National Sweetpotato Collaborators Group

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The 48th Annual Meeting of the

NATIONAL SWEETPOTATO COLLABORATORS GROUP

January 19-20, 2024

New Orleans, LA

2024 TECHNICAL PROGRAM
&
2023 PROGRESS REPORT

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AGENDA AND TECHNICAL PROGRAM
National Sweetpotato Collaborators Group

Chairperson: Shaun Francis, University of Arkansas Pine Bluff

<u>Friday January 19, 2024</u>

7:30 Registration and Continental Breakfast

8:00 Call to Order and Announcements

8:15 State Reports

8:45 Discussion

<u>Master of Science Student Competition</u>

Presiding: Katie Jennings

9:00 **Evaluation of Fungicides, and Their Residues, for Post-harvest Management of Black Rot of Sweetpotato.** Hunter Collins[1], Lina Quesada-Ocampo[1], Khalied Ahmed[2] Travis Gannon[2]. [1]Department of Entomology and Plant Pathology and NC Plant Sciences Initiative, North Carolina State University, Raleigh, NC 27606. [2]Department of Crop and Soil Sciences, North Carolina State University, Raleigh, NC 27695. (shcollin@ncsu.edu)

9:15 **Reducing Sweetpotato Reinfection through Vector Management.** Rachel Morrison[1], Natraj Krishnan[1], Sead Sabanadzovic[1], Lorin Harvey[2], and Fred Musser[1],[1]Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology, Mississippi State University, Mississippi State, MS 39762. [2]Department of Plant and Soil Sciences, Mississippi State University, Pontotoc, MS 38863

9:30 **RNA-seq Analysis Reveals Differentially Expressed Genes in Sweetpotato cv. Beauregard under Lead Stress**. Mary Ann Munda[1], Mae Ann Bravo[1], Lisa Arce[1], Marissa Barbosa[1], Arthur Villordon[2], and Don LaBonte[1]. [1]LSU AgCenter School of Plant, Environmental, and Soil Sciences, Baton Rouge, LA 70803. [2]LSU AgCenter Sweet Potato Research Station, Chase, LA 71324. (mmunda1@lsu.edu)

9:45 **Rotation and Cover Crop Field Studies in 2022-2023 for the Management of Guava Root Knot Nematode (*Meloidogyne enterolobii*) in Sweetpotatoes.** Baker Stickley[1], Jonathan Schultheis[1], Adrienne Gorny[2], Jessica Dotray[2], Brandon Parker[1] [1]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695. [2]Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC 27695. (bestickl@ncsu.edu)

10:00 Evaluating the Effect of Alternative Sweetpotato Vegetative Propagation Methods on Herbicide Tolerance and Sweetpotato Yield and Quality. Samuel Crawford, Colton Blankenship, Stephen Ippolito, Ryan Stainback, Katie Jennings and David Monks. Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695. (secrawf2@ncsu.edu)

10:15 Evaluation of Fungicide Applications and Residue Levels for Southern Blight Disease Management on Sweetpotatoes. Jack Mascarenhas[1], Hunter Collins[1], Lina Quesada-Ocampo[1], Khalied Ahmed[2], Travis Gannon[2]. [1]Department of Entomology and Plant Pathology and NC Plant Sciences Initiative, North Carolina State University, Raleigh, NC 27606. [2]Department of Crop and Soil Sciences, North Carolina State University, Raleigh, NC 27695. (jmmasca2@ncsu.edu)

10:30 Break

<u>PhD Student Competition</u>

Presiding: Michelle McHargue

11:00 Impact of Transplant Orientation in Furrow, Transplant Length and Plant/Harvest Timing on Yield of 'Covington' Sweetpotato. Keith D. Starke[1], Jonathan R. Schultheis[1], Katie M. Jennings[1], David. W. Monks[1] and David L. Jordan[1]. [1]North Carolina State University, Department of Horticultural Science, Kilgore, Box 7609, Raleigh 27695. (kdstarke@ncsu.edu)

11:15 Mechanisms of Resistance to *Meloidogyne enterolobii* and *M. incognita* on Sweetpotato Breeding Lines. David Galo[1], Josielle Santos Rezende[1], Don R. Labonte[2] and Tristan Watson[1]. [1]Department of Plant Pathology and Crop Physiology. Louisiana State University Agricultural Center, Baton Rouge, LA 70803. [2]School of Plant, Environmental, and Soil Sciences. Louisiana State University Agricultural Center, Baton Rouge, LA 70803. (DGalo@agcenter.lsu.edu)

11:30 Digital Phenotyping from Micro to Macro: New Opportunities for Sweetpotato Breeding at NCSU. Simon Fraher[1], Hoang Nguyen[2], Mark Watson[1], G. Craig Yencho[1], Michael Kudenov[2], Adrienne Gorny[3]. [1]Department of Horticulture Science, North Carolina State University, Raleigh, NC, 27695. [2]Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC, 27606. [3]Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC, 27607. (spfraher@ncsu.edu)

11:45 Soil Amendments Alter Soil Chemical Properties, Storage Root Yield, and Toxic Heavy Metal Accumulation in Sweetpotato cvs. Bayou Belle and Beauregard. Mae Ann Bravo[1], Arthur Villordon[2], Cole Gregorie[2], Lisa Arce[1], Marissa Barbosa[1], and Brenda Tubana[1]. [1]School of Plant, Environmental, and Soil Sciences, LSU AgCenter, Baton Rouge, LA 70803. [2]LSU AgCenter Sweet Potato Research Station, Chase, LA 71324. (mbravo4@lsu.edu)

12:00 Lunch

<u>PhD Student Competition</u>

Presiding: Michelle McHargue

1:00 **Declining Phosphorus Availability Increases Sucrose Synthase Activity and Storage Root Formation in Sweetpotato cv Beauregard**. Marissa B. Barbosa[1], Lisa I. Arce[1], Arthur C. Villordon[2], Cole Jeffrey Gregorie[2], Don Labonte[1]. [1]LSU AgCenter School of Plant, Environmental, and Soil Sciences, Baton Rouge, LA 70803. [2]LSU AgCenter Sweet Potato Research Station, Chase, LA 71324. (mbarb23@lsu.edu)

1:15 **Effect of Timing of the Weed Zapper on Palmer Amaranth Control and Sweetpotato Yield and Quality.** Colton D. Blankenship[1], Katherine M. Jennings[1], David W. Monks[1], David L. Jordan[2], Stephen L. Meyers[3], Nicholas Basinger[4], Charles Cahoon[2], and Jerry Baron[5]. [1]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695. [2]Department of Crop and Soil Sciences, North Carolina State University, Raleigh, NC 27695. [3]Department of Horticulture and Landscape Architecture, [4]Purdue University, West Lafayette, IN. [4]Crop and Soil Sciences Department, University of Georgia, Athens, GA (cdblank3@ncsu.edu)

1:30 **RNASeq Analysis Reveals Key Pathways Involved in Low Nitrogen Tolerance at the Onset of Storage Root Formation in Sweetpotato cv Bayou Belle.** Lisa Arce[1], Don LaBonte[1], Arthur Villordon[2], Cole Gregorie[2], Mae Ann Bravo[1], Marissa Barbosa[1].[1]LSU AgCenter School of Plant, Environmental, and Soil Sciences. Baton Rouge, LA 70803. [2]LSU AgCenter Sweet Potato Research Station. Chase, LA 71324. (larce3@lsu.edu)

1:45 **Comprehensive Two-Dimensional Gas Chromatography Reveals the Volatile Compounds Present in a Biparental Sweetpotato Mapping Population.** Modesta Abugu[1], Suzanne Johanningsmeier[2], Matthew Allan[2], Massimo Iorizzo[1], Ken Pecota[1], G. Craig Yencho[1].[1]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695. [2]USDA-ARS, SEA, Food Science and Market Quality and Handling Research Unit, 322 Schaub Hall, North Carolina State University, Raleigh, NC 27695. (mnabugu@ncsu.edu)

2:00 **Response of Sweetpotato (*Ipomoea batatas*) to Herbicides Applied Post-transplant.** Stephen Ippolito[1], Katherine M. Jennings[1], David W. Monks[1], Adrienne M. Gorny[2], Levi D. Moore[3], David L. Jordan[4]. [1]Department of Horticultural Science, North Carolina State University, Raleigh, NC. [2]Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC. [3]Southeast Ag Research, Inc, Chula, GA. [4]Department of Crop and Soil Science, North Carolina State University, Raleigh, NC. (sjippoli@ncsu.edu)

2:15 Break

Processing and Marketing

Presiding: Lorin Harvey

2:45 Relationships Among Physicochemical Properties, Textures, and Sweetness Perception in Baked Sweetpotatoes. Matthew C. Allan[1], Suzanne D. Johanningsmeier[1], Mariam Nakitto[2], Osvalda Guambe[3], Modesta Abugu[4], Kenneth V. Pecota[4], and G. Craig Yencho[4]. [1]USDA-ARS, SEA, Food Science and Market Quality and Handling Research Unit, 322 Schaub Hall, North Carolina State University, Raleigh, NC 27695, USA. [2]International Potato Center (CIP-SSA), Plot 47 Ntinda II Road, PO Box 22247, Kampala, Uganda. [3]International Potato Center (CIP-MOZ), Av. FPLM 2698, PO Box 2100, Maputo, Mozambique. [4]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695, USA. (matthew.allan@usda.gov)

3:00 Acrylamide Reduction in Sweetpotato Chips: Limiting Substrates and the Effects of an Asparaginase Treatment. Matthew C. Allan[1], Suzanne D. Johanningsmeier[1], Mariam Nakitto[2], Osvalda Guambe[3], Modesta Abugu[4], Kenneth V. Pecota[4], and G. Craig Yencho[4]. [1]USDA-ARS, SEA, Food Science and Market Quality and Handling Research Unit, 322 Schaub Hall, North Carolina State University, Raleigh, NC 27695, USA. [2]International Potato Center (CIP-SSA), Plot 47 Ntinda II Road, PO Box 22247, Kampala, Uganda. [3]International Potato Center (CIP-MOZ), Av. FPLM 2698, PO Box 2100, Maputo, Mozambique. [4]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695, USA. (matthew.allan@usda.gov)

Poster Session- 3:30-4:00

Beyond Sweetpotato: Creative Dishes that Incorporate Purple-Flesh Varieties. Wendy Mussoline[1] and David Dinkins[2]. [1] UF/IFAS Putnam County Agriculture Extension Agent, East Palatka, FL, 32131. [2] UF/IFAS Multi-County Community Development & Food Systems Extension Agent, Gainesville, FL, 32611. (wmussoli@ufl.edu)

Gate-To-Gate Life Cycle Analysis of Processed Sweet Potatoes: A Comparative Study. Rebekah Brown[1], Jonathan Allen[1]. [1]Food, Bioprocessing, and Nutrition Sciences Department, North Carolina State University, Raleigh, NC 27606. (rmwilso2@ncsu.edu)

Effect of 7-Day Storage Conditions in Sweetpotato Slips. Callie J. Morris[1], Lorin M. Harvey[1], Mark A. Hall[1], Mark W. Shankle[1], Varsha Singh[1]. [1]Pontotoc Ridge-Flatwoods Branch Experiment Station, Mississippi State University, Pontotoc, MS 38863. (cjw521@msstate.edu)

Weed Management in Sweetpotato with Bicyclopyrone. Donnie K. Miller[1] and Ashley M. Barfield[1]. [1]LSU AgCenter, St. Joseph, LA 71366. (dmiller@agcenter.lsu.edu)

Field Survey to Identify Weed Species Hosting Sweetpotato Viruses and Assessing Sweetpotato Variety Tolerance to Herbicidal Controls. Alyssa L. Miller[1], Te- Ming Tseng[1], Mark W. Shankle[2], Lorin M. Harvey[2]. [1]Plant and Soil Sciences Department, Mississippi State University, Mississippi State, MS 39762. [2]Pontotoc Ridge-Flatwoods Branch Experiment Station, Mississippi State University, Pontotoc, MS 38863. (alm1308@msstate.edu)

Nematicide Efficacy at Managing *Meloidogyne enterolobii* in Sweetpotato. Chang Liu[1,2], Zane Grabau[1], Rebeca Sandoval-Ruiz[1]. [1]Entomology and Nematology Department, University of Florida, Gainesville, FL 32611. [2]Department of Biochemistry, Molecular Biology, Entomology and Plant Pathology, Mississippi State University, Mississippi State, 39762. (cl2142@msstate.edu)

Developing a Community-Level Sampling Method for Detecting Multiple Pathogens in Sweetpotato. Julianna Culbreath[1], Catherine Wram[2], Churamani Khanal[3], Tyler Bechtel[4], Phillip A. Wadl[1], John Mueller[5], William B. Rutter[1]. [1]USDA-ARS United States Vegetable Laboratory, Charleston, SC, 29414. [2]USDA-ARS, MNGDBL, Beltsville, MD, 20705. [3]Department of Plant and Environmental Sciences, Clemson University, Clemson, SC, 29634. [4]Department of Food Science, University of Massachusetts Amherst, Amherst, MA, 01003. [5]Edisto Research and Education Center, Department of Plant and Environmental Sciences, Clemson University, Blackville, SC, 29817. (julianna.culbreath@usda.gov)

Genome Wide Association Study to Analyze the Genetic Variation of Fusarium wilt and Root knot Nematode (*Meloidogyne incognita*) Resistance in Louisiana Sweetpotato Population. Ajay Dhungana[1], Imana Power[2], Tristan Watson[2], Catherine DeRobertis[2], Philip Wadl[3] and Don La Bonte[1].[1]School of Plant, Environmental, and Soil Sciences, LSU AgCenter, Baton Rouge, LA 70803. [2]Department of Plant Pathology and Crop Physiology, LSU AgCenter, Baton Rouge, LA 70803. [3]USDA, ARS, U.S. Vegetable Laboratory, Charleston, SC, 29414. (adhung4@lsu.edu)

Development of Best Practices to Maximize Greenhouse Sweetpotato Slip Production in Mississippi. Pinkky Kanabar[1], Lorin Harvey[1], Callie Morris[1], Mark Shankle[1]. [1]Pontotoc Ridge-Flatwoods Branch Experiment Station, Mississippi State University, Pontotoc, MS 38863. (pk580@msstate.edu)

Assessment of Plant Growth Regulators in the Propagation of Sweet Potato Slips. Kerington L. Bass[1], Lorin Harvey[2], Guihong Bi[1], Richard Harkess[1], Taylor Blaise[1]. [1]Department of Plant and Soil Science, Mississippi State University Starkville, MS, 39762. [2]Pontotoc Ridge-Flatwoods Branch Experiment Station, Mississippi State University, Pontotoc, MS 38863. (kb3270@msstate.edu)

Assessing Challenges and Needs of Sweetpotato Industry Stakeholders through a National Survey. Mark A. Hall[1], Lorin M. Harvey[1], Mark W. Shankle[1], Rachael Carter[2], and Kelsey Harvey[3]. [1]Pontotoc Ridge-Flatwoods Branch Experiment Station, MS State University, Pontotoc, MS 38863.[2]Center for Government and Community Development, MS State University Extension Service, Mississippi State, MS 39762.[3]North Mississippi Research and Extension Center, MS State University, Verona, MS 38879. (mah1140@msstate.edu)

Tracking Natural Infection of Sweet Potato Leaf Curl Virus in First Year Seedlings of Sweetpotato. Phillip A. Wadl[1], Kaitlyn Whitley[1], Robert Bowers[1], John Coffey[1], Petrina McKenzie-Reynolds[1], and Sharon A. Andreason[1]. [1]USDA, Agricultural Research Service, U.S. Vegetable Laboratory, Charleston, SC 29414. (phillip.wadl@usda.gov)

Screening Sweetpotato Germplasm for Resistance to *Meloidogyne incognita*. Hannah Baker[1], Catherine Wram[2], Phillip A. Wadl[1], William B. Rutter[1]. [1]USDA, Agricultural Research Service, U.S. Vegetable Laboratory, Charleston, SC. [2]USDA, Agricultural Research Service, Mycology and Nematology Genetic Diversity and Biology Laboratory, Beltsville, MD. (phillip.wadl@usda.gov)

Field Performance of Virus-free Sweetpotato from Controlled Environment Derived Propagules. John Coffey[1], Phillip A. Wadl[1], Joni McGuire[1], Augustine Gubba[1,2], Bazgha Zia[1,3], Matthew A. Cutulle[3], Christie Almeyda[4], Christopher A. Clark[5], and Kai-Shu Ling[1]. [1]USDA Agricultural Research Service, U.S. Vegetable Laboratory, Charleston, SC. [2]School of Agricultural, Earth and Environmental Sciences, University of KwaZulu-Natal, South Africa. [3]Coastal Research & Education Center, Clemson University, Charleston, SC. [4]Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC. [5]Dept. Plant Pathology and Crop Physiology, Louisiana State University, Baton Rouge, LA. (phillip.wadl@usda.gov)

Genome-wide Association Study to Identify Loci for Sweetpotato Root Traits Using GWASpoly. Robert R. Bowers[1], Tyler J. Slonecki[2], Bode A. Olukolu[3], G. Craig Yencho[4], and Phillip A. Wadl[1]. [1]United States Department of Agriculture, Agricultural Research Service, United States Vegetable Laboratory, Charleston, SC. [2]Breeding Insight, Cornell University, Ithaca, NY. [3]Department of Entomology and Plant Pathology, University of Tennessee, Knoxville, TN 37996. [4]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695. (phillip.wadl@usda.gov)

Yield and Quality of Sweetpotato Grown under Protected Culture Systems. Luis Duque[1], F. Di Gioia[1]. [1]Department of Plant Science, Penn State University, University Park, PA 16802. (lud88@psu.edu**)**

Saturday January 20, 2024

7:30 Breakfast

8:00 Call to Order and Announcements

Plant Biology and Crop Production

Presiding: Amanda Nelson

8:15 Calculating Water Use Efficiency for Sweetpotato in North Carolina. Amanda Nelson[1]. [1]USDA-ARS-SWMRU Stoneville, MS 38776. (amanda.nelson@usda.gov)

8:30 Early Root Architectural Traits and their Relationship with Yield in *Ipomoea batatas* L. Duque, L.O.[1], Hoffman, G.[2], Pecota, K.[3], and Yencho, G. C.[3]. [1]Department of Plant Science, The Pennsylvania State University, University Park, PA 16802, U.S.A. 2. Department of Food Science, The Pennsylvania State University, University Park, PA 16802, U.S.A. [3]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695, U.S.A. (lud88@psu.edu)

8:45 Natural Arsenic Levels Stimulate Cultivar-Dependent Root Architectural Modifications During Transplant Establishment and Onset of Storage Root Formation in Sweetpotato. Arthur Villordon[1], Mae Ann Bravo[2], and Jack Baricuatro[3]. [1]LSU AgCenter Sweet Potato Research Station, Chase, LA 71324. [2]LSU AgCenter School of Plant, Environmental, and Soil Sciences, Baton Rouge, LA 70803. [3]Department of Chemistry and Physics, LSU-Shreveport, Shreveport, LA 71115. (avillordon@agcenter.lsu.edu)

9:00 SweetARMOR Update: Progress and Future Research Plans. Craig Yencho. Horticultural Science Department, North Carolina State University, Raleigh, NC 27695. (craig_yencho@ncsu.edu)

9:15 Potassium Carrier and Rates and Their Influence on 'Covington' Sweetpotato Yields, 2023. Jonathan R. Schultheis[1], Brandon K. Parker[1], Stuart W. Michel[1], and Baker E. Stickley[1]. [1]Horticultural Science Department, North Carolina State University, Raleigh, NC 27695. (jonathan_schultheis@ncsu.edu)

9:30 Nematicide Efficacy and Variety Resistance in Sweetpotatoes. C.S. Stoddard[1] and A.T. Ploeg[2]. [1]UC Cooperative Extension, 2145 Wardrobe Ave., Merced, CA, 95341. [2]University of California Riverside, 3401 Watkins Dr., Riverside, CA, 92521. (csstoddard@ucanr.edu)

9:45 Can Stylet Oils Reduce Non-persistent Virus Transmission in Sweetpotato? Jeff Davis[1]. [1]Department of Entomology, Louisiana State University Agricultural Center, Baton Rouge, LA 70803. (jeffdavis@agcenter.lsu.edu)

10:00 Break

<u>Disease, Insect, and Weed Management</u>

Presiding: David Picha

10:30 Herbicide Tolerance of Diverse Sweetpotato Varieties. Prakriti Dhaka[1], Juan C. Velasquez[1], Felipe K. Salto[1], and Nilda Roma-Burgos[1]. [1]Department of Crop, Soil and Environmental Sciences, University of Arkansas, Fayetteville, AR. (prakriti@uark.edu)

10:45 Optimizing Nematicide Application Methods for Management of Reniform Nematode (*Rotylenchulus reniformis*) and Southern Root-knot Nematode (*Meloidogyne incognita*) on Sweetpotato. Tristan Watson[1]. [1]Plant Pathology and Crop Physiology, LSU AgCenter, Baton Rouge, LA 70803. (TWatson@agcenter.lsu.edu)

