EXTENSION

Institute of Food and Agricultural Sciences

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

Flatwoods Citrus

Vol. 25, No. 1 **January 2022**

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

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February 2022 Zoom Citrus Seminar

Date & Time: Thursday, February 24, 2022, 10:00 AM – 11:00 AM
Title: **Scouting and Management of Citrus Diseases II (PFD, citrus black spot and citrus canker)**
Speaker: **Dr. Megan Dewdney**, Associate Professor, UF/IFAS Citrus Research & Education Center, Lake Alfred
Coordinator: Dr. Mongi Zekri, Multi-County Citrus Extension Agent, UF-IFAS

Dr. Dewdney will be talking about the scouting and management of citrus black spot, post-bloom fruit drop, and citrus canker. She will discuss the symptoms and how to recognize the diseases. The best management procedures will be discussed. Pesticide recommendations and timings will be described.

1 CEU for pesticide license renewal
1 CEU for certified crop advisors

Register in advance for this meeting:
https://ufl.zoom.us/meeting/register/tJMpd-yrpzgvGta6dJ4uro-gk5qD0msFsV4u
After registering, you will receive a confirmation email containing information about joining the meeting.

Wednesday March 23, 2022 for a possible in-person seminar

10:00 AM – 11:00 AM
Topic: Root structure and propagation methods with a hands-on demo of different root crowns.
Location: Immokalee IFAS Center
Speaker: **Dr. Ute Albrecht**, Assistant Professor, UF/IFAS SW Florida Research & Education Center, Immokalee
Coordinator: Dr. Mongi Zekri, Multi-County Citrus Extension Agent, UF-IFAS

UF | UNIVERSITY of FLORIDA

CEUs for pesticide license renewal

Earn CEU Credits NOW online through Southeast AgNet & Citrus Industry Magazine
http://citrusindustry.net/ceu/

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

- **2020 #4:** Protecting People From Pesticide Exposure (10/31/22)
- **2021 #3:** Before You Spray (7/31/22)
- **2021 #2:** When a Pesticide Doesn't Work (4/30/22)
- **2021 #1:** The Goals of Pest Management (1/31/22)

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.

FYI, there are also CORE CEU available at Growing Produce
http://www.growingproduce.com/crop-protection/ceu-series/

http://www.growingproduce.com/crop-protection/ceu-series/

Online Pesticide CEUs
https://pested.ifas.ufl.edu/ceu/

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EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

CLIMATE PREDICTION CENTER/NCEP/NWS
and the International Research Institute for Climate and Society

9 December 2021

ENSO Alert System Status: La Niña Advisory

Synopsis: **La Niña is favored to continue through the Northern Hemisphere winter 2021-22 (~95% chance) and transition to ENSO-neutral during the spring 2022 (~60% chance during April-June).**

In November, the continuation of La Niña was reflected in the below-average sea surface temperatures (SSTs) extending across the equatorial Pacific Ocean [Fig. 1]. In the last week, all of the Niño indices were between -0.7°C and -1.2°C, with the largest departures occurring in the easternmost regions of Niño-1+2 and Niño-3 [Fig. 2]. Below-average subsurface temperatures weakened slightly compared to the previous month [Fig. 3], but a large pool of negative temperature anomalies still extended across the central and eastern Pacific, down to ~200m depth [Fig. 4]. Low-level easterly and upper-level westerly wind anomalies persisted over most of the equatorial Pacific. Enhanced convection and rainfall were observed over Indonesia and convection was suppressed over the central and western equatorial Pacific [Fig. 5]. The Southern Oscillation Index and Equatorial Southern Oscillation Index were more positive than the previous month. Overall, the coupled ocean-atmosphere system was consistent with La Niña.

The IRI/CPC plume average of forecasts for the Niño-3.4 SST index indicates La Niña will continue through the February-April 2022 season [Fig. 6]. The forecaster consensus anticipates a transition to ENSO-neutral sometime during the Northern Hemisphere spring, with chances for La Niña declining below 50% after March-May 2022. The chance of a moderate-strength La Niña declined slightly from last month's update, but there is still a 59% chance of the Niño-3.4 index reaching a value less than -1.0°C for the November 2021 - January 2022 season. In summary, La Niña is favored to continue through the Northern Hemisphere winter 2021-22 (~95% chance) and transition to ENSO-neutral during the spring 2022 (~60% chance during April-June; click CPC/IRI consensus forecast for the chances in each 3-month period).

La Niña is anticipated to affect temperature and precipitation across the United States during the upcoming months (the 3-month seasonal temperature and precipitation outlooks will be updated on Thurs. Dec. 16th).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site (El Niño/La Niña Current Conditions and Expert Discussions). Additional perspectives and analysis are also available in an ENSO blog. A probabilistic strength forecast is available here. The next ENSO Diagnostics Discussion is scheduled for 13 January 2022.
To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.enso-update@noaa.gov.

