

# CRANBERRY CROP MANAGEMENT JOURNAL

DIVISION OF EXTENSION

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## 2024 Spring Mini Clinic Recap

By Allison Jonjak

Our 2024 Spring Mini Clinic saw record-breaking attendance. The live location at Whittlesey Cranberry Co in Cranmoor had 52. Livestream locations were held in Tomah (Valley Corp, 20 attendees), in Manitowish Waters (Bartlings' Manitowish Cranberry Company, 11 attendees), and newly this year in Minong (Jack Link's Aquatic Center, 17 attendees). With an action-packed agenda, we still found 5 minutes to step outside to view a bit of solar eclipse through the clouds.

Following is a high level recap for each of the presentations. For further questions, contact the presenter or Allison ([allison.jonjak@wisc.edu](mailto:allison.jonjak@wisc.edu)).



### ***Cranberry Weed Management Pre Season Update, Jed Colquhoun***

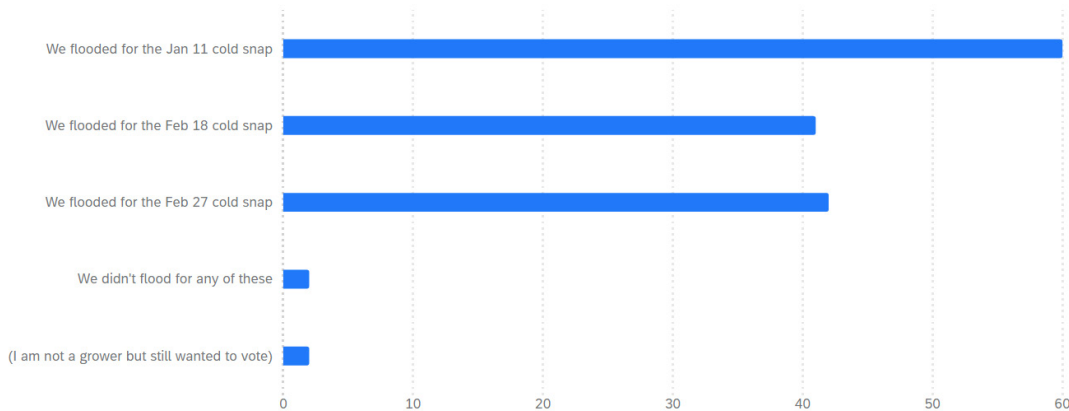
Devrinol must be applied after planting, before weeds emerge. It has no effect on emerged weeds. All Devrinol applications must be watered in within 24 hours of application in order to reduce photodegradation, and to get the product into the weed germination zone. Application rates for new plantings are much lower than those for established vines.

Evital must be applied to dormant vines, before weed growth resumes. Flooding after application results in poor weed control as well as injury risk due to puddling. Irrigation after application does improve weed control, just avoid puddles.

The Endangered Species Act Vulnerable Species Pilot Project will be rolled out on August 30 of 2024. Be prepared to use Bulletins Live Two, the EPA's interactive website tool, to comply with new mitigation measures. A demo of Bulletins Live Two will be given at the May Brown Bag.

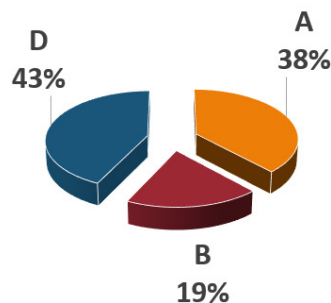
## Grower Polls, Allison Jonjak

Check the box if you flooded for the cold snap 66 ⓘ >



## Are you seeing bronzing as of yesterday?

- a. yes, minor
- b. yes, moderate
- c. yes, extensive
- d. no, no bronzing



### Cold Hardiness Prediction Model, Amaya Atucha

The prior method of cold hardiness evaluation was visual assessment of uprights. Because this was labor intensive and subjective, the Atucha lab has developed a new, quantitative method of evaluating cold damage via electrolyte leakage. This method produces more reproducible results and will result in speedier updates to the Cold Hardiness Prediction Model in the future.

