



University of Wisconsin-Extension

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Cranberry Weevil

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UW-Madison Fruit Crop Entomology and Extension

The next insect pest in our “Bugs in Wisconsin” cranberry series we will discuss is the cranberry weevil, *Anthonomus musculus* (Say) (Coleoptera: Curculionidae). While blackheaded fireworm, cranberry fruitworm, and sparganthis fruitworm are the main pests of cranberry, cranberry growers are sometimes faced with localized infestations of a variety of other pests which can affect yield. One of these less well known pest species is the cranberry weevil. Cranberry weevil is a pest species native to North America and has an appetite for new



<http://bugguide.net>

Figure 1. Adult cranberry weevil

growth, cranberry flower buds, and blueberry flower buds¹. It is a serious pest of concern on the East coast, especially in Massachusetts, and is less commonly encountered in Wisconsin². This weevil is considered a sporadic pest in Wisconsin because it rarely causes significant damage and tends to be localized and concentrated in hot spots in cranberries³.

Hosts:

Cranberry weevil can be a pest of both cultivated crops and native plants. Table 1 shows some potential hosts for cranberry weevil in Wisconsin². Cranberry weevil is a generalist in a sense that it can utilize various host plants in the Ericaceae, Melanthiaceae, and Clethraceae families⁴. A wider range of wild hosts provides a surplus of suitable overwintering habitat; on the other hand, in areas like Wisconsin where there is a limited range of wild hosts off-site of cultivated fields, populations tend to remain low and localized. Currently, Wisconsin’s natural ecotone discourages a buildup of cranberry weevil populations. The more diverse availability of native host plants on the East coast (e.g. swamp sweet bells, stagger bush, male berry, dangleberry, sheep laurel, swamp honeysuckle, and sweet

Cranberry weevil

Order: Coleoptera (beetles)

Family: Curculionidae (weevil family)

pepperbush) could help explain the wide range of pest pressure experienced between regions⁴.

Table 1. Potential cranberry weevil hosts in Wisconsin:

Cultivated plants	Native plants found in Wisconsin
Cranberry	Wild large cranberry
Low and high-bush blueberry	Wild low-bush blueberry
Low sweet blueberry	Huckleberry
	Chokecherry
	Wintergreen

Damage:

Cranberry weevil has a voracious appetite, causing damage to buds, petals, flowers, new foliage, and small berries (Figure 2). This damage reduces plant growth, pollination, and yield. The damage is identifiable by distinctive round holes (Figure 3), created by the weevils chewing mouth parts. Damage can also look like frost dieback, which occurs when weevils feed at the base of a shoot, thereby killing the new shoot². Infestation can also be identified by looking at the buds. The typical bud color is pink, but if it contains a larva, the color will change to a brownish-orange^{4,5}.

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Cranberry Weevil

Continued from page 1

Description and life cycle:

Adult cranberry weevils emerge as a deep reddish brown color and proceed to get darker within a few weeks going from dark red to a blackish color (Figure 1). Adults are about 1.5-2mm (1/16+”) long and, like all weevils, have a characteristic snout, about a third the length of its body. **Spring** – In mid-April until May, adults move onto crops including cranberry to feed on new foliage, they continue to feed and begin to mate in early June 1. **Summer** – Weevils move further onto cranberry and continue to feed on new foliage and buds. In late June, females lay an average of 20-50 eggs in their lifetime. One egg is laid at a time in individual blossom buds and hatch in 3-9 days. The larva proceeds to develop in 10-14 days, and then pupates in about 6 days. Infested buds are either severed or damaged by the adult at the pedicel and fall off the plant. Dropped buds may indicate a cranberry weevil infestation. By mid-July, a new generation of adults begins to emerge. **Fall** – Adult weevils start moving off the marsh and most have reached overwintering sites by August. **Winter** – Adults overwinter away from the crop in nearby (10-30 meters) uplands and wooded areas and take cover under debris and leaf litter¹.