Climate Prediction Center
National Centers for Environmental Prediction
NOAA/National Weather Service
College Park, MD 20740

United States Department of Agriculture
National Agricultural Statistics Service

CITRUS
January 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

January 12, 2022

Florida All Orange Production Down 3 Percent
Florida Non-Valencia Orange Production Down 3 Percent
Florida Valencia Orange Production Down 4 Percent
Florida All Grapefruit Production Unchanged
Florida All Tangerine and Tangelo Production Down 11 Percent

Forecast Dates - 2021-2022 Season	
February 9, 2022	May 12, 2022
March 9, 2022	June 10, 2022
April 8, 2022	July 12, 2022

Citrus Production by Type – States and United States

Crop and State	Production [1]		2021-2022 Forecasted Production [1]	
	2019-2020	2020-2021	December	January
	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)
Non-Valencia Oranges [2]				
Florida	**29,650**	**22,700**	**18,000**	**17,500**
California	43,300	40,600	35,000	39,000
Texas	1,150	1,000	450	300
United States	74,100	64,300	53,450	56,800
Valencia Oranges				
Florida	**37,750**	**30,100**	**28,000**	**27,000**
California	10,800	9,500	8,500	8,600
Texas	190	50	100	100
United States	48,740	39,650	36,600	35,700
All Oranges				
Florida	**67,400**	**52,800**	**46,000**	**44,500**
California	54,100	50,100	43,500	47,600
Texas	1,340	1,050	550	400
United States	122,840	103,950	90,050	92,500
Grapefruit				
Florida-All	**4,850**	**4,100**	**4,100**	**4,100**
Red	**4,060**	**3,480**	**3,300**	**3,300**
White	**790**	**620**	**800**	**800**
California	4,700	3,900	3,900	3,500
Texas	4,400	2,400	3,100	1,600
United States	13,950	10,400	11,100	9,200
Lemons				
Arizona	1,800	800	1,300	1,400
California	25,300	21,300	21,000	23,000
United States	27,100	22,100	22,300	24,400
Tangerines and Tangelos				
Florida	**1,020**	**890**	**900**	**800**
California [3]	22,400	28,100	21,000	21,000
United States	23,420	28,990	21,900	21,800

[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 tangors.

All Oranges 44.5 Million Boxes

The 2021-2022 Florida all orange forecast released today by the USDA Agricultural Statistics Board is 44.5 million boxes, down 1.50 million boxes from the December forecast. If realized, this will be 16 percent less than last season's final production. The forecast consists of 17.5 million boxes of non-Valencia oranges (early, mid-season, and Navel varieties) and 27.0 million boxes of Valencia oranges. A 9-year regression has been 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. Average fruit per tree includes both regular and first late bloom.

Non-Valencia Oranges 17.5 Million Boxes

The forecast of non-Valencia production is lowered 500,000 boxes to 17.5 million boxes. Final fruit size is close to the minimum, requiring 326 pieces to fill a 90-pound box. Final droppage of non-Valencia oranges (excluding Navels) at 39 percent is close to the maximum. The Navel forecast, included in the non-Valencia forecast, is unchanged at 450,000 boxes, and is 3 percent of the non-Valencia total.

Valencia Oranges 27.0 Million Boxes

The forecast of Valencia production is lowered 1.00 million boxes from the December forecast to 27.0 million boxes. Current fruit size is close to the minimum and is projected to be close to the minimum at harvest. Current droppage is above average and projected to be above average at harvest.

All Grapefruit 4.10 Million Boxes

The forecast of all grapefruit production is unchanged from December at 4.10 million boxes. If realized, this will be equal to last season's final production. The red grapefruit forecast is held at 3.30 million boxes. Fruit size of red grapefruit at harvest is projected to be average, and droppage is projected to be average. The white grapefruit forecast is unchanged at 800,000 boxes. Projected fruit size of white grapefruit at harvest is above average. White grapefruit droppage is projected to be below average.

Tangerines and Tangelos 800,000 Boxes

The forecast for tangerines and tangelos is reduced 100,000 boxes from December and is now 800,000 boxes, 10 percent less than last season's utilization of 890,000 boxes. This forecast number includes all certified tangerine and tangelo varieties.

Reliability

To assist users in evaluating the reliability of the January 1 Florida production forecasts, the "Root Mean Square Error," a statistical measure based on past performance, is computed. The deviation between the January 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 January 1 Florida all orange production forecast is 6.3 percent. If you exclude the three abnormal production seasons (three hurricane seasons) chances are still 6.3 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 6.3 percent, including or excluding abnormal seasons. Chances are 9 out of 10 (90 percent confidence level) that the difference will not exceed 10.9 percent including abnormal seasons, or 11.0 percent excluding abnormal seasons.

Changes between the January 1 Florida all orange forecast and the final estimates during the past 20 years have averaged 5.34 million boxes (4.90 million, excluding abnormal seasons), ranging from 0.30 million boxes to 12.7 million boxes (including and excluding abnormal seasons). The January 1 forecast for all oranges has been below the final estimate 5 times, above 15 times, (below 5 times, above 12 times, excluding abnormal seasons). The difference does not imply that the January 1 forecasts this year are likely to understate or overstate final production.

Forecast Components, by Type – Florida: January 2022

[Survey data is considered final in December for Navels, January for early-midseason (non-Valencia) oranges, February for grapefruit, and April for Valencia oranges]

Type	Bearing trees	Fruit per tree	Droppage	Fruit per box
	(1,000 trees)	(number)	(percent)	(number)
ORANGES				
Early-midseason (Non-Valencia) [1]	18,171	571	39	326
Navel	864	150	28	137
Valencia	30,349	394	30	263
GRAPEFRUIT				
Red	1,776	393	29	122
White	314	481	25	105

[1] Excludes Navels.

