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Poster Presentations

2026 Southeast Regional Fruit & Vegetable Conference

January 8 - 10

Savannah Convention Center

The 2026 Southeast Regional Fruit and Vegetable Conference invites the presentation of produce-related research posters from researchers and extension agents of land grant universities and colleges of agriculture and related sciences. This is a unique opportunity for researchers to share their produce-related research and findings with their target audience: growers, packers, and shippers.

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2026 Southeast Regional Fruit & Vegetable Conference
Poster Authors & Abstracts

***Denotes primary author**

Undergraduate:

1. Evaluating a ‘forgotten’ resistance trait to Cowpea Curculio in Southern Pea

Michael Maw Jayna Burch, ABAC*

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Abstract: Southern Pea (Vigna unguiculata) is a minor vegetable crop grown in the Southern U.S. In 2023 approximately 1800 acres of southern peas were produced across 31 south Georgia counties according to the Farm Service Agency. The most prominent pest to the southern pea is the Cowpea Curculio (Chalcodermus aeneus). Adult weevils will damage the seed in the pod while feeding and the female will also deposit her eggs into the pod itself. Once the eggs hatch into larvae, they feed on the developing seed before exiting. This greatly diminishes the possible crop yield, even if insecticide is regularly sprayed. A few varieties that have some resistance to Cowpea Curculio have been identified. A collection of varieties with reported resistance to the curculio were obtained from the USDA GRIN and seven varieties were hand planted in May 2024 at ABAC’s J.G. Woodruff Farm in a Randomized Complete Block Design in three replications. Once pod filling commenced, pod samples were regularly harvested from each plot from 24 July through 11 Nov. Samples were stored in a freezer for later analysis. Each sample was then removed from the freezer and the total pod number counted. Then five representative pods were selected for measuring if exit holes were found, number of seeds per pod, and how many seeds were damaged by feeding. Results are being analyzed and will be presented at the meeting.

Graduate/Post Doc:

2. Destructive and Non-Destructive Methods for Measuring Quality Traits in Cold-Hardy Avocados

Angela Osorio-Barahona Daniel Mancero - University of Florida*

José X. Chaparro - University of Florida

Abstract: Avocado (Persea americana Mill.) is a tropical and subtropical climacteric fruit whose rising per capita consumption worldwide is driving the expansion of production into colder regions. Previous studies indicated that avocado composition and quality depend strongly on the environment, cultivar, and harvest timing. High fruit quality and nutritional value remain essential market drivers. This study aims to evaluate avocado production in the southeastern United States by assessing nine University of Florida (UF) cold-hardy selections planted in North-Central Florida. These UF selections were compared with the market standard 'Hass' as well as West Indian × Guatemalan cultivars typically grown in South Florida. Fruit quality was evaluated through destructive analyses, including measurements of flesh oil content, dry matter, firmness, and color. A non-destructive near-infrared spectroscopy (NIRS) approach was also evaluated to determine its effectiveness in predicting oil content in varieties of different origin. Preliminary findings show that oil content of the cold-hardy UF avocado selections did not differ significantly from 'Hass' and exceeded that of West Indian cultivars. Correlations between NIRS and flesh dry matter measurements had an R^2 of 0.96 for 'Hass' and ranged between 0.91-0.97 for the UF avocado selections.

3. Application of Anaerobic Soil Disinfestation in Organic Strawberry Production

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Abstract: While the organic strawberry acreage is growing in Florida, the leading state in winter strawberry production, many challenges persist, especially those associated with

soil and nutrient management as well as disease, pest, and weed control. As a biological approach, anaerobic soil disinfestation (ASD) has been evaluated as an integrative tool to improve soil suppressiveness and enhance crop productivity in both protected and open-field systems; however, its performance in organic strawberry production under Florida's soil and subtropical environmental conditions has not been systematically examined. In this study, we evaluated six cultivars under two ASD treatments, including 13.9 m^3 ha^{-1} molasses and 9.5 (ASD1) or 14.25 Mg ha^{-1} (ASD2) Everlizer 3%N-3%P2O5-3%K2O (a heat-processed poultry manure product), with a no ASD control, at two locations (Balm and Citra). The results showed that both ASD1 and ASD2 led to a greater level of anaerobic conditions than the no ASD control, during the 3-week treatment period. The impact of ASD on weed suppression was inconsistent during the organic strawberry production season, and thrips pressure was higher in Balm. In Citra, marketable yield exhibited a significant ASD × cultivar interaction, with ASD1 showing the highest yield for 'Encore', followed by 'Ember'. In Balm, no interaction was detected; cultivar main effects dominated, with 'Florida Brilliance' and 'Encore' being the top yield performers. The destructive sampling data showed that both ASD treatments consistently increased shoot biomass and leaf number. Root dry weight responses were not affected by the ASD treatment in either location. Overall, ASD enhanced strawberry canopy vigor and yield under organic production, with effects varying by site-specific conditions and genotype. A multivariate analysis is underway to better elucidate the strawberry cultivar responses to ASD treatments across locations.

4. Economic Analysis of Tabletop Strawberry in Caterpillar Tunnels

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Abstract: Strawberry (Fragaria × ananassa) is a major specialty crop in Florida and the southeastern United States. Traditional open-field production faces increasing pressures from weather variability, soilborne diseases, and labor challenges, prompting interest in protected cultivation systems such as high tunnels and tabletop structures. Caterpillar tunnels offer a low-cost, flexible option that helps reduce rain and wind damage, and when paired with tabletop systems, can improve drainage, pest management, and overall labor efficiency. Despite these potential advantages, high upfront investment raises concerns about economic feasibility for small and medium-sized farms. Substrate choice is especially important, as materials such as coco coir, pine bark, bagasse, vermicompost,

and yard waste differ widely in both cost and their effects on plant growth and yield. Selecting an appropriate substrate mixture is therefore essential to achieving productive and economically viable tabletop strawberry systems. This study evaluated Florida Felicity and Florida Medallion cultivars grown in tabletop systems within caterpillar tunnels across multiple substrate treatments. Using partial budget analysis, the study assesses yield, cost differences, and net returns, offering insight into the economic potential of protected tabletop strawberry production in subtropical environments.

5. **Economic Evaluation of Anaerobic Soil Disinfestation on Six Strawberry Cultivars in Florida**

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Jason Hong, US Horticultural Research Laboratory, USDA-ARS

Erin Rosskopf, US Horticultural Research Laboratory, USDA-ARS

Zhifeng Gao, Food and Resource Economics Department, University of Florida

Abstract: The phase-out of chemical soil fumigants, such as methyl bromide, to control soilborne diseases has accelerated the emergence of various environmentally friendly alternatives. Anaerobic soil disinfestation (ASD), a chemical-free method, has proven effective in suppressing soilborne pathogens and controlling yield loss. Researchers have examined various levels of ASD treatments to assess their efficacy in soilborne diseases control. From an economic perspective, previous studies have explored whether the subsequent costs of ASD treatments can be offset by the net returns, so that farmers and stakeholders would be willing to adopt this practice. However, no study has explored the effect of ASD on different strawberry cultivars, which is another critical factor influencing adoption decisions. This study aims to evaluate the economic returns of ASD for multiple strawberry cultivars. Data were drawn from strawberry field experiments conducted from July 2024 to April 2025 in Citra, Florida. This study builds upon the two best ASD treatment applications identified in a previous study by Duan et al. (2025), characterized by 1482 gal/acre of molasses and two levels of nitrogen fertilizer: 4.2 tons/acre and 6.4 tons/acre. A pure control group, with no application of molasses and fertilizer, is included for comparison. The experiment was conducted using a randomized complete block design with four replications per treatment-cultivar combination, examining six strawberry cultivars: Florida Brilliance, Sweet Sensation, Florida Medallion, Florida Pearl, Ember, and Encore. For the economic analysis, this study applied partial budget and sensitivity

analysis to determine whether added returns offset increased costs associated with treatment application. Sensitivity explores profitability under varying changes in key production factors such as yield and strawberry market price, providing practical guidance for integrating ASD into commercial strawberry production systems while maintaining profitability.

6. **Persistence of Escherichia coli in soil, seeds and cilantro plants (Coriandrum sativum L.) and the antimicrobial effect of Salvia officinalis**

Janeth Gasca Corona Ynes Ortega – Center for Food Safety, University of Georgia, Griffin, GA, USA*

María Lorena Luna-Guevara – Benemérita Universidad Autónoma de Puebla, México

Abstract: Fresh cilantro (Coriandrum sativum L.) is susceptible to contamination by Escherichia coli and other foodborne pathogens, posing potential health risks for consumers. This study evaluated the survival of E. coli (7 Log_{10} CFU/g) in soil, seeds, and cilantro plants under greenhouse conditions for 60 days, in untreated samples and in samples treated with Salvia officinalis essential oil (EO). The EO (0.3 µL/mL, v/v) was obtained by steam distillation and characterized by gas chromatography–mass spectrometry. Enumeration was performed on Eosin Methylene Blue agar, and isolates were confirmed through biochemical (IMViC) and molecular (16S rDNA) analyses. E. coli remained viable throughout the 60 day, with the highest count observed in cilantro plants (9.61 Log_{10} CFU/g at day 7). EO application led to notable reductions in all tested materials (soil, seeds and cilantro plants) with an approximate 7.5 Log_{10} CFU/g decrease in inoculated plants after 60 days compared to untreated samples. These findings highlight the potential of S. officinalis EO as a natural antimicrobial alternative to reduce E. coli persistence during cilantro production.

7. **Integrating Native Perennial Vegetables into Controlled Environment Agriculture: Evaluating the Hydroponic Potential of Georgia Spiderwort (Tradescantia virginiana)**

Jared Mimbs *Mimbs, J., Roberson, A. and B. K. Biswas*

Abstract: Controlled Environment Agriculture (CEA), particularly hydroponics, offers crucial solutions for enhancing food security and climatic resilience by providing unparalleled scalability and environmental control. While commercial CEA primarily focuses on standard vegetable crops, expanding the genetic diversity of species within these systems is vital for creating sustainable, locally-relevant food pathways.

This study addresses this challenge by evaluating the hydroponic production potential of a historically significant but underexplored native species, Georgia Spiderwort (Tradescantia virginiana). Traditionally consumed by Cherokee communities, Spiderwort represents a unique, resilient perennial vegetable that could diversify regional CEA output. We hypothesize that controlled hydroponic conditions will optimize the plant's growth kinetics, providing high marketable yields and superior nutritional quality compared to conventional soil methods.

