



**UMass
Extension**

Cranberry Station Newsletter

DECEMBER 2010

UMASS CRANBERRY STATION

1 STATE BOG ROAD

P.O. BOX 569

EAST WAREHAM, MA 02538

<http://www.umass.edu/cranberry>

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Thank you for your donations to the Cranberry Station Centennial Fund. Thanks to your support, we have ordered the research vehicle, acquired some of its equipment, and established an Endowment to support our research and extension mission. For those looking for an excellent year-end giving opportunity, it's not too late to contribute. See the materials on our website (<http://www.umass.edu/cranberry> choose 'The Station' and then '100th Anniversary Endowment'). 100th Anniversary shirts, hats, and cups are still available too — they make great gifts!

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It was a year of extremes and scald - Notes from the Eighth Annual Cranberry Summit

On November 30, a group of Massachusetts growers, handlers, and researchers came together at the Cranberry Station to discuss the 2010 growing season. This year we were joined by researchers and growers from NJ via Skype. We discussed management challenges, research and education needs, and as always — the weather. This year was a year of weather extremes from the record rains in March, to the early start to the growing season, to the heat waves in July and August. The interaction of weather patterns with crop and fruit quality was the hot discussion topic. This is a summary of the discussion arranged by the topics covered.

General

Crops in general were down around the country compared to early estimates and to those in 2009. MA and NJ were the only states with crops higher than in 2009, with the Massachusetts crop estimated at 1.9 million barrels. All of the major 4 cultivars were up in yield (bbl/A) compared to last year, with Ben Lear showing the greatest (13%) increase. Several growers reported small fruit and noted that the final crop didn't live up to the amount of bloom.

Some data (average bbl/A) were provided by Joe DeVerna of Ocean Spray (2007 and 2008 cultivar data were presented at previous summits):

Massachusetts	2007	2008	2009	2010
All cultivars	123	189	147	156
Early Black	119	168	126	132
Howes	115	162	116	127
Stevens	213	227	191	203
Ben Lear	180	260	200	224

Joe noted that they do not yet have good data for newer hybrids due to small acreage planted and young age of the plantings. However, the Grygleski hybrid made up 5% of WI Ocean Spray deliveries with yields similar to those for Stevens in WI.

Parker Mauck of Decas Cranberry Products reported that their growers delivered about 3% less fruit than in

2009 and well below grower's early season estimates. Parker made the point that there is need for research and education on how to estimate the crop at various times in the early season. Early estimates of yield are very important for planning the sale of the coming crop. He also noted that fresh fruit was showing above average storage rot this season.

Both handler representatives noted that color was down in 2010. There was general agreement that the lack of cool nights in August and early September likely played a role. Brix was average in MA and down 20% from 2009 in NJ.

Other comments — "I hope we never have a growing season as early as this again."; "The only place I saw scald was in poor drainage areas."; "I had scald only in area of thin vines." Most agreed that weather was a major factor and that scald is poorly understood. There was also general agreement that this was not a bad year for insects and that dodder is becoming a huge challenge and concern.

Weather

Heavy March rain, early crop development due to higher than normal temperatures in early April, and many frost nights (as a result of early development and a return to normal night-time temperatures later in April and May) led to very saturated soils in the spring; some bogs went under water. Later in the summer, many locations experienced low rainfall leading to the need for extensive irrigation. Soil saturation going into bloom could have had an impact on the retention of set fruit — saturated soil is associated with poor fruit retention. This could help to explain the observations of excellent bloom but not so excellent yield.

The hot weather in July and August could have played a role in reducing fruit size. Most bogs were past fruit set by early July in 2010. During the first week of July, temperatures soared above 100°F for several days with growers reporting on-bog temperatures in excess of 120°F. The rate of fruit mass (size) development slows when the daily maximum air temperature is greater than 85°F or less than 68°F.

The most important impact of hot weather appeared to be on fruit quality. High temperatures stressed the plants, leading to increased susceptibility to fruit rot.

High temperatures with low humidity at the end of August were followed within a few days by the appearance of scald at many locations.

