

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

**University of Tennessee, Knoxville, TN  
Friday, October 5<sup>th</sup>, 2018  
9 a.m. to 3 p.m. EDT**

**Participants in attendance:** Lesley Oliver (AA-University of Kentucky), Margarita Velandia (Chair, University of Tennessee), Annette Wszelaki (University of Tennessee), Troy Dugger (Center for Profitable Agriculture, Tennessee), Krista Jacobsen (Vice-Chair, University of Kentucky), Christy Cassidy (University of Kentucky), Brett Wolff (University of Kentucky), Tim Woods (University of Kentucky), Matt Kleinhenz (Ohio State University), Ajay Nair (Iowa State University)

## **Agenda**

- Margarita Velandia (Tennessee) facilitated the meeting, which opened with introductions. There was one new participant, Troy Dugger of Tennessee's Center for Profitable Agriculture.
- Administrative advisor Lesley Oliver began the meeting by explaining the process for renewing the SERA 45 project, which will expire on September 30<sup>th</sup>, 2019. The group needs to work on a renewal proposal, which will consist of three pages and will need to show evolution from the last proposal. The group needs to think about altering the objectives and activities as laid out in the previous proposal. An updated proposal needs to be developed by January 1, 2019.
- Participants discussed crop diversification activities going on in their states. Written state reports were shared with the entire group by email prior to the meeting, and copies were provided for all participants who attended the meeting in person. Participants from Iowa, Ohio, Kentucky and Tennessee provided written reports. Because of the large number of participants from Kentucky, individuals provided separate reports rather than a single state report.

### **A. The group discussed research and extension activities in the participating states.**

1. Tennessee participants (Annette Wszelaki, Margarita Velandia) opened the discussion of state reports. Work has continued on a biodegradable mulch project, *Performance and Adoptability of Biodegradable Plastic Mulch For Sustainable Specialty Crop Production*, with Washington State University. Progress has been made, but there is still work to do. The team working on biodegradable mulch took a trip to Italy and Spain last summer, where there is a different mindset regarding regulations and incentives, than what is found in the United States, where economics are the top priority. Tennessee also has a research project comparing lettuce yield using drip and overhead irrigation on biodegradable mulches. The team observed that growers in Europe use overhead irrigation. There is far less literature on the economics of biodegradable mulches than on the performance of these mulches. Tennessee has been looking at the economics of biodegradable mulch adoption at the farm level, and has developed a publication to help growers know what they should consider before adopting the use of biodegradable mulch, including the cost of labor. The Economics

of Adopting Biodegradable Plastic Mulch Films, W650, UT Extension, is available online at <https://extension.tennessee.edu/publications/Documents/W650.pdf>. Another publication on factors affecting profitability using biodegradable mulch is in the works. Cost of labor and mulch adhesion have been found to be factors affecting profitability. Tennessee has also developed a Biodegradable Mulch Information Resources web page (<https://ag.tennessee.edu/biodegradablemulch/Pages/factsheets.aspx>).

Tennessee is also part of a project with Kentucky (Krista Jacobsen) and Georgia, *Cover Crops Under Cover: Evaluating Costs, Benefits and Ecosystem Services of Cover Crops in Year-Round High Tunnel Production*. A project on thermal protection strategies in high tunnels is just finishing up. The project is looking at ways to increase the temperatures in high tunnels during the winter using thermal protection rather than heaters. Tennessee is still doing on-farm variety trialing, and a Southeast Regional Pumpkin Trial that is in its 11<sup>th</sup> year with North Carolina State.

Tennessee continues to do farmers market price reports, but has had unsuccessful attempts to try to work with the data. Reviewers question why price ranges (minimum and maximum) rather than average prices are used. Margarita Velandia would like help from the SERA 45 group on how to use the price reporting data for research purposes.

Tennessee has a new project underway with the University of Kentucky – *Extending Roots of Fresh Stop Markets across the Southeast Region*, which has been funded by Southern SARE, USDA-NIFA. Fresh Stop Markets have had success in Kentucky, and the project is looking at expanding that success throughout the Southeast. Tennessee will be looking at the economics of Fresh Stop Markets. From a social justice perspective, Fresh Stop Markets are wonderful, with higher income families subsidizing lower income families buying fresh food. From an economic perspective, some things still need to be worked out to make the program successful.

Tennessee's extension activities have included farmers market boot camps in conjunction with the Center for Profitable Agriculture, which have been successful. Boot camps have covered production topics in 2018.

2. Matt Kleinhenz (Ohio) raised the question of how, for the SERA 45 project, small farms have been defined. Lesley Oliver (Kentucky) shared that the proposal indicates small farms were defined as farms that encompass 179 or fewer acres. Ajay Nair said 30 to 40 percent of the farms in Iowa are in the 5- to 20-acre range. Many of the specialty crop producers in Iowa are also corn and soybean farmers. They might have 1,000 acres of corn and soybeans, but they have 5 or 10 acres of vegetables.

Kleinhenz reported on activities in Ohio. There has been an effort around the commercialization of pawpaw. Sally Miller, plant pathologist at Ohio State, is conducting research on managing soil borne diseases in high tunnels. Kleinhenz does work with high tunnels year-round, using both organic and conventional production. The goal is to get the most out of high tunnel systems, whether it's innovating with their management, structures, soils, additives such as biostimulants, grafted plants, etc., any and all ways for small growers

to enhance their productivity while also enhancing their income. Ohio State has been working with low and mid-size tunnels, too. Ohio State has been trying to assist people with grafted plants. The university has for years been a supplier of grafted plants, giving growers a chance to try them.

3. Ajay Nair (Iowa) said that researchers at Iowa State are focusing on similar projects. Season extension is a priority for Iowa growers, so Iowa State is focused on high tunnel research. This includes addressing some key and practical questions such as heat stress management, including looking at different shade cloth materials. Researchers have also been looking at grafting, particularly low-cost methods to make it accessible to more farmers, as well as different grafting rootstocks, as Iowa is trying to catch up with work done in other states. Iowa State has also been conducting research on high tunnel production of peaches, comparing it with field production, as Iowa typically gets an outdoor peach crop only every three to four years.

Organic production system work has also been going on at Iowa State, including no-till production in vegetables. An organic transition project has been going on in collaboration with the University of Kentucky, working with mesotunnels using Protek netting.

Nair indicated he gets a lot of questions about garlic. Velandia said the Tennessee farmers market price reports show garlic selling for \$20 per pound, but no one is going to buy a pound of garlic. That price led to calls from extension agents saying some growers want to grow an acre of garlic. In addition to price, Nair indicated that the popularity of garlic might be due to the fact that management of garlic is not that strenuous compared to other crops, and it's a good crop for CSA boxes.

4. The group discussed mid-sized or mesotunnels. Kleinhenz (Ohio) said mid-sized tunnels are gaining interest among growers who don't want to commit to a high tunnel.

