

SERA 45 Crop Diversification Opportunities to Enhance the Viability of Small Farms Annual Meeting

**Virtual Meeting
Friday, September 18th, 2020
10 a.m. to 2 p.m. EDT**

Participants in attendance: Lesley Oliver (AA-University of Kentucky), Ajay Nair (Chair, Iowa State University), Melanie Stock (Vice-Chair, Utah State University), Annette Wszelaki (University of Tennessee), Troy Dugger (Center for Profitable Agriculture, Tennessee), Rob Holland (Center for Profitable Agriculture, Tennessee), Christy Cassady (University of Kentucky), Brett Wolff (University of Kentucky), Tim Woods (University of Kentucky), Rachel Rudolph (University of Kentucky), Shawn Wright (University of Kentucky), Liz Maynard (Purdue University), Wenjing Guan (Purdue University), Lewis Jett (West Virginia University)

Agenda

- Ajay Nair (Iowa State) facilitated the meeting, which opened with introductions.
- Participants discussed progress made toward the project objectives, crop diversification activities going on in the participating states, and opportunities for future collaboration. Written state reports were shared with the entire group by email prior to the meeting.

A. The group discussed progress made toward project objectives 1 and 2 (research-based production information and coordination of research and extension activities among the participants).

1. Several participants have been collaborating on a project involving winter squash variety trials. Annette Wszelaki (Tennessee) proposed this project at the 2019 SERA 45 annual meeting. Wszelaki, Wenjing Guan (Indiana), Rachel Rudolph (Kentucky), Melanie Stock (Utah) and Lewis Jett (West Virginia) have participated in these variety trials. Rudolph indicated there had been a great deal of disease and pest pressure. Several researchers encountered seed borne Fusarium in their trials. The project is looking not just at yield but also at storage ability of winter squash. Researchers will be storing fruit from each variety and each repetition up to six months. The group has been conducting research on kabocha squash. One challenge has been determining when the squash is ready to harvest, as some of the researchers had not worked with kabocha squash before. Jett indicated there was a strong market for kabocha and other types of winter squash in West Virginia. The project is part of a squash hunger campaign that could benefit communities in food deserts through food pantries.
2. Tennessee (Wszelaki) is also part of a project with Kentucky (SERA 45 participants Krista Jacobsen, Rachel Rudolph and Tim Woods) and Georgia, *Cover Crops Under Cover: Evaluating Costs, Benefits and Ecosystem Services of Cover Crops in Year-Round High Tunnel Production*. This project has led to development of several publications. The first of these publications, *Covers Under Cover: Managing Cover Crops in High Tunnels* (CCD-SP-15), is available on the University of Kentucky's Center for Crop Diversification (CCD) website at <https://www.uky.edu/ccd/sites/www.uky.edu.ccd/files/CoversUnderCover1.pdf>. Jacobsen, Rudolph and Wszelaki are among the authors of this publication, while SERA 45

participants Shawn Wright (Kentucky) and Jett (West Virginia) reviewed the publication. *High Tunnel Production and Marketing Survey: Data Summary* is currently undergoing review. Two additional publications resulting from this project are undergoing final edits by the authors and will be published on the CCD website after undergoing review.

3. A co-branded publication, *Extended Season Lettuce Production* (CCD-WVU-FS-1, ANR-HORT-20-001), written by Jett (West Virginia), has been published on the CCD website (<https://www.uky.edu/ccd/sites/www.uky.edu.ccd/files/WVextendedseasonlettuce.pdf>) since the 2019 SERA 45 meeting. Jett and Cassady (Kentucky) worked with their respective Ag Communications personnel to develop a co-branded fact sheet that includes Cooperative Extension Service logos from both universities, and publication numbers unique to both.
4. The CCD has begun developing six “crop profiles” for Tennessee’s Center for Profitable Agriculture (CPA) as part of a Tennessee Specialty Crop Block Grant. One profile, *Culinary Herb Production in Tennessee* (CCD-CPA-CP-1), has been completed. SERA 45 participants Jeanine Davis (North Carolina) and Wszelaki (Tennessee) reviewed the publication, which Cassady (Kentucky) designed. The CPA’s Troy Dugger worked with UT’s Ag Communications personnel to develop a header design that features logos from UT and the University of Kentucky.
5. Nair (Iowa) has been working on an organic transition project in collaboration with the University of Kentucky, working with mesotunnels using Protek netting for season extension and microclimate modification. Acorn squash is among the crops they are testing. Iowa State has developed a short video on installing the nets and harvesting squash.

B. Discussion of research and extension activities in the participating states

Attendees shared activities in their states as listed in the submitted state reports.

C. Discussion of opportunities for collaboration

1. Rudolph (Kentucky) asked if there is still interest in the group developing a Southeast grower guide for high tunnels, as had been discussed at last year’s meeting. The group discussed the possibility of applying for a grant to develop the guide, which would provide incentive for participating. Multi-state Specialty Crop Block Grants were discussed as a possible funding source. Liz Maynard (Indiana) mentioned the North Central IPM Program and other regional IPM programs as possible funding sources, as well as the Risk Management Agency. Maynard said North Carolina has received a lot of money from the Risk Management Agency to do publications on floriculture. Maynard asked what the funding would pay for, and possibilities discussed included graduate students, meetings for contributors, printed copies, and salary for an editor or coordinator of the publication. Nair (Iowa) said Iowa State has a high tunnel production guide published a few years ago. Maynard suggested starting with the Iowa guide, going through an update process for next season, parceling out the chapters and finding volunteers who will be in charge of different chapters. Nair said there are three or four main authors on the Iowa guide, and Nair will present the idea to them of transforming the Iowa guide into a regional guide. Maynard suggested talking to the Great Lakes Vegetable Working Group about sharing the web framework used for their guide to see if SERA 45 participants could use a separate but similar framework for a regional high tunnel guide. Melanie Stock (Utah) said NRCS might have funding options, such as Conservation Innovation Grants, for a high tunnel guide.
2. Winter squash study – Nair (Iowa) indicated he is interested in joining the winter squash

study, and asked if there is a publication outlining the protocol for the study. Wszelaki (Tennessee) said that was a good idea, and that the group does plan to keep doing trials of storage crops. They might choose a different winter squash or possibly sweet potatoes for the coming year. Nair referred to Wenjing Guan (Indiana) mentioning that one-year trials can be published in HortTechnology as preliminary results, in addition to development of extension publications, as possible productions from the study. The group discussed the possibility of seed company support, and the possibility of establishing a GoFundMe page to seek support from growers. Maynard (Indiana) also expressed interest in joining the winter squash trials. Wszelaki noted there is a merger of the Southeast vegetable extension workers and SERA 45 on the winter squash trials, so there are states involved from West Virginia to Utah to Louisiana. The winter squash trial involved eight locations, as several locations failed, including Ohio State's and Tennessee's trials due to disease. Rudolph (Kentucky) mentioned butterhead lettuce as another possible crop for variety trials, and Nair (Iowa) suggested garlic as a possibility. Stock (Utah) mentioned tulips as a cut flower crop that could be produced in high tunnels as an early crop that could be grown before vegetables. Tulips offer some storability in coolers. Stock said some growers in Utah starting growing tulips in 2020 and did very well. Stock recommended tulips as a cut flower that could work for the group because, unlike other cut flowers, tulips would not require many harvests.

3. The group revisited plans to start an e-newsletter that would be shared with growers in the participating states. One SERA 45 participant would submit an article on a crop diversification topic each month. Nair suggested topics such as changing the pH in a high tunnel production system, basic irrigation, and integrated pest management principles as possibilities. Stock said an e-newsletter would benefit growers in Utah, as she works with many young people who are new to farming and this tool would help combat the disinformation they often come across. Nair added that the newsletter could also offer SERA 45 participants an opportunity to get their graduate students involved in writing short articles.
4. Cassady (Kentucky) mentioned that the group had included webinars among their activities, and given the situation with COVID-19 and the increased use of online training, participants should be thinking about topics for webinars they could collaborate on in the coming year.