### Altacor Update, Bell Verbeten, FMC

Along with an update on various insect protection modes of action, Bill reminds growers that when you receive the new product formulation Altacor eVo, to note that the concentration has changed. While Altacor original was 35% active ingredient, the new Altacor eVo is 70% active ingredient. This means that the old formulation was applied at 4.5 oz/ac. The new formulation needs to be applied at 2.2oz/ac. As always, the product label is the law, and you should always check with your handler before making changes to your chemistry practices.

### Dewpoint Frost Considerations, Amaya Atucha and Allison Jonjak

Please see the [accompanying article](#) in CCMJ 37.1.

### Cranberry Viruses, Leslie Holland

While infected uprights can recover (or stop showing symptoms) of Tobacco streak virus and Blueberry shock virus, they may still carry virus-infected pollen. Additionally, some viruses have a latent period, where infection occurs but symptoms take several months or even a year to develop. Beds where a virus has been identified should not be used as a source of cuttings for new beds. The best time to scout for viruses is during early fruit set in mid to late July. Berries turn red prematurely, so look for

hot spots of infected uprights. Especially scout for scarring during this period, because as healthy fruit turns red, the infected regions will be more difficult to find by contrast.

The Holland lab is actively pursuing virus research, and would love to collect virus samples. If you have either Blueberry shock virus or Tobacco streak virus, please contact [laholland@wisc.edu](mailto:laholland@wisc.edu) to set up a confidential method for research participation.

### ***SpargDD Harmonization Task Force Update, Allison Jonjak***

The project to establish SpargDD (that is, growing degree days specifically for timing the phenological stages of sparganthis fruitworm) is under way. UW faculty, growers in central and northern WI, ag scientists from handlers, as well as engineers with temperature sensor systems are all participating. The goal of the project is to ensure all future research at UW takes place using the same constants, and to streamline the use of models so that growers can get an easy-to-use application window alert. The ultimate goal is to achieve equal or better application efficiency, using equal or fewer sprays.

While taking this project to its final conclusion plug-and-play conclusion will require more time and involve engineering, growers who are interested in implementing the model in its current form can get involved by contacting [allison.jonjak@wisc.edu](mailto:allison.jonjak@wisc.edu), or by using the below parameters at [app.blossom.ag/gdd](http://app.blossom.ag/gdd). (Thank you to John Moss and Blossom.ag for sharing this free tool with all growers!)

### **SpargDD**

-min temp: 49.9 F

-max temp: 85.9F

-start date: Jan 1

-sensor location: canopy height

-sensor location: flooded when vines are flooded, under ice, always there

-sensor location: shielded

### ***Towards A Better DD Model for Cranberry Pests, Shawn Steffan***

The Steffan lab has produced a thorough model for Sparganthis Fruit Worm growth stages, and this is the source of the SpargDD Harmonization Task Force project above. New directions for the work include a conversion factor from vine canopy temperature to dike temperature. Current data indicate that northern WI canopy temperatures are 11% cooler than vine temperatures, while central WI canopy temperatures are 15% cooler than dike temperatures. Future research will compare hourly DD accruals with a horizontal cutoff method, to the sine wave DD accrual with horizontal, vertical, and intermediate cutoffs.

### ***Introducing Steven Hall, Steven Hall***

New UW-Madison faculty member Steven Hall focuses on soil, water, and climate change mitigation.