FACTORS AFFECTING CITRUS FRUIT PRODUCTION AND QUALITY

Citrus fruit production and quality are influenced by many factors including climatic conditions and production practices.

In subtropical climates, the temperature usually falls below 70 °F for several months during winter. This period of cool temperatures causes growth to cease and citrus trees to become dormant for about 3 months. The cool temperatures during this dormant period promote floral induction. When warm spring temperatures, among other things, stimulate the resumption of vegetative growth, induced buds grow and produce flowers. In tropical climates, there is no period of cold temperature to induce dormancy. However, with periods of less than ample soil moisture (drought stress), flushes of bloom and vegetative growth normally follow these drought periods.

It is well documented that vegetative and reproductive (fruit) growth compete for available resources, such as carbohydrates (sugars) and mineral nutrients. Flushes of heavy vegetative growth will reduce the resources available to developing fruit, resulting in fruit with lower total soluble solids (TSS). A period of dormancy, during which there is little or no vegetative growth, reduces this competition for resources and results in fruit with increased TSS. The competition for resources between vegetative and reproductive growth is one of the reasons that citrus fruit grown in tropical climates tend to have lower TSS than those grown in subtropical climates.

CLIMATE

Within fairly broad parameters of adequate soil and reasonably good cultural and crop protection practices, climate is the most important component of the climate-soil-culture complex causing differences in fruit quality among commercial citrus production areas.

There is considerable diversity among citrus cultivars in their response to climate, especially as regards to market quality of the fruit. For example, 'Navel' orange develops its best eating and eye-appeal qualities in a Mediterranean type climate with cool, wet winters and hot, dry summers. In wet, tropical regions, 'Navel' fruit tends to be large, with poorly colored rinds, and low TSS and acid in the juice. Unlike 'Navel', grapefruit cultivars develop optimum internal quality in warm climates with little winter chilling. 'Valencia' orange is adapted to a broad range of climates, producing excellent to acceptable fruit quality in most of the world's important citrus regions.

Some, but not all of these climate-induced differences can be overcome with cultural practices. For example, there is no known cultural practice that allows California (a Mediterranean climate) to produce low-acid, thin-peel grapefruit similar to the world's top quality grapefruit grown in Florida (a humid subtropical climate).

Worldwide climate has a significant effect on citrus yield, growth, fruit quality, and economic returns. In growing regions where the average temperatures remain high all year (tropical climates), fruit peel chlorophyll does not degrade and oranges and tangerines remain green, whereas in cool-winter subtropical climates oranges and tangerines develop more intense orange peel color and greater eye-appeal at maturity.

In lowland tropical areas, due to high respiration rates at warm temperatures, fruit mature quickly and do not have sufficient time to accumulate high TSS and acidity declines rapidly so that the soluble solids/acid ratio increases sharply and the fruit quickly become insipid and dry. TSS in fruit accumulate most slowly in cool coastal areas. Maximum levels of TSS are usually attained in the mid-tropics and in humid subtropical regions with warm winters. Total acid (TA) levels are generally greatest in semiarid or arid subtropical and coastal climates and decline more slowly as fruit mature compared with other climates. Decrease in TA is primarily a function of temperature (heat unit accumulation) and the rapid respiration of organic acids at those higher temperatures.

GROWTH REGULATORS

Application of plant growth regulators (PGRs) can provide significant economic advantages to citrus growers when used in appropriate situations. Depending on cultivar and timing, PGRs may improve fruit set, increase fruit size by reducing cropload, extend the harvest season by delaying rind aging, and reduce preharvest fruit drop.

Gibberellic acid (GA) is recommended for citrus hybrids that are weakly parthenocarpic and without sufficient cross-pollination to improve fruit set. Applied from full bloom to two-third petal fall, GA can effectively set and produce an excellent crop of seedless self-incompatible mandarin hybrids. Application of GA to citrus fruit approaching maturity enhances peel firmness and delays peel senescence.

Application of GA in the fall often increases juice extraction from sweet oranges. It is likely that GA enhances juice extraction efficiency because increased peel firmness provides better mechanical support for fruit within extraction cups.

Applied in winter during floral induction to cultivars that routinely flower heavily but set poor crops such as ‘Navel’, ‘Ambersweet’, and ‘Ortanique’, GA reduces flowering and often results in increased fruit set. A combination of GA and 2,4-D has been used in many fresh fruit growing regions to enhance peel strength and extend the harvest seasons for grapefruit and sweet oranges.

Naphthalene acetic acid (NAA) is used to thin fruit when excessive set occurs. Thinning heavily cropping trees with NAA increases fruit size. The greatest thinning response to NAA has been shown to occur when applications are made when the average fruit diameter is about 1/2 inch, which typically occurs 6 to 8 weeks post bloom. Thinning of ‘Murcott’ and ‘Sunburst’ tangerines with NAA was found to increase fruit size, average fruit weight, and percent packout through improved fruit appearance.