Scald

The most common scald (steam scald) seen in MA is that which occurs in areas where water puddles and steam ‘cooks’ the fruit. Several growers reported this type of scald due to the need for extensive irrigation in the hot early summer and on new beds. The more rare type of scald, that associated with high temperatures and low humidity (dew point), was attributed to the hot days at the end of August into the first of September. In the second type of scald event (heat scald), the fruit are heat-injured due to the inability of the plant to cool the fruit enough through normal transpiration (drawing water up from the roots and out through the stomates (pores) in the leaves). Heat scald is intensified on plants where the fruit mass is large in comparison to leaf area (new plantings of large-fruited cultivars) and in areas where the vine is thin — exposed sand heats up more and berries exposed to the sun also heat up more than if they were buried in the canopy. As the fruit get larger, susceptibility may increase.

Several growers mentioned that there is some confusion about scald vs. rot. Frank Caruso noted that if you wait to examine the fruit at harvest (well after the scald event), fungi may have colonized the scalded fruit making it impossible to tell if the primary cause of the deterioration was scald or fungal disease. If the fruit are examined soon after the presumed scald event (within 24-28 hr), a lack of fungi in the berries would confirm that injury was due to scald. He also noted that hot, stressful conditions increase the susceptibility to and severity of fungal fruit rot disease.

Frank and Peter Oudemans from Rutgers discussed scald. Frank noted that the last big scald event in MA and NJ prior to this summer was in the summer of 1990. During that season, a torrential rain on July 24 (in MA) caused some flooding and other puddling that could have caused steam scald (fruit were cooked). This was followed by a high temperature/low humidity event from August 1-2, where heat scald conditions were present. Peter Oudemans noted that many NJ locations were very hard hit by scald in 2010. He

also indicated that if we had a good predictive/warning system that sprinkling during the heat of the day could effectively be used to protect the fruit, since in low humidity, the applied water would readily evaporate and cool the fruit.

The consensus was that we need to learn more about scald and how to predict it and protect fruit and perhaps design a grower notification system for when scald conditions are predicted. At our January meeting (see attached signup) we will devote a segment to scald with a grower panel and our guest speaker, Dr. Paul Croft. Paul was the researcher who, as a graduate student at Rutgers, identified scald conditions (as described in the disease section of the Chart Book). Paul will discuss scald conditions and will participate on the panel discussion.

What do we know from grower reports at the summit?

- Heat scald was severe on thin canopy and new beds.
- Heat scald was most severe on dry beds (low water table).
- Growers using subsurface irrigation via drainage tiles had less scald.
- Scald was observed on beds with poor drainage and/or heavy irrigation (this may have been steam scald).
- Growers that irrigated for 60-90 minutes in the early morning before scald conditions were predicted (>90°, low humidity) had little or no scald injury.
- Deep peat beds had the best crops and quality.

Frost

As mentioned above, the spring frost season began early, with as many as 30 nights requiring sprinkler protection. Some growers indicated that they experienced frost damage early (the plants were about 3 weeks ahead of the norm in their development so the season started earlier than many expected). Growers commented on the large number of frost nights, with two particularly bad ones. One of those required turning on irrigation systems by 8 PM; even on the Cape, this is very unusual. One grower reported that, on that night, 30 of his 40 automated sprinkler

systems turned on within a 15 minute period. This speaks to the utility of these systems - getting to 30 pumps in 15 minutes would be quite a logistical challenge.

Peter Jeranyama reported on his preliminary studies of Stevens and Howes beds protected from frost using cycled automation or late water floods. Interestingly, the most damaged buds (any sign of discolored areas in the bud was scored as damage) were observed on Stevens beds under automation or Howes beds after late water. Comparisons of the management details at these sites and additional sites and observations in 2011 will help us to determine the best ways to integrate these practices into frost management. Additional items to consider include: how much damage is sustained over the winter, when should cycling not be used (the group consensus on that was cold nights with low dew points were not good nights to cycle), what are the 'best' set points for starting and stopping when cycling for frost protection, and should startup be sooner (great number of degrees above tolerance) on low dew point nights?

Water management

Irrigation and scheduling. Growers indicated that they wanted to learn more about irrigating including the use of irrigation to reduce heat stress. It was noted that soil moisture probes and tensiometers have been used with good success. One grower noted that he felt better able to control moisture using irrigation in low rainfall periods. Another indicated he ran irrigation daily during hot periods (for 30-60 minutes after dawn). Several felt that they didn't have a good handle on irrigation, particularly in 2010. Irrigation scheduling is an area where additional education will be beneficial as Peter Jeranyama's research has reached a point where recommendations for use of instrumentation for scheduling can be made. Better understanding of scald (above) will also benefit irrigation management.

