



Poster Presentations

2025 Southeast Regional Fruit & Vegetable Conference

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Savannah Convention Center



The 2025 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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Poster Authors & Abstracts

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1. Fertilizer nitrogen application for sweet corn production in the southeastern US

Andre da Silva, Jessica Paranhos, Camila Rodrigues, Wheeler Foshee, Timothy Coolong*

Abstract: The variability of weather patterns in the southeastern United States is influencing nitrogen (N) fertilizer application in sweet corn production, with growers tending to overapply nitrogen, leading to increased costs and potential environmental harm. This study aimed to assess the effects of weather variability on N fertilizer application and to determine optimal nitrogen strategies for sweet corn in the region. Field trials were conducted across three fall growing seasons (2020, 2021, and 2022) at locations in southeastern Georgia (2020) and central Alabama (2021-2022), testing five N application rates (200, 225, 250, 275, and 300 lb/acre) and different application timings. Weather conditions, including rainfall, maximum, and minimum air temperatures, were monitored throughout each growing season. Sweet corn biomass was measured five times per season, and at maturity, ear characteristics, such as number of ears per plant, ear weight, ear length, ear width, number of kernel rows, and total kernel count were recorded. Air temperatures during all growing seasons remained within the optimal range for sweet corn growth. However, early-season rainfall events in all years led to the leaching of most applied pre-planting nitrogen. In 2020, the highest yield (23,167 lb/acre) occurred with 245.45 lb/acre of N; in 2021, the maximum yield (23,408 lb/acre) was observed with 241 lb/acre of N; and in 2022, the highest yield (26,250 lb/acre) was achieved with 175 lb/acre of N. Despite variations in nitrogen rates, yield differences between treatments were not statistically significant, likely due to similar nitrogen uptake by sweet corn plants across all treatments, which did not exceed 200 lb/acre. Nitrogen use efficiency (NUE) was highest with the 200 lb/acre nitrogen treatment. Biomass accumulation also showed variability across the years. In 2020, the highest biomass (2,236 lb/acre) occurred with 225 lb/acre of N, with the time to reach half of the total biomass ranging from 35 to 40 days. In 2021, the maximum biomass (2,216 lb/acre) was reached with 275 lb/acre of N, with time to half-biomass ranging from 26 to 38 days. In 2022, the highest biomass (2,706 lb/acre) occurred with 200 lb/acre of N, with time to half-biomass varying between 29 and 33 days. Weather conditions had a direct impact on biomass accumulation, which was positively correlated with yield and ear quality parameters. Although no significant differences in yield were

observed among the treatments, the results suggest that applying between 200 lb/acre and 225 lb/acre of N offers the best balance of nitrogen use efficiency and minimizes the risk of nitrogen waste.

2. Entomopathogenic Nematodes as a Potential Biological Control Agent for Ambrosia Beetle

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Abstract: Ambrosia beetles are generalist wood-boring pests of many economically important deciduous trees, such as peach (*Prunus* spp.), apple (*Malus* spp.), and pecan (*Carya* spp.). These beetles target young, stressed, or weakened trees that have become vulnerable through flooding, poor drainage, or frost injury. While preventative methods are available, those that can manage ambrosia beetle infestation once the adult has burrowed into the tree are few. Ambrosia beetles negatively impact the growth, aesthetics, and economic impact of the host plants. Entomopathogenic nematodes (EPNs) are a potentially useful curative management method for ambrosia beetles in orchard systems. In previous studies on peaches, EPNs have been shown to control another wood-boring insect, the lesser peachtree borer, *Synanthedon pictipes*. This study aimed to evaluate EPNs a management tool for ambrosia beetles once they tunnel into the tree. The efficacy of six different species of EPNs (*Steinernema carpocapsae*, *S. feltiae*, *S. glaseri*, *S. riobrave*, *Heterorabditis bacteriophora*, and *H. indica*) at two different rates (3,000 EPN/ml and 5,000 EPN/ml) were tested against ambrosia beetles *Xylosandrus crassiusculus* and *X. germanus* using four sawdust cup lab assays. All tested EPN strains resulted in high mortality in both ambrosia species, except for *S. riobrave* against *X. germanus*. Additionally, efficacy among strains varied based on the ambrosia beetle species. These results highlight the potential of EPNs to manage ambrosia beetles in situations that otherwise are untreatable –therefore reducing the economic damage due to attacks.

3. Grafted Rootstocks for Fusarium Wilt Management in Berrien County Watermelons: A 2-Year Summary

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Abstract: Georgia is one of the top watermelon producing states in the U.S. Typical annual production is over 16,000 acres at an economic value of over \$140 million. Berrien County is an agriculturally diverse county in south central Georgia and produces 700 to 800 acres of watermelons a year. There are several diseases Berrien County watermelon growers manage throughout the season. One of the historically most problematic has been Fusarium wilt. This soilborne fungus, caused by *Fusarium oxysporum* f. sp. *Niveum*, or FON, may lay dormant in soils for up to 15 years. The disease affects the plants vascular system, with characteristic symptoms including loss of turgor pressure in a single vine and brown 'streaking' in the vascular tissue. Early season infection causes plants to collapse. Later infection is also common when plants go under water stress as they put on fruit. The Carolina Strongback, developed by the USDA ARS and Clemson University, is a rootstock derived from citron watermelons and is marketed as resistant to Fusarium wilt. In 2023 & 2024 these grafted rootstocks and their non-grafted conventional counterparts were evaluated in Berrien County watermelon fields with a known history of Fusarium wilt. In addition, a hybrid squash (MM30) and 3 additional citron derived rootstocks (ORSWRS1 & ORSWRS2b in 2023; Cassius in 2024) were also evaluated in these trials. Watermelon plants were evaluated for Fusarium wilt incidence weekly, as well as total melons and total plot weight at seasons end. The results of these trials showed that the Carolina Strongback and MM30 had zero disease incidence in both years. Comparatively, disease incidence in non-grafted plants was 46.6% and 90% in 2023 and 2024, respectively. Additionally, disease incidence was 30% and 43.3% in 2023 for the citron derived ORSWRS1 & ORSWRS2b, respectively. Lastly, disease incidence was 36.7% in the citron derived Cassius in 2024. Regarding number of melons per plot, there were no statistical differences between treatments in 2023. In 2024, Carolina Strongback, Cassius and MM30 all showed statistically similar melons per plot, with the Cassius being statistically similar to non-grafted plants. Lastly, regarding plot weights, The Carolina Strongback and MM30 performed the best in 2023 at 191 and 212 lbs per plot, and were statistically higher than non-grafted at 80.9 lbs. In 2024, Carolina Strongback performed the best at 341.6 lbs per

plot, and was statistically similar to both the MM30 and Cassius at 250.1 and 216.4 lbs per plot respectively. Non-grafted plants in 2024 averaged 24.1 pounds per plot and were statistically similar to Cassius. The results here show that the Carolina Strongback and MM30 derived from hybrid squash both performed exceptionally well at reducing Fusarium wilt in these trials compared to their non-grafted counterparts. The additional citron rootstocks evaluated here did not perform as well except for the ORSWRS1 in 2023, which had statistically lower disease compared to the non-grafted. This data helps reinforce and justify the added cost benefit Berrien County growers make when deciding to use Carolina Strongback in fields with Fusarium wilt pressure.