The research utilized replicated Vertical Farming (Tower Garden) and Deep-Water Culture systems, alongside a soil control, under standardized light and temperature regimes. We systematically varied the nutrient solution concentration (EC) and pH across treatments to determine the optimal growth parameters. Key performance indicators measured over a 10-week cycle included shoot biomass, total marketable yield, leaf area index, brix score, and essential macro- and micronutrient concentration.

The findings will establish the first robust data set on the feasibility of integrating native Georgia species into commercial-scale hydroponic operations. By successfully validating T. virginiana as a high-performing CEA crop, this work directly contributes to crop diversification, promotes local agricultural heritage, and advances strategies for sustainable, high-yield localized food production.

Category: Graduate Student

Poster Topics: Production/Cultivation under CEA

8. **Plant-derived organic soil fumigant (Aster) is effective in reducing populations of Burkholderia species in the soil and associated bulb rot incidence in onion**

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Organization: University of Georgia

Affiliation: Department of Plant Pathology

Designation: Professor

Abstract: Bacterial species within the Burkholderia cepacia complex (Bcc) cause sour skin and slippery skin in onion (Allium cepa), leading to significant global economic losses. Currently, effective management strategies are not available to mitigate Bcc infections in onions. This study evaluated the efficacy of a plant-derived organic soil fumigant, Aster, against Burkholderia spp. and its potential to reduce bacterial onion bulb rot incidence. To achieve this, we conducted a series of in vitro assays, greenhouse evaluations, and field trials to assess the effectiveness of Aster in controlling onion bulb rot. Preliminary results

indicate that Aster can effectively reduce the growth of different Burkholderia species at application rates of ≥ 0.25% (v/v) in vitro. Among the tested strains of Burkholderia spp., 100% of the strains were sensitive to Aster, but B. gladioli pv. allicola seemed considerably sensitive compared to other species. Aster at 0.4% application rate significantly reduced B. cepacia soil populations and sour skin incidence in greenhouse trials. All rates lowered symptomatic scales compared to controls. In field trials, higher rates of ≥30 gal/Ac (0.25% (v/v)) reduced soil Burkholderia populations at 120 days post treatment (DPT). Application of Aster before planting along with 2.5 gal/Ac of PathoCurb (Kemin Industries, Des Moines, IA) six weeks later, numerically improved yield and reduced bulb rot, though not statistically significant. Both the greenhouse and field trials showed that Aster can reduce soil populations of Burkholderia spp., indicating the potential of this product in reducing the risk of onion bulb rot caused by this pathogen complex. These findings suggest Aster is a promising sustainable tool for managing Bcc-associated onion diseases, warranting further multi-year field validation.

9. **Effect of storage time and temperature on the microbial load in compost and compost teas**

Lois Adofowaa Amponsah Dr. Jinru Chen- University of Georgia, Department of Food Science & Technology*

Abstract: Compost and compost teas have gained popularity among farmers for their potentials to control plant diseases, enhance plant nutritional content, and support soil microbial communities. However, concerns over the microbial distribution in these materials necessitate investigation.

This study aimed to evaluate the microbial load and nutrient composition in selected commercial composts and compost teas.

Duplicate samples of three solid composts and three compost teas of commercial origin were stored at 4ºC and 22ºC for 16 weeks and analyzed for nutrient composition and the populations of total aerobes (TA), total yeasts and molds (YM), total and fecal coliforms (TC and FC), Enterococci (EC), Salmonella, and Listeria spp. Data obtained were analyzed using Fisher's Least Significant Difference test with Statistical Analysis Software.

Results showed that the mean YM counts in samples stored at the two temperatures were not significantly different ($P > 0.05$). The mean TC counts in samples stored at 22ºC were higher ($P < 0.05$) than those stored at 4ºC, and the opposite phenomenon was observed with the mean TA and Listeria counts. Mean count of each microbial group from all six composts fluctuated as storage time progressed. Compost tea I had the highest TA, YM, and Listeria counts, whereas compost tea II had the lowest TA, TC, and Listeria counts.

Solid compost II had the highest TA, TC, and Listeria counts and compost I had the highest YM counts, while compost III had the lowest TA, YM, TC, and Listeria counts. No enterococci and Salmonella were detected from all examined samples. The nutrient composition of all six samples remained steady during the storage period.

The microbial levels in evaluated composts and compost teas vary and are influenced by storage conditions. The study provides useful information to commodity growers interested in including composts or compost teas in agricultural production.

10. Investigating the persistence and inactivation of infectious viruses on strawberries

Macray Metz Malak A. Esseili (Department of Food Science and Technology/ Center for Food Safety/ Griffin Campus/University of Georgia)*

Abstract: Human norovirus (HuNoV) and hepatitis A virus (HAV) are the two major non-enveloped enteric viruses associated with foodborne outbreaks linked to produce such as leafy greens and berries. Both viruses are fecal-orally transmitted via food, water, or fomites. Recently, there have been several virus outbreaks associated with imported strawberries. Thus, there is an urgent need to explore safe, environmentally friendly technologies to inactivate viruses on strawberries. Blue light (BL) is a safe visible light with wavelength between 400-470 nm. This technology has been used in the medical field for the treatment of various bacterial and fungal infections and for decontamination of environmental surfaces. Although this technology was previously shown to inactivate enveloped viruses such as SARS-CoV-2, there are limited studies on its application to non-enveloped foodborne viruses such as HuNoV and HAV. The objectives of this study were to investigate (i) the persistence of infectious viruses (HuNoV and HAV) on artificially contaminated strawberries stored under refrigeration for one week and (ii) the effect of BL (405 nm at dose ~1000 J/cm2) during washing of artificially contaminated strawberries with HAV and HuNoV surrogate (Tulane virus-TV). The FDA BAM 26 standardized method was used to recover both viruses from strawberries. The infectivity of both viruses on strawberries was measured using the TCID50 assay. Virus infectivity was quantified on strawberries through one week of storage and on strawberries after the BL-treatment and in control washed but non-treated strawberries. Our results showed that both infectious viruses persisted on strawberries throughout the 7 days. However, HAV showed reduction in its infectivity only on day 7 by 80%. Furthermore, washing strawberries with water alone reduced the infectivity titers of TV and HAV by 95-85%. Treatment with BL during strawberry washing showed significant reduction in TV and HAV infectivity titers by 65-80%. The combined effect of washing in water under BL treatment showed ~98% reduction for both viruses. Another effect for BL was observed on inactivating the viruses that washed off the

strawberries by ~80%. In conclusion, both viruses showed high persistence on strawberries under refrigerated storage for several days; however, blue light shows promise for inactivating these viruses on strawberries during washing.

11. Advancing Beneficial Arthropod Habitat on Georgia's Working Lands

Madison Love Co-authors:*

Jason Schmidt, University of Georgia, Department of Entomology

Sarah Rezende, University of Georgia, Department of Entomology

Bodie Pennisi, University of Georgia, Department of Horticulture

Abstract: This project aims to develop region-specific guidance for establishing native plants on private working lands across four Georgia ecoregions. We will assess plant performance and associated arthropod taxa that support ecosystem services such as pollination, biological control, and soil health, while partnering with landowners to enhance the longevity and resilience of conservation habitats.

*Instructions specify 500 characters however it seems the website is allowing for 500 words.

12. Valorizing Citrus Byproducts for Functional Food Development

MINGHE WANG Hualu Zhou (University of Georgia Food Science Department, hualuzhou@uga.edu)*

Abstract: Each year, large quantities of citrus byproducts, such as peels, are generated during juice and fruit processing. These materials are often discarded or underutilized, even though they are rich in valuable bioactive compounds such as pectin, flavonoids, and dietary fibers. Among these, pectin is a natural polysaccharide well known for its gelling, emulsifying, and health-promoting properties. In this study, we developed a pH-based processing strategy to integrate citrus peel–derived pectin with curcumin, a potent antioxidant extracted from turmeric, to produce high-value functional food ingredients. Controlled pH adjustment enabled pectin to encapsulate curcumin, significantly improving its water solubility, dispersion stability, and resistance to degradation. The resulting citrus–turmeric complexes maintained vibrant natural color and showed good compatibility in food matrices such as beverages and plant-based formulations. This simple and sustainable approach adds economic value to citrus processing byproducts and provides an effective way to transform agricultural waste into functional, health-promoting foods, contributing to both waste reduction and sustainable food innovation.

13. In-Field Validation of Postharvest Water Management Practices to Prevent Cross-Contamination in Michigan and Virginia Commercial Apple Packinghouses

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Abstract: Introduction. Postharvest water systems used in apple packing including flumes and dump tanks, are essential for moving and washing fruit, yet they also represent a pathway for microbial cross-contamination in packinghouses.

Methods. Experiments were performed in commercial apple packinghouses to assess the efficacy of water management practices in Michigan (3) and Virginia (1). Apples were collected before entering the flumes (Produce-In), and after passing through one or two flumes (Produce-Out1,2). Microbial indicators including Aerobic Plate Count (APC), Enterobacteriaceae (EB), Total Coliforms (TC), and generic Escherichia coli (EC), along with physicochemical parameters such as turbidity, pH, temperature, and sanitizer concentration were tracked in water and on apple surfaces across water holding periods up to 80 h. Microbial concentrations in water and on apples were quantified using serial dilutions followed by plating on Petrifilm. Differences across sampling points and packinghouses were evaluated using linear models, and association between water quality parameters and microbial loads were assessed.

