PURDUE UNIVERSITY
Department of Horticulture & Landscape Architecture

HLA Happenings

Issue: 24-13
April 5, 2024

In This Issue

Dr. Stephen Meyers Promoted to Associate Professor

Dr. **Stephen Meyers** has been promoted to Associate Professor! All of us in HLA congratulate Dr. Meyers and look forward to working with him for years to come!

Dr. Ariana Torres and Jean Pierre Zavala Co-Authored New Article

VEG CONNECTIONS

Biopesticides and beneficial insects

MANAGING APHIDS ON HIGH-TUNNEL SPINACH DURING WINTER

BY SAMANTHA WILLDEN, JEAN PIERRE ZAVALA, ARIANA P. TORRES AND LAURA INGWELL

High tunnels are an essential tool to maintain cold-tolerant crops such as spinach and other leafy greens during winter months. However, even in winter, tunnels can also provide a hospitable environment for pests to proliferate. Green peach aphids, foxglove aphids and potato aphids are cold-tolerant pests that are common on winter greens.

To prevent aphid outbreaks in high tunnels, management options are needed that are safe, effective during winter and economically viable. Economic viability indicators such as benefit-cost, break-even and profitability analyses allow farmers to compare cost-effective pest management strategies and identify the most profitable approach.

We conducted a study during the winter of 2022-23 at a Purdue Agricultural Research Farm to determine the best combination of biopesticide sprays and commercially available biological control agents for aphid management on high tunnel spinach. Sprays included PyGanic [Pyrethrin], Sil-MATRIX [Potassium silicate] and Neemix [Azadiractin]. Biocontrol agents included the two-spotted lady beetle/ladybug [Adalia bipunctata], green lacewing [Chrysoperla carnea] and minute pirate bug [Orius insidiosus].

Two treatment applications were made during the season. See Table 1 [Page 28] for rates. We also

Chrysoperla carnea, one of the species of common green lacewing, is shown eating an aphid.

While high tunnels allow crops such as spinach to survive the winter, they also allow pests such as aphids to thrive.

24 | APRIL 2024

Dr. **Ariana Torres** and **Jean Pierre Zavala**, in collaboration with Dr. Laura Ingwell and Dr. Samantha Willden from Entomology, authored an extension article featured in VGN Connections, delving into the economic feasibility of biopesticides and biological control methods.

Drs. Gómez and Mitchell Helped Lead Nomination for NC Multistate Award

NCRA

The North Central Regional Association of State Agricultural Experiment Station Directors

hereby heartily congratulates **NCERA101: Controlled Environment Technology and Use**, for being the 2024 North Central regional award winner and our nominee to the agInnovation National Excellence in Multistate Research Award.

This honor was awarded by the NCRA on March 26, 2024, in recognition of outstanding accomplishment as a result of effective and exemplary multistate research collaboration demonstrated by a high standard of scientific quality, commitment to regional priorities, added value from interdependence, and measurable impacts and accomplishments.

Jeanette Thurston
NCRA Executive Director

Shibu Jose
NCRA MRC Chair 2024

Celina Gómez and Cary Mitchell helped lead the nomination for the 2024 NC Multistate Award Winner, announced Wednesday, April 3.

Peter Hirst to Co-Lead International Research Academy Trip

Along with Jerry Shively and Holly Wang from IPIA, **Peter Hirst** will be leading the International Research Academy to Italy April 8-12 to visit University of Bologna and FAO in Rome. The group will be exploring collaborative international research opportunities.

SFS Capstone Presentations

Please join us to celebrate the upcoming graduations of three SFS students by attending their SFS Capstone presentations.

When: April 18th, 5:30p – 7:00p
Where: HORT 222

Robert Luecke will talk about the prospects for permaculture on a small property in Brown County, Indiana.

Sophia Mears will talk about her experiences preparing fine farm-to-fork meals for both rich and poor.

Wil Brown-Grimm will discuss opportunities for gleaning healthy food from HLA's Meigs farm and Purdue Student Farms.

HLA Bowling Team

Our team **Good Thyme Gang** played against **The Purdudes** Monday afternoon at Mike Aulby's Arrowhead Bowl for Week 28 of the Purdue Staff and Students league. We won all 8 points, confirming our team's placement in first.

In the Women's Category: **Ashley Adair** placed 3rd with scratch game scoring a 162, placed 3rd with scratch series scoring a 460, placed 3rd with handicap game scoring a 252, and placed 1st with handicap series scoring a 730.

Alexandra Jewell placed 2nd with scratch game scoring a 196 and placed 1st with scratch series scoring a 523.

