

Cranberry Crop Management Journal



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Address Correction

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Thank you!

Observations from a cranberry road trip Jed Colquhoun, Extension Specialist, UW-Madison

Trips to other agricultural production regions have always proven fruitful for not only meeting new friends but also for expanding our horizons with new production techniques. There are often many solutions to the same problem, but that doesn't mean that one is right or wrong, just different!

Last week I had one of those opportunities while attending the North American Cranberry Research and Extension Workers (NACREW) conference in Bandon, Oregon, visiting with the growers and touring some cranberry beds. Here are a few observations from the cranberry road trip that I hope that you'll find an interesting break from harvest preparation. Thanks very much to the Oregon cranberry growers and OSU Extension for their hospitality!



One of the growers demonstrated their custom-built dry harvester for fresh cranberries – a nice piece of innovation that was very gentle on the fruit.

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Observations from a cranberry road trip continued from page 1

Jed Colquhoun, Extension Specialist, UW-Madison



A newly renovated cranberry planting. This grower had found great success with this type of “sanding”. Certainly not like Wisconsin

sand, but again a different solution that worked well for him. The rocks warmed rapidly in the sparse coastal sunlight, which seemed to accelerate plant growth and vining. Weeds were minimal in this production system.



While Oregon can be quite dry in summer months, the drought has extended north. Note the dry conditions around the production bed.



This was a very interesting observation in one of the experimental variety plots – a strong bloom in late August with a healthy looking crop underneath. The terminal portion of the runners had up to a dozen blossoms each. There was much speculation that the mild winter climate and lack of chilling may have caused this in an experimental, non-commercial variety.



This picture was taken on August 25. Notice the color – these look more like grapes than cranberries!

Cranberry Fruitworm

Christelle Guédot and Erin McMahan
UW-Madison Fruit Crop Entomology and Extension

Cranberry fruitworm (CFW) is one of the most damaging insect pest of cranberry in Wisconsin. This moth species is native to North America and can be found in most cranberry growing regions in the U.S. and in Canada. The range of plants that CFW feeds on is very limited and includes cranberry, highbush blueberry (in which it is also an important pest), huckleberry and deerberry. In Massachusetts, studies have shown that moths infest beds from outside sources, but found few eggs on blueberries and huckleberries in the areas surrounding the marshes. It is thought that they move extensively among cultivated marshes¹.

Cranberry Fruitworm

Order: Lepidoptera (moths and butterflies)

Family: Pyralidae

Scientific name: *Acrobasis vaccinii*



Adult cranberry fruitworm

Damage

CFW larvae feed exclusively on the cranberry fruit, and can cause serious damage to the crop. The adults cause no damage. Eggs are laid on developing berries, and immediately after hatching, the tiny larvae burrow into the berries and begin to feed on seeds and pulp. Larvae fill the berries with frass (excrement) as they feed, and damaged berries turn prematurely red and eventually shrivel up on the vine. Larvae move from berry to berry as they grow, often weaving several berries together in the process. Each larva can destroy 5-8 berries during its development². Early instar larvae and occasionally later instar larvae cover their entry hole with a silken door, making it more difficult for natural enemies and insecticides to affect them.



Cranberries damaged by CFW feeding

Description and Life Cycle

CFW has a single generation per year. Larvae overwinter on the bed floor in cases called hibernacula made of sand, trash and silk. The **hibernacula are about 3/8" long. The insects pupate in early spring inside these cases, and the adults emerge from the hibernacula from mid-June through July. Adults are grayish brown with white patches and two distinct dark spots on each forewing. With wings folded, the adult is about 1/2" long and the wings unfold to a span of about 2/3"**¹. Adults are nocturnal and one study has shown that adults travel between wooded uplands and the marshes throughout the night. The adults are thought to accumulate high in trees to mate and then return to the beds close to dawn. Moths can fly 270 feet in a single flight¹.



