

Cranberry Crop Management Journal

IN THIS ISSUE:

Weevil.....	1
Yellow Vine Syndrome .	2
Nutrient Management: Tissue Sampling	3
Observations from the Field.....	3
Tissue Nutrient Analysis	4
Grower Updates	6

Tired of seeing in BLACK & WHITE?

Receive the CCMJ in
COLOR by e-mail!

Sign up by emailing
us at
mlippert@co.wood.wi.us

Editor:
MATTHEW LIPPERT
Agriculture Agent
Wood County UW-Extension
400 Market Street
Wisconsin Rapids, WI
54494
(715) 421-8440
mlippert@co.wood.wi.us

STRAWBERRY ROOT WEEVIL AND BLACK VINE WEEVIL

by Christelle Guédot

UW-Madison Department of Entomology

Common Names: Strawberry root weevil and black vine weevil
Order: Coleoptera
Family: Curculionidae
Scientific Name: *Otiorhynchus vatus* and *Otiorhynchus sulcatus*

Strawberry root weevil (SRW; Fig 1) and black vine weevil (BVW; Fig 2) are present in cranberry in other states on the West and the East Coasts and may be found in Wisconsin in the future. We do not yet have confirmed reports of these weevils in Wisconsin but there were some discussions about them earlier this season which prompted me to write this article. If you think you may have found any of these weevils, please send some good quality pics to Christelle Guédot at guedot@wisc.edu or the specimens themselves at my address found at the end of any issue of CCMJ. Other weevils have been found on cranberry marshes this summer and we will discuss these once they get positively identified.

SRW adults are 1/5" long, shiny black to light brown with rows of small pits along the back, and a prominent blunt snout (Fig 1). BVW adults are larger than SRW, a little less than 1/2" long, dull black with yellow small flecks on the back (Fig 2). Larvae of both weevils are quite similar: they are about 12 mm long, C-shaped cream-colored legless grubs with a brown head. BVW is native to Europe and was first introduced to the US in the early 1900s. SRW is native to Eurasia. Both are now established in most of North America. The adults of both species cannot fly; they walk or get carried on plant material or equipment from one location to another. Adults climb up to feed on leaves at night and remain in the soil or leaf litter at the base of the plant during the day. BVW adults are polyphagous and feed on over 150 plants, including cranberry.



Figure 1: Strawberry root weevil. BugGuide. Photo credit: Harvey Schmidt



Fig 2. Black vine weevil. BugGuide. Photo credit: metriopectera



Fig 3. Strawberry root weevil larva. Oregon State University © Ken Gray Insect Image Collection.

LIFE CYCLE

Adult females lay eggs in the soil where larvae develop, feeding on plant roots. BVW adults feed for 21-28 days on foliage prior to producing eggs. Interestingly, all adults are females that are capable of laying eggs through parthenogenesis (asexual reproduction). Females lay eggs

in clusters of ~30 eggs in or on the soil from June to September. As soon as the eggs hatch after 10-14 days, larvae (Fig 3) wiggle down into the soil and start feeding on roots. Larvae will then overwinter 2-8 inches deep in the soil. From April to June, larvae pupate, and adults begin to emerge. Adults move slowly and should not be confused with swifter predacious ground beetles. There is only one generation per year of each species.

DAMAGE The main damage is caused primarily by the larvae feeding on the root system (Fig 4) in early spring. Larvae feed on small roots first and then move on to the cambium of larger roots. Damaged plants are weakened, stunted, more susceptible to winter injury and diseases, and may see a decrease in yield. Severe infestation may cause the plants to die. While adult weevils chew characteristic notches from the edges of leaves (Fig 5), their feeding is usually minor and does not result in economic loss. The presence of weevils can be detected by looking at the notches on the leaves on uprights, with bed edges and drier areas being most susceptible to weevil damage.

MONITORING In late spring-early summer, sweep with a net after dark for the presence of adults. The presence of adults on top of foliage can be confirmed after dark on warm calm nights using a flashlight. The action threshold for chemical management in the Pacific Northwest is set at one adult per 25 sweeps.

BIOLOGICAL CONTROL Nematodes, such as *Heterorhabditis* spp. and *Steinernema* spp., may provide some control of weevil larvae when applied as a drench (following label directions) in the root zone where grubs are present.