D. Discussion of progress made toward Objectives 3 and 4 (developing direct market information and decision aids that can be shared regionally, and conducting market research on consumer preferences and marketing channels that are most effective and profitable for small farms)

Tim Woods (Kentucky) shared that a large farm to restaurant marketing study had been sidetracked by COVID-19, but is still considered to have a lot of potential. Woods and Wolff (Kentucky) are involved in a national *Local Food Systems Response to COVID* project (<https://lfscovid.localfoodeconomics.com/>) that includes 17 communities of practice. Woods and Wolff have been working with produce auctions, and the study also involves Farm to School, the National Farmers Market Coalition, National Co-op Grocers, National Grocers Association, the James Beard Foundation (restaurants) and the Wallace Center (food hubs), as well as other partners. Woods said Kentucky auctions have had a great year with higher prices and basically the same level of production they had anticipated in March before COVID hit. Auctions are trying to anticipate what to expect in 2021. They have done a lot of innovations in 2020 in terms of delivery, CSA-type programs and order buying. Woods indicated consumers are looking for more opportunities to connect to local products,

which has led to opportunities for growers, but also the need for technical assistance. Wolff has provided that assistance by helping growers with virtual stores and assistance with delivery planning. Woods said there is a great need to help farmers get better at online services and delivery services, as well as to explore the feasibility of various aggregation strategies, such as multi-farm CSA operations. He mentioned the possibility of conducting additional consumer demand studies. Rudolph suggested a high tunnel marketing guide, either as part of a high tunnel production guide, or as a separate guide. Woods mentioned a high tunnel planning grant with Krista Jacobsen (Kentucky) which will allow researchers to map out survey work, focus groups and case studies to help growers market their high tunnel crops, looking at ways to integrate high tunnels into small farm businesses. Nair suggested having even a one- to two-page checklist for high tunnel growers regarding marketing.

Election of officers:

Chair: Melanie Stock, Utah State University

Vice-Chair: Rachel Rudolph, University of Kentucky

2021 Annual Meeting

If the situation with COVID-19 allows the group to meet in person in 2021, the meeting will be held in the Nashville area and hosted by participants at Tennessee's Center for Profitable Agriculture, as was originally planned for 2020.

SERA 45 State Reports - Iowa

Name: Dr. Ajay Nair

University: Iowa State University

Contributors:

Kathleen Delate, Professor, Horticulture

Chris Currey, Associate Professor, Horticulture

Mark Gleason, Professor, Plant Pathology and Microbiology

Cynthia Haynes, Associate Professor, Horticulture

Ajay Nair, Associate Professor, Horticulture

Angela Shaw, Associate Professor, Food Safety of Human Nutrition

Please provide a synopsis of current activities in your state that are directly related to the objectives of the SERA 45 project; if you are not aware of any activities related to an objective, please indicate that.

1. Please **list** current activities in your state involving **research-based production information** about specialty crops and systems that have potential to be profitable for small farms, including (but not limited to):

a) **protected agriculture** — high/ low tunnel/greenhouse production

Research and extension efforts in the area of high tunnel vegetable and fruit production were continued to identify proper cultivars, production techniques, and cultural operations to enhance yield and produce quality. Below are few of the studies and a brief description:

- *Identifying romaine lettuce cultivars suitable for high tunnel production (Rachel Perry and Ajay Nair)* – Tomato is the most widely and commonly grown vegetable within a high tunnel production system. Growers often plant tomatoes in for multiple years and this leads to challenges such as soil-borne pathogens, lack of soil fertility, and other soil related issues. The goal of this two-year study is to help Iowa high tunnel growers effectively utilize their high tunnels by growing appropriate lettuce types/cultivars that have high economic value. Research includes identifying high performing lettuce types/varieties, effect of planting date on yield and quality, bolting and disease resistance attributes

b) **Organic production systems** –

- Methods to enhance organic system soil fertility and plant protection continued at the ISU Neely-Kinyon Farm Long-Term Agroecological Research (LTAR) experiment. In the first 16 years of the LTAR, organic corn and soybean

yields have been equivalent to their conventional counterparts, with yields for organic alfalfa and oats equal to county averages. Soil quality continues to increase with the use of compost and cover crops. Organic no-till was applied to vegetable and field crops to examine production and soil quality effects. Lysimeter data continues to show that the concentration of leached N has been consistently lower under vegetables grown with a cover crop and in no-till. Soil quality comparisons show greater soil carbon sequestration with cover crops and compost.

- *Evaluation of broccoli cultivars for heat tolerance (Ajay Nair and Anne Carey)* - This project is currently being carried out at Iowa State University (ISU) Horticulture Research station. The first year of the study (spring 2020) investigated eight broccoli cultivars for their ability to tolerate heat and for crop growth, performance, and yield.
- *Use of cover crops and mesotunnels in organic cucurbit production (Mark Gleason and Ajay Nair)* - An organic transition project is being conducted in collaboration with University of Kentucky, which investigated the effect of Protek net on winter squash and melon production. Protek nets are 3-4 times expensive than typical row covers but have extended shelf life and reduce temperature stress under low tunnels. Based on results so far, Protek net systems are performing well providing insect protection and microclimate modification for enhanced growth, yield, and quality in winter squash and muskmelon production systems.

c) small-scale production systems

- *Midwest Food Safety Hub: Implementing safe production practices in specialty crop production (Angela Shaw)*
- *Precision pesticide spray systems for small scale and diversified orchards (Mark Gleason)*

d) Biodegradable mulches

- *Use of biodegradable mulches in pepper production (Ajay Nair, Moriah Bilenky, and Rachel Perry)* - The goal of this two-year study is to help vegetable growers sustainably manage weeds using biodegradable mulches. The study will primarily answer the following questions: 1) Do biodegradable mulches perform equal or better than conventional mulches in Iowa growing conditions?, 2) how long do the mulches last and how effective they are during the growing season?, and 3) what is the economic feasibility of these mulches?

2. Please **list** current **educational and extension activities** in your state focused on the **production and marketing of specialty crops**. Please include links and/or copies as appropriate. Examples might include (but are not limited to):

a) in-person trainings

- Practical Farmers of Iowa Conference (Jan 2020)
- Iowa Fruit and Vegetable Growers Conference (Jan 2020)
- Iowa High Tunnel Short course (Nov 2019)

- Iowa Organic Conference (Nov 2019)
- Frost protection field day for apple orchards (March 2020)
- Vegetable Pest Management Workshop

b) webinars

- Integrated pest management for vegetable crop production (<https://www.youtube.com/playlist?list=PLzZRnFJ154EJ8qvX1EvEwGvhHUFgDmopm>)
- Vegetable production online course
- Gardening while isolated
- Sow grow eat keep
<https://www.extension.iastate.edu/humansciences/sow-grow-eat-keep>
- Organic Field Day
(https://www.youtube.com/watch?v=P_PpIV5EmT4)
- Small Farms Sustainability podcasts
<https://www.extension.iastate.edu/smallfarms/small-farm-sustainability-podcasts>
- Zoom webinar series for county horticulturists

c) print publications

- Lang, K. and A. Nair. 2019. Effect of Tomato Rootstock on Hybrid and Heirloom Tomato Performance in a Midwest High Tunnel Production System. HortScience 54(5):840–845.
- Delate, K., T. Lubberstedt, P. Scott, W. Tracy and R. Turnbull. 2019. Developing field and sweet corn hybrids for organic producers: The ACES project. ASA Annual Meeting, San Antonio, TX.
<https://scisoc.confex.com/scisoc/2019am/meetingapp.cgi/Paper/120078>
- Currey, C.J. and A.G. Litvin. 2019. Improve culinary herb yield. Produce Grower August 2019: pp 8-9.
- Currey, C.J. 2019. Automation for hydroponics. Produce Grower April 2019: pp 8-10.
- Sweet Corn. HORT3089. Iowa State University
(<https://store.extension.iastate.edu/product/5485>)
- Cole crops. HORT 3087. Iowa State University.
(<https://store.extension.iastate.edu/product/5494>)
- Peppers. HORT 3084. Iowa State University.
(<https://store.extension.iastate.edu/product/5479>)
- Tomatoes. HORT 3091. Iowa State University.
(<https://store.extension.iastate.edu/product/3981>)
- Onions. HORT 3085. Iowa State University.
(<https://store.extension.iastate.edu/product/5481>)

d) **video**

<http://www.extension.iastate.edu/vegetablelab/>
<http://extension.agron.iastate.edu/organicag/>
<https://www.cucurbit.plantpath.iastate.edu/>

e) **field days**

- Fruit and Vegetable Field Day – 125 participants (growers, extension staff, industry leaders) in 2019.
- Organic Field Day - covered topics ranging from organic crop rotations to no-till vegetable production, reaching over 60 people.
- Amish Produce Walk/Field Day – 85 participants

f) Demonstrations

3. Please **list** current activities in your state related to **reporting specialty crop prices** from:

- a) farmers markets
 - <https://www.agmrc.org/>
- b) produce auctions
 - Visit to Twin County Produce Auction for on-campus staff, field specialists, and graduate students
- c) farm to school
- d) retail
- e) other – Marketmaker workshops (<https://foodmarketmaker.com/>)

4. Please **list** current **market research activities** in your state that could benefit small farms. Examples may include:

- a) consumer preferences
- b) comparison of marketing channels
- c) other

SERA 45 Guidelines for State Reports

Name: Petrus Langenhoven

University: Purdue University

Please provide a synopsis of current activities in your state that are directly related to the objectives of the SERA 45 project; if you are not aware of any activities related to an objective, please indicate that.

