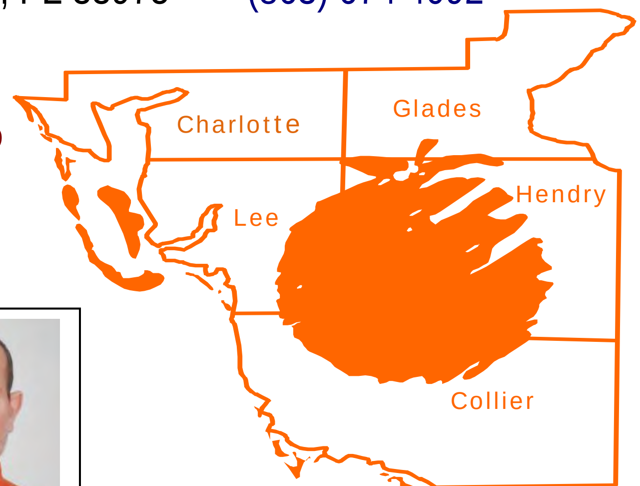
UNIVERSITY of FLORIDA
IFAS Extension

E X T E N S I O N

Institute of Food and Agricultural Sciences

Hendry County Extension, P.O. Box 68, LaBelle, FL 33975 (863) 674 4092

# Flatwoods Citrus




**Vol. 27, No. 3 and 4 , 2024**

Dr. Mongi Zekri
Multi-County Citrus Agent, SW Florida

Mongi Zekri

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# The 33rd Annual Farm Safety Day

## Friday, 3 May 2024
## Saturday, 4 May 2024 (class is now full)
## UF/IFAS SWFREC—Immokalee
## AN IMPORTANT MESSAGE TO EMPLOYERS

Safe and competent equipment operators are important to you as an employer. Accidents, which cause damage, injury or death to employees, equipment and crops, are costly. We believe all types of work-related safety incidents can be reduced with proper employee training. Our training has been designed to help your employees perform better, operate safely to prevent accidents, fulfill necessary training requirements and build pride in themselves and their farm company.

**Certificates**

The 2024 Southwest Florida Farm Safety Day will be held at the Immokalee IFAS Center, 2685 State Rd. 29 North, Immokalee, FL 34142. Each participant **will be provided with a certificate of training that can be placed into the employee's file**.

**Registration Info**

**The deadline for registration is Wednesday, April 24, 2024.** It is the employer's responsibility to assure that the employee is present at 7:30 AM on Friday, May 3, **or** on Saturday, May 4, at the Immokalee IFAS Center, 2685 State Rd. 29 North, Immokalee, FL 34142 to check in at the registration table and receive instructions (in both English and Spanish).

Using the Excel sheet in blue, please type the names of those who will be attending our 33rd Farm Safety Day on Friday, 3 May or Saturday, 4 May 2024 (please select the language and the date, Saturday's class is full). The cost is $30.00 per person, which will include educational sessions, handouts, pencils, refreshments, lunch, and a cap.

Make checks payable to: University of Florida
Mail checks to: Dr. Mongi Zekri
Hendry County Extension Office
P.O. Box 68
LaBelle, FL 33975
Email typed lists using the attached Excel sheet to maz@ufl.edu

**Don't wait. The number of trainings offered and attendance at each training is LIMITED. For each day, class size is limited to the first 80 Spanish-speaking and 20 English-speaking people.**

If there are any questions, please contact **Dr. Mongi Zekri (maz@ufl.edu or at 239 595 5494).**

**Company Name:**

| Employee First Name | Employee Last Name | English or Spanish | Friday only |
|---|---|---|---|

## CEUs for pesticide license renewal

**Earn CORE CEUs online through articles written by UF-IFAS Citrus Extension Agents in the Citrus Industry magazine**

http://citrusindustry.net/ceu/

The following series of articles and quizzes are available with their expiration dates noted:

- **2024 #1:** Scouting Tools and Tactics (1/31/25)
- **2023 #4:** How to Properly Transport and Store Pesticides (10/31/24)
- **2023 #3:** A Guide to Safe, Effective Pesticide Use (7/31/24)
- **2023 #2** What To Do When You've Been Exposed to a Pesticide (4/30/24)

***Each article grants one General Standards (Core) CEU when submitted and approved toward the renewal of a Florida Department of Agriculture and Consumer Services restricted-use pesticide license.***

**Florida Citrus Production Guide**
https://crec.ifas.ufl.edu/resources/production-guide/

The objective of the Florida Citrus Production Guide is to assist citrus growers in the identification of pest management options and the selection of appropriate control measures. This publication should serve as a reference once it has been determined that control measures might be warranted. It is not intended to replace pesticidal product labels which contain important usage information and should be immediately accessible for reference. Violations of directions for use printed on the label are against State and Federal laws. Care should be taken to select only those treatments best suited for control of the specific pest(s) identified as requiring suppression. Products listed in all tables have been shown to be efficacious, non-phytotoxic to citrus, and relatively safe on non-target arthropods and microorganisms when used as directed. However, it is important to realize that results may not be consistent under different environmental, application, and tank mix conditions.

