

# CITRUS DISEASES AND PEST STUDY GUIDE FOR FLORIDA 4-H AND FFA JUDGING EVENTS



# **Citrus Diseases and Pest Study Guide for Florida 4-H and FFA Judging Events**

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## DISORDERS and NUTRITIONAL DEFICIENCIES



### Copper Deficiency

- large dark green leaves
- gum pockets at nodes of twigs
- brownish scars on fruit, twigs, and leaves



### Glyphosate (Contact Injury)

- injury spots on leaves
- may cause defoliation of leaves
- new growth after application may appear as small, narrow leaves



### Iron Deficiency

- green veins on a light yellow to white colored leaf
- new growth exhibits symptoms first



### Magnesium Deficiency

- inverted green V pattern
- remainder of leaf is yellow
- entire leaf yellowing may occur as deficiency progresses



## DISORDERS and NUTRITIONAL DEFICIENCIES



### Manganese Deficiency

- dark green veins with a lighter green background
- normal size and shaped leaves



### Nitrogen Deficiency

- entire leaf becomes yellow
- no distinctive leaf patten



### Salt or Fertilizer Burn

- irregular dead areas on leaves
- injured areas are irregularly spaced
- brown in color



### Zinc Deficiency

- small and narrow leaves with yellow mottle on green background
- green islands
- distance between leaves is reduced on stem

## DISEASES and DISORDERS



Alternaria Brown Spot (leaves)

- initial brown spots develop yellow halos
- leaf lesions expand into circular irregular shapes that can cover a large portion of the leaf



Alternaria Brown Spot (fruit)

- fruit symptoms start as small dark specks
- lesions develop into either large black lesions or corky eruptions
- eruptions can fall off leaving craters on the fruit surface



Brown Rot

- light brown
- leathery to touch
- strong odor



Citrus Black Spot (leaves)

- younger lesions are reddish brown with light gray center
- older lesions are small, round, and sunken with a gray center, dark brown margin
- yellow halo

## DISEASES and DISORDERS



Citrus Black Spot (Hard Spot)

- small, round, sunken lesions
- lesions have gray centers with brick red to black margins
- fungal structures inside lesion appear as tiny black dots



Citrus Black Spot (Cracked Spot)

- large, flat, dark brown lesions with raised cracks in surface
- occurs on green and mature fruit



Citrus Black Spot (False Melanose)

- numerous small, slightly raised tan to brown lesions
- occurs on green fruit



Citrus Black Spot (Virulent Spot)

- small, reddish, irregularly shaped lesions



## DISEASES and DISORDERS



### Citrus Blight

- general decline of the tree
- increased number of sprouts growing from the tree trunk or branches



### Citrus Canker (leaves)

- early symptoms appear as slightly raised tiny blister-like lesions
- as lesions age, they turn tan to brown and a water soaked margin appears surrounded by a yellow ring or halo
- center of the lesion becomes raised and corky
- lesions are usually visible on both sides of the leaf



### Citrus Canker (fruit)

- lesions are dark brown to black and raised
- often surrounded by yellow halo



### Citrus Greening (leaves)

- blotchy mottle pattern (asymmetrical)
- yellow veins
- corky veins on mature leaves

## DISEASES and DISORDERS



### Citrus Greening (fruit)

- externally lopsided, misshapen, small
- color inversion off fruit rind (peel)
- internally curved central core, yellowing beneath the calyx button, and aborted (undeveloped) seeds



### Citrus Scab (leaves)

- raised and sunken lesions on leaf
- tan to gray in color
- deforms leaf
- rough to touch
- wart-like



### Citrus Scab (fruit)

- begins with slightly raised pink-brown lesions
- develops into wart-like, raised lesions
- color changes to yellowish brown to dark gray



### Foot Rot

- bark cracking on trunk of tree
- gumming
- lesions can girdle trunk
- found near the crown to below soil line

## DISEASES and DISORDERS



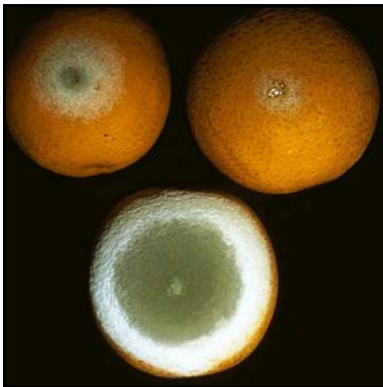
### Greasy Spot (leaves)