1. Please **list** current activities in your state involving **research-based production information** about specialty crops and systems that have potential to be profitable for small farms, including (but not limited to):
 - a) protected agriculture — high/midsize/low tunnel/greenhouse production
 - Grow cold tolerant grafted cucumbers for spring production in high tunnels (Guan)
 - High tunnel specialty melon production (Langenhoven, Guan, Deering, Egel, Torres)
 - High tunnel strawberry production (Guan, Ingwell)
 - Sweet Pepper variety evaluation (Langenhoven)
 - Microgreen production (Langenhoven, Saraswat, Guntaka)
 - High tunnel CBD hemp production (Langenhoven)
 - CBD hemp propagation (Langenhoven)
 - Insect pest management in greenhouse hemp production (Ingwell, Long)
 - b) organic production systems
 - Research evaluating organic growing media for transplant production (Guan, Maynard, Langenhoven, Hoagland)
 - Evaluation of bioinsecticides for CEW management in hemp production (Ingwell)
 - c) small-scale production systems
 - Watermelon, cantaloupe, specialty melon variety evaluation in open field (Guan, Langenhoven)
 - Spacing evaluation of grafted watermelons with different rootstocks (Guan)
 - Open field strawberry production with plasticulture system (Guan, Bordelon)
 - Winter squash evaluation (Guan, Wszelaki)
 - Field production of CBD hemp (Langenhoven)
 - Compost production using Black Soldier Flies (Ingwell)
 - d) biodegradable mulches
 - n/a
 - e) field production of fruit crops (Bordelon, Hirst, Beckerman, Long, Ingwell)
 - Grape cultivar trials
 - Grape production systems and management
 - Grape IPM

- Small fruit evaluation trials
- Small fruit IPM
- Pawpaw cultivar trials
- Apple rootstock, cultivar, and training systems

2. Please **list** current **educational and extension activities** in your state focused on the **production and marketing of specialty crops**. Please include links and/or copies as appropriate. Examples might include (but are not limited to):

a) in-person trainings

- Indiana Horticultural Conference & Expo www.indianahortconference.org
- Indiana Small farms Conference www.purdue.edu/dffs/smallfarms/small-farm-conference-2020/
- Illiana Vegetable Growers Symposium www.ag.purdue.edu/hla/Extension/Pages/IVGS.aspx
- Southwest Indiana Melon and Vegetable Growers Winter Technical Meeting (Guan and Egel)
- Urban Ag Certificate Program (Shoaf)
- Purdue Wine Grape Workshops (Bordelon, Blume, Barnett)

b) Webinars

Purdue Small Farm Education webinar series (Langenhoven)
Greenhouse and Indoor Production of Specialty Crops (Nemali)

c) Podcasts:

- Specialty Crop Soil Health Podcast <https://www.ccsin.org/podcast> or <https://www.hoosieragtoday.com/category/hat-soil-health-podcast/>

d) print publications

Newsletters:

- Vegetable crops hotline newsletter <https://vegcropshotline.org/>
- Facts for Fancy fruit <https://fff.hort.purdue.edu/>
- Purdue Landscape Report <https://www.purduelandscape.org>

Refereed journal publication:

- Guan, W., D. Nowaskie and D. Haseman. 2020. Rootstock evaluation for grafted cucumbers grown in high tunnels: yield and plant growth. HortScience. 55:914-919. <https://doi.org/10.21273/HORTSCI14867-20>
- Guan, W., E.T. Maynard, B. Aly, J. Zakes, D.S. Egel and L.L. Ingwell. 2019. Parthenocarpic cucumber cultivar evaluation in high-tunnel production. HortTechnology. 29:634-642. <https://doi.org/10.21273/HORTTECH04370-19>
- Torres, A., P. Langenhoven and B.K. Behe. 2020. Characterizing the U.S. Melon Market. HortScience 55:6. <https://doi.org/10.21273/HORTSCI14859-20>

- Torres, A.P. 2020. For Young Consumers Farm-to-Fork Is Not Organic: A Cluster Analysis of University Students. *HortScience*. 1(aop):1-7.
- Torres, A.P., Lancaster, N.E., & Vilas de Boas, L.H. 2020. Characterizing Organic Grain Buyers in the Midwestern United States. *Sustainability*, 12(12):51-69.
- Rodríguez, O, & Torres, A.P. 2020. One Box Does Not Check All: Investigating Farmers' Likelihood of Certifying Organic, Dropping Out of Certification, or Remaining Noncertified. *Food Distribution Research Society*. Impact Factor 0.05.
- Lancaster, N.E. & A.P. Torres. 2019. Looking at the Economic and Noneconomic Drivers of Farm Diversification. *Journal of Food Distribution Research*, 50(1). Impact Factor 0.05.

Extension Publications:

- Guan, W., D. Nowaskie, P. Langenhoven, and D.S. Egel. 2020. Cantaloupe and specialty melon variety evaluation in Indiana. Midwest Vegetable Trial Report. <https://docs.lib.purdue.edu/mwvtr/13/>
- Guan, W. 2020. Fall broccoli production in high tunnels. Midwest Vegetable Trial Report. <https://docs.lib.purdue.edu/mwvtr/11/>
- Guan, W. 2020. Summer squash variety evaluation for early-season production in high tunnels. Midwest Vegetable Trial Report. <https://docs.lib.purdue.edu/fvtrials/138/>
- Guan, W., D. Nowaskie, and D.S. Egel. 2020. 2019 Standard-size and personal-size triploid watermelon variety evaluation in Indiana. Midwest Vegetable Trial Report. <https://docs.lib.purdue.edu/mwvtr/10/>
- Egel, D. S., W. Guan. 2019. Evaluation of melon varieties for resistance to bacterial wilt, 2018. Plant Disease Management Reports. 13:V057. <https://www.plantmanagementnetwork.org/pub/trial/pdmr/volume13/abstracts/v057.asp>
- Greenhouse and Indoor Production of Specialty Crops: Plant monitoring using smartphones in protected agriculture <https://mdc.itap.purdue.edu/newsearch.asp?subCatID=425%20&CatID=10>
- Greenhouse and Indoor Production of Horticultural Crops: Determining the Economic Value of Providing Supplemental Light to Lettuce During Winter Production https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-283-W
- Miller, A.G., Langenhoven, P. and Nemali, K. (2020). Performance of Lettuce Varieties in Greenhouse Hydroponic Production. Purdue Extension, HO-309-W, https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-309-W (April 2020).
- Miller, A.G., Langenhoven, P. and Nemali, K. (2020). Performance of Lettuce Varieties under Cold Temperature Conditions in Greenhouse Hydroponic Production. Purdue Extension, HO-310-W, https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-310-W (April 2020).
- Miller, A.G., Langenhoven, P. and Nemali, K. (2020). Optimal fertilizer solution concentration for hydroponic lettuce production. Purdue Extension, HO-311-W, https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-311-W (April 2020).
- Philocles, S., Rodriguez, O.I. & Torres, A.P. 2020. Indiana Farmers Markets: Vegetable Prices of the 2019 Market Season. Purdue Cooperative Extension Publication HO-