11:00 Examining Viral Presence in Collections of Hawaiian Heirloom Sweetpotato Varieties. Anna H. McCormick[1], Jon Y. Suzuki[2], Sharon Wages[2], Aurora Kagawa-Viviani[3], Stacy Lucas[1], Briette L. Corpuz[2], Theodore J.K Radovich[1] and Michael J. Melzer[4] and Michael B. Kantar[1]. [1]Department of Tropical Plant and Soil Sciences, St. John Plant Science Lab, University of Hawai'i at Manoa, 3190 Maile Way, Honolulu, HI, 96822. [2]Tropical Plant Genetic Resources and Disease Research Unit, USDA ARS Daniel K. Inouye U.S. Pacific Basin Agricultural Research Center, 64 Nowelo St., Hilo, HI 96720. [3]Water Resources Research Center/ Department of Geography and Environment, 2424 Maile Way, Saunders Hall 445, Honolulu, HI, 96822. [4]Department of Plant & Environmental Protection Sciences, 3190 Maile Way, Honolulu, HI, 96822. (ahmccorm@hawaii.edu)

11:15 Sweetpotato Variety Performance in Spring Cover Crops. Prakriti Dhaka[1], Juan C. Velasquez[1], Felipe K. Salto[1], Matheus M. Noguera[1], and Nilda Roma-Burgos[1]. [1]Department of Crop, Soil and Environmental Sciences, University of Arkansas, Fayetteville, AR. (nburgos@uark.edu)

11:30 NC Sweetpotato Virus Research Update: NCPN Economic Study and CleanSEED Report. Christie Almeyda[1], Chunying Li[1], Sofia Ruiz[1], Andrea Rivas[1], Ken Pecota[2] and Craig Yencho[2]. [1]Micropropagation and Repository Unit, Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC 27607. [2]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27607. (cvalmeyd@ncsu.edu)

11:45 Progress Towards Developing Tools to Help Manage Root-Knot and Reniform Nematode in Sweetpotato. William B. Rutter[1], Phil Wadl[1], Catherine Wram[2], Hannah Baker[1], Julianna Culbreath[1], Churamani Khanal[3], Tyler Slonecki[4], Tyr Wiesner-Hanks[4]. [1]USDA-ARS United States Vegetable Laboratory, Charleston, SC, 29414. [2]USDA-ARS, MNGDBL, Beltsville, MD, 20705. [3]Department of Plant and Environmental Sciences, Clemson University, Clemson, SC, 29634. [4]Breeding Insight, Cornell University, Ithaca, NY 14853. (william.rutter@usda.gov)

12:00 Lunch

<u>Business and Planning Meeting</u>

1:00 Call to Order and Review of 2023 Minutes Shaun Francis

1:15 Graduate Student Contest Results Michelle McHargue

1:30 National Impact Award Mark Shankle

1:45 Resolutions Resolutions Committee
-Ken Pecota, Cole Gregorie, Michelle McHargue

2:00 Collaborator's Trial Discussion Jonathan Schultheis

2:15 Nominations Committee Report Nominations Committee
-Craig Yencho, Mark Shankle, Tara Smith

2:20 2025 Meeting Location Katie Jennings

2:30 National Stakeholder Group Update Tara Smith

2:45 Multistate Project Update David Monks

3:00 Adjourn

ABSTRACTS

<u>Master of Science Student Competition</u>

Presiding: Katie Jennings

9:00 Evaluation of Fungicides, and Their Residues, for Post-harvest Management of Black Rot of Sweetpotato. Hunter Collins[1], Lina Quesada-Ocampo[1], Khalied Ahmed[2] Travis Gannon[2]. [1]Department of Entomology and Plant Pathology and NC Plant Sciences Initiative, North Carolina State University, Raleigh, NC 27606. [2]Department of Crop and Soil Sciences, North Carolina State University, Raleigh, NC 27695. (shcollin@ncsu.edu)

Black rot, caused by Ceratocystis fimbriata, is a major economic post-harvest disease in the sweetpotato industry of the United States. Cultural practices and sanitation are commonly insufficient for management. There are only a small number of fungicides labeled for use in sweetpotato, and many of those are heavily regulated in export markets. North Carolina exports 40 - 50% of sweetpotatoes, thus, effective fungicides must be allowed for use in both domestic and export markets. To identify fungicides that manage black rot, both labeled and non-labeled products were evaluated for efficacy. To determine if rates used are below the maximum residue level for a specific market, fungicide residue levels were measured using HPLC. For these residue trials, sweetpotatoes were treated using a miniature packing line. In the efficacy trials performed, sweetpotatoes were artificially inoculated with the pathogen and placed onto a miniature packing line for treatment applications. Mertect, Stadium and Graduate A+ all provide significant reductions in disease severity when compared to the nontreated control. The results of these trials are important for increasing the number of products available for the sweetpotato industry.

9:15 Reducing Sweetpotato Reinfection through Vector Management. Rachel Morrison[1], Natraj Krishnan[1], Sead Sabanadzovic[1], Lorin Harvey[2], and Fred Musser[1],[1]Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology, Mississippi State University, Mississippi State, MS 39762. [2]Department of Plant and Soil Sciences, Mississippi State University, Pontotoc, MS 38863

Aphids are known to vector several viral diseases in sweetpotatoes. In this study, we examined different options for aphid management to reduce the spread of these diseases: crop borders, crop oils, and insecticides. To compare these management strategies, 10-row plots of virus-free crops surrounded by 2 rows of virus infected sweetpotatoes were planted in Starkville, MS during 2023. Treatments (bare soil, unsprayed sweetpotatoes, unsprayed soybeans, sweetpotatoes sprayed with insecticide, and sweetpotatoes sprayed with crop oil) were maintained on the outer 8 rows throughout the season. The middle two rows of virus-free sweetpotatoes were not treated and were used to evaluate the effectiveness of the treatments at reducing immigrating aphid densities and infection rates of sweet potato virus G, sweet potato virus C, sweet potato virus 2, and sweet potato feathery mottle virus.

9:30 RNA-seq Analysis Reveals Differentially Expressed Genes in Sweetpotato cv. Beauregard under Lead Stress. Mary Ann Munda[1], Mae Ann Bravo[1], Lisa Arce[1], Marissa Barbosa[1], Arthur Villordon[2], and Don LaBonte[1]. [1]LSU AgCenter School of Plant, Environmental, and Soil Sciences, Baton Rouge, LA 70803. [2]LSU AgCenter Sweet Potato Research Station, Chase, LA 71324. (mmunda1@lsu.edu)

Lead (Pb) is a widespread toxic element in agricultural soils and Pb accumulation in plant roots represents a potential health risk for human beings. The sweetpotato (Ipomoea batatas L.) is a globally important root crop and one of the leading raw products for baby food processing. Limited information is available about the mechanism by which sweetpotato responds to Pb stress at the molecular level. Understanding the genetic mechanism of Pb uptake is essential for developing management approaches to mitigate Pb uptake in this crop. To address this knowledge gap, RNA-seq was used to characterize the transcriptome and identify differentially expressed genes from Pb-treated and untreated sweetpotato cv. Beauregard. Samples were taken from adventitious root tips at 5, 10, and 15 days after planting (DAP). Transcriptomic analysis revealed 4,077, 5,159, and 3,206 differentially expressed genes at 5, 10, and 15 DAP respectively. Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment analysis shows that ABC transporters and sulfur metabolism pathways are upregulated at 5 DAP but are downregulated at 15 DAP, indicating that there may be a threshold in sweetpotato Pb tolerance. The results provide a deeper insight into the species-specific response of sweetpotato to Pb stress which can lead to the development of screening methods and evaluation of management strategies that reduce Pb uptake in this crop.

9:45 Rotation and Cover Crop Field Studies in 2022-2023 for the Management of Guava Root Knot Nematode (*Meloidogyne enterolobii*) in Sweetpotatoes. Baker Stickley[1], Jonathan Schultheis[1], Adrienne Gorny[2], Jessica Dotray[2], Brandon Parker[1] [1]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695. [2]Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC 27695. (bestickl@ncsu.edu)

Guava root knot nematode (GRKN, *Meloidogyne enterolobii*) is a soilborne, microscopic roundworm that feeds on the roots of plants, causing galling damage and yield loss. It is invasive, has a broad host range, and has been known to overcome host genetic resistance that is effective in managing other root knot nematode (RKN) species such as Southern RKN (M. incognita). Due to the aggressive nature of the pathogen on sweetpotato and the high economic cost of many nematicides, this project aims to identify holistic, multi-tactic management options for GRKN in sweetpotatoes. Multi-year rotational crop and cover crop studies were established in 2022 to evaluate the utility of combining non-host rotational crops and non-host cover crops in reducing population densities of GRKN and preserving marketable yields in a following sweetpotato crop. These rotational crop studies also included a fumigation treatment to evaluate the additive effect of Telone II fumigant along with rotation and cover crop combinations. Soil sampling results have shown differences in field RKN populations following non-host rotational crops peanut and corn versus a host rotational crop tobacco. However, soybean is a host rotational crop and yet had similar RKN populations as the non-host peanut and corn rotational crops. Differences in field RKN populations led to improved marketable yield of sweetpotato grown the next season when following peanut,

corn, or soybean. Cover crop treatments, which included black oats, wheat, and no cover did not affect marketable yield in this study. Application of Telone II resulted in superior US marketable No. 1 yields following a corn and peanut crop. No yield advantage was gained with the fumigant following the host crops soybean and tobacco. Additional information about rotational crops, cover crops, chemical nematicides, and host genetic resistance for management of root-knot nematode in sweetpotato, as well as additional research updates are provided by the SweetARMOR (Sweetpotato Advanced Resistance and Management of RKN) project, available at www.sweetarmor.org.

10:00 Evaluating the Effect of Alternative Sweetpotato Vegetative Propagation Methods on Herbicide Tolerance and Sweetpotato Yield and Quality. Samuel Crawford, Colton Blankenship, Stephen Ippolito, Ryan Stainback, Katie Jennings and David Monks. Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695. (secrawf2@ncsu.edu)

Sweetpotato is an important crop to North Carolina. Weed competition can reduce sweetpotato yield. Traditionally, non-rooted sweetpotato cuttings are transplanted in production fields. Limited research has been conducted on establishment of sweetpotato from plug plants by placing sweetpotato cuttings in plug trays and growing the cuttings in the greenhouse. Plug plants form a root ball before transplanting into the field, allowing for earlier establishment after transplanting. Theoretically plug plants could allow for better competition with weeds as well as potentially decreasing the number of days to canopy closure. In addition, forming a root ball before planting could improve sweetpotato tolerance to herbicides. Studies were conducted to determine the effect of herbicides on sweetpotato produced using vegetatively propagated sweetpotato plug plants. Treatments were arranged in a 6 x 3 factorial design. The whole plot factors were herbicide (nontreated, flumioxazin, clomazone, fluridone, fomesafen, and S-metolachlor) and propagation method (traditional, 2 node and 3 node plug plants). The study was maintained weed-free through cultivation and hand removal as needed. All vegetative cuttings other than the traditional were allowed to grow in the greenhouse for two weeks prior to transplanting on July 6 and 26 at the Horticultural Crops Research Station, Clinton NC. Herbicide treatments included flumioxazin at 107 g ai ha-1, clomazone at 420 g ai ha-1, fluridone at 336 g ai ha-1, and fomesafen at 280 g ai ha-1 applied PREPLANT. S-metolachlor was applied five days POST transplant at 800 g ai ha-1. Foliar injury from the herbicides was minimal with flumioxazin, clomazone, fomesafen, and S-metolachlor causing < 5% injury. However fluridone caused up to 50% injury at 3 wk after transplanting (WAT). Propagation method did not affect tolerance of sweetpotato to herbicides. Total yield (sum of canner, no. 1, cull, and jumbo grades) was similar to the nontreated check for all treatments. Averaged across treatments marketable yield was reduced with greenhouse propagated plug plants due to an increased number of cull storage roots. There were more culls for all greenhouse propagated transplants. Inversely, there were more no. 1 storage roots for traditionally planted sweetpotato.

10:15 Evaluation of Fungicide Applications and Residue Levels for Southern Blight Disease Management on Sweetpotatoes. Jack Mascarenhas[1], Hunter Collins[1], Lina Quesada-Ocampo[1], Khalied Ahmed[2], Travis Gannon[2]. [1]Department of Entomology and Plant Pathology and NC Plant Sciences Initiative, North Carolina State University, Raleigh, NC 27606. [2]Department of Crop and Soil Sciences, North Carolina State

University, Raleigh, NC 27695. (jmmasca2@ncsu.edu)

The United States is the largest exporter of sweetpotato in the world. As the highest sweetpotato producing state in the nation, North Carolina allocates 40-50% of its sweetpotatoes to the export market. However, the presence of fungal pathogens in growers' fields can reduce both the quality and yield of sweetpotatoes grown in NC. *Athelia rolfsii* is a fungal pathogen that causes southern blight, a fast-acting disease that affects the sweetpotato slips. Field diseases such as southern blight cannot always be managed through cultural practices alone and may require fungicide applications at key points during the production cycle. There are few fungicides labeled for use in sweetpotato, and use of fungicides on sweetpotatoes is heavily regulated for export due to maximum residue level (MRL) concerns. To identify fungicides and application timings that can help manage southern blight in sweetpotato, without exceeding current international residue tolerances, a field trial was conducted testing various active ingredients for managing the disease on sweetpotato. Mertect (thiabendazole), Quadris (azoxystrobin), and Inspire (difenoconazole) were applied either as a banded application at bedding and transplant water or only as transplant water. Samples were collected and analyzed at the end of the trial for detectable residue levels using HPLC. Plots treated with Inspire or Quadris at both application timings had a significantly decreased disease severity (>25%) compared to those applied at a single application. None of the tested products yielded samples that exceeded the current US or EU MRLs. Results from this study will provide information on the disease management capabilities and residue levels of the tested fungicides which are crucial for product security for the sweetpotato industry.

10:30 Break

<u>PhD Student Competition</u>

Presiding: Michelle McHargue

11:00 Impact of Transplant Orientation in Furrow, Transplant Length and Plant/Harvest Timing on Yield of 'Covington' Sweetpotato. Keith D. Starke[1], Jonathan R. Schultheis[1], Katie M. Jennings[1], David. W. Monks[1] and David L. Jordan[1]. [1]North Carolina State University, Department of Horticultural Science, Kilgore, Box 7609, Raleigh 27695. (kdstarke@ncsu.edu)

Sweetpotato (*Ipomea batatas (L.)* Lam.) is an important food crop that is grown extensively worldwide due to its high nutritional value and adaptability to different climatic conditions. Growers continually seek to improve yields and quality of their sweetpotato crop in order to optimize economic returns. Currently, the majority of commercial producers in North Carolina use a mechanical setter that orients 'non-rooted' sweetpotato cuttings (slips) vertically in the furrow, however, in recent years some growers have begun to transition to a mechanical setter that will transplant slips with a horizontal orientation in an effort to improve overall crop yield (tonnage per acre) and root quality. In 2019, 2021 and 2022 field experiments were conducted to evaluate the impact of plant orientation, transplant length and plant/harvest timing on yield of 'Covington' sweetpotato. Three planting methods were used to orient

‘Covington’ slips either vertically or horizontally in the furrow by 1.) hand-planting (vertical and horizontal), 2.) transplanting with a mechanical finger setter (vertical) and 3.) transplanting with a custom prototype setter (horizontal). Two different transplant lengths (10 and 15 inches) were evaluated. Four variations of plant/harvest timing were evaluated and were as follow: ‘early/early’, ‘early/late’ and ‘late/early’ and ‘late/late’. Four replications per plant/harvest timing were included in each year. Experimental design was a split-plot with transplant orientation treated as the ‘whole-plot’ and transplant length treated as the ‘sub-plot’. In 2019, the experiment was conducted at Cunningham Research & Education Center, Kinston, NC. In 2021, the experiment was conducted on-farm with a commercial grower located in Nash County, North Carolina. In 2022, the experiment was conducted at Horticulture Crops Research Station, Clinton, NC.

11:15 Mechanisms of Resistance to *Meloidogyne enterolobii* and *M. incognita* on Sweetpotato Breeding Lines. David Galo[1], Josielle Santos Rezende[1], Don R. Labonte[2] and Tristan Watson[1]. [1]Department of Plant Pathology and Crop Physiology. Louisiana State University Agricultural Center, Baton Rouge, LA 70803. [2]School of Plant, Environmental, and Soil Sciences. Louisiana State University Agricultural Center, Baton Rouge, LA 70803. (DGalo@agcenter.lsu.edu)

Meloidogyne enterolobii (Guava root-knot nematode; *Me*), a recently emerged and invasive soilborne plant parasitic nematode, and *M. incognita* (Southern root-knot nematode; *Mi*) are major pests of sweetpotato in the United States. The ability of *Me* to cause symptoms and reproduce on nematode resistant sweetpotato cultivars represents a threat to the sweetpotato industry. In this project, we aimed to identify the mechanisms of sweetpotato resistance against *Me* and *Mi*. A time-course study was conducted to compare development and reproduction of *Me* and *Mi* on sweetpotato genotypes ‘Beauregard’, ‘Jewel’, and the LSU AgCenter breeding lines ‘L14-31’, ‘L18-100’, and ‘L19-65’. Samples were collected at 7, 9, 11, 13, 21, and 35 days post inoculation (dpi), stained with acid fuchsin, and observed under a compound microscope. For *Me*, the mechanism of resistance appears to be associated with a hypersensitive response resulting in rapid, localized cell death in response to nematode penetration at an early stage of infection (7 dpi). This host response prevented further development of *Me* on resistant genotypes. In the case of *Mi*, the defense response occurred later, resulting in a delay in nematode development. Infective juveniles either died, matured as males, or experienced delayed development into adult females. Overall, results from this study give us a better understanding about the different mechanisms of resistance to *Me* and *Mi* on sweetpotato. Selected breeding lines evaluated in this project are being used to incorporate the observed resistance to *Me* and *Mi* in to new commercially acceptable sweetpotato cultivars.

11:30 Digital Phenotyping from Micro to Macro: New Opportunities for Sweetpotato Breeding at NCSU. Simon Fraher[1], Hoang Nguyen[2], Mark Watson[1], G. Craig Yencho[1], Michael Kudenov[2], Adrienne Gorny[3]. [1]Department of Horticulture Science, North Carolina State University, Raleigh, NC, 27695. [2]Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC, 27606. [3]Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC, 27607. (spfraher@ncsu.edu)

Machine learning for image analysis presents novel opportunities for high-throughput phenotyping in sweetpotato breeding. In particular, these strategies can help enhance crucial traits for Southeast sweetpotato growers, namely resistance to the quarantined guava root-knot nematode, Meloidogyne enterolobii, and storage root shape and yield. Using a microscope-mounted camera, we collected images of eggs from three species of root-knot nematode (Meloidogyne enterolobii, M. incognita, M. javanica). Eggs were visually counted and then detected using three machine learning approaches. While all three models were highly correlated with visual counts, our hybrid model had the strongest correlation for all three species (R2 > 0.96). In a second and unrelated set of experiments, we collected cellphone images of sweetpotato roots in the field and then counted and weighed them on a digital scale. Using a segmentation algorithm and computer vision methods, volume and count were approximated from the imaged storage roots. Human and machine counts were highly correlated (R2 = 0.94). In addition, physical weight and algorithm-estimated volume were also highly correlated (R2 = 0.96). Future applications of these technologies could allow higher-throughput nematode phenotyping. Plans for 2024 include application of the storage root phenotyping strategy to drone images, for even higher throughput phenotyping. This approach could allow data collection on all sweetpotato breeding plots, even those that are historically not harvested and phenotype due to undesirable traits. In the era of genomic selection, these undesirable plots can be just as informative as the promising ones.

11:45 Soil Amendments Alter Soil Chemical Properties, Storage Root Yield, and Toxic Heavy Metal Accumulation in Sweetpotato cvs. Bayou Belle and Beauregard.

Mae Ann Bravo[1], Arthur Villordon[2], Cole Gregorie[2], Lisa Arce[1], Marissa Barbosa[1], and Brenda Tubana[1]. [1]School of Plant, Environmental, and Soil Sciences, LSU AgCenter, Baton Rouge, LA 70803. [2]LSU AgCenter Sweet Potato Research Station, Chase, LA 71324. (mbravo4@lsu.edu)

Field trials were conducted to investigate the feasibility of applying commonly used soil amendments to reduce the accumulation of arsenic (As), cadmium (Cd), and lead (Pb) in sweetpotato storage roots. The cultivars Bayou Belle and Beauregard were grown on an experimental site with natural levels of As, Cd, and Pb. The following soil amendments were used: agricultural lime (AGL) (1 t·ac−1), gypsum (GYP) (1 t·ac−1), biochar (BIO) (1 t·ac−1), and silicon provided as wollastonite (WOL) (2.5 t·ac−1). Compared to the unamended plots, WOL and GYP were associated with elevated soil pH and sulfur levels while reducing Mn and Fe availability. There were no differences in storage root yield grades for both cultivars. The soil amendments were associated with reducing As and Cd extractability by 12 to 31% and 2 to 5%, respectively. A notable finding was the increase in Cd and Pb accumulation in the cultivar Beauregard amended with WOL. We hypothesize that the elevated pH was associated with reducing available binding sites and surface complexes such as with Mn and Fe, leading to the increased bioavailability of Cd and Pb. These preliminary findings support the hypothesis that AGL is a viable soil amendment under mixed toxic element conditions, reducing Pb accumulation without increasing the uptake of other toxic elements. The data also support the need for a systems-based approach for the long-term management of toxic elements in sweetpotato, where soil amendment application is integrated with the use of cultivars associated with low accumulation of specific toxic elements.

