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ADDRESS CORRECTION

Contact us if you have any address corrections, additions, or deletions.

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BLUEBERRY STUNT PHYTOPLASMA IN CRANBERRIES

Lindsay Wells-Hansen and Ben Tilberg
Ocean Spray Cranberries, Inc.

In July 2015, Blueberry stunt phytoplasma, a bacterial pathogen, was discovered on a single cranberry marsh near Mather, WI. Presence of the phytoplasma was associated with flower deformities, or “double bloom” (see photo), but it is unknown if these symptoms were caused by the phytoplasma or another factor(s). These disfigured flowers were first observed in a single Stevens bed in small patches dispersed throughout the affected bed. Symptoms were first observed in late July after all other uprights in the affected bed were out of bloom. Most uprights that showed deformed flower symptoms did not set fruit. On the few affected uprights that did set fruit, berries were misshapen and sometimes showed symptoms of russetting.

Blueberry stunt phytoplasma is a widespread and important disease in blueberry, and is spread from plant to plant by sharp-nosed leafhoppers as well as through infected planting material in blueberry fields. This is the first time that stunt has been detected in cranberry plants. As such, the information we have regarding this pathogen in cranberry is extremely limited, and it is unknown how Blueberry stunt is spread in cranberry.

We have marked the area of the bed in



which Blueberry stunt was detected in 2015, and we will continue to study uprights from this location in 2016. In an effort to glean more information about the possible impact of Blueberry stunt on affected cranberry plants, we ask that all growers in Wisconsin be on the lookout for any suspicious symptoms as we move into the 2016 growing season.

If you observe any bloom abnormalities such as those shown in the photo, please contact Lindsay Wells-Hansen (609-354-8645) or Ben Tilberg (715-240-0534), Agricultural Scientists with Ocean Spray Cranberries, Inc.

ROSE CHAFER

Katie Hietala-Henschell and Christelle Guédot
 UW – Madison Fruit Crop Entomology and Extension

Common name: Rose chafer

Scientific name: *Macrodactylus subspinosus* F.

Order: Coleoptera

Family: Scarabaeidae

Genus: *Macrodactylus*

Background and Biology: The Scarab beetle family (Scarabaeidae) encompasses around 30,000 species, while there is a wide range of omnivorous diets and functional roles played by this family many are considered agricultural pests. Rose chafer (*Macrodactylus subspinosus* F.) beetles are relatively common on ornamental and cultivated plants and are strong fliers. They are found in sandy areas of Wisconsin. Adult beetles are three quarters of an inch long, have black undersides and tan bodies covered in fine hairs, and have distinct long reddish-brown legs¹.



Rose chafer beetles have one generation per year and larvae overwinter in sandy soil and pupate in the spring². Adults emerge in late May through mid-June and live for about three to four weeks and can cause extensive damage to foliage³ and flowers, preferring flowers over leaves. After mating, rose chafer females preferably lay eggs in moist soil, greater than 15% moisture⁴. Eggs hatch in about two weeks and larvae feed on roots throughout the summer until they are fully developed in the fall³. Larvae feed on the roots of grasses and weeds and do not usually cause damage from root feeding¹¹.

Host and Damage: Rose chafer is a pest of many crops and feeds on plant tissues including buds, flowers, fruits and leaves. Damage caused by rose chafer can result in skeletonized leaves which is similar damage caused by Japanese beetle (*Popillia japonica* Newman)⁵. It is considered a generalist and can damage grapes, apples, peaches, roses, cherry, strawberry, raspberry, and blackberry^{1,3,6}. Adults use aggregation pheromones and congregate while feeding and cause the most damage when populations are highest in June⁶. With their large appetites and large population numbers, rose chafer can severely damage leaves, reduce photosynthetic capabilities, and damage fruit resulting in reduced yield⁷ or lost ornamentals¹. They have been seen in the last decade feeding on cranberry flowers, which could result in damage if numbers are substantial.

Control methods: Rose chafer populations can build quickly and scouting efforts should start in early May for early detection, in addition to keeping records to assist with integrated pest management⁸. There are multiple cultural control methods (handpicking beetles, mesh covers, tilling the soil to disrupt immatures), none of which seem to be practical in commercial cranberry production.

