UMass Pesticide Safety Training
Thursday – April 27, 2017
8:00 AM – 12:00 PM
Rosebrook Event Center
TownePlace Suites Marriott, Wareham, MA

4 contact hours
($50 if signed up by 4/17/17, $60 after that date)

7:30  Registration (with coffee)
8:00  Chemigation Safety – John Mason, Slocum-Gibbs (30)
8:30  WPS requirements and Pesticide Safety – Marty Sylvia (30)
9:00  Weed Control – Katie Ghantous (25)
9:25  Pesticide Registration Processes - Hilary Sandler (20)

9:45  COFFEE BREAK

10:15 – 10:35  Pesticide Resistance Module – Katie Ghantous (20)
10:35 – 11:00  Oesco Spray Technology – Howard Boyden (25)
11:00 – 11:30  Fruit Rot Management – Erika Saalau Rojas (30)
11:30 – 12:00  Insect IPM, another season – Anne Averill (30)

Reminder: All persons attending the meeting must register and pay, regardless if receiving pesticide credits or not.
Registration Form for UMass Pesticide Safety Training
Thursday - April 27, 2017, 8:00 AM - 12:00 PM
Rosebrook Event Center
TownePlace Suites Marriott, Wareham, MA

Please register for the meeting using this form. (PLEASE PRINT)

** To receive contact hours at this meeting you must have a photo I.D. and your pesticide license with you.

COMPANY NAME _________________________________________

COMPANY CONTACT PERSON _____________________________

EMAIL ________________________________

PHONE ________________________________

NUMBER OF ATTENDEES ________________________

NAMES OF ALL ATTENDEES (Please print)

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Return with payment by:
April 17, 2017
Include check made out to:
UMass
In the amount of:
$50.00 PER PERSON
IF POSTMARKED BY 4/17/17

After 4/17/17, registration increases to
$60.00 per person

Return to:
UMass Cranberry Station
P.O. Box 569
East Wareham, MA 02538

* Please Note
No Refunds after 4/17/17

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Weather round-up for 2016
Carolyn DeMoranville

Starting in 2017, Peter Jeranyama will be overseeing the collection of weather data at the Station and reporting on monthly conditions on the Station’s website.

Drought. The year 2016 had well-below average rainfall, was even drier than 2015 and the driest year since 2004. We had much less snow than in 2015; the total snowfall for 2016 was 42 inches, 7.5 inches above the yearly average. In 2015, the extreme winter snowfall helped to mitigate drought conditions, but in 2016 there was only about half the amount of snowfall (7.5 inches above average vs. 50.8 inches above average in 2015). As a result, drought conditions became apparent by June 2016 as rainfall began to fall below average once again. For the year, rainfall in East Wareham was 8.8 inches below average and the two year period of 2015-2016 saw a total deficit of 15.1 inches. The last time we saw large rainfall deficits in consecutive years was the major drought of 1965-1966; 1965 was 19.4 inches below the norm and 1966 was 10.3 inches below, for a two year deficit of 29.7 inches.

Warm. This was another very warm year with 11 of the 12 months having average daily temperature above the norm. Only April was below normal in temperature. The official winter in East Wareham (Dec. 2015 - Feb. 2016) was very warm and wet. Temperature for the 3 months averaged 37.3°F, 8.1 degrees above normal and 8.6 degrees warmer than the previous winter.

The average temperature for the year was 52.01°F, 2 degrees above the 30-year average, making this the 3rd warmest year in East Wareham since records began in 1926. We had our 7th above average July in a row and August set a new average daily temperature record for East Wareham at 74.5°F, surpassing the previous record of 73.7°F held in 1937 and 2015. The maximum temperature for the year of 95°F was recorded on July 23rd. The minimum temperature of -8.5°F was recorded on February 14th.

The official summer (June, July and August) saw the true drought begin with very warm, dry, and sunny conditions. The average temperature was 71.7°F, 2.5 degrees above the 30-year average for the 3-month period. All three months were above average in temperature, with August surpassing the 1937/2015 record.