12:00 Lunch

PhD Student Competition

Presiding: Michelle McHargue

1:00 Declining Phosphorus Availability Increases Sucrose Synthase Activity and Storage Root Formation in Sweetpotato cv Beauregard. Marissa B. Barbosa[1], Lisa I. Arce[1], Arthur C. Villordon[2], Cole Jeffrey Gregorie[2], Don Labonte[1]. [1]LSU AgCenter School of Plant, Environmental, and Soil Sciences, Baton Rouge, LA 70803. [2]LSU AgCenter Sweet Potato Research Station, Chase, LA 71324. (mbarb23@lsu.edu)

Sucrose Synthase (SuSy) plays a crucial role in sugar metabolism mainly in the sink tissues of plants. In sweetpotato, increased SuSy activity has been associated with increased storage root development and correlated with sink strength. However, little is known about the specific variables associated with increased SuSy activity. Evidence from model systems supports the hypothesis that phosphorus (P) starvation is associated with increased accumulation of carbohydrates in roots. In the first study, we measured SuSy gene expression in 'Beauregard' sweetpotato grown in a split root system and subjected to the following P treatments: positive control (+/+), negative control (0/0), declining P (-/-), and split P (+/-). The declining P treatment corresponded to 25, 50, 75 and 0% progressive reduction in P and was imposed on days 6, 9, 12, and 15, respectively. A second study was conducted to measure storage root development at 50 days. The (-/-) treatment was associated with increased SuSy activity in developing adventitious roots starting at 11 days after planting. Moreover, plants grown with the declining P treatment produced storage roots and storage root diameter comparable to those in the positive control. Decreased SuSy activity was associated with reduction in storage root number among P-deficient (0/0) plants. Taken together, these results support the hypothesis that P availability in the root zone is associated with positive sink strength and storage root formation signaling in adventitious roots. These findings can be used to develop tools and management practices to increase P fertilizer efficiency for consistent storage root yields in sweetpotato.

1:15 Effect of Timing of the Weed Zapper on Palmer Amaranth Control and Sweetpotato Yield and Quality. Colton D. Blankenship[1], Katherine M. Jennings[1], David W. Monks[1], David L. Jordan[2], Stephen L. Meyers[3], Nicholas Basinger[4], Charles Cahoon[2], and Jerry Baron[5]. [1]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695. [2]Department of Crop and Soil Sciences, North Carolina State University, Raleigh, NC 27695. [3]Department of Horticulture and Landscape Architecture, [4]Purdue University, West Lafayette, IN. [4]Crop and Soil Sciences Department, University of Georgia, Athens, GA (cdblank3@ncsu.edu)

Weed management is a major challenge in both organic and conventional sweetpotato production systems, with most sweetpotato hectarage requiring expensive hand weeding. The Weed Zapper is a commercially available machine that is used to electrocute weeds that grow over top of crop canopies. Because sweetpotato canopy heights are typically shorter than many troublesome weed species, the Weed Zapper has potential to be used to improve weed control and reduce the frequency of hand weeding. Studies were conducted to

determine the optimal frequency of use of the Weed Zapper in conventional and organic sweetpotato production systems for weed control and crop safety.

1:30 RNASeq Analysis Reveals Key Pathways Involved in Low Nitrogen Tolerance at the Onset of Storage Root Formation in Sweetpotato cv Bayou Belle. Lisa Arce[1], Don LaBonte[1], Arthur Villordon[2], Cole Gregorie[2], Mae Ann Bravo[1], Marissa Barbosa[1]. [1]LSU AgCenter School of Plant, Environmental, and Soil Sciences. Baton Rouge, LA 70803. [2]LSU AgCenter Sweet Potato Research Station. Chase, LA 71324. (larce3@lsu.edu)

Nitrogen (N) is a key limiting macronutrient for crop growth and development and affects sweetpotato storage root formation and yield potential. In high-input production areas, excessive N application can suppress storage root formation and results in environmental pollution. The crop is also grown in low-input production systems with little or no N applications. In this study, sweetpotato cv Bayou Belle response to N deprivation during the establishment and storage root formation stages was investigated through a transcriptomic approach. RNA-seq data revealed a number of differentially expressed genes (DEGs) between N sufficient (+N) and N deficient (–N) conditions at 5, 10, and 15 days after planting (DAP). The number of significantly upregulated genes varied between timepoints. DEGs were further classified into functional categories and pathways to reveal putative functions. Gene Ontology annotation together with KEGG analysis revealed that majority of the DEGs are involved in sulfur compound metabolic process at 5 DAP and in ammonium transport for both 10 DAP and 15 DAP. These results provide valuable insights about the molecular mechanism of N regulation in sweetpotato adventitious roots undergoing storage root formation. These findings can lead to the development of tools and processes for improving N use efficiency and consistent storage root yields while reducing environmental impact in this globally important crop.

1:45 Comprehensive Two-Dimensional Gas Chromatography Reveals the Volatile Compounds Present in a Biparental Sweetpotato Mapping Population. Modesta Abugu[1], Suzanne Johanningsmeier[2], Matthew Allan[2], Massimo Iorizzo[1], Ken Pecota[1], G. Craig Yencho[1]. [1]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695. [2]USDA-ARS, SEA, Food Science and Market Quality and Handling Research Unit, 322 Schaub Hall, North Carolina State University, Raleigh, NC 27695. (mnabugu@ncsu.edu)

The aroma of cooked sweetpotato results from an interaction of multiple volatile organic compounds (VOCs). Prior studies have identified close to 100 VOCs in cooked sweetpotatoes; however, most of these studies were conducted in only a few genotypes, which limits our ability to determine the genetic basis of their inheritance. Volatile compound analysis of a biparental population will help to capture the diversity of sweetpotato aroma profiles, for use in genetic studies and developing a flavor toolkit to aid breeders in varietal selection. Here, a biparental sweetpotato mapping population (NCDM04-001 x Covington-DC) comprising 416 genotypes segregating for a wide variety of flavor traits was analyzed for their volatile components. A composite sample of 5 raw sweetpotato storage roots were cryogenically ground and cooked inheadspace vials at 80 °C for 30 mins, followed by headspace solid phase microextraction for 30mins. All samples were analyzed in a

randomized order, and each batch included one genotype with 3 technical replicates, to check for technical reproducibility. VOCs were separated using comprehensive two-dimensional gas chromatography (GC×GC); and detected with high resolution time-of-flight mass spectrometry (ToFMS). A total of 626 features, of which 242 were annotated by mass spectral matching, contributed to the differentiation of genotypes in the biparental population. The most commonly identified compounds were alcohols, followed by alkanes, ketones and aldehydes. Sensory evaluation will be used to determine the contribution of these compounds to perception of flavors. This work constitutes the most detailed study to date characterizing the aroma profiles of a large biparental sweetpotato population and demonstrates the effectiveness of the comprehensive 2-dimensional GC x GC ToFMS in volatile analysis of complex matrices. This work also provides valuable insights to guide breeders in developing varieties that enhance consumer experience.

2:00 Response of Sweetpotato (*Ipomoea batatas*) to Herbicides Applied Post-transplant. Stephen Ippolito[1], Katherine M. Jennings[1], David W. Monks[1], Adrienne M. Gorny[2], Levi D. Moore[3], David L. Jordan[4]. [1]Department of Horticultural Science, North Carolina State University, Raleigh, NC. [2]Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC. [3]Southeast Ag Research, Inc, Chula, GA. [4]Department of Crop and Soil Science, North Carolina State University, Raleigh, NC. (sjippoli@ncsu.edu)

Weed competition with sweetpotato can reduce yield. In addition, competition for light and other resources can leave crops more vulnerable to infection by pathogens such as nematodes. Limited herbicides are registered for use in sweetpotato, especially POST-transplant. Therefore, field studies were conducted to determine the effect of herbicides applied POST-transplant to sweetpotato on sweetpotato growth, yield, and quality. Study design was a randomized complete block and treatments were replicated four times. Treatments were arranged in a 3 x 2 x 2 factorial arrangement in which the whole plot factors consisted of herbicide (nontreated, tolpyralate 29.2 g ai ha^{-1}, pyridate 696 g ai ha^{-1}), application timing (at 1 or 12 days after transplanting), and the addition or absence of *S*-metolachlor (1070 g ai ha^{-1}) in the tank mix. Foliar injury from tolpyralate and pyridate was relatively low and mostly transient with injury from all treatments < 8% by 4 wk after transplanting. In addition, injury was lower when applied at 1 d after transplanting. Total yield (sum of canner, no. 1, and jumbo grades) for all treatments was similar to the nontreated. Tank mixing *S*-metolachlor significantly reduced marketable yield but did not have a significant effect on total yield. Tolpyralate and pyridate are not registered for use in sweetpotato and have the potential to be registered for weed management POST-transplant.

2:15 Break

<u>Processing and Marketing</u>

Presiding: Lorin Harvey

2:45 Relationships Among Physicochemical Properties, Textures, and Sweetness Perception in Baked Sweetpotatoes. Matthew C. Allan[1], Suzanne D. Johanningsmeier[1], Mariam Nakitto[2], Osvalda Guambe[3], Modesta Abugu[4], Kenneth V.

Pecota[4], and G. Craig Yencho[4]. [1]USDA-ARS, SEA, Food Science and Market Quality and Handling Research Unit, 322 Schaub Hall, North Carolina State University, Raleigh, NC 27695, USA. [2]International Potato Center (CIP-SSA), Plot 47 Ntinda II Road, PO Box 22247, Kampala, Uganda. [3]International Potato Center (CIP-MOZ), Av. FPLM 2698, PO Box 2100, Maputo, Mozambique. [4]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695, USA. (matthew.allan@usda.gov)

Sweetpotato varieties vary greatly in perceived textures and sweetness. This study investigated the physicochemical properties that influence these important sensory attributes in baked sweetpotatoes. Fifteen genotypes were grown on 3 plots, harvested and stored using conventional methods, baked, and evaluated by a trained descriptive sensory panel for sweetness intensity and 13 texture attributes. Textures were also measured instrumentally by texture profile analysis (TPA). Raw compositions (dry matter, starch, sugar, and cell wall material contents), starch properties (gelatinization temperature, granule type ratios, granules sizes), and amylase (α, β) activities were characterized. TPA could only predict sensory textures of fracturability and firmness, while starch and sugar contents, B-type starch granule ratio, and amylase activities were associated with mouthfeel textures, such as moistness, perceived particle size, and cohesiveness. Sweetness perception was affected by perceived particle size as well as sucrose and maltose contents in the baked roots; and maltose contents were highly correlated with raw sweetpotato starch contents in genotypes with active amylases. These relationships between physicochemical properties and eating quality could be used to develop targets that help breeders and processors make selections of new varieties that meet consumer preferences.

3:00 Acrylamide Reduction in Sweetpotato Chips: Limiting Substrates and the Effects of an Asparaginase Treatment. Matthew C. Allan[1], Suzanne D. Johanningsmeier[1], Mariam Nakitto[2], Osvalda Guambe[3], Modesta Abugu[4], Kenneth V. Pecota[4], and G. Craig Yencho[4]. [1]USDA-ARS, SEA, Food Science and Market Quality and Handling Research Unit, 322 Schaub Hall, North Carolina State University, Raleigh, NC 27695, USA. [2]International Potato Center (CIP-SSA), Plot 47 Ntinda II Road, PO Box 22247, Kampala, Uganda. [3]International Potato Center (CIP-MOZ), Av. FPLM 2698, PO Box 2100, Maputo, Mozambique. [4]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695, USA. (matthew.allan@usda.gov)

Acrylamide is a potential carcinogen that can form in foods during cooking by the Maillard reaction between free asparagine and reducing sugars. Sweetpotatoes are relatively high in both reducing sugars (glucose and fructose) and free asparagine, making sweetpotatoes susceptible to acrylamide formation during frying. Sweetpotato chips were used as a model fried sweetpotato product to investigate the relationship between substrates and acrylamide formation in fried sweetpotatoes and evaluate the efficacy of an asparaginase processing treatment. Bayou Belle sweetpotatoes were grown at 2 growing locations in 2020 and 3 locations in 2021, harvested and stored using conventional methods, then processed into chips after 5 to 6 months of storage. Sweetpotatoes with 4 to 7 cm diameters were selected from each lot, sliced 1.5 mm thick, hand-mixed into a composite sample, aliquoted into 200 g batches, then fried for 3 min at 149˚C. From the 3 growing lots in 2021, raw slices were also blanched at 85˚C for 3.5 min, then soaked in an asparaginase solution or water (control) for

20 min, dried for 10 min at 35˚C to remove excess surface water, then fried as previously described. Acrylamide was quantified using liquid chromatography with a triple quadrupole mass spectrometer (LC-MS-MS) consistent with FDA guidelines. Sugars and asparagine were quantified using LC with pulsed amperometric detector (LC-PDA). Total nitrogen was measured using the Dumas method. Acrylamide levels in chips varied significantly by growing location and ranged from 367 to 5192 ng/g (PPB). Free asparagine was highly correlated with acrylamide levels ($r = 0.92$), while reducing sugars were not ($r < 0.33$). In multivariate analysis using all substrates to model acrylamide formation, free asparagine was the only significant variable. In the chips, 82 to 89% of the asparagine was depleted, whereas only 18 to 30% and 10 to 23% of glucose and fructose were degraded, respectively. Blanching removed ~50% of the sugars and 83 to 98% of the asparagine, and blanching plus an asparaginase treatment resulted in similar sugar losses with no detectable asparagine. Acrylamide was reduced 90 to 95% (80 to 196 ng/g) by blanching in water only (control) and 98 to 99% (12 to 29 ng/g) by blanching with an asparaginase treatment. Asparagine was the limiting factor for acrylamide formation in this study, and a blanch and/or asparaginase treatment are plausible acrylamide reduction strategies for fried sweetpotatoes. The findings could help sweetpotato breeders, growers, and processors concerned about acrylamide target minimizing free asparagine. This study also demonstrated a blanch or, even more so, an asparaginase treatment can remove much of the free asparagine and mitigate acrylamide formation.

Poster Session

Beyond Sweetpotato: Creative Dishes that Incorporate Purple-Flesh Varieties.

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Purple-flesh sweetpotatoes are an excellent contender for a niche market where high-end consumers are primarily interested in the unique flavor and color. There is currently only one purple sweetpotato grower in Northeast Florida so access to the crop is limited and a local niche market is preferable to avoid regulatory restraints associated with transporting sweetpotato across the Florida State line. Appealing to gourmet chefs in the historic and competitive environment of St. Augustine, Florida, was the goal of our participation in the 2023 Flavors of Florida Event. This was a premier tasting showcase hosted by UF/IFAS at the elegant Champions Club in the Ben Hill Griffin Football Stadium on March 23, 2023. Ticket prices were $75 and over 400 participants sampled exquisite foods and beverages produced all around the Sunshine State. We worked diligently with Blue Sky Farms, Palm & Pine Catering, and the UF/IFAS Food Science and Human Nutrition Department to come up with creative dishes made with purple sweetpotatoes. We made donuts, sourdough bread, vichyssoise and even a chocolate-dipped sweetpotato candy with a unique purple hue. But the prize- winning dish that received the prestigious “Taster’s Choice Award” for the evening was a delectable vegan potsticker made with purple sweetpotato and PAOW picadillo. Lasting impacts from the evening include an informative blog authored by UF/IFAS Communications that highlighted all the dishes at the event and a digital “Purple Sweetpotato

Recipes" collection created by the UF/IFAS Food Sciences and Human Nutrition Department. The goal of the event was to stimulate interest and create demand for the unique flavor and color of purple sweetpotatoes among elite chefs and consumers in Northeast Florida.

Gate-To-Gate Life Cycle Analysis of Processed Sweet Potatoes: A Comparative Study. Rebekah Brown[1], Jonathan Allen[1]. [1]Food, Bioprocessing, and Nutrition Sciences Department, North Carolina State University, Raleigh, NC 27606. (rmwilso2@ncsu.edu)

From the leaves to the root, the sweetpotato holds economic potential to the food systems of North Carolina as a nutrient-dense superfood used on its own or as a value-added derivative in other consumer products. As the utilization of the sweetpotato is expanding to more markets, processing technologies, shelf stability, and valorization approaches for the crop are also rising. The general sustainability assessments of these processing technologies are lagging behind in research. Comparative processing models are scarce and how they relate to environmental impact factors is a major gap in the literature. The purpose of the study is to conduct a gate-to-gate comparative life cycle assessment (LCA) of the inputs and outputs of a variety of sweetpotato consumer products such as canned, par-fried, chips, microwave-processed, weaning foods, etc. to determine the environmental impact and make suggestions for waste reduction, valorization, and process efficiencies. The study follows the ISO Standard 14040 Environmental Management, Life Cycle Assessment, Principles and Framework which begins by defining a goal and scope of the LCA, inventory analysis, impact assessment, and interpretation. Data collection is primary data through direct measurement when available or secondary through publications in peer-reviewed literature. The unit flows of the system will be modeled in established environmental databases such as Ecoinvent, Agri-Footprint, and ESU WorldFood. Environmental characterization factors will be provided through the Environmental Protection Agency's Tool for Reduction and Assessment of Chemicals and Other Environmental Impacts (TRACI) to determine processes that contribute most to the impact categories such as ozone depletion, acidification, climate change, and human health impacts. The results can show hot spots in methods of transportation and packaging choice as they are anticipated to contribute most to emissions and long-term waste reduction. The focus of this study is forward-facing as increasing numbers of worldwide government agencies and consumers are demanding a statement of standardized environmental data such as an LCA or environmental product declaration (EPD) for food and other consumer products. The completed model should point out the most sustainable sweetpotato processing and preservation methods relative to nutritional quality.

Effect of 7-Day Storage Conditions in Sweetpotato Slips. Callie J. Morris[1], Lorin M. Harvey[1], Mark A. Hall[1], Mark W. Shankle[1], Varsha Singh[1]. [1]Pontotoc Ridge-Flatwoods Branch Experiment Station, Mississippi State University, Pontotoc, MS 38863. (cjw521@msstate.edu)

Traditionally sweetpotato slips are cut from sprouted sweetpotato beds that are then transplanted to the field. Slips can be field-transplanted the same day they are cut or stored to "harden off" to potentially improve plant survivability after field-transplanting. The need to store cut slips for a several days to a week could arise due to many factors including weather,

equipment failure, and labor availability. A study evaluating plant survivability in the field and root yield of slips stored for 7 days was conducted at the Mississippi State University, Pontotoc Ridge Flatwoods Branch Experiment Station from 2021 to 2023. Treatments were applied to ‘Orleans’ slips the day they were cut. Slips were place under four storage treatments; ambient temperature under shade (87°F day/67°F night) with cut-ends submerged in 3 inches of water, ambient temperature under shade with no water, chilled in a cooler at 68°F with cut-ends submerged in 3 inches of water, and chilled in a cooler with no water. Stand count was collected approximately a week after transplant to assess plant survivability. Roots were harvested and graded according to USDA standards to determine US No. 1, canner, cull and jumbo yield grades. Total marketable yield was recorded as the sum of US No. 1, canner, and jumbo grade yields. Results are currently being analyzed.