Kleinhenz indicated that Ohio State benefits greatly from resources from the University of Kentucky and the University of Tennessee, especially specialty crop prices and budgets. Velandia indicated she would reach out to people in Ohio regarding price reporting.

5. Christy Cassady (Kentucky) presented reports from UK's John Strang, Shawn Wright and the Center for Crop Diversification (CCD). Wright has been conducting research on hops and annual rhubarb production at the Robinson Center for Appalachian Resource Sustainability (RCARS) in Eastern Kentucky. Other work includes construction of a passive solar greenhouse, establishment of a pawpaw orchard, and work with medicinal herbs, non-timber forest products, plasticulture strawberry production, a hazelnut cultivar evaluation, and fruit and vegetable production in high tunnels, low tunnels and in the field. Strang has been working on a haskap cultivar and selection evaluation, a matted row strawberry cultivar trial, a bacterial spot bell pepper cultivar evaluation, and an uba tuba pepper selection program. Other work at UK includes a thornless erect blackberry variety evaluation and a colored cauliflower cultivar evaluation in Western Kentucky.

The CCD has conducted two webinars since the 2017 meeting, one on transitioning to

organic production and one on pests and diseases of specialty crops. As part of a Kentucky Specialty Crop Block Grant, the CCD has developed five new publications (crop profiles on heirloom beans, heirloom tomatoes, figs and organic cucurbits, and a fact sheet on organic regulations and resources). The CCD has also updated 31 crop and marketing profiles since the 2017 SERA 45 meeting. The CCD monthly newsletter now has 1,655 subscribers. The CCD's Brett Wolff has been developing a series of videos highlighting special interest events or locations in the state. These are available on YouTube. The CCD has distributed resources at four field days and at the 2018 UK Horticulture Twilight Tour.

The CCD began collaborating in early 2018 with the Kentucky Horticulture Council on a variety of resources and activities. Josh Knight, a senior extension associate funded by the Hort Council, has developed a high tunnel planting date chart that is currently under review. He has also developed a Geographic Horticulture Directory of Kentucky (<https://uk-horticulture.github.io/hort-directory/>), which is available on the CCD website and features locations and contact information for shared equipment, farmers markets, produce auctions and educational greenhouses. Additional information is being added to this resource.

The CCD updated large-scale enterprise budgets (on a per-acre basis) in late 2017 for 18 vegetable and melon crops, and developed a set of small-scale budgets (most based on a 100-foot row) for the same crops as part of a 2016 Kentucky Specialty Crop Block Grant. As part of a 2018 Specialty Crop Block Grant, a new budget will be developed for peaches, and budgets for blueberries and strawberries will be updated in 2019. Budgets can be accessed at <http://www.uky.edu/ccd/tools/budgets>. Ten new podcasts have been developed in the past year and posted on the CCD website at <http://www.uky.edu/ccd/training/podcasts>.

Wolff reported that the CCD's Kentucky farmers market price reports attained a new high of 14 markets reporting. Reports are posted on the CCD website April through October. Prices from five produce auctions in Kentucky are also posted as received on the CCD website. All price reports can be accessed from <http://www.uky.edu/ccd/pricereports>.

The 2017 KSCBG funded the development of a new adaptable marketing curriculum — [Marketing for All](#) — designed to offer trainings to small farms. This curriculum has been presented in numerous workshops in Kentucky and three webinars in collaboration with the University of Tennessee Center for Profitable Agriculture in fall 2018.

The CCD is currently working on a nursery products buyer survey, a roadside farm market survey, and an organic producer/stakeholder survey. Additional surveys are planned for 2019/2020. A CCD user survey will be distributed this fall.

6. Velandia brought up the need to access additional statistical information as to who is accessing the UT and other price reports. Wolff pointed out that making the data on pricing more usable to researchers could impact its utility to the users. Velandia said her goal is to understand how people are using the prices in order to determine how to better deliver the information. Tracking downloads was identified as being particularly useful. Tim Woods (Kentucky) recommended the use of impact surveys to determine which resources are being used, how extension personnel are sharing resources with clients, and how resources might

be improved.

**B. Objective 1: Developing research-based production information about crops and systems that have potential to be profitable for small farms**

1. There is an opportunity for thinking about an economic analysis across crops for high, mid-size and low tunnels. Krista Jacobsen (Kentucky) recommended looking at crops other than tomato, and said there is a lot of work to be done on sequential plantings. Woods (Kentucky) said there is a need for research on high tunnel economics. Kleinhenz (Ohio) said the region needs to be more in tune with providing a year-round supply of produce.
2. The group discussed the opportunity to submit a multistate research project. Jacobsen mentioned the possibility of submitting an SCRI proposal. Wszelaki (Tennessee) suggested a planning grant. Kleinhenz pointed out that he is involved in the beginning stages of an SCRI conference planning grant on microclimate management technologies and implications for crop scheduling and productivity based on weather patterns. Velandia agreed to look at deadlines for SCRI planning grants, and to keep a conversation going to try to move forward.
3. Wszelaki said Extension Vegetable Specialist Rachel Rudolph (Kentucky) participated in radish variety trials this year along with Wszelaki and other researchers from states in the South. Radish seeds were donated by seed companies, and the trial involved South Carolina, Louisiana, Alabama and North Carolina in addition to Kentucky and Tennessee. Results varied significantly by state.
4. The group discussed the possibility of collaboration on biodegradable mulch research. Wszelaki said she has talked with Liz Maynard (Indiana) about doing research with biodegradable mulch, and she is interested. Wszelaki pointed out that Weed Guard Plus is located in Lexington, KY, which would alleviate the shipping costs that are so expensive in other states. Jacobsen said she would talk to Rudolph at UK about collaborating. Wszelaki said she will do a presentation on biodegradable mulch at the Kentucky Fruit and Vegetable Conference in Lexington in January 2019. Nair (Iowa) indicated he received a Specialty Crop Block Grant for 2019 to do research on biodegradable mulch. Wszelaki said the Tennessee NRCS is offering a cost share opportunity with biodegradable mulch, at least for the coming year, by the square foot. The cost-share also applies to landscape fabric. Growers will get \$.19 per square foot covered, but it's not a straightforward process, and it's a one-time cost-share for that particular acreage. It's on a state-by-state basis as to whether NRCS includes the cost-share option for biodegradable mulch. Historically underserved farmers will receive \$.24-\$.26 per square foot. Velandia said looking at the economics of biodegradable mulch, the product costs are at least double the cost of plastic, and while there are labor savings with biodegradable mulch, whether or not the labor savings offset the added cost of the product depends on the cost of labor in a given area.

**C. Objective 3: Price reporting discussion**

1. Wolff described the Kentucky price reporting process, in which he sends out a blank form to farmers market price reporters by email, they fill it out and email it back to him, and he fills out a report; the process is meant to accommodate low technological skills in reporters. The process leads to a report that is very user-friendly to farmers during the season, but terrible for processing the data after the season. Velandia said Tennessee adopted the Kentucky process, and there is value in uniformity among states in collecting price information. Wolff added that in 2017 UK created 3-year average price reports for farmers markets and produce auctions.