Methods of Control:

One of the most beneficial approaches to pest detection and control is to monitor early and consistently. Because cranberry weevil populations have localized outbreaks, across-the-board pesticide applications are avoidable and may disrupt beneficial insects. Cranberry weevil can be hard to control as many management techniques are not effective against them, including; early spring or fall floods, sanding, and some broad-spectrum insecticides^{4, 6}. To verify an infestation, eggs and larvae can be identified by selecting flower buds that are turning brownish-orange and dissecting these buds^{4, 5}. Adults are most active in warm sunny weather and are easily removed with a sweep net⁵. Since adults fall from the plant easily in an effort to “play dead” it is recommended to shake the bush and catch beetles in either a light colored cloth or sweep net^{1, 7}. Current management recommendations suggest an average of 4.5 weevils per 25 sweeps per acre as the economic threshold^{2, 4}.

One method of control for cranberry weevil suggests an additional 24 hour flood in June or July, as it seems to temporarily reduce weevil populations⁴. Additional recommendations include cultivating fields and in the spring burning trash and weeds off of adjacent acreage⁷. Recent studies have found that male-produced aggregation pheromones effectively caught adults and could be used to monitor and possibly manage cranberry weevil populations⁸. In Massachusetts a small *Habrocytus* wasp can parasitize immature stages of the weevil; parasitism rates were higher in abandoned marshes when compared to commercial marshes⁵. As previously mentioned, Wisconsin populations tend to be very low naturally, possibly because few alternative hosts are present on the marsh for them to overwinter in. Regular scouting is essential to properly manage pests however more research is needed to better understand natural, cultural, biological, and chemical controls in Wisconsin.

The spray schedule provided in the Cranberry Pest Management in Wisconsin publication for cranberry weevil includes an application of Lorsban, Grandevo, Avaunt, or Belay at the delayed dormant stage (1/2” of new growth) and again at hook stage to beginning of blossom if warranted. Please, read and follow the pesticide label to make sure that you comply with pre-harvest intervals and other regulations. Some insecticides face MRLs export limitations in cranberry so please make sure to check with your handler before using them.

Happy growing season!



Figure 2. Characteristic cranberry weevil damage on blueberry blossom



Figure 3. Cranberry weevil feeding damage on cranberry leaves

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Which St. Johnswort was it again?

Jed Colquhoun, Professor and Extension Specialist, UW-Madison

One of the most common questions in this early season has been how to tell apart the St. Johnswort species. The second question is often whether it really matters or not – they're all weeds in cranberry marshes! The answer is yes, it does matter, because some St. Johnsworts are more easily controlled by our herbicide tools than others. Northern St. Johnswort, for example, most often escapes control.

In response, here is a quick guide to separating out the most common St. Johnsworts that we see in cranberry marshes:

