



**UMASS
EXTENSION**

Cranberry Station Newsletter

DECEMBER 2005

UMASS CRANBERRY STATION

1 STATE BOG ROAD

P.O. BOX 569

EAST WAREHAM, MA 02538

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

The 2005 Year in Review - Notes from the Third Annual Cranberry Summit

On November 29, a group of Massachusetts growers, handlers, and researchers came together at the Cranberry Station to discuss the 2005 growing season. We discussed management challenges unique to a season of weather extremes. This is a summary of the discussion arranged by the topics covered.

Weather

The consensus of opinion was that weather factors were most important in determining quality and quantity of the 2005 crop — the snowy winter, the cold spring, and the dry warm summer.

2005 was a year of weather extremes. Some comparisons were made to the Cranberry Station records for East Wareham that go back to 1926. We had the snowiest winter in Cranberry Station records — 104 inches beats the previous record by 20 inches. The snow cover lasted 70 days after the January blizzard. May was the 2nd coolest and 3rd wettest in our records. We then went into a prolonged dry spell with the June-July period the driest in our records at 2.05 inches. The June through August period was our 3rd driest, 4.29 inches below normal and would have beaten the record for driest except for 3.42 inches of rain at the end of the month from the remnants of Hurricane Katrina. The longest wet spell of the summer was for 5 days in early July that was followed by 22 days with no precipitation. Continuing the extreme pattern, the two-month period of September-October was our 2nd wettest on record.

A comparison to NOAA records for the past 30 years at Plymouth showed that from November 2004 through May 2005, each month was colder than

average. May was wet (7") and June was very dry (1.7") compared to average, while August was hotter than average and had above average rainfall (but all of that came in a single event at the end of the month; records can be very misleading!). From May 28 through July 4, total rainfall was less than 1 inch. From July 10 through August 28, rainfall was less than 0.7 inch.

In contrast, the New Jersey growing area received a regular rainfall in July through the first half of August, with greater than ¼ inch on July 1, 8, 13, 18, and 27 and August 4, 8, 9, and 13. Total rainfall for that period was 7.7 inches. New Jersey received no rain from August 16 through September 26. In contrast to MA, the 2005 NJ crop was quite good.

So what is the implication of these extremes for the MA crop in 2005? Many of the conditions this past season were similar to those in the 1996 growing season. That year, the State average crop was down 20 bbl/a from the previous year. Based on current estimates for the 2005 crop, State average will be down about 25 bbl/a compared to 2004.

Effects of snow

Many growers commented on the extended snow cover on their bogs and wondered how much impact this had on the crop. Snow cover was in place at State Bog from December 27 to January 2 and again from January 17 to March 24, a record 70 days. Of particular concern were bogs where water was in place prior to the big blizzard. Afterwards, it was difficult to reach many bogs to pull water. In addition, on bogs where ditching was neglected, it was difficult to properly drain water from beneath the snow pack.

This was compared to Wisconsin conditions where generally a thick layer of ice forms, the remaining water is pulled (with some of the vine tops remaining encased in ice) and then snow cover happens. It was noted that many WI growers plow deep snow from the ice due to concerns about oxygen deficiency and poor light penetration and believe that snowy edges show stress. Justine Vanden Heuvel, Station Environmental Physiologist, indicated that she did not think that light penetration through snow is a major issue, as WI researchers had blocked light to the vines by placing black plastic over the ice, and did not note any differences in growth or yield in the following season. However, all agreed that vines trapped in a shallow layer of water might be subject to some degree of oxygen stress. While growers did not notice severe spring leaf drop in 2005, many thought the bogs looked generally poor after the winter.

Effects of cold spring weather

Many noted that the bogs were slow to develop in the spring with bloom coming late and lasting for an extended period. In general the plants seemed to be behind all season and looked poor from spring right through to summer. However, bloom looked great initially, but then seemed to hang on for an extended period.

