



## CRANBERRY STATION NEWSLETTER

February 15, 2019

UMass Cranberry Station  
1 State Bog Road  
PO Box 569  
East Wareham, MA 02538  
508-295-2212  
[ag.umass.edu/cranberry](http://ag.umass.edu/cranberry)

### UMASS PESTICIDE SAFETY TRAINING

Thursday, April 25, 2019

8:00 AM – 12:00 PM

Rosebrook Event Center

TownePlace Suites Marriott

Wareham, MA

**\$55.00 per person: must be postmarked by 4/16/19**

After 4/16/19 you are considered a “walk-in”: **cost will be \$75.00 per person**

Registration form is on page 9

#### **Tentative Schedule of Events (4 contact hours)**

- 7:30 Registration (with coffee)**
- 8:00 WPS and Safety Review – Marty Sylvia
- 8:30 Using Water for Management – Hilary Sandler
- 9:00 Zone II, \$\$, and Respirator – Marty Sylvia
- 9:20 Adjuvants – Hilary Sandler
- 9:40 Frost and Firmness – Giverson Mupambi
- 10:00 COFFEE BREAK**
- 10:30 Herbicides in 2019, Moss and Poverty Grass – Katie Ghantous
- 11:00 Fungus and Fruit Rot – Sai Sree Uppala
- 11:20 Insect Update – Anne Averill
- 11:40 Chemigation Myths and Revisiting Dyetests – Marty Sylvia

## CRANBERRY ENTOMOLOGY PROGRAM 2018

**Anne L. Averill and Martha M. Sylvia**

Averill was on sabbatical from May 2017-September 2018, so the funding, personnel, and lab activities are limited this year.



### CRANBERRY SCALE OUTBREAK

Scale insects continue to be exceptionally challenging to researchers and growers alike. These insects are difficult to identify to species and little is known of how new infestations establish. For a fifth year, we monitored Putnam scale (*Diaspidiotus ancylus*), which is responsible for vine die-off areas across the industry. Scales are sap-sucking insects that form protective covers over the body. In 2018, 144 samples were inspected, representing 24 growers and many different beds. While some growers achieved effective management, many additional sites had serious summer outbreaks with greater injury than typically seen in the past. Warmth and drought in June and July likely enhanced infestations, but why outbreak populations have originated after decades is unknown. A collaboration with UMass scale expert Ben Normark and the USDA-ARS Systematic Entomology Lab of the USDA in Beltsville, has resulted in confirmed identification of Putnam scale and a new identification of Latania Scale (*Hemiberlesia lataniae*), previously unreported in MA for 70 years. Both species have extensive host ranges and form 'enigmatic species complexes.' We have applied for research and extension funds: (1) to determine with greater precision and confidence the species identity of the two

cranberry pest species presently called Putnam scale and Latania scale; (2) to document the host range of those species; (3) to understand the mechanism that enables those species to feed on cranberry; and (4) to improve recommendations for ID and management.

### IMPENDING CRANBERRY WEEVIL MANAGEMENT CRISIS?

Cranberry weevil (*Anthonomus musculus*) populations were in outbreak numbers this May with putative failures of the environmentally-friendly Avaunt (indoxacarb).

#### Spring Weevil Average Sweep Sets 2018

5/25/2018	4.3	5	9.6	8
5/25/2018	Control	Avaunt	Evo	Actara
5/29/2018	21	6.3	3.3	3
5/30/2018	40.3	4.3	8.6	2.7

Cool weather may have impacted management since this suppresses weevil activity, and the adults must forage through the vines and feed to acquire a toxic dose. Weather appeared to be the most important factor in our studies that monitored spring weevil movement from overwintering sites in the woods onto bogs, a factor that complicates management decisions.

