Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program

Berry News

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Berry "To Do" List

Sustained catch of Spotted Wing Drosophila in eastern NY. Weekly sprays will result in much better results and save a good deal of your crop. Visit http://blogs.cornell.edu/swd1/ for postings of first detections throughout the state and information on control.

Remember:

- Monitor fruit for larvae as the crop ripens.
- Pick the fruit clean and remove culls from field.
- Store harvested fruit promptly at 32 degrees.
- Keep weed growth under control.
- Begin weekly insecticide program when fruit begins to color.

NOW is the time to gather **Foliar Nutrient Samples** (tissue testing). You have until mid-August. All the protocols are listed on the Agro-One Plant Tissue Testing web page.

-Blueberries-

- Prune out winter injured dead wood to prevent canker.
- **Cranberry fruit worm** is a huge concern for many growers. More information about this pest in the late June newsletter
- Scout for **mummyberry** now. The fruit is easier to distinguish as it appears "mummified", but it will be tricky to tell from those fruit that are shriveling on winter damaged wood. Look for fruit turning pink and having slight ridges. If you cut them open you will see white mycelium – a definite indication that it's infected. Take note to implement prevention program next year.

-Cane Berries-

- Scout for **mites** – especially in high tunnel plantings.
- Scout for canes infested by **raspberry cane borer**. These

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will have wilting tips and two dark rings of punctures on the canes where eggs have been laid. Cut off and destroy the wilted tips below the rings as soon as this damage is noticed. (See photo below)

- Look for **raspberry spur blight** damage. More information in the article in this issue.
- **Sap beetles** abound! Use Assail or Brigade – apply with lots of water (100-300 gallons) to insure good spray coverage. These insects have become a very big problem in many eastern NY fields.
- Selectively remove spent floricanes from summer raspberry planting. You can also thin the remaining new primocanes – remove shortest and weakest looking ones now. That will improve vigor and productivity when they become bearing floricanes next year.

Cut below second egg laying ring. Photo courtesy of R. Bessin, Univ. of KY

-Strawberries-

- **Renovate** June bearing strawberries now to maintain vigor of plantings. The drought has mostly broken so mowing the plants 4 days after 2,4-D application is the best protocol.
- Prior to mowing JB strawberries scout for **strawberry root and black vine weevil** adults now. You will see notching on leaves from those insects – an easy diagnostic cue. Also, take note of **weed issues** in the field. September is a good time to get rid of problem weeds like thistle.
- **Fertilize Day neutral** strawberries increasingly until 5 -7# actual N/acre/week is being delivered. This should correspond to maximum harvest. DN berries will have a lull in production approximately 4 weeks after a major heat spike – so you may be seeing poor fruit production now due to the July 4th heat wave. This is normal and they'll work out of it. Some varieties are better in the heat than others – Albion seems less prone to this heat induced dip in production than Seascape.
- Scout DN berries for **mites** and **tarnished plant bugs.**

Anthracnose Crown Rot of Strawberry

Source: North Carolina University / Edited by Laura McDermott, ENYCHP

North Carolina State University, http://content.ces.ncsu.edu/anthracnose-crown-rot-of-strawberry/

Eds. Note: This has been a significant problem for DN berries in the past – and usually in hot summers. Interestingly I've seen less of it this year – possibly nurseries are doing a better job with keeping stock clean. Give me a call if you are seeing this disease in your planting.

Anthracnose is an important disease of strawberry fruit, crowns, leaves, petioles and runners. Three related species of the fungus *Colletotrichum*, including *C. acutatum, C. gloeosporioides*, and *C. fragariae* can be associated with strawberry plants, but this article highlights Anthracnose Crown Rot (ACR) caused primarily by *C. gloeosporioides*. Disease control is difficult when environmental conditions are favorable, and the disease can be especially destructive to California strawberry cultivars when grown on plastic. The pathogen *tends* to be associated with the crown rot phase of anthracnose but can also affect other plant parts.

The most diagnostic symptom of ACR is red and white marbling of the crown (Figure SS-1). However, initial symptoms of ACR include plant stunting and flagging of young leaves due to lack of water (Figure SS-2). Initially plants wilt in the heat of the day, which is often over-looked as drought or heat stress. In advanced infection, the entire plant will die (Figure SS-2). Cutting the crown lengthwise reveals white and reddish brown streaks, creating a marbled effect, or a firm rot (Figure SS-1).

Figure SS-1 – Lengthwise cut through a crown with anthracnose crown rot showing the shades of red and white marbling. Frank J. Louws

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Roots at the site of attachment to the crown tend to remain white and the entire root system tends to remain fibrous. This in contrast to Phytophthora crown rot where the lesion in the crown usually has a consistent dark red to brown discoloration, although it may be marbled, and the roots at the site of attachment are typically black and have a poor fibrous structure.