4. A Microbial Water Testing Program for Fruit and Vegetable Growers

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Abstract: Ensuring the microbial safety of agricultural water is crucial for growers, particularly in the Southeast U.S., where diverse water sources are used. This study outlines the development and implementation of a comprehensive microbial water testing program to enhance food safety and compliance with regulatory standards. The program, designed for Alabama's growers, focuses on identifying potential microbial contaminants in irrigation water and establishing protocols for regular testing and water risk assessment. Key components of the program include the selection of appropriate water testing methods, the establishment of baseline microbial water quality profiles, and the integration of these profiles into farm management practices. Through a series of workshops and field demonstrations, growers were educated on the significance of microbial water testing and trained in the use of testing kits and the interpretation of results. The program also provided resources for growers to develop and implement corrective actions when microbial contamination was detected. Results demonstrated that surface water had a higher prevalence of generic E. coli levels than groundwater; however, the highest level of generic E. coli was detected from a well. Overall, results indicated a significant improvement in the microbial quality of agricultural water from participating farms. The program's success highlights the potential for similar initiatives to enhance food safety and public health across other regions. Future research will focus on long-term monitoring to further reduce the risk of microbial contamination in agricultural water.

5. EVALUATION OF CULTURAL PRACTICES TO REDUCE CENTER ROT IN VIDALIA ONION

Chris Tyson, Bhabesh Dutta, Aubrey Shirley, Derrick Bowen, Ross Greene, Savannah Tanner, Jason Edenfield, Lauren Stanley, Steven Powell ---University of Georgia.*

Abstract: Center Rot (*Pantoea* spp.) is a bacterial disease of onion and the leading cause of losses in Vidalia Onions annually. Extension Agents and Specialists have evaluated cultural practices in the Vidalia Onion growing region to compare disease incidence. 3 separate multi-year studies were conducted to examine these cultural parameters, and in each study, onions were rated for center rot incidence after 1 month in refrigerated storage. In the first study, harvesting onions by hand with clippers was compared to a Top Air mechanical harvester. Incidence of center rot was lower in machine harvested onions. Another trial examined the digging methods used to allow onions to field cure before they are clipped. A Top Air chain digger was compared to a straight blade undercutter. Incidence of center rot was lower in onions dug with a chain digger. In the third trial, hand clipping onions at different neck lengths of 0, 1, 2, 3, and 5 inches was evaluated. This study revealed that incidence of center rot was higher when onion necks were clipped at less than 2 inches versus neck lengths of 2, 3 or 5 inches.

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

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

7. Investigating postharvest quality loss in fresh-cut watermelon

Ebenezer Quandoh, Karin Albornoz - Department of Food, Nutrition and Packaging Sciences, Clemson University, Coastal Research and Education Center*

Abstract: Watermelon (*Citrullus lanatus* L.) is an economically important vegetable crop in the United States, with the Southeast producing over 70% of the national total. It is widely consumed for its sweetness, flavor, juice and fresh pulp in addition to its nutritional content and health-promoting properties. Fresh-cut watermelon, sold as cubes, quarters, chunks, spears, and halves, satisfies an increasing consumer demand for freshness and convenience. However, fresh-cut processing also induces undesirable changes in color, flavor, and texture that shorten shelf-life, leading to consumer rejection and postharvest losses and waste. Previous reports suggest that textural changes in fresh-cut watermelon are induced by modifications at the cellular level, particularly at the cell wall and membranes. However, the physiological mechanisms driving these changes remain elusive. In this study, we monitored the onset and progression of quality and texture loss in cubes of seedless watermelon (cv. 'Powerhouse' and 'Extazy') stored at $3\pm 1^{\circ}\text{C}$ for 2, 5, 7 and 10 days. At each storage interval, changes in color and firmness were measured using a colorimeter and texture analyzer, respectively. Juice leakage was evaluated by weighing the liquid released from the cubes. To gain insight into the physiological processes underlying quality loss, electrolyte leakage, an indicator of cell membrane integrity, was assessed by a conductivity meter. We further determined the activities of cell wall-modifying enzymes pectin lyase (PL) and polygalacturonase (PG), which result in textural changes. Firmness and flesh color declined progressively throughout storage, consistent with a loss of texture and visual quality in both cultivars. Weight loss and juice leakage rates increased, along with electrolyte leakage, indicating a decline in cell membrane integrity. Cell wall-modifying enzymes presented a heterogeneous response, where PG activity remained stable, while PL showed fluctuations over time. Altogether, these findings have improved our understanding of the biological processes that determine quality degradation, opening an avenue for more targeted strategies for quality preservation. In future investigations, we aim to expand on this knowledge by conducting comparative studies of watermelon cultivars with contrasting quality responses. We will also explore the impact of exogenous treatments on shelf-life improvement. Findings will be beneficial for developing effective management strategies for postharvest quality maintenance that reduce losses and waste.

8. Performance of Newly Released Bacterial Spot Tolerant Advanced Peach Selections in Alabama

*Elina Coneva**, *Ksenija Gasic*, *Clemson University*

Abstract: Clemson University Peach Breeding Program has recently released three early season bacterial spot (*Xantomonas arbuticola* pv. *pruni*) tolerant peach cultivars, namely ‘EveRes Ruby’, ‘CaroRes Wonder’, and ‘CaroRes Delight’. Five trees from each cultivar grafted on ‘Guardian’ rootstock were planted for testing at the Chilton Research and Extension Center, Alabama in 2019. Our results on cultivar productivity, fruit quality, and disease resistance suggest the new cultivars’ performance is promising for sustainable peach production in Alabama.

