

Cranberry

Crop Management Newsletter



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Stem Gall (Canker) Sightings

By Patty McManus, UW Extension Plant Pathologist

Special points of interest:

- Stem Gall
- Cottonball
- Gibberellic Acid for fruit set?
- Native pollinators
- Assail Insecticide

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Reports of cranberry stem gall (sometimes called canker) are trickling in. In this article I cover the basics, but for more information and photos, see UW-Extension bulletin A3795 (<http://learningstore.uwex.edu/Cranberry-Disorders-Cranberry-Stem-Gall-P403C87.aspx>). The most obvious symptom of stem gall is shoot dieback. Viewed from a distance, the browning and death of uprights sometimes follows a pattern, as though related to injury at harvest. In other cases, the dying uprights are patchy, especially at the ends of beds where floodwater enters first and exits last. Although gall development starts at the time that plants resume growth in the spring, dieback is usually not noticed until bloom or later. Woody uprights and runners are swollen and rough with peeling bark. Beneath the bark are small bumps and galls. When galls are so numerous that they encircle a stem, all tissues above the galled area die. The galls start out green and soft, but once the shoot dies back the galls become dry and hard. New shoots arise from below the galls, but it takes these new shoots a year or two to fill in the dead spots and become productive. We have never seen galls on current year's growth—just woody stems. Over the years, I have seen stem gall on Stevens, Ben Lear, Pilgrim, Searles, and Norman LeMunyon, but it's likely that other cultivars are susceptible as well.

Stem gall is caused by bacteria that produce the plant growth hormone indole acetic acid (IAA). Abnormally high levels of IAA disrupt the development of vascular tissues, through which water, nutrients, and carbohydrates flow. These bacteria probably enter plants through wounds created by harvest machinery, winter injury, and/or leaf drop. Damage to the earliest formed vascular tissues suggests that bacteria are already inside the plant at the time they break dormancy.

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Stem Gall sightings, Continued...

The bacteria involved in stem gall are common in soil, even where stem gall has never occurred. Symptoms can be awful one year and absent the next. This suggests that stem gall is highly dependent on the environment, and not just on the presence of bacteria. Unfortunately, it's not clear just which environmental factors are right for stem gall. We have noticed, however, that stem gall crops up in areas of the bed that were not well protected with ice or snow the previous winter. We are not currently doing research on stem gall, but if you have an outbreak, I would be interested in what you observe regarding cultivar, location in the bed, patterns, etc. More clues will shed more light on this curious malady.

By the time stem gall symptoms show up, bacteria are deep within cranberry tissues. We've looked at hundreds of stems under the microscope, and it's clear that their vascular tissues were damaged very early in the growing season. We never see vascular tissues start out normal and then go bad in June or July. This suggests that infection happens sometime before bud break but not after. As we move through July, the areas of dieback will enlarge, but that's because already-infected shoots are dying, not because of new infections.

Because stem gall is caused by bacteria, fungicides such as Bravo, Dithane (or other brands of mancozeb), Abound, Indar and Orbit **WILL NOT WORK**. Copper-based fungicides are bactericidal. However, experience with other plants suggests that copper is not effective in controlling diseases in which bacteria amass inside plants, as is the case with stem gall. Also, the sporadic nature of stem gall—bad one year, absent the next—makes it impossible to know when and where treatment will be needed. For these reasons, I do not recommend copper treatment.

Cottonball Update

By Patty McManus, UW Extension Plant Pathologist

As part of the pesticide screening project, Jack Perry and I have cottonball trials out at three sites in central Wisconsin. We recently rated primary infection (tip blight) and found very little disease at two sites, and just slightly more at the third site. I spoke with a crop scout who also reported that it seems to be a light cottonball year. Even so, I expect that we will have some infected fruit and some data to report from at least one of our three trials. Unfortunately, chemical companies have little interest in registering their products for control of cottonball. It's a spotty disease of a low-acreage crop and is therefore not much of a money-maker for them. Although I expect Orbit and possibly a related fungicide to be registered by 2007, there are no other new fungicides on the horizon. However, we are testing some biological control products that are quite good on a similar disease of blueberry and which showed some promise in our trials last year. We are also testing Orbit, Abound, and Bravo head to head. I know folks are concerned about negative effects of Bravo, but I am concerned about fungicide resistance developing if we just keep using Orbit and only Orbit. Abound has been around for a few years now, and in some, but not all, trials, it has performed as well as Orbit when applied during bloom. For now, there's not much more to report, but we will have more to say at the winter cranberry school.

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.