- 319-W. https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-319-W
- Velasco, J.E. & Torres, A.P. 2020. Calculating the Benefit-Cost of Using PGRs for Shrub Maintenance. Purdue Cooperative Extension Publication HO-315-W. https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-315-W
- Velasco, J.E. & Torres, A.P. 2020. A Sensitivity Analysis of Using PGRs for Shrub Maintenance. Purdue Cooperative Extension Publication HO-316-W. https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-316-W
- Velasco, J.E. & Torres, A.P. 2020. PGR Financial Calculator. Purdue Cooperative Extension Publication HO-317-W. https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-317-W
- Rodriguez, O.I., Velasco, J.E. & Torres, A.P. 2019. Indiana Farmers Markets: Specialty Crop Prices of the 2018 Market Season. Purdue Cooperative Extension Publication HO-386-W. https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-386-W
- Torres, A.P. 2019. What Does the 2017 Census of Agriculture Tell Us About Indiana Agriculture? Purdue Cooperative Extension Publication HO-307-W. https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-307-W
- Torres, A.P. 2019. To Certify or Not to Certify: How Marketplace Relationships Affect the Adoption of Organic Certification by Fruit and Vegetable Farmers. Purdue Cooperative Extension Publication HO-301-W. https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-301-W
- Rodriguez, O.I. & A.P. Torres. 2019. Are Local Tomatoes More Expensive? A Comparison of Price Trends between Farmers Markets and Grocery Store. Purdue Cooperative Extension Publication HO-300-W. https://mdc.itap.purdue.edu/item.asp?Item_Number=HO-300-W

e) video

- When to plant watermelons <https://www.youtube.com/watch?v=tHT2mAnNRWk&t=85s>
- How to splice graft cucumbers <https://www.youtube.com/watch?v=z-tXoobiMnY&t=2s>
- Scouting hemp for insect pests <https://youtu.be/1aO2IbcHmPY>
- Corn earworm monitoring and management in hemp <https://youtu.be/eJZgeEjgEMo>
- Corn earworm trapping and management in sweet corn <https://youtu.be/BYin961SwMk>
- Maggot damage to onion transplants <https://youtu.be/5w8tck2XqO8>
- Purdue Extension Cucurbit/Melon Project <https://youtu.be/DFThkjQXmm0>
- Purdue Extension Cucurbit/Melon Pollination <https://youtu.be/GRqONj5Ex0Mhttps://youtu.be/ctzQ1pygMFA>
- Purdue Extension Cucurbit/Melon Pest Management

f) field days

- Purdue Small Farm Education Field Day (Langenhoven)

g) Demonstrations

n/a

h) social media promotion of events/use of Facebook live

n/a

3. Please **list** current activities in your state related to **reporting specialty crop prices** and development of **decision aids** regarding:

a) farmers markets

- Purdue Horticulture Business provided weekly reports of farmers market prices for over 500 crops (www.hort.purdue.edu/hortbusiness). Data has been used to publish 3 Extension publications (and 2 in progress) through the Purdue Education store.

b) produce auctions

n/a

c) farm to school/institution

n/a

d) retail

- Purdue University College of Agriculture partnered with Microsoft to develop an online platform HoosierFoodMarket.com. Dr. Torres teamed up with faculty and staff from the Purdue College of Agriculture and Microsoft to provide a free online marketplace where growers, farmers' markets, and food hubs can make their own individual shops. Hoosier Food Market (www.hoosierfoodmarket.com) has been launched in June. Dr. Torres has designed and delivered training programs to assist farmers and consumers in using the tool.

e) community supported agriculture

n/a

f) direct-to-buyer

n/a

g) sampling standards

n/a

h) merchandising education

n/a

i) market performance metrics

n/a

j) other

4. Please **list** current **market research activities** in your state that could benefit small farms. Examples may include:
- a) consumer preferences
 - b) comparison of marketing channels
 - c) other

SERA 45 Guidelines for State Reports

Name: Christy Cassady & Brett Wolff

University: University of Kentucky Center for Crop Diversification

Please provide a synopsis of current activities in your state that are directly related to the objectives of the SERA 45 project; if you are not aware of any activities related to an objective, please indicate that.

1. Please **list** current activities in your state involving **research-based production information** about specialty crops and systems that have potential to be profitable for small farms, including (but not limited to):
 - a) protected agriculture — high/midsize/low tunnel/greenhouse production
 - b) organic production systems
 - c) small-scale production systems
 - d) biodegradable mulches

2. Please **list** current **educational and extension activities** in your state focused on the **production and marketing of specialty crops**. Please include links and/or copies as appropriate. Examples might include (but are not limited to):
 - a) in-person trainings
 - b) webinars
 - c) print publications
 - d) video
 - e) field days
 - f) demonstrations
 - a) In-person trainings –
 - Farmers Market Short Course (2020 KY Fruit and Vegetable Conference)
 - Getting Started with Fruit and Vegetable Production session (2020 KY Fruit and Vegetable Conference; included Choosing the Right Horticulture Enterprise, Small-scale Equipment Decision Making, and Beginner Basics Stations: Finding Resources)
 - Choosing Your Market Channel (2020 KY Fruit and Vegetable Conference)
 - Marketing Produce to Restaurants (2020 KY Fruit and Vegetable Conference)
 - Marketing for All (delivered multiple times across the state)
 - i. Marketing Basics,
 - ii. Social Media Basics,
 - iii. Exploring New Markets,

- iv. Visual Marketing,
- v. Market Signs that Work,
- vi. Using Price Data
- vii. Accepting more than just cash
- viii. Record Keeping Basics
- ix. Basics of Web Design

b) Webinars –

- In response to COVID-19, Brett Wolff developed a series of webinars:
 - i. [Low-tech Preordering Options](#)
 - ii. [Building a Simple Online Store](#)
 - iii. [Pick-up, Delivery, and Shipping for Direct Marketers: Key Considerations](#)
 - iv. [Adding Your Business to Google Maps](#)
 - v. [Promoting Your Product for Online Sales](#)
 - vi. [COVID-19 + Farmers Markets: Best Practices for Managers, Vendors, & Patrons](#)
 - vii. [Nice, Easy Graphics and Advertisements](#)
 - viii. [Components of a Facebook Business Page](#)
 - ix. [COVID & Farmers Markets Update](#)

c) Print publications – CCD crop, marketing and system profiles and fact sheets are being developed and updated. New profiles/fact sheets have been developed since the fall of 2019 on Covers Under Cover: Managing Cover Crops in High Tunnels (University of Georgia, University of Kentucky, University of Tennessee system profile, authors include SERA 45 participants Krista Jacobsen and Rachel Rudolph – Kentucky, and Annette Wszelaki – Tennessee); Extended Season Lettuce Production, co-branded CCD and West Virginia University fact sheet (author, Lewis Jett, SERA 45 participant from WVU); Culinary Herb Production in Tennessee (developed by the CCD for SERA 45 participants with the Center for Profitable Agriculture in Tennessee); Apple Economics; Social Distancing at Farmers Markets: Practical Tips for Managers and Vendors; 3-Year Average Weekly Prices at Kentucky Farmers Markets: 2016-2018; 3-Year Average Prices & Quantities at Kentucky Produce Auctions: 2017-2019.

The following profiles/fact sheets have been updated in the past year:

Chestnuts	Gooseberries & Currants	Produce Auctions
Culinary Herbs	Hanging Baskets	Raspberries
Edamame	Internet Marketing	Shiitake and Oyster Mushrooms
Goldenseal	Organic Asparagus	

The CCD developed a new budget for peaches, and a budget for strawberries was updated in November 2019.

The CCD's monthly newsletter has more than 1,700 subscribers.

- d) Video –
 - i. South Farm Virtual Tour
 - ii. Simple Cut Flower Videos
 - iii. CSA to Workplace Video Series

Other – Josh Knight has continued to add information to the Geographic Horticulture Directory of Kentucky (<https://uk-horticulture.github.io/hort-directory/>), available on the CCD website, which shows locations of and contact information for shared equipment, farmers markets, produce auctions, water testing labs, roadside markets, horticultural supply stores and educational greenhouses

A new resource on the CCD website is the Kentucky Commercial Cut Flower Grower Directory, <https://uk-horticulture.github.io/KY-Cut-Flowers/>.

CCD publications and general information were disseminated at the following conferences/meetings in late 2019-2020:

- Eastern Kentucky Farmers Conference (Morehead)
- Kentucky Fruit and Vegetable Conference (Lexington)
- Kentucky State University Small Farm Conference (Frankfort)
- Kentucky Women in Agriculture Conference (Louisville)
- Indiana Small Farm Conference (Danville)
- Ohio Ecological Food and Farm Association Conference (Dayton)
- Organic Association of Kentucky Conference (Louisville)
- Pick TN Conference (Franklin)
- Southern Sustainable Agriculture Working Group Conference (Little Rock, AR)
- West Virginia Small Farm Conference (Charleston)

3. Please list current activities in your state related to reporting specialty crop prices from:

- a) farmers markets
- b) produce auctions
- c) farm to school/institution
- d) retail
- e) community supported agriculture
- f) direct-to-buyer
- g) sampling standards
- h) merchandising education
- i) market performance metrics
- j) other

a. Prices are reported weekly from a selection of farmers markets across

Kentucky. Reports are posted on the CCD website from April through October. In 2020, we had a maximum of 11 markets reporting.