9. Exploring Improved Rabbiteye Blueberry Cultivars for Sustainable Production in Alabama

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Abstract: Blueberry acreage in Alabama has grown 37% over the last 15 years, but information on the performance of recently released cultivars with improved characteristics is limited. This project evaluates cultivars ‘Alapaha’, ‘Climax’, ‘Krewer’, ‘Ochlockonee’, ‘Pink Lemonade’, ‘Powderblue’, ‘Premier’, ‘Titan’, ‘Vernon’, and ‘Tifblue’. During the 2024 season ‘Ochlockonee’ produced the highest yield/plant, while ‘Titan’ had the largest size berries. Results can serve to guide cultivar selection for sustainable rabbiteye blueberry production in Alabama and the Southeast.

10. Assessment of New Perfect-flowered Muscadine Grape Cultivars under Alabama Conditions

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Abstract: This study is designed to evaluate the performance of newly released self-pollinating muscadine grape cultivars ‘Hall’, ‘Lane’, ‘Paulk’, ‘Razzmatazz’, ‘RubyCrisp’, ‘Southern Home’ and the pistillate ‘Eudora’ in comparison to the standard ‘Supreme’ under Alabama conditions. ‘Eudora’ produced the highest yield in 2024, while ‘Southern Home’ had the highest sugar content. Findings provide valuable insights for cultivar selection to support sustainable muscadine grape production in Alabama and the Southeast.

11. ‘NC 740’: A Premium Label Blackberry from the NCSU Breeding Program

Hannah C. Lepsch, Gina E. Fernandez, Thomas M. Kon*

Abstract: Exceptionally sweet and high quality berries are increasingly popular among consumers, largely through marketing strategies such as the ‘sweetest batch’ label developed by a major berry producer. As these opportunities emerge to capture a price premium, growers are incentivized to select cultivars not only primarily for productivity and harvest timing, but for remarkable flavor and fruit quality. To our knowledge, there is no publicly available blackberry cultivar adapted to the Southeast region that meets these standards. In fall 2025, North Carolina State University (NCSU) will be releasing a florican-fruiting blackberry, ‘NC 740’, that could occupy this niche. A replicated study of 13 advanced blackberry selections, including ‘NC 740’, from the Cornell, NCSU, and University of Arkansas breeding programs, and two commercial cultivars was established in 2021 and 2022 at the Mountain Horticultural Crops Research and Education Center in Mills River, NC. Four-plant plots were arranged in a randomized complete block design in a multi-bay Haygrove tunnel system. Whole plot yield, and fruit size, quality, and storage shelf life at 7 and 14 days after harvest, and phenotypic data were collected across two years. ‘NC 740’ occupies the mid-season harvest window comparable to Ouachita. The marketable yield of ‘NC 740’ averaged 3.1 and 2.8 kg/plant in its first and second year of production, respectively. Total yield exceeded or was similar to Von and Ouachita in year one, but 30-44% lower in year two, possibly due to altered pruning practices. The soluble solids content (SSC) (12.0 to 14.2 % SSC) and sugars to acid ratio (SSC:TA) (7.9 to 9.0) was consistently the highest among all selections and cultivars in this study in all study years. Though fruit was relatively smaller, 1.2-1.5 g/berry less than Ouachita, it was firm (<10% leaky and soft fruit), showed no red drupelet reversion at harvest, and maintained a high fruit quality after 7 days of storage. Similar to Von, this selection exhibited excellent disease resistance and good vigor, with a relatively earlier harvest period. ‘NC 740’ is currently being evaluated at 5 grower operations, and is expected to be available in limited

quantities in 2025 and widely available in 2026. This new release promises to be a desirable cultivar for Southeast production, noted for its sweet, sub-acid flavor, as well as high yields, vigor and disease resistance.

12. Characterization and fungicide sensitivity of *Gnomoniopsis fructicola* causing *Gnomonia* Leaf Blotch of strawberry

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Abstract: Emerging fungal pathogens have always been an issue of concern in strawberry production. In 2023, an unusual outbreak of *Gnomonia* leaf blotch occurred at one North Carolina (NC) and multiple South Carolina(SC) strawberry farms and marked the first report of its occurrence in SC. Molecular identification and phylogenetic analysis of isolates from multiple locations identified the fungus

Gnomoniopsis fructicola as the causal agent. In vitro germination of *G. fructicola* progressed slowly and remained less than 40% even after 24 h of incubation. Similarly, germ tube growth was slow compared to other pathogens. Slow symptom development on strawberry leaves of young strawberry plants grown in the greenhouse started 5 weeks after inoculation. Once the pathogen established on greenhouse plants, leaf necrosis forming blotches was observed. The baseline sensitivity of *G. fructicola* isolates to commonly used chemical classes of fungicides was assessed. Propiconazole, cyprodinil, pyraclostrobin, and fludioxonil were highly effective in mycelial growth assays with EC values <

0.01 µg/ml. Iprodione and thiophanate-methyl were also effective with EC

values ranging from 0.05 to 1.38 and 2.01 to 23.96 µg/ml, respectively. Fluopyram and fenhexamid were ineffective with EC values >100 µg/ml. Based on conversations with the producers, the disease outbreak was linked to transplants from the same nursery source. This study reports for the first time the presence of *Gnomonia* leaf blotch in South Carolina and provides valuable insights into chemical management options for *G. fructicola*.

13. Cultivar Development in the NCSU Strawberry Breeding Program

Ian Mellon, Dr. Gina Fernandez, NC State University - Department of Horticulture*

Abstract: The NCSU strawberry breeding program focuses on developing new strawberry varieties that are better suited for farmers and consumers in the region. Cultivars are selected for their elite traits, including disease resistance, flavor, and vigor. The program utilizes traditional breeding methods, along with newer tools such as marker-assisted screening and Fieldbook. In 2025, we will screen our germplasm for *Neopestalotiopsis* sp. resistance in collaboration with the University of Florida.

14. Effectiveness of Uncoated Kraft Paper Under Plastic Mulch vs. Plastic Mulch Alone for Nutsedge Control in Cucumber

*Isabel McNulty**

Abstract: The goal of this trial was to evaluate the effectiveness of uncoated Kraft paper under plastic mulch in comparison to standard plastic mulch alone. Several parameters were assessed, including the ability to resist nutsedge growth, the impact on soil moisture, and the effect on cucumber yield (early and total season). Two mulch treatments were applied in a randomized block design, each replicated four times. Data collection focused on three parameters; nutsedge plants that emerged through the mulch treatments, soil moisture content, and marketable yield of cucumbers.