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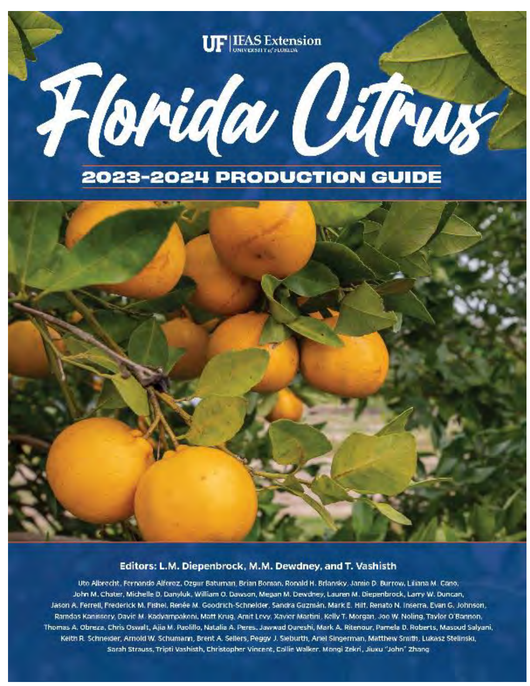
## PRODUCTION GUIDE MENU

- General
- Horticultural Practices
- Mites, Insects & Nematodes
- Diseases
- Weeds
- Pesticides

If you did not pick up your hard copy of the newly updated Florida Citrus Production Guide, you can find the electronic version online https://crec.ifas.ufl.edu/resources/production-guide/

If you need hard copies, you can get them free from your Citrus Extension Agent or from the Citrus Research & Education Center in Lake Alfred and the Southwest Florida Research and Education Center in Immokalee.



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If you would like to be among them, please contact me at 863 674 4092 or maz@ufl.edu



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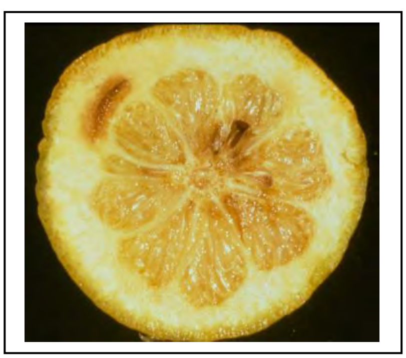
# Boron (B)

Boron is particularly necessary where active cell division is taking place. Boron plays an important role in flowering, pollen-tube growth, fruiting processes, nitrogen (N) metabolism, and hormone activity. Florida sandy soils are low in B, and a deficiency of this element in citrus occasionally occurs under field conditions. The deficiency may be aggravated by severe drought conditions, heavy lime applications, or irrigation with alkaline water. Boron is very mobile in the soil profile of sandy soils and readily leaches by rainfall or excess irrigation.

Boron deficiency is known as "hard fruit" because the fruit is hard and dry due to lumps in the rind caused by gum impregnation. The chief fruit symptoms include premature shedding of young fruits. Such fruit have brownish discoloration in the white portion of the rind (albedo), described as gum pockets or impregnations of the tissue with gum and unusually thick albedo. Older fruit are undersized, lumpy, misshaped with an unusually thick albedo containing gum deposits. Seed fails to develop and gum deposits are common around the axis of the fruit.



The first visual symptoms of B deficiency are generally the death of the terminal growing point of the main stem. Further symptoms are a slight thickening of the leaves, a tendency for the leaves to curl downward at right angles to the midrib, and sometimes chlorosis.

Young leaves show small water soaked spots or flecks becoming translucent as the leaves mature. Associated with this is a premature shedding of leaves starting in the tops of the trees and soon leaving the tops almost completely defoliated. Fruit symptoms appear to be the most constant and reliable tool for diagnostic purposes.

To treat citrus affected with B deficiency, B compounds can be applied either foliarly or in the fertilizer. As a maintenance program, apply B in the fertilizer at an annual rate equivalent to 1/200 of the N rate. In Florida, foliar spray applications have been found much safer and more efficient than soil application. Soil applications frequently fail to give satisfactory results during dry falls and springs and may result in toxicity problems if made during the summer rainy season. Boron solubility in the soil is reduced at soil pHs below 5 and above 7. Foliar spray may be applied during the dormant period through post bloom, but preferably during early flower development. Treating at this growth stage is important because boron does not move very readily from other parts of the tree to the buds. Applying boron at this time will assist in flower initiation and pollen production, satisfy the needs for pollen tube growth, and enhance fruit set. Boron levels in the leaf tissue should not drop below 40 ppm or exceed 120 ppm (dry wt basis). Where deficiency symptoms are present, double the amount suggested. Use care not to apply more than the recommended amount because it is easy to go from deficiency to excess.

# MICRONUTRIENTS IN CITRUS NUTRITION

**Iron (Fe)**: One of the functions of Fe is to act as a catalyst in the production of chlorophyll. Iron deficiency has been of importance on calcareous soils in certain areas of Florida where the soil contains high amount of calcium carbonate and has a pH of 8.0. Iron deficiency is attributed to low Fe content in white sandy areas near lakes and places known locally as "sand soaked areas". Iron deficiency can be induced by high levels of P and accumulations of heavy metals, primarily Cu, in the soil. In Florida, Fe deficiency is commonly associated with Zn and Mn deficiencies.

The symptoms of Fe deficiency are also known as "iron chlorosis". They occur on new growing leaves which are very light in color and sometimes almost white but with the veins greener than the remainder of the leaf. In acute cases, the leaves are reduced in size, very thin, and shed early. The trees die back severely on the periphery and especially in the top. Fruit set, yield, and fruit size will be reduced.