Results. In Michigan, sanitizer concentrations in flume water differed among packinghouses, with peracetic acid (PAA) ranging from 15 to 180 ppm and free chlorine from 7 to 50 ppm, showing high fluctuations over time; while in Virginia, free chlorine concentrations ranged from 6 to 25ppm. In the linear model across all packinghouses, no significant differences were observed between either Produce-Out 1 or 2 (-0.11 log

CFU/apple; 95% CI: -0.27 to 0.04; p = 0.18 or -0.19 log CFU/apple; 95% CI: -0.43 to 0.06; p = 0.14, respectively) compared to Produce-In for APC concentrations. Similarly, for Enterobacteriaceae concentrations, no significant differences were found for either Produce-Out 1 or 2 (0.003 log CFU/apple; 95% CI: -0.18 to 0.18; p = 0.97 or -0.13 log CFU/apple; 95% CI: -0.41 to 0.15; p = 0.35, respectively) relative to Produce-In. For TC, no significant difference was detected between Produce-Out1 and Produce-In (0.14 log CFU/apple; 95% CI: -0.05 to 0.33; p = 0.14). However, Produce-Out2 showed a significant increase (1.07 log CFU/apple; 95% CI: 0.77 to 1.36; p < 0.001). In Michigan, generic E. coli was detected in <2% of samples (Num/Dem), while in Virginia no total coliforms or generic E. coli were detected on apples or water . Concentrations in flume-tank water were 1.37 ± 1.14 log CFU/mL for APC (95% CI: 1.25–1.49), 0.26 ± 0.70 log CFU/mL for Enterobacteriaceae (95% CI: 0.19–0.33), and 0.21 ± 0.64 log CFU/mL for TC (95% CI: 0.15–0.28). Microbial reductions were not observed in any case, confirming that postharvest washing, even with sanitizers, is not a kill step.

Significance. Findings indicate that well-managed flume water does not lead to increased microbial loads on apples, even during extended holding periods. This supports a risk-based approach in which packinghouses determine when to refresh water based on sanitizer concentration, turbidity, and other monitored parameters rather than on fixed time intervals. APC, EB and TC continue to serve as practical indicators for informing these decisions.

14. Survey and development of diagnostic primers for the detection of Colletotrichum orbiculare causing cucurbit anthracnose in Georgia

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2. Marin Brewer; Department of Plant Pathology, University of Georgia, Athens, GA, 30602.

Abstract: Cucurbit anthracnose is caused by a complex of Colletotrichum spp., which impacts all above-ground parts of the plant. This disease impacts a wide range of cucurbit crops such as cucumbers, muskmelons, squash, gourd, pumpkin, cantaloupe, and honeydew. Although, C. orbiculare has traditionally been associated with anthracnose in cucurbits, particularly in cucumber and watermelon, it is not clear if the same fungal species is responsible for recent outbreaks in Georgia. A comprehensive survey of commercial fields (watermelon, cucumbers, cantaloupe, and muskmelon) was conducted in Georgia from 2021 to 2025. Leaves with symptoms of anthracnose were collected from commercial cucurbit fields and Colletotrichum spp. were isolated and characterized both morphologically and by using molecular systematic methods. A total of 709 isolates were

collected from 37 commercial cucurbit fields. These isolates were identified as Colletotrichum spp. based on their characteristics on a culture medium. Later, based on sequence similarity of internal transcribed spacer (ITS) region, 75% (year 2021 collection) of the isolates were identified as C. orbiculare. We also developed a conventional PCR based assay for C. orbiculare species and tested its sensitivity and specificity using a set of representative isolates from watermelon, cucumber and cantaloupe. This PCR assay was used to further detect C. orbiculare isolates from the culture collections of commercial field surveys (2021-2025). In 2021, 100% of the isolates originated from cucumber and 60% isolates originated from watermelon were C. orbiculare, while 83% of the isolates from cantaloupe were identified as the same species. In 2022 and 2023, 99% of the isolates were identified as C. orbiculare that originated from cucumbers. In 2024, 92% of the watermelon and 98% of the cucumber isolates were identified as C. orbiculare. The trends were similar in 2025 as well, C. orbiculare was predominant species causing cucurbit anthracnose [80% (watermelon); 98% (cucumber) and 100% (muskmelon) isolates] in Georgia. These observations indicate that the predominant species responsible for cucurbit anthracnose in Georgia is C. orbiculare.

15. The Impacts of Solarization and Biofumigation on Burholderia Population in Soil

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Abstract: Soil-borne bacterial pathogens, including Burkholderia species, pose significant challenges to sustainable organic onion production; yet, effective and consistent management strategies remain limited. To address this gap, soil samples were collected from two locations: Athens, where biofumigation was used, and Tifton, where solarization was applied, to examine how these treatments affect Burkholderia populations in onion-growing soils. Solarization, which relies on increased soil temperature to reduce pathogens under clear plastic to minimize pathogen viability, and biofumigation, which, when incorporated into the soil, releases bio-toxic compounds, were used as disinfestation strategies as they can alter the soil temperature, organic inputs, and microbial community functions in ways that may suppress pathogen populations. Both strategies target not only pathogens but also the soil microbial community, which is essential for nutrient cycling and overall soil health. This study evaluates the impacts of solarization and biofumigation on Burkholderia populations in organically managed onion production systems. Soil samples were collected at three distinct stages: before planting, at onion transplanting, and at harvest. In Athens, the treatments included control, mustard biofumigation, and

mustard biofumigation plus plastic. In Tifton, the treatments included black plastic, black plastic with aster, clear plastic, clear plastic with aster, and no-plastic control. The collected soils were analyzed to determine Burkholderia populations by assessing changes in soil health parameters, including microbial activity, after each treatment, and by targeting the recA genes to track shifts in soil health. These findings will support the development of improved management strategies for reducing soil-borne bacterial diseases and strengthening resilient organic onion production.

16. Polyploidy Induction of Triploid Interspecific Hybrids in Blueberries

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Abstract: Blueberry is a high-value fruit crop, and there is an increased demand for their cultivation and consumption all over the world. Blueberries are grown in diverse regions with varied weather, soil, biotic, and abiotic stress limiting their yield. Interspecific hybridization plays a significant role in broadening the genetic base of blueberries, which contributes to the development of improved cultivars adapted to specific regions. The genetic diversity for cultivated rabbiteye (RE) (2n=6x=72) blueberries is very narrow. Introgression from wild and other cultivated species would provide beneficial diversity for RE blueberries. Vaccinium elliottii (2n=2x=24) is an early-flowering, tall, and deciduous wild blueberry with small black fruits. Like RE, it is adapted to a wide range of soil types in the southeastern United States. On the other hand, southern highbush is a cultivated tetraploid (2n=4x=48) with high fruit quality but requires intensive soil amendment. To broaden the genetic base of blueberry breeding, interspecific crosses were made between three southern highbush breeding lines and V. elliottii. The success of these crosses was challenging due to strong triploid block from heteroploid crosses. Out of 422 pollination events only 7 seedlings were produced, and their ploidy level was confirmed by flowcytometric analysis. Three seedlings were confirmed to be triploids (3x); however, it is expected that triploids are sterile. Seedlings of the triploids were established in tissue culture, and chromosome doubling of these triploid hybrids was carried out to restore fertility and potentially improve their crossing efficiency with cultivated blueberries. The shoots produced through tissue culture were treated with 0.02% colchicine for 48 hours and transferred to woody plant medium (WPM) with zeatin. Chromosomally doubled shoots were identified by flow cytometry. The polyploid induction rate among the three triploid hybrids following colchicine treatment ranged from 15% to 67.5%. The confirmed

synthetic hexaploid hybrids produced from this study are expected to be cross-compatible with RE blueberries and bridge the ploidy gap among diploid, tetraploid, and hexaploid blueberry species.

17. Effect of Fertilizer Treatments on the Horticultural Performance of Aronia mitschurinii

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Abstract: We evaluated the effect of fertilizer treatments on the horticultural performance of Aronia mitschurinii (‘Viking’) grown under field conditions in Georgia. The study aimed to determine optimal fertilizer regimes for improving plant growth, yield, and fruit quality. A. mitschurinii (commonly known as Viking or chokeberry) is a nutrient-dense, cold-hardy berry with high antioxidant potential and increasing commercial interest in the southeastern United States. However, limited agronomic information exists regarding its response to fertilizer management under Georgia’s climatic conditions. Understanding fertilizer effects on growth and fruit quality parameters such as berry size, yield, pH, total soluble solids (°Brix), and titratable acidity (TTA) is essential for developing regionally adapted production guidelines. Optimizing fertility can enhance productivity and fruit quality while maintaining soil health and input efficiency.

A field experiment was established in 2023 at Mercier Orchards, a commercial farm located in Blue Ridge, Georgia (USDA Zone 7a). The experiment design was a randomized complete block design with four fertilizer treatments: 0, 6, 12, and 18 g of Nitrogen per plant. Growth and yield data were collected throughout the season, including growth index, berry size (mm), berry weight (g), and yield per plant (g/plant). Fruit chemistry parameters such as dry weight (g), total soluble solids, TTA, and pH were also analyzed.

Fertilizer treatment significantly influenced growth index. The 12 g N/plant treatment produced the highest mean growth index (159), followed by 18 g N (151) and 6 g N (146), while the lowest value (139) occurred in the control (0 g N). This suggests that moderate nitrogen input enhances vegetative growth. Berry size showed only slight variation across treatments, ranging from 11.8 mm to 12.1 mm, indicating that fruit enlargement was not significantly influenced by fertilizer rate. Similarly, berry weight did not differ significantly across treatments, although the control showed the lowest mean value (1.1 g). Yield was

not significantly impacted by fertilizer treatment. However, the 12 g N/plant treatment produced the highest yield (283 g/plant), a 45% increase over the control (195 g/plant). Yield declined slightly at the 18 g N/plant level (212 g/plant), indicating that excessive fertilizer application did not translate into additional yield benefits. While total soluble solids and titratable acidity were not significantly affected, fruit pH varied significantly, with the lowest values observed under 0 and 12 g N/plant treatments.

Overall, moderate fertilizer application (12 g N/plant) optimized plant growth and yield while maintaining stable fruit quality. These findings suggest that A. mitschurinii grown under Georgia conditions responds best to moderate fertilizer inputs for balanced productivity and quality.

18. Efficacy Levels of Ascaroside #18 in Controlling Enterohemorrhagic

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Abstract: Several previous studies revealed the efficacy of ascaroside #18 treatment for controlling Salmonella enterica and enterohemorrhagic Escherichia coli growth on alfalfa and fenugreek seeds and sprouts. The minimal and optimal concentrations of the treatment on alfalfa seed and sprouts have been determined by newly conducted research.

This study assessed if ascaroside #18 would be effective for controlling pathogen growth in other plants under similar experimental conditions.

Sanitized commercial fenugreek, spinach, radish, and lettuce seeds were exposed to 1 mM, 0.1 mM, 10 uM, or 1 uM of ascaroside #18 for 30 min before being immersed into each of four individual EHEC cell suspensions (ca. 103 log CFU/ml) for 1 h. The seeds were then sprouted on 1% water agar with or without the supplementation of an appropriate concentration of ascaroside#18 at 25oC in the dark. Inoculated seeds not treated with ascaroside #18 were sprouted on regular 1% water agar as treatment controls. On days 0, 1, 3, 5, and 7, EHEC populations in collected samples were enumerated. The data was analyzed using ANOVA of SAS.