CULTIVAR/ROOTSTOCK

The most important determinant of fruit production and quality under the grower’s control is cultivar selection. Under comparable conditions, ‘Hamlin’ orange always has poorer juice color and lower TSS than ‘Midsweet’ or ‘Valencia’ orange. On the other hand, ‘Hamlin’ produces higher, more consistent yields per acre than any other sweet orange cultivar. Worldwide, ‘Valencia’ produces premium quality fruit with excellent internal quality, high sugars, superior flavor, and deep orange juice color at maturity.

Besides cultivar, many of the horticultural characteristics of cultivars are influenced by the rootstock, including tree vigor and size, and fruit yield, size, maturity date, and quality. One of the best-known examples is the small fruit size of ‘Valencia’ budded on ‘Cleopatra’ mandarin (Cleo) rootstock. Cleo is well suited for use with ‘Temple’ orange, tangerines and tangerine hybrids. Sweet orange and grapefruit cultivars on Cleo generally produce small fruit and are not precocious, thus it is not commonly used for these varieties. Low yield associated with Cleo rootstock is the result of poor fruit set and size, and fruit splitting. Scions on Cleo are most productive on heavier soils.

Larger fruit with thicker, rougher peel, and lower concentrations of TSS and acid in the juice are generally associated with cultivars budded on fast-growing vigorous rootstocks such as rough lemon, 'Volkamer' lemon, *Citrus macrophylla*, and 'Rangpur'. However, these rootstocks impart high vigor to the scion and induce high yield. Tangerine fruit from trees grown on vigorous rootstocks tend to be puffy, hold poorly on the tree, and have high incidence of granulation.

Cultivars on slower-growing rootstocks generally do not produce vigorous vegetative growth, but tend to produce small to medium size fruit with smooth peel texture and good quality fruit with high TSS and acid content in the juice. This latter group of rootstocks includes trifoliate orange and some of its hybrids (citranges and citrumelos). Sweet oranges budded on 'Carrizo' citrange have been among the most profitable combinations over the long term in Florida. Planted on the right soils, trees on 'Swingle' citrumelo are very productive at high-density plantings.

IRRIGATION AND NUTRITION

Although citrus trees develop largely in response to their genetic endowment and the climate, good production practices can have favorable influences on fruit production and quality. Cultural practices that attempt to cope with climatic or weather problems include irrigation and nutrition. Irrigation is of particular importance during the spring, which coincides with the critical stages of leaf expansion, bloom, fruit set, and fruit enlargement.

Proper irrigation increases fruit size and weight, juice content and soluble solids/acid ratio. Soluble solids per acre may increase due to yield increase. However, soluble solids per box and acid contents are reduced. Through its tendency to stimulate vegetative growth, irrigation in the dry fall and winter may reduce soluble solids in the fruit. Decline in total acid levels can also be aggravated by excessive irrigation.

Citrus trees require a good water management system and a balanced nutrition program formulated to provide specific needs for maintenance and for expected yield and fruit quality performance. Adequately watered and nourished trees grow stronger, have better tolerance to pests and stresses, yield more consistently, and produce good quality fruit. On the other hand, excessive or deficient levels of water or fertilizer will result in low fruit yield and oversize fruit with poor quality and diluted soluble solids content.

The most important nutrients influencing fruit quality are nitrogen, phosphorus, and potassium. However, when any other nutrient is deficient or in excess, fruit yield and quality are negatively altered. Nitrogen (N) increases juice content, TSS per box and per acre, and acid content. However, excessive N can induce excess vigor and promote a vegetative rather than a flowering tree and can result in lower yields with lower TSS per acre. In contrast, low N levels promote extensive flowering but fruit set and yields are poor.

Phosphorus reduces acid content, which increases soluble solids/acid ratio. Potassium (K) increases fruit production, fruit size, green fruit and peel thickness. Foliar spray of potassium nitrate or monopotassium phosphate in the spring often increases fruit size of tangerine and grapefruit, and fruit size and total pound solids of 'Valencia' orange. Foliar application (6-8 weeks before bloom) of urea can increase flowering and fruit set.

SUNLIGHT AND PRUNING

Even though citrus trees can tolerate shade and still flower and fruit, maximum flowering occurs when trees are grown in full sun and light penetration through the canopy is maximized. Therefore, pruning, including topping and hedging, to avoid crowding is extremely important for optimum flowering. The amount of fruit that is set has a very significant effect on fruit quality. There is a positive correlation between the number of fruit per tree and fruit quality. When the number of fruit per tree is low, the peel texture, shape of fruit, and often fruit color are poor. Quality of individual fruit varies significantly, even on the same tree. Heavily shaded fruit borne on the interior of the canopy have less TSS than fruit on the exterior of the canopy. Insufficient light contributes to reduced TSS concentration of interior fruit nourished by heavily shaded leaves.

It is well established that shoots with fruit do not flower the following year. A heavy fruit crop tends to deplete carbohydrates and results in a small crop and increased vegetative growth the following year. Pruning after a heavy crop additionally stimulates vegetative growth and reduces fruit yield the following year. Pruning after a light crop and before an expected heavy crop can increase fruit size and help reduce alternate bearing. Pruning or topping and hedging usually increase fruit size and packout of fresh-market fruit by reducing crop load, thus increasing net cash returns to growers.