Iron deficiency is usually associated with high soil alkalinity, but it is also associated with over irrigation, prolonged spells of wet soil conditions or poor drainage and low soil temperature. Several areas affected with Fe chlorosis in south Florida have been materially helped or completely cured by careful control of irrigation and drainage. Iron deficiency sometimes occurs where excess salts are present in the soil.

Iron deficiency has been found to be one of the most difficult deficiencies to correct especially on calcareous soils. Foliar applications of Fe are not recommended because of their lack of effectiveness and risk of leaf and fruit burn. At their best, foliar sprays of Fe produce a spotted greening of the leaves rather than an overall greening. The most reliable means of correcting Fe chlorosis in citrus is by soil application of iron chelates. Iron sulfate has not given satisfactory control on either acid or alkaline soils. Citrus rootstocks vary in their ability to absorb Fe. Trifoliate orange and its hybrids (Swingle citrumelo and Carrizo citrange) are the least able to do so.

| Iron Chelates | Effective pH Range |
|---|---|
| Fe-EDTA | 4 to 6.5 |
| Fe-HEDTA | 4 to 6.5 |
| Fe-DTPA | 4 to 7.5 |
| Fe-EDDHA | 4 to 9.0 |

**Zinc (Zn)**: Zinc is essential for the formation of chlorophyll and function of normal photosynthesis. Zinc is also needed for the formation of auxins which are growth-promoting substances in plants.

Zinc deficiency symptoms are characterized by irregular green bands along the midrib and main veins on a background of light yellow to almost white. The relative amounts of green and yellow tissue vary from a condition of mild Zn deficiency in which there are only small yellow splotches between the larger lateral veins to a condition in which only a basal portion of the midrib is green and the remainder of the leaf is light yellow.

In less acute stages, the leaves are almost normal in size, while in very acute

cases the leaves are pointed, abnormally narrow with the tendency to stand upright, and extremely reduced in size. In mild cases, Zn deficiency symptoms appear on occasional weak twigs. Fruit formed on these weak twigs are drastically reduced in size and have an unusually smooth light-colored thin skin and very low juice content.
Zinc deficiency symptoms can be so severe that they may mask or noticeably alter the symptoms of other deficiencies or disorders. Deficiency in Zn can develop due to soil depletion or formation of insoluble compounds. Excessive P or N has also been found to induce or aggravate Zn deficiency.

Foliar spray applications of 3-5 lbs/acre of zinc are recommended on each of the three major flushes of citrus trees to prevent nutrient deficiencies, cope with HLB, and improve production. Sulfate forms are less expensive and nitrate forms appear to facilitate the uptake of micronutrients. Maximum benefit is obtained if spray is applied to the young growth when it is two-thirds to nearly fully expanded and before it hardens off.

**Manganese (Mn)**: Manganese is involved in the production of amino acids and proteins. It plays a role in photosynthesis and in the formation of chlorophyll.

Manganese deficiency occurs commonly in Florida. It is particularly evident in the spring after a cold winter. Manganese deficiency leads to a chlorosis in the interveinal tissue of leaves but the veins remain dark green. Young leaves commonly show a fine pattern or network of green veins on a lighter green background but the pattern is not so distinct as in Zn or Fe deficiencies because the leaf is greener. By the time the leaves reach full size, the pattern becomes more distinct as a band of green along the midrib and principal lateral veins with light green areas between the veins.

In more severe cases, the color of the leaf becomes dull-green. Interveinal leaf areas may develop many whitish opaque spots which give the leaf a whitish or gray appearance. The leaves are not reduced in size or changed in shape by Mn deficiency, but affected leaves prematurely fall from the tree. No particular twig symptoms have been related to Mn deficiency. In cases of acute Mn deficiency, the growth is reduced giving the tree a weak appearance.

Manganese deficiency may greatly reduce the crop and the color of the fruit. Manganese deficiency is frequently associated with Zn deficiency. This combination of the two deficiency symptoms on leaves is characterized by dark green veins with dull whitish green areas between the veins. In such combinations, the Mn deficiency is acute and the Zn deficiency is relatively mild.

In Florida, Mn deficiency occurs on both acid and alkaline soils. It is probably due to leaching in the acid soils and to insolubility in the alkaline soils. For deficient trees on alkaline soils, treatments by sprays of Mn compounds are recommended. On acid soils, Mn can be included in the fertilizer. Foliar spray application quickly clears up the pattern on young leaves but older leaves respond less rapidly and less completely. When Mn sprays are given to Mn-deficient orange trees, fruit yield, total soluble solids in the juice and pounds solids per box of fruit increase. Foliar spray applications of 3-5 lbs/acre of manganese are also recommended on each of the three major flushes of citrus trees to prevent nutrient deficiencies, cope with HLB, and improve production. Sulfate forms are less expensive and nitrate forms appear to facilitate the uptake of micronutrients.

If N is needed, adding 7 to 10 lbs of low biuret urea will increase Mn uptake.

**Copper (Cu)**: Copper also has a role in photosynthesis and chlorophyll formation. The functions of Cu in the mineral nutrition of plants are numerous. Heavy fertilization with N tends to increase the severity of Cu deficiency.