- looks like drops of oil
- slightly raised
- yellow halo appears and then disappears with age



### Greasy Spot Rind Blotch (Pink Pitting)

- symptoms begin as bluish specks between oil glands
- only on grapefruit
- lesions start pink but become brown or black 3-6 months after infection



### Green Mold (Postharvest)

- enters only through injuries to peel
- area first appears soft then white and olive-green
- green area becomes surrounded by wide, white margin
- green mold will cover entire fruit



### Melanose (leaves)

- small, raised lesions
- red to brown in color
- feels like sandpaper

## DISEASES and DISORDERS



Melanose (fruit)

- lesions are reddish-brown and rough
- feels like sandpaper



Postbloom Fruit Drop

- flowers have peach to brown colored spots
- causes young, developing fruit to drop



Root Rot

- soft, water soaked roots
- root cortex comes off to touch leaving thread-like tips



Sooty Mold

- black ash-like covering on leaves, fruit and twigs
- rubs off easily



## DISEASES and DISORDERS



Sour Rot (Postharvest)

- soft, slimy decay
- distinct sour odor
- often times seen after long periods of storage



Stem End Rot (Postharvest)

- leathery appearance beginning at the stem end stem end of the fruit and then spreading downward



Tristeza

- small leaves
- honeycombing below graft union
- only found on sour orange rootstock



Windscar

- light blemish on peel surface
- light brown
- no pattern



## PESTS, PATHOGENS, PARASITES, AND PREDATORS



Aschersonia

- also known as friendly fungus
- red or yellow raised growth covering whitefly nymphs



Asian Citrus Psyllid

- 3 to 4 millimeters in size
- brown mottled body
- transparent wings
- feeds at a 90° angle



Black Citrus Aphid

- small, 1/15 inch long
- reddish brown to nearly black
- long legs



Blue Green Citrus Root Weevil

- 8 to 14 millimeter long
- bright blue-green to aqua in color

## PESTS, PATHOGENS, PARASITES, AND PREDATORS



Brown Citrus Aphid

- 1.8 to 2.5 millimeters long
- dark brown to black in color



Caribbean Black Scale

- female is 3 to 5 millimeters long
- oval in shape
- ridges creates a distinct H pattern on back
- dark brown to black



Caribbean Fruit Fly

- adults are 12 to 15 millimeters long
- yellowish brown in color with brown bands on abdomen
- dark pattern on transparent wings



Chaff Scale

- irregularly rounded to oblong in shape
- color will vary, but is generally brownish
- found on twigs, leaves, and fruit
- no distinct markings on the body

## PESTS, PATHOGENS, PARASITES, AND PREDATORS



### Citrus Black Fly

- adult is 1.2 millimeters long
- small, four-winged
- black in color
- eggs are laid in a spiral pattern



### Citrus Leafminer

- moth looks like a speck of dust
- larva causes damage on upper or under side of leaf
- larva creates a maze underneath leaf epidermis
- brown lines with a shiny, glaze appearance



### Citrus Mealybug

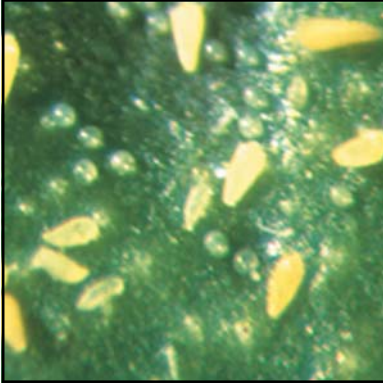
- 3 millimeters long
- soft oval shaped
- flattened and covered with a white powdery wax
- segmented body
- mobile
- located under and around the calyx button of fruit or where two pieces of fruit touch each other



### Citrus Red Mite

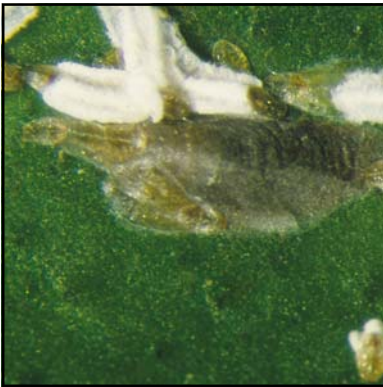
- female is about 0.5 millimeters long
- female is oval
- male is smaller than the female and has a tapering abdomen
- males and females are a deep red color
- the mite has eight legs