CFW larva feeding inside of a cranberry

Cranberry Fruitworm

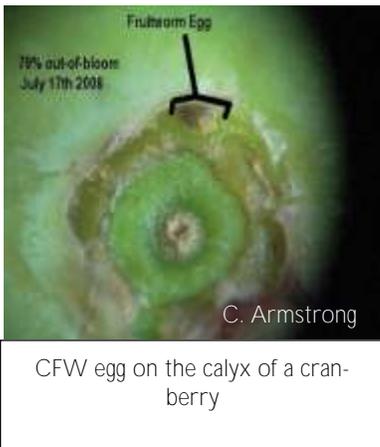
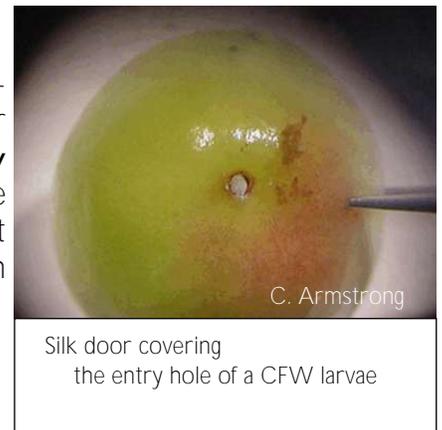
Christelle Guédot and Erin McMahan
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Females lay eggs once the fruit begin to grow and deposit a single oval egg at the blossom end (calyx) of a berry. Research has found that a single berries can contain multiple eggs¹. Eggs are generally laid in patches throughout a marsh with more eggs along the marsh edges and in weedy areas. The newly hatched larva is green with a light brown head capsule, and immediately drills into the berry and begins feeding. Larvae go through about 6 instars throughout their development and mature larvae are a bright **“apple” green, often with a reddish tinge along the back, and about ½”** in length. At the end of August, the larva drops to the bed floor to construct its hibernaculum².



CFW vs. Sparg

As stated in a previous article, CFW larvae and damage can be difficult to distinguish from that of sparganothis fruitworm. Sparg are longer and thinner **and are a darker, “dingier” green than CFW. Sparg larvae wiggle vigorously** when disturbed. CFW are a bright green tinged with red and do not wiggle when disturbed. Sparg often make ragged entry holes in the fruit and cast their frass outside of the berry. Early instar CFW larvae cover the holes with silk and all instars fill the berries with frass.



Monitoring

Pheromone traps can be used to monitor populations of male moths, and can provide an estimate of the timing of adult flight and of population densities, although male peak flight often occurs earlier than eggs appear. Growers often use plant phenology to predict hatch by calculating percent out of bloom and treating a set number of days (3-7) after 50% Out Of Bloom (OOB)³ or using the 50% OOB mark to time egg sampling.² It is recommended that egg sampling should begin 5-6 days after 50% OOB and that a minimum 200 berries should be checked for up to 4 acres as well as an additional 50 berries for each additional acre. Berries should be collected randomly throughout a bed and the fruit searched under magnification for eggs. The economic injury level is 1 egg per 100 berries checked. Sampling should continue every 3-4 days until the end of the flight (mid-August)².

Control

There are natural enemies of CFW in Wisconsin, but they do not seem to provide adequate control of CFW populations. Late water (a 30 day reflood before the plants break dormancy) has shown to reduce CFW populations in Massachusetts, but this is not a common practice in Wisconsin. Mating disruption using SPLAT technologies have shown to be effective and are currently under development. Chemical control options include broad-spectrum insecticides such as organophosphates (e.g., Diazinon, Imidan) and carbaryl (e.g. Sevin), selective insecticides like IGRs (e.g., Intrepid, Confirm, Rimon), spinosyns (e.g., Entrust, Delegate), microbial compounds (e.g., Grandevo and Venerate), neonicotinoids (e.g., Assail, Belay), and diamides (e.g., Altacor) can provide some control of CFW.

Cranberry Fruitworm

Christelle Guédot and Erin McMahan
UW-Madison Fruit Crop Entomology and Extension
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Check the table below for overall rating of insecticides from Jack Perry’s trials (Table 1). If warranted, sprays can be applied at ½” of new growth, hook stage to start of blossom, and after bloom, similar to the sparganthis fruitworm and black headed fireworm spray schedules. It is important to minimize sprays during bloom but also directly before bloom to avoid residual contact with pollinators. Using reduced risk pesticides, such as Altacor, Confirm, Intrepid, Rimon or Venerate, especially around bloom will help protect pollinators. Sprays after bloom should pay special attention to pre-harvest intervals, so as always, read and follow the label. Some insecticides face MRLs export limitations in cranberry so make sure to check with your handler before using them.

Happy growing season!

Table 1. Effectiveness of foliar-applied insecticides against cranberry fruitworm.

	Rate/acre	Fruitworm
Grandevo 30G	3 lb	++
Venerate 94L	8 qt	++
Venom 70SG	4 oz	+
Closer 2.2SC	5.7 oz	--
Altacor 35WG	4.5 oz	+++
Assail 30SG	6.9 oz	+++
Belay 2.1SC	4 oz	+++
Delegate 25WG	6 oz	+++
Diazinon 4EC	3 qt	++
Imidan 70WP	4 lb	++
Intrepid 2F	16 oz	+++
Confirm 2F	16 oz	+++
Knack 0.86EC	16 oz	++
Lorsban 4E	3 pt	++
Rimon 0.83EC	12 oz	++

Performance rating scale. “--” inadequate control, “+” 70 – 79% control, “++” 80 – 89% control, “+++” 90%+ control.