Weed Management in Sweetpotato with Bicyclopyrone. Donnie K. Miller[1] and Ashley M. Barfield[1]. [1]LSU AgCenter, St. Joseph, LA 71366. (dmiller@agcenter.lsu.edu)

A field study was conducted at the LSU AgCenter Northeast Research Station near St. Joseph La in 2023 with the objective to evaluate bicyclopyrone (Optogen®) herbicide for weed management in sweetpotato. A four-replication factorial treatment arrangement was utilized and included pre-transplant herbicide (Factor A: Optogen at 2.6 or 3.5 oz/A, Reflex at 1 pt/A, Valor at 2 oz/A, or Linex at 1.5 pt/A) and post-transplant herbicide (Command at 1.5 or 2.5 pt/A, Dual Magnum at 1.33 pt/A, or none). Treatments were applied to each 6.3’ x 25’ plot prior to or immediately following planting of ‘Bayou Belle” sweet potato on June 22. Parameter measurements included visual weed control 14 and 28 d after application (DAT) and yield (U.S. #1, canner, jumbo, and total). Factor interactions were not noted for any parameter measured. At 14 DAT, averaged across post-transplant treatments, bicyclopyrone at 2.6 oz/A resulted in 100, 100, 100, 75, 100, 99, 99, and 100% control of goosegrass, broadleaf signalgrass, browntop millet, yellow nutsedge, common purslane, horse purslane, slender amaranth, and barnyardgrass, respectively, which was similar to all other pre-transplant treatments. Averaged across pre-transplant treatments, only with respect to yellow nutsedge control with Dual Magnum was a post-transplant treatment advantageous compared to pre-transplant treatment alone (89% 73%). At 28 DAT, averaged across post-transplant treatments, bicyclopyrone at 2.6 oz/A resulted in 99, 100, 93, 98, 95 and 83% control of goosegrass, broadleaf signalgrass, browntop millet, common purslane, horse purslane, and barnyardgrass, respectively, which was similar to all other pre-transplant treatments. Bicyclopyrone at both rates provided no greater than 73 (equivalent to Valor and Linex but less than the 90% for Reflex) and 88% (equivalent to Reflex but less than the 99% for Valor and Linex) control of yellow nutsedge and slender amaranth, respectively. Averaged across pre-transplant treatment, control of all weeds benefited from post-transplant herbicide application (all post-transplant herbicides equivalent and greater than where one was not applied). Averaged across post-transplant treatments, U.S.#1, canner, jumbo, and total yield with the lower rate of bicyclopyrone was 428, 95, 122, and 645 bu/A, respectively, and equivalent to all other pre-transplant treatments. Averaged across pre-transplant treatments, U.S. #1 and canner yield were at least 370 and 109 bu/A, respectively, and equivalent among all herbicides and greater than where no herbicide was applied (331 and 87 bu/A). Jumbo yield was greatest with application of Dual Magnum (199 bu/A), while Command at both rates resulted in equivalent yield of 120 and 122 bu/A, and greater than the

64 bu/A where no herbicide was applied. Dual Magnum resulted in a 758 bu/A total yield, which was greater than that of Command at 2.5 pt/A (627 bu/A) and where no herbicide was applied (482 bu/A), and equivalent to that of Command at 1.5 pt/A (679 bu/A).

Field Survey to Identify Weed Species Hosting Sweetpotato Viruses and Assessing Sweetpotato Variety Tolerance to Herbicidal Controls. Alyssa L. Miller[1], Te- Ming Tseng[1], Mark W. Shankle[2], Lorin M. Harvey[2]. [1]Plant and Soil Sciences Department, Mississippi State University, Mississippi State, MS 39762. [2]Pontotoc Ridge-Flatwoods Branch Experiment Station, Mississippi State University, Pontotoc, MS 38863. (alm1308@msstate.edu)

Sweetpotato (*Ipomea batatas*), a member of the Convolvulaceae family, is susceptible to a complex of viruses that include the four potyviruses; sweetpotato virus G (SPVG), sweetpotato virus 2 (SPV2), sweetpotato virus C (SPVC) and sweetpotato feathery mottle virus (SPFMV). These viruses can be transmitted to sweetpotato (SP) plants by vector insects, particularly aphids, that acquire viruses from weedy plant species acting as a virus host and inoculum source. Storage root yield can be reduced by 50% when the SP plant is infected by this complex of viruses, so it is critical to identify weedy plants that are a potential virus-host. Several weed species were collected from three separate fields in Chickasaw county, MS and analyzed for potyviruses in 2023. One out of the three locations contained samples of woolly croton (Croton capitatus), trumpet creeper (Campsis radicans), hemp sesbania (Sesbania herbacea) and ivy leaf morningglory (Ipomoea hederacea) that preliminary tested positive for SPVG, SPFMV and SPVC. Ivy leaf morningglory and SP are members of the same plant family, making weed control difficult by way of herbicide application without injury to the SP crop. In addition, the number of herbicides labeled for use in SP production are limited compared to other crops. Therefore, research will be conducted to screen herbicides for control of weeds identified as a host for potyviruses and injury to SP varieties commonly used for commercial production in the United States. A herbicide screening assay is in progress at Mississippi State University and the University of Arkansas, involving several distinct foliar-applied herbicides. This assay targets 4 SP varieties, Beauregard, Dianne, Covington, and Orleans. Each SP plant is subjected to analysis for injury, vine length, and root/shoot dry weights. Study results will identify potential herbicides for use as a best practice to minimize virus reinfection in SP production fields.

Nematicide Efficacy at Managing *Meloidogyne enterolobii* in Sweetpotato. Chang Liu[1,2], Zane Grabau[1], Rebeca Sandoval-Ruiz[1]. [1]Entomology and Nematology Department, University of Florida, Gainesville, FL 32611. [2]Department of Biochemistry, Molecular Biology, Entomology and Plant Pathology, Mississippi State University, Mississippi State, 39762. (cl2142@msstate.edu)

Meloidogyne enterolobii (guava root-knot nematode) is an emerging global threat and damaging to sweetpotato production in the Southeast United States. Because current resistant cultivars are not effective against M. enterolobii, nematicide application is one of the few management strategies available against this nematode and field testing is urgently needed. This study assessed common nematicides for management of M. enterolobii and non-target effects on free-living nematodes in sweetpotato field production. In 2022 and 2023, treatments were (1) untreated control, (2) fumigation using Telone II, (3) Salibro at 2.25 kg a.i./ha, (4) Velum at 0.25 kg a.i./ha, (5) NIMITZ at 2 kg a.i./ha and (6) NIMITZ at 4 kg a.i./ha. Fumigation using Telone II was the only consistently effective nematicide at improving marketable yield relative to control and also consistently reduced most storage root galling measurements and midseason Meloidogyne soil abundances. NIMITZ at 4 kg a.i./ha consistently improved total yield, but not marketable yield whereas NIMITZ at 2 kg a.i./ha, Salibro, and Velum did not improve yield. Each of the fluorinated nematicide treatments reduced at least one nematode symptom or nematode soil abundances relative to control, but none provided consistent benefits across years. There were minimal effects on free-living nematodes. In summary, 1,3-D was the most effective nematicide tested for M. enterolobii management, but additional management may be needed under severe M. enterolobii pressure.

Developing a Community-Level Sampling Method for Detecting Multiple Pathogens in Sweetpotato. Julianna Culbreath[1], Catherine Wram[2], Churamani Khanal[3], Tyler Bechtel[4], Phillip A. Wadl[1], John Mueller[5], William B. Rutter[1]. [1]USDA-ARS United States Vegetable Laboratory, Charleston, SC, 29414. [2]USDA-ARS, MNGDBL, Beltsville, MD, 20705. [3]Department of Plant and Environmental Sciences, Clemson University, Clemson, SC, 29634. [4]Department of Food Science, University of Massachusetts Amherst, Amherst, MA, 01003. [5]Edisto Research and Education Center, Department of Plant and Environmental Sciences, Clemson University, Blackville, SC, 29817. (julianna.culbreath@usda.gov)

Sweetpotato is a clonally propagated crop, which requires planting ‘seed’ storage roots in the early spring for shoot production. The movement of sweetpotato ‘seed’ roots can vector the spread of soilborne plant pathogens, including root-knot nematodes (RKN) and viruses. To reduce the spread of diseased storage roots, we have developed a community-level sampling method to detect multiple pathogens in sweetpotato. For this method, we skinned batches of storage roots and collected 10 mL samples of homogenized skinnings for PCR-based detection of pathogens. Using conventional PCR and qPCR, we can consistently detect two significant species of RKN, *Meloidogyne enterolobii* and M. incognita. In a dilution series using M. enterolobii eggs, we were able to detect as little as 2 eggs/10mL sample. We are also working to extend this protocol for viral detection. Preliminary work on detecting sweetpotato leaf curl virus (SPLCV) with digital PCR indicates that this sampling method could also help screen for this important sweetpotato virus in storage roots.

Genome Wide Association Study to Analyze the Genetic Variation of Fusarium wilt and Root knot Nematode (*Meloidogyne incognita*) Resistance in Louisiana Sweetpotato Population. Ajay Dhungana[1], Imana Power[2], Tristan Watson[2], Catherine DeRobertis[2], Philip Wadl[3] and Don La Bonte[1].[1]School of Plant, Environmental, and Soil Sciences, LSU AgCenter, Baton Rouge, LA 70803. [2]Department of Plant Pathology and Crop Physiology, LSU AgCenter, Baton Rouge, LA 70803. [3]USDA, ARS, U.S. Vegetable Laboratory, Charleston, SC, 29414. (adhung4@lsu.edu)

Sweetpotato [*Ipomea batatas* (L.)] is the sixth most important food crop and plays a pivotal role in maintaining food security worldwide. However, the biotic factor such as diseases and nematodes has created significant problem resulting in yield loss. Sweetpotato are heavily infested by Fusarium wilt (*Fusarium oxysporum f. batatas*) and root knot nematodes (RKN) i.e. *Meloidogyne incognita* (Mi). There are no acceptable Fusarium wilt and Mi resistant varieties and growers have adopted the use of aggressive/harmful pesticides against these pests leading to increase in farmers cost of production and environmental degradation. Association studies aimed at linking genotype with phenotypic data can provide important information for breeders to develop genetic markers associated with resistance and hence improve overall breeding efficiency. This study includes a total of 300 multiparent population/lines (MPP) (which includes both parental and non-parental check), developed from open pollinated nursery, would be used to derive both phenotypic and genotypic data and perform genome wide association study (GWAS). Trials would be conducted in greenhouse to collect phenotypic data. Diversity Array Technology (DArT) sequencing would be performed to obtain markers information. The main hypothesis of this study is to identify genes associated against Fusarium wilt and Meloidogyne incognita in Louisiana sweetpotato population by using different statistical models and software. These specific markers would assist breeder in performing early stage selection of the progenies/lines, traits selection improving overall breeding program in the future. Similarly, specific markers of desirable traits can be used to maintain genotypic diversity in sweetpotato germplasm collection.

Development of Best Practices to Maximize Greenhouse Sweetpotato Slip Production in Mississippi. Pinkky Kanabar[1], Lorin Harvey[1], Callie Morris[1], Mark Shankle[1]. [1]Pontotoc Ridge-Flatwoods Branch Experiment Station, Mississippi State University, Pontotoc, MS 38863. (pk580@msstate.edu)

Sweetpotato (*Ipomoea batatas* (L.) Lam.) is propagated vegetatively on a commercial scale using stem cuttings known as slips or vine-cuttings, and thus, it is critical to maximize slip production to have sufficient planting material for commercial acreage. Sweetpotato slips that have been virus-indexed are used to produce certified foundation seed (CFS) roots in Mississippi. A large number of certified CFS producers depend on the rapid propagation of clean planting material in greenhouses in order to obtain transplants for the production of G1 storage roots. Producing high-quality slips is a key factor in influencing sweetpotato yield. Hence, effective strategies to improve greenhouse slip production is essential for growers. Nevertheless, scientific literature on best practices (BPs) for greenhouse sweetpotato slip production is limited. Therefore, this study is aimed to develop BPs to maximize CFS planting material in greenhouse conditions. Greenhouse experiments will be conducted in two greenhouses with three replications at Pontotoc Research and Extension Center, Mississippi State University, using sweetpotato cultivars ‘Beauregard’ and ‘Orleans’ to evaluate the effect of different temperatures, fertilizer rates, and spectrums of supplemental LED lighting. The study will use split-split plot design with main plot factor as temperature at 24°C and 30°C in each greenhouse, respectively. In experiment one, two-node stem cuttings will be grown at three fertilizer rates as 100, 200 and 300 mg L^{-1} of N in a commercial 20-10-20 fertilizer mix. In experiment two, two-node stem cuttings will be grown under one of the four lighting conditions, no supplemental light, 20% blue +80% red light spectrum, 8% blue +15% green +77% red light spectrum, and 8% blue +15% green +72% red +5% far-red light spectrum. Slip measurements which include vine node count, vine length, shoot fresh and dry weight, leaf area, stomatal conductance, and chlorophyll pigments will be determined. This greenhouse study will provide information on optimum fertilizer rate, and also demonstrate the impact of supplemental LED lights. Moreover, the study could be used as a guideline by certified CFS producers that can lead to fast propagation of superior quality sweetpotato slips.

Assessment of Plant Growth Regulators in the Propagation of Sweet Potato Slips. Kerington L. Bass[1], Lorin Harvey[2], Guihong Bi[1], Richard Harkess[1], Taylor Blaise[1]. [1]Department of Plant and Soil Science, Mississippi State University Starkville, MS, 39762. [2]Pontotoc Ridge-Flatwoods Branch Experiment Station, Mississippi State University, Pontotoc, MS 38863. (kb3270@msstate.edu)

There are various stages in the sweet potato (*Ipomoea batatas* (L.) Lam.) production system, each with its own set of challenges. Sweet potato slips frequently have non-uniform characteristics that can result in transplanting difficulties. Low transplant survival rates can be a result of abiotic stresses, specifically the lack of acclimation as slips moves from favorable greenhouse conditions to harsh field conditions. For producers, high slip mortality rates pose logistical and financial challenges. A number of plant growth regulators (PGRs) have shown to improve plant stress response and induce lignification, or thickening of cell walls, in other crops. However, the effects of applying PGRs to sweet potato slips in greenhouses prior to transplanting has not been thoroughly investigated. Greenhouse studies were conducted at Mississippi State University over two years using the cultivar 'Beauregard' to evaluate the effect of various PRGs and concentrations on slip performance. Trials were organized as a randomized block, replicated three times with experimental unit being individual plants in a 72-cell tray. Two-node slip cuttings were grown in a controlled environment and treated with 6 different PGR, Ancymidol, Flurprimidol, Paclobutrazol, Uniconazole, Indole-3-butyric acid (IBA), at three different concentrations categorized as low, medium, and high. To determine the effects of PGRs on the slips, measurements of plant height, stem diameter, number of nodes, and Soil Plant Analysis Development was collected weekly for 4-weeks. Leaf area and moisture content was collected at trial termination 5-weeks post treatment application. This investigation aims to improve sweet potato slip production, lessen losses related to low slip survival rates, and advance our knowledge of how PGRs affect sweet potato slip quality.

Assessing Challenges and Needs of Sweetpotato Industry Stakeholders through a National Survey. Mark A. Hall[1], Lorin M. Harvey[1], Mark W. Shankle[1], Rachael Carter[2], and Kelsey Harvey[3]. [1]Pontotoc Ridge-Flatwoods Branch Experiment Station, MS State University, Pontotoc, MS 38863.[2]Center for Government and Community Development, MS State University Extension Service, Mississippi State, MS 39762.[3]North Mississippi Research and Extension Center, MS State University, Verona, MS 38879. (mah1140@msstate.edu)

An assessment survey to understand challenges and perceptions of clean foundation seed (CFS) by stakeholders in the United States sweetpotato industry was conducted from April 1, 2021 to May 17, 2021. This online survey was created using Qualtrics software and administered by Mississippi State University. The term CFS refers to seed roots or plants produced from greenhouse slips established with virus-tested plant material in a laboratory and sourced from a National Clean Plant Center or certified seed producer. The survey consisted of three sections of questions: general, role specific, and virus testing and terminology questions. Survey participants were asked to select their role in the sweetpotato industry (producer, packer/shipper, industry representative, processor, crop improvement agency, researcher/scientist, or extension faculty/agent). There were 134 respondents that completed the survey with 98 reporting as sweetpotato producers. The remaining 36 respondents were separated from the larger pool of producers due to their role in the industry being either research related or an industry representative that supplied crop management products. Survey questions were formatted as yes/no, multiple choice, or Likert scale to gauge respondent understanding. When asked of the importance of CFS to a survey participants' operation, increased yield/production and improved sweetpotato quality were the two main answers. Survey results also concluded that over 44% of producer respondents purchase new CFS plant material annually from either a National Clean Plant Center or certified clean seed producer. The results of this survey guided discussions at a sweetpotato stakeholder 2-day workshop on July 20-21, 2021, with 75 attendees from across the nation. Following the survey and workshop, researchers and Extension specialists were able to prepare a proposal and successfully apply for SCRI funding to establish research and Extension efforts to promote the increased use of CFS.

Tracking Natural Infection of Sweet Potato Leaf Curl Virus in First Year Seedlings of Sweetpotato. Phillip A. Wadl[1], Kaitlyn Whitley[1], Robert Bowers[1], John Coffey[1], Petrina McKenzie-Reynolds[1], and Sharon A. Andreason[1]. [1]USDA, Agricultural Research Service, U.S. Vegetable Laboratory, Charleston, SC 29414. (phillip.wadl@usda.gov)

Sweet potato leaf curl virus (SPLCV) is a whitefly-transmitted begomovirus infecting sweetpotato and other morning glory (Convolvulaceae) species worldwide. Yield losses due to SPLCV have been reported at 10-80% depending on the cultivar. SPLCV infects its hosts systemically and is readily transmitted to clonal propagative material. The virus is widespread at the USVL, and testing of germplasm maintained in the breeding program indicates nearly 100% infection in storage roots of materials propagated at least four years. Prior to the public release of new germplasm, viruses must be eliminated through meristem-tip culture and confirmed virus-free. This process is laborious, and time-consuming. Furthermore, successful virus elimination can be genotype dependent. Identification of virus-free seedlings early in the selection process within a breeding program can offer an alternative to meristem-tip culture. In 2022, 100 first-year seedlings (FYS) selections were tested for SPLCV and revealed a single selection (1/100) with a positive test. We conducted similar testing in 2023 and found no SPLCV-positive FYS selections. To further assess the acquisition of SPLCV in the field, replicated plantings (n=3) of each selected FYS (n=37) were planted and monitored through harvest. A combination of bulk and individual plant testing was conducted at 60 and 120 days after planting (DAP). Approximately 22% of the bulk samples were infected at 60 DAP, and infection increased to at least 39% by 120 DAP. Testing of individuals within selected positive bulk samples did not support 100% infection at harvest. Altogether, these results demonstrate that SPLCV acquisition within the FYS selections is sufficiently low to facilitate the propagation of virus-free selections. Virus-free selections can then be maintained in an insect-free environment through additional field selection cycles, thereby avoiding virus infection in future selection cycles. This potential to bypass meristem-tip culture can make the sweetpotato breeding process more time efficient and cost-effective.

Screening Sweetpotato Germplasm for Resistance to *Meloidogyne incognita*.
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Meloidogyne incognita is the most common root-knot nematode found in agricultural regions worldwide. It can cause severe damage to many crops including sweetpotato storage roots, causing them to be unmarketable and resulting in significant yield losses. Identifying resistant crop varieties is one of the most effective ways to manage M. incognita. To identify germplasm with resistance to M. incognita, 47 sweetpotato accessions obtained from the USDA germplasm repository were screened in replicated greenhouse assays. ‘Beauregard’ was used as a susceptible control and ‘Regal’ as a resistant control. Sweetpotato slips containing 3 nodes each were planted in an autoclaved 1:1 mixture of sand and potting mix in Deepot D25L containers and arranged in a randomized block design, with 2-3 replicates per an accession. Two weeks after planting, each plant was inoculated with 10,000 M. incognita eggs. Eight weeks after inoculation, plants were harvested and rated for fibrosity, galling, number of egg masses, and eggs per gram of root. Resistance was defined as accessions with mean galling ≤ 10% and mean eggs per gram of root ≤ 500. Based on these criteria, 12 accessions were identified as having resistance to M. incognita.

Field Performance of Virus-free Sweetpotato from Controlled Environment Derived Propagules.
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Planting stock used for sweetpotato production relies on clonal propagation of either sprouted storage roots grown in plant beds or from cuttings from greenhouse grown plants. Virus infection and accumulation can occur through efficient transmission of viruses by insect vectors during vegetative propagation. The Sweetpotato National Clean Plant Network Centers (SP-NCPN) mission is to provide virus-tested planting stock of important cultivars for sweetpotato growers. However, most of the virus-tested materials can be rapidly re-infected again by one or more viruses within one growing season. Mass production of enough virus-tested propagating materials of sweetpotato is a major challenge and annually shortages exist. The SCRI CleanSEED sweetpotato project was funded in 2022 to specifically address this problem. We have developed a controlled environment agriculture (CEA) technology that provides rapid propagation of large numbers of virus-tested slips from SP-NCPN foundation stocks within 6 – 12 months. Initially, 1 virus-tested ‘Beauregard’ in vitro plantlet generated 500 rooted plants in 3 months compared to 3 plants from tissue culture micropropagation.

Within 3 months the 500 rooted plants generated about 250,000 plants. In 2023, virus-tested stocks of ‘Averre’, ‘Beauregard’, ‘Monaco’ and ‘Purple Majesty’ were used to generate slips and rooted transplants with the CEA technology to compare establishment and yield of CEA propagules with plant bed derived slips under field conditions. No significant differences were detected for establishment and canner and cull yield, whereas differences were found for total, marketable, jumbo, and US no. 1 yield. Our results offer a potential solution for providing growers a readily available source of virus-tested propagule source that are comparable to field grown slips.

