insulating tree wraps usually eliminates the need for sprouting. Wraps often stay in place for up to 3 years. They should, however, be checked periodically for the presence of ants or fungus diseases. Freedom from sprouts may be enough to justify their use. Wraps will also provide protection from errant herbicide applications. There are no simple answers to the use of wraps. Each situation is different and requires careful horticultural and economic consideration to arrive at the best procedure.

GROVE PLAT

Since resets are usually scattered throughout a block of much larger trees, they are often difficult to locate and may be accidentally overlooked, resulting in inadequate care. An annually updated grove plat is probably the best method for assessing general grove condition and productivity. Plats can be prepared by hand or with the assistance of a computer. This can help determine the number of trees which will be needed and where they should be placed. Reset plats can be prepared to later help equipment operators locate newly-planted trees for periodic care.

MEDITERRANEAN FRUIT FLY

The Mediterranean fruit fly, *Ceratitis capitata*, is one of the world's most destructive fruit pests. The species originated in the Mediterranean region of Europe and North Africa, and is not known to be established in the United States. When it has been detected in Florida and California, especially in recent years, each infestation necessitated intensive and massive eradication and detection procedures so that the pest did not become established.

Medfly Adult male

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, the Mediterranean fruit fly is ranked first among economically important fruit fly species. Its larvae develop and feed on more than 260 different fruits, flowers, vegetables, and nuts. Although it may be a major pest of citrus, it is often a more serious pest of some deciduous fruits, such as peach, pear, and apple. The larvae feed on the pulp of host fruits, sometimes tunneling through it and eventually make the fruit inedible.

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. Harvesting fruit before complete maturity is practiced in Mediterranean areas infested with this fruit fly. In this age, 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 are extremely difficult and expensive. In addition 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.

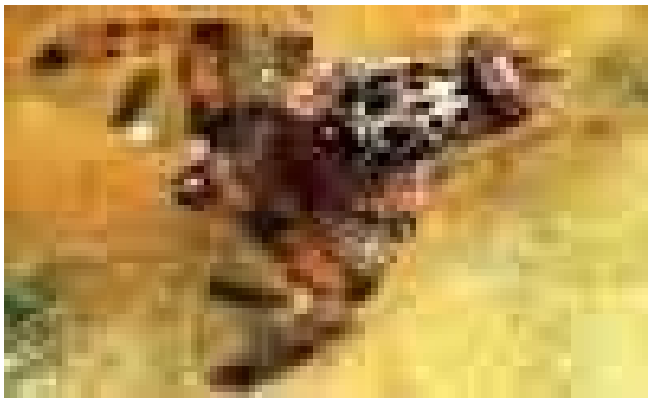
Distribution

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, 3-14 August 1981, and April to October 1998, with one or two flies found in various counties during 1967, 1983 to 1988, 1990 to 1991 and in July, 1997; in Texas from June to July 1966; and in California since September 1975.

There are over 200 countries worldwide infested with the Mediterranean fruit fly.

Identification

The medfly has no near relatives in the Western Hemisphere. The adults are slightly smaller than a housefly and have wings typical of fruit flies. They can be distinguished fairly readily from any of the native fruit flies of the New World. The eggs are very slender, curved, 1 mm long, smooth and shiny white. The larva are white with a typical fruit fly larval shape and the last instar is usually 7 to 9 mm long. The pupa is cylindrical, 4 to 5 mm long, dark reddish brown, and resembling swollen grain of wheat. The adult is also 4 to 5 mm long and yellowish with brown tinge, especially on the abdomen, legs, and some markings on wings.



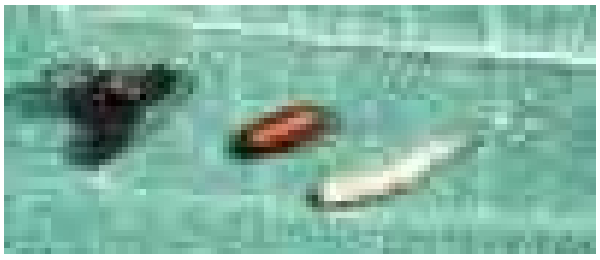
Medfly Adult

Medfly ovipositing

Life History and Habits

The length of time required for the medfly to complete its life cycle under typical Florida summer weather conditions, and on which eradication schedules in Florida are based, is 21 to 30 days. A female medfly can lay one to 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).

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. When the eggs hatch, the larvae promptly begin eating, and tunnels are formed. Fruit in a hard or semi-ripe condition is better for oviposition than fully ripened fruit. Ripe fruit is likely to be juicier, and such fruits are often associated with a high mortality of eggs and young larvae. Females will not oviposit when temperatures drop below 60ºF except when exposed to sunlight for several hours. Development in egg, larval, and pupal stages stops at 50ºF. During warm weather eggs hatch in 1.5 to three days.



Medfly life cycle

Larvae pass through three instars. Larval life may be as short as six to 10 days when the mean temperatures average 77 - 79ºF. 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. Larvae require 14 to 26 days to reach maturity in a ripe lemon as compared with 10 to 15 days in a green peach. Larvae leave the fruit at daybreak and pupate in the soil or whatever is available. Minimum duration of the pupal stage is six to 13 days when the mean temperature ranges from 76 - 79ºF.

Larval infestation

Adults emerge early in the morning during warm weather and sometimes even during cool weather. They can fly short distances, but winds may carry them a mile or more away. Oviposition may take place as early as four to five days after emergence during very warm weather and over 10 days when temperatures range between 68 - 72ºF.

Adults die in greatest numbers within two to four days after emergence if they cannot obtain food. Usually about 50% of the flies die during the first two months after emergence. Some adults may survive up to a year or more under favorable conditions of food, water, and temperature. When host fruit is continuously available and weather conditions favorable for many months, successive generations will be large and continuous. Lack of fruit for three to four months reduces the population to a minimum.

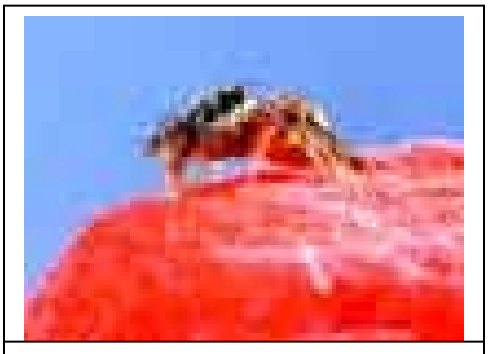
Medfly trap

Detection and Survey

A primary method of collecting larvae is by cutting infested fruit. Adults are collected primarily by use of sticky-board traps and baited traps. Larval identification is extremely difficult, so that when feasible it is best to rear them to adults for identification.

Management

As a Mediterranean fruit fly infestation falls under the control of Florida's regulatory agency - the Department of Agriculture and Consumer Services and its Division of Plant Industry, there are no University of Florida management recommendations. Plus treatment strategies are changing in an environment of public concern about aerial application of baits and malathion insecticide.



Adult feeding on bait-dye