2. Velandia presented information about Tennessee's new price reporting app. Some reporters had asked for an easier way to report prices, such as an app, two to three years ago. UT created an IT office that focuses on different statistical activities, one of which is developing apps. This is the first year of testing the app. She said there are things that need to be improved. The app is available to any reporter who registers and receives permission from Velandia to use it. The date is automatically populated, the user selects the market, and starts typing a crop; the app shows options and the user chooses the crop. The user enters the price and saves it. It automatically saves the data and the reporter can add more prices. As Velandia moves through a market, she reports prices for a crop only if they are different from what she has already reported, as Tennessee reports a minimum and a maximum price. Some reporters prefer paper because many prices don't change from one week to the next, and the app currently does not allow reporters to access prices from the previous week. The reporter can add new products, which are saved automatically. Once all prices are entered, the reporter has an opportunity to edit prices. Once submitted, the information goes directly to a database, which is easy to convert to a report. Two or three Tennessee reporters are using the app, and which reporters choose to use it depends on their age and ability to use apps. Velandia gives reporters the option of filling out a form, then taking a photo of it or scanning it, and some reporters prefer that option. Some farmers market reporters are interns from extension offices who are younger, and are excited about using the app. Velandia sends reporters the paper form each week so they know what products to expect. But with the app, the entire database is available. Data can be exported as a CSV file, and can be condensed into minimum and maximum prices. Having an Excel file ready with all the data might be useful for research purposes. Velandia has given access to the app to two market managers in the Washington, D.C. area to try, and has asked for feedback from them. The University of Tennessee has someone being paid to manage the app and update the databases, and can't give everyone access to the app for free. Tennessee is looking for a sustainable model so the app can be made available to more users. Wszelaki asked if it would help on the research side to include the number of vendors selling a particular product. Wolff said Kentucky has included vendor numbers in its farmers market reports this year; not exact numbers but, for example, five or more selling a crop was listed as "high." Velandia said she needs to train reporters, and is planning to do trainings across the state, showing how the app works and how to report prices. She sees the app as a way to get more people excited about reporting prices and collecting more information. The issue from the reporters' standpoint regarding including vendor numbers is how much more time is being added on the reporting side.
3. Velandia said she uses price reports to show trends, and to show people how to use the prices. Velandia mentioned a paper that had been submitted for publication but was rejected. From a research perspective, she is asked why not she is not using average prices. She is hoping for help from the group as to how to tell the story of pricing, and to better sell the idea of price reporting, as well as with research that will do more to help producers make pricing decisions. She wants to give producers a guideline of minimum and maximum when deciding how to price a product, but there has to be a way to translate that into a research publication. Wolff recommended focusing on putting pricing information together and showing people how to use it, as there are things those working with price reporting take for granted that growers don't necessarily intuitively see. Velandia pointed out that the cost of living and the cost of production is changing, but prices at farmers markets aren't changing. She said there is an

opportunity for collaboration between Tennessee's Center for Profitable Agriculture (CPA) and the CCD, to develop a publication on how to translate prices into business decisions.

**D. Objective 4: Conducting market research in the participating states on consumer preferences and marketing channels that are most effective and profitable for small farms**

1. Kleinhenz (Ohio) said he sees a need for production researchers to learn about market changes as early as possible, otherwise they have to adapt their research to catch up with producers' needs as they relate to new marketing options. He pointed to the "blue apron phenomenon" of home meal kits. The concept takes a local foods and convenience-based model and scales it up so that consumers can get a meal kit shipped anywhere in the country. If that gets popular, there will be local and regional markets. For production people, that's a big development. Woods (Kentucky) mentioned an area survey of consumers that involves buying local food at restaurants with different formats, looking at differences in opportunities and profits. Work done in Kentucky and by Brad Bergefurd (Ohio) with produce auctions can provide insight for the Ohio River Valley states into preferences for early season markets and for early season extension, and what kinds of products are in demand based on patterns seen at auctions. The research shows the early season market versus the peak market for different products. Woods said that the farmers market and auction data are getting to the point of providing some very local insight with implications for season extension.

**E. Objective 2: Coordinating research and extension activities among participants**

1. The group discussed several areas for possible collaboration.
  - a. High tunnels - Kleinhenz (Ohio) is currently working on a planning proposal. The full team is not set, so he is recruiting potential partners.
  - b. Produce auctions and farmers market prices – there is an opportunity for collaboration on an extension publication and a research publication.
  - c. Wolff pointed to his work with video and photography for the CCD to develop products that are of interest to the public and to farmers as a way of showing them what we're doing. He would like to come to some events in the region to help communicate what's going on with the SERA 45 group. Wolff also recommended that participants use Facebook live from events in their states. Interviews can be recorded and posted on YouTube.
  - d. Velandia mentioned a proposal Tennessee has submitted to make a presentation at the Ohio Ecological Food and Farm Association (OEFFA) Conference in February on biodegradable mulch, which will include performance, soil impact and economics.
  - e. The possibility of submitting a paper on a specific topic to a multidisciplinary journal was mentioned. Oliver (AA-Kentucky) suggested there might be an opportunity to join with another SERA, such as the Local Foods SERA group.
  - f. Velandia suggested a way to build on the objectives of the original proposal would be to take a close look at labor constraints regarding adoption of biodegradable mulch in the region.

**F. Participants discussed in more detail plans for renewing the SERA 45 proposal.**

Woods (Kentucky) suggested keeping four objectives, as there are in the original proposal. Wolff emailed the original proposal to the group. Oliver said the new proposal is something

the group can deal with through email over the next couple of months. She suggested as an example, for the price reporting objective where progress has been made, the next step would be to do an analysis to make the data more helpful not just to producers but also for other researchable questions.

Oliver said the main thing is to show the project is evolving. The group does need to retain a blend of research and extension. While the statement of issues and justification often doesn't change when a proposal is renewed, that is the place to say that this group has successfully collaborated, and the next project will build on those collaborations.

Kleinhenz asked about the possibility of changing the project title, given different thoughts as to what crop diversification means, and how that might lead some people to misread the usefulness of the project. He suggested reaching out to colleagues to let them know the project is consistent with what they are doing, and asked if it would benefit from a new title. Oliver said definitely reach out to colleagues, but that she would check to see if a change of title would mean starting over again rather than renewing the current project. She thinks it is common for the title to be altered somewhat over time.

Wszelaki (Tennessee) pointed out that most states involved in SERA 45 are doing work on hops.

Nair (Iowa) made the group aware of an online newsletter (e-GRO) produced by a multistate group of floriculturists that includes one article each month that is two to three pages long. It is available online at <http://e-gro.org>. There are 12 people involved, and they each contribute one newsletter article during the year. The last page includes all of their university logos and the logos of their sponsors. He suggested SERA 45 develop a similar online newsletter, and suggested that we start such a newsletter in January. The advantage is it offers an extension project as well as impact, and offers the SERA group an opportunity to work together.