Genome-wide Association Study to Identify Loci for Sweetpotato Root Traits Using GWASpoly. Robert R. Bowers[1], Tyler J. Slonecki[2], Bode A. Olukolu[3], G. Craig Yencho[4], and Phillip A. Wadl[1]. [1]United States Department of Agriculture, Agricultural Research Service, United States Vegetable Laboratory, Charleston, SC. [2]Breeding Insight, Cornell University, Ithaca, NY. [3]Department of Entomology and Plant Pathology, University of Tennessee, Knoxville, TN 37996. [4]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695. (phillip.wadl@usda.gov)

Sweetpotato is an important food crop and plays a pivotal role in preserving worldwide food security. Due to its polyploid genome, high heterogeneity, and phenotypic plasticity, sweetpotato genetic characterization and breeding can be difficult. Genome wide association studies (GWAS) can provide important resources for breeders to improve breeding efficiency and effectiveness. GWASpoly, was used to identify single nucleotide polymorphisms (SNPs) associated with the root traits of shape, dry matter content, flesh color, skin color, and defects in a breeder subset of 384 accessions from the USDA sweetpotato germplasm collection. SNPs with significant associations were matched to the ‘Beauregard’ genome and any genes within a 75Kb range were recorded. There is wide diversity in sweetpotato flesh color with white, cream, yellow, orange, and purple varieties. Orange-fleshed varieties are high in the provitamin A beta-carotene; whereas purple-fleshed varieties have high concentrations of anthocyanins, which also have health-promoting properties. Varieties with high starch and dry matter content, which are preferred in sub-Saharan Africa, are typically white-fleshed and low in beta-carotene. A greater understanding of the genetic loci underlying sweetpotato root traits will enable marker-assisted breeding of new varieties with desired properties. This study provides supporting evidence for previous research on genetic loci involved in dry matter and beta-carotene content, and novel genetic loci involved in these, and other root traits are presented.

Yield and Quality of Sweetpotato Grown under Protected Culture Systems. Luis Duque[1], F. Di Gioia[1]. [1]Department of Plant Science, Penn State University, University Park, PA 16802. (lud88@psu.edu**)**

Horticultural-protected culture systems such as high and low tunnels are increasingly adopted across the United States as a flexible and sustainable tool to advance the production of vegetables, small fruits, herbs, cut flowers, and ornamentals. High and low tunnels are especially common as part of the farm infrastructure among small and diversified farms that market their products directly to consumers and/or specialty markets. These relatively low-cost cultivation systems provide an added protected environment relative to the field and allow an extended growing season. The application of protected culture systems such as low and high tunnels to sweetpotato crops in Pennsylvania could address some of the challenges mentioned above contributing to increase yield stability and quality, thereby opening new market opportunities. The goal of this research was to determine the adaptability and performance of sweetpotato to four different management strategies as follows: high tunnel (HT), low tunnel (LT), black plastic mulch (BPM) and bare ground (BG) tailored for the mild temperate growing conditions of the Mid-Atlantic and Northeastern U.S. All four management strategies were evaluated during the 2021-2023 growing season. Our results showed higher total and marketable yield (~700 bu/ac) using BPM compared to all other treatments (~400 bu/ac). With regards to sweetpotato categories, all treatments showed increased quantities in U.S. No. 1 compared to all other categories. In general, clones showed inconsistent yields under all treatments. However, Bayou Belle showed the highest U.S. No.1 yield under BPM, BG, and LT, while White Bonita showed the lowest U.S. No. 1 yield under BPM, HT, and LT. Overall findings suggest that sweetpotato clones are adaptable to different management systems, albeit with variable yield and quality attributes. Production of already available commercial sweetpotato germplasm under protected culture systems could be a profitable enterprise for vegetable growers in Pennsylvania and the Northeast region given the potential season extension, which could allow growers to diversify their operations and introduce a new crop in their rotation system.

Saturday January 20, 2024

7:30 Breakfast

8:00 Call to Order and Announcements

Plant Biology and Crop Production

Presiding: Amanda Nelson

8:15 Calculating Water Use Efficiency for Sweetpotato in North Carolina. Amanda Nelson[1]. [1]USDA-ARS-SWMRU Stoneville, MS 38776. (amanda.nelson@usda.gov)

The role of water in sweetpotato's growth and yield is vital. Climate change is leading to increased extremes in both frequency and intensity of droughts and floods, while water deficits reduce leaf water potential and total water use, and subsequently reduce total plant mass and storage root yield. The uncertainty in water supply makes it necessary to understand the role water has in sweet potato cultivation, including water use (WU) and water use efficiency (WUE). Little research has been done on WU and WUE in sweet potato and field studies are rare, especially within the United States. As a preliminary step to address this research need and calculate regional values, WU and WUE were measured and calculated for the 27 cultivar trials being conducted by ARS and NC State in North Carolina in two locations over three years. All trials had an average rainfall of 475 mm (502 at one site, 452 at the other) during the growing period, which was an average 116 days (114 at one site, 119 at the other). Total kg of sweetpotato yield per mm per hectare ranged from 16 to 335, with an average of 88, which is at the upper end of previous world-wide estimates. Trends for cultivars and sites will be presented.

8:30 Early Root Architectural Traits and their Relationship with Yield in *Ipomoea batatas* L. Duque, L.O.[1], Hoffman, G.[2], Pecota, K.[3], and Yencho, G. C.[3]. [1]Department of Plant Science, The Pennsylvania State University, University Park, PA 16802, U.S.A. 2. Department of Food Science, The Pennsylvania State University, University Park, PA 16802, U.S.A. [3]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27695, U.S.A. (lud88@psu.edu)

Background and Aims Root system architecture in storage root crops are an important component of plant growth and yield performance that has received little attention by researchers because of the inherent difficulties posed by in-situ root observation. Sweetpotato (Ipomoea batatas L.) is an important climate-resilient storage root crop of worldwide importance for both tropical and temperate regions, and identifying genotypes with advantageous root phenotypes and improved root architecture to facilitate breeding for improved storage root yield and quality characteristics in both high and low input scenarios would be beneficial. We evaluated 38 diverse sweetpotato genotypes for early root architectural traits and correlated a subset of these with storage root yield. Methods Early root architectural traits were scanned and digitized using the RhizoVision Explorer software system. Furthermore, average total and marketable yield and number of storage roots was assessed on a subset of eight genotypes in the field. Results Significant genotypic variation was detected for all early root traits including root mass, total root length, root volume, root area and root length by diameter classes. Based on the values of total root length, we separated the 38 genotypes into three root sizes (small, medium, and large). Principal component analysis identified four clusters, primarily defined by shoot mass, root volume, root area, root mass, total root length and root length by diameter class. Several early root traits were positively correlated with total yield, marketable yield, and number of storage roots. Conclusion These results suggest that early phenotyped root traits, particularly total root length and root mass could improve yield potential and should be incorporated into sweetpotato ideotypes. To help increase sweetpotato performance in challenging environments, breeding efforts may benefit through the incorporation of early root phenotyping using the idea of integrated root phenotypes.

8:45 Natural Arsenic Levels Stimulate Cultivar-Dependent Root Architectural Modifications During Transplant Establishment and Onset of Storage Root Formation in Sweetpotato. Arthur Villordon[1], Mae Ann Bravo[2], and Jack Baricuatro[3]. [1]LSU AgCenter Sweet Potato Research Station, Chase, LA 71324. [2]LSU AgCenter School of Plant, Environmental, and Soil Sciences, Baton Rouge, LA 70803.

[3]Department of Chemistry and Physics, LSU-Shreveport, Shreveport, LA 71115. (avillordon@agcenter.lsu.edu)

The primary objective of this work was to generate baseline species-specific information about root system architectural adaptations to natural levels of arsenic (As) during transplant establishment and onset of storage root formation in sweetpotato. Cultivars Bayou Belle and Beauregard were grown on sand substrate and provided with 0.5X Hoagland's nutrient solution with varying levels of As: 0, 5, 10, and 15 mg·L-1. In the first experiment, entire root systems were sampled at 5, 10 and 15 d, corresponding to key adventitious root developmental stages. Compared to the untreated controls at 15 d, 'Bayou Belle' and 'Beauregard' provided with 15 mg·L-1 As showed increases in the following root architectural attributes, respectively: 168% and 130% (main root length); 168% and 98% (lateral root length); and 140% and 50% (lateral root density). A second experiment was performed to produce storage root samples at 50 days. Storage root length, width, length/width ratio did not vary with As levels. As accumulation in storage roots increased with increasing As levels. The observations are consistent with findings in other species that show similar growth stimulation at low As levels. Findings from this study support the hypothesis that current sweetpotato cultivars are inherently adapted to natural levels of As.

9:00 SweetARMOR Update: Progress and Future Research Plans. Craig Yencho. Horticultural Science Department, North Carolina State University, Raleigh, NC 27695. (craig_yencho@ncsu.edu)

Sweetpotatoes are an important specialty crop in the southeastern US. However, the emergence of the root-knot nematode (RKN), *Meloidogyne enterolobii* (Me) in the southeast has created significant problems. Me can result in severe sweetpotato yield loss and it has resulted in crop and seed quarantines across the US. It is also a zero-tolerance pest in Europe. There are no acceptable Me resistant varieties and growers have adopted aggressive soil fumigation and nematicide treatments to reduce infestations, and growers continue to struggle with the Southern RKN, M. incognita (M.i.), too. Sustainable sweetpotato RKN management requires a systems-based approach using strategies including timely diagnostics, crop rotation, weed management, resistant varieties, economic forecasting and precision pesticide applications. The SweetARMOR project is a 4-year $5.1 million multistate (NC, LA, MS, TN and CA) effort that incorporates all of these concepts in a comprehensive research and extension project that integrates short-term outcomes that rapidly respond to the emerging Me pest issue, with a longer-term genomic-assisted sweetpotato breeding strategy. The goals of the project are to develop, implement, and evaluate a sustainable RKN management program in sweetpotato that can be used as a model in other vulnerable US specialty crops. Achievement of these goals will deliver varieties that can be grown in a production system that maximizes yield, storage root quality and culinary attributes, thus enabling stakeholders along the US sweetpotato supply chain to maintain their competitive advantage in the US and global marketplace. This presentation will highlight the most recent research developments of the SweetARMOR project and describe our future research plans.

9:15 Potassium Carrier and Rates and Their Influence on 'Covington' Sweetpotato Yields, 2023. Jonathan R. Schultheis[1], Brandon K. Parker[1], Stuart W. Michel[1], and Baker E. Stickley[1]. [1]Horticultural Science Department, North Carolina State University, Raleigh, NC 27695. (jonathan_schultheis@ncsu.edu)

A potassium carrier and rate study was conducted in 2023 to determine how these factors influenced 'Covington' sweetpotato yields in a low medium potassium index soil. The study was conducted on-farm with Hershel Williams & Sons farming operation in Autryville, North Carolina. Treatments were replicated four times and plot size was four-row plots that were 30 ft long and 44 in apart. Plants were spaced 12 in apart in-row. The three potassium carrier treatments were: muriate of potash (0-0-60), sulfate of potash (0-0-50), and potassium magnesium sulfate (KMag, 0-0-22). The four potassium rates employed were 0, 75, 150, and 225 units of potassium per acre. The study was planted 30 June and harvested 13 October, 105 days after planting. Roots from one of the middle rows were harvested, graded and sorted into US no. 1, canner, jumbo, and cull categories and weighed. Yields were similar regardless of the potassium carrier used. Yield of US no. 1 and total marketable roots were highest when either 150 or 225 units of potassium were applied per acre. US no. 1 yields ranged from 14,741 to 20,523 lb/ac for the 225 and 150 lb/ac rates, and ranged from 24,542 to 29,205 lb/ac for total marketable yields. In contrast, the 75 lb/ac rate generally led to reduced yields of 14,771, 14, 127, and 12,573 lb/ac when muriate of potash, KMag, and sulfate of potash, respectively were applied at the 75 unit/ac potassium rate. When no potassium was applied, yield of US no. 1 roots was 12,048 lb/ac. Yields averaged 28% improved marketable yields with either 150 or 225 potassium units/ac compared with 75 potassium unit/ac

9:30 Nematicide Efficacy and Variety Resistance in Sweetpotatoes. C.S. Stoddard[1] and A.T. Ploeg[2]. [1]UC Cooperative Extension, 2145 Wardrobe Ave., Merced, CA, 95341. [2]University of California Riverside, 3401 Watkins Dr., Riverside, CA, 92521. (csstoddard@ucanr.edu)

Management options for root knot nematodes (*Meloidogyne spp.*) on sweetpotatoes (*Ipomea batatas*) includes fumigation, nematicides, and variety resistance. Telone (1,3-D) is highly effective, however, the amount available is insufficient to meet the needs of the industry because California restricts Telone by implementing "use caps" for the entire state. Novel new nematicides offer potential new nematode management alternatives that are effective and less toxic as compared to fumigation. Nimitz (fluensulfone), Velum (fluopyram), Salibro (fluazaindolizine), and biofumigant materials were evaluated for efficacy and crop safety in commercial sweetpotato fields in California from 2017 – 2023. Application rates and timings varied by field and year, but in general most materials were applied through surface drip tape at maximum label rates. Velum and Salibro were applied after transplanting, using RCB design with four replications. Soil samples showed no significant ($p<0.05$) difference in root knot nematode (Meloidogyne incognita) counts in any treatment in any year as compared to the untreated control. Significant differences did occur between nematicide treatments on total market yield, with general order of response.
Salibro>Velum=Nimitz>biologicals=untreated. Averaged across all sites and years, Salibro and Velum had 35.5% and 18.0% higher yield, respectively, than untreated plots. The use of RKN-resistant sweetpotato cultivars is another option to minimize nematode damage. The peach root-knot nematode M. floridensis was first reported in California in 2018 from M. incognita-resistant almond rootstocks in Merced County, the center of California sweetpotato production, and in Kern County. The California Department of Food and Agriculture (CDFA)

rated this nematode as an A-rated pest in California, with a very limited distribution. No information is available on the host status of sweetpotato for M. floridensis, therefore, a study was performed to evaluate reproduction on seven sweetpotato cultivars and compared to a M. incognita race 3 and a M. incognita Mi-gene resistance-breaking isolate. Susceptible and an Mi-gene-carrying resistant tomato (Solanum lycopersicum) cultivars were also included in this study for comparison. Two sweetpotato cultivars were excellent hosts for all three Meloidogyne isolates, while three cultivars were resistant. The two remaining sweetpotato cultivars were hosts for M. floridensis and the resistance-breaking M. incognita isolate, allowing an increase in nematode populations, while they were poor hosts resulting in a decrease in nematode levels for the M. incognita race 3 isolate. The study showed that M. floridensis can reproduce on tomato and some sweetpotato cultivars that are considered resistant to M. incognita race-3 populations.

9:45 Can Stylet Oils Reduce Non-persistent Virus Transmission in Sweetpotato? Jeff Davis[1]. [1]Department of Entomology, Louisiana State University Agricultural Center, Baton Rouge, LA 70803. (jeffdavis@agcenter.lsu.edu)

The electrical penetration graph (EPG) technique has been essential in understanding the behavioral activities behind transmission of noncirculative plant viruses (i.e., virus particles attached to the cuticular lining of vector mouthparts or foregut). Intracellular punctures of epidermal or mesophyll cells related to “sap sampling,” termed potential drops (pd), are used by vectors to determine host quality. It is via these pds that noncirculative virus acquisition and inoculation occurs. Stylet oils have been reported to minimize virus spread of non-persistent stylet borne viruses like Sweetpotato feathery mottle virus (SPFMV) but are not commonly used in sweetpotato production. To better understand if stylet oils could be used in sweetpotato clean seed production, we conducted EPG studies to better understand the effects of stylet oils on aphid behaviors associated with virus transmission and vector efficiency trials to see if SPFMV acquisition and inoculation could be reduced.

10:00 Break

<u>Disease, Insect, and Weed Management</u>

Presiding: David Picha

10:30 Herbicide Tolerance of Diverse Sweetpotato Varieties. Prakriti Dhaka[1], Juan C. Velasquez[1], Felipe K. Salto[1], and Nilda Roma-Burgos[1]. [1]Department of Crop, Soil and Environmental Sciences, University of Arkansas, Fayetteville, AR. (prakriti@uark.edu)

A greenhouse study was conducted at University of Arkansas, Fayetteville in 2023 to determine sweetpotato tolerance to herbicides. Herbicide treatments (g ai ha-1) included carfentrazone (17.5 & 35), saflufenacil (37 &74), acifluorfen (280 & 560), sulfentrazone (126 & 252), metribuzin (42 & 84), imazethapyr (35 & 70), diclosulam (13.4 & 27), topramezone (9.2 & 18.4 g ai ha−1), fluridone (168 &336 g ai ha−1), glyphosate (560 & 1120 g ai ha−1) and glufosinate (409 & 818 g ai ha−1). These were 0.5X and 1X of recommended rates. Sweetpotato varieties tested were Diane, Orleans, Beauregard 14 (B14), Covington, 529, Morado, Beauregard, Bayou Belle, Hatteras, Evangeline, Centennial and Heartogold. The

herbicides were applied to sweetpotatoes with 50 cm vine length at 187 L ha-1 with the recommended adjuvants. Data were collected for injury at 7 and 28 days after treatment (DAT). At 7 DAT, the least injurious herbicides were imazethapyr, fluridone, glyphosate, metribuzine, and topramezone with 6.5 to 11% injury averaged across varieties and herbicide rates. These herbicides may be tested further for tolerance in field studies. Glufosinate and the PPO inhibitor herbicides caused severe injury ranging from 71 to 99%. In general, the 0.5X and 1X rates caused similar injury except for acifluorfen where the 0.5X rate caused 50% vs. 92% at 1X. Of these injurious herbicides, acifluorfen was tolerable at 0.5X in some varieties including Evangeline, Heartogold, Morado, 529, and Bayou Belle with injuries ranging from 19 to 28%. Thus far, three herbicides (fluridone, glyphosate, and glufosinate) were also evaluated at 28 DAT. Injury from fluridone remained low (0 to 16%) while that of glyphosate increased to about 50% in some varieties. Heartogold, Morado, and Diane were tolerant to 0.5X of glyphosate showing only 8% injury. Injury with glufosinate remained high across varieties regardless of rate, ranging from 78 to 100%.

10:45 Optimizing Nematicide Application Methods for Management of Reniform Nematode (*Rotylenchulus reniformis*) and Southern Root-knot Nematode (*Meloidogyne incognita*) on Sweetpotato. Tristan Watson[1]. [1]Plant Pathology and Crop Physiology, LSU AgCenter, Baton Rouge, LA 70803. (TWatson@agcenter.lsu.edu)

In Louisiana, the reniform nematode (*Rotylenchulus reniformis*) and southern root-knot nematode (*Meloidogyne incognita*) are economically important pests of sweetpotato. Management of these two plant-parasitic nematode species has focused primarily on the use of nematicides, as there are not commercially available sweetpotato varieties with resistance to both pests. Various nematicide formulations have been evaluated for nematode management in Louisiana, with Velum (active ingredient: fluopyram) and Majestene (active ingredient: bacterial metabolites) showing the most consistent efficacy across trial years. Many nematicide formulations can be applied using various methods, including Velum and Majestene. This study evaluated the influence of three nematicide application methods (broadcast, in-furrow, or hill drench) on the efficacy of Velum and Majestene applied to sweetpotato planted in a nematode infested field. Reniform nematode soil population densities were unaffected by nematicides, regardless of application method. All nematicide application methods provided some level of southern root-knot nematode suppression during the growing season; however, a yield benefit was only observed when Velum was applied in-furrow (+79 bu/A US#1 grade sweetpotatoes) or when Majestene was applied as a hill drench (+45 bu/A US#1 grade sweetpotatoes). Overall, these data suggest that nematicide efficacy can be optimized by choosing appropriate application methods for each formulation.

11:00 Examining Viral Presence in Collections of Hawaiian Heirloom Sweetpotato Varieties. Anna H. McCormick[1], Jon Y. Suzuki[2], Sharon Wages[2], Aurora Kagawa-Viviani[3], Stacy Lucas[1], Briette L. Corpuz[2], Theodore J.K Radovich[1] and Michael J. Melzer[4] and Michael B. Kantar[1]. [1]Department of Tropical Plant and Soil Sciences, St. John Plant Science Lab, University of Hawai'i at Manoa, 3190 Maile Way, Honolulu, HI, 96822. [2]Tropical Plant Genetic Resources and Disease Research Unit, USDA ARS Daniel K. Inouye U.S. Pacific Basin Agricultural Research Center, 64 Nowelo St., Hilo, HI 96720. [3]Water Resources Research Center/ Department of Geography and

Environment, 2424 Maile Way, Saunders Hall 445, Honolulu, HI, 96822. [4]Department of Plant & Environmental Protection Sciences, 3190 Maile Way, Honolulu, HI, 96822. (ahmccorm@hawaii.edu)

Sweetpotato has been a staple crop in the Hawaiian Islands since Polynesians settled the islands ~1,200 years ago. Previous work has established that Hawaiian Heirloom sweet potato varieties represent unique germplasm that are more closely related to each other than varieties from other parts of the world. While much work has been done characterizing Hawaiian heirloom plant genetics, much less work has been done characterizing viral genetic presence and diversity. In this study we explored viral presence across an extant collection of 70 Hawaiian heirloom varieties sourced from five different botanical collections over three Islands (O'ahu, Maui and Big Island Hawai'i). Samples were examined for the presence of four viruses from the family Potyviridae namely; Sweet potato virus G (SPVG), Sweet potato virus C (SPVC), Sweet potato virus 2 (SPV2), Sweet potato feathery mottle virus (SPFMV), and one from the family Geminiviridae; Sweet potato leaf curl virus (SPLCV). We found high levels of virus across all collections, including many instances of double and triple infections. These findings have large implications for conservation and local fresh markets.