Overall, we started 2016 in a rainfall deficit from 2015 but with average conditions until June when drought conditions returned. The year as a whole was warm (11 of 12 months above average and the third warmest annual average temperature in East Wareham records), with summer quite hot and a new record average temperature for August. The year ended with continued dry conditions but more seasonal temperatures.

Carolyn DeMoranville, Director
Cape Cod Rabies Task Force Update
Brian Bjorklund

Since 2004, the Cape Cod Rabies Task Force has been working towards the elimination of raccoon rabies from Cape Cod. As you may recall, oral rabies vaccination (ORV) activities in much of Plymouth County and Mainland Barnstable County ceased once racies was discovered on the Cape and those activities were moved full-time there in 2004. Largely due in part to a successful oral rabies vaccination (ORV) baiting program, no cases of raccoon-variant rabies has been discovered east of the Cape Cod Canal since 2013. During the spring of 2016, an ORV zone west of the Canal was implemented to prevent the reintroduction of racies to Cape Cod and to reduce cases in the new zone. This new ORV zone includes mainland Bourne and Sandwich, as well as Wareham, Plymouth, and portions of Carver, Kingston, Middleboro, Rochester, and Marion (Figure 1).

During the spring (April-May) and fall (September-October), ORV baits (Figure 2) will be distributed by hand and bait station throughout the ORV zone. We seek your permission to access your property for the bait distribution. It is critical that all areas within the ORV zone are baited in order to vaccinate as many raccoons, foxes, coyotes, and other rabies vectors as possible to strengthen the population immunity.

After baiting is complete, we return to baited areas and live trap to capture raccoons and other rabies vectors to assess the effectiveness of the baiting. All target species (raccoons, skunks, foxes, coyotes, fishers, etc.) are sampled, hand-vaccinated, ear-tagged, and released at the site of capture once recovered from anesthesia.

If you own property within the zones shown in Figure 1 and are interested in allowing us to access your property for ORV bait distribution and live-trapping, please contact Brian Bjorklund, Wildlife Biologist and Coordinator of the Cape Cod Rabies Program, by phone at 413-537-9394 or brian.bjorklund@aphis.usda.gov. Please feel free to contact Brian with any questions or concerns.
Plant Nutrition Program 2016
Dr. Carolyn DeMoranville
(program includes Krystal DeMoranville, research technician)

Cranberry nitrogen budgets with focus on floods and rain events.
The partnership of the Cranberry Station and ARS with the Coalition for Buzzards Bay and Marine Biological Laboratory continued in 2016, completing a 20-month study of 3 bogs that focused on flooding and large rain events as potential exporters of nutrients. Some of our findings:

- Total N flowing into and out of the bogs was generally low. One bog had a net N output of 1.3 kg N/ha (surface and groundwater outputs were higher than inputs). Two bogs had net N retention of 3.0 and 6.7 kg N/ha (surface and groundwater outputs were lower than inputs).
- All bogs had net P outputs carried by precipitation, surface and groundwaters. Outputs ranged from 1.0 to 2.8 kg P/ha.
- Measurements of net N and P losses to surface waters from these bogs were similar to or lower than previous estimates.
- Most N outputs (77-97%) and most P outputs (80-96%) were in outflowing surface waters.

Use of tile drainage.
From 2012 to 2106, with funding from NE-SARE, Cranberry Station faculty worked with a team of growers to study the use of tile drainage. In 2016, I completed the final report for the project, including a Best Management Practices document and a project summary Fact Sheet. Research results confirmed the consensus practice of growers - 20 foot spacing between the tiles provides adequate but not excessive drainage and accommodates common in-ground irrigation designs. We learned from research and grower experiences that the optimum depth for tile installation is more site-specific, depending on soil texture, sub-grade depth and composition, and site hydrology. Over 200 cranberry growers were surveyed at the end of the project; 85 responses were received from growers who were the decision-maker for the farm. These growers represented 64% of the Massachusetts cranberry acreage. During the project they installed tile on 747 acres (6% of the MA acreage) and planned to install on an additional 347 acres by the end of 2017. Of those that installed tile since 2012, 37% reported that information from this project changed how they used tile or encouraged them to use tile for the first time. Of the 39 growers who installed tile into existing cranberry beds (retrofit), 70% reported increased yield and improved fruit quality (less fruit rot). Below is an example of outcomes reported by growers:

<table>
<thead>
<tr>
<th>Outcome</th>
<th>% of growers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield improved</td>
<td>80</td>
</tr>
<tr>
<td>Fruit quality improved</td>
<td>77</td>
</tr>
<tr>
<td>Need fewer pesticides</td>
<td>73</td>
</tr>
<tr>
<td>Need to irrigate less</td>
<td>53</td>
</tr>
<tr>
<td>Surface dries more quickly</td>
<td>23</td>
</tr>
<tr>
<td>Fewer puddles</td>
<td>77</td>
</tr>
<tr>
<td>Bed moisture was more</td>
<td>53</td>
</tr>
</tbody>
</table>

After retrofitting tiles - What did you observe?  n=39
Cranberry nutrient management.
Major revisions were made to the chart book in 2015 to reflect decades of research work in nitrogen and phosphorus management. Further revisions of the Nutrient Management section of the Chart Book were made in 2016 to reflect Nutrient Management Regulations put forward by MDAR. In addition, I prepared templates and digital calculators for growers to use in nutrient management planning and regulatory compliance. The nutrient management tools may be found at: https://ag.umass.edu/cranberry/publications-resources/nutrient-management-for-cranberries

I also worked with CCCGA as they added a module for nutrient management to their BOGS online record-keeping software.

The Compendium of Blueberry, Cranberry, and Lingonberry Diseases and Pests.
This year, the revised compendium was finally released by APS Press. This project was several years in the making and is the second edition of the original that was published in 1995. The resulting 231 page book will be an excellent, if expensive resource. Anne Averill and Frank Caruso served as editors and contributors. I contributed information on six topics related to abiotic disorders (those not caused by biological agents like diseases and insects).

Comparison of controlled release, soluble granular fertilizers, liquid fertilizers, and an organic liquid fertilizer.
Over the past several years, I have conducted field trials with various fertilizer formulations. In 2016, I set out to compare some of these materials in a large scale demonstration at State Bog and Rocky Pond Bog. At State Bog, Sections 1 and 3 received only liquid fertilizers; Section 2 received controlled release fertilizer; Section 4 was treated with our standard granular program. At Rocky Pond, the North side received our standard program and the South side was treated with a combination of granular fertilizers and the organic liquid (made from fish waste and waste from the Ocean Spray cranberry line).

From each treatment area, we collected fruit samples to estimate crop, soil and tissue samples for analysis of nutrients, and vegetation samples to determine plant growth. These samples are currently being analyzed and the results will be presented to the grower community at the Station’s January meeting.

Papers:
Jeranyama, P., J. Sicuranza, H. Hou, and C. DeMoranville. 2016. Shade effects on chlorophyll, gas exchange, and nutrient content of cranberry vines exhibiting yellow vine syndrome. J. Applied Hort. accepted for publication
Ndlovu, F. P. Jeranyama, C. DeMoranville, and M. DaCosta. 2016. Evaluation of cold acclimation in cranberry cultivars in MA in prep

University of Massachusetts Amherst, College of Natural Sciences. United States Department of Agriculture cooperating. UMass Extension provides equal opportunity in programs and employment.
1. **Irrigation water management.** Irrigation scheduling continues to be a major challenge in cranberry production. Many growers tend to rely on the 1 inch per week “rule” from rain and irrigation despite evidence that in most years this results in some weeks with inadequate water and others with excess. This project tested wireless tensiometers, non-digital tensiometers and farmer practice for irrigation management. When the tensiometer was used to decide when to water, irrigation was initiated only when the tension reading was -5 kPa and stopped at -2 kPa. The grower method of 1 inch per week was used as control. In each method, volumetric moisture sensor readings were taken and canopy temperatures were continuously monitored using a data logger. Cranberry plant density and yield components were measured. The results showed that the grower practice had tension readings of -2 kPa or less and consistently wetter than the tensiometer method. On average, the volumetric water content of grower practice was 26 % and 17 % with the tensiometer method. Fruit rot was 7% higher and yield was 24% lower under the grower practice relative to the tensiometer method. It is highly likely that irrigation based on detecting available moisture in the soil and irrigating only when the moisture is inadequate to support plant growth results in better cranberry yield and less fruit rot.