## PESTS, PATHOGENS, PARASITES, AND PREDATORS



Citrus Rust Mite

- adult is 0.13 millimeters long
- elongated and wedge-shaped
- light yellow in color



Citrus Snow Scale

- female is 1.5 to 2.25 millimeters long
- female is shaped like an oyster shell with one ridge down her back
- females are dark brown in color and hard to see
- juvenile male is white to light yellow and has three ridges down his back
- adult male has wings
- found mostly on the trunk and limbs of the trees



Cottony Cushion Scale

- 10 to 15 millimeters long (including egg sac)
- scale is broadly oval
- bright reddish brown in color with white egg sac

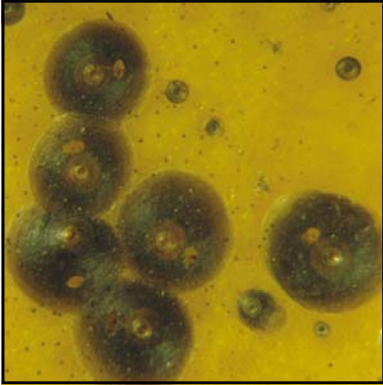


Diaprepes Root Weevil

- 9 to 20 millimeters long
- orange back with black lines



## PESTS, PATHOGENS, PARASITES, AND PREDATORS



### Florida Red Scale

- adult female is 2.02 to 2.2 millimeters long
- round in shape
- dark reddish brown with light brown center
- three concentric rings
- male is free-flying, gnat-like



### Fuller's Rose Beetle

- about 8 millimeters long
- brownish to gray in color
- all female and flightless



### Glover's Scale

- brown to purple in color
- looks like an exclamation point



### Grasshopper (American)

- 25 to 45 millimeters long
- light brown with black markings

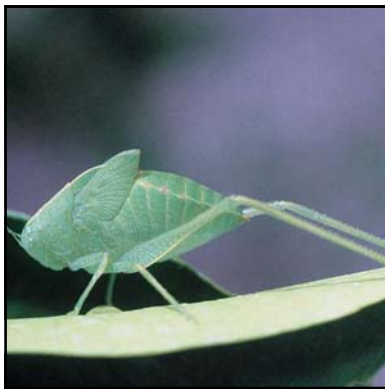


## PESTS, PATHOGENS, PARASITES, AND PREDATORS



Green Citrus Aphid

- 1.8 millimeters long
- green abdomen
- pale pink to dark brown thorax



Katydid

- 50 to 64 millimeters long
- bright green
- long, hairlike antennae
- 4 segmented legs



Lady Beetle

- many species
- number of black or white spots, if any, vary



Leaf Footed Plant Bug

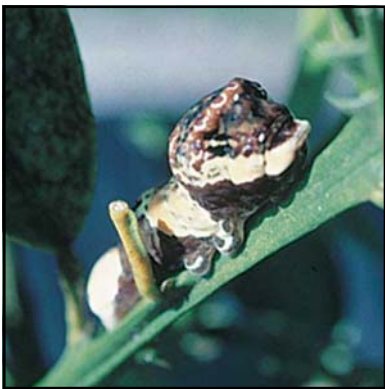
- 20 millimeters long
- dark brown
- yellow band across the body
- back legs look like a leaf

## PESTS, PATHOGENS, PARASITES, AND PREDATORS



Mediterranean Fruit Fly

- 3.5 to 5 millimeters long
- yellowish body with white, brown and black accents
- two white bands on abdomen
- black spots on thorax



Orange Dog

- 35 to 65 millimeters in length
- brown and white caterpillar
- resembles bird droppings
- can give off foul odor when aroused
- projects red antennae when disturbed



Purple Scale

- 2 to 3 millimeters long
- purple to dark brown in color
- elongated and usually curved
- shaped like a comma



Red Imported Fire Ant

- 0.13 to 0.25 inch long
- reddish-brown to black in color

## PESTS, PATHOGENS, PARASITES, AND PREDATORS



Six Spotted Mite

- 0.35 millimeters long
- pale yellow in color
- 1 to 3 pairs of small dark spots along each side of the body
- mite has eight legs



Southern Green Stink Bug

- female is 12 millimeters long; male is slightly smaller
- bright green
- oval shaped
- antennae has 5 segments



Texas Citrus Mite

- 0.4 millimeters long
- males more slender than females
- tan to brownish green
- dark green to black spots on upper side of body



Whitefly

- adult usually 2-3 millimeters long

## **PHOTO CREDITS**

### **Disorders and Nutritional Deficiencies**

Copper Deficiency. Futch, S.H. and Tucker, D.P.H. (2011). A Guide to Citrus Nutritional Deficiency and Toxicity Identification. Gainesville, Florida. University of Florida.