Velandia suggested the CCD website as a home for such a newsletter, and suggested reaching out to the group to see how many people would be interested in writing for it. The newsletter would be distributed to growers in all of the SERA 45 states. Wolff said the CCD would be willing to develop a format and post the newsletter each month, but can't chase content. Nair said he would take the initiative to reach out to the group and schedule writers of monthly content. Jacobsen (Kentucky) pointed out that various groups already have newsletters, and this would be a way to add content to existing newsletters. Kleinhenz would like to reach out to others who are doing work that would apply locally in Ohio, and add to their articles in some way; that makes the article a lower burden for him, and the authors of articles from other states would get a wider distribution of their material. Velandia suggested a short Qualtrics survey to determine who is interested in participating. Wszelaki suggested including food safety topics because growers need to hear about food safety often. Nair volunteered to write the first article for January, and Velandia said Tennessee would provide an article on biodegradable mulch. Jacobsen (Kentucky) said she could provide an article on moveable tunnels.

Oliver announced that a new participant, Melanie Stock of Utah State University, had just joined the SERA 45 project.



**Election of officers:**

**Chair:** Krista Jacobsen, University of Kentucky

**Vice-Chair:** Ajay Nair, Iowa State University

Ajay Nair will move into the role of chair in 2020. Participants voiced concern over traveling to Iowa in 2020, as some have trouble securing travel funds to SERA annual meetings. The group agreed to consider other locations, including West Virginia and Illinois, that have not yet hosted a meeting, and also to consider a site such as a state park within the region.

**2019 Annual Meeting**

The University of Kentucky will host the 2019 annual meeting.

The meeting concluded with a tour of the University of Tennessee Organic Crops Unit, one of six farming units that comprise the East Tennessee AgResearch and Education Center. Annette Wszelaki led the tour, which included the UT Organic Internship and VOL Supported Agriculture Program, microbial biostimulant trials, forage mixtures for organic dairy systems, consumer and residential horticulture trials, cucurbit downy mildew sentinel plots, thermal protection strategies in high tunnels, and cover crops in high tunnels.

# SERA 45 State Report - Iowa

**Name: Dr. Ajay Nair**

**University: Iowa 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/ 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:

- *Impact of shade material and cultivar on high tunnel colored pepper production (Kristine Lang and Ajay Nair)* - This study investigated the impact of shade cloth on seven pepper cultivars. Data collected included ambient air and soil temperature, light intensity, yield and quality. Preliminary results show that 30% shade cloth provides satisfactory shade, reduces ambient and soil temperature without much compromising on light intensity inside the high tunnel. The 50% shade material reduces temperature but that comes at the added cost of reduction in light intensity. The no-shade treatment did not mitigate heat stress during peak summer and resulted in lower pepper yields and quality.
- *Tomato grafting rootstock study (Ajay Nair)* - A new tomato grafting trial was initiated to identify appropriate rootstocks in tomato production to suppress soil borne diseases and enhance plant growth, yield and quality. Project is ongoing and data is being collected.
- *Season extension study for high tunnel peach production (Diana Cochran)* - Peach production in Iowa is limited to the southern tier counties (warmer climate). However, with season extension technology (high tunnels) we are investigating high tunnel peach production. In 2016, a trial was established to compare field-grown peaches to high tunnel field grown peaches. The project is ongoing and data being collected on peach growth and development. At the same time when peaches were planted in high tunnels, an outside planting was also established to compare both production systems.

- *Fall season extension study using row covers within high tunnels (Ajay Nair and Kristine Lang)* – This feasibility study evaluated three high tunnel planting dates for lettuce and bak-choi under Midwest growing conditions. First planting was third week of September followed by two more plantings at one-week intervals. In addition, row cover treatments (row cover or no row cover) were installed to document changes in microclimate that could help crop establishment, growth, and yield. Preliminary results show benefits of row using covers not only to increase temperature but also to protect from insect pests such as grasshoppers that are abundant in the fall. Early planting of both crops performed better than two later plantings

**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.

### **c) small-scale production systems**

- *Strawberry disease management (Mark Gleason)*– This study was established at the ISU Horticulture Research Station near Gilbert, IA, to evaluate of fungicide-spray strategies to protect strawberries from anthracnose fruit rot, caused by the fungus *Colletotrichum acutatum*, in the presence of isolates of the fungus that are resistant to a widely used fungicide group called strobilurins. Recently, resistance to strobilurins by *C. acutatum* has been spreading throughout the U.S. on strawberry transplants that have symptomless infections of strobilurin-resistant strains of the fungus, so management answers are needed if these fungicides are no longer effective. Analysis of the Iowa field experiment is ongoing, and the trial will be repeated in 2019.
- *Integration of poultry and vegetable production systems (Nair and Bilenky)* - This project is currently being carried out on transitional organic land at the Iowa State University (ISU) Horticulture Research station. The first year of the study investigated changes in soil properties, crop performance, and poultry health.
- *Hops production for the Midwest: Cultivar selection and nutrient management (Cochran)*
- *Midwest Food Safety Hub: Implementing safe production practices in specialty crop production (Angela Shaw)*
- *Use of mulches and mesotunnels in organic cucurbit production (Mark Gleason)* -

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.

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  
Iowa Fruit and Vegetable Growers Conference  
Horticulture In-Service Training  
High tunnel crop production workshops  
Workshops on mitigating heat stress in high tunnels workshop  
Iowa Organic Conference  
Frost protection for apple orchards

**b) webinars**

Integrated pest management  
Vegetable production webinar series  
Nutrient management in vegetable production

**c) print publications**

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 – 130 participants (growers, extension staff, industry leaders) in 2018.
- Organic Field Day - covered topics ranging from organic crop rotations to no-till vegetable production, reaching over 65 people.
- Conservation Tillage Field Day - Highlighted functionality and use of roller crimper and strip tillage equipment in sustainable vegetable production systems.
- High tunnel pepper and tomato production Field Day
- Iowa Public Radio Field Day – 100 participants
- Amish Produce Walk/Field Day – 75 participants

f) **Demonstrations**

- Mechanical weeding for sustainable vegetable production
- Equipment Demonstration Field Day
- Sprayer calibration for tree fruits

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

- a) farmers markets
- b) produce auctions
  - Visit to Twin County Produce Auction for on-campus staff, field specialists, and graduate students
  - On-site disease and insect diagnostic clinic for Amish and Mennonite growers at the Twin County Produce Auction, Kalona, IA
- 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 State Report - Kentucky (CCD)