Effects of warm, dry summer

Many of you have said or heard other growers say "Irrigation just isn't the same as rainfall". This seems a bit counter-intuitive since after all water is water. However, on further reflection some points regarding the differences can be made:

1. During dry spells, the water added by irrigation may be lost more quickly since evaporation is greater on warm sunny days in comparison to days that are overcast.
2. Rainfall is more uniformly distributed than irrigation from even the best sprinkler system.
3. If maintenance of the water table is not part of an irrigation regimen, during long dry spells irrigation water will be lost to a receding water table. However, in 2005, most growers did not notice water table decline until late season if at all (based on levels in ponds and reservoirs).
4. If a water table is maintained under the bog, frequent irrigation may lead to the bog being too wet. Bruce Lampinen showed that immediately following an irrigation

event, the water table in the center of bog sections is routinely very close to the surface. He also showed that having a water table closer than 6 inches from the surface could lead to poor fruit retention. Conversely, having a water table deeper than 18 inches could expose the bed to the risk of drought stress. In a survey of area bogs in 1999 and 2000, Bruce determined that a majority of bogs were too wet during much of the summer. Growers tended to irrigate a bit too soon early in the season, leading to a trend of wet conditions through the season. In other words, the frequency of irrigation maintained uniform wetness (timing was correct) but the wetness level was often too high. In a comparison of an experimentally split Stevens bed, the drier end (maintained at proper moisture using monitoring devices) had greater fruit retention after fruit set, compared to the end that was wetter.

5. Even in this dry summer, growers reported that reservoirs stayed full and wondered if they had kept their bogs too wet. A grower who uses water level floats indicated that he was irrigating less than most of his neighbors and had no poorer crop. A fact sheet is available from the Station detailing construction and use of the floats (also known as Lampinometers after their inventor).

The dry summer was excellent for low fruit rot incidence. While disease was high in local blueberries due to the rainy May weather, the dry spell during cranberry bloom prevented fruit rot fungi from infecting the cranberries. While the warm dry summer promoted good fruit quality in terms of sound berries, the warm weather in late summer, particularly warm nighttime temperatures, led to the poorest fruit color since at least 1992. Finally, the lack of rain was cited as a factor in the small fruit size this season. Although New Jersey had a prolonged period of no rain (Aug. 16 - Sept. 26), the rainfall during July and August allowed for good berry sizing, reflected in their average crop of 200 bbl/a.

Other weather-related points

In general, pollination weather was not bad although the only summer rainy period lasted for 5 days in early July. In spite of this, several growers noted that bee activity was less apparent than normal and that honey production in on-bog hives was down. Natural pollinators also seemed less prevalent this year also. There was some thought that nectar flow was down this season. We

discussed the possibility of poor flower function related to winter injury that was subtle enough that flowers formed but were not fully functional from a point of view of nectar production and/or ability to set fruit. There are some old writings of Drs. Franklin and Bergman indicating that such a phenomenon might be associated with oxygen deficiency injury during the winter (see snow above).

Scald injury was mentioned and we discussed conditions that can cause this problem. Primarily, wet fruit is not a cause. Vapor from puddles on a very hot day may damage plants but the primary cause of scald is the inability of the fruit to stay cool. The plant cools itself by moving water from the roots and out of the leaves, a process called transpiration. On dry hot days (low humidity), transpiration rates can be very high. If there is not enough water in the soil to maintain high transpiration, fruit scald may occur. The prevention is to water ahead of hot, dry conditions so that there is adequate soil moisture available. Chemical burn is a separate issue and is discussed below.

Chemigation/pesticide management

The topic of possible chemical injury to fruit or plants was discussed. The first question was in regard to the need (or not) for washing off chemicals after early morning applications. The consensus of opinion was that washing-off was not effective since many materials are engineered to be rainfast for up to an inch of precipitation. With regards to bee toxicity, wetting might actually reactivate the material. However, it was also the consensus that particularly for pesticides with sticker or spreader materials included, early morning application before a hot day may be problematic. Many growers were particularly concerned about Bravo and other formulations of chlorothalonil in this regard and it was recommended that no applications go on after 8 am.