Figure SS-2: Range of symptoms of ACR showing plants with early wilt symptoms (top left); stunted plants showing wilt (top right); completely collapsed plants (bottom row) and crown discoloration (bottom right). Frank J. Louws

Disease Cycle

Infected strawberry transplants are the primary source of inoculum in fruiting fields. The pathogen may be present on active lesions but in most

cases it is in a quiescent phase – i.e. it has infected green tissue but is not causing symptoms. This symptom-less phase of the disease cycle allows the pathogen to build up undetected and then disease expression occurs under favorable climate conditions (e.g. wet and hot) or when there are some type of chemical/physiological changes in the plant. In nurseries and sometimes in fruiting fields, the pathogen can originate from non-cultivated plant species, start off in the quiescent phase but rapidly move to the necrotic or symptomatic phase. Important plants include Virginia creeper (*Parthenocissus quinquefolia)*, wild and muscadine grape (*Vitis /Muscadinia rotundifolia)* and smilax (*Smilax rotundifolia)*. However, this pathogen species is complex and only about 10 to 67% of the *C. gloeosporioides* isolates from these non-cultivated plants are pathogenic on strawberry.

Once the disease starts, conidia spores are produced in abundance on petioles, runners, and upper crown tissue and are dispersed through rain-splash, especially wind-driven rain. Movement of machinery and workers through the field also may contribute to inoculum spread. Warm, humid conditions are optimal for this disease, thus cultural practices that encourage aeration and rapid drying of plants should be used. Straw mulches may help to reduce the dispersal of spores in splashing water, but plastic mulches provide a springboard for droplets, thus encouraging the spread of disease. Overhead irrigation can also contribute to disease spread.

Management

1. Use Disease-Free Plants

Resistant plants are not available. If you have had problems with this disease, talk to your supplier to make sure they are aware of that. There are diagnostic procedures but no protocol that has been universally accepted for testing nursery plants.

2. Crop Rotation and Manage Non-Cultivated Plants

Rotation out of strawberries for 2 or 3 years will help to rid the field of inoculum from infected plant tissues or infested debris in the soil. However, anthracnose crown rot does not commonly reappear a second year in a field unless the disease is re-introduced on contaminated plants. If the disease recurs in multiple years, local plants may harbor the pathogen and these non-cultivated plants should be removed with an emphasis on the species identified above.

3. Monitor Crop

Periodic scouting of a field, especially during warm and wet weather, will enable early detection of anthracnose. As soon as disease is discovered, immediately remove and destroy infected and surrounding plants to help reduce inoculum levels. Killing the plants with herbicide will initiate spore production by the pathogen, and if these plants are not removed the problem will be aggravated. In most cases, infected plants die within 30 to 45 days after transplanting. However, the amount of plant death typically remains limited in fruit production systems, unlike anthracnose fruit rot that can damage a whole crop.

Nitrogen levels should be kept at the required level, since high nitrogen levels in the soil favor fungal development. Keep foliage dry and reduce

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water splash by use of drip irrigation to help lower conidial dispersal and spread of the pathogen. Editor's Note: For more information about how nutrient levels may affect the severity of this disease, see http://www.plantmanagementnetwork.org/pub/php/research/2009/strawberry/

4. Chemical Control

Current fungicide recommendations are available in the 2015 Cornell Pest Management Guidelines. Captan, Pristine, Switch and several other fungicides are labelled. One to 2 foliar sprays targeted toward the crown when hot wet weather is forecasted can reduce disease spread.

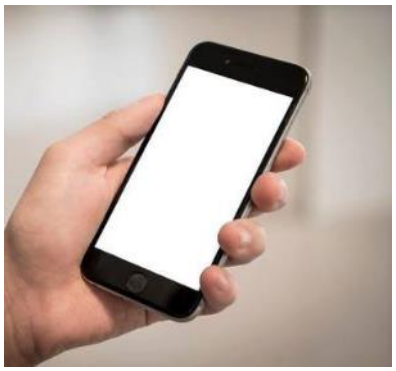
Diagnostic Procedures

One of the first indications of anthracnose crown rot on strawberry plants is the development of drought symptoms limited to foliage originating from a single crown. Plants with anthracnose crown rot also have nicely developed root systems, in contrast to the rotted and feeble root systems of plants with Phytophthora crown rot or black root rot. A telling symptom of infection by C. fragariae or C. gloeosporioides can be found when the crown is cut open longitudinally; a marbling with distinct red and white areas and their interface is present.

If strawberry crowns are suspected of having athracnose crown rot but no signs of the pathogen are evident, sporulation can be induced by placing crowns in a moist chamber for 24 to 48 hours.

Traditionally, morphological characteristics such as conidial shape, the presence or absence of setae, and colony color have been used to differentiate Colletotrichum species. These traits, however, are highly variable among isolates and often subject to interpretation. The morphological differences between C. fragariae and C. gloeosporioides are too subtle for reliable differentiation when cultured on PDA. To make measurements and morphological observations of conidia and setae, isolates should be cultured on strawberry leaf agar (SLA) under continuous fluorescent light.

ITS sequence analyses is the most reliable way to identify species of Colletotrichum. The internal transcribed spacer regions, including the 5.8 rDNA, can be amplified using universal primers ITS1 and ITS4 as part of a standard PCR protocol.