**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/ low tunnel/greenhouse production
  - b) organic production systems
  - c) small-scale production 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
  - b) webinars
  - c) print publications
  - d) video
  - e) field days
  - f) demonstrations
  - a) In-person trainings – Crop Diversification: Possibilities and Strategies (presentation, 2017 Kentucky Women in Agriculture Conference, Lexington).
  - b) Webinars – The CCD hosted two webinars, Going Organic: A Beginner’s Guide to Transition (October 2017), and What to Look for: Pests and Diseases of Specialty Crops (April 2018). Twenty-five people participated in the Going Organic webinar, and 30 participated in the Pests and Diseases webinar. Webinar recordings are available on the CCD website at <http://www.uky.edu/ccd/node/186>.
  - c) Print publications – CCD crop, marketing and system profiles are being updated. New profiles have been developed since the fall of 2017 on heirloom beans, heirloom tomatoes, organic cucurbits and figs. A new

publication, Organic Regulations and Resources, was developed in the winter of 2018. The following profiles/fact sheets have been updated in the past year:

Asian Vegetables	Kohlrabi	Sweet Corn
Bell Peppers	Microgreens	Sweet Potato
Blackberries	Minor Fruit Not Suitable for KY	Tomatoes
Blueberries	Okra	KY Buy Local Program
Broccoli	Pawpaw	Marketing to Retailers
Cauliflower	Pears	Marketing to Restaurants
Eggplant	Potato	MarketReady program
Elderberry	Snap Beans	Roadside Farm Markets
Field-grown Cut Flowers	Starting a Nursery Business	What to Think About Before You Plant
Hot Peppers	Strawberries	
Jujube and Aronia	Summer Squash	

In 2019, new crop profiles on Ginger & Turmeric, and Saffron, Cumin & Coriander will be developed, and 46 crop and marketing profiles will be updated.

The CCD's monthly newsletter has 1,655 subscribers.

- d) Video – New pilot “CCD Roadtrip” and other YouTube video series (more coming soon) highlighting a special interest event or location in the state.
- e) Field Days – The CCD has distributed publications and information about our resources at:

#### 2018 Organic Association of Kentucky Field Days

- Organic Transplant Production
- Fertility Management in Diversified Cropping Systems
- Cultivation and Weed Control
- Maximizing High Tunnel Production

#### 2018 UK Horticulture Twilight Tour

Other – The CCD is now collaborating with the Kentucky Horticulture Council on a variety of Extension resources and activities. Josh Knight, a senior Extension associate funded by the Hort Council to work with the CCD, has collaborated with UK Extension Vegetable Specialist Rachel Rudolph to develop a high tunnel planting date chart. The chart is currently undergoing review. Josh has developed a 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 and educational greenhouses. Additional information will be added to this map in the future.

Crop production budgets for blackberries and for 18 vegetable and melon

crops were reviewed and posted on the CCD website in late 2017. These include large-scale budgets on a per-acre basis, and small-scale budgets based on a 100-foot row.

As part of a 2018 KY Specialty Crop Block Grant, a new budget will be developed for peaches, and budgets for blueberries (Cost and Returns Estimates Summary, Wholesale/Retail Marketing, Pick Your Own Marketing) and strawberries will be updated in 2019.

The CCD has developed 10 new podcasts as part of a Kentucky Specialty Crop Block Grant. All are available on the CCD website at <http://www.uky.edu/ccd/training/podcasts>:

Maple Syrup Production (Jeremy Williams)  
Beekeeping (Dr. Tammy Horn Potter)  
Cut Flowers (Elizabeth Hendricks Montgomery)  
Apples (Billy Reid)  
Christmas Trees (Tom Nieman)  
Sweet Cherries (Bill Forgie)  
Low Tunnel Production (Cathy Rehmeyer)  
Jujube (Clifford England)  
Kentucky Horticulture Council (Cindy Finneseth)  
Producer Grants (Aaron Shapiro)

CCD publications and general information were disseminated at the following conferences/meetings in late 2017-2018:

Ag Diversification Night, Harrison County Extension Office  
Farming for the Future, Bracken County Extension Office  
Kentucky Fruit and Vegetable Conference (Lexington)  
Kentucky State University Small Farm Conference (Frankfort)  
Kentucky Women in Agriculture Conference (Lexington)  
Illinois Specialty Crop, Agritourism and Organic Conference (Springfield, IL)  
Ohio Ecological Food and Farm Association Conference (Dayton, OH)  
Organic Association of Kentucky Conference (Lexington)  
Pick TN Conference (Chattanooga, TN)  
Southern Sustainable Agriculture Working Group Conference (Chattanooga, TN)  
UK Robinson Center Field Day (Quicksand, KY)

CCD personnel will be participating in meetings and conference trade shows at the following sites in late 2018 and 2019:

Kentucky Fruit and Vegetable Conference (Lexington)  
Illinois Specialty Crop, Agritourism and Organic Conference (Springfield, IL)  
Indiana Hort Congress (Indianapolis, IN)



Southern Sustainable Agriculture Working Group Conference (Little Rock, AR)  
PickTN Conference (Franklin, TN)  
Ohio Ecological Food and Farm Association Conference (Dayton, OH)  
Indiana Small Farm Conference (Danville, IN)  
Organic Association of Kentucky Conference (Lexington)  
Kentucky Women in Agriculture Conference (Cave City)  
Kentucky State University Small Farm Conference (Frankfort)

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
  - d) retail
  - e) 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. This year, we had a maximum of 14 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. Note that Bath County has begun reporting again after a brief hiatus.
- c) CCD team experimented with a pilot retail price collection process in 2017, but logistics were too complicated with relatively low funding.
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

Work has begun on development of:

- 1) A nursery products buyer survey
- 2) A roadside farm market survey
- 3) An organic producer/stakeholder survey

Additional surveys are planned for 2019-20, including:

- 1) A Kentucky produce planting intentions survey
- 2) 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.
- 3) A Kentucky restaurant produce buyers survey, which was last done in 2006, to monitor changes in buying trends.

- 4) A produce auction buyers survey to help us craft better price reports and help the auctions improve their outreach.

We will also be distributing a CCD User Survey this fall.

# SERA 45 State Report - Kentucky (Strang)

**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/ low tunnel/greenhouse production
  - b) organic production systems
  - c) small-scale production systems
    - Haskap cultivar and selection evaluation
    - Matted Row strawberry cultivar trial
    - Thornless erect blackberry variety evaluation (Wolf - UKREC)
    - Hazelnut cultivar evaluation (Wright -RCARS)
    - Bacterial spot bell pepper cultivar evaluation
    - Colored cauliflower cultivar evaluation (Becker - UKREC)
    - Uba tuba pepper *C. baccatum* selection program to find earlier maturing higher yielding selections and to evaluate preservation techniques
  
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
    - Kentucky Fruit and Vegetable Conference, January 8-9, 2018
  - b) webinars - None
  - c) print publications
    - 2017 Annual Fruit and Vegetable Research Report (PR-739)  
<http://www2.ca.uky.edu/agcomm/pubs/PR/PR739/PR739.pdf>
    - An IPM Scouting Guide for Common Problems of Brambles in KY (ID-251)  
<http://www2.ca.uky.edu/agcomm/pubs/ID/ID251/ID251.pdf>
  - video - None
  - d) field days
    - Fruit Grower Orchard Meeting, Mulberry Orchard, Shelbyville, KY, March 6, 2018
    - Fruit Grower Orchard Meeting, Reed Valley Orchard, Paris, KY, May 3, 2018
  - e) demonstrations
    - Danville Senior Citizens Center thornless erect blackberry program

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
- d) retail
- e) other

-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:

None

# SERA 45 State Report - Kentucky (Woods)

**Name: Tim Woods**

**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/ low tunnel/greenhouse production
  - b) organic production systems
  - c) small-scale production systems

## **Journal Articles**

Woods, Timothy and Dawn Thilmany (2018), “Engaging Consumers in the Dynamic Local Foods Marketplace”, Choices 33(4):1-2.