Diseases

This was an uneventful year for diseases. Weather contributed to very good keeping quality since moisture was low and temperature was moderate. Handlers reported excellent storage quality early. However, there were some instances of late-stored fruit deteriorating rapidly if there were any injuries on the berry (even slight 'dings'). On weedy fresh fruit beds, growers and handlers are noticing more dings and bruising on the fruit attributed to harvest injury. Frank Caruso, Plant Pathologist, noted that field rot in some of his experiment controls was only 30% in 2005 as compared to 60+% in other years. He is

also following 11 beds of Stevens that have historically had problem levels of fruit rot. In 2005, only one of the 11 had appreciable field rot. Frank received no reports of fungicide failures in 2005. Some of the growers present indicated that they integrated Abound into their fungicide schedules this year. However, due to low disease pressure, little could be determined in terms of efficacy. Growers also reported using reduced fungicide rates and fewer applications in 2005.

Dodder control/Kerb

Hilary Sandler, Weed IPM Specialist, indicated that some growers reported Kerb failures this season. This may relate to late and prolonged germination of dodder. Late germination may have been related to snow cover. Even in off-bog buckets at State Bog, first germination was delayed to May 9, compared to April 21-25 most years. By the time the dodder was at prime stage for treatment, growers were moving on to insect management. Consequently, for logistical reasons, many may have applied Kerb too early. However, one grower who waited quite late to apply had excellent results.

Insects - insecticide

Cranberry fruitworm (CFW) was a challenge for everybody in 2005 in June, July, and August. Population levels were extremely high — the uniform snow cover may have favored survival of the hibernacula on the bogs. Many growers reported damaging populations into late August. Anne Averill, Cranberry Entomologist, indicated that 2005 had the highest levels of infestation of CFW she had ever seen. Growers questioned the timing of sprays using percent out of bloom. However, this season, a spray at 7 days after 50% out of bloom was correct timing for peak egg-laying. It may have appeared off due to prolonged bloom (seemed to stall in mid-July). Moth flight was normal in its timing, with a huge peak in late June-early July and a second peak in late July. However, the number of moths during these flights was larger than normal. And as fruit set was prolonged (due to prolonged bloom) late set fruit were subject to infestation from the increased later flight. In the end though, the critical period was the first two weeks of July with peak egg laying occurring from July 7 to 14.

Due to the high populations, the potential for a large flight in 2006 is great. Of course, winter conditions can affect survivorship with fluctuating winter temperatures favoring mortality. Research results indicated that application of

½ inch of sand increased CFW survival, 1 inch had no effect, and only 2 inches of sand suppressed the insect.

Black Headed Fireworm (BHF), continues to be a problem and is responsible for sprays of Diazinon and Intrepid during the spring. Flooding can control this pest early in the season but generally does not eliminate the need for later spring sprays. In the early season, this pest is difficult to differentiate from winter moth larvae. However, based on one location where winter moth did serious damage to cranberry buds, winter moth larvae may also be a pest needing management if levels in the bog are high. In areas with suspected previous damage or high moth flights, scouting earlier than mid-May may be necessary. Based on previous years, BHF is often active by early May anyway.

Cranberry weevil was well controlled by Avaunt (Section 18 registration) and Actara in 2005. Populations seem to be on the decline (reported spring counts were all 30 or less per sweep set) so that the summer generation was below action levels on many bogs. Growers that did treat the summer population with Actara got good results. Due to the availability of Actara on a full registration and its efficacy against both generations, Avaunt will not be available in 2006. It is in the process of getting a full registration but this will take until at least 2007.

Sparganothis fruitworm was not as problematic in 2005 as in some previous years but remains a challenge for growers that have historic populations and particularly for fresh fruit producers due to delivery standards. There were some reports of late season outbreaks on bogs that had apparent early season control.

Flea beetles were very active again in 2005, appearing early and still being observed into September. Many growers sprayed for this pest and reported it was particularly active on new beds and on beds after ditch edges were mowed. This pest may preferentially infest weeds on some bogs, particularly Joe Pye Weed. It was noted that, historically, this insect was reported to attack stems and cause 'girdler-like' damage.

Intrepid, a new reduced risk compound, was discussed. This material is effective for controlling Sparganothis fruitworm and BHF and was used heavily in 2005. Due to detection of Intrepid in groundwater, this material will remain on the State Zone II list.