How to tell the St. Johnsworts apart					
Common name	Latin name	Size of plant	Leaves	Flower	Seed Capsule
Common St. Johnswort	<i>Hypericum perforatum</i>	Plant over 3' tall with lots of stems and spreading branches. Invasive species.	Leaves long and narrow , rounded at base and tip, oblong or elliptical. Leaves have black dots with clear translucent glands.	Sepals pointed and about $\frac{1}{3}$ - $\frac{1}{2}$ as long as petals. Leafy floral bracts.	Narrow oblong capsule, deep reddish brown, with 3 sections
Marsh St. Johnswort	<i>Triadenum fraseri</i>	Plant 1-2' tall, upright stems not as bushy or as branched as many other St. Johnsworts.	Leaves can be waxy and oval and are rounded at base and tip. Light green, blue-green, or reddish.	Usually don't see flowers; rarely open. Pink. Small sepals come about $\frac{1}{3}$ way up petals.	Bright red pointed seed capsules in clusters.
Northern St. Johnswort	<i>Hypericum boreale</i>	Plant 4-16" tall, not bushy, with upright single stems	Leaves small, (up to $\frac{1}{2}$ ") oval and rounded, with 3-5 red veins from the base.	Flowers small and inconspicuous, clusters leafy and open. Leafy floral bracts.	Purple or reddish seed capsules which are as long as the sepals (or longer)
Kalm St. Johnswort	<i>Hypericum kalmianum</i>	Dense shrub forms a mound 2-3' tall.	Leaves narrow, oblong, and up to 2" long. Bluish green.	Clusters of flowers $\frac{1}{3}$ " - $\frac{1}{2}$ " across, numerous threadlike stamens	Brown seed capsule pointed teardrop or pyramid shaped, with 5 sections
Creeping St. Johnswort	<i>Hypericum ellipticum</i>	Low plant 9" - 24" tall. Stems don't typically branch.	Leaves are elliptical	Sepals are about $\frac{1}{2}$ as long as petals. Flowers 2x as large as majus and boreale, but smaller than perforatum or kalmia.	Round pointed seed capsule is reddish-brown with 3 sections.
Larger Canadian St. Johnswort	<i>Hypericum majus</i>	Plant grows to 3' tall.	Leaves large, narrow 1 $\frac{1}{2}$" long, with pointed tips.	Clusters dense with flowers. Sepals narrow and pointed, longer than the petals. No leafy floral bracts.	Tiny seeds look like miniature ear of corn. Seed capsule maroon to purple.
Orange-grass	<i>Hypericum gentianoides</i>	Small bushy annual plant 4" - 24" tall. Branches are wiry.	Leaves are tiny scales close to stem.	Flowers solitary (not in clusters).	Small red narrow cone shaped capsule with 3 sections.

WCREF Announces Wisconsin Cranberry Leadership Development Program for 2015-16 Class

Developing strong leaders for agriculture and the cranberry community is vitally important for the continued success of the industry in Wisconsin. Wisconsin's cranberry growers recognized this need as we developed an industry strategic plan. The WSCGA and Wisconsin Cranberry Board, Inc. worked through the Wisconsin Cranberry Research and Education Foundation to develop and implement a program to provide a new generation of leaders with the tools they need to fill this role. We are pleased to announce that we are taking applications and nominations for the third class in this program.

A class of no more than 15 participants will be selected. We are looking for individuals who are part of a cranberry growing farming operation or employees that play a key role in the farm and are committed to serving in a leadership role in the industry now or in the future. Participants must commit to attending all of the sessions. There are no age requirements or restrictions

Nominations

If you know of someone who would be interested in the program or would be a good candidate and wish to nominate them for the program please do so using the enclosed nomination form. We ask you to submit the form to us by June 19 to allow us to contact the individual and provide them with an application form.

Applications

Individual application forms are available from the WSCGA Offices if you wish to apply or share them with someone on your marsh. Each applicant should complete the form and submit it to:

WCREF Leadership Development Program

132 East Grand Avenue, Suite 202

PO Box 365

Wisconsin Rapids, WI 54495-0365

Applications are due July 17. The first class will be announced at the WSCGA Summer Meeting, Field Day and Trade Show on August 5 at Wisconsin River Cranberries.

Cottonball Symptoms—What to Look For

Patty McManus

The next few weeks leading up to and during bloom are when you need to be on the lookout for the “tip blight” phase of cottonball (see photos). The loss of uprights to cottonball is insignificant. The problem with tip blight, however, is that spores are formed on infected shoots. The spores infect flowers and infected flowers produce berries with the white, cotton-like fungus that gives this disease its name. The photos show classic caramel-brown discoloration of leaves and crooking of tips covered with white masses of spores. Often leaves just below the tips have the brown color only at the base in a U or V shape, while leaves higher up are entirely brown. Keep in mind that infected shoots are usually not easy to find. They tend to show up more in wet areas, mossy areas, and where tips might have been injured by frost (e.g., near bed edge ditches).