In addition to cultural control, trapping can be implemented to monitor and control populations⁹. Recommendations in other crops suggest placing rose chafer traps, or white Japanese beetle traps, in combination with rose chafer lures 30 feet from crop of interest or every 200 feet^{10,11}. White traps are better at catching rose chafer than yellow traps and effective lures contain octyl butyrate¹².

Different insecticides have different levels of residual toxicity and leaf protection¹³. In other crops, treatment is recommended if there are two or more beetles per vine³. Insecticides can knock down populations however they will need to be reapplied regularly as rose chafers are strong fliers and new populations can establish quickly. Carbaryl (Sevin), acetamiprid (Assail), and imidan (Phosmet) are registered on cranberry. Although they are not registered for rose chafer on cranberry, these products have been shown to be effective against rose chafer in other crops and are registered for other pests on cranberry. Thus, use of these products on cranberry is legal as long as the user follows the cranberry label restrictions. In addition, make sure to check with your handler if you decide to treat for rose chafer with any of these products to comply with MRLs restrictions.

(Article References listed on page 6)

2016 FUNGICIDE UPDATE

Patty McManus

UWEX Fruit Crops Specialist & Plant Pathologist

The past few years have been a bit sleepy in terms of new, exciting fungicide chemistries for cranberry growers. Elsewhere in this issue is the report that the European Union has eased its MRL on chlorothalonil, to a level that is the same as in the U.S. Here I review some of the newer fungicides and how to use them to best effect. For specific use instructions such as rates, timing, and precautions, see *2016 Cranberry Pest Management in Wisconsin* (UW-Extension bulletin A3276) or the *2016 Cranberry Pesticide Chart* from Cranberry Institute. Be sure to have the current bulletin and chart on hand and get rid of the old versions to avoid confusion, or worse, doing things that run afoul of the law. Another “blanket” statement is that you should communicate with your handler about restrictions they might have on various pesticides. Rules vary among handlers, rules change, and I am not a reliable source of information on who allows what.



Proline (prothioconazole) from Bayer CropScience was first available to growers in 2014. In our research trials it consistently has been an outstanding fungicide for fruit rot control when used at the full rate (we didn't test reduced rates). In one study a few years ago we wanted to collect rotten berries to see which fungi were present. In the Proline plots we sometimes could not find more than one or two soft berries in an entire 5' x 5' plot! This is better than Bravo, Abound + Indar, and any other treatment we've tested. Proline is also proving effective against cottonball: in our 2014 and 2015 trials, Proline was as effective as the cottonball standards, Indar and Orbit/Tilt. If your handler gives the green light to use Proline, I highly recommend it.

Quilt Xcel (azoxystrobin + propiconazole) from Syngenta is a pre-mixed combination of the active ingredients of Abound and Orbit/Tilt. Separately, Orbit/Tilt is very good and Abound is pretty good at controlling cottonball. Thus, although we have not tested this combination, I would expect it to be effective for cottonball control, at least if used at the higher end of the label rate. You could of course, mix the two fungicides on your own, but the pre-mix product is available for your convenience. I would not recommend Quilt Xcel for fruit rot control, however. The Abound component would provide some benefit, but the Orbit component would not. You'd be better off using Abound at a higher rate on its own or another effective fruit rot fungicide.

Oso (formerly Tavano) is a newer fungicide from Certis USA that has **polyoxin D zinc salt** as its active ingredient. Polyoxin D is a fermentation product of *Streptomyces*, a soil bacterium, and is considered a relatively safe biofungicide exempt from a pre-harvest interval (in practice, a 0-day PHI). Polyoxin D has an entirely novel mode of action that inhibits chitin, the major component of fungal cell walls. The low toxicity and novel mode of action are welcome additions! Oso, when mixed with a non-ionic surfactant (NIS), was often as effective as the standards in controlling fruit rot and cottonball. We'll continue studies with this new chemistry and keep you posted.

Regalia is a “soft” fungicide that is approved for use in organic production. The active ingredient is **extract of *Reynoutria sachalinensis***, giant knotweed, which when applied to plants supposedly turns on defenses. It is registered for use against many diseases of many crops. It gave variable results in our 2014 and 2015 trials, leaving me reluctant to recommend it. It provided good to very good control of fruit rot and cottonball in many trials, but then failed miserably in others. This is one that needs more work.