[http://www.choicesmagazine.org/UserFiles/file/cmsarticle\\_650.pdf](http://www.choicesmagazine.org/UserFiles/file/cmsarticle_650.pdf)

Woods, Timothy, Ali Asgari, and Jairus Rossi (2018), “Trust Signals and Legitimacy in Local Products for Local Markets”, Choices 33(4).

[http://www.choicesmagazine.org/UserFiles/file/cmsarticle\\_652.pdf](http://www.choicesmagazine.org/UserFiles/file/cmsarticle_652.pdf)

Thilmany, Dawn and Timothy A. Woods (2018), “Local Food Coming of Age: The Evolution of the Local Brand, Policy Initiatives and Role of Direct Markets in the Agriculture Portfolio”, Choices 33(3):1-2

Holcomb, Rodney B., Clinton L. Neill, Joanna Lelekacs, Margarita Velandia, Timothy A. Woods, H.L. Goodwin, and Ronald L. Rainey (2018), “A Local Food System Glossary: A Rose by Any Other Name”, Choices 33(3)

Rossi, Jairus J., Timothy A. Woods, and James E. Allen IV (2017), “Impacts of a Community Supported Agriculture (CSA) Voucher Program on Food Lifestyle Behaviors: Evidence from an Employer-Sponsored Pilot Program”, Sustainability <http://dx.doi.org/10.3390/su9091543>

Rossi, Jairus, James E. Allen, Timothy A. Woods, and Alison F. Davis (2017), “CSA Shareholder Food Lifestyle Behaviors: A Comparison Across Different Consumer Groups”, Journal of Agriculture and Human Values, doi:10.1007/s10460-017-9779-7, <http://link.springer.com/article/10.1007/s10460-017-9779-7>

### **Other Refereed and Numbered Publications**

Ernst, Matthew, Timothy Woods, John Strang, Shawn Wright, “2017 Kentucky Blackberry Cost and Return Estimates for Erect, Thornless Erect, and Thornless Semi-Erect Blackberries”, ID-149, University of Kentucky College of Agriculture, Food and the Environment CES Publication, September, 2017.  
<http://www2.ca.uky.edu/agcomm/pubs/ID/ID149/ID149.pdf>

Wolff, B., M. Béchu, T. Woods & A. Butler (2017) Three - Year Average Prices & Quantities at Kentucky Produce Auctions: 2014 - 2016. CCD - FS - 6. Lexington, KY: Center for Crop Diversification. [www.uky.edu/ccd/pricereports/KYPA3yravg](http://www.uky.edu/ccd/pricereports/KYPA3yravg)

Thompson, Tiffany, Mark Williams, Tim Woods, Carl Dillon, and Ric Bessin, “Economic Analysis of the University of Kentucky Community Supported Agriculture Organic Vegetable Production System”, University of Kentucky Ag Experiment Station Publication SR-111, July 2017.  
<http://www2.ca.uky.edu/agcomm/pubs/SR/SR111/SR111.pdf>

Timothy Woods, Matthew Ernst, and Debra Tropp. “Community Supported Agriculture – New Models for Changing Markets”. U.S. Department of Agriculture, Agricultural Marketing Service, April 2017.  
<https://www.ams.usda.gov/sites/default/files/media/CSANewModelsforChangingMarketsb.pdf>

Wolff, Brett, Martin Bechu, Tim Woods, and Alex Butler, “ KY Farmers Market 3-Year Average Weekly Prices”, University of Kentucky CCD Fact Sheet CCD-FS-3, April 2017.  
[http://www.uky.edu/ccd/sites/www.uky.edu.ccd/files/KYFM3yravg\\_Wolff\\_Bechu\\_Woods\\_Butler.pdf](http://www.uky.edu/ccd/sites/www.uky.edu.ccd/files/KYFM3yravg_Wolff_Bechu_Woods_Butler.pdf)

### **Current work:**

- High tunnel producer survey ready for distribution regionally. Collaborating with partners in KY, TN, NC, and GA
- Kentucky organic industry supply chain survey underway in collaboration with Matt Ernst and CCD
- KY Farm Share Coalition project on-going related to the organic CSA – employer wellness voucher evaluations.

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

**Recent Symposia, Presented Papers, Posters, and Published Proceedings**

Zare, Mahla, Jairus Rossi, Alison Davis, and Timothy Woods, “Local Food System Vitality – Looking at Components across Consumer Age Groups”, Selected poster prepared for Agricultural and Applied Economics Association meeting, Washington, DC, June 2018. <https://ageconsearch.umn.edu/record/274062>

Zare, Mahla, and Tim Woods, “Local food purchasing frequency by locavores across market channels - implications for local food system development”, poster presented at the Southern Agricultural Economics Association Annual Meeting, Jacksonville, FL, February 2-6, 2018.

Butler, Alex, Tim Woods, Martin Bechu, and Mike Reed “Structural Changes in Demand During Early and Peak Season in Kentucky Produce Auctions”, selected paper presented the Southern Agricultural Economics Association Annual Meeting, Jacksonville, FL, February 2-6, 2018. <https://ageconsearch.umn.edu/record/266716>

Woods, Timothy, Jairus Rossi, and Alison Davis, “Local Food Vitality Index: Utilizing Resident Consumer Views of Food System Performance to Create a Development Road Map”, plenary session for Food Distribution Research Society, Honolulu, HI, October, 2017.

Nordesty, Wilson, Shang-Ho Yang, and Timothy A. Woods, “Facing Market and Production Issues: Can Fair Trade Be the Solution for Coffee Sector in Haiti?”, Presented paper, Food Distribution Research Society, Honolulu, HI, October, 2017.

Bergefurd, Brad, Tim Woods, Martin Bechu, Alex Butler, and Brett Wolff, “Local versus Regional Engagement in Ohio Valley Produce Auctions: A Price Analysis”, Presented paper, Food Distribution Research Society, Honolulu, HI, October, 2017.

Woods, Timothy and Jaime Davis, “Is That Farmers Market Right for You?”, Selected presentation at the Southern Sustainable Ag Workers Conference, Lexington, KY January 2017.