If Cu in citrus leaves falls below 4 ppm in dry matter, severe Cu deficiency will develop. In the range of 4 to 5 ppm, mild to moderate deficiency symptoms may occur. Copper deficiency rarely occurs when the Cu concentration in leaves is 6 ppm or above.

Excessive applications of nitrogenous fertilizers have been considered for years a contributing cause for this trouble giving rise to the term "ammoniation". The cause might be an unbalanced N/Cu ratio.

The first symptom is the formation of unusually vigorous large dark green foliage with a "bowing up" of the midrib. The twigs are also unusually vigorous, long, soft, angular, frequently "S" shaped and more or less drooping.

Fruit symptoms are most pronounced on oranges. Brown stained areas of hardened gum on the rind of the fruit may precede the appearance of leaf and twig symptoms. In severe cases, dieback of young twigs will occur and the twigs will be covered by reddish brown droplets of gums.

Insufficient available Cu in the soil is believed to be the primary cause of the symptoms described. Copper deficiency is more of a problem on newly planted flatwoods land than the ridge. Prevention or cure of Cu deficiency is accomplished by either foliar sprays or soil applications of Cu compounds. A Cu spray of solution containing 3 to 5 lbs of elemental Cu applied during bloom time commonly causes an almost immediate recovery and results in a good setting of normal fruit. Copper deficiency can be a controlling factor in fruit production, and acute Cu deficiency may put trees entirely out of production. Foliage sprays are often valuable emergency treatments when symptoms of Cu deficiency are first observed.

## CONCLUSION

**Most micronutrient deficiencies may be recognized by visual symptoms. However, leaf analysis is helpful in verifying deficiencies particularly when non-typical symptoms or multiple nutrient deficiencies appear. Leaf analysis also provides information on low, but not yet deficient, amounts of an element so that treatment may be applied to prevent a deficiency.**

**For more details and more information on citrus nutrition, go to Nutrition of Florida Citrus Trees at:**

**http://edis.ifas.ufl.edu/pdffiles/SS/SS47800.pdf**

# Researchers predicting well above-average 2024 Atlantic hurricane season

**02April 2024**
**By Josh Rhoten**

Hurricane Ian approaches the coast of Florida, Sept. 27, 2022. Credit: CSU/CIRA and NOAA

*Note: The full forecast is available at tropical.colostate.edu and the CSU team will also issue forecast updates on June 11, July 9 and Aug. 6.*

Colorado State University hurricane researchers are predicting an extremely active Atlantic hurricane season in their initial 2024 forecast. The team cites record warm tropical and eastern subtropical Atlantic sea surface temperatures as a primary factor for their prediction of 11 hurricanes this year.

When waters in the eastern and central tropical and subtropical Atlantic are much warmer than normal in the spring, it tends to force a weaker subtropical high and associated weaker winds blowing across the tropical Atlantic. These conditions will likely lead to a continuation of well above-average water temperatures in the tropical Atlantic for the peak of the 2024 Atlantic hurricane season. A very warm Atlantic favors an above-average season, since a hurricane's fuel source is warm ocean water. In addition, a warm Atlantic leads to lower atmospheric pressure and a more unstable atmosphere. Both conditions favor hurricanes.

While the tropical Pacific is currently characterized by El Niño conditions, these are likely to transition to La Niña conditions by the peak of the Atlantic hurricane season from August to October. La Niña tends to decrease upper-level westerly winds across the Caribbean into the tropical Atlantic. These decreased upper-level winds result in reduced vertical wind shear, favoring Atlantic hurricane formation and intensification.

Given the combined hurricane-favorable signals of an extremely warm Atlantic and a likely developing La Niña, the forecast team has higher-than-normal confidence for an April outlook that the 2024 Atlantic hurricane season will be very active. This is the highest prediction for hurricanes that CSU has ever issued with their April outlook. The prior highest April forecast was for nine hurricanes, which has been called for several times since the university began issuing April forecasts in 1995. However, the team stresses that the April outlook historically has the lowest level of skill of CSU's operational seasonal hurricane forecasts, given the considerable changes that can occur in the atmosphere-ocean between April and the peak of the Atlantic hurricane season from August–October.

Tropical Weather and Climate Research Team predicts 23 named storms in 2024
Members of the CSU Tropical Weather and Climate Research Team from left: DesRosiers, Klotzbach, Bell

The CSU Tropical Weather and Climate Research Team is predicting 23 named storms during the Atlantic hurricane season, which runs from June 1 to Nov. 30. Of those, researchers forecast eleven to become hurricanes and five to reach major hurricane strength (Saffir/Simpson Category 3-4-5) with sustained winds of 111 miles per hour or greater.

The team bases its forecasts on a statistical model, as well as four models that use a combination of statistical information and model predictions of large-scale conditions from the European Centre for Medium-Range Weather Forecasts, the UK Met Office, the Japan Meteorological Agency, and the Centro Euro-Mediterraneo sui Cambiamenti Climatici. These models use 25-40 years of historical hurricane seasons and evaluate conditions including: Atlantic sea surface temperatures, sea level pressures, vertical wind shear levels (the change in wind direction and speed with height in the atmosphere), El Niño (warming of waters in the central and eastern tropical Pacific), and other factors.

So far, the 2024 hurricane season is exhibiting characteristics similar to 1878, 1926, 1998, 2010 and 2020.

