



Berry News

Spring Berry "To Do" List

All Crops

- **NOW is the time to gather leaves for foliar nutrient testing. See the article with link to Agro One lab in this newsletter.**
- Spotted Wing Drosophila have been found in all regions of eastern NY. Berry growers should begin SWD sprays as fruit begins to color. A spray program should be augmented by consistent and thorough picking with no culls left in field and rapid cooling of harvested fruit. For more information about SWD management, see the Cornell SWD Pesticide Management Guidelines attached in previous newsletters, or refer to the Cornell Pest Management Guidelines for Berry Crops.

Blueberries

- Scout for flagging from canker infections.
- Scout for gray mold, anthracnose and other 'fruit' diseases.
- Look for scale on blueberries – see article and pictures in this issue.
- Scout for mummyberry now. The fruit is easier to distinguish as it really is looking "mummy-ish", 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 appear. Also, if you cut them open they will full of white mycelium which will help you differentiate from other shriveling berries. Sort mummified fruit out and remove from planting. Take note to implement prevention program next year.

Raspberries and Blackberries

- In general, the summer red raspberry crop was down. Lack of rain and collapsing floricanes due to latent winter injury reduced yield throughout the region. Black raspberries and blackberries look much better however. This might be the biggest blackberry crop we've seen in eastern NY in a long time! Make sure to protect from SWD.
- Scout for mites – especially in high tunnel plantings.
- Scout for canes infested by raspberry cane borer. These 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.

Strawberries

- June bearing strawberries should be renovated as soon as picking finishes. Even Malwina is done now!
- Day Neutrals are finally beginning to fruit in dependable numbers. Keep removing runners so that all the energy goes to bud set in the crown. Once it gets to be September this is less of

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Strawberries grown in low tunnels just east of Cape Town, South Africa. These tunnels were covered at the beginning of their spring (early August!), and there were conservatively 20 acres covered at this one farm.

In this issue of Berry News:

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an issue because the 6 weeks after the middle of October is gravy for fruit anyway. Make sure they are getting plenty of fertilizer – between 3-5# of actual N per week – moving towards 5-7# N as the fruit starts to ripen – although this rate has been questioned by colleagues in NH and Pennsylvania. Depending on your

soil type and the pre-plant nutrients added, we may be adding excessive amounts of Nitrogen when we should be focusing more on Potassium – more to come on this subject! Leaf analysis would help if you want to keep track of what is happening in the plant.

Impacts of Heat

Mary Concklin, UConn

The heat this summer has impacted fruit and the plants. These blueberry leaves with the red center were interesting because of the pattern which did not fit a biotic disorder or nutritional problem. When the leaf was moved in the picture to the right it became apparent the upper leaf was protecting part of the lower leaf and that this disorder was related to the environment. Several diagnosticians in the country weighed in and said it was related to extreme heat and they had seen this same pattern in azaleas and rhododendrons.

Source: *CT Small Fruit Update*, July 29, 2016



Scale Control in Highbush Blueberry

Mary Concklin, UConn

Literature reviews report three insect scale pests of highbush blueberry: Putnam scale, Lecanium scales, and terrapin scale. In my surveys of Connecticut highbush blueberry plantings, I have observed that Putnam scale is the major cause of scale infestations. On two occasions, I have observed oystershell scale on blueberry branches. Dr. Cynthia Wescott, in *The Gardener's Bug Book*, lists 12 additional scale species attacking blueberry. They are: Azalea bark, cottony maple, European fruit Lecanium, Japanese wax, oak Eriococcus, parlatorialike, and red bay. European fruit Lecanium has been reported on blueberry in Connecticut; but these other species do not appear to be pests at this time. The most common scale in Connecticut and Southern New England is the Putnam scale, which can cause excessive defoliation, decline, and eventual death of blueberry plants.

Putnam Scale Biology and Control

In the last few years, we have seen an increase in Putnam scale (*Diaspidiotus ancylus*) infestations in Connecticut blueberry plantings. These usually occur in older plantings where irregular or improper pruning has allowed excessive

old wood to remain on the bush. Stems and old canes are most likely to be infested, but scale colonization of new growth under heavy infestation and fruit infestations have been seen in some cases. Any planting more than six years old may be a candidate for Putnam scale invasion.

The Putnam scale is an armored scale insect that has a life cycle typical of this large group of pests. The scales pass the winter in Connecticut as fully developed adult insects, which appear as grey waxy dots about 1/16-inch in diameter. With old grey bark and wood that is scaly, these scale encrustations blend in with the color of the bark and are often invisible to the naked eye. The aid of a 10x to 20x hand lens is needed to detect infestations on wood. However, on leaves and fruit the detection is easier. The small grey dots stand out on waxy green leaves and even more so on coloring berries. On fruit, the scale appears to be surrounded by a circular red discoloration. Often the fruit is dimpled at the site of scale attachment. Even a single scale attachment per fruit can completely distort the fruit at harvest.

