

# COLD HARDY CITRUS CONNECTION



## IN THIS ISSUE

### **SILICON: A BENEFICAL NUTRIENT IN CITRUS PRODUCTION**

### **6 HELPFUL TOOLS FOR THE CITRUS INDUSTRY**

### **CITRUS PLANTINGS IN GEORGIA CONTINUE TO INCREASE**

### **WHAT RETAIL BUYERS ARE LOOKING FOR FROM SUPPLIERS**

### **COLD HARDY CITRUS ASSOCIATION CORNER**

We hope you're staying cool (and dry) this summer! In this edition, you'll find information on using silicon for improving cold and heat tolerance in citrus, resources for citrus growers, an updated acreage estimate for Georgia citrus production, and marketing. You'll also find information and save the dates for several upcoming grower meetings. One being the Citrus and Specialty Crop Expo. This year's expo will be held at the Florida State Fairgrounds in Tampa, August 16-17th! This year, the expo is a *little* bit closer for us as it has traditionally been held each year in Ft. Myers. If you've never been, I highly recommend making the trip! The Citrus Expo is "the world's premier seminar and trade show program for the citrus industry" and well worth the trip. If we can help in any way, please, do not hesitate to reach out!



**Danielle S. Williams**  
UF/IFAS Gadsden County  
2140 W. Jefferson St.  
Quincy, FL 32351  
Office: 850-875-7255  
Cell: 850-509-7384  
dsprague@ufl.edu

# Silicon: A Beneficial Nutrient for Improving Cold and Heat Tolerance in Citrus Production

By: Dr. Muhammad A. Shahid, UF/IFAS NFREC, Assistant Professor of Horticulture

Silicon is the second most abundant element (25.7%) after oxygen (49.2%) in the earth crust. Plants can only uptake silicon in the form of silicon dioxide ( $\text{SiO}_2$ ) and/or mono-silicic acid ( $\text{H}_4\text{SiO}_4$ ). There is a difference between elemental silicon (used as plant nutrient) and silicone (product of silicon, carbon, hydrogen and oxygen for use as sealant, adhesive and lubricant). The concentration of silicon in plant tissues varies from organ to organ with higher accumulation in the mature leaves compared to the stem and roots. Monocots accumulate higher amounts of silicon as compared to dicots. Silicon accumulation across the plant species varies as legumes < fruits < vegetables < grasses < grain crops. Silicon is not a plant essential nutrient like N, P, K but a plant beneficial nutrient, providing supplemental growth and yield improving effect. Silicon was approved as a plant beneficial nutrient by the Association of American Plant Food Control Officials (AAPFCO) in 2012. After approval, nutrient manufacturers were able to identify qualifying formulations of silicon as a plant beneficial nutrient. Silicon fertilizer products are also approved by the Organic Materials Review Institute (OMRI) for use in organic production.

Silicon is beneficial to many horticultural and agronomic crops. Silicon enhances seed germination, root formation, fruit size and quality. It provides mechanical and physiological properties to the plants, improving resistance to various biotic and abiotic stresses. It improves the resistance to various diseases such as brown spot, rot root, fusarium wilt, powdery mildew, downy mildew, anthracnose, phytophthora, fruit decay etc. in different fruit crops. On one hand, silicon application makes a silica-bilayer on plant tissues providing the mechanical barrier for the entry of pathogens within plant tissues, however, it improves the activity of defense-related enzymes, antimicrobial compounds and pathogenesis-related (PR) proteins in plants on the other hand contributing enhanced resistance to different bacterial and fungal diseases. Silicon enhanced resistance to various chewing and piercing-sucking pests such as weevils, beetles, aphids, whiteflies scale, spider mites etc. Silicon is accumulated in cell walls enhancing resistance to lodging and limb/stem breakage due to the heavy winds and fruit load.

Silicon can be applied in different ways to the plants. Silicon can be directly applied by incorporating in the soil if using a powder form or dissolved in water to make solution that's applied to the soil through sprinkler, drip, or overhead irrigation.