15. Sensitivity of *Geotrichum candidum* from commercial peach farms to DMI fungicides and investigation of resistance mechanisms

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Abstract: *Geotrichum candidum* Link (1809) is a yeast-like fungus that causes sour rot of peaches (*Prunus persica*). Outbreaks of the disease have occurred since 2021 in peach

fruit kept in cold storage at a commercial farm in South Carolina (SC). A total of 55 isolates, 40 from symptomatic fruit from cold storage (SC packing house isolates), 11 from three SC orchards (SC non-packing house isolates), and 4 California (CA) baseline isolates were evaluated for propiconazole sensitivity. Mycelial growth assays revealed that CA baseline isolates had the lowest EC50 values, with an average of 0.001 µg/ml and minimum inhibitory concentration (MIC) values >1 to <3 µg/ml. SC non-packing house isolates had intermediate EC50 values, with an average of 0.3 µg/ml and MIC values >10 to <30 µg/ml. SC packing house isolates, on the other hand, had average EC50 values of 4.8 µg/ml and MIC values >300 µg/ml. The results of germination assays were similar to mycelial growth assays. Resistance from packinghouse isolates was due to point mutations E126K and G460S in the DMI target gene CYP51B. Overexpression of CYP51A, CYP51B, and 5 ATP-Binding Cassette transporter genes could not be linked to propiconazole-reduced sensitivity in SC non-packing house isolates. Detached fruit assays revealed that in contrast to packinghouse isolates, label rates of propiconazole controlled both sensitive and reduced sensitive isolates. Tebuconazole, mefentrifluconazole, and fenbuconazole had minimal to no effect on the mycelial growth of *G. candidum* isolates with or without mutations in the CYP51B gene.

16. Cross-Resistance between the biorational fungicide Howler and the synthetic fungicide fludioxonil in *B. cinerea*

Johanna Wesche, Peishan Wu, James Faust, Guido Schnabel*

Abstract: Howler EVO is a biological fungicide based on metabolites of the bacterium *Pseudomonas chlororaphis* strain AFS009. One of the metabolites, pyrrolnitrin (PRN), is a chemical analogue of the phenylpyrrole fludioxonil used to manage gray mold of fruit crops caused by *Botrytis cinerea*. Resistance to fludioxonil in *B. cinerea* is well documented and linked to mutations in the transcription factor *mrr1*, leading to overexpression of the ATP-Binding Cassette (ABC) transporter gene *BcatrB*. Moderately resistant isolates are designated MDR1 and MRD1h based on the specific variation of mutations in *mrr1* and the level of *BcatrB* expression. This study investigated EC50 values of 54 *B. cinerea* isolates sensitive and with moderate resistance to fludioxonil for sensitivity to fludioxonil and Howler EVO. The Pearson correlation coefficient indicated a strong correlation between EC50 values of fludioxonil and Howler EVO. Isolates that were moderately resistant to fludioxonil and classified as MDR strains were also moderately resistant to Howler EVO. The effect of Howler EVO and fludioxonil on *BcatrB* gene expression was studied by qPCR. Both fungicides induced the *BcatrB* gene expression up to 100-fold in sensitive *B. cinerea* isolates. In detached fruit assays on cherry, sensitive *B. cinerea* isolates were completely

inhibited by formulated fludioxonil (Scholar) and significantly suppressed in growth by Howler EVO. However, MDR1 and MDR1h isolates produced disease in Scholar and Howler EVO treatments. Our results indicate cross-resistance between the synthetic fungicide fludioxonil and the biofungicide Howler EVO, indicating that, at least for some biofungicides, resistance management is necessary.

17. Soil-borne Burkholderia species are associated with onion bulb rot in Vidalia onions in Georgia

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Abstract: Bacterial species from the Burkholderia genus cause sour skin and slippery skin rot in onion, resulting in millions of dollars in crop losses worldwide. There are more than 60 known species of Burkholderia that are ubiquitous in nature and can colonize a diverse range of niches including water, soil, plant rhizosphere, humans, hospital equipment, and various other animal species. The Burkholderia cepacia complex (Bcc) consists of several species that are pathogenic on plants and animals including humans. Little is known about the diversity of Bcc species that cause onion sour skin and slippery skin rot, many other Burkholderia species have recently been added to the Bcc. In bacterial systematics the recA gene has been extensively used for the identification of Bcc species due to sequence variation within the gene that enables the discrimination of the various Burkholderia species. Our objectives were, to isolate and characterize onion associated Burkholderia species in soils of the Vidalia onion-growing zone in Georgia, by: Selective culturing Burkholderia species on Burkholderia-specific medium and use Sanger sequencing with recA gene to identify bacterial genera, amplicon sequencing of recA gene to determine relative abundance of the Burkholderia species complex in the Vidalia soils and, evaluating sour skin and slippery skin incidences in fields where soils were sampled.

18. FarmGate Reports for South Carolina Fruits & Vegetables

Kevin Burkett, Justin Ballew, Kevin Burkett, Phillip Carnley, Jackie Jordan, Brittney King, Rob Last, Briana Naumuk, Kendall Prevatte, Sarah Scott, Zack Snipes, Cory Tanner*

(Clemson University)

Abstract: In fall of 2023, Extension Agents across South Carolina surveyed growers on specialty crop acreage for the year. The goal was to identify counties of production, acreage, and observable market prices for the year. Sixteen crops were identified to survey for 2023. The project is planned where all fruits and vegetables will be reported once every three-year rotation.

19. Survey of CEA Food Safety Practices

Laura Strawn, Tom Stenzel, CEA Alliance*

Jennifer McEntire, Food Safety Strategy

Abstract: Controlled environment agriculture (CEA) is a growing sector, yet data on its food safety practices are limited. This study aimed to characterize food safety practices across CEA farms. A survey of 124 farms captured details on production systems, crop types, and food safety measures. Generally, larger CEA operations (by both size and revenue) managed water (e.g., testing) and performed environmental monitoring. Most of these farms also adhered to several third-party audit programs (e.g., Primus GFS and SQF). Grow media used in CEA farms was diverse, with approximately 20 types reported. Peat (60%), coco coir (45%) and rockwool (39%) were the most often used. Nearly 66% and 17% of CEA farms indicated they were covered by the FSMA Produce Safety Rule (PSR) and Preventive Controls for Human Foods (PCHF) Rule, respectively. CEA farms prioritized training of employees, regardless of being covered by FSMA regulations or third-party audits. Overall, findings emphasize the need for targeted research and tailored guidance to enhance food safety in CEA.