![Graph](image)

**Fig 1.** Effect of average soil tension in July and August on cranberry fruit yield
2. **Irrigation cycling in cranberry frost protection**: The objectives of this project are to (i) demonstrate the efficacy of automated irrigation cycling for cranberry frost protection by evaluating cranberry buds for frost damage following frost events with cycling implemented (ii) determine the effective set points for automated frost cycling by evaluating several options selected from grower experience and the literature on the science of frost protection, (iii) quantify the amount of water applied and fuel used during the evaluated cycling protocols for both mild and severe frost events and compare to water use in a non-cycled protocol, (iv) field test various sensors and compare temperature measurements of the bud/canopy and (v) synthesize the information gathered and develop BMP guidance for the use of automated irrigation cycling in cranberry frost protection.

3. **Sun scald research**. High summer temperatures (> 95°F) could potentially cause physiological stresses on cranberry vines. If these high temperatures occur during fruit set, sun scalding could result and further weaken the immunity of the fruit/vines so that they become more susceptible to fruit rot. Other possible physiological stresses that could occur include cessation of cell expansion, cell wall synthesis, poor stomatal conductance and low photosynthesis rates that in turn affect fruit yield. Plants in general have a cooling mechanism of hydrating themselves through a process called transpiration. Could it be possible that the transpiration process is inadequate to cool the vines? If so, can in-day brief sprinkling through the irrigation system be a solution. What are the temperature ranges that should be used to decide when to initiate and when to stop the sprinkling without wetting the vines to the extent of encouraging fruit rot pathogens? This project seeks to compare a pre-dawn irrigation event in anticipation of a hot summer day versus in-day brief sprinkling of the vines to avoid sun scald on developing fruit.
CRANBERRY ENTOMOLOGY PROGRAM 2016
Anne L. Averill, Martha M. Sylvia
Andrea Couto and Noel Hahn

POLLINATOR CONSERVATION PROGRAM

OUTREACH AND ACTIVITY

May 2016: four-day Pollen School was held at the Cranberry Station with sessions on pollen processing and pollen ID. We hosted 10 attendees (fellow researchers from 4 New England states).

May 2016 at the UMASS Campus, we coordinated the two-day meeting of the cooperators (21 researchers) on our 5-year USDA-NIFA Pollinator Security grant (Averill is project director).

August 2016 at UMass Cranberry Station, we hosted a three-day Pollinator Habitat Working Group meeting for 16 attendees (researchers and USDA folk from 5 New England states); this involved coordination of two days of presentations, field trips and arrangement of lodging/food.

Demonstration: State Bog Pollinator Garden at UMass Cranberry Station. New plantings included early blooming azaleas, rhododendrons, pussy willow, and fragrant sumac. Labeling and mapping for easier ID as well as weeding and watering in drought year were carried out.

Extension publication: A Review on Bees, UMass Amherst, (Cranberry edition)
Bee Pamphlet April 2016, 16 pages (This was delivered at an April meeting of 100 attendees, together with a 30-min presentations by Andrea Couto and Martha Sylvia titled “State of the bees”

Extension publication: A Review on Bees, UMass Amherst (Northeast crops edition)
Bee Pamphlet expanded and republished Oct. 2016, 36 pages. Includes sections on apple, blueberry, cranberry and pumpkin pollination, plus what conditions support bees.

RESEARCH PROJECTS

BUMBLE BEE COLONY HEALTH AT MANAGED BOGS, UNMANAGED BOGS, AND WILDLIFE CONSERVATION AREAS: Do commercial cranberry systems provide a healthy habitat for bumble bee colonies? Bumble bee colonies placed at ten sites in Bristol and Plymouth Counties were assessed after 6-7 weeks (colonies were deployed well prior to cranberry bloom at all sites). Colony mass, plus the number of workers and reproductives, were quantified. Colonies at wildlife management areas initially performed better, but experienced heavy predation. At commercial cranberry beds, colonies collapsed within a couple weeks of deployment at three sites, but performed well at two other managed sites (one being UMASS State Bog).