## **Silicon for Citrus Production Continued**

Seeds and cuttings can be treated with silicon through dusting, soaking, misting, and dipping. Silicon application rate depends on plant bioavailable form of silicon in the product, application method and plant type. Although silicon phytotoxicity is uncommon, but it is suggested to run small test before using silicon fertilizer on large scale. Plant response to silicon varies from species to species and variety to variety within same species. Some plant species/varieties response well to foliar application while root zone application or the combination of both (foliar + root zone) works well for others. Crop-specific research is needed to determine the optimal level of silicon for getting maximum beneficial effect in terms of growth, yield, disease resistance and abiotic stress. In general, 50-100ppm of silicon is good for foliar application, 50ppm for the regular fertigation or 100ppm once in a week, and 1-6 tons depending upon soil pH for soil incorporation in powder form. Liquid silicon fertilizer is formed by dissolving silica ( $\text{SiO}_2$  or sand) in lye, so final solution is very alkaline with pH 11-12. Therefore, it is suggested to adjust the pH to 6.5-7 before foliar or fertigation application. Concentrated silicon fertilizer should not be used with other regular nutrients because silicates will polymerize to form gel like materials. Conventional fertilizer (N, P, K) and silicon fertilizer application should be done alternatively. Always make a fresh silicon solution for getting the maximum results. Research has shown that silicon provides maximum results if used regularly in the nutrition program compared to just a few applications throughout the season.

The beneficial effects of silicon application have been observed in various fruit crops but research on silicon application in citrus is very limited. The Fruit Physiology Lab at UF/IFAS North Florida Research and Education Center is investigating the role of silicon in aiding plant growth and development, fruit yield and quality, resistance to pest and disease attack, and tolerance to abiotic stresses. A large-scale on-farm project is also investigating the element's ability to improve heat and cold tolerance in citrus. We are using two levels of silicon 150 and 200ppm of silicon applied by foliar application and root drenching applied fortnightly and monthly. So far it is observed that 200ppm of silicon applied fortnightly through foliar application is more beneficial in satsuma (Owari) and red navel (Cara Cara) (Fig 1). In a programmed cold chamber study, it was observed that silicon application improved cold hardiness by preventing crystallization of water within tissues, which is the first sign of damage visually appeared as water-soaked spots on leaves (Fig 2). In addition, tissue analysis from the field showed that silicon treated plants had less internal freeze damage to their cells compared to those not treated with silicon.

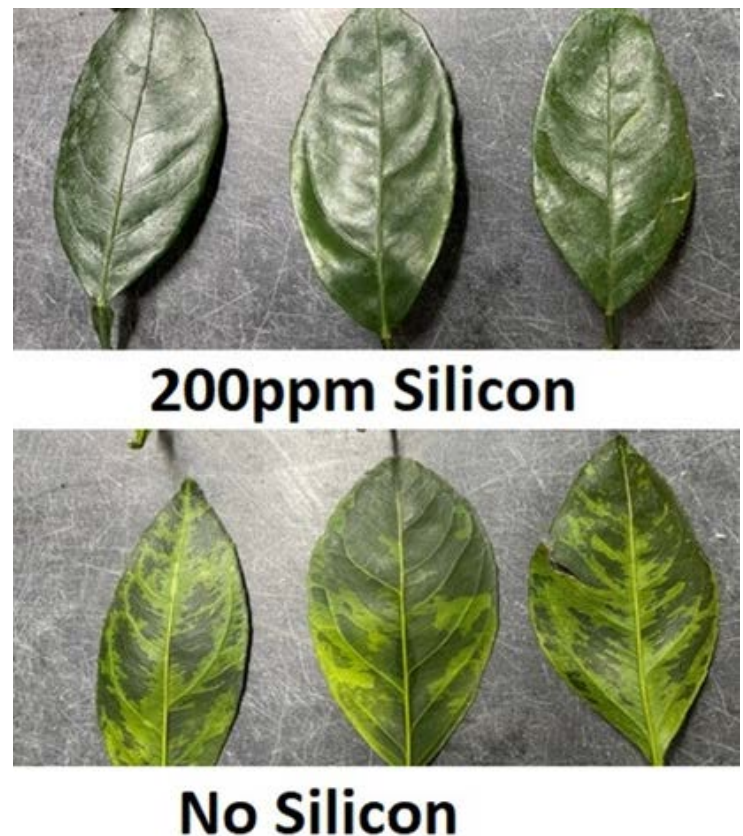


## Silicon for Citrus Production Continued

Silicon also reduced the bark splitting and dieback of new growth, which are the common late freeze damage symptoms. We are also collecting data on different morphological and physiological attributes this summer to determine the role of silicon in improving heat tolerance.