- water used for cranberry production often has high nitrogen and phosphorus even before it enters the cranberry marsh
- marshes and adjacent lands may provide opportunities for chemical and biological retention and removal of these nutrients
- with careful and creative water management, cranberry marshes might be able to improve regional water quality

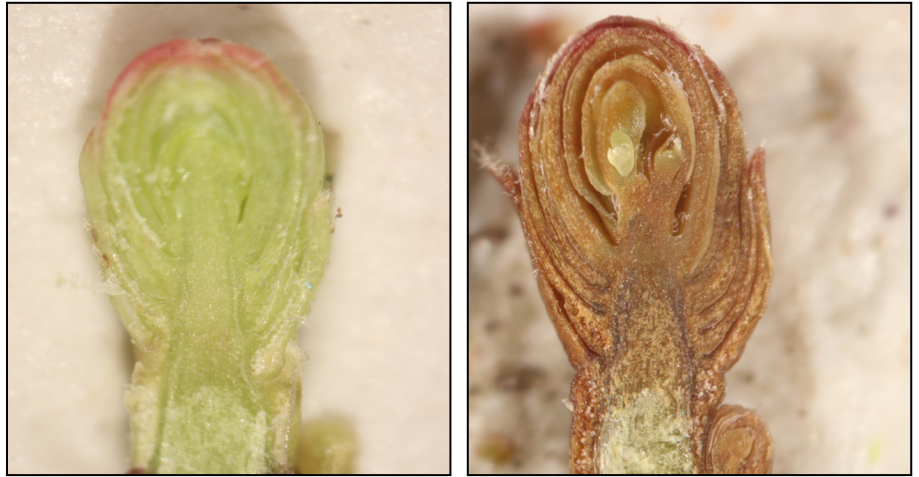
Dr. Hall is looking forward to meeting and working with cranberry growers, and can be reached at [steven.hall@wisc.edu](mailto:steven.hall@wisc.edu).

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# Vine Bronzing: What To Do Next?

By Amaya Atucha

Several marshes across the state have reported seeing significant amounts of bronzing in their vines, most likely due to winter damage. The damage started appearing after ice-off and has become more noticeable as vines began turning color with the warmer weather. There has been a lot of speculation regarding the timing of when the damage happened, and some evidence points to a cold event during February when ice had already melted in most beds. The question on many growers' minds right now is what to do now? Here's my recommendation:



**Figure 1. Dissection of cranberry buds: healthy green bud on the left and brown damaged bud on the right.**

1. Make sure you are doing a proper assessment of the damage in your beds. First, collect 50 uprights from at least 3 or 4 spots in each damaged bed and dissect the terminal buds to estimate the level of damage (Figure 1). Damaged buds will be brown and dried on the inside.
2. There is nothing you can do to recover buds that are damaged at this point. So do not apply any fertilizer at this point since this will have no effect on recovering dead buds.
3. Based on your damage estimation, you will need to reassess the amount of fertilizer you had planned to apply this growing season. I would consider decreasing N fertilizer rates if you have more than 20% bud damage in your beds.
4. It is very possible that beds with substantial bronzing will also have leaf drop. Again, adding higher doses of fertilizer or beginning fertilization too early in the spring will not help vines recover lost foliage.
5. The best advice is to wait for bud break and the new growth to start pushing. Once you see new growth developing, you could consider doing a first application of NPK fertilizer before bloom if new growth looks weak and pale. If that is not the case, wait until bloom to determine your potential crop for the season, beginning your fertilization plan for the season.

# Frost Protection: Considering Wind Speed and Dew Point

By Amaya Atucha

At our Spring mini clinics, we had several questions regarding the influence of dew point and wind speed on the timing of turning on sprinkler irrigation for frost protection. Here, I will address the considerations you need to keep in mind when determining when to turn on your irrigation to protect the vines.

Plant phenological stage: The cold hardiness of plants can change significantly as anatomical and physiological changes begin to occur due to warmer temperatures. Early phenological stages, such as tight and swollen buds, will be much more tolerant to frost damage than more advanced stages, such as hook and bloom (refer to Table 1). Frequent scouting of beds is necessary to determine the phenological stages of cultivars as the season progresses and to adjust critical temperatures for frost protection.

Table 1. Minimal survival temperatures (°F) for different cranberry phenological stages.