Results of statistical analyses showed that plant type, treatment concentration, and sprouting time were the main effects ($P < 0.05$) influencing EHEC populations on seeds and sprouts. The mean EHEC population on spinach samples was the highest while fenugreek samples had the lowest mean EHEC population. The minimal inhibitory concentration of ascaroside #18 was 10 uM and the most effective concentration was 1 mM with the

presence of ascaroside #18 in water agar. The cell populations increased continuously during the seedling process.

This project confirmed that ascaroside #18 can be used in plants other than alfalfa. It identified the appropriate treatment concentrations. These findings suggested that ascaroside #18 treatment could be used as one of the interventions in agricultural practices, specifically for seeds and sprouts.

19. Comparing Root Traits of Different Strawberry Cultivars in a Soilless Substate-based Tabletop System under Organic Production in Caterpillar Tunnels

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Scott Goldstein, Horticultural Sciences Department, University of Florida

Vance M. Whitaker, University of Florida Gulf Coast Research and Education Center, University of Florida

Abstract: Strawberry production is increasingly incorporating protected environments and soilless substrates to help improve yield stability and resource use efficiency, accompanied by the increasing consumer demand for organic strawberries. In this study conducted in low-cost caterpillar tunnels, we focused on examining the root characteristics of different strawberry cultivars grown in a tabletop organic production system using troughs filled with a pine bark and compost mixture-based substrate. Bare-root transplants of six short-day cultivars and one day-neutral cultivar were planted at two spacings, i.e., six or eight plants per trough (1 m long), in October 2024 and the final harvest was completed in June 2025. The experiment was arranged in a split plot design with plant spacing as the whole plot factor and strawberry cultivar as the subplot factor, with four replications and two troughs in each experimental unit. At the end of the growing season, root dry weight was measured, and root length, surface area, and average diameter were quantified using the WinRHIZO image analysis system. Significant differences were detected among cultivars for root total length and surface area, whereas similar levels of average root diameter were observed. The day-neutral cultivar tended to have greater root biomass compared with some of the short-day cultivars. Plant spacing did not exhibit any significant impact on the root traits examined. These preliminary results provided insights into strawberry root characteristics in relation to cultivar-specific adaptability in soilless substrate-based tabletop systems under organic production. Strawberry plant health, productivity, and fruit quality will be further analyzed in combination with the root attributes to obtain a more in-depth understanding toward developing and optimizing the tabletop system for organic strawberry production.

20. **Effect of Storage Temperature on the Postharvest Quality and Shelf-Life of Collard Greens**

Zenaba Abdissa Karin Albornoz*

Abstract: Collard greens (Brassica oleracea, var. viridis) are nutrient-dense leafy green vegetables widely consumed in the Southeastern US, known for their health-promoting compounds with antioxidant activity, such as polyphenols, chlorophylls, and carotenoids. A high moisture content makes collards highly perishable, with quality rapidly declining after harvest. Like any other perishable produce, storage temperature plays a crucial role in determining the shelf-life of collard greens. However, there are no published reports detailing their postharvest responses at different temperatures. This study investigated the effects of storage temperature on the organoleptic and nutritional quality of collard greens 'Top Bunch 2.0' grown in Charleston, SC, during the fall of 2024. Intact or fresh-cut leaves were precooled, sanitized, wrapped in bags, and stored at 2°C, 5°C, and 7°C for up to 28 days. Four replicates were used, each consisting of 6 leaves (intact) or ~150 g (fresh-cut). Quality was assessed on a weekly basis. Key parameters, including fresh weight loss, objective color, visual quality/marketability, chlorophyll and carotenoid content, total polyphenols, antioxidant capacity, and ammonia content (an indicator of senescence and degradation), were monitored throughout the storage period. A fresh weight loss of 0.5% was observed for samples stored at 2°C, whereas losses of 2% and 3% were observed for those at 5°C and 7°C, respectively. ΔE, a global color change indicator, showed an increase of 330% at 5°C and 930% at 7°C as compared to 2°C. Chlorophyll degradation also increased as storage temperatures increased, with 35.8% degradation at 5°C and 81.5% at 7°C compared to 2°C. Ammonia content also increased 159.2% at 5°C and 881.5% at 7°C. Antioxidant capacity declined more slowly at 2°C compared to the other temperatures. These findings show that maintaining proper temperature management during storage is essential for preserving the nutritional and sensory quality of the produce and extending its shelf-life. Adoption of such temperature-controlled handling strategies could reduce postharvest losses and ensure that consumers receive high-quality, health-promoting leafy greens.

Faculty:

21. **Evaluation of Polymer-Coated Paper Mulches for Watermelon Production in North Florida**

Alia Ortiz-Bayron Sydney Williams, Bob Hochmuth, Taite Miller, UF/IFAS North Florida Research and Education Center – Suwannee Valley*

Abstract: A spring 2025 field trial was conducted at the UF/IFAS North Florida Research and Education Center - Suwannee Valley to evaluate the performance of various polymer-coated Smurfit-Westrock paper mulches compared with standard plastic mulch in seedless watermelon production. Treatments were arranged in a randomized complete block design, and assessments focused on nutsedge emergence, paper mulch degradation, and marketable yield. Paper mulches showed clear advantages in suppressing nutsedge growth, with minimal punctures observed compared with frequent emergence through plastic mulch. All paper mulch treatments maintained structural integrity throughout the growing season and did not reach levels considered significant or total degradation. Watermelon yields were comparable among treatments, indicating that the paper mulches supported crop performance similar to plastic mulch. These findings highlight the potential of polymer-coated paper mulches as an effective alternative to conventional plastic for managing weeds and maintaining durability in North Florida watermelon production. A similar continuation of this project is underway in fall 2025 to further compare coatings and paper mulch formulations under additional seasonal conditions.

22. Filling gaps for knowledge-based adoption of Carolina strongback grafted watermelon nursery: Optimizing the transplanting date and density

Bhupinder Jatana VasanthKumar SS; Edisto Research and Education Centre, Clemson University, SC, US*

Yefan Nian; Sandhill Research and Education Centre, Clemson University, SC, US

Abstract: Grafting is an effective management strategy in watermelon crop against soil borne pathogens. Carolina strongback (SB) rootstock used for grafting, is resistant to both fusarium wilt and root knot nematodes which are devastating soil borne pest of watermelon. Recent experiments have shown that SB grafted plant have higher plant vigour and bear fruits 7-10 days later than regulate plants leading to farmers losing early profitable watermelon market. Similarly, grafted watermelon nursery is 4-5 times more expensive than regular nursery which leads to reluctance among growers for adoption of this effective management strategy. To fill these gaps for informed adoption of SB grafted nursery, a field experiment was conducted at Blackville SC in 2024 and 2025. The experiment comprised of three transplanting times (April 1, 10 and 20) and four transplant densities (1800 non-grafted, 1800, 1550 and 1300 grafted plants/acre) in a split plot design. The highest plant vigour rating was observed in SB grafted nursery at 1800, 1550 and 1300 plants/acre as compared to 1800 non-grafted plants/acre. April1 and April 10 recorded the highest fruit yield at first harvest as compared to April 20 transplanting. Similar fruit yield was observed for different transplanting times and density at second, third and fourth picks.

Transplanting of SB grafted plants at 1300 plants/acre recorded the highest total fruit yield as compared 1800 and 1550 grafted and 1800 non-grafted plants/acre.

23. Reinventing Food Security through Controlled Environment Agriculture

Bipul Biswas Biswas, B.K., A. Roberson, Mimbs, J., Sarkar, S. Jones, D, Hicks, C.J. Scott, D., Kapsoiyo, A., Brown, I, Colvard, A., Towner, M. Ramirez, M. Mccullough, M., Harris, C., Mann, S., Mensah, V., Gandham, N., Moore, J., Linda, I., C., Mann, S., Johnson, D., Dorsey, J., Williams, O., Dennis, K. , Craig, D. Vilsaint Z., and S. Birmingham.*

Abstract: Global food security faces an urgent crisis, underscored by persistent daily food insecurity deaths and the compounding pressures of an eight-billion-plus global population, diminishing arable land due to urbanization, and escalating climate volatility. Conventional agriculture, relying on high-yielding varieties and modern engineering, is nearing its limits, providing only incremental production increases (estimated 10-20%). This falls critically short of the projected 77% yield increase required to meet escalating global demand over the next 50 years, necessitating an immediate paradigm shift in food production methodology. Controlled Environment Agriculture (CEA), specifically utilizing soilless technologies like hydroponics, presents a viable and necessary solution to these escalating challenges. Based on ten years of comprehensive comparative research, our findings demonstrate dramatic superiority over traditional methods. CEA technology enables 100 to 400 times greater crop yield, utilizes up to 99% less physical space, and achieves a 95% reduction in agricultural water usage. Crucially, the controlled environment eliminates the detrimental effects of untimely weather and the need for chemical fertilizers, herbicides, and pesticides. Over the past decade, we successfully cultivated a wide array of food, medicinal, fruit, and staple crops, including various lettuces, brassicas (broccoli, kale), fruiting plants (tomato, strawberry, cucumber), rice, and potato. All cultivated crops exhibited superior production capabilities and demonstrably higher nutrient content compared to their soil-grown counterparts, validating CEA as the necessary path to reinvented, long-term global food stability.

