

NECC2103: High tunnel specialty crop production
Multistate Research Coordinating Committee & Information Exchange Group

Annual Meeting Agenda – March 27, 2025
(9:30 am – 12:30 pm EST)

Participants should submit state reports to me (fxd92@psu.edu) by March 25, 2025. The reports will be shared back with all participants before we meet on March 27th – so that we can keep our updates short. (If you'd like to review your previous state report, please do so using the link below).

Discussion points:

- Introductions (9:30 to 10:00 am EST)
- State reports (10:00 am to 12:00 pm EST)
- Discussions of multistate group renewal (as coordinating committee or as research project) and new Officer elections (12:00 to 12:30 pm EST)

Link to previous state reports is here:

[NECC 2103 State Reports _2024](#)

Link to official project here:

<https://nimss.org/projects/view/mrp/outline/18781>

Link to minutes from the last meeting here:

[2024 Annual meeting minutes](#)

State report template is here:

[2025 State Report Template](#)

Project Summary & Info

Objectives

1. Share information regarding on-going and planned research and extension activities pertaining to high tunnel agriculture.
2. Complement and strengthen existing research and educational partnerships between members focused on high tunnel agriculture.
3. Plan rigorous and relevant research that will optimize soil, water, crop and pest management for high value crops in high tunnels.

Procedures and Activities

The Committee will:

- Meet annually to discuss relevant high tunnel research and outreach efforts occurring in each state
- Provide a venue for establishing cooperative research efforts and for sharing data and research results among participants on an ongoing basis
- Establish subgroups to plan cooperative research projects and write multi-institutional, multi-regional research grant proposals
- Maintain a website with links to participating people and institutions

Expected Outcomes and Impacts

- High Tunnel Information Exchange: Members will cover a range of specialized disciplines, including plant physiology, pathology, entomology, ecology, horticultural crop production, soil science, agricultural engineering, economics, social sciences, etc. and will represent a broad geographical distribution. Through an annual meeting in a central location, members will share information about existing projects and activities.
- Coordination of Activities Related to High Tunnel Research and Outreach Comments: Major concerns of high tunnel producers will be identified and discussed. Research and outreach needs will be prioritized, leading to efficient use of public funds for high-priority research, teaching and outreach programs.

Organization/Governance

The recommended Standard Governance for multistate activities include the election of a Chair, a Chair-elect, and a Secretary. A new Secretary is selected at the end of the annual meeting at which point the current Secretary becomes Chair-Elect, and Chair-Elect becomes Chair for the next 12 months. The Committee Chair and Chair-Elect are responsible for organizing the annual meeting and planning the agenda, and The Secretary records the minutes at the meeting following their election. All officers are to be elected for at least two-year terms to provide continuity. Administrative guidance will be provided by an assigned Administrative Advisor and a NIFA Representative.

Current Officers:

Anna Wallingford (ARS): secretary
 Xin Zhao (FL): chair-elect
 Francesco Di Gioia (PA): chair
 Becky Sideman: past-chair

NOTES:

2025 reports here:

https://pennstateoffice365-my.sharepoint.com/personal/fxd92_psu_edu/_layouts/15/onedrive.aspx?id=%2Fpersonal%2Ffxd92%5Fpsu%5Fedu%2FDocuments%2FPenn%20State%20MANAGEMENT%2F2025%20Multistate%20high%20Tunnel%20project%2F2025%20State%20Report%20Template%2FNECC2103&ga=1

Attendees: Francesco Di Gioia (PA), Annette Wszelaki (TN), Lewis Jett (WV), Bruce Hoskins (ME), Kacie Athey (IL), Adria Fernandez (MN), Julie Grossman (MN), Xin Zhao (FL), Judson Reid (NY), Cheryl Sullivan (VT), Matthew Kleinhenz (OH), Samantha Willden (NY), Petrus Langenhoven, Liz Maynard, Wenjing Guan, Alireza Shokoohi (MA), Harlene Hatterman-Valenti (ND), Anton Bekkerman, Lori Koenick (NY), Margaret Skinner (VT), Laura Ingwell (Purdue), Heather Grab (PA)

Introductions all around.