Drainage. With the wet spring season, growers who had improved drainage were pleased. Others are planning to work on bypassing water around downstream beds. One grower indicated using drainage tile to help maintain the water table beneath the bed, draining in wet periods and adding water during dry spells, was effective in achieving good crop and quality.

Diseases

Fruit rot. As noted above, some growers were concerned that they could not differentiate between scald and fruit rot. There was also discussion about the discrepancy between the good Keeping Quality Forecast and the high rot at harvest. Frank explained that the forecast does not account for stress conditions that occur after June 1 and that these can overcome the positive factors that are in place prior to that date, leading to what we saw in 2010 - a good forecast and not so good final outcome. Carolyn mentioned the heat stress conditions in early July and the fact that fruit were already sizing at that time (larger fruit cannot cool as quickly as smaller fruit). She wondered if increased physiological stress would increase susceptibility or severity of subsequent fruit rot disease.

Several growers indicated that they have implemented a mixed fungicide protocol for fruit rot: one chlorothalonil application plus two other materials for a total of three applications. Growers chose Indar, Abound (if they could hold water), or Dithane for the other applications. Some indicated that they avoided the full bloom period for their chlorothalonil application to avoid phytotoxicity on the flowers. Growers were generally pleased with Indar for fruit rot control.

Other diseases. Phytophthora was increased by the wet spring with Crimson Queen showing high susceptibility. Leaf spot was very prevalent on beds that had been planted in 2009 and Demoranville was particularly hard hit. Culturing of the spotted leaves in affected beds revealed two fungi, *Phyllosticta vaccinii* and *Colletotrichum acutatum*. These same two fungi were simultaneously present in rotted fruit collected from the same beds. Frank recommended trash floods, sanding, and increased fungicides for these beds to reduce the inoculum that can lead to more leaf spotting and rotted fruit in 2011. He also noted that severe leaf spot appears to be a seasonal, weather-dependent problem, not occurring widely every year, but just in some years.

Peter Oudemans noted that their work on Fairy Ring has identified two weed species as alternate hosts for the causal fungus. Briars (three species, including sawbriar and greenbriar) and swamp primrose infected

by certain rust fungi should be removed from cranberry beds to help prevent the spread of fairy ring (development of new rings).

Nutrient management

This was not a hot topic this year. One grower reported that he applied nitrogen based on potential seen at bloom and felt that in the end, he had over applied by 5-8 pounds since the crop did not come up to expectations. Another grower indicated that he continued to use 10-15 pounds/acre P with good results.

Pollination

Anne Averill reported that in a study of 30 sites in 2010, honey bee and bumble bee activity was excellent. She observed no bee kills on bogs where Delegate was used for cranberry fruitworm (CFW) despite reports that Delegate is toxic to bees. She did see mortality after sprays of Lorsban and Diazinon. She also saw some bee mortality at a site where Belay was applied.

Weeds

Dodder. Many growers agreed that dodder is a huge problem and that they do not have the tools they need to manage it. Results with Callisto were mixed, likely due to the fact that cranberry detoxifies the herbicide. So, if dodder is attached to cranberry, Callisto will have little effect on the dodder. However, if the dodder is attached to a Callisto-susceptible weed, then suppression of dodder seed production can be substantial. Growers did note good success with Callisto against other weeds.

There was some discussion of quinclorac and the possibility that its use in 2009 suppressed dodder into 2010. Hilary reported that her research is showing that with the correct use pattern, quinclorac is very effective against dodder. As part of that work, fruit samples will be analyzed for residue so that the best use pattern can be determined — one that is effective against dodder with minimal fruit residue. This is important since the European market will not accept cranberries with any level of quinclorac residues at this time. A large percentage of cranberries are now sold outside the U.S. so these are important issues for handlers and growers.