If you easily find shoots with tip blight, or if you had an unacceptably high level of cottonball in 2014, then you should spray during bloom to prevent infection of flowers. Spores infect through the stigma and style, mimicking pollen. The most effective fungicides are *Indar* (fenbuconazole) and *Orbit/Tilt/Propimax* (propiconazole). *Abound plus Indar*, each at half rates, is also effective. *Abound* alone, even at its high rate, is only fair. We have little data on *Evito* and *Proline*, but they both show promise. There is an increasing concern about the effect of fungicides on pollinators but to control cottonball, **sprays need to go on during bloom**. Start at about 10% bloom and then apply a second application at about full bloom. Be sure to check labels so you don't apply at less than the legal interval between sprays.



Cranberry Journal—Grower Update

Cranberry Grower Update from David Bartling of Manitowish Cranberry Co., Inc.

With the more mild temperatures, this past week's planting went well, compared to digging in sprinkler risers in snow and 30 degrees two weeks ago. Our three acres of renovations are nearly complete and we can shift our focus to the rest of our farm and managing weeds such as pulling maples, willows, and wiping brown bush and leather leaf.

The soil temperatures are around 50 degrees, and buds are swollen to elongated a couple of inches depending on the variety. After scouting on Thursday, I found quite a few False Army Worms near or above the economic threshold, but very few other pests; we will spray select beds or the entire farm depending on further scouting results and weather forecasts early next week.



Cranberry Leafminer

Coptodisca negligens

Pam Verhulst

Lady Bug IPM, LLC /Consult with Pam, LLC

Cranberry Leafminers are not a new pest to Wisconsin. They were first reported in the 1930's and have continued to make their presence known with sporadic outbreaks across the state ever since. When scouting, Cranberry Leafminer signs are most obvious during the last part of May. They can be identified by sweeping cranberry leaves with oval holes in them, sweeping yellow elliptical cases (~1/8" long) and observing larvae feeding on the lower leaves. The old growth is discolored with tiny insect trails or mining. The larva can be seen within the leaf when held up to a light source. (see photo's for examples from the 2015 season)

Most of the following life cycle descriptions were taken from A. Averill & M. Sylvia's publication; Cranberry Insects of the Northeast (1988).



When held up to a light source the leafminer larva may be seen within the cranberry leaf.



Infested Cranberry Leaves: May 18, 2015



Cranberry leafminer leaf cases that have fallen from infested leaves. They can also be observed in sweep nets.

The larvae are now pupating on the bog floor and will soon emerge as adults. The adults will be flying and mating when the bees are pollinating which eliminates the possibility for a broad spectrum contact insecticide. The best time to target these pests is during the first four larval instars when they are actively feeding on the cranberry leaves. The timing for the application this year, was the first week in May

(environmental conditions are always a factor from year to year). The larvae are deposited inside the leaves which limits the insecticides that are effective. Through trial and error growers and consultants have found positive results when a systemic insecticide is applied in early May. Systemic insecticide treatments will need to be repeated for 2-3 consecutive years when the infestation is very high. As for this year, take note of any areas that you are finding leafminer activity and have a plan for next May. A way to prevent any secondary pest (insects, weeds or pathogens) from reaching damaging levels is to follow an integrated pest management (IPM) program. An important part of an IPM program is to practice pesticide rotation. Make sure you are rotating your insecticides, herbicides and fungicides strategically so you are not using a product with the same mode of action against the same pests year after year. With the example of leafminers; flooding and contact insecticides have little effect on them because of their life cycles. For many growers rotating those two control methods have been working great against the traditional spring cranberry pests (Blackheaded Fireworm, Sparganothis, Cutworm, Spanworm and Looper) making it easy to dismiss the importance of further insecticide rotation. More research is needed to determine what properties or situations are more susceptible to cranberry leafminers. For now, the best action is to continue a good IPM program.



Cranberry leaves with oval holes. These are often picked up in sweep nets.