**Current work:**

- MarketReady - producer training program designed to educate producers on best business practices associated with selling to grocery, restaurant, wholesale, and other institutional markets. Continuing to adapt this to other states. Current projects with VA, LA, and NB
- Marketing-For-All – led by Brett Wolff.

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
- d) retail
- e) other

**see some items listed above in #1 and #2**

**Current work:**

- working with KY Horticulture Council (with KDA, Community Farm Alliance, and others) on state farm market association
- working with Ariana Torres (IN), Brad Bergefurd (OH), and Kathryn Boys (NC/VA) on auction data analysis

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

**see some items listed above in #1 and #2**

**Current work:**

- consumer preferences for local in various restaurant formats with Wuyang Hu (OH) and Alison Davis, Mahla Zare (KY)
- Market Channel Assessment training with VA, NC, SC partners – SSARE project
- Community Food Systems Certification agent training with partners in IA (AGMRC).



# SERA 45 State Report - Kentucky (Wright)

**Name: Shawn Wright**

**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/ low tunnel/greenhouse production
  - b) organic production systems
  - c) small-scale production systems

Currently working on hops and annual rhubarb production.

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

We are also constructing a passive solar greenhouse and established a pawpaw orchard this year. Have worked with medicinal herbs, non-timber forest products, plasticulture strawberry production. Have worked with fruit and vegetable production in high tunnels, low tunnels and field production.

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
  - d) retail
  - e) 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 State Report - Ohio

**Name:** Matt Kleinhenz  
**University:** Ohio State

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

\* organic high tunnel ... a) effects of microbe-containing crop biostimulants on carrot, lettuce, spinach, and tomato development, yield, and quality; b) performance of grafted tomato plants representing multiple rootstock-scion combinations. (Kleinhenz)

\* high tunnel ... a) microclimates as a function of covering types and regimens and their effects on lettuce (direct-seeded, transplanted) development, yield, and quality (including sensory), emphasizing fall and spring production periods (Kleinhenz)

\* grafting methodology for cucurbit and solanaceous crops (Kleinhenz)

\*high tunnel...a) use of anaerobic soil disinfestation (ASD) to manage soilborne diseases (fungal, root knot nematode, bacterial) of tomato; b) evaluation of grafting in conjunction with ASD to manage soilborne diseases of tomato; and c) assessment of microbial community structure (microbiome) in tomato systems treated with ASD (Miller)

b) organic production systems

\* effects of microbe-containing crop biostimulants, used in transitional- and certified-organic systems, on tomato and butternut squash development, yield, and quality (Kleinhenz)

\* separate and combined effects of grafting/RS and microbe-containing crop biostimulants on tomato yield and quality in a strip-tillage system (Kleinhenz)

\* soil balancing philosophy-based soil amendment application effects on edamame, dwarf popcorn, and butternut squash soils, crops, and weeds (Culman, Kleinhenz, Doohan)

c) small-scale production systems

\* year-round performance of systems established with the separate or combined use of low, mid, and high tunnels (Kleinhenz)

\*evaluation of the genotype X environment interaction regarding yield, disease resistance and fruit quality of pawpaw cultivars (Davies, Bergefurd, Inwood, Scheerens)

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/presentations

1/10/2018. Riverhead, NY; Long Island Agricultural Forum -- microbial biostimulants facts and research-extension

1/11/2018. Riverhead, NY; Long Island Agricultural Forum -- soil health management in high tunnels

1/15/2018. Sandusky, OH; Ohio Vegetable and Potato Growers Assoc Ohio Produce Network -- what, why, and how of specialty potatoes

1/15/2018. Sandusky, OH; Ohio Vegetable and Potato Growers Assoc Ohio Produce Network -- soil balancing overview

1/19/2018. Chattanooga, TN; Southern Sustainable Agr Working Group (SSAWG) -- grafting overview

1/29/2018. Wooster, OH; County Line Produce Auction Grower-OSU Meeting -- winter greens production

2/14/2018. Indianapolis, IN; Indiana Horticultural Congress -- microbials overview and next steps

2/16/2018. Dayton, OH; OEFFA Conference -- microbials summary and discussion

2/16/2018. Dayton, OH; OEFFA Conference -- soil balancing project overview

2/16/2018. Dayton, OH; OEFFA Conference -- soil balancing specialty crops experiment summary

2/21/2018. Niagara Falls, ONT, CA; Ontario Fruit and Vegetable Growers Conference -- microbial biostimulants overview

2/27/2018. Cleveland, OH; OSUE Cuyahoga County Urban Market Gardener Training Program -- season extension and crop production/marketing

3/2/2018. Napoleon, OH; OSUE Henry County Direct Marketing School -- vegetable product quality and marketing

3/3/2018. Danville, IN; SARE Farmers' Forum -- microbial biostimulants overview and project summary

3/9/2018. Carlsbad, CA; BioControls West Conference -- microbials project overview and panel discussion

3/24/2018. Wooster, OH; Advancing EcoAgriculture PodCast -- crop quality and marketing

4/5/2018; Wooster, OH; Tomato Breeders Roundtable Rootstock Breeding Session -- session moderator

4/7/2018. Massillon, OH; OSUE NE Ohio Small Farm Conference -- vegetable varieties for high tunnels

4/7/2018. Massillon, OH; OSUE NE Ohio Small Farm Conference -- soil amendments in

vegetable production

4/24/2018. Wooster, OH; VPSL/OSUE Cuyahoga County Season Extension Open House and Tour -- facilities tour and discussion

6/27/2018. Chicago, IL; New Ag Intl Biostimulant Summit -- university/industry partnerships (presentation and panel discussion)

7/24/2018. Raleigh, NC; Crops and Chemicals Biostimulant/Biofertilizer Conference -- moderate panel, serve on panel, summarize microbial biostimulant research-extension effort

8/24/2018. Wooster, OH; OSUE Wayne County IPM Scout Training -- crop biostimulants, specialty potato production/marketing

9/7/2018. Wooster, OH; Ohio University science journalism practicum interview -- climate (change) and tomato production

9/12/2018. Wooster, OH; OSU International Programs in Agriculture Monrovia Delegate Plot Tour and Discussion -- production-marketing and related research-extension

b) webinars

<http://u.osu.edu/vegprolab/microbe-containing-products/call-in-conversations/>

Miller, S. A. How should biopesticides be evaluated and recommended for use in vegetable disease management programs? Great Plains Diagnostic Network Webinar series, March 7, 2018.

c) print publications

9/1/18. Kleinhenz, M. [Fruit yield and quality in a strip-till tomato systems as influenced by grafted plants and crop biostimulants](#). VegNet Newsletter.

8/11/18. Organic options for cucurbit powdery mildew management. Ohio Veggie Disease News. <http://u.osu.edu/miller.769/2018/08/11/organic-options-for-cucurbit-powdery-mildew-management/>

8/13/18. Kleinhenz, M. Building a shared understanding of soil balancing. VegNet Newsletter.