25 YEAR SURVEY: Is the diversity of bee species in decline in the cranberry region?
Eleven bogs, previously surveyed in 1990-1991 and in 2007-2009, were revisited this year and assessed for pollinator activity and diversity. Diversity is dropping. This was concluded based on identical sampling practices that have been done over the 25 year interval. Amazingly, 7 of the sites did not stock honey bees, reflecting a key change in grower practices as profit has declined. Counts at these non-honey bee sites had increased bumble bee activity.

POLLEN LOADS OF QUEEN BUMBLE BEES: What plant species are queens using for pollen collections?
Spring success of queen bumble bees is critical to the founding of colonies. For a second year, pollen loads were collected from queens of five species. We are currently assessing how general they are in their pollen collecting and which plant species are commonly utilized.
MICROBIOTA IN BUMBLE BEE GUTS: Do gut microbial communities vary in ‘healthy’ vs ‘non-healthy’ conditions?
Gut symbiont communities are critical for the health of many insect species. In tent settings, we exposed bumble bee colonies to varied neonicotinoid (a common insecticide that functions as a nerve toxin) feeding regimes for 6 weeks. DNA and RNA were extracted from whole guts and the diversity and abundance of gut symbionts are currently being analyzed by a cooperator.

POLLLATION DEFICIT: Would cranberry yield be higher if there were more pollinators?
This was a pilot test. During bloom, sections of bog were covered with tents and bumble bee colonies were added for one day. Compared to open bog sections, yield and berry weight were sometimes higher in the tented sections.

ASSESSMENT OF EUROPEAN HONEY BEE HEALTH IN MASSACHUSETTS HIVES
A limited project. Across MA, sampling of 75 backyard hives showed that the majority had treatable levels of the worst honey bee pest, Varroa mite, but that levels of the microsporidian pathogen Nosema was low.

INSECT PEST MANAGEMENT PROGRAM

CRANBERRY FRUITWORM EGGLAYING ON HYBRID CRANBERRY CULTIVARS: Are the early, large-fruiting cultivars more susceptible to infestation than the native varieties?
Berries were collected at three sites and inspected for cranberry fruitworm eggs. Two native varieties (EB and H) and two new large-fruiting hybrids (ST, CQ) were included for assessment. Egglaying occurred before 50% out-of-bloom, confirming our recommendation to treat (with bee-safe compounds) at 50% out-of-bloom, as eggs are hatching. For the large-fruiting hybrids, fruitworm infestation was observed four days before 50% out of bloom and just a few days before the native varieties. Of all eggs laid (112), 80% were on the hybrids and 20% were on the natives.

CRANBERRY SCALE OUTBREAK
For a 3rd year, reports of dead vines across the MA cranberry-growing region were common and Putnam scale (Diaspidiotus ancylius) was the culprit. Seventeen companies or individual growers brought in samples from 49 sites in May-June to determine if they had scale and to consult with us about the best timing for management. Eight companies/growers had multiple sites that were affected. Thirteen samples were NOT infested, and did not require treatment. Vines from thirty sites (26 of these were new) were infested and many growers brought in second samples to target peak crawler emergence. One Dearness scale (Rhizaspidiotus dearnessi) site continued from last year. A field trial with three low-impact options targeting crawler and white cap developmental stages showed some promise.

CO-EDITED A MAJOR PUBLICATION: COMPENDIUM OF BLUEBERRY, CRANBERRY AND LINGONBERRY DISEASES AND PESTS, 2ND ED., APS PRESS, 231 PP Ten years in the making!

REGULATORY PROGRAM Funding: IR-4
The chlorothalonil residue trial was repeated this year by Marty Sylvia to comply with a European request to fast track the sampling from harvest to lab analysis (funded by TASC grants, USDA through CMC).