11:15 Sweetpotato Variety Performance in Spring Cover Crops. Prakriti Dhaka[1], Juan C. Velasquez[1], Felipe K. Salto[1], Matheus M. Noguera[1], and Nilda Roma-Burgos[1]. [1]Department of Crop, Soil and Environmental Sciences, University of Arkansas, Fayetteville, AR. (nburgos@uark.edu)

A field study was conducted at the Vegetable Research Station, Kibler, Arkansas in 2023, to evaluate the performance of sweetpotato [*Ipomoea batatas* (L.) Lam.] varieties under spring-planted cover crops. This was a split-split plot experiment with three factors- weeding (main plot), cover crop (subplot), and cultivar (sub-subplot). Weeding treatments were hand-weeded and not-weeded; cover crops were cereal rye + clover, cereal rye + vetch, cereal rye + winter pea, and fallow, and sweet potato varieties were 'Heartogold,' 'Morado,' 'Centennial,' and 'Beauregard14'. Data included total cover crop biomass, weed count, vine length and sweetpotato yield. Crover crop biomass was highest with cereal rye + vetch followed by cereal rye + winter pea and cereal rye + clover, respectively. Grass weeds accounted for 95% of total weed species. The highest weed density occurred with cereal rye + clover cover crop in both weeded and non-weeded plots. The interaction effect of sweetpotato variety and cover crop, on weed density was significant, where the lowest total weed density occurred in plots with Heartogold planted into cereal rye + vetch cover crop. Regardless of variety and weeding treatment, sweetpotato vines were longest in cereal rye + vetch cover crop. Comparing varieties averaged across cover crops and weeding treatments, Centennial and Morado had the longest vines, while Heartogold had shortest four weeks after transplanting (4WAT). At 8 WAT, Morado planted in cereal rye + vetch cover crop had the longest vines in both weeding treatments. Total marketable yield was calculated as the sum of jumbo, no.1, and canner roots. Overall, hand-weeding increased yield by 127.8% relative to the non-weeded treatment. Among cover crops, cereal rye + vetch with handweeding and cereal rye + winter pea without handweeding resulted in the highest marketable yield of sweetpotato. Sweetpotato roots were significantly smaller in non-weeded plots compared to handweeded plots, regardless of cover crop and variety. Therefore, jumbo roots were rare in non-weeded plots. Whether handweeded or not, Centennial produced the highest yield, averaged across cover crops. Beauregard14 produced the lowest yield under handweeded treatment and Heartogold yielded the least without handweeding. Sweetpotato yield was positively correlated with vinelength (r=0.503).

11:30 NC Sweetpotato Virus Research Update: NCPN Economic Study and CleanSEED Report. Christie Almeyda[1], Chunying Li[1], Sofia Ruiz[1], Andrea Rivas[1], Ken Pecota[2] and Craig Yencho[2]. [1]Micropropagation and Repository Unit, Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC 27607. [2]Department of Horticultural Science, North Carolina State University, Raleigh, NC 27607. (cvalmeyd@ncsu.edu)

It is known that the accumulation and perpetuation of viruses in sweetpotato is a major constraint for production of seed and the commercial crop. The potyvirus complex is prevalent in NC and comprises Sweet potato feathery mottle virus (SPFMV), Sweet potato virus G (SPVG), Sweet potato virus C (SPVC) and Sweet potato virus 2 (SPV2). Under the National Clean Plant Network (NCPN) economic study, the sweetpotato clean centers started an experiment aiming to assess the value of clean seed in comparison to older generation seed. The goal of this study was to evaluate the performance and quality of foundation seed after it had been integrated into commercial sweetpotato operations. Because sweetpotato is vegetatively propagated, viruses and mutations can accumulate readily which can lead to cultivar decline. NCPN trials started in NC in 2021 with Covington and Beauregard as evaluated varieties. G1 seed was used as a reference to compare the yield and virus incidence of growers' generation 2 (G2), generation 3 (G3) and generation 4 (G4) seed roots (grown in the growers' seed production fields 1, 2 or 3 years following the year of foundation seed production). This experiment was repeated in 2023 as the last year for data collection. Virus data suggested a low incidence of viruses (mainly SPFMV) on G1 material. Potyviruses (mainly SPVG, SPVC and SPFMV) started to be prevalent on G2 and G3 material. In the older generation evaluated (G4), all potyviruses (SPVG, SPVC, SPFMV and SPV2) were detected. In general, the prevalence of four potyviruses was associated to higher seed generations, indicating a buildup over the years on clean seed regardless of the variety. This third year of data will correlate viral infections and yield results. The NCPN economic study will integrate data from the six sweetpotato clean centers participating in this initiative. This study will allow us to understand the impact of clean seed on the economic value of the crop to educate growers and stakeholders. One goal of the SCRI Clean SEED project is to evaluate best practices to harden greenhouse plants before cutting slips to plant in the field. The purpose of this study was to mitigate slip die-off after transplanting in the field to provide clean foundation seed producers with an increased plant survival rate. Stand counts were taking after a few weeks of planting and there were no differences in slip survival after transplanting. Storage root yield will be determined from the entire plot at harvest according to USDA grading standards. This study will be helpful to provide recommendations to growers at the early stage of field planting.

11:45 Progress Towards Developing Tools to Help Manage Root-Knot and Reniform

Nematode in Sweetpotato. William B. Rutter[1], Phil Wadl[1], Catherine Wram[2], Hannah Baker[1], Julianna Culbreath[1], Churamani Khanal[3], Tyler Slonecki[4], Tyr Wiesner-Hanks[4]. [1]USDA-ARS United States Vegetable Laboratory, Charleston, SC, 29414. [2]USDA-ARS, MNGDBL, Beltsville, MD, 20705. [3]Department of Plant and Environmental Sciences, Clemson University, Clemson, SC, 29634. [4]Breeding Insight, Cornell University, Ithaca, NY 14853. (william.rutter@usda.gov)

In the southern US, sweetpotatoes are infected and damaged by multiple species of nematode which reduce both the quantity and quality of storage roots. These pests include multiple species of root-knot nematodes (Meloidogyne species) and reniform nematode (*Rotylenchulus reniformis*). To help sweetpotato growers manage these pests, the US vegetable laboratory is working in collaboration with multiple institutions to identify new sources of resistance to both root-knot and reniform nematodes in sweetpotato, develop new genotyping and phenotyping tools to accelerate resistance breeding, and test new detection tools to help slow the spread of invasive species such as *Meloidogyne enterolobii*. We will provide brief updates on all of our ongoing nematology research with regards to sweetpotato and solicit feedback on where future research efforts should be focused.

12:00 Lunch

<u>Business and Planning Meeting</u>

1:00 Call to Order and Review of 2023 Minutes Shaun Francis

1:15 Graduate Student Contest Results Michelle McHargue

1:30 National Impact Award Mark Shankle

1:45 Resolutions Resolutions Committee
- Ken Pecota, Cole Gregorie, Michelle McHargue

2:00 Collaborator's Trial Discussion Jonathan Schultheis

2:15 Nominations Committee Report Nominations Committee
-Craig Yencho, Mark Shankle, Tara Smith

2:20 2025 Meeting Location Katie Jennings

2:30 National Stakeholder Group Update Tara Smith

2:45 Multistate Project Update David Monks

3:00 Adjourn

State Reports

State: Mississippi

Name of respondent, title, and affiliation:
Lorin Harvey - Mississippi Sweetpotato Specialist

Planted acreage in 2023:
28,039 acres

Harvested acreage in 2023:
≈27,700 acres

Percent of crop marketed for fresh and processing:
80% Fresh, 20% process

Anticipated acreage for 2024:
28,000 acres

Varieties grown and estimated percent of acreage:
Beauregard: 75%
Orleans: 20%
Others: 5%

Percent of acreage irrigated: 20%

Major pest problems: Weeds (nutsedge, smell mellon, hornbeam copperleaf), above normal incidence of soft rot in storage.

Abiotic disorders: Drought and excessive heat.

Other major challenges to production: Cost of production and labor.

Other comments: Overall yields were below average. Most of the crop was affected by excessive heat and drought from late June through August with many fields going 45+ days without rain. These conditions caused decreased yields and extreme variability in root size.

State: Florida

Name of respondent, title, and affiliation:
Wendy Mussoline, PE, PhD, UF/IFAS County Extension Director and Agriculture Agent

Planted acreage in 2023:
4,708 acres

Harvested acreage in 2023:
NE FL – 8 acres purple-flesh varieties
NW FL – 200 acres Beauregard
South FL – 4,500 acres Boniato

Percent of crop marketed for fresh and processing:
100% Fresh Market

Anticipated acreage for 2024:
Same

Varieties grown and estimated percent of acreage:
See above

Percent of acreage irrigated:
100%

Major pest problems (weeds, insects, diseases):
NA

Abiotic disorders (herbicide, nutrient, weather-related):
NA

Other major challenges to production (lack or storage, labor issues, water rights, etc):
---Profitability on large scale
---Wireworm
---Effective herbicides are not available
---Plant material is difficult to access

State: Louisiana

Name of respondent, title, and affiliation:
Jeffrey Cole Gregorie, Instructor/ Sweetpotato Specialist LSU AgCenter

Planted acreage in 2023:
5347.54 acres

Harvested acreage in 2023:
≈5,250 acres

Percent of crop marketed for fresh and processing:
48% Fresh 62% Processing

Anticipated acreage for 2024:
5,500 acres

Varieties grown and estimated percent of acreage:
Beauregard: 40%
Orleans: 40%
Bayou Belle: 18%
Others: 2%

Percent of acreage irrigated: 90%

Major pest problems: Weeds (nutsedge, pigweed, smell mellon), Insects (cucumber beetles), Deer pressure

Abiotic disorders: Drought and excessive heat

Other major challenges to production: Labor continues to issue of concern.

Other comments: The crop in the northern region of the state was mostly planted under good growing conditions; however, the southern part of the state experienced drought conditions for the majority of the production season. Entering late June, drought conditions became prevalent throughout the state and have remained into the month of November. Along with the drought, growers also had to deal with excessive heat with temperatures averaging over 100°F for many days in July and August. With these extreme weather conditions came uncertainty for how the crop would perform. Where irrigation was not possible in drought-stricken areas, yields were reduced. Fortunately, most of the acreage in Louisiana can be irrigated, and on those acres, strong yields with above average packouts were reported.

State: North Carolina

Name of respondent, title, and affiliation:
Jonathan Schultheis, Professor, North Carolina State University

Planted acreage in 2023:
72,000

Harvested acreage in 2023:
72,000

Percent of crop marketed for fresh and processing:
75% fresh: 25% processing

Anticipated acreage for 2024:
78,000

Varieties grown and estimated percent of acreage:
Covington – 93%; Murasaki – 3%; Bayou Belle – 2%; Beauregard – 1%; Others – 1%

Percent of acreage irrigated: <5%

Major pest problems (weeds, insects, diseases):

Weeds: Palmer amaranth, nutsedge
Insects: Wireworms
Diseases:
Abiotic disorders (herbicide, nutrient, weather-related): None

Other major challenges to production (lack or storage, labor issues, water rights, etc):
1. Market shrinkage and competition for international markets
2. Continued increases in labor costs
3. Contiuned increases in production costs

Other comments:
The weather during harvest was very good such that all planted acreage was harvested. Root quality was excellent. In some cases, roots were smaller is some cases (did not size up) due to relatively dry conditions in some growing locations.

State: Arkansas

Name of respondent, title, and affiliation:
Shaun Francis, Extension Specialist, University of Arkansas at Pine Bluff

Planted acreage in 2023:
App. 5,260 acres

Harvested acreage in 2023:
100% of planted acreage

Percent of crop marketed for fresh and processing:
65% Fresh, 35% Processing

Anticipated acreage for 2024:
5,600 acres

Varieties grown and estimated percent of acreage:
Beauregard: 50%
Orleans: 50%
Others: <1%

Percent of acreage irrigated:
50%

Major pest problems: Weeds (pigweed, yellow nutsedge, smell melon), Insects (cucumber beetle)

Abiotic disorders: Dry spell, particularly during planting

Other major challenges to production: Very difficult attracting local labor. The increasing cost of hiring nonimmigrant labor via the H-2A program is increasing growers' cost of production.

Other comments: The lack of adequate moisture caused by a severe dry spell really hurt some growers. However, those farmers who were in a position to irrigate their fields still managed to obtain above average yields.

State: California

Name of respondent, title, and affiliation:
Scott Stoddard, Farm Advisor, UC Cooperative Extension Merced County

Planted acreage in 2023: 18,500 acres

Harvested acreage in 2023: 18,500

Percent of crop marketed for fresh and processing:

80% Fresh 20% Processing

Anticipated acreage for 2024: 17,500 acres

Varieties grown and estimated percent of acreage:
Beauregard: 0%
Orleans: 0%
Covington: 25%
Diane: 30%
Bellevue: 10%
Vermillion: 5%
Bonita: 10%
Murasaki: 15%
Purple/purple (Stokes purple and various numbered lines from LSU and NCSU): 4%
Others: 1%

Percent of acreage irrigated: 100%

Major pest problems: Southern blight in the hotbeds continues to be a minor issue for most growers, especially with Diane. RKN. Fusarium + charcoal rot (Macrophomina) pre and post harvest.

Abiotic disorders: nothing this year.

Other major challenges to production: Cost of labor is a major issue; harvest.

Other comments: Wet winter with twice average precipitation resulted in slow hotbed growth and delayed planting, but was otherwise beneficial for the growers and helped with leaching of salts and field prep for fumigation because moist soil is required. June was extremely mild, with most days below 90 F and no major wind, which resulted in excellent stands and root set for most fields. Yields were excellent this year overall and about 10 bins to the acre above average (~40 bins/A). Nonetheless, input costs have skyrocketed in the past 3 years, resulting in net negative returns for many growers. Significant reduction in acreage is expected in 2024.

TABLE 1. NATIONAL SWEETPOTATO COLLABORATORS ENTRY FORM
2024 Trial

ENTRIES	BREEDER	COMMENTS

DON R. LABONTE, LSU DEPT OF HORTICULTURE
137 J.C. MILLER HALL, BATON ROUGE, LA 70803
225-578-1024, FAX 225-578-1068, DLabonte@agctr.lsu.edu

PHILLIP WADL, USDA/ARS, US VEGETABLE LAB
2700 SAVANNAH HWY, CHARLESTON, SC 29414
843-402-5308, FAX 843-573-4715, Phillip.Wadl@ARS.USDA.GOV

G. CRAIG YENCHO, NCSU DEPT OF HORTICULTURE
214A KILGORE HALL, RALEIGH, NC 27695
919-513-7417, FAX 919-515-2505, Craig_Yencho@ncsu.edu

For NCSU entries please contact:
KEN PECOTA, NCSU DEPT OF HORTICULTURE
212 KILGORE HALL, RALEIGH, NC 27695
919-218-1537, FAX 919-515-2505, Ken_Pecota@ncsu.edu

Collaborators Reports

2023 Louisiana Collaborators Trial – Mer Rouge, Louisiana

The Collaborator Trial was in Mer Rouge, LA. This is a sandy loam texture soil – much different than most soils in Louisiana. The trial was planted on 9 June, 2023 and harvested 10 October, 2023 – 123 days. The stand was excellent and good growth early, but a significant weed infestation occurred. The weeds were universal and heavy in certain areas of the plot. This made yield estimates unreliable; however, overall root shape was excellent for most lines. High temperatures and dry conditions prevailed. Herein are observations on the various lines in the trial.

LA18-100 – Attractive round elliptic shape in this trial. Lighter skin tone than Beauregard with a rose cast. Often see some color variation in storage roots but fades in storage. Plant bed production is best when roots are pre-sprouted. There was a significant number of Jumbos which is indicative of earliness.

05-097 (USDA) – Red skin roots were very long. There was significant latex produced. Likely needs a heavier soil type for proper root shape. This line was in a heavy weed area. No plant bed data as plants from greenhouse.

NCP16-0046 – Purple, smooth skin. Roots were mostly round-elliptic. Yield was very low – likely a high weed infestation. No plant bed data as plants from greenhouse. No plant bed data as plants from greenhouse.

Purple Majesty – Purple skin and flesh. U.S. #1 and #2 roots were very round and yield was good. There was significant latex produced. No plant bed data as plants from greenhouse.

Purple Splendor – Purple skin and flesh. U.S. #1 roots were very attractive and mostly elliptic with smooth skin. The U.S. #2 roots were a mix of attractive elliptic to round. Yield was good. Some latex but not significant. No plant bed data as plants from greenhouse.

Beauregard – Light rose, copper skin. Roots were elliptic for U.S. #1 and U.S. #2 were a mix of elongate and elliptic roots. Yield was fair and impacted by weeds.

Orleans – Light rose, copper skin. Roots were elliptic for U.S. #1 and U.S. #2 roots. Yield was fair and impacted by weeds.

Covington – Rose skin. U.S. #1 roots were elliptic and attractive. U.S. # 2 roots were a mix of round to elliptic. Yield was low and impacted by weeds.

NATIONAL SWEET POTATO COLLABORATORS SUMMARY OF DATA
2023

BUSHELS PER ACRE (50 lbs.)

STATE AND LOCATION REPORTING: New Hampshire________

DATE TRANSPLANTED:6/9/23 DATE HARVESTED: 9/28/23 NO. GROWING DAYS:111

DISTANCE BETWEEN ROWS (in.):72 DISTANCE IN ROW(in.):9

PLOT SIZE: NO. OF ROWS:1 LENGTH (ft.):20 (except as noted below) NO.REPLICATIONS:4

IRRIGATION (AMOUNTS AND DATES): Irrigated to provide ½ inch of rain equivalent 4-5 times during the first 2-3 weeks after transplant; with one additional application in end of july. We also received 23.25 inches of natural rainfall between 9 June and 28 Sept 2023.

FERTILIZER: N 75lbs, P_2O_5 0lbs, K_2O 200lbs (PER ACRE)

SELECTION	US #1'S	CANNERS	JUMBOS	TOTAL MARKETABLE	PERCENT US #1'S	CULLS
L18-100 [a]				619		325
05-097 (USDA) [b]				334		67
NC15-0728 [b]				542		76
NCP16-0046 [b]				489		191
NC17-0452 [b]				515		199
Purple Majesty				279		79
Purple Splendor				469/562		147/142
Beauregard				499		345
Orleans				543		150
Covington				409		124
Bonita				441		133

[a] only 7.5 foot plots (10 slips) were used; limited plant material
[b] only 15 foot plots (20 slips) were used; limited plant material

Our grading: *Roots were sorted into the following categories: marketable (root diameter at least 1.5 inch with no major defects that would reduce storage life), cull (roots of any size that exhibited wounds, breakage, or severe cracking that would reduce storage life), undersized (small roots with diameter less than 1.5 inches, that did not fall into the cull category). The marketable category in this modified rating system corresponds with the U.S. standard No. 1 and No. 2 categories (USDA, 2005).*

US #1's - Roots 2" to 3 1/2" diameter, length of 3" to 9", must be well shaped and free of defects.
Canners - Roots 1" to 2" diameter, 2" to 7" in length.
Jumbos - Roots that exceed the diameter, length and weight requirements of the above two grades, but are of marketable quality.
Percent US #1's - Calculated by dividing the weight of US #1's by the total marketable weight (Culls not included).

Culls - Roots must be 1" or larger in diameter and so misshapen or unattractive that they could not fit as marketable roots in any of the above three grades.

NATIONAL SWEET POTATO COLLABORATORS SUMMARY OF DATA 2023

BUSHELS PER ACRE (50 lbs.)

STATE AND LOCATION REPORTING: Arkansas, Pine Bluff

DATE TRANSPLANTED: _6/13/2023_ DATE HARVESTED: _10/12/2023_ NO. GROWING DAYS: _121_

DISTANCE BETWEEN ROWS (in.): ___42___ DISTANCE IN ROW(in.): ___12____

PLOT SIZE: NO. OF ROWS: __2___ LENGTH (ft.): __25___ NO.REPLICATIONS: ___4___

IRRIGATION (AMOUNTS AND DATES): __Furrow irrigation at planting and as needed during season__

FERTILIZER: N _40 lbs._, P_2O_5 _140 lbs.__, K_2O __180 lbs.__(PER ACRE)

SELECTION	US #1'S	CANNERS	JUMBOS	TOTAL MARKETABLE	PERCENT US #1'S	CULLS
L18-100	X	X	X	X	X	X
05-097 (USDA)	256 de	137 ab	39 d	432 de	59 bc	124 a
NC15-0728	377 bc	85 cd	146 bc	608 ab	62 bc	36 b
NCP16-0046	311 cde	154 a	33 d	498 bcd	62 bc	22 b
NC17-0452	460 ab	99 c	62 cd	621 ab	74 a	16 b
Purple Majesty	516 a	104 bc	81 bcd	701 a	73 a	24 b
Purple Splendor	222 e	57 de	77 bcd	356 e	62 bc	43 b
Beauregard	332 cd	41 e	256 a	629 ab	55 c	21 b
Orleans	443 ab	95 c	170 ab	708 a	62 bc	26 b
Covington	389 bc	91 c	100 bcd	580 abc	67 ab	21 b
Bonita	304 cde	89 cd	67 cd	460 cde	66 ab	17 b

US #1's - Roots 2" to 3 1/2" diameter, length of 3" to 9", must be well shaped and free of defects.
Canners - Roots 1" to 2" diameter, 2" to 7" in length.
Jumbos - Roots that exceed the diameter, length and weight requirements of the above two grades, but are of marketable quality.
Percent US #1's - Calculated by dividing the weight of US #1's by the total marketable weight (Culls not included).
Culls - Roots must be 1" or larger in diameter and so misshapen or unattractive that they could not fit as marketable roots in any of the above three grades.