2018. Kleinhenz, M. [Researchers share five “fast facts” to help growers understand biofertilizers](#). Organic Broadcaster, Moses Organic. July/August issue. p.5.

2018. Kleinhenz, M. [Big claims, big questions, and big potential in small packages: tips for using microbe-containing crop biostimulants](#). OEFFA Newsletter. Spring Issue. p. 20.

d) video

e) field days

7/3/2018. West Salem, OH; OSUE Wayne County - County Line Produce Auction Crop

Walk – diagnostics, grafting, microbial biostimulants, quality, irrigation, on-farm research, winter meeting

7/17/2018. Apple Creek, OH; OSUE Wayne County-Mt. Hope Produce Auction Crop Walk -- diagnostics, grafting, irrigation-fertility, quality

8/9/2018. Wooster, OH; OSU Basic Cation Saturation Ratio Project Farm and Plot Walk -- specialty crop soil balancing experiment overview

f) demonstrations

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
- d) retail
- e) 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 State Report - Tennessee

**Name:** Margarita Velandia and Annette Wszelaki

**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/ low tunnel/greenhouse production
  - b) organic production systems
  - c) small-scale production systems

*Production:*

- *Performance and Adoptability of Biodegradable Plastic Mulch for Sustainable Specialty Crop Production*
- *Cover Crops Under Cover: Evaluating Costs, Benefits, and Ecosystem Services of Cover Crops in Year-Round High Tunnel Production*
- *Systems Thermal Protection Strategies in High Tunnels to Further Extend the Growing Season*
- *Comparing Lettuce Yield and Quality Using Drip and Overhead Irrigation on Biodegradable Mulches*
- *On-farm Fresh-market Tomato and Pumpkin Variety Trials*
- *UT-NCSU Southeast Regional Pumpkin Trial*

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. Lockwood, David. "Do Fruit & Nut Crops Have a Place on Your Farm & In Your Market?" Farmers Market Boot Camp, Clarksville, TN, January 30, 2018 (Participants = 32); Martin, TN, January 31, 2018 (Participants = 22); Memphis, TN, February 1, 2018 (Participants = 27); Blountville, TN, February 6, 2018 (Participants = 22); Alcoa, TN, February 7, 2018 (Participants = 29); Shelbyville, TN, February 8, 2018 (Participants = 22).
    2. Grigsby, Chuck. "Online Marketing Strategies for Direct Farm Marketers." Farmers Market Boot Camp, Clarksville, TN, January 30, 2018 (Participants = 32); Martin, TN, January 31, 2018 (Participants = 22); Memphis, TN, February 1, 2018 (Participants = 27); Blountville, TN, February 6, 2018 (Participants = 22); Alcoa, TN, February 7, 2018 (Participants = 29); Shelbyville, TN, February 8, 2018 (Participants = 22).
    3. Velandia M. "The Economics of Adopting Biodegradable Plastic Mulch Films"

- and “Farmers’ Markets Price Reporting Mobile Application.” Area Specialists Workshop, Murfreesboro, TN, May 22, 2018 (Participants = 12).
4. Velandia, M. “The Use of Biodegradable Mulch Films in Vegetable Production.” West Region Market Outlook Update in-service training, Jackson, TN, November 2, 2017 (Participants = 30).
  5. Velandia, M. “The Use of Biodegradable Mulch Films in Vegetable Production.” Central Region Market Outlook Update in-service training, Murfreesboro, TN, November 1, 2017 (Participants = 27).
  6. Velandia, M. “The Use of Biodegradable Mulch Films in Vegetable Production.” Eastern Region Market Outlook Update in-service training, Knoxville, TN, October 31, 2017 (Participants = 22).
  7. Velandia, M. “True Costs and Profitability in Vegetable Production.” Organic Crops Field Tour, Knoxville, TN, October 26, 2017 (Participants = 40).
  8. UT-TFVA Twilight Tours (six tours across the state on a variety of topics: food safety, high tunnels, strawberry production, tomato production, pumpkin production, peach, blackberry and blueberry production)
  9. UT Produce Safety Workshops (six on-farm workshops, two in each region, rotating around the state for 3 years: Worker Health and Hygiene; Postharvest Water; Preharvest Water; Wildlife, Domesticated Animals and Land Use; Soil Amendments; Postharvest Handling and Sanitation)

b) webinars

c) print publications

1. **Velandia, M.**, A. Smith, A. Wszelaki, S. Galinato, and T. Marsh. 2018. The Economics of Adopting Biodegradable Plastic Mulch Films. W650, UT Extension [Refereed]. [Available Online](#).
2. Galinato, S., T.L. Marsh, C.A. Miles, P. Tozer, **M. Velandia**, S. McDonald, S. Ghimire, and K. Chen. 2018. Using Biodegradable Mulch. Peer Reviewed Extension Publication, Washington State University [Refereed]. [Available Online](#).

*Biodegradable Mulch Information Resources*

<https://ag.tennessee.edu/biodegradablemulch/Pages/factsheets.aspx>

*UT Food Safety Posters (available by request... lots available!)*

*UT Organic and Sustainable Crop Production Program Factsheets*

<http://organics.tennessee.edu/publications.htm> (soon to transition to

<http://utvegetable.com>)

*UT Food Safety Factsheets*

<http://utvegetable.com>

d) video

e) field days



- 1) *UT Organic Crops Field Tour, April 2019*  
(this field tour is held every 18-months, alternating between April and October)
- 2) *UT Steak and Potatoes Field Day, August 7, 2018*  
(yearly, first Tuesday in August)
- f) demonstrations
- g) websites  
<http://utvegetable.com>  
<https://extension.tennessee.edu/Pages/ANR-CED-CH-Fruit-and-Vegetable.aspx>
- h) social media  
Facebook  
*UT Organic and Sustainable Crop Production*  
Twitter  
[@UT Organics](https://twitter.com/UTOrganics)

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

- a) farmers markets
  - *Report prices at Tennessee Farmers Markets – Tennessee Farmers Markets Price Reports* <http://www.uky.edu/ccd/pricereports/TNFM>
  - **Velandia, M.**, D. Hinton, and T.L. McKinley. *Farmers Market Price Reporting App*. The purpose of this app is to facilitate the collection of farmers markets prices at Tennessee farmers markets. Available at <https://iiwgbt.app.appery.io/apperyio-app.html>

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

Grants:

1. Tanaka, K., K. Rignall, K. Moskowitz, 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(\$268,000). *Role: Principal Investigator for University of Tennessee.*

Publication:

1. Bellingham, S.\*, **M. Velandia**‡, C. Boyer, D.M. Lambert, C. Hellwinckel, and A. Wszelaki. "Factors Influencing Tomato Prices at Tennessee Farmers Markets." *Journal of Food Distribution Research*. Rejected, to be re-submitted to the *Journal of Food Products Marketing*.