Lab and field data reveal that more work will be needed to confirm reduced Avaunt efficacy, since all treatments showed reduced counts when compared to the control. Avaunt Evo, a new formulation of Avaunt, showed similar efficacy as the original formulation. It was designed to be more rainfast and more attractive to the insects. Actara (thiamethoxam), the non-environmentally friendly neonicotinoid, is effective but forms low residues (at parts-per-billion concentrations in cranberry pollen and nectar),

which may pose a sublethal risk for incoming pollinators if there is no dilution of foraging loads from other flower species.

#### **REGULATORY PROGRAM Funding: IR-4**

A new chemistry fungicide mix was run as a residue trial in 2018 by Marty Sylvia and Hilary Sandler. This fungicide will be a good option for fruit rot management and allows one more mode of action to fight resistance development. Two trials are slated for 2019, including an herbicide and a fungicide.

#### **SWEEPING SHIFTS IN BUMBLE BEE SPECIES**

##### **COMPOSITION**

Of the wild pollinators on cranberry, bumble bees are by far the most important. Repeated measure sampling of beds that had been surveyed in 1990-91, 2007-09, and 2016-17 were revisited and assessed for pollinator activity, allowing a quarter-century assessment of pollinator diversity and abundance. UMASS

Commonwealth Honors College student Emily Brown tallied these data and presented her honors thesis in April 2018: “Catastrophic loss of bumble bee (*Bombus* spp.) diversity in 27-year survey of Massachusetts cranberry pollinators” and is writing this up for publication.

Currently, a single generalist species of bumble bee (*Bombus impatiens*) dominates the wild pollinator community responsible for pollination. Analysis of thousands of bumble bees showed that the expanding *B. impatiens* populations are more likely to be parasite free and harbor fewer intense pathogen infections or co-infections than the other remaining species, two of which we believe are in decline. This disparity in pathogen load may hasten species loss. We anticipate that the different kinds of bumble bee in Massachusetts cranberry will drop to three in the next few years, from nine in the 1950s.

Refereed publications:

**Averill, A.L.**, M.M. Sylvia, N. Hahn, and A.V. Couto. 2018. Bees (Hymenoptera: Apoidea) foraging on American cranberry in Massachusetts. *Northeastern Naturalist* 25(3):502-512.

Dibble, A., F.A. Drummond, A.L. Averill, K. Bickerman-Martens, K., S.C. Bosworth, S.L. Bushmann, et al. 2018. Bees and their habitats in four New England states. *Maine Agric. Forestry Exp. Station (MAFES) Miscellaneous Report 448*, 50 pp.

Hoshide, A.K., F.A. Drummond, T.H. Stevens, E. Venturini, S.P. Hanes, M.M. Sylvia, C.S. Loftin, D.E. Yarborough, and A.L. Averill. 2018. What is the value of wild bee pollination for wild blueberries and cranberries, and who values it? *Environments* 5(9): 98-132.

Xu, G. E. Palmer-Young, K. Skyrn, T. Daley, M. Sylvia, A. Averill and S. Rich. 2018. Triplex real-time PCR for detection of *Crithidia mellifica* and *Lotmaria passim* in honey bees. *Parasitol Res.* 117(2):623-628.

## CRANBERRY IPM/WEED PROGRAM 2018

### **Hilary Sandler and Katie Ghantous**

with support from K. DeMoranville,  
N. DeMoranville, L. Hardy, J. Scott,  
and W. Kerrester

#### **Research Highlights:**

##### **Screened herbicides for use in cranberry.**

Novel herbicides are needed to control problem weeds and allow growers access to more chemical mode of actions (MoA) to enable them to rotate chemicals and practice Resistance Management. Our program screened three postemergence herbicides registered for use in other food crops but not cranberry, against perennial grasses and dodder in greenhouse trials and for crop safety in field trials, and an additional seven for moss control. Application timings of a grass control herbicide were tested on two cranberry varieties to support efforts to revise the product able to allow grower a longer application window.

##### **Continued crop safety and efficacy studies with Kerb SC.**

We studied the effects of single and multiple applications of different rates applied to either spring dormant cranberry or after cranberry budbreak to demonstrate crop safety and to help us formulate grower recommendations in the future when the herbicide is registered. This study also had a greenhouse component looking at the efficacy of Kerb against dodder and for safety on newly planted cranberry vines. We are using these data as part of a packet to request an emergency exemption from U.S. EPA for the use of Kerb in 2019.