Gibberellic Acid and Cranberry Production
Teryl Roper
Professor and Head
Dept. of Plants, Soils and Climate
Utah State University

"Ah, summer,
what power you
have to make us
suffer and like it."

Russell Baker

I had a call this morning from a Wisconsin cranberry grower inquiring about using Gibberellic Acid (GA) to substitute for not being able to obtain the number of beehives that he wished to have. This is not a good idea. While GA products are registered for use on cranberry, their registered use is to eliminate the crop and must be applied at about 2% bloom. It is not registered to increase fruit set in cranberry, so an application during full bloom would be an illegal application. Remember to read the label carefully before application. The label is the law.

Several reports of research using GA on cranberry are included in the scientific literature from the 1960s. Some of this research was repeated with newer formulations in Wisconsin by Elden Stang. The results from this research are remarkably similar. Application of GA does result in increased fruit set (#fruit/#flowers), but it does not increase yield. Two undesirable side effects also occur. First the fruit that set are very small and mostly below market grade, and second the vines become elongated and "leggy".

Extrapolating the use of growth regulators such as GA from vegetable crops or even other fruit crops is risky. Plant growth regulators produce different responses in different plants and may even produce different results in the same plant depending on timing of application and rate of application.

"Renovation and Expansion-
2009"



TUNE UP YOUR POLLINATION WITH NATIVE BEE CONSERVATION

Eric Mader, Pollinator Outreach Coordinator

The Xerces Society for Invertebrate Conservation

www.xerces.org

The big pollination story for 2009 was the unseasonably cold weather during flowering, with temperatures between the low 50s and low 60s throughout central Wisconsin during the last few days of June.

Growers are now evaluating how successful their own pollination was, but experienced beekeepers will tell you that little honey bee foraging occurs below 55 degrees. Maximum foraging, does not occur until temperatures warm above 65 degrees.

This news should serve to remind us of the value that native bees have in pollination. Native bees, especially our bumble bees, have a greater cold weather tolerance and are less affected by overcast conditions and rainy weather. In fact bumble bees routinely forage at temperatures below 50 degrees and are unfazed by light rain.

There has been a new interest in native bee conservation among growers, especially as honey bee prices continue to rise, and new berry varieties with greater pollination requirements are being planted.

Providing Native Bee Habitat

Unlike honey bees which can be moved from place to place, native pollinators are limited in the distance they will travel. For small bees, the farthest they will fly from their nest may be a distance of only several

hundred yards. Even bumble bees will typically forage no more than 1 mile from their nest. Because of this limited mobility, native bees require season-long food sources to survive and maximize their populations.

The crop bloom provides an abundance of flowers for several weeks, but unless there is food available before and afterwards, native bee populations will never reach their full potential.

One solution to increasing native bee numbers that is gaining more attention is to provide them with pollinator food plots. The concept is a familiar one to Wisconsin deer hunters: provide an abundant, year-long food supply, and your resident wildlife population prospers.

These pollinator food plots should meet several criteria:

1. They should include native plants that won't need to be replanted every year.

2. They should include species that do not bloom at the same time as cranberries (e.g. no basswood trees or non-native clovers)

3. The plants should have a low weed potential so that they do not invade the marshes. One way to control this is to pick plants with a low tolerance for flooding.

TUNE UP YOUR POLLINATION WITH NATIVE BEE CONSERVATION, continued...

Using these criteria, some pre-bloom plants to consider include:

"Summer afternoon- Summer afternoon ...the two most beautiful words in the English language."

Henry James

Serviceberry (*Amelanchier arborea*)
Lupine (*Lupinus perennis*)
Wild Geranium (*Geranium maculatum*)
Wild Indigo (*Baptisia alba*)

Some post-bloom food plot plants include:

Purple Prairie Clover (*Dalea purpurea*)
Smooth Blue Aster (*Aster laevis*)
Showy Goldenrod (*Solidago speciosa*)
New England Aster (*Aster novae-angliae*)

Funding and Technical Support for Pollinator Habitat

You might be surprised to learn that a number of support programs are available through the USDA-NRCS to develop this type of pollinator habitat.

"We all learn by experience but some of us have to go to summer school."

Peter De Vries

Here in Wisconsin, the NRCS offers technical and financial support for pollinator plantings through both the Wildlife Habitat Incentives Program (WHIP), and the Environmental Quality Incentives Program (EQIP). A number of growers have already signed up for this assistance, and if you are interested in participating, you should contact your local NRCS office for more information.

Do Habitat Enhancements Actually Work?