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Raspberry Spur Blight

Angela Madeira, University of Massachusetts

Editors Note: This disease is more prevelant than growers realize. While it doesn't cause immediate crop loss, it results in poor vigor over time and a shorter productive life of the planting.

Raspberry spur blight is caused by the fungus *Didymella applanata*. All species of Rubus are susceptible to spur blight, but red raspberries are particularly sensitive. It is believed to have no other hosts.

Life Cycle

Infection occurs in early spring and is favored by wet weather. In spring, spores (both ascospores and conidia) are released from tiny, black, round fruiting bodies. The spores are carried by wind or splashed by rain onto the leaves, where they germinate. The fungus infects leaves and grows down the petiole and into the cane, where it forms a lesion. Fruiting bodies may be observed in fall. The fungus survives the winter in infected plant tissue and crop debris. Disease can be especially severe in years when there is abundant rain in early summer.

Signs and Symptoms

Symptoms appear in summer. Leaf lesions are brown with yellow margins and often V-shaped. Infected leaves may shrivel and drop, but the petiole is left behind on the cane. Mature leaves are more susceptible to infection than young leaves, and so disease usually begins on the lower third of the cane. Dark brown to purplish lesions form just below axillary buds. Lesions are fairly superficial and the fungus does not invade the vascular system. In late fall or the following spring the epidermis over the lesion may split, and fruiting bodies may be visible. Overwintering lesions may turn silver or gray. Infected buds often fail to survive the winter, or will produce weak shoots in the spring. Bud failure is more severe in years when temperatures remain warm into late fall. Spur blight may be mistaken for winter injury.

Management

Cultural/Biological:

•Proper cane spacing and weed control will maximize sun exposure and air flow and facilitate drying of canes. Do not work with canes in wet weather. Avoid overhead irrigation, as it soaks the foliage and contributes to splash dispersal of spores.

•Sanitation is crucial, as the fungus overwinters in infected plant material. Remove spent floricanes after harvest. Remove any infected primocanes and burn or bury them. Complete pruning well before new canes emerge in spring.

•Remove wild brambles growing in the vicinity, as they can act as a reservoir for the disease

•No varieties of Rubus are truly resistant to spur blight, but some cultivars are less prone to the disease than others. These include "Brandywine', 'Festival', 'Hilton', 'Killarney', 'Latham', 'Madawaska', and 'Newburgh'.

•Avoid excess nitrogen. Spur blight is most severe in overgrown plantings.

•Stressed plants are more susceptible to diseases. Control insect pests such as borers and maggots. Proper fertilization and irrigation also help prevent plant stress.

Chemical:

•An application of lime sulfur before growth resumes in spring can decrease disease incidence.

•A preventive fungicide application may be desirable after pruning if the planting has a history of spur blight.

•Several products are available for spur blight control including Lime Sulfur, Abound, Cabrio, Captan etc. See the 2018 Cornell Pest Management Guidelines for Berry Crops for more information.

—For Your Information—

Great little video about checking for SWD fruit infestation – a MUST watch!
Click HERE: https://www.youtube.com/watch?v=TXij-udedqI

Nanocrystals used to prevent frost injury:
Interesting article about research into using Nanocrystals to prevent frost injury in fruit crops. The unique nanocrystal solution was formulated by Xiao Zhang, associate professor at WSU Tri-Cities' Bioproducts, Sciences and Engineering Laboratory, and a team of collaborators representing multiple disciplines. Check out the article in Fruit Growers News.

Webinar Video, 2/3/18, SWD Management website: Video recording of How to Use Biological Controls when Managing SWD

Could Repellents Be Useful in Protecting Crops From Spotted-Wing Drosophila? Check out this article in Entomology Today reviewing work done at Cornell in the area of repellants.

Frost damaged cherry buds on left, healthy buds on right. From Fruit Growers News.

Calendar of Events

August 6, 2018 – **Northern Berry Field Meeting**, 5-7pm, Rulf's Orchard. We'll discuss tissue testing, SWD and other pest issues, and general berry culture. Lots of different berries including hascaps, tunnel raspberries etc.

August 14 - 15, 2018 - NASGA Summer Tour Watsonville, California www.nasga.org Summer tour will take place in northern California. We plan to visit progressive growers and marketers in the Watsonville area as well touring low elevation nurseries near Manteca and Turlock. Along the way we will take in other agriculture ventures. In California the options are endless.

August 15, 2018 – **Virtual Field Trip: Fall Producing Blackberry Production** – Webinar from 10-11am CST. While primocane blackberries aren't a good bet in our region – this might still be of interest to some growers.

August 22, 2018 – **Berry Field Meeting – Hummingbirds as SWD control**, 5-7pm, Gardenworks, Salem, NY. Blueberries and Brambles, plus a wonderful value added farm store.

November 6-9, 2018 - NASGA European Tour Amsterdam, Netherlands www.nasga.org

December 4-6, 2018 - Great Lakes Expo, Grand Rapids, MI

January 9-11, 2019 - NARBA Annual Conference, Savannah, GA

January 28-31, 2019 - Mid Atlantic Fruit and Vegetable Convention: (Berry Tunnel workshop Jan. 28th)

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