- b. Prices from Bath County, Casey County, Fairview, Hart County and Lincoln County produce auctions are posted on the CCD website as they are received.
 - c. Produce Auction 3-Year Average (2017-2019) report published
4. Please **list** current **market research activities** in your state that could benefit small farms. Examples may include:
- a) consumer preferences
 - b) comparison of marketing channels
 - c) other

Surveys have been conducted and reports are being developed on:

- 1) An organic producer/stakeholder survey
- 2) A high tunnel grower survey (currently under review)

Work has begun on development of:

- 1) A nursery products buyer survey, focusing on garden centers
- 2) A survey of homeowners and their demand for nursery products

Additional surveys are planned for 2020-21, including:

- 1) A farmers market vendor and market manager survey that will look at changes in marketing activity resulting from creating a permanent market facility, and using a rural and urban market lens to look at those changes.
- 2) A Kentucky restaurant produce buyers survey, which was last done in 2006, to monitor changes in buying trends.
- 3) A produce auction buyers survey to help us craft better price reports and help the auctions improve their outreach.

SERA 45 Guidelines for State Reports

Name: Rachel Rudolph

University: Univ. of Kentucky

Please provide a synopsis of current activities in your state that are directly related to the objectives of the SERA 45 project; if you are not aware of any activities related to an objective, please indicate that.

1. Please **list** current activities in your state involving **research-based production information** about specialty crops and systems that have potential to be profitable for small farms, including (but not limited to):
 - a) protected agriculture — high/midsize/low tunnel/greenhouse production
 1. High tunnel cultivar trials: lettuce, kale
 2. Tomato grafting for root knot nematode resistance in high tunnels
 3. Evaluation of the rotation of tomato with fresh-cut flowers in a high tunnel system for improved pest, disease, and soil management
 4. Evaluating excess soil phosphorus and manganese toxicity in tomato
 - b) small-scale production systems
 1. Multistate winter squash trial—fall
 2. Multistate beet trial—spring and fall
 3. Evaluation of the use of planting date to manage for arthropod pests in spring-planted broccoli
2. Please **list** current **educational and extension activities** in your state focused on the **production and marketing of specialty crops**. Please include links and/or copies as appropriate. Examples might include (but are not limited to):
 - a) in-person trainings
 1. January 2021: Kentucky Fruit and Vegetable Conference
 2. 2021: High tunnel trainings/workshops for county extension agents (train the trainer)
 3. 2020: Tomato grafting workshops for county agents (train the trainer)
 - b) Webinars
 1. Selecting the right cover crop for you production system
 2. How to prepare your soil for cover cropping
 3. Winter vegetable crops
 4. How to foliar sample
 5. 2020 Vegetable crop update: cultivar and management recommendations
 - c) print publications
 1. 2020 Fruit and Vegetable Research Report. *In preparation.*
 2. Ground cherry production factsheet. *In preparation.*
 3. Biofumigation factsheet. *In preparation.*
 - d) video
 1. How to foliar sample
 2. How to prepare your soil for cover cropping

- e) field days—cancelled due to COVID-19
- f) demonstrations—cancelled due to COVID-19

3. Please **list** current activities in your state related to **reporting specialty crop prices** and development of **decision aids** regarding:

- a) farmers markets
- b) produce auctions
- c) farm to school/institution
- d) retail
- e) community supported agriculture
- f) direct-to-buyer
- g) sampling standards
- h) merchandising education
- i) market performance metrics
- j) other

Not my area.

4. Please **list** current **market research activities** in your state that could benefit small farms. Examples may include:

- a) consumer preferences
- b) comparison of marketing channels
- c) other

Not my area.

SERA 45 Kentucky State Report 2020

Name: John Strang

University: University of Kentucky

Please provide a synopsis of current activities in your state that are directly related to the objectives of the SERA 45 project; if you are not aware of any activities related to an objective, please indicate that.

1. Please **list** current activities in your state involving **research-based production information** about specialty crops and systems that have potential to be profitable for small farms, including (but not limited to):
 - a) protected agriculture — high/midsize/low tunnel/greenhouse production
 - b) organic production systems
 - c) small-scale production systems
 - a. Matted row strawberry cultivar trial
 - b. Highbush blueberry cultivar trial using zippered landscape fabric cultural system
 - c. Pie pumpkin cultivar trial
 - d. Uba tuba pepper *C. baccatum* selection program to find earlier maturing higher yielding selections
 - d) biodegradable mulches

2. Please **list** current **educational and extension activities** in your state focused on the **production and marketing of specialty crops**. Please include links and/or copies as appropriate. Examples might include (but are not limited to):
 - a) in-person trainings
 - a. Kentucky Fruit and Vegetable Conference January 5-7, 2020
 - b) Webinars
 - a. Home Bramble Production, April 16.
 - b. Tree Fruit Production, April 21.
 - c. Blackberry Production, April 28.
 - d. Non-Chemical Weed Management & Teff Grass (Agent training)
 - c) print publications
 - a. 2019 Annual Fruit and Vegetable Research Report (PR-762)
<http://www2.ca.uky.edu/agcomm/pubs/PR/PR762/PR762.pdf>
 - b. An IPM Scouting Guide for Common Problems of Peach in KY (ID-260)
<http://www2.ca.uky.edu/agcomm/pubs/ID/ID260/ID260.pdf>
 - c. Fruit and Nut Cultivar Nursery Sources - 2020
https://www.uky.edu/hort/sites/www.uky.edu.hort/files/documents/HortFact_3002_2020.pdf
 - d) Video
 - e) field days
 - f) demonstrations

a. Danville Senior Citizens Center thornless erect blackberry program

3. Please **list** current activities in your state related to **reporting specialty crop prices** and development of **decision aids** regarding:

- a) farmers markets
- b) produce auctions
- c) farm to school/institution
- d) retail
- e) community supported agriculture
- f) direct-to-buyer
- g) sampling standards
- h) merchandising education
- i) market performance metrics
- j) other

a. Average Kentucky wholesale and retail fruit prices collected as a basis for the Kentucky NAP program fruit prices

4. Please **list** current **market research activities** in your state that could benefit small farms. Examples may include:

- a) consumer preferences
- b) comparison of marketing channels
- c) other

SERA 45 Guidelines for State Reports

Name: Jeanine Davis

University: North Carolina State University

Please provide a synopsis of current activities in your state that are directly related to the objectives of the SERA 45 project; if you are not aware of any activities related to an objective, please indicate that.

These are the projects I am personally involved in. There are many, many more relevant research and extension projects at NC State University.

1. Please **list** current activities in your state involving **research-based production information** about specialty crops and systems that have potential to be profitable for small farms, including (but not limited to):
 - a) Protected Agriculture — high/midsize/low tunnel/greenhouse production
 - b) Organic Production Systems
 - Breeding tomatoes for organic production. There are two projects. One is an OREI funded project in its second phase. It is a multi-state project led by Purdue University to create tomato varieties specifically for organic farmers. There is a major emphasis on disease resistance. In North Carolina Jeanine Davis at NC State University conducts the trials in western NC and Sanjun Gu at NC A&T State University conducts the trials in eastern NC. We delayed our 2020 start until 2021 because of COVID research restrictions. The second project is a Specialty Crops Block Grant funded project led by tomato breeder, Dilip Panthee at NC State University. We are evaluating new lines of heirloom-type tomatoes that he has bred in research station and on-farm trials. Good disease resistance, high yield, and excellent taste are the major objectives. Again, because of COVID research restrictions we have delayed the start of the field trials until 2021.
 - We are part of a multi-state OREI funded project to study vegetable varieties and insect control in organic production. The project is led by Tuskegee University and we are in our final year. We are examining how different varieties perform for yield, insects and disease and evaluating some insect control products. I have late season cowpea (Southern pea) trials in the organic unit in western North Carolina. Eight on-farm cooperators across the Carolinas (7 in NC and 1 in SC) are growing a wide array of crops including tomatoes, summer squash, cowpeas, sweetpotatoes, lettuce, leeks, okra, cucumbers, white potatoes, cauliflower, carrots, and edamame.
 - c) Small-scale Production Systems
 - We are part of the Eastern Broccoli Project, a SCRI funded project led by Cornell University now in its second phase of funding. Public and private breeders have been developing broccoli varieties specifically for our humid, wet conditions in the eastern US. Our involvement in western North Carolina

is to trial new breeding lines for summer production in our mountains. Because of our topography, all production will be destined for small and mid-sized farms. We had one on-farm trial this season.