Cranberry leafminer eggs are laid during blossom time on the underside of the cranberry leaves. The eggs remain there for about nine months, overwintering with the cranberries. In the spring the larvae begin to feed on the cranberry leaves. The larval stage takes about three months. The larvae undergo five instars, but only feeds during the

first four. During the fifth instar the leafminer stops eating and constructs an elliptical case from the upper and lower part of the cranberry leaf, sewing the edges together with silk. The insect then pupates inside the case. The case falls from the cranberry leaf to the bog floor and in a few weeks adults will start emerging; peaking during full bloom. Shortly after the case detaches and falls to the bog floor. The affected leaves typically fall too. For years Cranberry leafminers were considered secondary pests, therefore there is not a lot of research on them. Recently, we have been seeing more of these pests at levels that have reached economic thresholds. With the increased amount of activity we are learning more about them and how to control them. Unfortunately, if you are finding uprights with holes in them now, there is little you can do this season



An upright with leafminer damage on nearly every lower leaf. (Eggs are laid during bloom of the previous season leaving this season's new growth unaffected)

Observations from the Field Flooding and "Hot Spots"

Jayne Sojka
Lady Bug IPM, LLC

This was the perfect spring to flood for insect control. There were two weeks in a row with rain or frost in the forecast nearly every day. These weeks were during our spring pests control time, which is why it was ideal for flooding.

Growers are always amazed at what they see come out of the beds with their spring bug floods. The following pictures were shared by a grower and Shawn Steffan helped identify them.

Both pictures are arthropods from the subclass Collembola or Springtails. There are hundreds of different species of springtails. Most prefer moist environments where they feed on fungi, bacteria, and decaying vegetation.

Some species are found on the surface of water, in caves and on patches of snow (so-called snow fleas). If you sweep tiny arthropods that appear to jump or "spring" away you are probably looking at a Springtail. We sweep countless amounts of them when we are scouting throughout the season. Luckily, springtails are not known to be harmful to cranberries.



Springtail Family: *Hypogastruridae*
Photo by: Ben and Jamie Rezin



Springtail Family: *Sminthuridae*
Photo by: Ben and Jamie Rezin

If you did not flood for insect control you probably used an insecticide.

When flooding you can clearly see that all the vines are under water and the larval pests are usually found in the trash.

When you are spraying you trust your calibrations and boom to take care of the pests. Sometimes applications do not go as planned and parts of a bed may not get the full coverage.

Observations from the Field Flooding and "Hot Spots"

Continued from page 7

The pictures below are from a "hot spot" or a section of a bed that was not covered during an insecticide application. This is a great learning experience for new scouts or growers that have any doubt about controlling spring pests. The pests in this particular hot spot are *Amphipyra pyramidoides* you may recognize it from one of the many common names: Green Cranberry Fruitworm (GCF), Pyramidal Fruitworm or Humped Green Fruitworm. The GCF is in the same family as cutworms and false armyworms, but lies in a different subfamily. The subfamily difference is that true cutworms, when this large, will rest on the bog floor during the day and do most of their feeding at night and the GCF will feed on foliage continuously.



Amphipyra pyramidoides
Green Cranberry Fruitworm
Photo by: Pam Verhulst

Early in the season these larvae are usually referred to and counted towards cutworm thresholds. The arrangement of the legs on this species appear the same as cutworms and they feed in a similar manner. Also, they have not yet developed the distinct markings and hump; which is only visible in instars 3 through 6.

References to products in this publication are for your convenience and are not an endorsement of one product over similar products. You are responsible for using pesticides according to the manufacturer's current label directions. Follow directions exactly to protect the environment and people from pesticide exposure. Failure to do so violates the law.

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If you feel that your insecticide application did not go on as planned be sure to scout those areas carefully (after the reentry interval expires) to be sure you do not have any hot spots. Hot spots that are left untreated can result in visual and economical damage to your plants. Untreated areas also allow those surviving insects to continue to grow, mate and lay eggs which will result in the next generation being more difficult to control.



Amphipyra pyramidoides
Green Cranberry Fruitworm swept from a "hot spot" where the insecticide was not effective.
Photo by: Pam Verhulst

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