Winter moth presence in the area was noted again this year. This insect decimated blueberry crops where it was not controlled. This season, we encountered a case of very early damage in several cranberry beds at one location, and some growers present indicated that they probably lost crop to this pest. Flights of the adult moths within the past two weeks indicate that pressure will continue in 2006. It is a pest that will need to be watched closely, perhaps warranting earlier season scouting (see also BHF above). We may not have seen many cases of damage due to early BHF sprays that would also control this insect. The case where we did see damage — the insect fed on the bud prior to bud break. Later, in feeding tests on new growth, the insect seemed not to feed on cranberry. Spintor controls this insect.

Physiology

Fruit size was down this year, however, heat units were similar to last year through the bloom period. The reduction in fruit size noted this year may be due to water issues.

Growers who used late water this year were pleased with the outcome. Justine reported that organic bogs that she monitored had excellent outcomes with late water and that she could detect little impact of the flood on vine health as measured by carbohydrate (sugar) content, indicating that yield was likely unaffected by these floods.

Fruit color was poor, probably due to warm nights during late summer into early fall.

Several fresh fruit growers and handlers reported seeing misshapen fruit this year, primarily on Early Black. Other saw similar symptoms on Ben Lear. The fruit had a yellow, flattened area on the calyx end. This symptom has been described as 'monkey-facing'. When the fruit are cut open, there is an area of red pigment in the center. We have sent berries to a plant anatomist at Cornell for examination and he thought he saw evidence of insect penetrations in some of the affected areas. However, he has also not ruled out spray damage by chlorothalonil fungicide application. Whatever the cause, it occurred early in fruit development causing a group of cells to develop improperly (sort of like a birth defect or 'cellular confusion'). Microscopic examination of the fruit will continue during the winter in an effort to pinpoint a cause. We will keep you posted!

Growers all reported spotty crops — areas of beds with few fruit and other areas with good crops. We discussed the possibility that this related to areas of marginal oxygen deficiency and/or drainage issues during the winter but could make no definitive conclusion. Winter moth feeding could not be ruled out in these instances.

Irrigation

Irrigation should be scheduled based on soil moisture and evaporative demand (water used by the plant). In beds with a water table present, the water level float (see above) is the best tool. Using this device, the water table should be maintained between 6 and 18 inches below the surface. This allows water to move to the roots but avoids water logging. During particularly dry hot spells, water use by cranberry can reach 2 inches per week, while in the early season it is more likely to be ~1/2 inch. So while the average comes out to 1 inch per week for the whole season, following that rule leads to too wet or too dry conditions during the season. Irrigating by feeling the soil often leads to over irrigation. Tensiometers can be used but are challenging in our layered soils. The Station has fact sheets available regarding irrigation and the water level floats.

On drier bogs, irrigation barely kept up with maintaining the plants this summer and stress was visible by late season in areas of the sprinkler pattern that received the least water. Nozzle selection played a part in how severe the symptoms were; this likely contributed to differences in uniformity.

Varietal differences

Many growers reported poor crops on Howes while other had poor results with Early Black. Most growers reported lower than expected crops on Stevens. A comparison of MA and NJ crops showed MA at 115 bbl/a and NJ at 200 bbl/a in 2005. Both regions have large numbers of Early Black acres but NJ has no Howes. Variety alone could not account for the regional difference — the primary difference between MA and NJ in 2005 was summer rainfall (see above). However, MA is only ~20% planted to high-yielding varieties — the lowest percentage of any growing region. This indicates a future need for renovation of some acres to higher-yielding stock.

General

Growers worried about the cumulative impacts of reduced management. It was noted that harvest damage is greater

on weedy bogs, particularly damage to fresh fruit by harvesters.

Dick Ward discussed the importance of maintaining a community of cranberry farming, particularly the need for continuing efforts to exchange information.

A question was also raised regarding plant damage during harvest very late in the season (after November 1). Some growers noticed tip breaking. While plants are woodier by then, there was no reason that they should be more brittle, so this remained unresolved.

Organic crops were good in 2005.

And so on that high note, best wishes for the 2006 season.

Carolyn DeMoranville
Station Director

Thanks and Happy New Year

As we come to the end of the year - my best wishes to all for a healthy and prosperous 2006. I also want to thank the companies, and organizations listed below for providing financial support to the Station in 2005, either directly or through the donation of goods and services. We appreciate your support.