CULTURAL CONTROL Flooding at harvest will cause some weevil larvae to drown. In the Pacific Northwest, they suggest that a flood applied 2-3 weeks after harvest, when temperatures may still be warm, may result in large numbers of early instar larvae to drown.



Fig 4. Strawberry root weevil damage to roots. Oregon State University © Ken Gray Insect Image Collection.



Fig 5. Strawberry root weevil damage to leaves. Oregon State University © Ken Gray Insect Image Collection.

YELLOW VINE SYNDROME

Vines showing symptoms of yellow vine syndrome (YVS) have become more prevalent in some beds in the last few weeks. In more severe/advanced cases of YVS, affected uprights may begin to turn brown. While the exact cause(s) of this syndrome has not yet been elucidated, research suggests that YVS likely results from nutritional imbalances in the plants that stem from the inability of the affected plants to uptake nutrients efficiently. However, this often does NOT mean that your fertilizer regime is lacking or should be altered. Instead, these symptoms likely result from the plants having a root system that is shallow and/or damaged, often due to water stress (either too much or too little). As such, symptoms are often exacerbated by the application of dichlobenil (i.e., Casoron). Research and grower observations are inconclusive regarding addition of nutrients, but work from Massachusetts suggests that foliar feeding with magnesium or urea may work well to alleviate symptoms of YVS.



by Lindsay Wells-Hansen
Ocean Spray Cranberries, Inc.

NUTRIENT MANAGEMENT- STAYING IN COMPLIANCE WHEN TISSUE SAMPLING

by Pam Verhulst
Consult With Pam, LLC

Growers are patiently watching their berries size and color. Buds for the 2018 crop are showing and fertilizer applications are coming to an end. Now, is the time to plan your tissue sampling.

Researchers have concluded that the best time to collect cranberry tissue samples is in late summer to early fall, usually August 15 until September 15. Nutrient levels change more rapidly outside of the recommended time and make interpretation of the results more difficult. When selecting a sampling date, also consider growing degree days, plant observations and fertilizer applications. Ideally, you would like those variables similar to the previous year's sampling time.

To stay in compliance with the 590 requirements, make sure you fulfill the following:

- 1 tissue sample per management unit
- 1 tissue sample per every 5 acres over 4 years.

When Collecting Remember:

- Collect this season's growth (growth above fruit).
- Collect when vines are dry and do not rinse.
- Walk in a "W" pattern through the bed collecting several uprights (~10-15 times) to efficiently represent the entire bed.
- Place samples in a paper bag with your name, account number and the bed number. Ship or deliver to a certified lab.

*Refer to Cranberry Tissue Testing for Producing Beds in North America for detailed tissue collecting descriptions.

*Soil samples are only required on new plantings. However, if you are a grower that applies soil amendments to alter your soil pH, consider taking soil samples during this time. Those results can be used to support your in-season decisions.



OBSERVATIONS FROM THE FIELD

by Jayne Sojka
Lady Bug IPM, LLC

Let's take a moment to appreciate the beauty that surrounds you every day.

The trumpeter swan family swims in the reservoir and you have the privilege of watching the family grow and take flight. Whooping cranes are making their way across several counties and it wasn't long ago that we did NOT see any. Ducks are more abundant and the prehistoric sounding Sandhill cranes dot the support lands around our marshes.

Stop and SEE the gifts that we are given and the beauty that they provide.



PESTS OF THE HOUR

Flea Beetle and more Flea Beetle seem to be the pest of the moment. We have success stories to share with controlling these from many of our growers. Actara with a good sticker has provided us with an inexpensive control measure and an effective one as well. In heavy infestations with 50 to 60 flea beetle in a series of 20 sweeps along with heavy feeding on vines as well as some chewing on fruit was observed before the application. Within 48 hours of that application we saw success. (We gave it that long before we came in to check on control) We swept next to nothing in HOT SPOTS.

Japanese Beetles are working the weeds around the cranberry beds and it seems that Actara controlled them along with Flea Beetle. We understand the life cycle of this particular pest ends around the 1st of September.

Across Wisconsin we are finding Bronzed uprights dotting all varieties. Some of the bronzed uprights can be explained yet others are a mystery to us. We understand environmental concerns due to the wet season yet every marsh has its very own set of circumstances. If you find that your situation is different than normal years please send samples into the diagnostic clinic in Madison.