##### **Moss in cranberry bogs.**

Moss has been identified as an emerging pest problem by cranberry growers. An extensive survey of moss species present was conducted on State Bog in 2018. Ten (10) different species were identified (Wheaton intern in cooperation with UMass



Herbarium experts). The most widespread were Haircap moss and two Sphagnum species, with the rest occurring in much smaller amounts. This reaffirmed our goal in targeting Haircap and Sphagnum spp. for weed management.

The herbicide in the 2017 IR-4 trial has shown efficacy against moss (and dodder). A replicated field trial was conducted in 2018 testing two rates and two timings of this compound and another new herbicide which the cranberry industry is pursuing for registration. Both showed crop safety at earlier application timings, and good moss control. This project was done in collaboration with WI and NJ researchers.

Another five products were also screened for moss efficacy. Three of the products were very injurious to cranberry, but one product that can be applied as a liquid or granular showed good crop safety and some efficacy against moss. This product will be further tested for rates, application timing, and application frequency next field season.

In order to better document the impact of moss on cranberry production, samples of cranberry and moss were collected from areas of varying weed density. The data will be analyzed for correlations between cranberry density, moss density, and cranberry yield.

### **Promoting better understanding of dodder biology** (with Dr. A. Caicedo, Biology).

Samples of dodder were collected from commercial cranberry bogs as well as non-agricultural areas. Dr. Caicedo's lab on campus will use the collected materials for DNA extraction and subsequent genotyping with a genomic technique called GBS (genotyping by sequencing). The genetic data will be analyzed to deduce the relationships between dodder occurring in wild and cultivated bogs, and between dodder biotypes in different cultivated bogs.

#### **Extension Highlights:**

- In collaboration with Cornell, completed activities on a SARE Professional Development Grant that enables Extension Educators to present a unified approach to educate growers about resistance management.

- We participate in Maximum Residue Limit (MRL) discussions with other scientists and industry representatives to review export issues and prioritize pesticides.

- Provided 1<sup>st</sup> year of support (scouting, recommendations, etc.) for a new cranberry farmer with newly acquired bogs.

- **Scholarworks** (digital repository). Station documents were downloaded by people from 136 different countries. China was the 3<sup>rd</sup> most common country for downloads.

#### **Other Program Highlights:**

- Published 2 journal articles and 6 abstracts (meeting presentations).
- Sandler, H.A. Repeated applications of mesotrione and napropamide on new cranberry plantings. *Weed Tech.* 31:599-608.
- Ghantous, K.M. and H.A. Sandler. Evaluations of pre- and postemergence herbicides for dodder management in cranberry. *Acta Hort.* 1180:379-386.
- Employed one UMass-Amherst student and two Wheaton students.
- Administrated EIP grant program for UMass Extension small fruit, tree fruit, vegetable, and cranberry teams. Year 1 (of 3-year grant) monies from USDA-NIFA: \$270,542.
- Obtained industry support for applied research in weed management. \$20,044.

#### **ScholarWorks Metrics:**

Cranberry Chart Book: 1,047 copies (+6% from last year)

Cranberry Production CP-08 Manuals: 462 copies (+65% from last year)

BMPs: 762 copies (+13% from last year; IPM was downloaded most frequently, 351 times)

Fact Sheets: 685 copies (same as last year; Physiology of cranberry yield, 213 downloads)

- **UMass Cranberry Web Site**

8,667 users (-4.5% from 2017)  
23,421 page vies (-4% from 2017)  
1:30 minutes spent on site per visit

#### **Top 5:**

How Cranberries Grow  
Cranberry Chart Book  
Faculty/Staff page  
IPM Message Alerts  
Frost Tolerance Reports

## CRANBERRY PATHOLOGY

### **Sai Sree Uppala**

#### **Proud New Member of Team Cranberry!!**

Krystal DeMoranville, Technician

#### **Overview of my background:**

Before joining the UMass-Cranberry Station as an Assistant Professor - Extension Plant Pathology, I received 13 years of extensive training in agricultural research, extension and grant writing in various capacities as an undergraduate Student Intern (at Acharya N.G. Ranga Agricultural University, AP, India), Graduate Research Assistant (at Kerala Agricultural University, India; Auburn University, AL) and Post-Doctoral Research Scientist (at Oregon State University and Texas A&M University).