In conclusion, silicon is beneficial for improving heat and cold tolerance and disease control, but research is in progress to optimize its concentration, threshold level in tissues, and effective application method and application timing. If you are a citrus grower and interested in using silicon then consider following general recommendations 1) use of 150-200ppm monthly or fortnightly application, 2) choose the product with maximum level of plant available silicon (at least more than 10%), 3) continuous application of silicon throughout the season is recommended for getting the optimal results. Any type of sprayer can be used for silicon application, make sure to saturate all plant parts very well. Feel free to contact [mshahid@ufl.edu](mailto:mshahid@ufl.edu) for any questions regarding silicon application.



**Figure 2.** Silicon application improved cold hardiness by preventing crystallization of water within tissues.

# 6 Helpful Tools for the Citrus Industry

By: Lisa Strange, Agriculture & Natural Resources Extension Agent, Taylor County

Free resources are the best and knowing where to get that information is half the battle. When I learn of a new link, website, or a vendor, I bookmark it, and or write it down in my 'special notebook' (like an old telephone/address book) that I still use, so one of the two places, I have readily available. The following 6 tools can help with disaster preparedness, citrus health, and resources for crop related management.

**The first tool is you.** Most importantly, your personal safety. Hurricane season is upon us and historically runs from June 1st to November 30th. The Big Bend region has already seen multiple tornadoes, thunderstorms, and periods of high winds with heavy downpours of rain and hail. "Hello El Nino, we are ready for you". Be prepared by having these few supplies gathered and ready to grab:

- Bottled water
- Non-perishable foods & can opener
- Battery powered radio
- Extra batteries & flashlights
- First aid kit
- A safe place where all family members know where to go with the kit, to a closet or interior walled area.
- Battery back-up for cell phones
- Tarp or plastic sheeting & duct tape
- Moist towelettes
- Garbage bags,
- Wrench or pliers

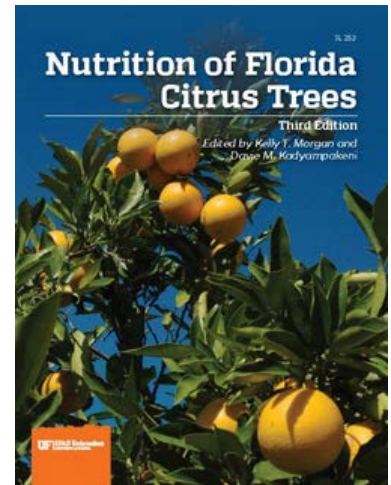
To keep a watch on the tropics and your local weather; the NOAA National Hurricane Center is the place to monitor tropical weather developments. At the site:

<https://www.weather.gov/news/230706-ElNino> provides a more detailed explanation of how El Nino impacts the climate and a plethora of other weather-related predictions.

**The second tool** is the University of Florida's Automated Weather Network, referred to as FAWN. Since conception in 1997, the FAWN database and website are maintained in Gainesville and managed by Project Manager, Rick Lusher. Currently, there are 47 solar powered stations that collect weather data and transmit it to a computer in Gainesville every 15 minutes. The stations measure temperatures at two, six, and 30 feet above ground, soil temperatures, wind speed and direction, rainfall, relative humidity, barometric pressure, leaf wetness and solar radiation. This system can provide growers with reliable climate predictions three to six months in advance so they can plan and protect their crops. Historical data charts are available upon request. Go to the fawn site at <https://fawn.ifas.ufl.edu/>

## 6 Helpful Tools for the Citrus Industry

**The third tool** is soil and tissue test. The best safety precaution you can take for your groves is to maintain them to the highest level of health possible, by keeping slow-release fertilizers available to the crop all season long and maintaining annual tissue and soil testing. Tissue and soil analysis are powerful tools to determine nutrient deficiencies and toxicities. Refer to publication: Nutrition of Florida Citrus Trees Chapter 4 for details on proper testing strategies. Check with your local Extension office for a hard copy of the publication. Healthy trees are stronger and thus more likely to tolerate extreme conditions compared to a diseased, stressed tree.



**The fourth tool** is the Best Management Practices for Citrus Operations program (BMP enrollment). A program under the umbrella of Florida Department of Agriculture and Consumer Services (FDACS) that offer free consulting and suggested strategies on irrigation, nutrient management, water resource protection recordkeeping and cost share opportunities specific to your site. To find out who is the representative for your area and schedule a free site visit, check out the brochure at: FDACS BMP Program. Have your county extension agent present with you during the site visit. Sometimes they can help interpret and have a second set of eyes/ears on what the environmental specialist has to say.