Growers asked about how to time Casoron applications for dodder. Scouting for first emergence of the dodder

works best. Hilary will continue to work to determine how best to use quinclorac but suggests that growers plan to manage dodder with early season Casoron followed by Callisto post-emergence. There is good evidence that Callisto inhibits the production of viable dodder seed if the dodder is attached to a Callisto-susceptible weed host. Research continues on the use of flame cultivation on dodder and looks very promising.

One grower reported an increase in incidence of yellow loosestrife.

Insects - insecticides

In general, growers felt that insects were not the biggest challenge in 2010. Some specific observations:

Early season insects. Insects were active very early in 2010. One grower reported weevil damage by the end of April. By the first week of May, winter moth and weevil were being found at many locations. Black headed fireworm was very widespread and looks to continue to be a major pest on most bogs.

Cranberry fruitworm (CFW). Pressure was low in 2010 and most reported no problems with control. First insecticide applications for CFW were going on as early as June 21 due to the advanced development of the plants. Anne reported that spraying at 50% out of bloom for Early Black and Stevens was effective but that spraying that early on Howes was not necessary - the traditional 7-9 days after 50% out of bloom was sufficient for Howes.

Most growers used Diazinon or Delegate for first CFW applications. Delegate was used at the Station bogs (no Diazinon) with excellent results.

Other insects. Sparganothis fruitworm was not a problem in 2010. Anne reported the first confirmed infestation of cranberry rootworm in MA since she has been here (this pest is often found in NJ).

Note: Product trade names are used for convenience and are not meant as an endorsement of any particular product.

CAROLYN DEMORANVILLE AND STAFF

UMass Cranberry Management Update

WEDNESDAY, JANUARY 19, 2011

Radisson Hotel Plymouth Harbor

**REGISTER NOW! PAGE 7!
5 Contact Hours, \$25!**

- 7:30 Registration (with coffee)
- 8:00 - 8:10 Station Update - Carolyn DeMoranville, Director
- 8:10 - 8:30 Flame Cultivator Study Update – Katie Ghantous
- 8:30 - 8:50 Weed Management and New Plantings - Hilary Sandler
- 8:50 - 9:10 Plant Physiology Research - Peter Jeranyama
- 9:10 - 9:45 Nutrient Management - Carolyn DeMoranville
- 9:45 – 10:15 Coffee break
- 10:15 - 10:45 Pathological Observations for the 2010 Season – Frank Caruso
- 10:45 - 11:20 Scald Conditions - Paul Croft, Meteorologist, Kean University, NJ
- 11:20 - 11:55 Disease Interactions Panel - Frank Caruso, Paul Croft, + growers
- 11:55 - 1:00 LUNCH BREAK (on your own)
- 1:00 - 3:00 Entomology Afternoon
- 1:00 - 1:30 Insect management research and recommendations - Anne Averill
- 1:30 - 1:45 Cranberry Weevil Management – Martha Sylvia
- 1:45 - 2:00 Minimizing insecticide residues – Anne Averill
- 2:00 - 2:20 Tipworm Update - Sunil Tewari
- 2:20 - 3:00 Pollinators in cranberry: biology, status, and conservation - Anne Averill
- 3:00 - 3:45 Open Time - TBA
- 3:45 - 4:00 Wrap-up and Paperwork

Training Workshops to Prepare for Pesticide Applicator License Exams

This workshop, which is sponsored by Pesticide Education, UMass Extension, is designed to help individuals **prepare** for the pesticide applicator license exam. This workshop provides a review of the study manuals and is not intended to replace a thorough reading of the study manuals on your own. Dates for this training here at the Cranberry Station Library are set for **February 10 - 11** and **April 12 - 13, 2011**. To register for workshops contact Natalia Clifton at 413-545-1044.

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CAROLYN DEMORANVILLE
STATION DIRECTOR

**Registration Form for UMass Cranberry Management Update
 Wednesday, January 19, 2011 7:30 AM - 4 PM
 Radisson Hotel Plymouth Harbor**

Please register for the meeting using this form.

COMPANY _____

CONTACT _____

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**Return with payment by:
 January 10th, 2011**

NAMES OF ATTENDEES _____

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The directory includes:

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- * UMass Soil and Tissue Testing Lab information
- * Pesticide license information, including test dates, training workshops, and how to get a pesticide license
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The guide is also available online as a pdf at www.extension.umass.edu/agriculture
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