Carolyn DeMoranville

2005 Contributors to the UMass Amherst Cranberry Station

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2006 UMass Extension Green Directory Now Available!

The 2006 UMass Extension Green Directory is a comprehensive guide to educational resources for Massachusetts Agriculture industry professionals. This 32 page guide is used as a reference document all year long!

The directory includes the following:

- Contact information for UMass Extension Agriculture Specialists and Faculty
- Upcoming UMass Extension conferences, seminars and workshops
- UMass Plant Diagnostic Lab submission information for insect, disease and cultural problems
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To receive a hard copy, send us your mailing address:

Email at greeninfo@umext.umass.edu;

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Also available online at www.umass.edu/agland

WORKER PROTECTION TRAININGS

Worker Protection Trainings for cranberry workers in the handler category will be offered in the spring of 2006: April 26, May 31, and June 28. There is a \$5 fee to cover the cost of the WPS training manual.

Contact Martha Sylvia: 508-295-2212, ext. 20 to sign up or for additional information.

Mass Aggie Seminars Scheduled for 2006.

The University of Massachusetts Extension Agriculture and Landscape Program will once again sponsor a seminar series for back yard gardeners and beginning or part-time farmers and landscapers. In the tradition of the Mass Aggie Seminars, the 2006 UMass Small Farm and Garden days will feature UMass Extension Educators and UMass Amherst faculty. Instruction will emphasize how to produce food and manage landscapes and small farms in a sustainable manner. A broad and diverse range of topics will be presented, covering specifics within several areas including livestock, tree fruit, berries, vegetables, flowers, landscape plants, and turf.

Programs are scheduled from February through April. For more information, visit their website at www.MassAggieSeminars.org or call 413-545-0895.

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Dr. Carolyn DeMoranville, Director

December 2005 Issue

Deborah Cannon, Editor

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Dr. Carolyn DeMoranville
Station Director

CRANBERRY STATION NEWSLETTER & REVISED 2006 CHART BOOK RENEWAL

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The Cranberry Station Newsletter is provided **free to all MA growers, cranberry researchers and IPM consultants nationwide.** **Annual subscription fee of \$15** is required for **out-of-state growers and industry personnel.** All persons wishing to receive this newsletter (whether paying or not) must complete and return this renewal form to maintain a subscription. Include a check (made out to UMass) with the renewal form if you are out-of-state or are industry personnel. **All subscriptions sent by email, including out-of-state and or industry personnel are FREE.**

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**Registration Form for Cranberry Management Update
 Wednesday, January 18, 2006 7:30 AM - 4 PM
 Radisson Hotel Plymouth Harbor**

Please register for the meeting using this form.

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Attach additional sheets as necessary.

****LAST CHANCE TO REGISTER****

REGISTRATION FORM ON PAGE 7

Cranberry Management Update

Radisson Hotel Plymouth Harbor - JANUARY 18, 2006

TENTATIVE SCHEDULE - 4 CONTACT HOURS OFFERED

- 7:30 - 8:00 Registration (with coffee)**
- 8:00 - 8:30 Station Update and Bog Renovation - Carolyn DeMoranville**
- 8:30 - 9:00 Phosphorous Nutrition - Carolyn DeMoranville**
- 9:00 - 9:20 Smolder, Bioherbicide for Dodder - John Cascino - Sylvan Co.**
- 9:20 - 9:50 Pruning and Bed Establishment - Hilary Sandler**
- 9:50 - 10:20 Coffee break**
- 10:20 - 10:40 Keeping Company with Kestrels - Joanne Mason**
- 10:40 - 11:00 Flooding Physiology - Justine Vanden Heuvel**
- 11:00 - 11:45 Sanding, Pruning, and Irrigation Management Project**
- 11:45 - 1:00 LUNCH BREAK (on your own)**
- 1:00 - 2:00 Panel - Renovation and innovation**
- 2:00 - 2:30 Disease Management - Frank Caruso**
- 2:30 - 3:30 Insect Management - Anne Averill**
- 3:30 - 3:45 Sanding - Martha Sylvia and Michelle Botelho**
- 3:35 - 4:00 Wrap-up and Paperwork for Credits**

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UMASS EXTENSION**