Glyphosate. Futch, Stephen H. (2011). Identification of Mites, Insects, Diseases, Nutritional Symptoms and Disorders on Citrus. Gainesville, Florida. University of Florida.

Iron Deficiency. Futch, S.H. and Tucker, D.P.H. (2011). A Guide to Citrus Nutritional Deficiency and Toxicity Identification. Gainesville, Florida. University of Florida.

Magnesium Deficiency. Futch, S.H. and Tucker, D.P.H. (2011). A Guide to Citrus Nutritional Deficiency and Toxicity Identification. Gainesville, Florida. University of Florida.

Manganese Deficiency. Futch, S.H. and Tucker, D.P.H. (2011). A Guide to Citrus Nutritional Deficiency and Toxicity Identification. Gainesville, Florida. University of Florida.

Nitrogen Deficiency. Futch, S.H. and Tucker, D.P.H. (2011). A Guide to Citrus Nutritional Deficiency and Toxicity Identification. Gainesville, Florida. University of Florida.

Salt or Fertilizer Burn. Futch, S.H. and Tucker, D.P.H. (2011). A Guide to Citrus Nutritional Deficiency and Toxicity Identification. Gainesville, Florida. University of Florida.

Zinc Deficiency. Futch, S.H. and Tucker, D.P.H. (2011). A Guide to Citrus Nutritional Deficiency and Toxicity Identification. Gainesville, Florida. University of Florida.

### **Diseases and Disorders**

Alternaria Brown Spot (leaves). Megan M. Dewdney, University of Florida, IFAS, Citrus REC

Alternaria Brown Spot (fruit). Jamie D. Burrow, University of Florida, IFAS, Citrus REC

Brown Rot. Jamie D. Burrow, University of Florida, IFAS, Citrus REC

Citrus Black Spot (leaves). Megan M. Dewdney, University of Florida, IFAS, Citrus REC

Citrus Black Spot (Hard Spot). Megan M. Dewdney, University of Florida, IFAS, Citrus REC

Citrus Black Spot (Cracked Spot). Megan M. Dewdney, University of Florida, IFAS, Citrus REC

Citrus Black Spot (False Melanose). Megan M. Dewdney, University of Florida, IFAS, Citrus REC

Citrus Black Spot (Virulent Spot). Megan M. Dewdney, University of Florida, IFAS, Citrus REC

Citrus Blight. Ron Brlansky, University of Florida, IFAS, Citrus REC

## **PHOTO CREDITS**

Citrus Canker (leaves). Jamie D. Burrow, University of Florida, IFAS, Citrus REC

Citrus Canker (fruit). Jamie D. Burrow, University of Florida, IFAS, Citrus REC

Citrus Greening (leaves). Jamie D. Burrow, University of Florida, IFAS, Citrus REC

Citrus Greening (fruit). Jamie D. Burrow, University of Florida, IFAS, Citrus REC

Citrus Scab (leaves). Megan M. Dewdney, University of Florida, IFAS, Citrus REC

Citrus Scab (fruit). Megan M. Dewdney, University of Florida, IFAS, Citrus REC

Foot Rot. Jamie D. Burrow, University of Florida, IFAS, Citrus REC

Greasy Spot (leaves). Jamie D. Burrow, University of Florida, IFAS, Citrus REC

Greasy Spot Rind Blotch. Dewdney, M.M. and J.D. Burrow. (2012). Citrus Foliar Fungal Diseases for the Dooryard. Gainesville, Florida. University of Florida.

Green Mold. Brown, G.E. (2011). Green Mold. Gainesville, Florida. University of Florida.