"Our analog seasons were all very active Atlantic hurricane seasons," said Phil Klotzbach, senior research scientist in the Department of Atmospheric Science at CSU and lead author of the report. "This highlights the somewhat lower levels of uncertainty that exist with this outlook relative to our typical early April outlook."

The team predicts that 2024 hurricane activity will be about 170% of the average season from 1991–2020. By comparison, 2023's hurricane activity was about 120% of the average season. The most significant hurricane of the 2023 Atlantic hurricane season was Hurricane Idalia. Idalia made landfall at Category 3 intensity in the Big Bend region of Florida, causing $3.6 billion dollars in damage and resulting in eight direct fatalities.

In addition to the various hurricane metrics that CSU has used for many years, the forecast team introduced a new metric last year. Accumulated Cyclone Energy (ACE) occurring west of 60 degrees west longitude is an integrated metric accounting for storm frequency, intensity and duration in the western half of the Atlantic basin. ACE generated west of 60 degrees west correlates better with landfalling storms in the Atlantic basin than basinwide ACE, since virtually all hurricane-prone landmasses in the Atlantic Ocean are located west of 60 degrees west.

Generally, a slightly lower percentage of basinwide ACE occurs west of 60 degrees west in El Niño years relative to La Niña years. Since the team anticipates La Niña as the most likely outcome in 2024, the percentage of basinwide ACE occurring west of 60 degrees west is predicted to be higher than last year.

The CSU team will issue forecast updates on June 11, July 9 and Aug. 6.

This is the 41st year that CSU has issued an Atlantic basin seasonal hurricane forecast. Professor Emeritus Bill Gray originated the seasonal forecasts at CSU and launched the report in 1984. He continued to author them until his death in 2016. The authors of this year's forecast are Phil Klotzbach, Professor Michael Bell, Ph.D. candidate Alex DesRosiers, and Research Scientist Levi Silvers. The CSU Tropical Weather and Climate Team is part of the Department of

Atmospheric Science in the Walter Scott, Jr. College of Engineering at CSU and is one of the top ranked Atmospheric Science programs in the world.

The CSU forecast is intended to provide a best estimate of activity in the Atlantic during the upcoming season – not an exact measure.

As always, the researchers caution coastal residents to take proper precautions.

“It takes only one storm near you to make this an active season for you,” Bell said.

Scientific graphic showing the Atlantic basin seasonal hurricane forecast for 2024 from the Colorado State University team

Atlantic hurricane landfalling probability included in 2024 report

The report also includes the probability of major hurricanes making landfall:

- 62% for the entire U.S. coastline (average from 1880–2020 is 43%).
- 34% for the U.S. East Coast, including the Florida peninsula (average from 1880–2020 is 21%).
- 42% for the Gulf Coast from the Florida panhandle westward to Brownsville (average from 1880–2020 is 27%).
- 66% for the Caribbean (average from 1880–2020 is 47%).

The forecast team also provides probabilities of named storms, hurricanes and major hurricanes tracking within 50 miles of each county or parish along the Gulf and U.S. East Coast, as well as hurricane-prone coastal states, Mexican states, Canadian provinces and countries in Central America and the Caribbean. These probabilities for regions and countries are adjusted based on the current seasonal forecast.



# MICROSPRINKLER IRRIGATION & FERTIGATION

Microsprinkler irrigation is an important component of citrus production systems in Florida. Microirrigation is more desirable than other irrigation methods for several reasons. Three important advantages are: water conservation, the potential for significantly improving fertilizer management and for cold protection.

Research has shown that when properly managed (no overirrigation), water savings with microirrigation systems can amount to as much as 80% compared with subirrigation and 50% compared with overhead sprinkler irrigation.

Microirrigation provides for precise timing and application of fertilizer nutrients in citrus production. Fertilizer can be prescription-applied during the season in amounts that the tree needs and at particular times when those nutrients are needed. This capability helps growers increase the efficiency of fertilizer application and should result in reduced fertilizer applications for citrus production. Research has also shown the important advantage of microsprinklers for freeze protection of citrus.

Fertigation is the timely application of small amounts of fertilizer through irrigation systems directly to the root zone.

Some advantages of fertigation:

♦ Fertilizer is placed in the wetted area where feeder roots are extensive,

♦ Fertilizer may be applied more frequently in small amounts so that it is available when the tree needs it,

♦ Increased fertilizer application frequency can increase fertilizer efficiency and reduce leaching,

♦ Application cost is much lower than that of dry or foliar fertilizer application.

Through fertigation, comparable or better yields and quality can be produced with less fertilizer. Microirrigation systems must be properly maintained to apply water and fertilizer uniformly. Growers must determine:

(1) which fertilizer formulations are most suitable for injection,

(2) the most appropriate fertilizer analysis for different age trees and specific stages of growth,

(3) the amount to apply during a given fertigation event, and

(4) the timing and frequency of applications.

Properly managed applications of plant nutrients through irrigation systems significantly enhance fertilizer efficiency while maintaining or increasing yield. On the other hand, poorly managed fertigation may result in substantial yield losses. Fertigation involves deciding which and how much nutrients to apply, selecting the most effective formulations and scheduling injections to ensure that essential nutrients are available as needed.

Injection Duration

A minimum injection time of 45 to 60 minutes is recommended. This time is sufficient for uniform distribution of nutrients throughout the fertigation zone. Limit injection time to prevent the application of too much water, because excessive water leaches plant nutrients below the root zone.