CONCLUSION

The improvement in citrus fruit production and quality that a grower can achieve through choice of scion/rootstock combinations, good irrigation management, balanced nutrition, and proper pruning may easily be overwhelmed by pests, diseases, and other injuries. Excessive leaf loss will noticeably reduce flowering the following spring and subsequent fruit production. The primary causes of leaf loss are freeze, tropical storm injury, salt and water stress problems including drought stress and flooding injuries, mites, greasy spot, herbicides and pesticide toxicities. Excessive leaf loss in the fall and in early winter is the worst thing that can happen to citrus trees. It will reduce accumulation of carbohydrates affecting flowering, fruit set, and fruit yield. Therefore, good practices in citrus groves should be adapted to minimize negative plant physiological stresses, improve tree health and performance, and enhance citrus trees to produce high yield of good fruit quality.

USING CITRUS LEAF FREEZING INFORMATION TO DETERMINE CRITICAL TEMPERATURE

https://fawn.ifas.ufl.edu/tools/coldp/crit_temp_select_guide_citrus.php

Chris Oswalt, Polk County Extension E-mail Chris Oswalt

With the onset of cooler temperatures citrus trees cease active growth and become quiescent. This continued quiescence at lower temperatures results in a subsequent increase in cold hardiness termed acclimation. Citrus trees proceed through many changes during acclimation. These changes include: increases in sugars and amino acids with decreases in starch levels within plant tissues. Tissue moisture decreases along with increases in the stability and binding of cell water. These factors combine to increase the ability of citrus tissues to withstand the formation and presence of ice.

Citrus trees acclimated to cold temperatures have survive temperatures as low as 14°F. Acclimation is affected by exposure temperatures, scion cultivar, rootstock cultivar, rootstock/scion combination, tree nutritional status, crop load and water stress. Acclimation is dynamic and will change during the winter in response to warming exposure temperatures with a possible resumption of growth.

Leaf killing points vary in magnitude in response to the above conditions, although the predominate factor, would be exposure temperatures. Studies of citrus leaf killing point temperatures clearly indicate that citrus trees grown in more northern growing areas acquire greater acclimation than trees grown in growing regions further south. Trees grown in southern regions of the state are also more susceptible to active growth due to favorable growing conditions during the winter.

Non-acclimated citrus leaves will generally survive to temperatures of 24°F. New spring flush leaves formed in April will rarely survive temperatures of 31°F, by mid May these leaves will have similar leaf killing points to mature leaves. Research studies indicated that citrus leaf killing points can range from 16°F to 24°F during the winter with a Satsuma cultivar reaching 14°F during one year. Field observations indicated that these leaf killing point values hold up in a number of freezes.

CITRUS LEAF KILLING TEMPERATURES FOR FLORIDA CITRUS

Location	Variety/Rootstock	11/29/2021	12/06/2021	12/13/2021	12/20/2021
Balm	Valencia/Swingle	NA	NA	NA	NA
Ft. Meade	Valencia/US 942	23	21.5	23	22.5
Frostproof	Hamlin/Swingle	22	20.5	22	21
Green Swamp	Hamlin/Swingle	20.5	20.5	21	20
Sugar Belle	Sugar Belle/ US 942	20.5	20.5	21.5	21
Bingo	Bingo/US 942	21	20.5	22.5	22.5

Location	Variety/Rootstock	12/27/2021	01/03/2022	01/10/2022
Balm	Valencia/Swingle	NA	NA	
Ft. Meade	Valencia/US 942	NA	23	
Frostproof	Hamlin/Swingle	NA	22	
Green Swamp	Hamlin/Swingle	NA	21.5	
Sugar Belle	Sugar Belle/ US 942	NA	21.5	
Bingo	Bingo/US 942	NA	23	

Freeze Damage to Citrus Trees

Severe freezes can damage leaves, twigs, and even kill entire trees. Freeze damage to citrus occurs when water inside the fruit, leaves, and twigs becomes ice and ruptures the cell membranes. During the fall and winter, extended periods of cool weather prior to a freeze can allow citrus trees to harden and acclimate, and therefore withstand more cold weather than non-acclimated trees. On the other hand, freeze damage is more severe when it follows a warm spell. Because new growth is more susceptible to freeze damage, do not do anything that stimulates new growth during the winter.

Symptoms of Freeze Damage

The evidence of freeze damage to citrus fruit is the presence of ice crystals in the fruit. Ice formation inside the fruit usually ruptures the juice sacs. Within several days of warm weather after a freeze, water will be lost from the fruit causing a reduction in its juice content.

Following severe freezes, mature fruit should be harvested as soon as possible to minimize losses due to excessive fruit drop and reduction in juice content.

Freezes cause the leaves to dry out, curl, turn brown, and fall.

If twigs and wood have not been damaged severely, the leaves will rapidly shed.

If twigs or wood have been seriously damaged, the frozen leaves may remain attached on the tree for several weeks.

After a severe freeze, twig dieback can continue for a couple of years. Another sign of severe freezing damage includes splitting of barks.

The true extent of freeze damage to branches may not be clear within the first three months following a freeze. No attempt should be made to prune or even assess damage from freezes until at least the new spring flushes get fully expended and mature.