**The fifth tool** is the largest database for agriculture production and related information. The National Agricultural Statistics Service (NASS), a sister division under the umbrella of the United States Department of Agriculture (USDA). The



NASS database is used to help policymakers and farmers make informed decisions about crop production, marketing and many other aspects of agriculture. The information collection periods are weekly, monthly, bimonthly, and any chemical information is collected annually. An impressive data bank NASS is the best possible agriculture resource for the public, on every state in the U.S.

## 6 Helpful Tools for the Citrus Industry

As a Florida reporter for the weekly Crop Progress and Condition Survey, I realized the importance of the local information I provide. All weekly survey data is compiled, then posted on the NASS site and is utilized all over the country. As a matter of fact, Rick Lusher with FAWN, imports information from the NASS site for his weekly reports. I encourage you to look at these sites to appreciate the vast information and services available. It's almost overwhelming but the information is priceless. For more information, visit their website: [NASS USDA](#). Another great site with resources from 16 other sister agencies of USDA is the [USDA NASS Resources Sister Agencies](#) website.

**The sixth tool** are the agencies that can provide funding and resources for growers after disasters, such as the USDA Farm Service Agency (FSA) and the USDA's Natural Resource and Conservation Service (NRCS). Mark Clikas, President of the Cold Hardy Citrus Association, encouraged growers in the April issue of the Cold Hardy Citrus Connection, to contact their local USDA FSA office to sign up for the Noninsured Crop Disaster Assistance Program (NAP). Signing up for the program and sharing yield and loss data with the USDA benefits growers in the cold hardy region to establish and generate the county historical data kept by USDA for future programs and assistance. In addition to these agencies, check with your local Farm Bureau for funding as well as Florida Department of Agriculture and Consumer Services.

Finally, repeating the first tool is you. Being actively involved by attending meetings, trainings, attending workshops and field days, and proactive memberships are tools that you can provide to other growers. And keep in contact with your local extension agent. They are a wealth of information and resources to assist in getting answers.



# Citrus Plantings in Georgia Continue to Increase



UNIVERSITY OF GEORGIA  
EXTENSION

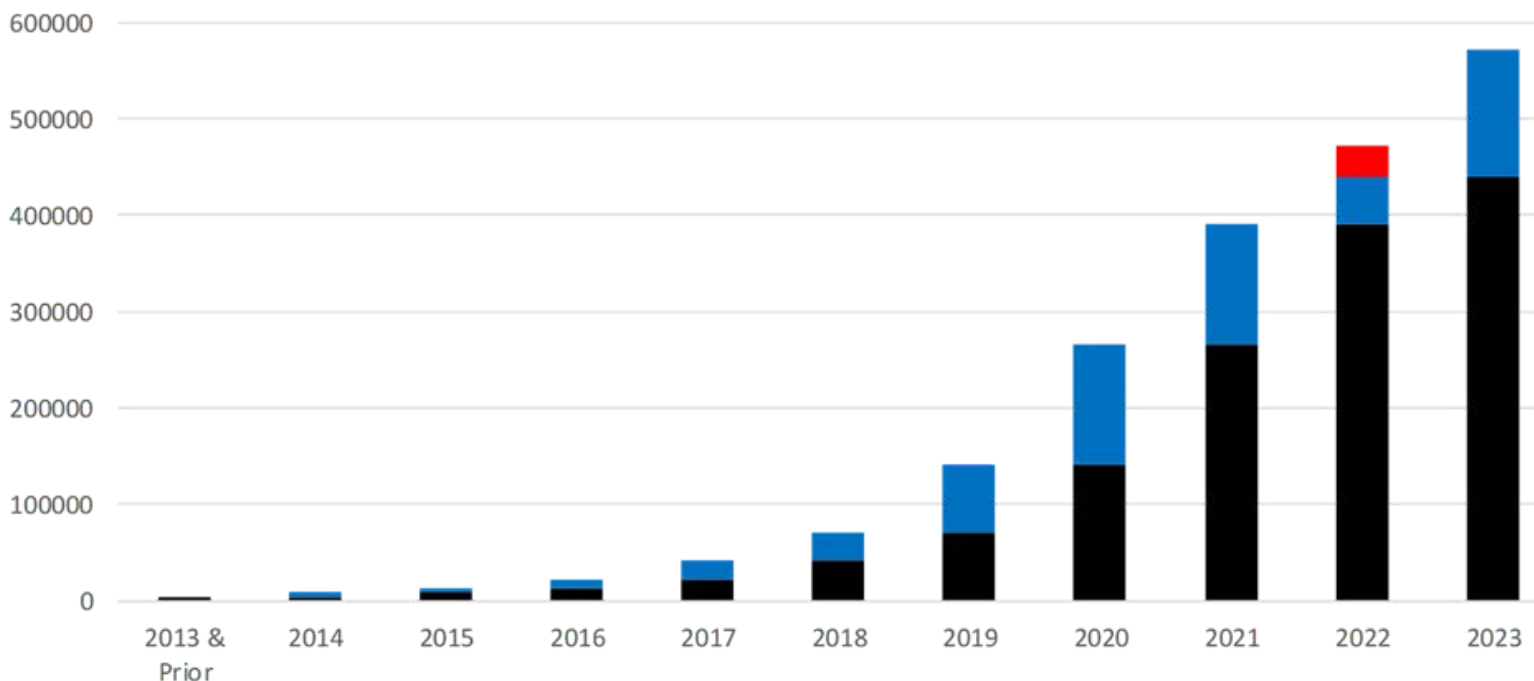
By: Jake Price, UGA Citrus Extension Agent