NATIONAL SWEET POTATO COLLABORATORS SUMMARY OF DATA 2023

BUSHELS PER ACRE (50 lbs.)

STATE AND LOCATION REPORTING: NCSU, Horticultural Crops Research Station, Clinton

DATE TRANSPLANTED: 06/15/2023 DATE HARVESTED: 10/03/2023
NO. GROWING DAYS: 110

DISTANCE BETWEEN ROWS (in.): 42 DISTANCE IN ROW(in.): 12

PLOT SIZE: NO. OF ROWS: 2 LENGTH (ft.): 25 NO.REPLICATIONS: 4

IRRIGATION (AMOUNTS AND DATES): 0.5” on 8/22

FERTILIZER: N 87 , P_2O_5 94 , K_2O 202 , B 0.5 (PER ACRE)

Selection	US #1	Canner	Jumbo	Total Marketable	Percent US #1	Cull
Beauregard_G2	425	116	169	709	60	62
Bonita_G2	181	189	20	390	46	71
Covington_G2	202	166	22	390	50	49
L14-31_G2	418	134	68	620	67	49
L18-100_G2	403	105	233	740	52	46
NC15-0728_G9	326	219	31	576	56	32
NC16-0193_G2	164	330	36	530	32	21
NC17-0452_G7	354	194	34	582	61	41
NC17-0799_G7	237	156	41	434	53	50
NCMC18-0168_G6	384	205	64	653	58	24
NCP16-0046_G2	293	154	40	488	60	8
Orleans_G2	472	136	52	661	72	58
PurpleMajesty_G2	340	124	55	519	65	26
PurpleSplendor_G2	252	212	49	513	47	36
USDA05-097_G2	194	258	28	481	37	54
USDA09-130_G2	404	227	52	682	59	45
Mean	316	183	62	560	55	42
LSD (0.05)	124	55	51	148	14	47
CV	28	21	58	19	18	78

US #1's - Roots 2" to 3 1/2" diameter, length of 3" to 9", must be well shaped and free of defects.
Canners - Roots 1" to 2" diameter, 2" to 7" in length.
Jumbos - Roots that exceed the diameter, length and weight requirements of the above two grades, but are of marketable quality.
Percent US #1's - Calculated by dividing the weight of US #1's by the total marketable weight (Culls not included).
Culls - Roots must be 1" or larger in diameter and so misshapen or unattractive that they could not fit as marketable roots in any of the

above three grades.

2023 NATIONAL SWEETPOTATO COLLABORATOR TRIAL DESCRIPTORS

STATE AND LOCATION REPORTING: NCSU, HCRS, Clinton, NC
SOIL TYPE: Sandy Loam
COMMENTS: High set and good shapes, could have harvested 2 weeks later

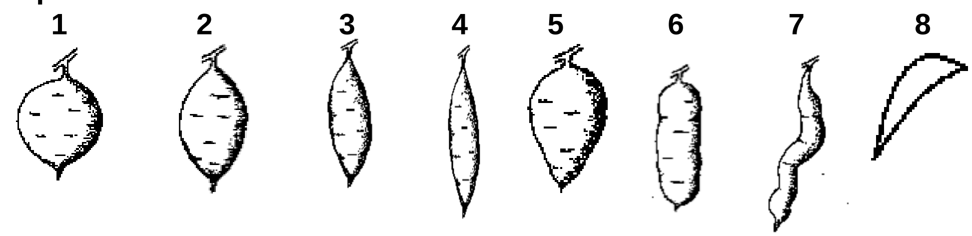
SELECTION	Skin color	Skin texture	Flesh color	Eyes	Lenticels	Shape	Shape uniformity	Season	Overall appearance	Comments
Beauregard_G2	Rose	6	Orange	7	7	6,3	6	2	6	Blocky, HighYield
Bonita_G2	Cream	7	Cream	7	7	3,6	6	1	6	nice finish
Covington_G2	Rose	6	Orange	7	6	6	6	2	6	Good shapes
L14-31_G2	Red	6	Orange	7	7	3,6	6	2	6	Good shapes
L18-100_G2	Rose	7	Orange	7	6	6,3	6	3	6	Blocky, low set
NC15-0728_G9	Yellow	7	Cream	6	7	3,6	6	2	6	Blocky, good shapes
NC16-0193_G2	Red	7	Cream	7	7	3,6	7	1	6	Good Uniformity
NC17-0452_G7	Orange	7	Orange	7	7	3,6	7	2	7	Good size, uniformity and root stalk
NC17-0799_G7	Purple		White	7	6	6,3	6	2	6	Good shapes
NCMC18-0168_G6	Orange	7	Orange	7	6	6,3	7	2	7	Good shapes and uniformity
NCP16-0046_G2	Purple	7	Purple	7	7	3,6	7	1	6	Good shapes, uniformity
Orleans_G2	Rose	6	Orange	6		6	6	2	6	Blocky
PurpleMajesty_G2	Dark Purple	5	Purple	6	5	3,6	7	2	6	Good shapes, uniformity, size
PurpleSplendor_G2	Dark Purple		Orange	7		6	6	1	6	Inconsistent length
USDA05-097_G2	Red	7	Orange	7	7	3	7	2	6	Good shapes, off sizing
USDA09-130_G2	Orange	7	Orange	7	5	3,6	7	2	7	Good size distribution and shapes

Skin color	Skin texture	Flesh Color	Eyes	Lenticels	Shape	Shape uniformity	Season
1= white	1 = very rough	0 = white	1 = very deep	1 = very prominent	1 = round	1 = very poor	4 = early
2= cream	3 = moderately rough	1 = cream	3 = deep	3 = prominent	2 = round-elliptic	3 = poor	3 = mid to early
3= tan	5 = moderately smooth	2 = yellow	5 = moderate	5 = moderate	3 = elliptic	5 = moderate	2 = midseason
4= copper (Jewel)	7 = smooth	3 = orange	7 = shallow	7 = few	4 = long elliptic	7 = good	1 = mid to late
5= orange (Hern.)	9 = very smooth	4 = deep orange	9 = very shallow	9 = none	5 = ovoid	9 = excellent	0 = late
6= rose (Beau)		5 = Purple			6 = blocky		
7= purple					7 = irregular		
					8 = asymmetric		

Overall appearance

1 = very poor
3 = poor
5 = moderate
7 = good
9 = excellent

Shapes



NATIONAL SWEET POTATO COLLABORATORS SUMMARY OF DATA
2023

BUSHELS PER ACRE (50 lbs.)

STATE AND LOCATION REPORTING: NCSU, Cunningham Research Station, Kinston

DATE TRANSPLANTED: 06/29 DATE HARVESTED: 10/17
NO. GROWING DAYS: 110

DISTANCE BETWEEN ROWS (in.): 42 DISTANCE IN ROW(in.): 12

PLOT SIZE: NO. OF ROWS: 2 LENGTH (ft.): 25 NO.REPLICATIONS: 5

IRRIGATION (AMOUNTS AND DATES): 0.4” on 7/27, 7/31, 8/9, 8/10, 8/21; 2” total

FERTILIZER: N 60 , P_2O_5 60 , K_2O 152 , B 0.5 (PER ACRE)

Selection	US #1	Canner	Jumbo	Total Marketable	Percent US #1	Cull
Beauregard_G2	283	48	366	696	44	77
Bonita_G2	179	68	164	411	45	66
Covington_G2	334	96	85	515	65	37
L14-31_G2	293	81	271	645	45	133
L18-100_G2	286	58	337	681	41	40
NC15-0728_G9	274	95	171	539	51	18
NC16-0193_G2	354	131	54	539	66	69
NC17-0452_G7	326	127	72	525	62	88
NC17-0799_G7	371	100	61	532	70	62
NCMC18-0168_G6	317	116	160	593	53	56
NCP16-0046_G2	219	79	210	508	43	94
Orleans_G2	376	52	228	656	57	103
PurpleMajesty_G2	279	65	151	495	56	74
PurpleSplendor_G2	165	81	146	392	41	74
USDA05-097_G2	195	166	73	435	43	91
USDA09-130_G2	365	137	159	660	55	97
Mean	283	94	168	550	52	74
LSD (0.05)	90	49	101	109	15	51
CV	25	41	47	15	23	55

US #1's - Roots 2" to 3 1/2" diameter, length of 3" to 9", must be well shaped and free of defects.
Canners - Roots 1" to 2" diameter, 2" to 7" in length.
Jumbos - Roots that exceed the diameter, length and weight requirements of the above two grades, but are of marketable quality.
Percent US #1's - Calculated by dividing the weight of US #1's by the total marketable weight (Culls not included).
Culls - Roots must be 1" or larger in diameter and so misshapen or unattractive that they could not fit as marketable roots in any of the above three grades.

2023 NATIONAL SWEETPOTATO COLLABORATOR TRIAL DESCRIPTORS

STATE AND LOCATION REPORTING: NCSU, Cunningham Research Station, Kinston
SOIL TYPE: Sandy Loam
COMMENTS: Low set, more jumbos, could have harvested 2 weeks earlier

SELECTION	Skin color	Skin texture	Flesh color	Eyes	Lenticels	Shape	Shape uniformity	Season	Overall appearance	Comments
Beauregard_G2	Rose	7	Orange	7	7	6,2	6	3	6	
Bonita_G2	Cream	7	White	7	7	3	7	2	6	nice size
Covington_G2	Rose	7	Orange	7	7	6,2	7	2	6	
L14-31_G2	Light Purple	7	Orange	7	6	2,3	6	2	6	
L18-100_G2	Rose	7	Orange	7	7	6,2	7	4	6	skin discoloration, early
NC15-0728_G9	Yellow	7	Yellow	7	6	6,2	6	2	6	
NC16-0193_G2	Purple	5	White	7	7	6,3	7	2	7	looks very nice
NC17-0452_G7	Orange	7	Orange	7	8	6,3	7	2	6	
NC17-0799_G7	Red	7	White	7	7	3,2	5	2	6	
NCMC18-0168_G6	Orange	7	Orange	7	7	6	6	2	7	Looks nice
NCP16-0046_G2	Light Purple	7	Light Puprle	7	7	6,2	7	2	7	Good shapes
Orleans_G2	Rose	2	Rose			6	6	2		
PurpleMajesty_G2	Dark Purple	7	Purple	7	5	6,2	7	2	6	
PurpleSplendor_G2	Purple	7	Purple	7	5	2	6	2	5	off sizing
USDA05-097_G2	Red	7	Orange	7	7	3	7	2	6	Good shapes, off sizing
USDA09-130_G2	Orange	7	Orange	7	5	3,6	7	2	7	Good size distribution, shapes

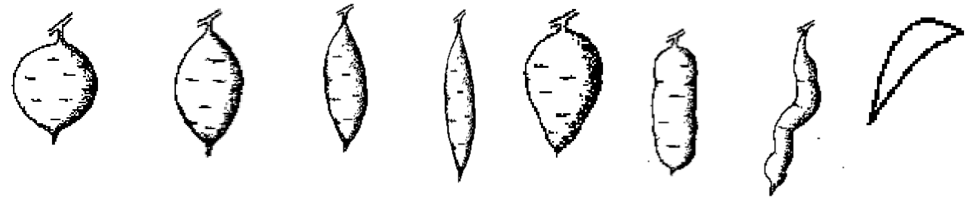
Skin color	Skin texture	Flesh Color	Eyes	Lenticels	Shape	Shape uniformity	Season
1= white	1 = very rough	0 = white	1 = very deep	1 = very prominent	1 = round	1 = very poor	4 = early
2= cream	3 = moderately rough	1 = cream	3 = deep	3 = prominent	2 = round-elliptic	3 = poor	3 = mid to early
3= tan	5 = moderately smooth	2 = yellow	5 = moderate	5 = moderate	3 = elliptic	5 = moderate	2 = midseason
4= copper (Jewel)	7 = smooth	3 = orange	7 = shallow	7 = few	4 = long elliptic	7 = good	1 = mid to late
5= orange (Hern.)	9 = very smooth	4 = deep orange	9 = very shallow	9 = none	5 = ovoid	9 = excellent	0 = late
6= rose (Beau)		5 = Purple			6 = blocky		
7= purple					7 = irregular		
					8 = asymmetric		

Overall appearance

1 = very poor
3 = poor
5 = moderate
7 = good
9 = excellent

Shapes

1 2 3 4 5 6 7 8



NATIONAL SWEETPOTATO COLLABORATORS SUMMARY OF DATA

2023

STATE AND LOCATION REPORTING: Livingston, CA
DATE TRANSPLANTED: 5/17/2023. DATE HARVESTED: 9/20/2023. No. GROWING DAYS: 126
DISTANCE BETEEN ROWS (in): 40. DISTANCE IN ROW (in): 10
PLOT SIZE: NO. OF ROWS: 1 LENGTH (ft): 45 NO. OF REPS: 4
IRRIGATION: drip irrigation. 1.5 to 2 inches per week during summer, total 30".
FERTILIZER: PPI 60 gpa 8-8-8 followed by drip applied 10-0-10. About 175-50-175 N-P2O5-K2O.

			-------	50	lb Bu/A	-------		%	%	
#	SELECTION	CLASS	US #1's	CANNERS	JUMBOS	MKT YIELD	BINS/A	US #1's	CULLS	L:D
4	Cov G3	Yam	814	250	68	1131	70.7	71.8%	6.3%	3.31
3	NC 09-122 G2	Red	729	199	196	1123	70.2	65.7%	8.8%	3.39
15	Murasaki	Japanese	718	140	208	1066	66.6	67.3%	4.8%	2.57
11	NC 10-0118	Yam	662	193	61	917	57.3	72.4%	30.0%	3.07
2	L-14-31	Red	633	179	144	956	59.7	66.4%	9.0%	3.16
14	Bellevue G2	Yam	625	171	182	978	61.1	64.3%	13.8%	2.99
13	Vermillion G2	Red	621	178	55	855	53.4	72.6%	12.7%	3.30
8	Purple Splendor	Purple	619	280	62	961	60.0	64.4%	7.1%	3.13
9	Diane	Red	605	273	48	926	57.8	65.3%	14.5%	3.84
10	Purple Majesty	Purple	604	109	87	800	50.0	76.0%	5.1%	3.16
6	L-18-100	Yam	507	64	321	891	55.7	57.6%	18.4%	3.02
5	Orleans	Yam	498	101	61	660	41.3	74.8%	39.7%	3.42
1	Bx-G1	Yam	382	82	217	681	42.6	57.6%	31.9%	3.17
7	Bx-G3	Yam	372	68	148	589	36.8	63.7%	37.2%	3.20
12	L-14-11	Red	340	107	45	492	30.8	69.3%	17.8%	3.12
	Average		582	160	127	868	54	67.3%	17.1%	3.19
	LSD 0.05		128.2	54.4	104.0	200.0	12.5	9.4%	16.6%	0.5
	CV, %		15.4	23.9	57.7	16.1	16.1	9.8	67.8	10.5

US #1's	Roots 2 to 3.5 inches in diameter, length 3 to 9 inches, well shaped and free of defects.
Mediums	Roots 1 to 2 in diameter, 2 to 7 inches in length.
Jumbos	Roots that exceed the size requirements of above grades, but are marketable quality.
Mkt Yield	Total marketable yield is the sum of the above three categories.
bins/A	bins/A are estimated based on market box yield assuming 20 boxes (17.6 Bu) per bin.
% US #1's	Weight of US #1's divided by total marketable yield.
% Culls	Roots greater than 1" in diameter that are so misshapen or unattractive as to be unmarketable.
LSD 0.05	Least significant difference. Means separated by less than this amount are not significantly different (ns).
L:D	Length to diameter ratio (10 root sample)
CV, %	Coefficient of variation, a measure of variability in the experiment.

SCORE SHEET FOR EVALUATION OF SWEETPOTATO SPROUT PRODUCTION
2023

Date Bedded: 2/23/23 Location: Livingston,CA
Date Evaluated: 4/6/2023 Type of Bed: cold
Evaluated by: C.S. Stoddard

Selection	Roots Presprouted Yes / No	Plant Production 1-5 (1)	Uniformity of Emergence 1-5 (2)	Earliness 1-3 (3)	Root Conditions 1-5 (4)	Remarks (5)
L18-100	Yes	3	3	1	5	lots small plants all green
05-097 (USDA)	---	---	---	---	---	Rec'd as plants
NC15-0728	---	---	---	---	---	Rec'd as plants
NCP16-0046	---	---	---	---	---	Rec'd as plants
NC17-0452	---	---	---	---	---	Rec'd as plants
Purple Majesty	Yes	1	2	1	5	all green, all small
Purple Splendor	Yes	5	5	3	5	all green, tall, most production
Beauregard	Yes	3	2	2	5	light purple new growth
Orleans	Yes	4	4	2	5	mostly uniform
Covington	Yes	3	3	2	5	purple new growth dk green
Bonita	---	---	---	---	---	Not in trial

(1) Plant production is to be rated from 1-5 based on observation during pulling season. A rating of 1 indicates LOW plant production, while 5 indicates GOOD plant production.
(2) Uniformity of emergence is to be rated from 1-5. One (1) indicates POOR uniformity while 5 indicates the HIGHEST degree of uniformity of emergence.
(3) Earliness of plant production is to be rated from 1-3. One (1) indicates LATE emergence while 3 indicates EARLY production.
(4) Root conditions six weeks after first pulling are to be rated from 1-5. One (1) indicates COMPLETE ROTTING, while 5 indicates PERFECTLY SOUND conditions.
(5) Notes on size of root, decay in beds, etc.

2023 NATIONAL SWEETPOTATO COLLABORATOR TRIAL DESCRIPTORS

STATE AND LOCATION REPORTING:___Livingston, CA_______________

SOIL TYPE:_____Delhi Sand_____________

COMMENTS:

The first of two screening trials. This location was with Quail H Farms, field near Livingston, CA. Soil type was Delhi sand, (pH 6.0, EC 1.10, Na 1.2% base sat). Conventional field, fumigated with metam-K prior to planting. Drip irrigated, water quality good. Wet winter with 2X average precipitation, cool wet spring, very mild June temperatures and good set overall. Low pest pressure. 1 -row plots, 50 plants long, 10" spacing. Machine harvested and sorted by grower crew. Ratings made 3 weeks after harvest.

** entry grown in different field*

SELECTION	Skin color	Skin texture	Flesh color	Eyes	Lenticels	Shape	Shape uniformity	L:D ratio	Overall appearance	Comments
L18-100	Rose	5	4	5	6	3,2,7	6	3.02	5.5	slight veins, small rough patches
05-097 (USDA) *	dark red	6	3	7	3	3,4,5	7	---	5	lents, veins, sprouts
NC15-0728 *	tan		yellow							Variable shape, lents
NCP16-0046*	purple		purple							Variable shape, grooving
NC17-0452 *	Cu	7	3							Nice set and shape
Purple Majesty	Purple	7	deep purple	5	5	3,4,7	6	3.16	7	dull purple, some veins
Purple Splendor	Purple	7	purple	5	5	3,6,4	6	3.13	6	pimples forming, rough
Beauregard	Cu	5	3	7	7	4,7,8	6	3.17	6.5	YCR, some WW
Orleans	Rose Cu	6	3	5	5	3,4	7	3.42	6.5	slightly rough, lents, eyes
Covington	Rose	7	3	5	6	3,6	7	3.31	7	grooves, eyes
Bonita										
L-14-31	dusty red	7	4	7	5	2,3	7	3.16	8	some WW
NC 09-122 G2	dusty red	7	4	7	5	2,5	7	3.39	8	less eyes than 14-31
Diane	Red	4	5	9	6	3,4	7	3.84	6	long red, skin little rough
NC 10-0118	Cu	6	4	7	5	2,5,8	5	3.07	6	deep orange, WW

L-14-11	Red	8	4	7	7	3,4,5	7	3.12	8	smooth red, fairly uniform
Vermillion G2	Red	8	4	9	7	2,3,4	6	3.30	8	nice red, most sheen
Bellevue G2	Orange	8	3	9	5	2,3	8	2.99	7	WW, some lents
Murasaki	Purple	7	white	5	7	1,2,3	5	2.57	6	Some pimples

All ratings done on #1 roots.