- We continue our Specialty Crops Block Grant funded research on breeding hops for the Southeastern US. There are small and mid-sized hop yards in North Carolina growing for craft breweries, tea companies, medicinal herb manufacturers, florists, and manufacture of value-added products. We now have several promising lines that are being trialed on farms in NC and many eastern states will the hops being evaluated by large to small craft brewers.
- We are involved in a number of multi-department led hemp studies across the state led by Jeanine Davis and David Suchoff. The projects in the eastern part of the state are geared towards larger producers, but the western studies are for the more boutique scale growers in our mountains. Studies include coordinated variety trials and spacing, colored mulch, and planting date and harvest date studies. Most of our hemp studies in NC are field studies but Brian Whipker is leading some greenhouse studies especially focused on fertility.
- We have a US Forest Service funded project on increasing seed production on native ginseng. This is part of our forest farming medicinal herbs efforts that have been ongoing for over 30 years in western NC.
- Our black Perigord truffle research continues on filberts at the research station in western NC. It has been producing for three years. A multi-species host tree study will be planted there this fall.
- Chris Gunter and I, in cooperation with a private ag consultant, completed a colored carrot study in the mountains, piedmont, and coastal plains of NC.

d) Biodegradable Mulches

2. Please **list** current **educational and extension activities** in your state focused on the **production and marketing of specialty crops**. Please include links and/or copies as appropriate. Examples might include (but are not limited to):

a) In-person Trainings

- We held agent training sessions in May on hops, hemp, medicinal herbs, and truffles

b) Webinars

- We Can Grow Truffles in the Southeast!
- What You Should Know Before You Plant Medicinal Herbs
- Challenges and Opportunities for Hemp Production in the Southeast

c) Presentations at conferences

- What You Should Know Before You Planting Medicinal Herbs
- Creative Marketing for Niche Crops
- Growing Hemp: Pest Management, Market Trends and Research Updates
- Hemp Research Updates
- Update on NCSU Truffle Research
- Truffles 101
- Forest Farming Enterprises in Appalachia

- Forest Gardening
 - Growing Hemp: Pest Management, Market Trends, and Research Updates
- d) Print Publications (all on-line now)
- Cultivation of Ramps (*Allium tricoccum* and *A. burdickii*) (revised)
 - Commercial Goldenseal Cultivation (revised)
 - Organic Sweet Corn Production (revised)
 - Bloodroot (*Sanguinaria canadensis*) (revised)
 - Lavender: History, taxonomy, and production (updated)
- e) Conferences
- Helped coordinate the Winter Vegetable Conference in February in Asheville, NC
- f) Field Days
- Participated in hemp virtual field day
- g) Demonstrations
- Woodland botanicals demonstration and education area
- h) Social Media/Facebook
- NC Alternative Crops & Organics FB group
 - NC Industrial Hemp FB page
- i) Websites and News Updates-dozens of updates on our research and extension activities, and new updated pages are posted on <https://newcropsorganics.ces.ncsu.edu/> and <https://hemp.ces.ncsu.edu/>

3. Please **list** current activities in your state related to **reporting specialty crop prices** and development of **decision aids** regarding:

- a) farmers markets
- b) produce auctions
- c) farm to school/institution
- d) retail
- e) community supported agriculture
- f) direct-to-buyer
- g) sampling standards
- h) merchandising education
- i) market performance metrics
- j) other

4. Please **list** current **market research activities** in your state that could benefit small farms. Examples may include:

- a) consumer preferences
- b) comparison of marketing channels
- c) other

SERA 45 Guidelines for State Reports

Name: Annette Wszelaki, Patrick T. Dugger, and Margarita Velandia

University: The University of Tennessee

Please provide a synopsis of current activities in your state that are directly related to the objectives of the SERA 45 project; if you are not aware of any activities related to an objective, please indicate that.

1. Please **list** current activities in your state involving **research-based production information** about specialty crops and systems that have potential to be profitable for small farms, including (but not limited to):
 - a) protected agriculture — high/midsize/low tunnel/greenhouse production
 - b) organic production systems
 - c) small-scale production systems
 - d) biodegradable mulches
 - *Evaluating Cultivar Selection and Integrated Pest Management Practices in Blueberry Production*
 - *Reclaiming High Tunnel Soil Health for Sustained Specialty Crop Production*
 - *Labor, Efficiency, Automation, and Production for Sustainability in the Nursery Crops Industry*
 - *Organic Internship VOL Supported Ag Program*
 - *Comparing Lettuce Yield and Quality Using Drip and Overhead Irrigation on Biodegradable Mulches*
 - *Multi-state Squash Hunger: Kabocha Squash Variety Trial*
 - *Multi-state Spring and Fall Beet Variety Trials*

2. Please **list** current **educational and extension activities** in your state focused on the **production and marketing of specialty crops**. Please include links and/or copies as appropriate. Examples might include (but are not limited to):
 - a) in-person trainings
 1. **Dugger, T.**, M. Bruch Leffew, D. Lockwood, A. Smith, T. Woods. – “Sustaining Tennessee Farms with Value-Added Agriculture and Alternative Crops” – Agent In-Service Training, November 19 and 20, 2019 (Participants = 30 Extension Agents).
 2. **Wszelaki, A.**, R. Snyder, J. Kemble, C. Sams, J. Walgenbach, and Z. Hansen. Undercover Tomato Production Short Course – Agent and Grower Training, March 10-11, 2020
 3. **Wszelaki, A.**, Producer conference and county meeting talks on biodegradable mulches, cover crops in high tunnels, food safety, variety trials and organic production.
 4. Critzer, F., J. Buchanan, M. Danyluk, L. Dunn, C. Gunter, C. Rock, L. Strawn and **A. Wszelaki**. Bridging the GAPS: Approaches for Treating Water On-farm Train-the-Trainer, August 12, 2020. ASHS Workshop (Participants=60 agents, educators,

researchers)

5. Critzer, F., J. Buchanan, M. Danyluk, L. Dunn, C. Gunter, C. Rock, L. Strawn and **A. Wszelaki**. Bridging the Gaps: Approaches for Treating Water On-farm Train-the-Trainer, October 13-14, 2020. Western Center for Food Safety (Participants=24 agents and educators)

b) webinars

1. **Wszelaki, A., M. Velandia**, and M. Bruch Leffew (joint presentation). "Community Supported Agriculture (CSA) Twilight Q&A: Operating During the COVID-19 Pandemic." Zoom Meeting, UT Extension, April 30, 2020 (Participants = 20).
2. **Velandia M.** "Labor Use and Labor Challenges faced by Tennessee Fruit, Vegetable, and Dairy Farms." Area Specialists Workshop (Zoom meeting), May 4, 2020 (Participants = 12).
3. **Wszelaki, A.**, L. Dunn, B. St. John and A. Hopper. Filling in Your Gaps: Field Gaps, November 10, 2020
4. **Wszelaki, A.**, L. Dunn, B. St. John and A. Hopper. Filling in Your Gaps: Packinghouse Gaps, November 17, 2020
5. **Wszelaki, A.**, L. Dunn, B. St. John and A. Hopper. Filling in Your Gaps: Challenges for Small Farms, November 24, 2020
6. **Wszelaki, A.**, L. Dunn, B. St. John and A. Hopper. Filling in Your Gaps: Where People Lose GAP Audit Points and Possible Solutions, December 1, 2020
7. **Pepper, H.**, J. Bruhin, M. Brown, "Farmers Market Vendor Bootcamps." Three in-person sessions conducted with 70 participants, topics included, "Merchandising Methods to Make Money", Bruhin; "Digital Marketing Trends", Bruhin; "Food Product and Cost-Pricing Tools", Pepper; "Business Planning Basics", Pepper; "Food Product Safety and Regulations", Brown.
8. **Pepper, H.**, J. Bruhin, M. Brown, "Farmers Market Virtual Vendor Bootcamps." Four-day series with 231 participants, including the same topics as found in number 9 above.
9. **Pepper, H.**, M. Brown, N. Staisey, "Growing Sales at Farmers Markets." Four-day webinar series with 197 participants, topics included, "How to Grow Market Sales", Staisey; "Data Driven Advocacy: Communicating the Value of Farmers Markets, Farms, and Farm Products", Staisey; "Food Product Safety and Regulations", Brown; "Lessons from a Small-Town Farmers Market Becoming a Nonprofit Organization", Pepper.

c) print publications

1. Denton, R., **M. Velandia**, Z. Hansen, and D. Lockwood. 2020. "Sample Budgets for Blueberry Production under Various Integrated Pest Management and Marketing Strategies." 2020. UT Extension.
2. Ferrell, J.B., **M. Velandia, A. Wszelaki**, L. Eckelkamp. "What Do I Need to Know Before Considering Interns as a Source of Labor for My Farm Business?" 2020. W942, UT Extension [Refereed].