Melanose (leaves). Jamie D. Burrow, University of Florida, IFAS, Citrus REC

Melanose (fruit). Jamie D. Burrow, University of Florida, IFAS, Citrus REC

Postbloom Fruit Drop. Futch, S.H. and Timmer, L.W. (2011). A Guide to Citrus Disease Identification. Gainesville, Florida. University of Florida.

Root Rot. James Graham, University of Florida, IFAS, Citrus REC

Sooty Mold. Futch, Stephen H. (2011) Identification of Mites, Insects, Diseases, Nutritional Symptoms and Disorders on Citrus. Gainesville, Florida. University of Florida.

Sour Rot (Postharvest). Brown, G.E. (2011). Sour Rot. Gainesville, Florida. University of Florida.

Stem End Rot (Postharvest). Brown, G.E. (2011). Diplodia Stem-End Rot. Gainesville, Florida. University of Florida.

Tristeza. Dewdney, M.M., Yates, J.D., Brlansky, R.H., Spann, T.M., and Rogers, M.E. (2009). Citrus Greening, Blight and Tristeza Comparison Identification Sheet. Gainesville, Florida. University of Florida.

Windscar. University of Florida.



## **PHOTO CREDITS**

### **Pests, Pathogens, Parasites and Predators**

Aschersonia. Futch, Stephen H. (2011). Identification of Mites, Insects, Diseases, Nutritional Symptoms and Disorders on Citrus. Gainesville, Florida. University of Florida.

Asian Citrus Psyllid. Michael E. Rogers, University of Florida, IFAS, Citrus REC

Black Citrus Aphid. Futch, S.H., McCoy, C.W., Michaud, J.P. and Childers, C.C. (2012). A Guide to Identification of Soft-bodied Citrus Insect Pests. Gainesville, Florida. University of Florida.

Blue Green Citrus Root Weevil. Futch, S.H. McCoy, C.W. and Nigg, H.N. (2012) A Guide to Soil Insect Pests Identification. Gainesville, Florida. University of Florida.

Brown Citrus Aphid. Futch, S.H., McCoy, C.W., Michaud, J.P. and Childers, C.C. (2012). A Guide to Identification of Soft-bodied Citrus Insect Pests. Gainesville, Florida. University of Florida.

Caribbean Black Scale. Futch, S.H., McCoy, C.W. and Childers, C.C. (2012). A Guide to Scale Insect Identification. Gainesville, Florida. University of Florida.

Caribbean Fruit Fly. Weems, Jr., H.V., Heppner, J.B., Fasulo, T.R. and Nation, J.L. (2012). Caribbean Fruit Fly, *Anastrepha suspensa* (Loew) (Insecta: Diptera: Tephritidae). Gainesville, Florida. University of Florida.

Chaff Scale. Futch, S.H., McCoy, C.W. and Childers, C.C. (2012). A Guide to Scale Insect Identification. Gainesville, Florida. University of Florida.

Citrus Blackfly. Nguyen, R., Hamos, A.B., and Fasulo, T.R. (2010). Citrus Blackfly, *Aleurocanthus woglumi* Ashby (Insecta: Hemiptera: Aleyrodidae). Gainesville, Florida. University of Florida.

Citrus Leafminer. University of Florida.

Citrus Mealybug. Futch, S.H., McCoy, C.W., Michaud, J.P. and Childers, C.C. (2012). A Guide to Identification of Soft-bodied Citrus Insect Pests. Gainesville, Florida. University of Florida.

Citrus Red Mite. Futch, S.H., Childers, C.C. and McCoy, C.W. (2011). A Guide to Citrus Mite Identification. Gainesville, Florida. University of Florida.

Citrus Rust Mite. Futch, S.H., Childers, C.C. and McCoy, C.W. (2011). A Guide to Citrus Mite Identification. Gainesville, Florida. University of Florida.

Citrus Snow Scale. S.H., McCoy, C.W. and Childers, C.C. (2012). A Guide to Scale Insect Identification. Gainesville, Florida. University of Florida.

Cottony Cushion Scale. Futch, S.H., McCoy, C.W. and Childers, C.C. (2012). A Guide to Scale Insect Identification. Gainesville, Florida. University of Florida.

## **PHOTO CREDITS**

Diaprepes Weevil. Dewdney, M.M. and J.D. Yates. (2009). Phytophthora Management for Commercial Citrus Groves. Gainesville, Florida. University of Florida.