20. Field Screening of Cabbage (*Brassica oleracea* var. *capitata*) Cultivars for Resistance to Black Rot

Manisha Kumari, Dr. Theodore McAvoy, The University of Georgia, Horticulture Department*

Abstract: One of the most effective strategies for managing black rot (*Xanthomonas campestris* pv. *campestris*, Xcc) in cabbage (*Brassica oleracea* var. *capitata*) is the use of resistant cultivars. This study aimed to evaluate the resistance of commercial and experimental cabbage cultivars to black rot, and to determine their yield potential, harvest maturity, and head quality. A field experiment was conducted during the fall of 2023 at the Hort Hill research farm, University of Georgia, Tifton campus, involving nine cultivars: 1488, Capture, Celebrate, Cheers, Expat, Melissa, TCA-576, TCA-606, and TCA-607. The cultivars 'Cheers' (a commonly grown high-yielding cultivar), 'Capture', 'Expat' (claimed to have high resistance to black rot), and 'Melissa' (a black rot susceptible Savoy cabbage) were used as checks for comparison with other F1 hybrids. Plants were spray-inoculated with Xcc (250 ml of 10^6 CFU/ml) at 5 and 7 weeks after transplanting. The experiment was arranged in a randomized complete block design with four replications. Uniform agronomic practices, including irrigation, fertilization, and insect management, were applied across all plots. Black rot resistance was rated on a scale of 1 to 9, where 1 indicated the most resistant and 9 the most susceptible cultivar. Harvests were conducted on 11/30/2023, 12/12/2023, 12/20/2023, and 01/03/2024.

Significant differences were observed among treatments for black rot severity, total head counts and weights, and average head weight. 'TCA-607' and 'Capture' exhibited the highest resistance to black rot, while '1488' was the most susceptible. The other cultivars showed moderate levels of resistance. In the first harvest, 'Cheers' and 'TCA-607' had the highest total marketable head counts and weights, indicating early maturity. Additionally, 'Cheers' and 'TCA-607' maintained the highest total marketable head counts and weights throughout the trial, followed closely by 'TCA-606', 'Celebrate', and '1488'. Furthermore, 'TCA-607' outperformed all other cultivars in terms of average head weight. Among all the cultivars, 'Melissa' and 'Expat' performed the worst in terms of total marketable counts and weights.

Overall, based on the results of this trial, the experimental cultivar 'TCA-607' demonstrated the best combination of traits, including superior black rot resistance, highest yields, and largest heads. This study provides valuable insights for cabbage growers in regions susceptible to black rot, highlighting the importance of selecting resistant cultivars with desirable agronomic traits to effectively manage the disease and enhance cabbage production.

21. The Efficacy of Drytec® and Tsunami®100 Treatments in Inactivating Enterohemorrhagic E. coli on Alfalfa Seeds and Sprouts

*Myungji Kim**, 1. *Murli Manohar, Ascribe Bioscience, Ithaca NY, USA.*

2. *Jinru Chen, Department of Food Science and Technology, The University of Georgia, Griffin GA, USA.*

Abstract: The sprout industry faces an ongoing challenge in managing recurring outbreaks linked to the consumption of contaminated alfalfa sprouts, demanding effective control of pathogenic bacteria on alfalfa seeds. This study examined the efficacy of treatments with Drytec® (calcium hypochlorite) and Tsunami®100 (peroxyacetic acid) in inactivating enterohemorrhagic E. coli (EHEC) on alfalfa seeds and sprouts. Four individual EHEC cell suspensions (ca. 5 log CFU/g) were used to inoculate alfalfa seeds (2 g) at room temperature for 1 h. Inoculated seeds were rinsed with sterile water, and then treated with Drytec® for 15 min or Tsunami®100 for 30 min, and control seeds underwent sterile water treatment for 15 and 30 min, respectively. Treated seeds were sprouted on 1% water agar at 25°C for 7 days, with periodic assessments of EHEC populations. Data were fit into the general linear model and analyzed using ANOVA. Fisher's least significant test was used to separate the means at a 95% confidence interval. The mean EHEC inoculation level on alfalfa seeds was 2.63 log CFU/g. No EHEC cells were detected following seed treatments with Drytec® and Tsunami®100. During sprouting, Drytec®-treated seeds had no detectable EHEC even from the enrichment assay, while at some sampling points, Tsunami®100-treated seeds had a mean recovery of 0.80 log CFU/g or less of EHEC cells. Treatments with Drytec® and Tsunami®100 reduced mean EHEC populations on sprouts by 4.54-4.60 log CFU/g and 1.52-1.25 log CFU/g, respectively, compared to the water treatment controls. Mean populations of the four strains differed significantly ($P < 0.05$), with E. coli K4492 (E. coli O157:H4) having the highest and E. coli BAA-2326 (E. coli O104:H4) having the lowest mean cell populations on sprouts. EHEC cell population increased with sprouting time until Day 3. Drytec® and Tsunami®100 treatments demonstrate effectiveness in suppressing the growth of EHEC on alfalfa seeds and sprouts.

22. Developing best management practices for melonworm (*Diaphania hyalinata*) in Arkansas pumpkins

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Amanda L. McWhirt, Department of Horticulture, University of Arkansas System Division of Agriculture, Little Rock, AR, 72204

Abstract: Melonworm, *Diaphania hyalinata*, can quickly injure pumpkins in the Midsouth, though impact varies depending on arrival time and pumpkin variety. We evaluated eight pumpkin varieties from four *Cucurbita* species and found that *C. pepo* exhibited the most larvae per plant and over 40% injured fruit. We also evaluated insecticide timing with scouting-based systems, which minimized inputs and fruit injury. These data suggest that knowledge of varietal susceptibility and the use of scouting to time insecticides can minimize inputs while reducing melonworm impact in the Midsouth.

23. Investigating novel and sustainable IPM strategies to improve vegetable production in south Georgia: Introducing our new Vegetable Entomology Program

*Saumik Basu**, This poster represents my new Vegetable Entomology program at UGA Tifton Campus. Although this poster does not have any particular co-author but it represents all members associated with this program.

Abstract: We are a new vegetable entomology lab group located in the beautiful city of Tifton at South Georgia. Our vegetable entomology lab is focused on seeking and developing novel and sustainable integrated pest management strategies to improve major vegetables in South Georgia, a hub of vegetable production in the US. Our team is currently working on multiple projects associated with major pest problems (whiteflies, diamondback moths, thrips, pepper weevils, etc.) and some of the vector-transmitted diseases, causing huge losses to key vegetables (e.g., cabbage, tomato, collards, onion, pepper, squash etc.) produced in southern Georgia. Our research projects address issues associated with the vegetable industry and provide information and solutions applicable to the vegetable growers and county agents in Georgia.

24. Evidence of pyrethroid resistance in corn earworm in southern Georgia - 2024

*Stormy Sparks**, Phillip Roberts, Professor, University of Georgia, Department of Entomology.