Each year I estimate the number of citrus trees planted in Georgia. Calculating 2023 numbers has been a little different because of tree losses due to the December 2022 freeze. Of the 567 new acres of trees planted in 2022, I estimate Georgia lost 230 acres. Approximately 80% of trees planted in 2022 were non-satsuma varieties which are less cold hardy, plus, first year trees are more susceptible to freezes. With the loss of trees, Georgia's 2022 citrus acreage was revised from 3,262 to 3,032 the total acres.

In 2023 citrus tree nurseries sold 904 acres of trees to Georgia which was an increase from 2022. Many of these trees were used to replace lost trees. 92% of the trees sold to Georgia growers in 2023 were produced in Georgia nurseries. Only 190 of the 904 acres planted were satsumas, which continues a shift away from satsumas in Georgia. I estimate that 66% of the citrus acreage in Georgia is satsumas. The most common non-satsuma varieties being planted are grapefruit, tangos, shiranui, and navels. My best estimate is that Georgia has 3,936 acres of citrus planted in 2023. For my calculations, I estimate 145 trees per acre.

## Citrus Trees Planted in Georgia

570,760 total trees (3,936 acres)



The bar graph shows the total number of citrus trees planted in Georgia from year to year. The portion in black indicates the total number of trees carried over from previous years and the portion in blue is the number of trees planted that year. The red portion of the bar in 2022 is the estimated tree losses.



# What Retail Buyers are Looking for from Suppliers

By: Terry Feinberg, Moxxy Marketing

It's not enough to grow the sweetest citrus. For your products to get into the mouths of consumers, you first have to sell to a retailer (unless you're selling direct-to-consumer, which is a different sales process).



Getting a retail buyer's attention is an art and a science that varies from buyer to buyer and chain to chain, but there

are some best practices for understanding a retailer's needs and priorities, which will enable you to craft a more successful pitch.

## **Straight from the Buyers' Mouths**

Buyers can, or already do, source similar products from your competitors. When it comes to easy-peel mandarins, they may have strong purchasing programs in place with Halos, Cuties or Peelz. So, why should they buy from you?

Over the past 17 years, Moxxy has conducted hundreds of interviews with buyers through our Perceptions Research service. As a result, we've developed uncommon knowledge and informed observations on the preferences and processes with most major buying organizations in North America.

## **Here's our advice:**

### **Get to Know Your Prospects**

While we know price is an important factor in every sales conversation, in all the interviews we've conducted—from premium chains to discounters—we've yet to have a buyer say that price was their top consideration. However, proactive communication, attentive customer service, and trustworthy relationships, along with consistent availability and quality, are nearly always at the top.

Most retailers are willing to pay a bit more for consistent quality and service. Building quality relationships takes time. Buyers trust people who demonstrate they are interested in more than just closing a sale. This includes getting to know your buyers personally and having conversations about a shared interest (Go Dawgs or go Noles). More importantly, it comes by demonstrating knowledge and interest in their business success, eagerly solving problems when they arise, and bringing new, creative ideas to the table.