FUNDING:
STUDIES ON THE HEALTH & CONSERVATION OF BEES IN CRANBERRY: USDA-NIFA, MDAR, and USDA-Hatch/Multistate
CRANBERRY INSECT RESEARCH: PEST MANAGEMENT AND POLLINATION: CCCGA, CI, CRF and OSC
Selected Highlights of the
2016 Cranberry IPM/Weed Program

Dr. Hilary Sandler and Dr. Katherine Ghantous
with support from N. Demoranville and K. DeMoranville

Research Highlights:

Improving weed control in cranberry with novel uses of registered herbicides. Due to the difficulty of registering new herbicides for use in cranberry, we are developing new use patterns of herbicides that are currently available. Devrinol is used for preemergence weed control, and is labeled for use in the early spring. We evaluated crop safety with applications of Devrinol later in the season to help control weeds that germinate in warmer weather. Grass-specific herbicides are registered for use in cranberry, but an obstacle to effective use of these herbicides is that they can only be applied by ground rig or aerial application. Chemigation allows for treatment of infested areas more quickly and at a lower cost. Broadcast and chemigation applications of Intensity as well as single vs multiple applications at various timings were evaluated. Both herbicides have excellent crop safety with these new use patterns. Registrants are willing to pursue Special Local Needs labels. Results will enable growers to increase the range of weeds controlled in a cost-effective and efficient manner.

Screening novel herbicides for use in cranberry. Novel herbicides are needed to control emerging weed issues, as well as to allow for growers to have access to a wider range chemical mode of actions (MoA) to enable them to rotate chemicals and practice the principles of Resistance Management (RM). Our program screened six herbicides (registered for use in other food crops but not cranberry) which represented 5 different MoA groups, two of which are not represented by any currently registered herbicides. Initial screening trials were conducted in the greenhouse. A promising candidate from 2015 screening trials, Chateau (flumioxazin), was included in the 2016 screening field trials and has been selected as an IR-4 (residue trials) priority for 2017. Identifying novel herbicides for use in cranberry will ideally lead to registration of these products, giving growers more and better tools to control weeds while enabling them to practice RM principles.

Extension Highlights:

• In collaboration with Cornell University, we offered a “Train the Trainer” webinar series on Pesticide Resistance Management for Extension personnel in the Northeast. The 4-part workshop series attracted 238 attendees. A Core Module (PowerPoint) presentation was developed and distributed to participants for their use as an education tool. NE-SARE Grant: $91,500.
  
  o https://www.youtube.com/watch?v=-1KwmE0tLvS
  o https://www.youtube.com/watch?v=eYQq8PMFlWQ
  o https://www.youtube.com/watch?v=WOECQUI27F0
  o https://www.youtube.com/watch?v=LycGVxxgh_8

• We are in the process of obtaining a Special Local Needs label (SLN or 24c) for chemigation applications of Intensity and Intensity One for control of grasses.
• We successfully lobbied to have a novel herbicide (Chateau, active ingredient flumioxazin) nominated for IR-4 trials. This is a crucial step for registering a new product for use in cranberry.

• Provided support (scouting, recommendations, etc.) for a new cranberry farmer who is transitioning his newly acquired bogs from conventional to organic.

• Initiated a 2-year study on the effects of registered herbicides on five newer large-fruited cranberry hybrid varieties.

• Scholarworks (digital repository). UMass Cranberry Station documents were downloaded by people from 84 different countries. Interestingly, the largest increase of downloads came from China. We saw virtually no downloads from China in recent years, but in 2016, China ranked in the top 3 or 4 countries, usually behind Western Europe and Canada.

Metrics:
- Cranberry Chart book: 1,228 copies (+18% from last year)
- Cranberry Production CP-08 Manuals: 302 copies (-18% from last year)
- BMPs: 638 copies (-6% from last year; IPM was downloaded most frequently with 255)
- Fact sheets: 722 copies (+133% from last year; Sparganothis had 167 downloads).

UMass Cranberry Web Site was updated and aligned with its sister programs in Extension in January. The software platform allows for easy and quick updating from any computer. 88% were from the U.S. but others were from Canada (4.5%), Poland/UK (0.7%), India, Japan, and Germany.