Connie Rogers, Graduate Student, University of Georgia, Department of Entomology

Abstract: Reports of control failures with corn earworm in sweetcorn, along with adult vial tests for pyrethroid resistance, have suggested a high potential for pyrethroid resistance in this pest. Corn earworm larvae were collected from nine corn fields in southern Georgia in 2024 and bioassayed. Survival levels in the pyrethroid treatments indicated a high potential for resistance with approximately 30 percent survival at the highest rate tested. Two additional bioassays with alternative registered insecticides indicated a potential resistance issue with Coragen at a much lower level.

25. Utilizing Blue Dye to Visualize Drip Irrigation Efficiency and Nutrient Leaching in Sandy Soils – The Blue Dye Don't Lie

Sydney Williams, Sydney Williams, Bob Hochmuth, Taite Miller, Isabel McNulty, Kaleb Kelley, Carson Jones, Morgan Pearson, Kelly Aue, Tim Norris, Mike Tucker, UF/IFAS NFREC-Suwannee Valley*

Jay Fraleigh, Irritec USA

Abstract: This field demonstration shows how soluble blue dye injection into drip irrigation systems can effectively visualize water movement in raised beds covered with plastic mulch, providing valuable insights for improving irrigation management in vegetable crop production. By conducting blue dye demonstrations, farmers can observe the depth and spread of water in the root zone, helping to fine-tune irrigation run-times, optimize emitter coverage, and minimize nutrient leaching. The results, gathered from demonstrations at the North Florida Research and Education Center, highlight how understanding water movement allows for better irrigation scheduling, more efficient water use, and enhanced nutrient delivery. This practical approach offers a simple yet powerful tool for improving irrigation practices and conserving water in vegetable production systems.

26. Petiole Sap Testing on Watermelons as a Best Management Practice in the Suwannee Valley

Sydney Williams, Sydney Williams, Bob Hochmuth, Emily Beach, Mark Warren, Tatiana Sanchez-Jones, Tyler Pittman, Jay Capasso, and Dan Fenneman, Raymond Balaguer, UF/IFAS Extension*

Abstract: UF/IFAS Extension partnered with local growers in the Suwannee Valley to assess the effectiveness of petiole sap testing as a Best Management Practice (BMP) for nutrient management in watermelon production, a key crop in the region. By utilizing sap

testing meters, Extension agents provided growers with real-time insights into plant nutrient levels, enabling more precise fertilization and minimizing over-application of nutrients. Findings showed notable reductions in nitrogen and potassium inputs, leading to significant cost savings for growers. Overall, petiole sap testing proved to be an effective tool in optimizing fertilizer use, enhancing environmental sustainability, and improving the economic viability of watermelon farming in the Suwannee Valley.

27. MANAGING CITRUS LEAFMINER IN ORGANIC CITRUS PRODUCTION IN GEORGIA

Sydni Ingram, Madhav Koirala, Rajendra Acharya, Shivakumar Veerlapati, Vishal Patil and Apurba Barman - University of Georgia, Department of Entomology*

Abstract: Citrus leafminer is one of the most destructive pests of citrus in Georgia. Growers often struggle to control this pest in citrus groves, especially on young flushes, due to the cryptic nature of this insect. Adults fly into the grove and lay eggs on young leaves. The caterpillars feed by making tunnels under the epidermal layer of the leaf and young twigs. As a result, the infested leaves are deformed, losing potential photosynthetic areas and, most importantly, may facilitate a point of entry for canker-causing bacterial pathogens. When growers see the symptoms on leaves, it is too late to make any applications for effective control. Therefore, a proactive, preventative approach based on pest monitoring will be useful. For the last three years, a field trial has been conducted in cooperation with a commercial producer to evaluate the efficacy of *Beauveria bassiana* combined with other organic products to control leafminers. In 2022, well-timed applications of *Beauveria* alone could reduce infestation by up to 30%. However, in the 2023 field season, *Beauveria* alone could not reduce the leafminer infestation to an expected commercial level. A treatment of *Beauveria* applied through drip irrigation in combination with foliar application of Spinosad (Entrust®) showed some promise in reducing the leafminer infestation. A pheromone-baited delta trap was placed to monitor the pest density in the field and it was evident from the trap capture that in 2023, the leafminer population was magnitude higher than in 2022. During the 2024 season, *Beauveria* (applied through drip irrigation) was combined with four other foliar treatments, *Beauveria* + Spinosad, *Beauveria* + Neem Oil, *Beauveria* + Thyme Oil, *Beauveria* + O1YS Chitosan, and an untreated control. Among the treatments, Spinosad provided significantly higher protection from leafminer damage to new flushes of citrus leaves.

28. Promoting BMP Adoption Through the Florida Stakeholder Engagement Program (STEP) Contest

Taite Miller, Carson Jones, Vivek Sharma, Kevin Athearn, Shiva Bhambota, and Bob Hochmuth*

Abstract: The Florida Stakeholder Engagement Program (STEP) contest is a collaborative effort between the University of Florida's Agricultural and Biological Engineering department, the Florida Department of Agriculture and Consumer Services (FDACS) and the North Florida Research and Education Center- Suwanee Valley. The program aims to promote the adoption of Best Management Practices (BMPs) by engaging growers and industry partners in a competitive manner, with nitrogen and irrigation applications being a key component on grain corn, an essential commodity grown in the Suwanee Valley region. Fifteen teams participated in 2024 and chose cultivar, plant population, nitrogen and irrigation applications and a marketing strategy for their grain. The winning teams were recognized for “Most Profitable” and Highest Input Use Efficiency”. The success of the program indicates potential for the adoption of BMPs through collaboration between industry stakeholders and growers in the state.

29. Best Management Practice (BMP) Efforts at the Suwanee Valley Agricultural Center

Taite Miller, Bob Hochmuth, Sydney Williams*

Abstract: The University of Florida is committed to developing and promoting Best Management Practices (BMPs) to enhance sustainable agricultural production. At the North Florida Research and Education Center- Suwanee Valley, comprehensive BMP trials and Extension demonstrations have been conducted to address key challenges faced by growers. These efforts focus on optimizing water use efficiency, improving soil health, and managing nutrient applications. By collaborating with industry partners, researchers and Extension agents evaluate and demonstrate effective BMPs that reduce environmental impact while maintaining or improving crop yields. Findings from these projects highlight the success of innovative practices that support economic and environmental sustainability for the region’s agricultural stakeholders.