Phosphorous acid products. **Aliette**, which is an aluminum salt of phosphorous acid, was the first in this group. Now we have **Phostrol, Prophyt, Legion, and Rampart**. These are effective in controlling *Phytophthora* on many different woody plants, including cranberry in the eastern U.S., but we have not tested them on cranberry in Wisconsin. More than any fungicide, good soil drainage is the key to controlling *Phytophthora* pathogens. The active

2016 FUNGICIDE UPDATE (continued from page 3)

ingredients in phosphorous acid products are one or more phosphite salts (potassium phosphite, sodium phosphite, ammonium phosphite). From a practical standpoint, you can consider these products all the same. However, these fungicides do not contribute to P nutrition. Phosphorous acid releases the phosphite (also called phosphonate) ion, which is transported in the plant to the roots. While the phosphite ion is fungicidal to *Phytophthora*, it does not provide P for the plant. Phosphorous acid products do not release the phosphate ion, which is the form of P that plants use.

Fruit rot control without Bravo (or other chlorothalonil products). The European Union has eased chlorothalonil restrictions for 2016. However, chlorothalonil is one of those fungicides that draws scrutiny for other reasons (e.g., human and environmental health), so growers who are in it for the long run should probably be thinking of how they might live without chlorothalonil regardless of export issues. Fortunately, there are effective alternatives that can be substituted directly for chlorothalonil. These include mancozeb, or Abound + Indar, or Evito + Indar, or Proline. I'd like to get a bit more data on Oso, but it also might be a good substitute for Bravo. In Wisconsin fruit rot can usually be kept in check with 2-3 sprays starting at early (10%) to mid (50%) bloom. If fruit rot levels were low the previous year, but you are afraid to forego sprays altogether, the best timing for a 1-spray program would be late bloom/early fruit set. There are countless different ways you can mix or alternate fungicides in an effective 2-spray or 3-spray program, and the following table provides some "no-chlorothalonil" programs. Options 1-4 involve two sprays; options 5-8 involve three sprays. Here are some points to keep in mind when developing a spray program:

- Limit use of fungicides in the same chemical class (FRAC code) to 3 or fewer sprays per season (except M coded fungicides which are not prone to resistance). FRAC codes are listed on the *CI Cranberry Pesticide Chart* and on product labels. Briefly, Indar and Proline are code 3, Abound and Evito are code 11, and chlorothalonil and mancozeb are code M.
- Indar is weak on *Colletotrichum* (bitter rot) so it should not be used alone (except for cottonball control). Indar + Abound, or Indar + Evito, are good combinations that cover a broad spectrum of fungi.
- Proline has been excellent when used alone in our trials, but check with handlers for restrictions. Also, note that it has a long pre-harvest interval (45 days).
- Do not use mancozeb during early fruit set or later, as it inhibits red color development.

Examples of "no chlorothalonil" spray programs:

OPTION	EARLY-MID BLOOM	LATE BLOOM-EARLY FRUIT SET	10-14 DAYS LATER
1	Indar + Abound	Indar + Abound	---
2	Proline	Proline	---
3	Indar + Abound	Proline	---
4	Mancozeb	Indar + Abound	---
5	Indar + Abound	Indar + Abound	Proline (beware 45-day PHI)
6	Proline	Proline	Indar + Abound
7	Mancozeb	Proline	Indar + Abound
8	Mancozeb	Indar + Abound	Indar + Abound

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.

SPRING HAS SPRUNG WITH A LOUD “PEEP”!