3. Bruch Leffew, M., **A. Wszelaki**, D. Lockwood, M. Morgan, N. Miller, **M. Velandia**, H. Pepper, J. Bruhin, and A. Fulcher. "Considerations for Operating a Pick-Your-Own Operation During the COVID-19 Pandemic." CPA 373, UT Extension. [Available Online](#).
4. Fulcher, A., M. Bruch Leffew, **A. Wszelaki**, and **M. Velandia**. 2020. "Operating a Garden Center during the Covid-19 Pandemic." D114, UT Extension. [Available online](#).
5. **Velandia, M., A. Wszelaki**, A. Fulcher, W.A. Bailey, and J.H. Chadwell. 2020. "Information to Protect Farmworkers and their Employers in the Midst of Covid-19." D100, UT Extension. [Available Online](#).
6. **Velandia, M.** 2020. "Actualización del Programa H-2A y El COVID-19: Expansión de los Criterios Para Aplicantes a la Visa H-2A que No Necesitan una Entrevista en Persona." D66-B, UT Extension. [Available Online](#).
7. **Velandia, M., A. Wszelaki**, and W.A. Bailey. 2020. "Updates on the H-2A Program and COVID-19: Expansion of the Categories of the H-2A Visa Applicants whose Applications can be Decided on Without and In-person Interview." D66-A, UT Extension. [Available Online](#).
8. **Velandia, M., A. Wszelaki**, A. Fulcher, T. Petty, M. Bedwell, W.A. Bailey, and R. Jones. 2020. "Updates on the H-2A Program in the Midst of Covid-19." D-64, UT Extension. [Available Online](#).
9. Critzer, F., J. Buchanan, M. Danyluk, C. Gunter, L. Strawn and **A. Wszelaki**. Bridging the GAPS: Approaches for Treating Water On-farm Series: W 920-A Agricultural Water Treatment and FSMA: extension.tennessee.edu/publications/Documents/W920-A.pdf
10. Critzer, F., J. Buchanan, M. Danyluk, C. Gunter, L. Strawn and **A. Wszelaki**. Bridging the GAPS: Approaches for Treating Water On-farm Series: W 920-B Agricultural Water Treatment Tools: extension.tennessee.edu/publications/Documents/W920-B.pdf
11. Critzer, F., J. Buchanan, M. Danyluk, C. Gunter, L. Strawn and **A. Wszelaki**. Bridging the GAPS: Approaches for Treating Water On-farm Series: W 920-C Developing On-farm Water Treatment Programs: extension.tennessee.edu/publications/Documents/W920-C.pdf
12. Critzer, F., J. Buchanan, M. Danyluk, C. Gunter, L. Strawn and **A. Wszelaki**. Bridging the GAPS: Approaches for Treating Water On-farm Series: W 920-D Implementing Agricultural Water Treatments on the Farm: extension.tennessee.edu/publications/Documents/W920-D.pdf

d) video

e) field days

1. Fulcher, A., **A. Wszelaki**, and **M. Velandia** (joint presentation). "Best Landscape, Retail, and Farmworker Practices and Resources During COVID-19." Green Industry Field Day (Virtual Field Day), University of Tennessee, June 16, 2020 (Participants = 20).
2. **Wszelaki, A.**, "Squash Hunger: Kabocha Variety Trial", Organic Crops Virtual Field Tour, University of Tennessee, October 2, 2020

(https://www.youtube.com/watch?v=H1rUHWGAj3g&feature=emb_logo; Views = 31).

- f) Demonstrations
 - g) social media promotion of events/use of Facebook live
Facebook @UTProduce
Instagram @ut_vsa
 - h) websites
<http://utvegetable.com>
<https://ag.tennessee.edu/biodegradablemulch/Pages/default.aspx>
<https://extension.tennessee.edu/Pages/ANR-CED-CH-Fruit-and-Vegetable.aspx>
3. Please **list** current activities in your state related to **reporting specialty crop prices** and development of **decision aids** regarding:
- a) farmers markets
 - b) produce auctions
 - c) farm to school/institution
 - d) retail
 - e) community supported agriculture
 - f) direct-to-buyer
 - g) sampling standards
 - h) merchandising education
 - i) market performance metrics
 - j) other

4. Please **list** current **market research activities** in your state that could benefit small farms. Examples may include:
- a) consumer preferences
 - b) comparison of marketing channels
 - *Evaluation of the economic feasibility of U-Pick and retail marketing opportunities for blueberries in Tennessee.*
 - c) Other
 - *Tennessee fruit and vegetable producers willingness to pay for biodegradable mulches.*

Grants:

1. Jacobsen, K., **T. Woods**, **A. Wszelaki**, D. Butler, T. Coolong, J. Grossman, M. Hutton, M. Rogers, R. Rudolph, and **M. Velandia**. "Reclaiming High Tunnel Soil Health for Sustained Specialty Crop Production." SCRI, USDA-NIFA, 08/2020 – 08/2022.
2. Fulcher, A., N. Bumgarner, A. LeBude, S. Marble, L. Nackley, M. Palma, L. Ribera, L. Warner, A. Rhin, and **M. Velandia**. "L.E.A.P, Labor, Efficiency, Automation, and

- Production for Sustainability in the Nursery Crops Industry.” SCRI, USDA-NIFA, 08/2020 – 08/2022.
3. Tanaka, K., K. Rignall, K. Moskowicz, **M. Velandia**, C. Trejo-Pech, and S. Muntz. “Extending Roots of Fresh Stop Markets across the Southeast Region.” Southern Sustainable Agriculture Research & Education (SARE) Program, USDA–NIFA, 4/2018 -3/2021.
 4. Hansen, Z., N. Bumgarner, D. Lockwood, M. Rose, V. Sykes, and **M. Velandia**. “Evaluating Cultivar Selection and Integrated Pest Management Practices Economically to Support Blueberry Growers in the Mid-South.” Southern Region Small Fruit Consortium, 3/2019 – 2/2020.
 5. Holland, R., T. Dugger, “Developing and Utilizing Crop Profiles for Tennessee Specialty Crop Growers” (Crop Profiles); Working with Center for Crop Diversification to develop six crop profiles for use in Tennessee. Specialty Crop Block Grant, 11/1/2018 – 8/1/2021.
 6. Holland, R., T. Dugger, “Considerations for Growing and Marketing Specialty Crops in Tennessee.” Specialty Crop Block Grant, 11/1/2019 – 8/1/2022.
 7. Dugger, T. “Building Rural Economic Enterprises Sustainably and Efficiently,” USDA Rural Business Enterprise Grant, 7/1/2019 – 6/30/2021.
 8. Dugger, T. SARE Model Program – “Professional Development Program Grant,” 7/1/2019 – 6/30/2020
 9. **Wszelaki, A.**, and S. Flowers, “UT Organic Farm Internship Program,” UTK Green Fee, 2019-2021.
 10. **Wszelaki, A.**, B. Leib, and Z. Hansen, “Comparing lettuce yield and quality using drip and overhead irrigation on biodegradable mulches,” USDA Specialty Crop Block Grant, 2018-2021.
 11. Schneider, K., and **A. Wszelaki** (Lead PI- TN Subaward), “Southern Regional Center for Food Safety Training, Outreach and Technical Assistance Continuation, and Lead Regional Coordination Center,” 2018-2021.
 12. **Wszelaki, A.**, F. Critzer and J. Richards, “Exploring Opportunities for Tennessee Department of Agriculture to Prepare to Implement FDA Rule: Standards for the Growing, Harvesting, Packing, & Holding of Produce for Human Consumption,” 2016-2021.