No placements in the Men's Category.

Calling for substitutes next season!

We bowl 3 games on Monday nights starting at 6:30pm. All Purdue faculty, staff, students, and retirees are welcome. If you would like to bowl with us for a session during the next season, please email **Alexandra Jewell at jewell4@purdue.edu**.

2024 HLA Spring Seminar: Dr. Stanton Gelvin

Dr. Stanton Gelvin
H. Edwin Umbarger Distinguished Professor
Biological Sciences, Purdue University
Thursday April 11th, at 3:30 pm
HORT 117 or via Zoom.

Understanding and manipulating *Agrobacterium* T-DNA integration for plant genome engineering

Agrobacterium-mediated transformation (AMT) is the most commonly used method to deliver genome engineering reagents efficiently into plants. T-DNA integration into the plant genome is frequently a natural consequence of AMT and is a key step in generating transgenic plants. The mechanism of integration has been debated. Recent data indicate that DNA polymerase theta (PolQ) may play a key role in integration, but we have shown that other plant DNA repair and recombination systems may also be important. However, because of regulations regarding transgenic plants, there may be instances when scientists may wish to introduce and transiently express transgenes in the absence of T-DNA integration. We therefore sought to develop mutant

Agrobacterium strains that could deliver and transiently express genome engineering reagents but not integrate them. The *Agrobacterium* effector protein VirD2 plays an important role in both T-DNA transfer and in T-DNA integration. We generated VirD2 variant *Agrobacterium* strains and tested them for their ability to effect transient transformation but with low levels of stable transformation. Our best strains can generate mutations, following delivery of T-DNA encoding Cas9 and sgRNAs, at a level 50-80% as well as can a wild-type *Agrobacterium* strain, but with almost no stable transformation. We propose that these strains can be used for integration-free plant genome editing, thus bypassing regulations that limit field release of plants harboring transgenes.

This Week in the Jules Janick Horticulture Garden

The **Jules Janick Horticulture Garden** is starting to wake up from its winter slumber.

- Virginia Blue Bells
- Summer Snowflake
- Valerie Finnis Grape Hyacinth
- Lady Jane Tulips

And of course…more tulips!

HLA's Tent at Spring Fest 2024

Hydroponics for Everyone Workshop

Hydroponics training is offered to everyone in May and June at Purdue University. Interested participants can choose either May or June session. There will be four classes for each session on Saturdays from 9am-4pm. Training will be provided at the state-of-the-art Purdue hydroponics facility located in the Department of Horticulture and Landscape Architecture, 625 Ag. Mall Drive, West Lafayette, IN 47907

Registration fees are $300 per participant. Use the following links to register:

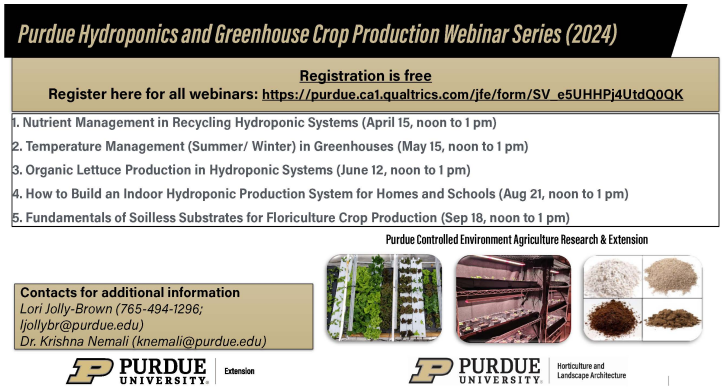
May session HYDROMAY | Purdue Ticket Office (ticketmaster.com)

June session HYDROJUN | Purdue Ticket Office (ticketmaster.com)

Course Highlights

- Taught by Purdue faculty *
- Extensive hands-on experience *
- Lunch included with free parking *
- Receive printed materials, plants, and seedlings *
- Limited number of participants per session *

Purdue Hydroponics and Greenhouse Crop Production Webinar Series



Register for the Purdue Hydroponics and Greenhouse Crop Production Webinar Series.

Purdue Small Farm Education Field Day

Purdue Fruit and Vegetable Field Day

Newsletters:

Facts for Fancy Fruits: https://fff.hort.purdue.edu

Vegetable Crops Hotline: https://vegcropshotline.org/

Purdue Landscape Report: https://www.purduelandscapereport.org

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Editor: Pamela J Fisher | Department of Horticulture and Landscape Architecture, 625 Agriculture Mall Dr., West Lafayette, IN 47907