Suzanne Arendt
RedForest Crop Consulting, LLC

Signs of spring in Wisconsin are uplifting after a long, cold winter. People are grilling, migratory birds return, robins are seen picking the ground for worms, motorcycles are roaring, flip flops are dug out of the closet and for cranberry growers it's the start of a new beginning to grow our crimson state fruit. A cranberry growers spring chores include moving water and getting their lift pumps, irrigation systems, and everything else ready for another season. But what many people can't experience as spring, the cranberry grower does. At the end of the work day when they can finally take a deep breath, they are reminded even more so of the bountiful nature reserve they have on their own land by just simply listening to the evening sounds of the spring swamp. Amphibians, especially frogs can sing us to sleep or keep us awake all night long. There are 12 species of frogs and toads in Wisconsin and I can site at least 6 of those species that are found on cranberry marshes: the American toad, the American bullfrog, gray tree frog, leopard frog, wood frog, green frog and spring peepers. Of course, the male spring peepers chorus is an astonishing sound of a new spring and new beginnings. It is an honor to be host to such a group of indicator species. The habitat that a cranberry grower provides for frogs is yet another testament to our stewardship to the land that we live and raise our families on. If you haven't visited a cranberry grower at sundown in the spring it is a must hear! And frog "hunting" (observing and photographing) is a fun family adventure on the farm. So get out your boots and enjoy the sounds of spring!

BRAVO STATUS

Patty McManus
UWEX Fruit Crops Specialist & Plant Pathologist

In case you missed it, the following text comes from the Cranberry Marketing Committee web site: *The European Union published Commission Regulation (EU) 2016/67, amending chlorothalonil on cranberries from 0.01 ppm (LOD) to 5 ppm, which is now the same tolerance as in the U.S. The regulation enters into force on February 11, 2016. Growers will be able to use chlorothalonil on this year's crop for fruit that will be exported to the EU. The industry members that were a part of this project deserve a great big congratulations and appreciation for the time and effort spent on this effort.*

This is good news for those who rely on chlorothalonil (Bravo, Echo, Equus) for disease control. Nevertheless, I suggest that growers communicate with their handler about any possible restrictions on pesticides.

NEW BULLETIN ON TSV

Patty McManus
UWEX Fruit Crops Specialist & Plant
Pathologist

A new extension bulletin that summarizes our work on TSV is available from the UW-Extension Learning Store:

<http://learningstore.uwex.edu/Product.aspx?ProductId=1796&CategoryId=87>

From the site you can download a pdf free of charge or purchase hard copies. The lead author, Lindsay Wells-Hansen, and I provide a description of symptoms, biology of the virus, and recommendations, including a section on how to sample beds for TSV. While you are at the Learning Store site, be sure to check out the bulletins that are available for download or purchase.

OBSERVATIONS FROM THE CRANBERRY BEDS

Jayne Sojka/Lady Bug IPM, LLC

April 21, 2016 a warm sunny day, I did some spot checking in BHF 2015 hot spots and I found newly hatched larvae. Understand that the vines are still purple and the bud movement minimal so the larvae will perish from starvation.

When conditions are right larvae will hatch from their eggs but survival is the question.

We always look for economic levels before we take action with any cranberry pests plus factor in plant stage, weather/growing degree days. Leaf miners are also starting to emerge, along with loopers and spanworm. SPRING has sprung in the insect world!

The mighty Bug Mobile and I have been traveling the highways after dark and the windshield is splattered with miller flight. I even saw a June Beetle at this early date! For those of you that wish to Mass Trap June beetles make sure those traps are in place the 1st week of May and you will start to see activity.

GROWER UPDATES

Adams 73 Cranberry

Frost protection season is upon us. We fired up our pumps for the first time the night of the 22nd. Looking at the forecast, it appears that we will have some busy nights over the next ten days.

Prior to our first frost event we were able to get some pruning and herbicide applications done at Adams 73. We pruned about 50 acres of Stevens last week that were getting a little woolly on us. We finished out the week with Casoron applications across the marsh. With temps in the 80's last week, you could almost watch the grass grow.

On our schedule for the upcoming week will be more grass herbicide applications (weather permitting), along with some Round Up wiping applications.

Sleep will be a hot commodity over the next couple weeks. Be safe and get some sleep when you can.

Jeff Hopkins
Adams 73 Cranberry

Habelman Bros. Tunnel City

After having all winter to rest we can start with our 24 hour workdays again. A wise man once said when the white bush behind the shed starts blossoming, start protecting at 32 degrees. We start protecting around 280 growing degree days. The last several years has been following this trend. We hope to have enough data before the old tree dies behind the shed. Soil temperatures have been averaging around 50 degrees.

The vines look healthy. Mother nature has been kind to us. The weeds are starting to appear and the battle plan has begun. Casoron will be applied in the next few days.

Hope mother nature is kind to all of us this year. Hope everyone has a good start to their growing season.

Team Habelman

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