30. Mutations Contributing to Diamide Resistance in Diamondback Moth

Thomas Dunn, Paulo Cremonez, Auburn University*

David Riley, University of Georgia

Alton Sparks Jr., University of Georgia

Donald Champagne, University of Georgia

Abstract: The diamondback moth (DBM), *Plutella xylostella*, is a major pest of cruciferous crops. In the States of Florida and Georgia, the current control paradigm consists of heavy insecticide applications. Diamide insecticides (IRAC Class 28) were originally highly efficacious for DBM control in both States. However, high level chlorantraniliprole resistance was documented in the late 2010's with high level diamide cross-resistance occurring in both States by the early 2020's. Currently, molecular research suggests that mutations of the ryanodine receptor (RyR), the target of diamides, are major contributors to the observed diamide cross-resistance. Here, we report fluctuations in the frequencies of the I4790K and G4946E mutations in DBM populations from Florida and Georgia which are likely influencing diamide cross-resistance in these populations.

31. Grafted Watermelon Production under Different Nitrogen Fertilization Programs

Xin Zhao, Isaac Vincent, Tatiana Sanchez-Jones, Bob Hochmuth, and Xin Zhao**

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Tatiana Sanchez-Jones: University of Florida/IFAS Extension Alachua County, Newberry, FL 32669

Bob Hochmuth: University of Florida/IFAS North Florida Research and Education Center - Suwannee Valley, Live Oak, FL 32060

Xin Zhao: Department of Horticultural Sciences, University of Florida, Gainesville, FL 32611

Abstract: On-station field trials were conducted in Florida in Spring 2024 to assess grafted watermelon production in response to two contrasting nitrogen fertilization programs involving conventional soluble fertilizers vs. a full-season controlled-release fertilizer. 'Troubadour' watermelon was grafted onto two rootstocks and grown under two spacings, in comparison with non-grafted watermelon. The wild watermelon rootstock led to higher

yields than the squash rootstock, while the two fertilization programs differed in early and total yields and soil nitrate-nitrogen levels.

32. Department of Food Science and Technology, The University of Georgia, Griffin GA, 30223-1797

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Abstract: Evidence has substantiated the efficacy of ascaroside#18 treatment in the control of Salmonella and EHEC growth in alfalfa seeds/sprouts, as indicated in several prior studies. However, the minimal and optimal concentrations of the treatment have not been determined.

This study compared the efficacies of 4 different concentrations (1 mM, 0.1 mM, 10 M, and 1 M) of ascaroside#18 in control Salmonella and EHEC (2 strains each) growth on alfalfa seeds/sprouts.

Sanitized commercial alfalfa seeds were exposed to the four respective concentrations of ascaroside#18 for 30 min before being immersed into each of the four bacterial suspensions (ca. 10^3 log CFU/ml) for 1 h. The seeds were sprouted on 1% water agar with or without the supplementation of an appropriate concentration of ascaroside#18 at 25°C. 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, Salmonella and EHEC populations in collected samples were enumerated. The data was analyzed using ANOVA of SAS.

Results of statistical analyses showed that bacterial strain type, treatment concentration, and sprouting time were the main effects ($P < 0.05$) influencing Salmonella and EHEC populations on seeds/sprouts. *S. Cubana* had a significantly higher population than other tested strains. The minimal inhibitory concentration of ascaroside#18 was 1 M, and the most effective concentration was 1 mM among the concentrations tested. There was no significant difference in Salmonella and EHEC populations recovered from the two types of water agar. The peak pathogen populations were retrieved on day 7 with dramatic increases occurring from day 0 to day 1.

The study identified the minimal and most effective concentrations of ascaroside#18 treatment among the 4 tested concentrations for control of Salmonella and EHEC growth

on alfalfa seeds/sprouts. Continuous exposure to ascaroside#18 during sprouting was unnecessary to enhance its inhibitory effect.

33. Biofilm Development and Removal on/from HDPE Coupons of Various Colors Using Selected Sanitizing Treatments

Yaxi Dai, Jinru Chen, Department of Food Science and Technology, The University of Georgia*

Abstract: Packing facilities for fresh market blueberries have developed various protocols to clean/sanitize harvest containers to prevent cross-contamination between berries and their surface containers. However, it is unknown whether these cleaning/sanitization practices could effectively remove biofilms formed by microorganisms from blueberry production/packing environments.

This study investigated the effectiveness of some cleaning and sanitization practices in removing the biofilms formed on coupons of high-density polyethylene (HDPE), a material often used to manufacture blueberry harvest containers. It also assessed whether the color of HDPE had any effect on the formation and removal of biofilms.

Three inoculums of fecal coliforms isolated from fresh market blueberry harvest/packing environments were used to develop biofilms on HDPE coupons with various colors (n=7). Coupons of selected colors (yellow and orange) with developed biofilms were treated with sterile water, 100 ppm 3% sodium hypochlorite, and 2% liquid dishwashing detergent, respectively either with or without a 5-min soaking, manually or using a bench top wash machine for 1 min. The experiment was replicated twice, and each treatment trial had duplicated samples. Biofilms or their residues were quantified using the crystal violet binding assay. Data collected were analyzed using the Analysis of Variance of the SAS.

Treatments with soaking and using the bench top wash machine removed significantly ($P \leq 0.05$) more biofilms from coupons than those without soaking and manual washing. Sodium hypochlorite-treated coupons had significantly more biofilm residues than dish soap-treated coupons, while no differences ($P > 0.05$) in biofilm residues were observed between these two types of coupons and treated with water-treated coupons and dishwashing detergent. Biofilm residues on the orange coupons were significantly higher than on the yellow coupons, although coupon color did not have a significant impact on biofilm formation.

The type of sanitizer and sanitation approach are both important for removing biofilms from HDPE coupons, the color which may also affect biofilm removal. The concentration of

sanitizer and detergent used by some packing facilities may not be adequate to eradicate biofilms from berry-contact surfaces. The study provides practical information to blueberry growers and packers. The study reveals the challenges of maintaining the hygiene of blueberry harvest containers.