Skin color	**Skin texture**	**Flesh Color**	**Eyes**	**Lenticels**	**Shape**	**Shape uniformity**	**Season**
1= white	1 = very rough	0 = white	1 = very deep	1 = very prominent	1 = round	1 = very poor	4 = early
2= cream	3 = moderately rough	1 = cream	3 = deep	3 = prominent	2 = round-elliptic	3 = poor	3 = mid to early
3= tan	5 = moderately smooth	2 = yellow	5 = moderate	5 = moderate	3 = elliptic	5 = moderate	2 = midseason
4= copper (Jewel)	7 = smooth	3 = orange	7 = shallow	7 = few	4 = long elliptic	7 = good	1 = mid to late
5= orange (Hern.)	9 = very smooth	4 = deep orange	9 = very shallow	9 = none	5 = ovoid	9 = excellent	0 = late
6= rose (Beau)		5 = Purple			6 = blocky		
7= purple					7 = irregular		
					8 = asymmetric		

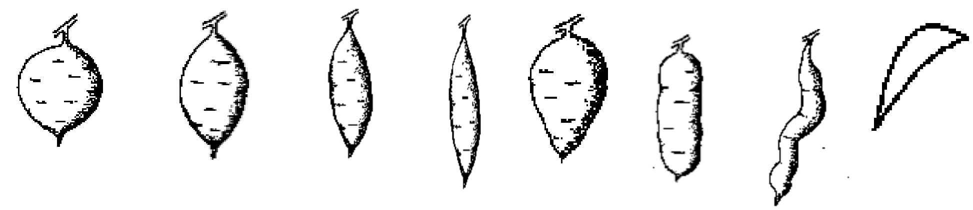
Overall appearance

1 = very poor
3 = poor
5 = moderate
7 = good
9 = excellent

L:D ratio based on 20 roots (5 roots/plot)

Shapes

1 2 3 4 5 6 7 8



NATIONAL SWEET POTATO COLLABORATORS SUMMARY OF DATA

2023

BUSHELS PER ACRE (50 lbs.)

STATE AND LOCATION REPORTING: MSU-Pontotoc, MS

DATE TRANSPLANTED: 6/9/23 DATE HARVESTED: 10/6/23 NO. GROWING DAYS: 119

DISTANCE BETWEEN ROWS (in.): 40 DISTANCE IN ROW(in.): 12

PLOT SIZE: NO. OF ROWS: 1 LENGTH (ft.): 30 NO.REPLICATIONS: 4

IRRIGATION (AMOUNTS AND DATES): N/A

FERTILIZER: N 50, P_20_5 150, K_20 300 (PER ACRE)

SELECTION	US #1'S	CANNERS	JUMBOS	TOTAL MARKETABLE	PERCENT US #1'S	CULLS
L18-100	286 ab	79 bc	138 a	503 a	57 bc	77 abc
05-097 (USDA)	197 cd	120 ab	6 e	324 d	61 bc	72 abc
NC15-0728	196 cd	95 abc	81 b	372 cd	53 c	124 a
NCP16-0046	220 bcd	98 abc	17 de	336 cd	66 ab	49 bc
NC17-0452	328 a	108 abc	7 e	443 ab	74 a	54 bc
Purple Majesty	283 ab	130 a	28 de	440 ab	63 bc	49 bc
Purple Splendor	210 cd	126 a	20 de	356 cd	59 bc	31 c
Beauregard	261 bc	74 c	53 bcd	388 bcd	67 ab	46 bc
Orleans	242 bc	72 c	75 bc	389 bcd	62 bc	93 ab
Covington	259 bc	97 abc	41 b-e	396 bc	64 ab	57 bc
Bonita	175 d	121 ab	35 cde	330 cd	53 c	117 a
Mean	242	102	46	389	62	70
LSD (0.05)	67	43	44	67	11	54
CV	19	30	67	12	12	53

US #1's - Roots 2" to 3 1/2" diameter, length of 3" to 9", must be well shaped and free of defects.
Canners - Roots 1" to 2" diameter, 2" to 7" in length.
Jumbos - Roots that exceed the diameter, length and weight requirements of the above two grades, but are of marketable quality.
Percent US #1's - Calculated by dividing the weight of US #1's by the total marketable weight (Culls not included).
Culls - Roots must be 1" or larger in diameter and so misshapen or unattractive that they could not fit as marketable roots in any of the above three grades.

2023 NATIONAL SWEETPOTATO COLLABORATOR TRIAL DESCRIPTORS

STATE AND LOCATION REPORTING: MSU-Pontotoc, MS
SOIL TYPE: Silt Loam
COMMENTS:____

SELECTION	Skin color	Skin texture	Flesh color	Eyes	Lenticels	Shape	Shape uniformity	Overall appearance	Comments
L18-100	5	5	3	9	7-5	2,5,3	7	7	Larger, nice sized
05-097 (USDA)	7	3	2-3	9	7-9	1,2,3,5	3	3	Variable size, pale orange flesh
NC15-0728	2	3	1	5	5	1,8,3	1	3	Some ball-shaped
NCP16-0046	7	7	5	9	7	1,2,8,3,5	3	3	Smaller size
NC17-0452	5	9	3	7	5	2,3,4,8	5	7	Shape wide range, veiny
Purple Majesty	7	7	5	7	7	3	7	7	Good shape
Purple Splendor	7	3	5	7	7-9	1,2,8	1	3	Smaller sized
Beauregard	6	7	3	9	5	3,4,8	3	5	N/A
Orleans	5	9	3	9	7-5	2,3,5,8	3	5	Wide range in size and shape
Covington	4,5	1	3	9	9-7	1,2,3,8,5	3	3	Reddish-orange color
Bonita	2	5	0	7	9-7	1,2,3,5	7	5	Wide range in size, lots of “tails”

Skin color
1= white
2= cream
3= tan
4= copper (Jewel)
5= orange (Hern.)
6= rose (Beau)
7= purple

Skin texture
1 = very rough
3 = moderately rough
5 = moderately smooth
7 = smooth
9 = very smooth

Flesh Color
0 = white
1 = cream
2 = yellow
3 = orange
4 = deep orange
5 = Purple

Eyes
1 = very deep
3 = deep
5 = moderate
7 = shallow
9 = very shallow

Lenticels
1 = very prominent
3 = prominent
5 = moderate
7 = few
9 = none

Shape
1 = round
2 = round-elliptic
3 = elliptic
4 = long elliptic
5 = ovoid
6 = blocky
7 = irregular
8 = asymmetric

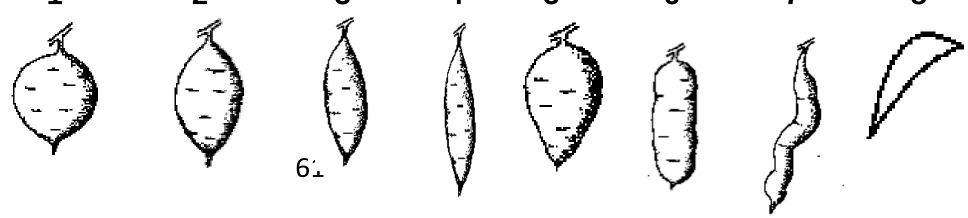
Shape uniformity
1 = very poor
3 = poor
5 = moderate
7 = good
9 = excellent

Season
4 = early
3 = mid to early
2 = midseason
1 = mid to late
0 = late

Overall appearance
1 = very poor
3 = poor
5 = moderate
7 = good
9 = excellent

Shapes

1 2 3 4 5 6 7 8



NATIONAL SWEET POTATO COLLABORATORS SUMMARY OF DATA 2023

BUSHELS PER ACRE (50 lbs.)

STATE AND LOCATION REPORTING:___Mound Bayou, MS________

DATE TRANSPLANTED:___6/21/23_____ DATE HARVESTED:____10/24/23__________ NO. GROWING DAYS:___125_____

DISTANCE BETWEEN ROWS (in.):___36______ DISTANCE IN ROW(in.):____12_______

PLOT SIZE: NO. OF ROWS:__2____ LENGTH (ft.):___25_____ NO.REPLICATIONS:______4_______

IRRIGATION (AMOUNTS AND DATES): 7/24/23 and 8/21/23___Furrow irrigation________________

FERTILIZER: N___, P_2O_5____, K_2O____(PER ACRE) No fertilizer applied

SELECTION	US #1'S	CANNERS	JUMBOS	TOTAL MARKETABLE	PERCENT US #1'S	CULLS
NC15-0728	81	13	21	115	66.1	
NCP16-0046	92	19	13	124	74.0	
NC17-0452	55	9	12	76	72.8	
05-097 (USDA)	106	15	4	125	86.1	
Purple Majesty	100	17	18	135	71.8	
Purple Splendor	71	19	15	105	67.8	
Covington	107	20	14	141	77.4	

US #1's - Roots 2" to 3 1/2" diameter, length of 3" to 9", must be well shaped and free of defects.
Canners - Roots 1" to 2" diameter, 2" to 7" in length.
Jumbos - Roots that exceed the diameter, length and weight requirements of the above two grades, but are of marketable quality.
Percent US #1's - Calculated by dividing the weight of US #1's by the total marketable weight (Culls not included).
Culls - Roots must be 1" or larger in diameter and so misshapen or unattractive that they could not fit as marketable roots in any of the
above three grades.

2023 NATIONAL SWEETPOTATO COLLABORATOR TRIAL DESCRIPTORS

STATE AND LOCATION REPORTING:___Mound Bayou, MS__
SOIL TYPE:___________________
COMMENTS:____

SELECTION	Skin color	Skin texture	Flesh color	Eyes	Lenticels	Shape	Shape uniformity	Season	Overall appearance	Comments
NC15-0728	4	7	2	7	7	2	3		5	
NCP16-0046	7	7	5	5	9	5	7		7	
NC17-0452	3	5	3	9	9	2	5		5	
05-097 (USDA)	3	3	3	3	5	3	5		5	
Purple Majesty	7	3	5	9	7	7	3		3	
Purple Splendor	7	3	5	9	7	2	5		5	
Covington	6	9	3	9	9	6	3		7	

Skin color
1= white
2= cream
3= tan
4= copper (Jewel)
5= orange (Hern.)
6= rose (Beau)
7= purple

Skin texture
1 = very rough
3 = moderately rough
5 = moderately smooth
7 = smooth
9 = very smooth

Flesh Color
0 = white
1 = cream
2 = yellow
3 = orange
4 = deep orange
5 = Purple

Eyes
1 = very deep
3 = deep
5 = moderate
7 = shallow
9 = very shallow

Lenticels
1 = very prominent
3 = prominent
5 = moderate
7 = few
9 = none

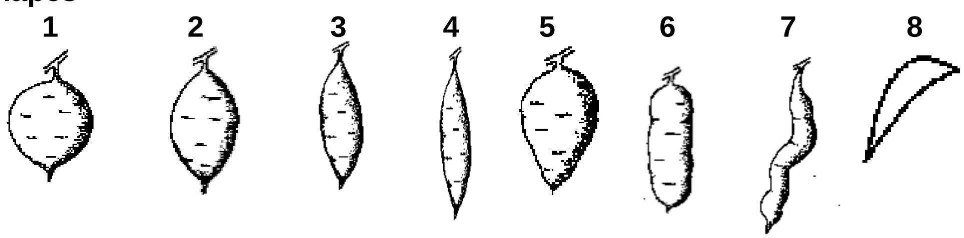
Shape
1 = round
2 = round-elliptic
3 = elliptic
4 = long elliptic
5 = ovoid
6 = blocky
7 = irregular
8 = asymmetric

Shape uniformity
1 = very poor
3 = poor
5 = moderate
7 = good
9 = excellent

Season
4 = early
3 = mid to early
2 = midseason
1 = mid to late
0 = late

Overall appearance
1 = very poor
3 = poor
5 = moderate
7 = good
9 = excellent

Shapes



Business Meeting Notes

National Sweetpotato Collaborators Group
January 20-21, 2023
Wilmington, NC

Minutes from the 2023 Business Meeting of the National Sweetpotato Collaborator's Group Meeting on Saturday, January 21st, 2023 at the Embassy Suites Wilmington Riverfront in Wilmington, North Carolina.

The meeting was called to order by Katie Jennings. The first item of business was to review and approve the minutes from the 2022 Meeting. Jonathan Schultheis made a motion to approve the minutes, Mark Shankle seconded the motion, all were in favor, and the motion carried.

Michelle McHargue then presented the winners of the Graduate Student Contest, awarding first and second place in the MS category and first, second, and third places for the PhD students.

The National Impact Award was presented by Mark Shankle, who read comments from the nomination letters about the contributions of the award winner, Dr. Arthur Villordon. Dr. Villordon thanked the group and all applauded him.

Michelle McHargue read the Resolutions for the 2023 Meeting. Craig Yencho made a motion to approve the Resolutions as written, Ken Pecota seconded the motion, all were in favor, and the motion carried.

Ken Pecota then stood up to lead a group discussion regarding the Collaborators Trials for 2023 and beyond. Only Mississippi State University submitted trial data for the 2022 Trials. The 2022 Trials were impacted in most locations due to COVID related delays for the USDA as well as regulatory restrictions for transfer of live plant materials between cooperating states. Tissue culture was discussed as an option, but many locations are not yet equipped to grow material from tissue culture, are constrained by the timing of the work being at harvest, or have more stringent regulatory requirements that would impact timing. Louisiana State University, Mississippi State University, and University of Arkansas at Pine Bluff all reported they would be able to use tissue culture and the fall timing was not an issue. North Carolina State University was concerned over the harvest timing and the fact that most of their lines have not already been started in tissue culture, putting them behind in producing material for all sites. An approximate minimum of 200 plants are needed for field trials at each site, allowing for 50 plant plots replicated 4 times. University of California at Davis must first send their material through screening at Foundation Plant Services, which would impact timing and availability. Further complicating the Collaborator's Trials is the need for Material Transfer Agreements between each breeder and state that would be exchanging materials. A blanket MTA was explored and was deemed not acceptable by North Carolina State University leadership. It was decided that the locations that can still receive live plant material will use live plants this year and work on preparing to start the tissue culture work for next year, and work on getting MTAs in place in the meantime. Those sites that must use tissue culture may have to wait until they have these items in order and may not be able to participate in this year's trials.

The Lines for entry in the 2023 Collaborator's Trials were then discussed. Louisiana State University entered L18-100 with Orleans as the check. Phil Wadl on behalf of the USDA entered USDA05-097, with Beauregard as the check. North Carolina State University entered NC17-0452, with Covington, Orleans, or Beauregard the recommended checks, NC15-0728 with Bonita as the check, and NCP16-0046 with either Purple Majesty or Purple Splendor as the checks.

Scott Stoddard then presented the State Report for California, as he was not present at the start of Friday's meeting when the other State Reports were done.

Nominations for office were then conducted. The Nominating Committee consisted of Craig Yencho and Katie Jennings. Callie Morris was nominated and accepted the position of Secretary-Treasurer to replace outgoing Secretary-Treasurer Theresa Arnold. Tristan Watson was nominated and accepted the position of Chair Elect, to serve as Chair of the 2025 NSCG Meeting.

The next item for discussion was the location for the 2024 Meeting. The US Sweetpotato Council will be meeting in New Orleans from January 20-24, 2024. SRASHS will be meeting in Atlanta, GA from February 1-6, 2024. Much discussion was had on the benefits of meeting with each group. In years past we have typically met with SRASHS and broke away every few years to meet in conjunction with the US Council. Michelle McHargue mentioned some benefits of meeting with SRASHS is that they arrange for the hotel location and contract and pay for the meeting room and much of the equipment needed to run the meeting, and if we meet with SRASHS, abstracts are published in their proceedings as well as HortScience. Katie Jennings and Tara Smith mentioned that there are other ways to publish abstracts. Jonathan Schultheis mentioned that many NSCG members also present their research at other SRASHS meetings, but this means we lose participants in our meetings at times. Katie Jennings reminded us that we have to pay for registration for both SRASHS and the NSCG meeting which could be cost prohibitive for some. Many questioned what we get for the SRASHS registration fee. It was mentioned that a benefit of meeting with the US Council is that we are more likely to get grower participation in our meeting. Craig Yencho mentioned that our group has grown considerably and we could conceivably meet on our own outside of another group and this opens opportunities for changing the days and times of the meeting. Katie Jennings requested a show of hands vote for each meeting location. Only 6 members raised their hands to meet with the SRASHS, and the vast majority of the members voted to meet with the US Council. There was concern expressed that if we meet with The US Council again next year, it will effectively sever our ties with SRASHS. It was decided that Katie Jennings would reach out to David Reed with SRASHS and see if we would be welcome to meet with them in 2025 if we meet with the US Council for a second year in a row for the 2024 meeting. Katie can then report to the group and we can conduct a member survey to finalize the location if needed.

Tara Smith then gave a National Stakeholder update and invited all members to attend the meeting on Sunday.

Mark Shankle gave a CleanSEED update, which was brief because he reported the work has just recently commenced. He described the CleanSEED work as the “R&D” function, and the National Clean Plant Network serves as the “Sales and Marketing” function for this work. He expects a report to be ready to share at next year’s NSCG meeting.

David Monks then gave a Multistate Project update. He reported that next year we will need to renew our project, which is currently a SERA-5 project. He said that we could instead apply for a Multistate Research Project, which due to the nature of our work, we qualify for. There would be some additional documentation needed, but there are benefits of the Multistate Project over a SERA project, such as reimbursable travel fees, which could make it worthwhile. In addition, we need to update our information on the NIMMS website. It shows we only have 5 NSCG members, and two of them are now inactive. Faculty should sign up as members. David mentioned he could help facilitate this update.

Katie Jennings then asked for any other items of business or discussion. There was none. Katie said it was now time to pass the gavel to the Chair Elect, Shaun Francis. Tara Smith said first we should all thank Katie for her service this year. All applauded. Katie then thanked the planning committee for their help, and all applauded. Katie then passed the gavel to Shaun Francis, and Katie officially became Past Chair and Shaun became Chair. Shaun Francis then adjourned the meeting.

Respectfully prepared and submitted by Michelle McHargue.

RESOLUTIONS

National Sweetpotato Collaborators Group
January 20-21, 2023
Wilmington, NC

Whereas, the National Sweetpotato Collaborators Group (NSCG) met for the 47th year to share research and foster relationships both old and new; and

Whereas, Dr. Arthur Villordon was presented the sixth annual National Research Impact Award in honor of his tireless enthusiasm that has greatly contributed to his numerous achievements to sweetpotato production practices that have benefitted the sweetpotato industry with applicable outcomes; and

Whereas, the Student Competition, which included 21 presentations, was chaired by Michelle McHargue, and was greatly facilitated by the assistance of judges Don La Bonte, Victor Mascarenhas, Wendy Mussoline, Amanda Nelson, David Picha, and Cathy DeRobertis; and

Whereas, the 2023 winners of the NSCG Student Competition for MS students were in first place Jack Mascarenhas for his presentation "Effects of Root and Slip Fungicide Applications on Sweetpotato Southern Blight and Pesticide Residue Levels Postharvest", and second place Stuart Michel for his presentation "Curing Duration and Temperature Effects on Covington Sweetpotato Over Time and Environmental Conditions of International Sweetpotato Shipments"; and

Whereas, the 2023 winners of the NSCG Student Competition for PhD students were in first place Lisa Arce for her presentation "Variation in Gene Expression of Putative *PHT1;5* Gene Among Sweetpotato Cultivars in Response to Phosphorus Deficient Conditions", second place Keith Starke for his presentation "Effect of Flumioxazin and *S*-metolachlor on Covington Sweetpotato Planted Vertically or Horizontally", and tied for third place Callie Morris for her presentation "Evaluation of Slip Storage Conditions on Stand and Yield" and Modesta Abugu for her presentation "The Sweet Scents of Sweetpotato: Identification of Volatile Compounds Predicting Unique Flavors"; and

Whereas, the 2023 meeting of the NSCG was supported by generous contributions from BASF, Black Gold, Helena Agri-Enterprises, Lamb Weston, The Louisiana Sweetpotato Commission, Mississippi Sweetpotato Council, North Carolina Sweetpotato Commission, NCSU Sweet Armor Project, Simplot, Syngenta, and Valent; and

Whereas, the 2023 meeting of the NSCG proceeded smoothly under the leadership of Katie Jennings and the efforts of secretary-treasurer Theresa Arnold with able help from moderators Michelle McHargue, Jonathon Schultheis, Mark Shankle, and Scott Stoddard, and the imperative AV assistance of Tommy Batts; and

Whereas, we must acknowledge the many years of dedicated service from our outgoing secretary-treasurer Theresa Arnold who has vacated her position in service to a new specialty crop;

Now therefore be it resolved, that the NSCG and its members express our sincere gratitude for all of the above-mentioned contributions, which serve the greater good for the national sweetpotato community and international collaborators.

Respectfully prepared and submitted by Michelle McHargue.

National Sweetpotato Collaborators Group Email List

Email	Last	First
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sjippoli@ncsu.edu	Ippolito	Stephen
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