- 9,112 users (-23% from 2015)
- 35,096 page views (no change from 2015)
- 1:34 minutes spent on site per visit (no change from 2015)

Top 5:
- How Cranberries Grow
- IPM Message Alerts
- Faculty/Staff page
- Cranberry Chart Book
- Frost Tolerance Reports

Other Program Highlights:

• Published 2 journal articles (Weed Technology, J. Chemical Ecology) and 3 abstracts.

• Provided summer internships for two science students (UMass-Amherst & Wheaton College).

• Conducted 5th year of treatments for studying the long-term effects of delayed applications of Casoron on four cranberry varieties.

• Hosted a bogside workshop on sprayer calibration and boom sprayer technology at a grower farm.

• Administrated EIP grant program for UMass Extension small fruit, tree fruit, vegetable, and cranberry teams. Year 2 (of 3-year grant) monies from USDA-NIFA: $194,000.

• Obtained industry support for applied research in weed management. CI/CRF/OSC: $32,950.
Fruit Rot Management

The search for Bravo alternatives continues. As a result of a new Maximum Residue Limit (MRL) imposed by the European Union in 2015, most fruit handlers in MA restricted the use of chlorothalonil for export-certified fruit.

Joint efforts from cranberry industry members, non-profit and grower organizations accomplished a revision of the MRL that enabled growers to use chlorothalonil in 2016.

Despite the good news of having Bravo back, the MRL restriction set in 2015 reaffirmed the need to seek Bravo alternatives, safeguard fungicide efficacy, and reduce fungicide reliance.

In 2016, field trials were designed to test new fungicide products and develop strategies that optimize the efficacy and timing of fruit rot management programs.

As a result, fruit management recommendations for 2017 will include:

- Efficacy ratings for 2 relatively new fungicide products in MA
- Fungicide programs excluding chlorothalonil
- Guidelines to optimize fungicide timing

Concurrently, efforts to assess the status and monitor the risk of fungicide resistant fruit rot pathogen populations continue. To date, in vitro screenings suggest that one major fruit rot pathogen and possibly three other fungal species display reduced sensitivity to a popular fungicide used by most cranberry growers.

Upgrading Diagnostic Resources

In 2014, two new cranberry virus diseases were confirmed in MA. Virus testing services can be costly and available to growers only by a third party. Hence, the UMass Cranberry Station and Cape Cod Cranberry Grower’s Association partnered and successfully obtained funding to upgrade the diagnostic capability and services offered to cranberry growers.

The funds granted for this project will enable the purchase of equipment to test for emerging virus diseases using serological- and molecular-based methods. This will also allow the opportunity to validate and develop diagnostic assays applicable to a broad range of cranberry pathogens, including fruit rot fungi.

Fruit Rot Working Group

In response to the chlorothalonil restriction set in 2015, cranberry researchers and industry stakeholders across the country joined forces to revise industry needs and priorities at this time of crisis.

Since the creation of the group, several of these priorities have been addressed, mainly:

- **Fruit Quality**: ongoing collaboration with Ocean Spray to identify critical harvest processes that impact fruit quality, coordinated fungicide trials across regions, improving bog side cleaning practices and fungicide efficacy.
- **Biology of fruit rot fungi**: coordinated field trials to determine timing of infection of field and storage rot fungi, molecular characterization of fruit rot pathogen populations, validation of detection tools (2017).
- **Infrastructure**: increased communication and collaboration between researchers to secure federal funding.
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Thursday – April 27, 2017 – 8:00 AM -12:00 PM
Rosebrook Event Center, TownePlace Suites Marriott, Wareham, MA

The Registration form for the meeting is in this newsletter on page two. The fee for the meeting is $50.00 per person if received in person by 4/17/17 (or postmark your mail-in by that date).

Later registrations, including call-ins to pay at the door will be charged $60. We instituted this system in response to an increase of folks calling in at the last minute to pay at the door and then not showing up for the meeting (and thus not paying).

We have to give a final count to the hotel ahead of time, and pay on the count, so we request that you register and pay by the deadline.