Literature cited:

1. **Averill, A., and M. Sylvia. 1998.** Cranberry Insects of the Northeast. University of Massachusetts, Amherst.
2. Mahr. 2005. Cranberry Fruitworm. UW-Extension Publication. University of Wisconsin, Madison. <http://longbeach.wsu.edu/cranberries/documents/cranberryfruitwormwisconsin.pdf>
3. Martinson N. and L. Kummer. Year Unlisted. Wisconsin Cranberry Insect Pest Identification Pocket Guide. Fey Publishing Company, Wisconsin Rapids, WI.

Observations from the field

Jayne Sojka/ Lady Bug IPM, LLC

As a result of the hot weather in August, we witnessed some strange stress to our vines. In some cases bronzed uprights appeared, while other marshes exhibited a dull red coloration similar to what may be seen in early dormancy. The environmental situation of the beds being drier and experiencing heat and drought stress, actually pruned the vines back, causing the coloration changes.

We've witnessed bloom again! On many marshes we've seen a second blossom period which started taking effect in August. It is amazing to see such a sight! Our growing degree days are far succeeding that of 2014. This is not unusual however, as I have witnessed this in previous growing seasons. The week of August 24th made me a little worried because of the cold evenings and cooler days. It felt as though fall was here to stay! It was not the case though, as September has been coming on strong with hot and humid weather which will assist in berry weight gain. Be very careful with this heat and maintaining your bed moisture, as cranberries are nearly 80% water.

Flea Beetle populations have been wreaking havoc on many marshes this season. It seems that as soon as one hatch is under control another hatch begins. There has been a lot of controversy on controlling Flea Beetle **populations as some growers are frustrated with the available products' effectiveness. However, these insects are quite wimpy and should be able to be controlled with just about anything we use. One challenge is that they never hatch out at the same moment and our PHI's do not allow a wide spectrum of control measures.** I understand that some growers have addressed this one pest three different times! Keep in mind that I have personally seen this pest right up until harvest, so you may not be able to get total eradication. There has to be a point in which we accept some damage and plan an entirely different control tactic in 2016.

We have also observed a high amount of Red Shoot on a good number of marshes this season, which has been **higher than I've witnessed in previous seasons. We first noticed it occurring in Searles, McFarlin and then Stevens. Now we are beginning to see it in Ben Lear, Pilgrim and even more Stevens' beds. We have witnessed it both on marshes that follow strong fungicide programs, as well as marshes that have never used fungicides.** In mid to late August the Red Shoots stood out like a sore thumb as they were bright red, thick, and waxy. The affected plants have leaves that are slightly curved and the shoots pull out very easily. I have seen Red Shoot on marshes for the past 25 years but it has not been consistently noticeable every year. We are planning to mark some of them and see if it appears again in 2016 in the same areas.

Here's hoping you have an awesome harvest and all goes smoothly.

Jayne Sojka/Lady Bug IPM, LLC

Red Shoot

Patty McManus

Red Shoot is a cranberry disease caused by the fungus *Exobasidium perenne*. While generally considered of minor importance, red shoot is showing up in several locations throughout central Wisconsin specifically on Stevens, Searles, and McFarlin to a noticeable degree.

The Red Shoot fungus is related to the fungus that causes red leaf spot, but the symptoms are distinct and different. Red Shoot causes stunting and distortion of shoots, and turns them red or yellow in color. The spindly shoots look so unusual that they are sometimes mistaken for a weed. However, if you follow a shoot to its base, you will see that it is connected to the cranberry runner, and often the spindly Red Shoots occur in a cluster arising from the same point along the runner.

By mid-summer the lower surfaces of leaves are covered with white, powdery fungal spores. Shoots wither **shortly after spore formation, so we are now getting to the point where you probably won't see more new red shoots, but rather they will "disappear" for the season. The fungus overwinters in diseased cranberry runners. The fungus will be there next year, but it's not known why symptoms show up some years but not others.**

Because Red Shoot is not believed to cause yield loss or long-term damage to beds, we do not have control recommendations. Nevertheless, growers who have seen Red Shoot this year should monitor beds for the **disease next year so that we can determine if the disease is becoming more than a "minor" concern.**



Cranberry Journal—Grower Update
Manitowish Cranberry Co., Inc.

Manitowish Cranberry Update :

After a cold stretch, the temperatures are back into the high 70's and 80's, and the berries have really sized in the last week. The berry counts that Ocean Spray did on our farm do not reflect a "bumper" crop, but it is still larger than last year's crop; the crop numbers align with our thoughts on what we have seen. With most of our harvest equipment cleaned, serviced, and checked, we can now (slightly) enjoy the calm before the storm.

We only have a couple small projects on the farm to finish up including mowing all dikes and ditch banks one last time before harvest and pulling maples and willows on our new plantings and our two year old bed. In the office, I have been working on determining how many irrigation lateral gaskets we have so I can have them on hand to replace all the gaskets in our above ground irrigation pipe after harvest; little did I know how many gaskets we will need, which brand, and what size they all are!

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