24. Mustangs Grow Pumpkins: The Power of Problem Based Learning and Collaboration

Blake Carter Brandi Bonorato, SEMS STEAM Coordinator*

Abstract: Effingham County, with a growing population of over 70,000, has seen reduced agricultural land in its southern region, particularly in Guyton and Rincon. This urbanization limits students' exposure to agriculture, especially at South Effingham Middle School (SEMS) in Guyton. Recognizing this, the Agriculture and Natural Resources Agent partnered with the STEAM Coordinator to integrate agriculture into the school's curriculum through

Problem-Based Learning (PBL). Since 2021, SEMS has collaborated with UGA's Cecilia McGregor, receiving donated Orange Bulldog pumpkin seeds for the school's farm at Honey Ridge Agricenter (HRA). One grade level focuses their PBL on maintaining the pumpkin patch. In 2023, 6th graders tackled the issue of deer eating the previous year's pumpkins, focusing on maintaining and growing pumpkins at HRA. Both classroom learning and hands-on activities were used, with classroom lessons incorporating soil testing, recipe making, and critical thinking. Teachers guided students in preparation for hands-on activities at the farm, and the Social Studies department explored marketing concepts related to agriculture. The collaboration has produced a thriving pumpkin patch, providing students with experiential learning that extends beyond traditional teaching. The hands-on approach enabled students to appreciate horticulture, teamwork, and sustainable practices. The patch has become a community pride, symbolizing successful collaboration between SEMS, Extension, and UGA. Assessment of student learning was multifaceted, including journals, project-based assessments, and interdisciplinary activities. These assessments align with Experiential Learning Theory, emphasizing reflection and growth. The Cognia STEM certification process further evaluated the program's effectiveness through interviews, observations, and testimonials, ensuring its alignment with educational standards and reinforcing the program's success. The school has transformed a simple pumpkin patch into a sustainable agricultural anchor for all three grades at SEMS. The work done with students has helped the school earn state and Cognia STEM certifications, making it the first and only middle school in the state to obtain both certifications thus far.

25. Evaluation of Carbon Robotics Laser Weeder in Direct Seeded and Transplant Vidalia Onion Production Systems

Chris Tyson Stanley Culpepper, University of Georgia*

Abstract: A study was conducted to evaluate the Carbon Robotics Laser Weeder in direct seeded and transplant Vidalia Onions in Georgia. For the direct seeded evaluation, there were 4 treatments: the Laser Weeder, the standard herbicide program for direct seeded, which includes the use of Dacthal, Prowl, and Goal herbicides, the Laser Weeder with the standard herbicide program, and an untreated control. In the transplant evaluation, 4 treatments were also evaluated: Laser Weeder, standard herbicide program with Goal and Prowl herbicides, Laser Weeder plus standard herbicide program, and an untreated control. Plant stand, onion size, yields, and weed control measurements were taken for both evaluations. In the direct seeded study, none of the treatments influenced plant stand, and no injury was observed from the Laser Weeder treatments. The Laser Weeder effectively controlled primrose, radish, swinecress, and henbit. Compared to the herbicide

program, average onion diameter and weight was at least 39% and 68% greater with the Laser Weeder treatment. In the transplant study, none of the treatments influenced plant stand and no injury was observed from Laser Weeder. All of the treatments except untreated control provided excellent weed control.

26. Extension and Tourism Partnerships Elevate Agriculture

Hannah Eason Morgan Pinkerton, UF/IFAS Extension Seminole County; Matthew Smith, UF/IFAS Extension Lake County; JK Yarborough, UF/IFAS Extension Orange County; Kevin Camm, UF/IFAS Extension Orange County; Shane Michael, UF/IFAS Extension Seminole County; Karen Aplin, Orlando North; Jessica Pickering, Orlando North*

Abstract: Situation:

Rapid urban development across central Florida has contributed to significant farmland loss, even as the proximity of farms to population centers remains critical for food access, agritourism, and agricultural literacy. A 2024 UF/IFAS needs assessment identified raising agricultural awareness as a top priority for central Florida producers. To address this need, UF/IFAS Extension partnered with Orlando North Tourism, the Seminole County tourism and marketing agency, to develop an outreach strategy that leveraged social media storytelling to connect residents with the region’s agricultural community. The objective of this program was to increase public engagement with agriculture by collaborating with social media content creators to expand outreach, elevate farm visibility, and foster community support for local producers.

Methods:

In early 2025, a two-day multicounty farm tour was conducted across Seminole and Orange Counties, showcasing a diversity of agricultural operations including livestock, commercial horticulture, specialty crops, and emerging niche farms. A curated group of social media influencers was invited to engage directly with farmers, UF/IFAS Extension agents, and agricultural industry professionals. Through farm visits, guided tours, demonstrations, and one-on-one conversations, influencers gained firsthand insights into local production, sustainability practices, conservation efforts, and challenges faced by farmers in a rapidly urbanizing region. Participants were encouraged to create authentic social media content highlighting their experiences, farm stories, and the importance of supporting local agriculture. UF/IFAS and Orlando North provided coordinated messaging, media support, and fact-checked agricultural information to ensure accuracy and educational value.

Results:

Updated campaign analytics demonstrate substantial public engagement with agritourism content and strong community investment in the farm tour initiative. The organic social media campaign reached 126,541 unique individuals and generated 242,687 total video views, confirming a high natural interest in local farm stories. Combined organic and paid website traffic resulted in 2,126 sessions, with visitors remaining on the site for an average of 1 minute and 13 seconds, indicating meaningful interaction and content exploration. Social content achieved an estimated 14.5% average engagement rate, while paid promotion delivered a 3.92% click-through rate and an efficient $0.16 cost-per-click (paid), exceeding common tourism and outreach benchmarks.

Beyond digital performance, the event secured over $15,000 in sponsorships and in-kind donations, demonstrating strong regional support. Additional outcomes included new partnerships between farmers and local chefs, cross-promotional marketing efforts among farms, strengthened relationships with community organizations, and increased influencer recognition of the educational resources that UF/IFAS Extension provides. Overall, the program facilitated new collaborations and reinforced existing networks across the local food system.

Conclusion:

This program illustrates the effectiveness of collaborative programming and strategic influencer engagement in elevating agricultural literacy and strengthening local food systems. With a cost well under one cent per person reached, the initiative proved both efficient and scalable. Strong organic engagement confirms that agritourism content resonates deeply with central Florida audiences, and paid amplification effectively broadened reach while attracting high-quality website traffic. Continued tracking of social media engagement, partnership growth, and local economic impact will guide future Extension strategies that support sustainable agriculture amid ongoing urbanization.

27. Extension and Tourism Partnerships Elevate Agriculture

Hannah Eason Morgan Pinkerton, UF/IFAS Extension Seminole County; Matthew Smith, UF/IFAS Extension Lake County; JK Yarborough, UF/IFAS Extension Orange County; Kevin Camm, UF/IFAS Extension Orange County; Shane Michael, UF/IFAS Extension Seminole County; Karen Aplin, Orlando North; Jessica Pickering, Orlando North*

Abstract: UF/IFAS partnered with Orlando North Tourism to deliver a 2-day multicounty farm tour that leveraged social media influencers to elevate agricultural awareness and highlight local producers. The campaign reached 126K people, generated 242K video views, and had a 15% engagement rate, which is considered high. More than $15,000 in

sponsorships and new farmer–chef collaborations strengthened community ties and support for local agriculture.

28. From Turmeric to High-Value Functional Foods: Enhancing Curcumin Bioavailability Using Food Nanotechnology

Hualu Zhou Minghe Wang, University of Georgia*

Abstract: Turmeric is widely recognized for its health benefits, primarily due to curcumin, its major bioactive compound. However, curcumin's poor water solubility and instability in the digestive system have long limited its effectiveness in foods and supplements. Our research introduces a sustainable nanotechnology strategy that directly converts raw turmeric into nanoparticles, eliminating the need for chemical organic solvents or purifying steps. These turmeric nanoparticles were incorporated into a food-grade emulsion system to evaluate their digestion behavior and nutrient release using a standardized gastrointestinal model. Results showed that nano-formulated turmeric dramatically improved curcumin stability during digestion (over 90% retained) and enhanced its bioaccessibility by nearly tenfold compared to conventional curcumin crystals. When incorporated into emulsion food matrices, curcumin absorption further increased, demonstrating the strong potential of this formulation for functional food applications. This study highlights the use of food nanotechnology to enhance the nutritional value of turmeric and create high-value functional foods from agricultural crops, offering new opportunities to develop health-promoting products.

29. Mulch Color: Black, White or Black Plastic Painted White for Fall Pepper Production in Georgia

Joshua Dawson Justin Shealey, Sarah Curry, Ben Reeves and Dr. Ted McAvoy – University of Georgia*

Abstract: Plastic mulch plays a crucial role in regulating soil temperature, retaining soil moisture and fumigants, and suppressing weeds resulting in increased plant vigor and yields in vegetable production systems. In fall pepper production, white plastic mulch is commonly used to reduce heat during late summer plantings, however white plastic is more expensive than black plastic and many growers reuse black plastic from the spring and paint it white in the fall to further cut costs. Therefore, growers are seeking cost saving alternatives to white plastic and are considering using black plastic mulch or black plastic mulch painted white to reduce heat absorption for fall bell pepper production in Georgia. This study was conducted in a commercial bell pepper farm in Lowndes County in 2025 to evaluate the performance of three mulch treatments; standard white plastic, unpainted black plastic, and painted black plastic (10% white latex paint solution diluted with 90%

water and sprayed at 50 gallons per acre) under fall growing conditions. Data collected focused on early season soil temperatures, plant survival rate, plant growth, total and marketable yield and average pepper fruit size. Results indicate that white mulch had the lowest soil temperatures with the highest plant survival, growth and yield, while black plastic painted white had moderate performance and unpainted black plastic performed the worst.

30. Farmers Market Price Reports in South Carolina

Kevin Burkett Jake Parker, student, Clemson University*

Will Culler, PhD. Agribusiness, Clemson University

Abstract: (We may actually switch this to an undergraduate poster later but I wanted to go ahead and submit it.)

Starting in 2025, Clemson University coordinated a project with farmers markets in South Carolina to report prices of fruits and vegetables sold at their markets. These reports were done on a voluntary basis (generally through the market managers) with the volunteers receiving a small stipend for their time. We had 11 South Carolina farmers markets report prices during April - September 2025. A link to the reports can be found here: https://www.clemson.edu/extension/agribusiness/resources/marketing/price-reports.html

The original data was collected through a Qualtrics survey tool and student Jake Parker used the data to create the reports listed on the website. Going forward the goal is to create automations through Qualtrics that will put the data into a standardized report. We also developed a survey for users of the reports to provide feedback on how they are being used. Data will be collected again April - September 2026. We anticipate even greater participation in 2026.

These reports offer growers, buyers, and educators' reliable access to current market data to support production, marketing, and research decisions. Previous to this project only wholesale market data was available through Columbia, SC. This projects allows producers to get more targeted data for their operation based on location, direct-to-consumer pricing, and seasonal trends in their area.