SERA 45 Guidelines for State Reports

Name: Dr. Melanie Stock

University: Utah State University

Please provide a synopsis of current activities in your state that are directly related to the objectives of the SERA 45 project; if you are not aware of any activities related to an objective, please indicate that.

1. Please **list** current activities in your state involving **research-based production information** about specialty crops and systems that have potential to be profitable for small farms, including (but not limited to):
 - a) protected agriculture — high/midsize/low tunnel/greenhouse production
 - 1) Advancing and scheduling bloom of the peony (perennial cut flower) with high tunnels, low tunnels, and soil heating.
 - 2) Snapdragon – planting date, cultivar, and high tunnel vs. field trials
 - 3) Lisianthus - planting date, cultivar, and high tunnel vs. field trials
 - 4) Stock - planting date, cultivar, and high tunnel vs. field trials
 - 5) Dahlia – presprouting vs. direct planting, cultivar, and high tunnel vs. field trials
 - b) organic production systems
 - 1) None.
 - c) small-scale production systems
 - 1) Dahlia – nitrogen management
 - 2) Zinnia – day versus night irrigation efficiency
 - 3) Multistate winter squash variety trial
 - d) biodegradable mulches
 - 1) None.
2. Please **list** current **educational and extension activities** in your state focused on the **production and marketing of specialty crops**. Please include links and/or copies as appropriate. Examples might include (but are not limited to):
 - a) in-person trainings
 - 1) Utah Urban and Small Farms Conference; Salt Lake City, UT; Mar. 2020
 - b) Webinars
 - 1) Association of Specialty Cut Flower Growers; Aug. 2020
 - c) print publications
 - 1) Snapdragon Cut Flower Production in Utah. USU Extension Fact Sheet. Horticulture. Cutflower/01. *In Press*.
 - 2) Evaluating production strategies for Ranunculus in the Intermountain West. ASCFG Cut Flower Quarterly. *In press*.
 - 3) [Zinnia Cut Flower Production in Utah](#). USU Extension Fact Sheet. Horticulture. Cut Flower/01. Paper 2124. *Published Aug. 2020*.
 - 4) [Sweet Pea Cut Flower Production in Utah](#). Horticulture. USU Extension Fact

Sheet. Horticulture/Garden/2019-07pr. Paper 2063. *Published Dec. 2019.*

- 5) [Peony Cut Flower Budget for One High Tunnel](#). 2019 Utah Agricultural Statistics and Utah Department of Agriculture and Food Annual Report, pages 68-69. *Published Dec. 2019.*
 - d) video
 - 1) None
 - e) field days
 - 1) Cancelled due to COVID-19
 - f) Demonstrations
 - 1) Selecting soil tests and sampling for urban farms (train the trainer event). Feb. 2020.
 - g) social media promotion of events/use of Facebook live
 - 1) [USU Research on Snapdragons](#). Hosted by @usu_smallfarms on Instagram. Posted on IGtv. Aug. 2020.
3. Please **list** current activities in your state related to **reporting specialty crop prices** and development of **decision aids** regarding:
- a) farmers markets
 - 1) None.
 - b) produce auctions
 - 1) None.
 - c) farm to school/institution
 - 1) None.
 - d) retail
 - 1) Snapdragon Cut Flower Budget for One High Tunnel. USU Extension Fact Sheet. Horticulture. Cutflower/01. *In preparation, anticipated submittal Sep. 2020.*
 - 2) Snapdragon Cut Flower Budget for One Field. USU Extension Fact Sheet. Horticulture. Cutflower/01. *In preparation, anticipated submittal Sep. 2020.*
 - 3) Peony Cut Flower Budget for One High Tunnel. USU Extension Fact Sheet. Horticulture. Cutflower/01. *In preparation, anticipated submittal Sep. 2020.*
 - 4) Peony Cut Flower Budget for One Field. USU Extension Fact Sheet. Horticulture. Cutflower/01. *In preparation, anticipated submittal Sep. 2020.*
 - 5) [Peony Cut Flower Budget for One High Tunnel](#). 2019 Utah Agricultural Statistics and Utah Department of Agriculture and Food Annual Report, pages 68-69. *Published Dec. 2019.*
 - 6) *Note: the [sweet pea](#), [zinnia](#), and snapdragon fact sheets also contain economic reporting, such as price points and market preferences.*
 - e) community supported agriculture
 - 1) None.
 - f) direct-to-buyer
 - 1) None.

- g) sampling standards
 - 1) None.
- h) merchandising education
 - 1) None.
- i) market performance metrics
 - 1) None.
- j) Other
 - 1) None.

4. Please **list** current **market research activities** in your state that could benefit small farms. Examples may include:

- a) consumer preferences
 - 1) I collaborate with a farm co-op that informally tests floral markets and reports back preferences on bloom colors, packaging, pricing, and flower type.
- b) comparison of marketing channels
 - 1) None.
- c) Other
 - 1) None.

SERA 45 State Report

Name: Lewis W. Jett

University: West Virginia University

Please provide a synopsis of current activities in your state that are directly related to the objectives of the SERA 45 project; if you are not aware of any activities related to an objective, please indicate that.

1. Please **list** current activities in your state involving **research-based production information** about specialty crops and systems that have potential to be profitable for small farms, including (but not limited to):

a) Protected Agriculture — high/midsize/low tunnel/greenhouse production

- We are evaluating shade fabric (percentage, date of application) for high tunnel production in southern West Virginia. This project is funded through both Conservation Districts and a Specialty Crop Block Grant.
- Currently evaluating winter allium production in low tunnels and high tunnels for 2020-21.
- Currently evaluating winter cabbage production in high tunnel for processor in southern WV in 2020-21.
- Initiating a SARE Professional Development project to map assets and create grower cooperatives around high tunnel leafy green production in 2 regions of West Virginia.
- Evaluating fig production in high tunnels. (1 cultivar)
- Evaluating grafted tomatoes in high tunnels (Project funded by Matt Kleinhenz, OSU)
- Evaluating irrigation frequency for high tunnel cucumbers. This project is funded through a cooperative agreement with USDA-NRCS.
- Evaluating cover crops within high tunnels in southern WV.
- Using high tunnels to produce heirloom, Appalachian seeds.

b) Organic Production Systems

- Evaluating heirloom bean production (SARE Funded Partnership Grant)
- Evaluating organic hazelnut production.
- Evaluating hascap production
- Evaluating cider apple varieties (Dr. Mira Danilovich)

c) Small-scale Production Systems

- Evaluation of winter squash (SERA 45 Cooperative Project)
- Evaluating heritage bean production for commercial markets.

2. Please **list** current **educational and extension activities** in your state focused on the

production and marketing of specialty crops. Please include links and/or copies as appropriate. Examples might include (but are not limited to):

- a) In-person Trainings
 - Producer trainings for bean trellis construction (SARE Partnership Grant)

- b) Webinars
 - Webinar on growing and harvesting vegetables for the ***WV-Grow This!*** Program for over 6000 citizens in WV.
 - Seed Saving Video
 - Square Foot Gardening Video
 - Harvesting Beets and Carrots Video

- c) Presentations at conferences: The West Virginia Small Farm Conference in February 2020 had over 500 attendees
 - *Growing and Marketing Appalachian Heritage Beans*
 - *Heritage Tomato Production*

The Mid-Atlantic fruit & Vegetable Convention had over 800 attendees.

- *Leafy Green Production*
- *Winter Allium Production*

d) Print Publications (all on-line now)

- A Novel Trellis design for heritage beans-Midwest variety Trial Report
- Evaluation of West Virginia Heritage Beans
- Building Raised Beds

e) Conferences:

- 2020 West Virginia Small farm Conference
- 2020 West Virginia Small Farm Conference High Tunnel Workshop

f) Field Days

- Organic Horticulture farm Virtual Field Day

g) Demonstrations

- How to save seed
- How to grow and harvest beets and carrots
- How to prune tomatoes

3. Please **list** current activities in your state related to **reporting specialty crop prices** and development of **decision aids** regarding:

- a) farmers markets
- b) produce auctions
- c) farm to school/institution
- d) retail
- e) community supported agriculture
- f) direct-to-buyer
- g) sampling standards
- h) merchandising education
- i) market performance metrics
- j) other

4. Please **list** current **market research activities** in your state that could benefit small farms. Examples may include:

- a) consumer preferences
 - test marketing processed and unprocessed heritage beans at farmers' markets
 -
- b) comparison of marketing channels
- c) other