The value of natural areas on resident wild bee populations is real and well documented. One recent study found that vegetable farms in New Jersey received sufficient pollination entirely by native bees in areas adjacent to abundant natural habitat.

A similar recent study on canola in Canada demonstrated that native bees alone could provide effective pollination when 30% of the overall land area was maintained as wild pollinator habitat.

TUNE UP YOUR POLLINATION WITH NATIVE BEE CONSERVATION continued...

More research is ongoing into the value of natural areas to support pollinators for other crops, including cranberries. Here in Wisconsin, UW researcher Hannah Gaines has been performing surveys of cranberry pollinators, and has identified more than 100 different bee species visiting our bogs. According to Hannah, the bogs surrounded by natural habitat have a greater abundance and diversity of native bees, than those bogs surrounded by farmland.

For growers who are interested in this research, Hannah is looking for additional survey locations for 2010. In particular, she would like to hear from growers who are currently not renting honey bees, and growers who have already planted pollinator food plots. She can be reached at 774-392-0498, or via email at: gaines@entomology.wisc.edu.

The Xerces Society

Finally, a number of other pollinator conservation resources are available from The Xerces Society for Invertebrate Conservation. Among these resources are numerous free downloadable fact sheets, bumble bee pocket identification guides, and *Farming for Bees*, our booklet on managing native pollinators on farms. These publications are available on the web at: <http://www.xerces.org/pollinator-conservation/>

Remember that native bee conservation does not have to be a complete replacement for honey bees. You might choose to continue renting honey bees, but by having a robust population of native bees in your marshes, you are ensured against honey bee shortages, price increases, and lousy weather. With honey bees and native bees working side-by-side, pollination will never be a problem.



Wild indigo, *Baptisia alba* is a great native plant for building bumble bee populations prior to the cranberry bloom

Bits 'n' Pieces.

- Assail is marketed by United Phosphorous, Inc. (UPI).
- It is a 30 SG (soluble granule) formulation that is 30% active ingredient by weight.
- The Restricted Entry Interval (REI) is 12 hours.
- The Preharvest Interval on cranberry is 1 day.
- The rate of use on cranberry is 4.0-6.9 oz formulated product per acre.
- No more than 13.8 oz formulated product can be used per season. This allows three applications at the low rate and
- two applications at the high rate.
- Allow at least 7 days between applications.
- Acetamiprid is highly toxic to bees and should not be applied immediately before bloom or during bloom.
- Acetamiprid is highly toxic to aquatic organisms and must be kept out of water.
- Acetamiprid is moderately selective in its activity against beneficial insects. Selectiveness is improved at lower rates. Therefore, in IPM programs, use the lowest effective rates,
- It may be applied by ground equipment, chemigation, and by air.

-- Dan Mahr, University of Wisconsin, Entomology

New Insecticide Profiles: Assail-- Dan Mahr, University of Wisconsin, Entomology

Within the past few years several new insecticides have become registered for use on cranberry. Product names include Actara, Admire, Assail, Avaunt, Delegate, Entrust, Intrepid, Knack, and SpinTor. These are mostly in new chemical groups. Many are more selective than previous broad spectrum insecticides in the organophosphate and carbamate classes and therefore fit better into IPM programs where we wish to protect beneficial insects. Many have a safer mammalian toxicity profile and therefore are safer to applicators. This is the second article in a series designed to provide some basic information about these newer products and how they might fit into your insect management program.

Assail has the active ingredient acetamiprid, another of the products in the new class of insecticides known as the neonicotinoids (see previous article about Admire Pro). The acute oral mammalian toxicity (LD_{50}) of Assail is in the range of 130-890 mg/kg (depending on species of test animal). This spans the range between Toxicity Categories II and III, meaning the dermal toxicity is >2000; placing it in Category III (slightly toxic) via skin exposure.

Assail is a somewhat selective insecticide. Currently it is registered only against gypsy moth, sparganothis, and tipworm; additional insects may be added to the label as we gain more experience.

Potential tipworm usage. We have had Assail in our insecticide trials for four years now, and it has ranked as one of the best materials, giving 83-100% control of larvae in comparison with untreated plots. In 2009, we are conducting timing trials to determine the best application timing as well as number and rate of treatments. Unfortunately, frequent and relatively late frost protection was applied to our plots. At this point, we are still gathering data from these plots.

Potential dearness scale usage. As with imidacloprid, acetamiprid shows reasonably good activity against various scale insects and is registered for scale control on certain crops. However, its potential effectiveness against dearness scale has not been evaluated. If you do have a dearness scale infestation and that it is slightly to moderately toxic if ingested, would be willing to host research plots, please let us know.



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