NY state report (Judson, Lori, Sam) – 500 soil-based GH (tunnel) operations, mostly tomato. Lots of cover cropping work, looking at nutrient contributions and microbial health. Lori new to many of you, working in the field doing applied research, with plant pathology background. Protected ag (5 CEA TT) cluster at Cornell, which includes – entomology (Sam W.), plant pathology (Dominique), physiologist, engineer, economist. Cohort should be on board by spring of 2026. Sam is focusing on companion planting and microbial products use in high tunnels.

VT state report (Margaret, Cheryl) – all work is externally funded; collaborative with other states. VT producing high tunnel quarterly newsletter (High and Dry) for high tunnel growers. Initially NH-VT production, but going beyond that now. Much of the content and info goes beyond northern NE region; would be nice to have more involvement beyond that. Short articles would be ideal; photos. High tunnel conference likely to happen going forward, alternate years – next this fall 2025. Cheryl interested in future collaborations looking at intercrops/banker plants (e.g. alyssum) in HT.

MN (Juli, Adria) – Lots of work with legume cover crops; work on research stations initially – and now, with OREI, on-farm experiments with growers choosing CC to try in winter, spring, and summer slots. Data collection taking place right now. Many different systems, and cool to see which crops are widely successful across systems. Beginning high tunnel producer course a part of this project as well. Many new growers, but many are new farmers and **lots of demand** for organic nutrient management guidance. Working to update the high tunnel production guide for MN and making it modern... SCBG proposal submitted to help with the nutrient management piece of this. ORG grant also ready to go, if they stop being paused. Extension collaborator Natalie Hoidal working with HT as well; looked at 100 farms across MN and collected data to look at P loading. Excellent baseline. (Lori – very excited to collaborate in NY on cover cropping projects).

FL (Xin) – Unique soil and environmental conditions in FL. Focus has been on organic systems; lots of work with composts and organic fertilizers, in combination with cover crops. Soil nutrient management a primary focus. Collaborating with Francesco on anaerobic soil disinfestation (ASD) in HT. Soilless culture a new addition to HT work, e.g. for tabletop strawberries – using locally available organic amendment/substrates (replacing coir) – looking at “substrate health” in this system. Teaching high tunnels integrated into undergrad courses. Because of high sand content in soil ; looking at ways to increase organic matter and address the very high rate of OM mineralization in very high temperatures.

IL (Kacie) – Biocontrol-focused work; lots of work with spiders. Working with engineers (robot integration into HT for tomato harvesting, pest detection). Also, many extension folks in state do HT research. Collaborating with Purdue-led SCRI project; which is ongoing. Lots of tomato production, increasing cut flower work. Cut flower strips within high tunnels as conservational biocontrol strategy? Have just hired a horticulturist to work in HT; CEA background – now at IL. (Robotics a component of Xin’s tabletop strawberry project in FL – very similar)

Side discussion about soil testing for soil health: Waters lab in GA; Woods End in ME; Cornell Soil Health Test.

IN (Wenjing, Liz, Petrus, Laura) – new plant pathologist, Cesar, joined team. Work across many systems, not just HT. Looking at biocontrols for root knot nematodes and suppressive soils. Another project is focused on strawberry in tunnels (soil-based and table top) – this crop presents unique challenges. Other crops: melons, watermelons – low labor input, and onions. Beginning some cut flower work. Mentioned that several Indiana conferences have HT tracks or sessions. Midwest Trial report is where lots of research reports are published. SCRI focused on pest management decisions across rural-urban gradient; lots of work looking at insects done on-farm throughout Midwest and northeast. On-farm work completed; now data analysis.

Side discussion of insect graveyard during plastic swap; many have observed – has anyone documented?

Francesco – observed many root knot nematodes in tunnels on farm, and used ASD to kill. Laura – what about entomopathogenic nematodes? And what does recolonization process look like after ASD?

ME (Bruce) – HT testing program continues to grow; ran about 800 samples last year. Already 300 this week since 1 Jan; mostly commercial with a few research samples – from all over the country. Posted a ‘User’s Guide to HT Soil Testing’ on website, in response to grower questions. Funding secured to expand operation, but will take a couple of years. Will hire a few folks, including a replacement as Bruce is aiming towards retirement. Has 10 yrs of HT data from testing that could be analyzed if it’s interesting to anyone. Contact if so.