Phenological stage	Minimal survival temperature (°F)
Swollen buds	0-19
Cabbage Head	21-25
Bud break	21-25
Bud elongation	27
Rough Neck and early hook	27-28
Hook	30
Bloom	30-31

Source: Workmaster and Palta (2009): [Frost Hardiness of Cranberry Plant](#)

1. Wind Speed: The basis of frost protection with overhead irrigation is that the water we apply to the plants will convert from a liquid state to a solid state (ice), releasing energy (latent heat of fusion water) in this process. As long as liquid water is freezing on the plant at all times, the plant surface temperature will remain at about 32 °F. However, if wind velocities are high, water may evaporate from the plant surface, causing evaporative cooling and lowering the temperature of the plants, thus increasing frost damage. To avoid evaporative cooling in windy situations, we need to increase the volume of water applied while frost protecting (refer to Table 2). Frost protection by irrigation has its limitations and is not recommended if wind velocities

Table 2. Water amounts needed to frost protect at varying temperatures and wind speeds ([University of Florida Frost Protection Bulletin](#)).

Canopy temperature (°F)	Wind Speed (mph)					
	0-1	2-4	5-8	10-14	18-22	30+
	Acre-inches per hour needed for freeze protection					
27	0.10	0.10	0.10	0.10	0.20	0.20
26	0.10	0.10	0.14	0.20	0.40	0.60
24	0.10	0.16	0.30	0.40	0.80	1.60
22	0.12	0.24	0.50	0.60	1.20	1.80
20	0.16	0.30	0.60	0.80	1.60	2.40
18	0.20	0.40	0.70	1.00	2.00	3.00
15	0.26	0.50	0.90	1.30	2.60	4.00
11	0.34	0.70	1.20	1.70	3.40	5.00

exceed 10 miles per hour and temperatures are below 23 °F.

2. Dew point: When to start frost protecting significantly depends on the moisture content of the air, which can be measured using methods such as relative humidity (RH) and dew point. While RH indicates the amount of water vapor in the air relative to its maximum capacity at a given temperature, it alone isn't sufficient for determining when to initiate frost protection. Dew point, which reflects the temperature at which moisture transitions from vapor to liquid, is a more reliable indicator. When the dew point is too low and the air is dry, the water applied through overhead irrigation to protect the plants will evaporate to compensate for the low humidity in the air. This will lower the surface temperatures of the plants and result in more frost damage. When dew point temperatures are moderate, some of the water applied will evaporate, but the other portion will freeze, releasing heat and warming up the air around the plants. After the overhead irrigation has been running for a while, the RH will increase, resulting in less water evaporation and more water freezing, which will lead to an overall positive net energy. In simple terms, if the dew point is too low, you must start frost protecting at warmer temperatures, since a large portion of the water applied at the beginning will evaporate, lowering the overall plant surface temperature, until the air saturates with water vapor and the water being applied begins to freeze, thus releasing heat.

To determine the temperature at which you should start frost protecting, you can refer to Table 3. First, determine the critical temperature for frost damage at a given phenological stage (refer to Table 1), and then select the dew point temperature forecasted for the frost event. The point where the row and column intersect is the temperature at which you should start frost protecting. It is generally recommended to use overhead irrigation as a method to frost protect only when in the 24 to 32 °F temperature range.

Table 3. Minimum temperature at which overhead irrigation should be turned on/off based on dewpoint.

Dew-point Temperature (°F)	Critical Temperature for frost damage (°F)										
	22	23	24	25	26	27	28	29	30	31	32
32											32.0
31										31.0	32.7
30									30.0	31.7	33.3
29								29.0	30.6	32.3	34.0
28							28.0	29.6	32.2	32.9	34.6
27						27.0	28.6	30.2	31.8	33.5	35.2
26					26.0	27.6	29.2	30.8	32.4	34.0	35.7
25				25.0	26.5	28.1	29.7	31.3	32.9	34.6	36.3
24			24.0	25.5	27.1	28.6	30.2	31.8	33.5	35.1	36.8
23		23.0	24.5	26.0	27.6	29.1	30.7	32.3	34.0	35.6	37.3
22	22.0	23.5	25.0	26.5	28.1	29.6	31.2	32.8	34.5	36.1	37.8
21	22.5	24.0	25.5	27.0	28.5	30.1	31.7	33.3	34.9	36.6	38.2
20	22.9	24.4	25.9	27.4	29.0	30.6	32.1	33.7	35.4	37.0	38.7
19	23.4	24.9	26.4	27.9	29.4	31.0	32.6	34.2	35.8	37.5	39.1
18	23.8	25.3	26.8	28.3	29.8	31.4	33.0	34.6	36.2	37.9	39.5