Care of Freeze-Damaged Trees

Pruning Freeze-Damaged Wood

No pruning should be done until late in the spring or the summer after a freeze. In early spring, freeze-damaged trees often produce new growth that soon dies back. Sufficient time should be given for the dying back to cease and for the new healthy growth to take place and fully expand. Experience has shown that early pruning does not promote recovery and that delaying pruning to the proper time will save money.

Irrigation & Fertilization

When leaves are lost, evaporation from the tree canopy is greatly reduced. Therefore, the amount of water required should be reduced. Over irrigation will not result in rapid recovery, but may cause root damage. Normal irrigation should be practiced when trees regain their normal foliage development and canopy density. Fertilization of freeze-damaged trees should also be reduced until the trees are back to their original size and their canopy is back to the original density.

The 31st Annual Farm Safety Day

Friday, 6 May 2022
Saturday, 7 May 2022

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 accidents 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 2022 Southwest Florida Farm Safety Day is almost here. Farm Safety Day is an educational event designed to emphasize the importance of farm/equipment safety. Each participant is presented with a certificate of attendance and **the employer will be provided with a certificate of training that can be placed into the employee's file**.

Registration Info

The deadline for registration is Friday, April 22, 2022. It is the employer's responsibility to assure that the employee is present at 7:30 AM on Friday, May 6 **or** on Saturday, May 7 at the Immokalee IFAS Center, 2685 State Rd. 29 North, Immokalee, FL 34142 to receive their nametag. Upon arrival each participant will check in at the registration table and receive a packet containing their nametag, instructions (in both English and Spanish) session handouts, an evaluation form, rodeo cap and pencil. They will be directed to their respective course sessions.
Please give us the names of those who will be attending our 31st Farm Safety Day on **Friday, 6 May** **or** **Saturday, 7 May 2022 (please select the date)**. The cost is **$25.00** per person, which will include educational sessions, handouts, pencils, refreshments, lunch, door prizes, and a cap.

Make checks payable to: University of Florida

Mail registration and checks to:
University of Florida, IFAS, SWFREC
Attention: Barbara Hyman
2685 State Rd. 29 North
Immokalee, FL 34142

Deadline is Friday, April 22, 2022

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

31st ANNUAL SAFETY DAY

Friday, 6 May 2022
Saturday, 7 May 2022

Location: University of Florida, IFAS, SWFREC
2685 State Rd. 29 North
Immokalee, FL 34142

SCHEDULE:

7:30-8:10	Check In, Coffee, Juice, Refreshments, Door Prizes
8:10-9:00	Session 1 (Begin sessions)
9:00-9:10	Break (change session, door prizes)
9:10-10:00	Session 2
10:00-10:10	Break (change session, door prizes)
10:10-11:00	Session 3
11:00-11:10	Break (change session, door prizes)
11:10-12:00	Session 4
12:00-1:30	Lunch and Adjourn

The 2022 FARM SAFETY DAY
REGISTRATION FORM

Please give us the names of those who will be attending our 30th Farm Safety Day on **Friday, 6 May** or **Saturday, 7 May 2022** at the Immokalee IFAS Center, 2685 State Rd. 29 North, Immokalee, FL 34142. The cost is **$25.00** per person, which will include educational sessions, handouts, refreshments, lunch, and a cap.

Make checks payable to:
University of Florida

Mail registration and checks to:
University of Florida, IFAS, SWFREC
Attention: Barbara Hyman
2685 State Rd. 29 North
Immokalee, FL 34142

Deadline is Friday, April 22, 2022

Company Name:

Administrative Contact Person:

E-mail address:

Mailing Address:

Telephone: ___________________ Fax:_________________ County:___________________

Please list the employees who will be attending our safety training and please check their language preference*****. If there is not enough space to fill in all attendants, please attach an additional sheet with the necessary information.

Name	Friday or Saturday	English	Spanish	Name	Friday or Saturday	English	Spanish
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***Please Note: It is very important that we know the date (Friday, 6 May or Saturday, 7 May 2022) and the language capabilities for each attendee.**
Next to each attendee's name please mark in which language they are more fluent.
If there are any questions, please contact **Barbara Hyman (hymanb@ufl.edu) at 239 658 3400.**

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

Dear Agricultural Producer/Industry Representative,

I am writing to urge you to join in supporting the Southwest Florida Research and Education Foundation.

Agriculture is changing and facing a new era of challenges. With the constant variations in our environment, the constant stream of new pests and diseases and the importance of protecting and enhancing our natural resources, government has been increasing regulations forcing farmers and growers to find a new way of managing their operations and resources and meet the regulations that help protect the environment while remaining profitable.

SWFREC, as a research and education center, is essential to educate the population about the importance of agriculture and in helping farmers and growers meet these challenges by providing them support and knowledge of the latest technology. Over the years, the center has in no small measure contributed to the growth and success of agriculture in Southwest Florida. See attached.

Your gift is important to support the cutting-edge research conducted at SWFREC. Your contribution to the SWFREC Foundation helps us recruit and retain star faculty who help UF help feed the world. Becoming a member of the Southwest Florida Research and Education Foundation will not only allow you to enable the SWFREC to continue to provide cutting edge research but you will also be able to help direct that research.