When targeting Clover and other tough labeled weeds with stinger please remember that the ideal time is AFTER harvest. Look for 2 days of 50 degrees before that application and 3 days after to get the BEST results from this herbicide. Stinger can be an awesome product but it can also cause a unique stress like the picture I have here. Remember one must look at the WHOLE picture. Just how much damage is the weed causing and how can we control that challenge without stress to our vines.

All across Wisconsin we are seeing smaller fruit than usual, but remember we are NOT in charge. Mother Nature provides the weather conditions that our fruit needs to size, shape, and gain dimension.



TISSUE NUTRIENT ANALYSIS AND CHANGES IN NUTRIENT CONTENT DURING THE GROWING SEASON

by Amaya Atucha *UW-Extension Fruit Crop Specialist*
Beth Ann Workmaster, *Researcher, Department of Horticulture, UW-Madison*

Tissue testing is perhaps one of the most important factors to consider when establishing nutrition management plans for cranberry marshes. Some of the benefits of taking tissue samples every year include: early detection of nutrient deficiency or toxicity, establish fertilizer needs for the next growing season, diagnose problems, and evaluation of current fertilization plan. The current recommendation to sample tissue for nutrient analysis during mid-August to mid-September is based on studies performed with older varieties, such as 'Howes' and 'Early Black', which reported that nutrient concentrations in cranberry vines are most stable during this period. To determine if this recommended sample period for tissue analysis (mid-August to mid-September) would also be the period of greatest stability in nutrients for new cranberry varieties, the fruit lab at UW-Madison established a study to look at changes in nutrient concentration from hook to fruit set in 'Stevens', 'Crimson Queen', and 'HyRed' cultivars. The results of two years of data show that new cranberry cultivars present similar patterns of nutrient concentrations during the growing season as the industry standard cultivar 'Stevens'. Within the macronutrients, nitrogen, phosphorous, and potassium present relative stable levels during mid-August to mid-September (Figure 1). However, calcium, magnesium and boron have an increasing concentration trend during the sampling period (Figure 1). Based on these results, the study concluded that the current sampling window (mid-August to mid-September) is also recommended for the new high yield cultivars, and suggest that sampling period could extend until late September, if necessary.

Figure 1 [shown on next page] Shoot tissue nutrient content. Nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg), calcium (Ca), boron (B), and copper (Cu) tissue content for uprights of 'Stevens' (ST), 'Crimson Queen' (CQ), and 'HyRed' (HR) sampled from four central Wisconsin cranberry marshes in 2013 and 2014. Yellow dots signify normal range for nutrient. Error bars show the standard error of the mean (n=12). The current mid-August to mid-September sampling window is highlighted in gray

GROWER UPDATE

SARATOGA CRANBERRY COMPANY

Not much is happening on the marsh this time of the year. We went to Warrens for the field day but other than that there has not been anything noteworthy to report on. There is still no pest pressure since our Altacor shot a month ago and not too many weeds that need pulling. With no other pressing matters to worry about, all we are doing is mowing dams and thinking about the approaching harvest. Our Crimson Queens look like they about a month off from harvest and then we will start the Stevens when they decide to color up. As of 8/14/2017 we have 2,698 growing degree days accumulated.

Russell Sawyer

UW-Extension Cranberry Specialists

Jed Colquhoun

UWEX Fruit Crops Weed Scientist
1575 Linden Drive
Madison, WI 53706
(608) 852-4513
jed.colquhoun@ces.uwex.edu

Patty McManus

UWEX Fruit Crops Specialist & Plant Pathologist
319B Russell Labs
1630 Linden Drive
Madison WI 53706
(608) 265-2047
pmanus@wisc.edu

Christelle Guédot

*Fruit Crops Entomologist/
Pollination Ecologist*
Department of Entomology
546 Russell Laboratories
1630 Linden Drive
Madison WI 53706
(608) 262-0899
guedot@wisc.edu

Amaya Atucha

Extension Fruit Crop Specialist
UW-Madison
297 Horticulture Building
1575 Linden Drive
Madison, WI 53706
(608) 262-6452
atucha@wisc.edu

Shawn Steffan

Research Entomologist
USDA-ARS
UW Madison, Department of Entomology
1630 Linden Drive
Madison, WI 53706-1598
(608) 262-1598
steffan2@wisc.edu

Juan E. Zalapa

Research Geneticist
299 Horticulture
1575 Linden Drive
USDA-ARS Vegetable Crops Research
Madison, WI 53706
(608) 890-3997
jezalapa@wisc.edu



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.