CITRUS BLACK SPOT fungal disease causes fruit blemishes and fruit drop especially on sweet oranges.

Lemons are the most susceptible, but sweet oranges, especially mid to late maturing types such as Valencia, are highly susceptible to this disease. Hamlin sweet oranges and tangerine/mandarin types are moderately susceptible. Grapefruit is thought to be moderately susceptible and symptoms have been seen in Florida.

Black spot fruit symptoms are wide ranging and have many different names. Hard spot is the most diagnostic symptom of black spot. Lesions are nearly circular, depressed, with gray necrotic tissue at the middle, and a brick-red to black margin that can be cracked around the edges. Significant fruit drop is a common symptom in heavily infected groves.

Fruit remains susceptible most of the growing season. Monthly fungicide applications of copper and/or strobilurins (Abound, Gem, or Headline) will be needed from early May to mid-September to control black spot. If there is substantial rain in April, starting fungicide applications in April is advised. Since only four strobilurin fungicides can be used in a season for any purpose, it is recommended for fresh fruit to reserve strobilurin fungicides for times when phytotoxicity from copper applications is a concern (temperatures >90°F). For processing fruit, strobilurins can be used earlier in the season, and applications for greasy spot and melanose can be combined. It is recommended that strobilurin fungicides not be applied in two consecutive sprays to manage pathogen resistance. Currently, we do not have any other rotational fungicides for resistance management.

In addition to chemical control measures, practices to accelerate leaf litter decomposition beneath the trees to reduce the ascospore inoculum may be beneficial. Enhancing leaf litter degradation should commence in mid-March. There are three methods that have reduced the ascospore inoculum of *Mycosphaerella citri*, the fungus that causes greasy spot. The first is to increase the microsprinkler irrigations to at least 5 times a week for approximately a ½ hour per irrigation period for 1.5 months. The leaf litter decomposition will be greater compared to that with the traditional irrigation frequency. A drawback is that leaf litter reduction will be confined to the areas where the microsprinklers reach. A second method is to apply urea (187 lb/treated acre) or ammonium sulfate (561 lb/acre) to the leaf litter. The final method is to apply dolomitic lime or calcium carbonate (2226 lb/treated acre) to the leaf litter. The

decay rate is greater for litter treated with lime and inoculum production is reduced. All treatments worked equally well with *M. citri* and there is no indication that one method is better than another. Lime or irrigation methods should not be used in conjunction with the high N treatments, since they have opposite methods of action.
Care must be exercised in handling and moving citrus fruit, leaves, twigs and debris from citrus black spot (CBS) Quarantined Areas, since the disease may be easily and unwittingly spread to other citrus trees, nurseries or groves.
There are many rules and regulations that **Growers, Harvesters, Haulers, Processing, Packing Facilities and Haulers have to be aware of with relation to the black spot disease in Florida. For more information, go to:** https://crec.ifas.ufl.edu/extension/pest/PDF/Citrus%20Black%20Spot.pdf

READ THE LABEL.
See Table 1.
Rates for pesticides are given as the maximum amount required to treat mature citrus trees unless otherwise noted. To treat smaller trees with commercial application equipment, including handguns, mix the per-acre rate for mature trees in 250 gallons of water. Calibrate and arrange nozzles to deliver thorough distribution and treat as many acres as this volume of spray allows.

**Table 1.**
Recommended Chemical Controls for Citrus Black Spot

| Pesticide | FRAC MOA[2] | Mature Trees Rate/Acre[1] |
|---|---|---|
| copper fungicide | M 01 | Use label rate. |
| Enable 2F | 3 | 8.0 fl/oz. Do not apply more than 24 oz/acre/season |
| Abound | 11 | 9.0-15.5 fl oz. Do not apply more than 92.3 fl oz/acre/season for all uses. Best applied with petroleum oil. |
| Gem 500 SC | 11 | 1.9-3.8 fl oz. Do not apply more than 15.2 fl oz/acre/season for all uses. Best applied with petroleum oil. Do not apply within 7 days of harvest. |
| Headline SC | 11 | 12-15 fl oz. Do not apply more than 54 fl oz/acre/season for all uses. Best applied with petroleum oil. |
| Pristine | 11 + 7 | 16-18.5 oz. No more than 74 oz/acre/season |
| Amistar Top | 11 + 3 | 15.4 fl oz. Do not apply more than 61.5 fl oz/acre/year |
| https://edis.ifas.ufl.edu/pdf/CG/CG088/CG088-D4ijbgvp5b.pdf | | |