MA (Alireza, Sue) – Continuing outreach/extension, plus limited research. Two primary projects plus hires. Ali focused on entomology side of things with IPM, esp. biocontrol. Other new person is Giannou Vee (???) – specialty crop faculty member who wants to work in HT. Water use efficiency and disease management projects focused on soil water sensors in HT. Also collaborating with UArk on spinach variety trials and disease management; another on fertility management and soil testing in very high OM soils (urban HT). Lack facilities for HT research; trying to build a second one. State building inspector requiring additional construction requirements that is challenging it.

Matt had a conversation with Columbus officials who had similar safety concerns to discuss ubiquity of HT, and management knowledge and history

Xin: Collaborations with AI and engineers a real opportunity for innovation in HT to bring precision ag technologies to lower tech structures.

ND (Harlene) – Project focusing on of water conservation through the use of sensors. Another study focused on rootstocks for reducing time to maturity of tomato; certain combinations did result in increased marketable yield. Have been focused on both paste and fresh market types. Another project focused on caterpillar tunnels for wine grape production to do a better job ripening fruit (Marquette, Petite Pearl) – varieties respond differently. Working on a HT manual for ND growers.

Xin using caterpillar tunnels at research farm because they can be installed by the researchers and don't need contractors - so are much lower cost than full tunnels. And they perform surprisingly well in hurricanes (as long as plastic is removed first).

OH (Matt) – Andre Sanabria-Velasquez, new plant pathologist, plus another. HT capacity Wooster, Columbus, Piketon. Seaman Corp. developing new films. Comparing films on different tunnels. Ventilation status a primary focus of research. Developed system for remote ventilation management for rollup sides (extensive data available) – now adapting for shade cloth moving or rowcover movement. Lots of enthusiasm for this technique.

PA (Francesco, Heather) – Others working with HT include Beth Gugino, Kathy Demchak, nematologist Mikhail Kantor. Project on ASD: currently focused on nutrient management post ASD. Organic transition program new project looking at weed control by ASD. Penn Dept of Ag project focused on specialty crops including Italian melon in HT. Organizing webinars etc. relating to HT. Heather beginning a collaborative project with Sam Willden looking at thrips population dynamics in HT.

TN (Annette) – David Butler and Annette are the team. Main project going on now is a solarization project in collab with UKY (Rachel Rudolph) – possible to solarize bed by bed; comparing different seasons and with open vs. closed tunnels. April didn't work; July worked just fine; Sept decent for TN. Good results against several soilborne pathogens. Hired a pathologist in Nov; will begin. Hurricane effects; flooding and silt deposits in tunnels – growers need short-term guidance. Advice welcome. And info on NeoP incidence in tunnels vs. open field on strawberry? *Source of plants can be the problem; can occur in both field and HT.*

WV (Lewis) – 1300 HT in WV; lots of microclimates. Completed a HT production guide for producers, avail in May – for beginning growers primarily. Focusing on more use, year-round, for HT. Certificate program in HT management. Could easily be replicated in other states. Extension uniquely qualified to do this. Research-wise, looking mainly at cropping systems – looking at bell pepper trials; complement what Purdue has done – with early and late pepper production in tunnels. Also primocane blackberries in HT, collaborating with Wenjing on overwintering HT onions (SD and ID). Potentially high economic returns with early sweet onions. Colleague Dr. Quesada completing a project on exclusion screening in HT.

Where to reliably send nematode samples? Francesco suggests best perhaps to work with a nematologist; establish a collaboration. Xin points out that location and timing of samples within the tunnel can greatly impact results.

Matt – Many may remember Bill Lamont, a real pioneer of high tunnel agriculture. He passed away since our last meeting. More info about him is below:

<https://www.kochfuneralhome.com/obituaries/William-Bill-James-Lamont-Jr?obId=33641639>

Election of new secretary – Becky nominated Sam Willden, who accepted and all approved.

Action Item: Leadership group will get together with Anton for 30-45 minutes in the coming weeks to discuss the pros/cons of continuing this as a coordinating committee vs. transitioning to a research project.

For those attending ASHS, Xin suggested getting together there for another in-person meeting. (we'll follow up with an email to the group to connect about this as the date gets closer!).