The original project was funded through a South Carolina Specialty Crop Block Grant. That proposal will end later in 2026. We will evaluate whether or not the program can continue on a completely voluntary basis with no stipends or if there is another source of funding to continue small stipends for market volunteers.

31. Spraying Drone Efficiency: A Comparative Study of Application Rates and Adjuvant Addition

Lucas Sales Regimar Garcia dos Santos - University of Georgia, Horticulture Department*

Marcelo Rodrigues Barbosa Júnior - University of Georgia, Horticulture Department

Luan Pereira de Oliveira - University of Georgia, Horticulture Department

Abstract: The use of spraying drones in modern horticultural production has become a significant development, offering several advantages over conventional ground-based sprayers. These include a reduction in soil compaction, minimized crop trampling, and improved the capacity to operate in areas with difficult access, including hilly terrain and wet fields. Despite the increasing use of adjuvants, there remains a gap in information regarding accurate application rates and the influence of adjuvants on spray quality for specialty crops. The objective of this study was to evaluate the coverage area (CA, %) and Drop Density, generated by a commercial spraying drone under different application rates, with and without adjuvant addition, in a commercial carrot production field.

The experiment was conducted in Lake Park, Georgia, using an XAG P100 Pro drone, equipped with a 50L tank. Two application rates were tested, each with and without the adjuvant Goodspray (Forquímica), and all treatments were replicated three times. Water-sensitive papers were positioned at the top and bottom thirds of the carrot canopy across nine beds, with 30 meters each. Drone flights were performed at an altitude of 3.7 m, with the central bed being targeted. After the spraying process, the papers were collected and analyzed individually using the SprayX DropScope wireless digital microscope to quantify the percentage of coverage (CA%) and the Drop density.

The study results demonstrated that the application rate and the addition of adjuvants had a significant impact on the performance of the spray. Higher application rates resulted in increased coverage area in both canopy levels, while the presence of adjuvants improved drop density, particularly in the lower canopy. The variation in drop density indicated significant alterations in droplet size distribution, which have consequences for product penetration, drift reduction, and target efficacy. The evaluation of upper versus lower canopy deposition yielded insights into the influence of rate and formulation on spray penetration.

Also, the study shows the significance of selecting suitable application rates and contemplating the incorporation of adjuvants when employing drone-based chemical applications in carrot production. These findings contribute to improving precision and operational efficiency for aerial spraying in horticultural fields, supporting growers to adopt cutting-edge technologies in agriculture.

32. Training and Outreach impacts for the Southern Center for FSMA Training, 2018-2024

Peggy Geren Peggy Geren1, Keith Schneider2, Renee Goodrich2, Matt Benge2, Michelle Danyluk1, (1) University of Florida CREC, Lake Alfred, FL, (2) University of Florida, Gainesville, FL.*

Abstract: The Southern Center for FSMA Training is a consortium of 22-26 institutions that between 2018-24 aimed at enhancing produce safety through a variety of educational means, including conducting and evaluating standard courses. Outputs and outcomes showcase significant knowledge gain and behavior change. A gap exists identifying and understanding the challenges and obstacles training participants might face when trying to implement best practices on their farm after the training concludes.

33. UGA Ag Water Team Increases Water Educational Efforts in Fruit and Vegetable Production in South Georgia

Phillip Edwards Beasley, S., Bennett, J., Capasso, J., Crews, B, Edenfield, J., Green, R., Hall, D., Jackson, D., Lyon, D., Mallard, J., McAllister, S., Mosteller, M., Porter, W., Quayle, J., Shirley, A., Smith, J., Tyson, C., Williams, Z.*

Abstract: Achieving adequate soil moisture is a most critical component in production agriculture. From multiple methods used to apply irrigation to monitoring soil moisture, the goal is to reach yield goals and achieve maximum profitability. In previous years much of the efforts of the UGA Ag Water Team have focused primarily on traditional row crop irrigation scheduling as a substantial portion of Georgia's agricultural production acres are devoted to these cropping systems. Our educational programming efforts are driven by county extension agent/educator needs and suggestions. In 2025 a portion of those educational efforts focused on fruit and vegetable irrigation as more opportunities developed to focus and gain expertise in these areas. Members of the water team collaborated with agents and educators in blueberry, muscadine, satsuma, snapbean, Vidalia Onion, and watermelon. A key component of our educational efforts is to provide unbiased local information to growers via their local UGA County Extension personnel. Obtaining precise crop water needs is addressed primarily through the use of soil moisture sensors. Soil moisture sensors were utilized in Vidalia Onions in collaboration with the UGA Ag and Environmental Services Lab. Sensors were also installed in watermelon, satsuma, blueberry, and a demonstration sensor in muscadine. The use of technology to answer water questions and concerns is growing. Examples include real-time soil moisture availability throughout the growing season. Delving deeper in water efforts the ag water team focused in specific concerns such as: the use of soil moisture sensors to document various irrigation strategies on satsuma oranges, determining how overhead irrigation impacts watermelon production on plastic mulch, conducting drip irrigation calibrations, and use of blue-dye to assess water infiltration in drip and overhead irrigation. As

production agriculture continues to diversify into more fruit and vegetable production it is evident that there is much room to expand the knowledge base as it relates to water use and efficiency across the state.

34. Evaluating Controlled-Release Fertilizer as a Best Management Practice for Carrot Production in Florida's Suwannee Valley

Sydney Williams Bob Hochmuth, Taite Miller, and Alia Ortiz Bayron*

UF/IFAS North Florida Research and Education Center-Suwannee Valley

Abstract: UF/IFAS Extension conducted a field trial during the 2024-25 season to evaluate controlled-release fertilizer (CRF) as a Best Management Practice (BMP) for carrot production in the Suwannee Valley. The study aimed to determine whether CRF could maintain yield performance while improving nitrogen use efficiency and reducing nutrient losses in sandy soils prone to leaching. The project included both large-scale commercial and small-plot comparison trials to assess CRF placement strategies and their impact on crop performance. Results indicated that CRF maintained competitive yields while enhancing fertilizer efficiency and minimizing leaching potential. Incorporating CRF into the bed improved nutrient uptake compared to surface placement, highlighting the importance of application methods in achieving optimal results.

Overall, this project demonstrated that CRF is an effective and practical nutrient management tool for Suwannee Valley carrot growers. Adoption of CRF supports both economic profitability and environmental sustainability, aligning with regional BMP goals for vegetable production systems.

35. Use of Controlled-Release Nitrogen in Snapbean Production in the Suwannee Valley

Taite Miller Taite Miller, Robert Hochmuth, Rajkaranbir Singh, Lakesh Sharma, Tyler Pittman, Mark Warren*

Abstract: Snapbean production in the Suwannee Valley of Florida occurs on sandy soils that are highly vulnerable to nitrogen leaching, making efficient fertilizer management essential for both crop performance and environmental protection. Controlled-release fertilizers (CRFs) offer a potential strategy to improve nitrogen delivery by synchronizing nutrient release with crop demand. A series of research trials at the UF/IFAS North Florida Research and Education Center–Suwannee Valley, along with on-farm demonstrations, were conducted to evaluate CRF as an alternative to conventional nitrogen sources for snapbean production. These studies examined different nitrogen rates, fertilizer placement methods, and commercial production conditions to assess crop response, nitrogen

availability, and potential leaching risk. This work aims to provide growers with science-based guidance on the suitability of CRF in snapbean systems and to support nutrient management decisions that align agronomic goals with water-quality stewardship.

36. H2grow System: A Climate Smart Solution for Water Conservation in Vegetable Production System

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North Mississippi Research and Extension Center/Mississippi State University

Abstract: Agriculture continues to account for over 70% of global freshwater withdrawals, despite extensive research into water conservation methods in food production. A significant portion of this water usage is attributed to irrigation. In vegetable crops, the traditional raised bed system with plastic mulch can reduce irrigation application by minimizing evaporative losses. However, this system does not prevent water and nutrient losses to deep percolation or lateral movement outside the bed area. Therefore, this study evaluates an alternative raised bed system (H2grow), and compares its impact on water use, yield, and fruit quality in bell pepper production against the conventional raised bed system. Six treatments were tested, which included three nitrogen (N) application rates in both raised bed systems (bed type). A split-plot design was used, with bed type as the primary factor and nitrogen rates as the secondary factor. All treatments were replicated four times. Soil moisture sensors were used to trigger irrigation when soil moisture levels fall below 90% field capacity. Soil moisture, nutrient levels, and tissue nutrient content were monitored throughout the growing season. Yield and fruit quality (fruit wall thickness), were assessed at harvest. Preliminary results show that cumulative water use under the H2grow was 33% lower than the conventional raised bed, regardless of nitrogen application rates. This corresponds to a water savings of 1460 m^3/ha. Although there were no significant differences in yield or wall thickness between bed types; the H2grow system showed promising potential over conventional beds with a p-value of 0.08 for yield and 0.06 for wall thickness. Nitrogen application rates had no significant effect on yield or fruit wall thickness, though fruit biomass was lowest under the low-N treatment. These findings demonstrate that the H2grow system significantly conserves water in bell pepper production and has the potential to reduce the water footprint in commercial vegetable production. As water conservation becomes an increasing concern in agriculture, this innovative technology offers a critical solution to address the growing challenge of freshwater use in food production.

37. Strawberry Tabletop System in Open-Field, A Promising Alternative Production System in Florida

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Scott Goldstein, Biological Scientist II, University of Florida/ IFAS, Horticultural Sciences

Abstract: Conventional strawberry production in Florida is unique, with many disease and insect pest challenges. While greenhouse tabletop production and its different variations can solve some of said challenges, it can be a very high-cost alternative in Florida, primarily due to the infrastructure and enormous energy requirements for environmental conditions management. In this 3-year on-farm research project in collaboration with a Florida strawberry grower, we examine a modified tabletop system in open-field conditions to utilize the best of both worlds. In season 1 (2025-2026), we tested three soilless substrate mixtures: 1) coco coir (control), 2) pine bark + yard waste (compost), and 3) pine bark + yard waste (compost) + vermicompost. Substrate treatments we replicated four times with both black and white plastic mulch under conventional and organic production systems (approximately 1/8 acres each). Irrigation and fertigation are controlled and monitored with an automated system utilizing regular drip tape. In the ongoing season 2 (2025-2026), we evaluate the best-performing substrate (pine bark + yard waste (compost) + vermicompost) versus coco coir as the industry standard control. Preliminary results from season 1 and current observations from season 2 indicate the ability of the plants to establish and grow with a comparable plant vigor to commercial conventional field production. Season 1 yield data showed that substrate 3 covered by white plastic mulch has yielded the highest in both conventional and organic systems. An interesting pattern in conventional plots was observed, where white plastic yielded higher across all substrates, with differences becoming more pronounced as the season progressed. This is likely due to the potential benefits of white plastic in managing chilli thrips. However, further yield data collection and analysis are required to determine the substrate recommendation. The elevated and well-ventilated nature of this production system offers a significant advantage for disease reduction, such as gray mold and neopestalotiopsis leaf spot, fruit, and crown rot. It also offers an advantage in food safety risk assessment due to the distance of the fruit from the ground soil. The elevation of the tabletop system also offers other great benefits, such as lack of need to fumigate and the ease of planting, regular crop management practices, and, most importantly, harvest, where workers can perform all tasks standing, which improves their efficiency and performance. Current and future research aims to further optimize this system and quantify its commercial financial feasibility as a supplemental or alternative growing system.