Membership Categories (Annual):

Regular $25, Silver $100, Gold $500, Platinum $1,000, Other ________

Please make check payable to SWFREF, Inc., and mail it to:

SWFREF, Inc.
ATTN: Becky Decker
2685 SR 29 North
Immokalee, FL 34142

You can also pay online at https://www.eventbrite.com/e/southwest-florida-research-and-education-center-foundation-tickets-224675208597 or scan the QR code below.

Simply put, if you are engaged in agriculture, you cannot afford not to support the Southwest Florida Research and Education Center through your contribution to the SWFRE Foundation.

I hope you will act today to support the Foundation and thank you for your generous contribution that will enable us to continue to support the agricultural community with cutting edge research and extension educational programming.

Sincerely,

Gene McAvoy

Gene McAvoy
Associate Director for Stakeholder Relations

IRRIGATION, NUTRITION, AND CITRUS FRUIT QUALITY

Mongi Zekri, Thomas A. Obreza, Robert Koo, and Fernando M. Alferez

Florida has the highest citrus fruit quality standards in the world. The most important quality factors for Florida citrus growers, production managers, processors, and packers include fruit juice content, soluble solids and acid concentrations, soluble solids-acid ratio, fruit size, and color. Florida citrus growers discern between quality factors for the fresh and processing markets. For example, fruit size, shape, color, and maturity date are most important for fresh fruit, but high juice content and soluble solids are desired for processing fruit. However, in the case of fresh fruit, emphasis must be made on the importance of internal quality as well in order to ensure returning customers. Fruit quality is affected by several factors, including cultivar, rootstock, climate, soil, pests, irrigation, and nutrition.

The effects of irrigation and nutrition on fruit quality are important and should be understood and taken into consideration by citrus growers and production managers to increase profitability and enhance sustainability and worldwide competitiveness. It is interesting to note that preharvest conditions in the grove will have an effect during postharvest in terms of quality, and that these effects may only be noticed after several weeks, when the fruit is already at the final destination. In general, excessive irrigation and fertilization reduce fruit quality. Therefore, supplying sufficient nutrition and using sound irrigation scheduling techniques should be high-priority management practices for every grower. Citrus trees require a properly designed, operated, and maintained water management system and a balanced nutrition program formulated to provide specific needs for maintenance and for expected yield and fruit quality.

Irrigation contributes to the efficiency of fertilizer programs. Citrus trees with sufficient water and nutrients grow stronger, better tolerate pests and stresses, yield more consistently, and produce good quality fruit. On the other hand, excessive or deficient irrigation or fertilization may result in poor fruit quality. In general, fertigation programs should take into consideration the need of minimizing environmental stresses, especially closer to the harvesting window.

The most important management practices influencing fruit quality are irrigation and nitrogen, phosphorus, potassium, and magnesium nutrition. Some micronutrients like manganese, zinc, boron and copper can also affect fruit quality, but only if they are deficient in the tree. In general, when any nutrient element is severely deficient, fruit yield and fruit quality will be negatively affected.

EFFECTS OF SPECIFIC ELEMENTS

Trends in fruit quality response to increasing nutrient and water availability are described and summarized below:

NITROGEN (N)

- Increases juice content and color, total soluble solids (TSS), and acid concentration.

- Increases TSS per box and per acre. However, excessive N, particularly with inadequate irrigation, can result in lower yields with lower TSS per acre.
- Decreases fruit size and weight.
- Increases peel thickness and green fruit at harvest.
- Increases incidence of creasing.
- Reduces stem-end rot incidence and green mold of fruit in storage.
- On the other hand, an excess of N produces thicker peel and albedo gets separated from the carpelar segments of the fruit, leading to puffiness. The fruit becomes more misshapen and prone to deformation and wounds, making them more susceptible to infection. This is more common in mandarin; hence, these fruit should be packed carefully without overcrowding the crates.

PHOSPHORUS (P)

- Reduces acid concentration, which increases TSS-acid ratio. Phosphorus rates have no effect on TSS per box but may increase TSS per acre due to increase in fruit production in soils that are low in plant-available P.
- Increases number of green fruit but reduces peel thickness.
- P deficiency results in lower yield per tree, thicker albedo, and open central axis.

POTASSIUM (K)

- Potassium produces mostly negative effects on juice quality except for TSS per acre. Potassium increases fruit production, therefore producing more TSS per acre.
- Decreases juice content, TSS, TSS-acid ratio, and juice color.
- Increases acid content.
- Increases fruit size, weight, green fruit, and peel thickness.
- Reduces incidence of creasing and fruit plugging. In storage, reduces stem-end rot.
- On the other hand, K deficiency may induce smaller but better-colored fruit and thin skin. It has been related to the alteration known as creasing, with weaker albedo that gets less dense, resulting in long depressions in the peel. This alteration appears in the fruit still on the tree.

MAGNESIUM (MG)

- Slightly increases TSS per box and per acre, and TSS-acid ratio.
- Slightly increases fruit size and weight, but decreases rind thickness.

IRRIGATION

- Increases juice content and TSS-acid ratio.
- Reduces TSS and acid concentration. TSS per box decreases, but TSS per acre may increase due to yield increase.
- Increases fruit size and weight, increases green fruit at harvest but decreases rind thickness.
- An excess of irrigation, especially in periods of higher rainfall, may result in an excess of peel breakdown. In some varieties, like Sugar Belle, this may have special incidence at the end of the fruit developing phase prior to change in color (August–September) in which rainfall is abundant, especially in Florida.