34. Monitoring the Quality of Heirloom Collard Greens during Post-harvest Storage

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Abstract: Collard greens (*Brassica oleracea* L. var. *viridis*) are South Carolina's state vegetable. These nutrient-rich leafy vegetables belong to the Brassica family, characterized by large loose, and flat leaves that have a limited shelf-life after harvest. Traditional collard cultivars or "Heirlooms" represent an important part of the cultural and culinary tradition of the Southeast that has been preserved for their unique characteristics such as color, flavor, and texture. The demand for Heirloom vegetables has increased in the last decade, driven by consumers who seek unique flavors and a connection to local crops and communities. However, reports about the changes in nutritional content and quality attributes of Heirloom collards during postharvest storage are limited. In this study, 11 different types of collard greens (5 commercial hybrids and 6 Heirlooms) and 3 commercial kale (*Brassica oleracea* var. *acephala*) cultivars were analyzed for their color (L^* , a^* , b^* , Chroma, and Hue), appearance and marketability traits during storage at 5°C (41°F) for 0, 14 and 26 days. To assess the compositional quality and rate of deterioration, the total chlorophyll and carotenoid content, total polyphenols, and ammonia levels were monitored at each time point. Chlorophyll and carotenoids are responsible for the characteristic green pigments in leafy vegetables, whereas polyphenols are indicators of their nutritional content and health-promoting properties. The ammonia content is measured as an indicator of protein breakdown and leafy green deterioration. Results revealed a heterogeneous performance of the different Heirloom collard greens during postharvest storage, consistent with their phenotypic diversity. These findings aim to 1) expand the knowledge on postharvest handling practices for Heirloom collard greens in South Carolina, 2) contribute valuable information to small- and medium-scale growers,

and the scientific community, and 3) inform consumers who seek fresh produce of high nutritional content and distinctive organoleptic characteristics.

35. Evaluating Winter Squash Cultivars as a Potential Alternative Cucurbit Vegetable Crop to Combat Whitefly and Whitefly-Transmitted Viruses for Fall Production in Southern Georgia

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Abstract: The predominant cucurbit vegetable crop during fall in Georgia is summer squash, with a production value of around \$94.08 million on 7,757 acres in 2022, while winter squash acreage was insignificant. Whitefly and whitefly-transmitted viruses (WTV) account for 30-50% of summer squash yield losses on average and threaten squash production during fall in the region. Cucurbit leaf crumple virus (CuLCrV), Cucurbit yellow stunting disorder virus (CYSDV), and Cucurbit chlorotic yellows virus (CCYV) are the predominant WTV in southern Georgia. We carried out an experiment during fall 2023 in Tifton, Georgia, to evaluate host-plant resistance of winter squash types, and cultivars for whitefly and WTV and to study their potentiality for fall production in the region. We compared ten commercial hybrid cultivars, of which two were acorn types ('Tay Belle' and 'Table Ace'), five were butternut types ('Waltham', 'Ceres', 'Atlas', 'Ultra HP' and 'Genesis'), and one each of a hubbard type ('Golden Hubbard'), a kabocha type ('Sweet Mama') and a calabaza type ('La Estrella'). We collected data on whitefly adults and nymphs count, silver leaf disorder, WTV severity, and fruit yield. In addition, we ran quantitative polymerase chain reaction (qPCR) and quantitative reverse transcription polymerase chain reaction (RT-qPCR) on leaf samples to detect and quantify viruses. There were significant differences between winter squash types and cultivars for whitefly feeding preference, silver leaf disorder, virus severity, virus loads and marketable yield. The cultivars La Estrella, Atlas, and Ceres exhibited the significantly lowest number of whitefly adults per 50 cm² leaf area (<20), whereas it was highest for Golden Hubbard (>100). All other cultivars acquired a moderate number of whitefly adults ranging from >20 to 80 per 50 cm² leaf area. Similarly, the number of whitefly nymphs per 12.25 cm² leaf area was lowest in 'Waltham' followed by all other butternut types, whereas it was highest for 'Tay

Belle' and 'Table Ace'. We found significantly severe leaf silvering in 'Golden Hubbard' and 'Sweet Mama' followed by Tay Belle and Table Ace. The cultivars Sweet Mama and Ceres had the lowest WTV symptom severity. In contrast, 'Tay Belle' and 'Table Ace' exhibited the most severe WTV symptoms. All other winter squash cultivars evaluated had moderate WTV severity. At 45 days after sowing (DAS), virus copy numbers for CYSDV and CuLCrV were negligible and insignificant, while Sweet Mama had the lowest CCYV copy number. Interestingly, certain virus-tolerant cultivars showed high virus copy numbers but moderate visible symptoms. The number of marketable fruits per acre was highest in Ceres (8954.0) and Genesis (8913.3). 'Genesis' exhibited statistically highest marketable fruit weight per acre (20891.9 lbs). The cultivars Tay Belle and Table Ace performed significantly lowest in marketable fruit number and weight per acre. The findings of this study suggest that butternut squash, mainly cultivar Genesis, is a potential alternative cucurbit vegetable crop for fall production in southern Georgia with moderate Whitefly feeding preference, silver leaf disorder, WTV severity, and the highest marketable fruit number and weight per acre among the evaluated cultivars.

36. Treatment of Palletized Broccoli with 1-MCP from Harvesthold® Fresh Sheet, a Polymer-Based Delivery System

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Abstract: We evaluated a new commercial product for the treatment of fruits and vegetables with 1-methylcyclopropene (1-MCP) named HarvestHold® Fresh sheet (HHF, Verdant Technologies, Centennial, CO), a polymeric sheeting material that releases 1-MCP in response to high humidity. Broccoli was procured as whole heads in 20-lb waxed boxes. The day following harvest, the boxes were opened and two 6 x 13-inch sheets of HHF were placed on top of the broccoli heads with the 1-MCP-emitting surface facing the broccoli. Boxes were stacked on a pallet to a height of 6 layers, 8 boxes per layer. Six boxes in the palletized product, one in each layer, were fitted with a 0.8 mm i.d., 2-m long, Teflon tube to permit pulling gas samples from the treated box. For gas sampling, 5 mL was removed, discarded, and a second 5 mL was taken for 1-MCP analysis. We followed the release of 1-MCP until the 1-MCP in the boxes and the storage chamber atmosphere diminished to zero. At that point, the room temperature was changed and the following day, the broccoli boxes were opened, the HHF sheets replaced, and the process repeated. Temperatures studied were 0, 5, 10, and 20 °C at 90-95 % relative humidity. A portion of the 0 °C HHF

treated broccoli were set aside, held at 0 °C for 19 days and transferred at 15 °C for 4 days for shelf-life evaluation. The 1-MCP in the boxes of broccoli was low, ranging between 0.01 and 0.1 ppm on average, and continued to be detected for 5, 3, 3, and 1 days at 0, 5, 10, and 20 °C, respectively. The concentration of 1-MCP in the room atmosphere was similar to that detected in the boxes, suggesting the 1-MCP dispersed readily from the boxes. There was little difference in the 1-MCP concentration in the various pallet layers. Despite the low concentrations of 1-MCP, the use of HHF at 0 °C yielded greener broccoli heads with higher chlorophyll levels than untreated heads after 2 1/2 weeks of storage, showing the effectiveness of the 1-MCP release from HHF sheets. The impact of low concentrations for extended storage has been little investigated, but the results suggest a better understanding of the interplay between concentration and exposure time on broccoli would be interesting and beneficial for quality retention.