Source: Snyder, Richard L., and C. A. Davis. “[Principles of frost protection.](#)” University of California (2000): 1-13.

# Sign-up for the SAME Newsletter!

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*By Leslie Holland*

The S.A.M.E. (Systems Approach to Managing the Expression of Cranberry Fruit Rot) Initiative is a comprehensive, interdisciplinary project involving University of Wisconsin-Madison, USDA-ARS, Rutgers University, and the University of Massachusetts-Amherst designed to address critical knowledge gaps in our understanding of cranberry fruit rot and provide effective management strategies to growers.

The SAME newsletters will include research updates from the project team, the latest findings from our research, and spotlight key personnel contributing to the success of this project. Project updates will be delivered 2-4 times each year.

[Enter your email here](#) to sign-up for the newsletter and check out the [first newsletter here!](#)



# Grower Updates

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## Flying Dollar Cranberry

*By Seth Rice*

Hello everybody! Looks like we finally have some rain here finally after not having any last year. Hope everybody got their irrigation system set up with little to no damage. It's always interesting to see what Mother Nature has in mind for us.

We had a small window to get our early herbicides like casoron and evital on. Most people had to flood for that stretch of cold weather and that nasty wind. If you were lucky enough have decent ice over the winter and be able to sand you are counted as being lucky. Some people around us have more "bronzed" vines than others. For having such a mild winter I think everybody came out decent (all things considered).

The grass is popping up in some of the beds already in spots. Good luck everybody on the upcoming season!

## Vilas 51

*By Jeremiah Mabie*

For once my first article is not about how much ice we have left on the beds, what a crazy "winter" we sure didn't have! Everyone up north seemed to fair the winter fairly well, there is some very minor damage on some marshes but nothing to talk about. It was a pretty tight window for sanding with the lack of cold weather this winter but everyone seemed to manage getting sand hauled.

All sprinklers are in and operational with some growers starting frost watch last week depending on what day they dropped the flood. Marshes that are renovating have vines bailed and are starting to work on the beds as they dry up. Hopefully we get a break in the wet weather this week to start applying spring herbicides.



Overall things are going well up here and we are all ready for the growing season to be upon us, now let's just hope mother nature is on our side! I hope everyone else had a good winter and are looking forward to another wonderful, bountiful and safe year! are on a gradual warming trend so hopefully in the next week or two we will get to see the vines finally and start putting irrigation in. Keep thinking warm thoughts everyone and I hope you all have a smooth and uneventful start to the growing season!



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# Update from the Wisconsin Cranberry Research Station

*By Beth Ann Workmaster*

The growing season is up and running, following the recent period of flooding for nighttime freezing temperatures. This week Wade made an application of Select Max herbicide for the control of grasses. One of the biggest activities at the station will be the planting of the three newly renovated beds closest to the station office building. Crimson King and Midnight 8 will be the cultivars planted there.

The old shop was demolished to make room for the expansion of these beds, and now the new shop construction is continuing, located up on top of the hill, nearby the office building. Beth has overseen the assignment of researcher field space and UW, USDA, and Ocean Spray work is gearing up. The station will be the site of 14 different research projects overseen by eight PIs (Primary Investigators). Each of these projects are supported by several research staff, post-doctoral researcher, graduate students, and undergraduate student summer workers.