The following information has been developed as part of the Decision Information System for Citrus. (http://disc.ifas.ufl.edu/bloom)

Dr. Tripti Vashisth, Horticulturist
Citrus Research & Education Center, Lake Alfred, FL

1/12/2022

Flower Bud Induction Advisory #4

Flower Bud Induction 2021 - University of Florida, Institute of Food and Agricultural Sciences (ufl.edu)

Season Forecast: This is a La Niña winter, second in a row, which means Florida is experiencing temperatures warmer than normal and rainfall lower than normal. We are in for warm and dry winter weather!

Under these conditions, enough hours below 68° F are likely to accumulate to induce an economic level of flower buds but intermediate warm periods during the winter can lead to multiple flowering waves and a very prolonged bloom. On the positive side, if dry weather prevails, not much differentiation will happen and dry conditions during the bloom period could potentially lower the risk for postbloom fruit drop (PFD).

Current Condition: We continue to experience warm weather, as expected in a La Niña winter. Currently, all citrus producing regions have induction hours (IH) ranging from 1100 to 840 IH, north to south. This puts us in a high induction period, it is predicted that we will have at least 2 waves of bloom, pretty much everywhere. Unfortunately, with the current warm weather we are already seeing small number of early off-season blooms in many blocks, especially the ones that have been harvested. The first major wave of flowering is likely to happen in the first week of February in central Florida and by February 15th in southwest. The second wave of flowering is expected with a 2-3 week gap from first wave. Currently, for Indian River region, the model predicts one wave of flowering around February 20th but it is very likely that instead of one strong flower wave there might be a prolonged flowering period spanning from mid-February to mid-March. Altogether, it is very likely that we will see prolonged and sporadic flowering this season especially in the groves that have been picked or have lighter than usual crop or stressed trees. It is time to start thinking about fertilizer application. With warm weather, trees are starting to put out vegetative and flower buds. It will be ideal to have your spring fertilizer on ground before first wave of flower is obvious.

Rainfall is going to play a significant role! Dry and cool weather will be ideal. If we get some cold weather (which is unlikely in La Niña) it will really help with flowering. Cool weather stops growth and then promotes induction of flower buds as more cool weather accumulates. After moderate induction (we are in high induction right now), a warm spell coinciding with rainfall can initiate differentiation, which after sufficient days of warm temperatures will lead to bloom. Trees will be very vulnerable to growth stimulation by a warm period after they accumulate 300-400 hours of cool temps if soil moisture is adequate or significant rainfall event happens.

Normal healthy trees could have their induction boosted and differentiation interrupted by applying some drought stress. ***Unfortunately, with vulnerable root systems associated with HLB you shouldn't risk heavier preharvest fruit drop of the current crop by using water stress to prevent unwanted early vegetative growth and enhance induction of flowers.***

Under current conditions, DO NOT apply GA with intention of suppressing early flowering in groves, GA application is not beneficial for suppressing early flowering (if the differentiation has already initiated).

Flowering related management considerations for HLB-affected trees:

- Gibberellic acid sprays (20 g a.i. per acre) can be used to suppress early spring flowering but the timing of application is critical for GA to be effective. GA should be applied before warm temperatures (that is before differentiation begins). DO NOT spray GA after first of January to manage flowering. GA can keep the fruit green, therefore can be a concern for fresh market fruit.
- DO NOT drought stress HLB-affected trees even though drought stress promotes flower induction and suppress vegetative growth, you should not risk current crop due to additional drought stress. Drought stress can exacerbate fruit drop. Daily, lower volume irrigations to minimize fall drought stress is suggested, especially when the weather is warm.
- Flowering enhancing fertilizer to increase the number of flowers are NOT suggested for severely HLB-affected trees as they are very less likely to benefit because of 2 reasons: (1) HLB-affected trees have more dead wood therefore, there are fewer buds available to become flower, interestingly a good branch of severe HLB trees has same flowering potential as mild HLB trees. So additional flowering promoting fertilizer is not needed. (2) High twig dieback and low fruitlet retention is the main concern with severe HLB trees in regards to fruit set. Only 2% of the total flowers turn into harvestable crop therefore, pushing tree to flower more is not advisable as that is likely to waste trees' energy and resources in extra flowers.

  Flower Bud Induction 2021 - University of Florida, Institute of Food and Agricultural Sciences (ufl.edu)

Sending hard copies of this ***Flatwoods Citrus newsletter*** *by regular mail will stop this year. You will receive your copy only through e-mail or through* ***https://citrusagents.ifas.ufl.edu/newsletters/***

☐ If you did not receive the ***Flatwoods Citrus*** newsletter and would like to be on our e-mailing list, please check this box and complete the information requested below.

☐ If you wish to be removed from our mailing list, please check this box and complete the information requested below.

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

Subscriber's Name:____

Company:____

Phone:__________________________

E-mail:____

Racial-Ethnic Background

__American Indian or native Alaskan

__Asian American

__Hispanic

__White, non-Hispanic

__Black, non-Hispanic

Gender

__Female

__Male