38. Economic Analysis of Grafting, Density, and Planting Date Strategies in Watermelon Production

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Abstract: This study evaluates the economic viability of watermelon production across different grafting statuses, plant densities, and planting date treatments. Using partial budget analysis and Monte Carlo simulations based on two seasons of field trial data (2024-2025) in South Carolina, we analyzed net returns, revenue potential, and production risk. We also conducted a sensitivity analysis to examine how net returns change under various market conditions, including fluctuations in crop prices and transplant costs. Our results show that the economic performance of grafted watermelon is highly dependent on complementary production practices, including planting date and plant density. This highlights the importance of designing an integrated production system centered around grafting to ensure farm profitability. Overall, this study helps growers identify economically advantageous practices by quantifying profitability and risk across various production strategies

39. Insecticide Efficacy of Novel Chemistry ISM-555 on Commercial Vegetables in Georgia 2025

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Abstract: ISM-555 is a novel product being brought to the market by Syngenta. There have been few novel insecticide products brought to the market in recent years. ISM-555 will be the first product labeled under the new Endangered Species Act regulations. In commercial vegetable crops ISM-555 will be labeled as Incipio. Currently, The University of Georgia Vegetable Team has insect efficacy data on the following pests and crops: Cotton Jassids in Okra, Flea Beetles in Eggplant, Pepper Weevils in Bell Pepper, Thrips in Snap Bean and Diamondback Moth Caterpillars (DBM) in Collard Green.

Non-Judging:

40. Innovative Ideals and Controlled Environment Technics.

Arthur Roberson A. Roberson*; B K. Biswas,*

Abstract: In the course of a changing world and society, everything is being affected. Not only the way we learn and do business, but even the way we eat and grow food. Health issues are paramount and solutions are few. One idea is to be able to produce high-quality sustainable produce at low cost. Up until the present time, our soils have the source of approximately 95% of the food we consume. Plants depend on it to receive water, oxygen, and nutrients. Although fertilizers have enhanced the growth and yields of our crops, they have also created undesirable effects as well, such as birth defects in humans, animals, population loss, soil erosion, and soil quality degradation. Our present methods of agriculture are not sustainable options for the future. Greenhouse and Hydroponics grown vegetables are becoming increasingly more popular by demand. More people are looking for a low-cost way to obtain fresh and nutritious vegetables, especially in a time when more people are turning away from meats and steering towards a more vegetable based diet. Producing high yield produce that is free from Pests, pesticides, fungicides, and other harmful matters, can be established with a minimal cost using basic materials and creative ideas. Such as is the case with all things human, changes are necessary. Therefore, we look to improve designs and technics. Such has been the case with our greenhouse designs and innovative ideas. We are constantly trying to present designs and ideas that will contribute to not only farmers, but to the community as well as every household. We have designed and built our own CEA (Controlled Environment Agriculture room). This is a sealed room that has a controlled temperature/humidity and lighting system, as well as a video monitoring/recording system, with plans for automatic exhaust systems, UV sterilization and hand wash systems. We are designing low-cost systems that anyone can buy or make from readily available materials that will allow up to 36 plants to grow in less than 2 square feet of space.

41. 2025 Southeast Georgia Citrus Grower Survey

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Abstract: Citrus is a rapidly expanding Strategies crop in Southeast Georgia, with over 570,000 trees planted as of 2023. As new growers enter the industry, there are increasing

demands for region-specific research and production guidance. This survey was conducted at the Southeast Georgia Citrus Update held at the UGA Vidalia Onion and Vegetable Research Center on July 24, 2025. It was designed to gather insights from citrus growers in Southeast counties to help Extension agents and researchers understand local priorities, practices, and challenges. The ultimate goal is to inform future research directions and strengthen UGA Extension's support for this emerging industry. Based on survey, priorities to best serve Georgia citrus growers include: 1. Developing Georgia-specific pest management strategies2. Investigating market development opportunities for small citrus growers 3. Conducting trials on rootstock hardiness, irrigation timing, and nutrient delivery 4. Expanding outreach on technology, sustainability, and integrated pest management.

42. Florida's Extension Programs Prepare Produce Growers for Produce Safety Rule Inspection

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Keith Schneider and Renee Goodrich - University of Florida FSHN, Gainesville, FL.

Kirby Quam and Chelsea Peebles - Florida Department of Agriculture and Consumer Services, Bartow, FL.

Abstract: University of Florida Institute of Food and Agricultural Sciences collaborates with the Florida Department of Agriculture and Consumer Services to provide food safety education/outreach through Produce Safety Alliance (PSA) Grower Training and On-Farm Readiness Reviews (OFRR) to assist Florida growers in meeting the requirements of the Produce Safety Rule. Pre/Post test scores from in-person and remote PSA grower trainings indicate an increase in knowledge and OFRR surveys indicate sanitation, post-harvest water, and worker training required the most improvements.

43. Crops Under Cover! Protective Row Covers for Pest Exclusion

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Sarah Clark, Department of Entomology, University of Kentucky

Ric Bessin, Department of Entomology, University of Kentucky

Mark Williams, Department of Horticulture, University of Kentucky

Abstract: Diversified organic growers must master the production of many specialty crops with a limited set of tools to combat pests, diseases, weeds, and a changing climate. Some of these tools, like OMRI (Organic Materials Review Institute)-listed pesticides, perform sub-optimally and sometimes fail to reduce damage from pests and diseases. However, mounting evidence suggests that protective row cover systems limit pests, insect-vectored diseases, and some extreme weather conditions. The overall goal of this USDA-OREI-funded project is to expand the organic toolkit by optimizing protective row covers to overcome biotic and abiotic challenges to specialty crops in the Southeast, Midwest, and Northeast.

A national survey of organic growers revealed widespread use of row covers, with 91% using row covers for frost protection, 83% for season extension, and 48% for pest control. 79% of growers used row covers on less than an acre, with 41% of growers using row covers on less than a quarter acre.

Field experiments in the three regions (2024-25) highlighted variable benefits of protective row covers across region, crop, pest, and season. Further, different insect netting products varied in their longevity and effectiveness for small insect pests. Fine-mesh nets increased the marketable yield of brassica greens (arugula, bok choy, and napa cabbage) and eggplant by excluding flea beetle pests. Cucumber yield increased via reductions of cucumber beetles and vectored bacterial wilt.

Using mini-weather stations under row covers and in uncovered plots, we found fine-mesh row covers reduced high wind speeds during storms. Further, we observe mild temperature increases under fine-mesh row covers in spring and fall, with no statistical differences in summer.

A major barrier to row cover adoption remains the high upfront costs of row cover materials. However, our economic analysis suggests that the multi-use of row cover materials across multiple plantings per year increases profitability compared with other pest management practices.

Collaborating with Kentucky growers through on-farm trials comparing row-covered vs. uncovered plots revealed that 87% of growers perceived increased yields under row covers for a wide range of vegetables. Further, 69% of growers would be willing to purchase row covers to adopt this practice, though 30% would only do so if row cover materials were discounted.

More information can be found at Crops Under Cover (https://cropsundercover.mgcafe.uky.edu/).

44. NCSU Strawberry Breeding Program: Advanced Selections

Ian Mellon Dr. Gina Fernandez - Department of Horticultural Science*

Abstract: The NCSU Strawberry Breeding Program aims to develop cultivars well-adapted to the needs of regional growers. North Carolina's strawberry industry is dominated by U-pick and farm-stand markets, and the program emphasizes flavor, yield, and disease resistance in its selections to follow grower priorities. Resistance to Neopestalotiopsis rot remains a major breeding priority, as most current commercial cultivars offer little to no host tolerance to this disease.

45. Comparative Analysis of Yield and Quality Parameters of Triploid Watermelon (Citrullus lanatus) Cultivars under Field Conditions in Georgia

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Abstract: Watermelon (Citrullus lanatus L.) is one of the most economically important vegetable crops grown during the spring season in Georgia, with the majority of the watermelon supply for the Fourth of July coming from southern Georgia. Due to changing market demands and varying environmental conditions, ongoing screening of commercially available cultivars is crucial to identify those that offer high yield, excellent fruit quality, and desirable fruit size distribution for growers in the southeastern United States. Field experiments were conducted at the University of Georgia's Tifton Vegetable Park Research Farm during the spring of 2022 and 2023. The objectives were to compare commercially available large seedless watermelon cultivars for performance to determine marketable and unmarketable yields, average fruit weight, fruit size distribution, soluble solids content (SSC), and the occurrence of hollow heart.