My research and extension in various crops (rice, peanuts, Kentucky bluegrass, peppermint, vetch, leafy vegetables, apples, and pears) so far focused on the development of integrated disease management strategies (cultural methods, fungicides, endophytes, biocontrol agents, antibiotics), understanding the host-pathogen-environment interactions affecting disease development/management, development and evaluation of disease forecast guidelines, screening varieties for disease resistance, fungicide resistance monitoring and development of innovative extension outreach programs.

#### **Scholarly Achievements:**

Published 11 peer-reviewed manuscripts, 1 book chapter and 3 conference proceedings, 11 extension publications and 15 conference presentations.

- Obtained two research grants (one from Texas Rice Research Foundation (TRRF) and one from Indian Council of Agricultural Research (ICAR)) – totaling \$63,000.

- Reviewer for 8 peer-reviewed journals and member in 6 professional societies.
- Senior Editor for American Phytopathological Society- Plant Health Instructor journal.

#### **My Vision for Cranberry Research and Extension:**

Improve understanding of the biology and ecology of the cranberry pathogens, especially the fungi associated with fruit rot.

- Explore the diversity and significance of endophytic micro-organisms from the wild and cultivated cranberry bogs.
- Investigation of factors affecting disease occurrence, management and fungicide resistance.
- Development of strategies to avoid or delay fungicide resistance.
- Establishment of economic threshold levels, timely disease scouting guidelines.
- Development of disease forecast models.
- Development of novel, environmentally-friendly, cost-effective, and sustainable integrated disease management strategies for organic and conventional cranberry production systems.
- Establishing a state-of-the-art cranberry disease diagnostic lab, and provide timely and accurate diagnosis and management guidelines, to minimize yield losses.
- Develop timely and innovative extension outreach programs on diagnosis and management of cranberry diseases.
- Establishing strong professional relationships with other cranberry researchers, growers, industry personnel, agricultural consultants, marketing agencies and regulatory agencies; and work towards developing sustainable production strategies.

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## ***NEW FEDERAL FUNDING FOR CRANBERRY RESEARCH***

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***Casey Kennedy, Hydrologist, USDA-ARS***

In 2018, Congress appropriated an additional \$1,000,000 annually to invest in cranberry production in the states of Massachusetts, New Jersey, and Wisconsin. In Massachusetts, the 2018 funds were used to support a new technician and to purchase lab equipment. It is very likely that an additional \$1,000,000 will be appropriated in fiscal year 2019. New additional funding to support Massachusetts cranberry research would then total approximately \$600,000. These increases in USDA funding are due to the efforts of the grower associations in Massachusetts (Cape Cod Cranberry Growers' Association), New Jersey (American Cranberry Growers Association), and Wisconsin (Wisconsin State Cranberry Growers Association).

Ultimately, the new funding will be used to hire a permanent USDA-ARS scientist and technician by 2021. The new scientist will focus on irrigation and drainage management in cranberry production. The new funding will also support the following:

- a postdoctoral researcher to focus on irrigation and drainage management in cranberry production;
- renovation of lab space for new USDA-ARS scientist;
- renovation of a section of State Bog to include new hybrid cultivars, subsurface tile drainage, and irrigation system;
- new water isotope analyzer to replace existing instrument used by the ARS Hydrologist.