## **Do Your Homework**

Sellers usually know what they are selling, but they frequently don't understand why the buyer is buying.

Some basic research before you approach a new prospect will help you develop a mutually beneficial sales strategy. Find out how they are positioning and presenting products to consumers. Visit a few stores—in person. Review circulars, websites, apps, ad programs, and retail media to see how they are positioning store brands compared to supplier-branded products.

Once you determine this information, you can better speak to retailers' needs, and present your company and products from an angle of delivering on what's most important to them and their shoppers.

## **Build Trust with Better Communication & Relevant Information**

The workload and pressures are greater than ever on buyers. When you have bad news, communicate it as early as you can and offer alternatives/solutions. Supporting your retailers during challenging times is one of the fastest ways to build confidence, trust, and a solid working relationship.

Communicate relevant information frequently. This might include reports on your crop's status, quality and volume, non-contract pricing, etc. If a weather event in your growing region is all over the news, communicate the impacts.

## **Get Creative & Present Innovative Ideas**

Sales people sometimes ask, "how can I get you to buy more?" Buyers rarely have a good answer to this question, and it's not their responsibility to help you sell to them. Instead, present new and creative ideas to your buyers. Perhaps a different packaging format, such as a display bin, multi-count bag or enhanced graphics. And don't just tell the buyer your ideas, prepare mockups or renderings so they can see how your ideas will work in their stores.

And don't forget promotable volumes and retailer media. As retailers have jumped into the media business, their promotional and advertising opportunities can generate increased sales to their most loyal consumers, and it is also further encouragement for the retailer to do more business with you.

## **Win-Win**

In food and beverage sales, quality and price definitely matter—a lot—but when two or more vendors have similar products at competitive prices, the supplier who demonstrates sincere interest in furthering the success of the retailer, will win.



# COLD HARDY CITRUS ASSOCIATION CORNER

Summer 2023 in our Cold Hardy Citrus region has been very eye opening compared to 6 months ago. The amount of growth the satsuma trees have experienced the last few months has been encouraging, although, I know it's mostly been foliage growth without much fruit for many groves that I have seen or heard about. It is very important for growers to fertilize and protect your groves from all pests to continue this new growth that we have all experienced these last few months. We need to make sure the trees are healthy and prepared to be going into the winter months.



Mark Clikas, CHCA President

I am sure everyone's fruit load is down as low as 10-20% compared to previous years due to the freezes we experienced. We will all need to work together to make this harvest the most efficient as possible due to the low volume of fruit available. I hope growers were able to put new resets planting out for damaged trees that were lost in 2022 freeze event. Replacement trees have been hard to find and very young when available. The CHCA is working on continuing to market the Sweet Valley Citrus Region with marketing funds that growers produced in 2022 harvest season. We are waiting to hear from Florida Department of Agriculture on the new marketing grant that we applied for back in January. We continue to support the research and Extension of the UF/IFAS North Florida Research and Education Center specialists working through that location on citrus programs.

I would like to ask all members of CHCA to please beware the annual membership emails will be sent out through our CHCA accountant, Brenda Sorenson very soon. If you have any questions or need more information, please feel free to reach out to a board member or email us at [coldhardycitrus@gmail.com](mailto:coldhardycitrus@gmail.com)

Thank y'all for being part of the CHCA and I hope to see many of the growers while traveling in the region in the near future.

Mark Clikas  
President, Cold Hardy Citrus Association  
850-718-6695  
[markclikas@gmail.com](mailto:markclikas@gmail.com)



# Upcoming Grower Meetings

---

## **Georgia Citrus Update - August 9th from 12-3:30**

Valdosta, GA

Topics: Changing weather patterns and temperature extremes, rootstock influence on cold hardiness, using ethylene to de-green satsumas, evaluation of pre-emergence herbicides, and

Georgia Citrus Association update

For more information, contact Jake Price at 229-333-5185

---

## **Citrus and Specialty Crop Expo - August 16-17**

Tampa, FL

For more information or to register, please visit: [Citrus and Specialty Crop Expo](#)

---

## **North Florida Citrus Production Workshop - September 7th**

Perry, FL

For more information or to register, please visit: [Cold Hardy Citrus Workshop](#)

---

## **Cold Hardy Citrus Field Day - October 26th**

UF/IFAS NFREC, Quincy, FL

For more information or to register, please visit: [Cold Hardy Citrus Field Day](#)

---