The trials included twelve commercially available triploid watermelon cultivars arranged in a randomized complete block design with four replications. Standard cultural and irrigation practices were followed for both seasons. Results revealed significant differences among cultivars for total and marketable yields, fruit size class distribution, and quality parameters. Among the twelve cultivars tested, 'Excursion', 'ACX 6177', 'Miramonte', 'El Capitan', 'Sierra Nevada', and 'Jetski' were the top performers, each producing total yields exceeding 60,000 lbs/acre. Of these cultivars, 'Excursion',' Sierra Nevada', and 'El Capitan' had a high percentage of 30/36 count watermelons, while 'ACX 6177', 'Miramonte', and 'Jetski' had a large percentage of 45/60 count watermelons. In contrast, 'Powerhouse' and 'Captivation' performed the worst, having lower average fruit weight and total yields. In terms of fruit quality, 'Jetski', 'Warrior', 'Captivation', Sierra Nevada', 'Embasy', and 'Powerhouse' had the highest soluble solid content among all the cultivars. However, all

cultivars had an average soluble solid content of more than 10%, which represents ‘very good internal quality’ per USDA standards. ‘Warrior’ and ‘Captivation’ had significantly higher hollow hearts in the fruits than all other cultivars. This two-year study identified clear varietal differences in yield potential, fruit size distribution, and internal quality under southern Georgia’s spring growing conditions. Based on yield, sweetness, and low hollow heart incidence, ‘Excursion’, ‘El Capitan’, ‘Miramonte’, ‘Sierra Nevada’, ‘ACX 6177’, and ‘Jetski’ are recommended for commercial cultivation in southern Georgia. These cultivars offer growers a range of options based on preferred fruit size, rind color, and shape to meet diverse market demands. Conversely, ‘Warrior’, ‘Powerhouse’, and ‘Captivation’ performed poorly for yield and/or hollow heart incidence and are not recommended for production in this region. The results from these trials provide updated, region-specific information to assist growers and extension agents in selecting and recommending watermelon cultivars best suited for spring production in Georgia.

46. Assessing the Efficacy of Ascaroside #18 Treatment in the Control of Escherichia Coli O157:H7 in Spinach at Harvest and Postharvest Stages

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Abstract: Outbreaks of E. coli O157:H7 infection linked to spinach consumption have occurred in the United States in 2006, 2012, and 2021. The recurring nature of these outbreaks highlights the need for effective antimicrobial interventions. This study 1) assessed the efficacy of spinach seed treatment with ascaroside (ascr) #18 or Ca(OCl)2, and 2) evaluated the combined effect of ascr #18 seed and foliar spray on E. coli O157:H7 populations in spinach during harvest and postharvest storage. Spinach seeds (2 g per sample per treatment) were treated with 20,000 ppm $Ca(OCl)_2$ or 1 mM ascr#18 for 15 or 20 min, and control seeds were treated with sterilized water or 10% ethanol, respectively. The treated seeds were grown for 4 and 6 weeks. In separate experiments, spinach grown from 1 mM ascr#18-treated seeds were foliar sprayed with ascr#18 solutions (0.1 µM, 1 µM, 10 µM) or a control solution (0.1% ethanol) at three intervals: 1 week, 2 weeks, and 2 days before each harvest in weeks 3, 5, and 7. Following harvest in both experiments, spinach stems (10 g per sample) were inoculated with ca. 6 log CFU of E. coli O157:H7. The inoculated samples were stored at 4°C for 4 weeks. E. coli O157:H7 populations were enumerated weekly. The average cell counts in spinach grown from two types of treated seeds were significantly ($P \leq 0.05$) or insignificantly ($P > 0.05$) different from their respective

controls on non-selective and selective agar, respectively. Compared to spinach treated with seed treatment only, adding ascr#18 foliar spray resulted in lower E. coli O157:H7 populations, with lower populations observed in mature leaves than in younger leaves, which was not shown in seed-only treated spinach. This study may assist those aiming to control E. coli O157:H7 on spinach with ascr#18 seed and foliar treatments.

47. University of Florida Small Farms Academy Delivering Unique Trainings for Small and Beginning Farmers

Robert Hochmuth Wanda L. Laughlin, and Alia Ortiz-Bayron*

Abstract: Since 2009, the University of Florida's North Florida Research and Education Center–Suwannee Valley has offered diverse, hands-on training programs through the Small Farms Academy to support small and beginning farmers and ranchers. These trainings emphasize "learning by doing" on working farms and in greenhouses, covering topics such as: hydroponic nutrient and water management, starting a successful hydroponic business, mind your business- hydroponics for profit, growing herbs in hydroponic systems, high tunnel organic tomato production, cold hardy citrus, drip irrigation school, tractor and farm implement safety, diversified fruit orchards, whole farm integrated pest management, small scale mushroom production, microgreens 101, leafy greens for protected agriculture, and building your own farm food safety plan. Over the past 16 years, more than 3,250 farmers and prospective farmers have participated in 40 training topics. While most attendees are from Florida, participants have also come from over 16 other states and more than 10 countries, reflecting the broad impact and relevance of these training courses.

48. IR-4 Project: Success and Benefits to Specialty Crop Growers

Roger B. Batts All co-authors have the same affiliation; IR-4 Project Headquarters, NC State University.*

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Abstract: IR-4 Project: Success and Benefits to Specialty Crop Growers. Roger B. Batts, Jaimin Patel, Alice Axtell, Jerry Baron, Debbie Carpenter, and Hannah Ross. IR-4 Project, NC State University, Raleigh, NC

For more than 60 years, the IR-4 Project has helped growers/farmers of specialty crops (fruits, vegetables, nuts, herbs, spices, ornamentals and other horticultural crops) gain access to registrations of safe and effective chemical and bio-based herbicides, fungicides and insecticides. The IR-4 Project remains relevant because the crop protection industry focuses their research and development efforts on products that provide large sales that yield adequate return on investment. They shy away from specialty crops because of the cost of development of the data required for registration. The IR-4 Project fills this gap of developing data utilizing a network of public sector researchers (University and USDA-ARS) with expertise in pest management and analytical chemistry. Since its inception, IR-4 has secured over 23,000 registrations of crop protection products in food crops and over 56,000 uses in ornamental crops under its Environmental Horticulture program. IR-4 contributes nearly $9 billion to the annual US gross domestic product, according to a 2022 report by the Michigan State University Center for Economic Analysis.

IR-4 activities include, but are not limited to:

Food Crop Program: Facilitates regulatory approval of pest management solutions for specialty food crops through three research platforms:

- Residue Studies - determining the amount of chemical pesticide remaining in the crop at harvest;
- Product Performance - developing data to show that a potential use of a pesticide is safe and effective; and
- Integrated Solutions - utilizing multiple tactics including chemical pesticides, biopesticides, emerging technologies and other tools in combination to manage critical pests.

Environmental Horticulture Program: Supports regulatory approval of pest management solutions for environmental horticultural crops including landscape/nursery plants, cut flowers and more.

Biopesticide Regulatory Support: Aids in development and registration of bio-based pesticides for use on specialty crops.

International Activities: Facilitates the international harmonization of Maximum Residue Levels (MRLs), supporting U.S. specialty crop growers in accessing export markets. IR-4 also helps build capacity of global minor use programs and collaborates with international partner organizations.

For more information, please visit our website: https://www.ir4project.org/

49. **Forests adjacent to blueberry crops generate seasonal stability of ground-dwelling spider communities**

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Abstract: Spiders are among the most diverse and abundant predators within agroecosystems that contribute significantly to biological control. Recent studies show that land-use change can alter the functioning of spider food webs, but the composition and dynamics of spider communities are largely unknown in many systems. Here, we study how within-farm field positions shape aspects of spider communities in blueberry production. We estimated ground-dwelling spider communities in blueberry fields of southeast Georgia for eight months to include the blooming and fruiting phenological stages. Over two years, we sampled eight commercial farms using pitfall traps among three field positions (interior, edge, and forest border). During the two-year study, we enumerated 3020 adult spiders representing 24 families and 84 genera. Spider communities were primarily included (89%) in five families: Lycosidae (45%), Linyphiidae (8%), Gnaphosidae (11%), Phrurolithidae (7%), and Corinnidae (15%). Forests supported higher richness, greater evenness, and more temporally stable communities compared to commercial blueberry habitats. In contrast, both the field interior and edge were compositionally similar, with a high temporal rate of community change of a few disturbance-tolerant genera. In contrast, both the field interior and edge were compositionally similar, with a high temporal rate of community change of a few disturbance-tolerant genera. Our findings show a diverse ground-dwelling spider community in blueberry systems in Georgia and suggest that forests adjacent to crops play a key role in supporting biodiversity and foresting ground spiders.

50. **Wild bee communities in blueberry fields and adjacent forests in Georgia**

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Abstract: Wild bees provide invaluable pollination services in agricultural landscapes and are the target of various conservation programs. Understanding the identity and dynamics of bee communities helps to plan compatible conservation strategies and gauge their

effectiveness, especially in pollinator-dependent crops such as blueberries. In our study, we assessed temporal dynamics in the composition of wild bee communities in blueberries and adjacent forest borders in Georgia.

We assessed eight blueberry fields from March to October over two years. We identified 72 wild bee species and 26 genera. Bee species diversity, richness, and abundance fluctuated over time. Our community analysis showed that although blueberry field location influences species composition, the month of capture explained a higher degree of variance in wild bee community composition. The temporal changes in the species composition were mainly explained by the individual phenologies of the most abundant species and a high reordering in the relative abundance of these species throughout the months. These results provide initial information on the wild bee communities in blueberry fields in Georgia, which can be used to improve future studies and conservation strategies.

51. A Survey on the Cleaning and Sanitization Practices for Blueberry Harvest Containers and Mechanical Harvesters in the United States

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Abstract: Currently, cleaning and sanitation of harvesting tools and equipment are not mandatory although certain practices are encouraged by blueberry grower associations, cooperative extension services, and regulatory bodies in the United States. Thus, fresh blueberry producers may select their preferred cleaning and sanitization approaches.

This study aimed to gain insights into the commonly used cleaning and sanitation practices used by some blueberry producers in the United States by conducting an online survey.

A questionnaire consisting of 25 questions was used to collect the information including demographic information, operation type, harvesting method, and cleaning and sanitization approach used by participating fresh blueberry establishments.

A total of 71 responses were received in 2021. The vast majority of the survey respondents (90.4%) reported that they cleaned flats/lugs/crates at varying frequencies using cold or

warm water along with scrubbing, or the use of pressure, a garden hose, or a washing machine. Among these respondents, 86.7% used detergents, surfactants, or unspecified products for cleaning. About 90.1% of the survey respondents used quaternary ammonium, bleach, selectrocide, or nonspecified products to sanitize flats/lugs/crates, while 26.8% of the respondents used sanitizing wipes to clean harvest containers. Fifty-nine out of the 71 respondents cleaned mechanical harvesters at varying frequencies with either cold or warm water in combination with dish detergent, surfactant, nozzle, or nonspecified approaches, and among these respondents, 55 sanitized mechanical harvesters after cleaning.

The study suggests that although the majority of the survey respondents have appropriate cleaning and sanitation practices in their facilities, food safety education is necessary to encourage all fresh blueberry producers to adopt such practices.

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