### **WPS “Train the Trainer”**

Massachusetts Department of Agricultural Resources (MDAR) along with the EPA Region 1 is offering two opportunities for individuals to take the WPS “Train the Trainer” course in order to train agricultural workers and be in compliance with WPS. This course is free of charge and will offer three (3) Continuing Education Units.

The first course will be here at the UMass Cranberry Station on March 6, 2019 from 9:00am-12:00pm. For more information please contact Laurie Rocco at 617-626-1782 or [laurie.rocco@mass.gov](mailto:laurie.rocco@mass.gov).

For a registration form please [here](#) or visit [www.ag.umass.edu/cranberry](http://www.ag.umass.edu/cranberry) .

## RESPIRATOR TRAINING

### 1 Pesticide Recertification Credit

Respirator Requirements, Training, Medical Evaluation and How to Fit Test – review of the requirements for using a respirator, choosing the correct respirator, required training with paperwork, Medical Evaluation reviewed, handed out, where you can have it completed, and the information, technique and tools of how to run a respirator fit test. Two classes will be offered:

**Cranberry Station Library 8-10:00am**

**Monday, March 18, 2019 or Monday, April 15, 2019**

**\$40/per person.** Space is limited to 25 seats so please register.

Bring your respirator.

Contact **Marty Sylvia: 508-295-2212 x20**

## UMASS CRANBERRY STATION WORKER PROTECTION STANDARD (WPS) HANDLER TRAININGS

Worker Protection Training using the new materials from the EPA for cranberry workers in the handler category for Spring 2019 will be held in the Cranberry Station Library 2:00-4:00 PM on the following Wednesdays:

**March 27<sup>th</sup>**

**April 24<sup>th</sup>**

**May 29<sup>th</sup>**

**June 26<sup>th</sup>**

There is a \$10 fee to cover the cost of the WPS training manual. If you have a pesticide license, you do not need this training. If you have workers, they do need this training!

Contact **Marty Sylvia: 508-295-2212 x20** to sign up or for more information.

## Tune into TickTalk with TickReport!

A FREE live webinar series by Dr. Stephen Rich, Director of the UMass Laboratory of Medical Zoology. The second Wednesday of the month in February, March, April, May, and October 2019 from 12:00 -1:00pm. Preregistration is required to access webinars.

For the full schedule click [here](#) or visit [www.ag.umass.edu/cranberry](http://www.ag.umass.edu/cranberry).

## CRANBERRY STATION NEWS

**Hold on to your Chart Book!** The Cranberry Station published a multiple year Chart Book in 2018 covering 2018 to 2020. Update inserts will be available around April 1<sup>st</sup>.

If you do need a Chart Book please contact the Robyn Hardy, 508-295-2212x10, for availability.



**Hilary Sandler, Station Director**

## UMASS PESTICIDE SAFETY TRAINING REGISTRATION FORM

**Thursday, April 25, 2019  
7:30 AM – 12:00 PM  
Rosebrook Event Center  
TownePlace Suites Marriot  
Wareham, MA**

**\$55.00 per person  
Must be postmarked by 4/16/19  
After 4/16/19 you are considered a "walk-in":  
cost will be \$75.00 per person  
Please contact the Station to be added to the list.**

Please make checks payable to **UMass** and return registration form along with payment to:

**UMass Cranberry Station  
PO Box 569  
East Wareham, MA 02538**

**Don't forget your Photo ID and Pesticide Number**

**PLEASE PRINT**

**ALL** Pesticide Safety Training (4/25/19) attendees **MUST** register and pay (whether receiving credits or not)

Name: \_\_\_\_\_

ADDITIONAL ATTENDEES:

COMPANY: \_\_\_\_\_

\_\_\_\_\_

EMAIL: \_\_\_\_\_

\_\_\_\_\_

PHONE: \_\_\_\_\_

\_\_\_\_\_



**CRANBERRY STATION  
NEWSLETTER**

**Inside this issue:**

- **Pesticide Safety Registration**
- **2018 Research Highlights**
- **Station Updates**

UMass Cranberry Station  
PO Box 569  
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OFFICIAL BUSINESS