# NUTRITION OF CITRUS TREES

Fertilizer management should include calibration and adjustment of fertilizer spreaders, booms, pumps, or irrigation systems to accurately deliver fertilizer rates and place fertilizers within the tree rootzone. To increase fertilizer efficiency, soil and leaf analysis data should be studied and taken into consideration when generating a fertilizer program and selecting a fertilizer formulation. For citrus trees in the citrus greening (HLB) era, soluble fertilizer should be split into 6-10 applications per year with a complete balanced fertilizer. Besides nitrogen, phosphorus, and potassium, be sure that the fertilizer has magnesium, and micronutrients such as manganese, zinc, iron, and boron. The use of controlled release fertilizer or frequent fertigation is preferred. For mature trees, the highest nutrient requirement extends from late winter through early summer. This coincides with flowering, heavy spring flush, fruit set, and fruit development and expansion. For best fresh fruit quality, nutritional requirements, particularly nitrogen (N), should decrease late in the summer and fall. Based on tree demands, 2/3 to 3/4 of the yearly fertilizer amount should be applied between February and June. In warm areas such as southwest Florida where tree growth can continue certain years during the winter, fertilizer applications should also be made in the fall to satisfy vegetative growth demand. However, fall fertilizer applications may sometimes delay fruit color development and fruit maturity for early and mid-season cultivars. Foliar applications of micronutrients should be applied at least 3 times a year on the major spring, summer, and fall flushes when the new leaves are about fully expanded. Foliar spray applications of 3-5 lbs/acre of magnesium, manganese, zinc, and copper, and 0.25-0.50 lb/acre of boron and molybdenum are also recommended on each of the three major flushes of citrus trees to prevent nutrient deficiencies, cope with HLB, and improve production. Sulfate forms are less expensive and nitrate forms appear to facilitate the uptake of micronutrients.

## IFAS fertilizer guidelines for nonbearing citrus trees

| Year in grove | Lb N/tree/year (range) | Lbs Fertilizer/tree/year (range) | | Lower limit of application frequency | |
|---|---|---|---|---|---|
| | | 6-6-6 | 8-8-8 | Dry | Fertigation |
| 1 | 0.15 – 0.30 | 2.5-5.0 | 1.9-3.8 | 6 | 10 |
| 2 | 0.30 – 0.60 | 5.0-10.0 | 3.8-7.5 | 6 | 10 |
| 3 | 0.45 – 0.90 | 7.5-15.0 | 5.6-11.3 | 6 | 10 |

## IFAS fertilizer guidelines for bearing citrus trees (4 years and older)

| Oranges | Grapefruit | Other varieties | Lower limit of application frequency | |
|---|---|---|---|---|
| Lbs N/acre/year (range) | | | Dry | Fertigation |
| 120 - 200 | 120 - 160 | 120 – 200 | 6 | 10 |

# From the Florida Citrus Budwood Annual Report

## The top 15 Variety Clones and Rootstocks budded for the 2022-2023 fiscal year (July 1, 2022 - June 30, 2023)

| Rating | Variety Clone | R/S |
|---|---|---|
| 1 | Valencia SPB-1-14-19 | US-942 |
| 2 | Hamlin 1-4-1 | KuhC |
| 3 | Vernia UF 35-15 | X-639 |
| 4 | WG Man 911-C-37 | Swingle |
| 5 | Meyer Le US | US-812 |
| 6 | Persian Lime SPB-7 | Volkamer |
| 7 | Ruby Red Gft F-58-39 | Sour Orange |
| 8 | Ray Ruby Gft CGIP-103 | Own Root |
| 9 | Valencia F-55-4 | US-897 |
| 10 | Star Ruby Gft DPI-60 | Rough Lemon |
| 11 | Orri CGIP-134 | C-54 |
| 12 | Calamondin DPI-555 | US-802 |
| 13 | Key Lime SPB-51-12 | C-35 |
| 14 | Sweet Orange UF OLL8 | Kinkoji |
| 15 | Valencia SPB-1-14-31 | Macrophylla |

United States Department of Agriculture
National Agricultural Statistics Service

# CITRUS April Forecast Maturity Test Results and Fruit Size

Cooperating with the Florida Department of Agriculture and Consumer Services
851 Trafalgar Ct, Suite 310E, Maitland, FL 32751-4132
(407) 648-6013 · (855) 271-9801 FAX · www.nass.usda.gov/fl

April 11, 2024

**Florida All Orange Production Down 5 Percent from March Forecast**
**Florida Non-Valencia Orange Production Unchanged**
**Florida Valencia Orange Production Down 8 Percent**
**Florida All Grapefruit Production Down 9 Percent**
**Florida All Tangerine and Tangelo Production Unchanged**

| Forecast Dates - 2023-2024 Season | |
|---|---|
| May 10, 2024 | June 12, 2024 |
| July 12, 2024 | |

## Citrus Production by Type – States and United States

| Crop and State | Production [1] | | 2023-2024 Forecasted Production [1] | |
|---|---|---|---|---|
| | 2021-2022 | 2022-2023 | March | April |
| | (1,000 boxes) | (1,000 boxes) | (1,000 boxes) | (1,000 boxes) |
| **Non-Valencia Oranges [2]** | | | | |
| **Florida** | **18,250** | **6,150** | **6,800** | **6,800** |
| California | 31,500 | 36,100 | 38,000 | 38,000 |
| Texas | 170 | 570 | 600 | 700 |
| United States | 49,920 | 42,820 | 45,400 | 45,500 |
| **Valencia Oranges** | | | | |
| **Florida** | **22,950** | **9,670** | **13,000** | **12,000** |
| California | 7,600 | 8,600 | 8,000 | 8,000 |
| Texas | 30 | 560 | 350 | 400 |
| United States | 30,580 | 18,830 | 21,350 | 20,400 |
| **All Oranges** | | | | |
| **Florida** | **41,200** | **15,820** | **19,800** | **18,800** |
| California | 39,100 | 44,700 | 46,000 | 46,000 |
| Texas | 200 | 1,130 | 950 | 1,100 |
| United States | 80,500 | 61,650 | 66,750 | 65,900 |
| **Grapefruit** | | | | |
| **Florida-All** | **3,330** | **1,810** | **2,200** | **2,000** |
| **Red** | **2,830** | **1,560** | **1,900** | **1,750** |
| **White** | **500** | **250** | **300** | **250** |
| California | 4,100 | 4,300 | 3,800 | 4,100 |
| Texas | 1,700 | 2,250 | 2,350 | 2,600 |
| United States | 9,130 | 8,360 | 8,350 | 8,700 |
| **Lemons** | | | | |
| Arizona | 1,250 | 1,400 | 900 | 1,050 |
| California | 25,200 | 26,000 | 20,000 | 22,000 |
| United States | 26,450 | 27,400 | 20,900 | 23,050 |
| **Tangerines and Mandarins** | | | | |
| **Florida** | **750** | **480** | **500** | **500** |
| California [3] | 17,500 | 23,550 | 22,000 | 22,000 |
| United States | 18,250 | 24,030 | 22,500 | 22,500 |