Florida Red Scale. S.H., McCoy, C.W. and Childers, C.C. (2012). A Guide to Scale Insect Identification. Gainesville, Florida. University of Florida.

Fullers Rose Beetle. Futch, S.H. McCoy, C.W. and Nigg, H.N. (2012) A Guide to Soil Insect Pests Identification. Gainesville, Florida. University of Florida.

Glover's Scale. S.H., McCoy, C.W. and Childers, C.C. (2012). A Guide to Scale Insect Identification. Gainesville, Florida. University of Florida.

Grasshopper (American).Squitier, J.M. and Capinera, J.L. (2011). American grasshopper, *Schistocerca americana* (Drury) (Insecta: Orthoptera: Acrididae). Gainesville, Florida. University of Florida.

Green Citrus Aphid. Futch, S.H., McCoy, C.W., Michaud, J.P. and Childers, C.C. (2012). A Guide to Identification of Soft-bodied Citrus Insect Pests. Gainesville, Florida. University of Florida.

Katydid. Futch, S.H., Childers, C.C. and McCoy, C.W. (2012). Identification of Insect Pests. Gainesville, Florida. University of Florida.

Lady Beetle. Fasulo, T.R. and Halbert, S.E. (2012). Aphid Pests of Florida Citrus. Gainesville, Florida. University of Florida.

Leaf Footed Plant Bug. Mead, F.W. (2010). Leaf-footed Bug, *Leptoglossus phyllopus* (Linnaeus) (Insecta: Hemiptera: Coreidae). Gainesville, Florida. University of Florida.

Mediterranean Fruit Fly. Thomas, M.C., Heppner, J.B., Woodruff, R.E., Weems, H.V., Steck, G.J. and Fasulo, T.J.(2010). Mediterranean Fruit Fly, *Ceratitidis capitata* (Wiedemann) (Insecta: Diptera: Tephritidae)

Orange Dog. Futch, S.H., Childers, C.C. and McCoy, C.W. (2012). Identification of Insect Pests. Gainesville, Florida. University of Florida.

Purple Scale. S.H., McCoy, C.W. and Childers, C.C. (2012). A Guide to Scale Insect Identification. Gainesville, Florida. University of Florida.

Red Imported Fire Ant. Futch, S.H., McCoy, C.W. and Nigg, H.N. (2012). A Guide to Soil Insect Pests Identification. University of Florida. Gainesville, Florida.

Six Spotted Mite. Futch, S.H., Childers, C.C. and McCoy, C.W. (2011). A Guide to Citrus Mite Identification. Gainesville, Florida. University of Florida.

## **PHOTO CREDITS**

Southern Green Stink Bug. Futch, S.H., Childers, C.C. and McCoy, C.W. (2012). Identification of Insect Pests. Gainesville, Florida. University of Florida.

Texas Citrus Mite. Futch, S.H., Childers, C.C. and McCoy, C.W. (2011). A Guide to Citrus Mite Identification. Gainesville, Florida. University of Florida.

Whitefly. Fasulo, T.R. and Brooks, R.F. (2010). Whitefly Pests of Florida Citrus

## **RESOURCES**

- Dewdney, M.M. and N.A. Peres. (2012). Citrus Black Spot. Gainesville, Florida. University of Florida.
- Dewdney, M.M. and J.D. Burrow. (2012). Citrus Foliar Fungal Diseases for the Dooryard. Gainesville, Florida. University of Florida.
- Dewdney, M.M., Yates, J.D., Brlansky, R.H., Spann, T.M., and Rogers, M.E. (2009). Citrus Greening, Blight and Tristeza Comparison Identification Sheet. Gainesville, Florida. University of Florida.
- Dewdney, M.M. and J.D. Yates. (2009). Phytophthora Management for Commercial Citrus Groves. Gainesville, Florida. University of Florida.
- Futch, Stephen. (2011). Identification of Mites, Insects, Diseases, Nutritional Symptoms and Disorders on Citrus. Gainesville, Florida. University of Florida.
- Futch, S.H., McCoy, C.W. and Nigg, H.N. (2012). A Guide to Soil Insect Pests Identification. University of Florida. Gainesville, Florida.
- Olson, J.A., W.J. Becker, J.G. Cheek., and L.K. Jackson. (1981). Identification of Citrus Varieties and Problems. Gainesville, Florida. Instructional Materials Service: University of Florida.