[1] Net pounds per box: oranges in California-80, Florida-90, Texas-85; grapefruit in California and Texas-80, Florida-85; lemons-80; and tangerines and mandarins in California-80, Florida-95.
[2] Navel and miscellaneous varieties in California. Early (including Navel) and midseason varieties in Florida and Texas.
[3] Includes tangelos and tangors.

## All Oranges 18.8 Million Boxes

The 2023-2024 Florida all orange forecast released today by the USDA Agricultural Statistics Board is lowered 1.00 million boxes to 18.8 million boxes. If realized, this will be 19 percent more than last season's revised production. The forecast consists of 6.80 million boxes of non-Valencia oranges (early, mid-season, and Navel varieties) and 12.0 million boxes of Valencia oranges. An 8-year regression was used for comparison purposes. All references to "average", "minimum", and "maximum" refer to the previous 10 seasons, excluding the 2017-2018 season, which was affected by Hurricane Irma, and the 2022-2023 season, which was affected by Hurricanes Ian and Nicole. Average fruit per tree includes both regular bloom and the first late bloom.

## Non-Valencia Oranges 6.80 Million Boxes

The forecast of non-Valencia orange production is unchanged at 6.80 million boxes. Non-Valencia harvest is over for the season. The Row Count survey conducted March 26-27, 2024 showed the relatively complete harvest of early & mid-season non-Valencia rows. The Navel forecast, included in the non-Valencia portion of the forecast, is 180,000 boxes.

## Valencia Oranges 12.0 Million Boxes

The forecast of Valencia orange production is reduced 1.00 million boxes from the previous forecast and is now 12.0 million boxes. Final fruit size is below the average, requiring 271 pieces to fill a 90-pound box. Final droppage, measured at 50 percent, is above the average. The Row Count survey conducted March 26-27, 2024, showed 51 percent of the Valencia crop harvested.

## All Grapefruit 2.00 Million Boxes

The forecast of all grapefruit production is lowered 200,000 boxes to 2.00 million. The Row Count survey conducted March 26-27, 2024, indicated 97 percent of red and white grapefruit rows are harvested.

## Tangerines and Tangelos 500,000 Boxes

The forecast for tangerines and tangelos is unchanged at 500,000 boxes. This forecast number includes all certified tangerine and tangelo varieties.

## Reliability

To assist users in evaluating the reliability of the April 1 Florida production forecasts, the "Root Mean Square Error," a statistical measure based on past performance, is computed. The deviation between the April 1 production forecast and the final estimate is expressed as a percentage of the final estimate. The average of squared percentage deviations for the latest 20-year period is computed. The square root of the average becomes statistically the "Root Mean Square Error." Probability statements can be made concerning expected differences in the current forecast relative to the final end-of-season estimate, assuming that factors affecting this year's forecast are not different from those influencing recent years.

The "Root Mean Square Error" for the April 1 Florida all orange production forecast is 3.7 percent. If you exclude the four abnormal production seasons (four hurricane seasons), the "Root Mean Square Error" is 4.0 percent. This means chances are 2 out of 3 that the current all orange production forecast will not be above or below the final estimates by more than 3.7 percent including abnormal seasons, or 4.0 percent excluding abnormal seasons. Chances are 9 out of 10 (90 percent confidence level) that the difference will not exceed 6.3 percent including abnormal seasons, or 7.0 percent excluding abnormal seasons.

Changes between the April 1 Florida all orange forecast and the final estimates during the past 20 years have averaged 2.87 million boxes (3.15 million, excluding abnormal seasons), ranging from 0.05 million boxes to 5.7 million boxes including abnormal seasons, (1.3 to 5.7 million boxes excluding abnormal seasons). The April 1 forecast for all oranges has been below the final estimate 9 times, above 11 times, (below 8 times, above 8 times, excluding abnormal seasons). The difference does not imply that the April 1 forecasts this year are likely to understate or overstate final production.

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# https://citrusagents.ifas.ufl.edu/newsletters/

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Please send: Dr. Mongi Zekri
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Hendry County Extension Office
P.O. Box 68
LaBelle, FL 33975
or E-mail: maz@ufl.edu

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## ***Racial-Ethnic Background***

__American Indian or native Alaskan
__Asian American
__Hispanic
__White, non-Hispanic
__Black, non-Hispanic

## ***Gender***

__Female __Male