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Life Cycle

If the waxy scale covering is carefully lifted, the immobile yellow insect can be observed. Under this waxy covering, the female feeds, mates and produces living young, called crawlers. The adult male is a tiny winged insect, which emerges from the scale covering and mates with the female. The adult male does not feed. In the spring, female scales lay a mass of eggs under their scale coverings. Around mid-May, the young scale insects, called crawlers, hatch. This stage is highly mobile and can migrate to leaves and fruit. Crawlers are mite-like in size, six-legged, yellow, with two antennae and flattened. As it matures, it stops moving, then settles down to feed. It molts, shedding legs and antennae to become flattened yellow sacs attached to the bark. It then begins to form the typical grey waxy scale covering over its body. These scales also secrete honeydew while feeding. Honeydew can drop onto leaves and fruit below. Black sooty mold may grow on this honeydew.

Putnam Scale Control

This scale is a much greater problem if bushes are not frequently pruned. The best strategy for management of scale insects is an annual pruning of old wood. Putnam and other scales that attack blueberry are principally stem feeders and do not thrive on strong, vigorous wood. Dormant pruning of old, weak canes and scale-encrusted wood prevents the scales from increasing. This should be followed by dormant oil application. Treat from March 1 to first bloom with horticultural oil. Thorough spray coverage of all stems and branches is essential. Large volumes of spray, 200 to 300 gallons per acre, are needed under heavy scale infestations. Use high pressure so that the plant is well soaked. Do not apply oil sprays within twenty-four hours before or after temperatures dipping to 32oF or below. It is best to wait for the temperature to rise above 50oF and the wind to be calm. Oil and lime sulfur, if used for the disease *Phomopsis*, should be put on as separate sprays and not combined. Sulfur is physically incompatible with superior oils.

By: Norman L. Gauthier, University of Connecticut, Cooperative Extension Educator, Entomologist. Updated by: Mary Concklin, UConn IPM. 2012. Published in *Grower, Vegetable and Small Fruit Newsletter*. February 1993. Volume 93-2. p. 4-5.



Photo (above) shows scale on blueberry fruit and (below) on the underside of the leaves. To the naked eye, the scale looks like a small dimple that can be scraped off with your finger. Photos by A. Mills, CCE ENYCHP



Evaluation of Strawberry Varieties for High Tunnel Production

Wenjing Guan, Purdue University

Source: Issue: 16-09 *Facts for Fancy Fruit*, Purdue University

We are familiar with strawberries grown as a perennial crop in Indiana. Bare root strawberry plants are set in the spring. Fruit is first harvested in the second year and the planting is renovated annually. Using this system, strawberry seasons last for three to four weeks from middle May through June. The traditional system has been replaced with an annual plasticulture system in the southern United States ever since the 1980s. In the annual plasticulture system, strawberry plugs (rooted runner tips) are transplanted in plastic covered beds in late summer or fall. Fruit are harvested in spring in the next year. After the fruiting season, the plants are removed. The annual plasticulture system is favored in the south because it has a longer harvest period and produces strawberries with bet-

ter quality. In Indiana, trials established to test the annual plasticulture system had limited success because of short fall season and harsh winter. However, this impression might be changed with the use of high tunnels. Studies have shown that high tunnels extended strawberry season, increased yield and improved berry quality. To test feasibility of growing strawberries in high tunnels with the annual production system, a trial was conducted at Southwest Purdue Agricultural Center from August 27, 2015 to May 31, 2016 to test yield, quality and harvest period of ten strawberry varieties (Figure 1). In this article, we will discuss findings of the trial.

Varieties tested in the trial include:

Albion
Benicia

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Camarosa
Camino Real
Chandler
Festival
Radiance
San Andreas
Sweet Ann
Sweet Charlie

Overall, the trial achieved great success. A total of 1,295 lbs of strawberries were harvested from 660 plants (66 plants of each variety) in a 30 × 96 high tunnel. For most of the varieties, peak harvest season started in middle April and lasted till the end of May. ‘Albion’, ‘San Andreas’ and ‘Sweet Ann’ are day-neutral varieties, they started to produce berries in middle October. Although the yield in fall can hardly justify commercial production. The only exception might be ‘Albion’ that produced the most berries in October, November and December (0.17 lb/plant).

The top yielding variety in this trial was Radiance that produced 2.86 lb berries per plant, following by San Andreas (2.37 lb/plant), Chandler (2.17 lb/plant) and Benicia (2.08 lb/plant). ‘Camarosa’, ‘Sweet Ann’ and ‘Sweet Charlie’ had the lowest marketable yield (1.42 lb/plant, 1.62 lb/plant, and 1.69 lb/plant, respectively). ‘Radiance’ produced the most strawberries, it was also the variety that had the longest harvest period. A few ‘Radiance’ strawberry ripened in November, December and during the coldest period in January and February. Primary harvest took off in end April. In the spring, harvest of ‘Sweet Charlie’ and



Figure 1. Strawberries grown inside a high tunnel at Southwest Purdue Agricultural Center. Photo was taken on April 16 2016. By W. Guan

er berries while fruit of ‘Chandler’ were much softer, easily being damaged through handling.

Unmarketable fruit of most of the varieties were less than 15% of the total yield except ‘Sweet Ann’ (21%) and ‘Camarosa’ (18%) in this trial. Most of the cull fruit were caused by gray mold. Other disease and pest problems we have encountered include powdery mildew, yellow striped armyworms and two-spotted spider mites. In winter, we used row covers for frost protection. Pollination was carried out by wind.

The 2015/2016 season was featured by warm fall and mild winter that was favorable for strawberry production. In the 2016/2017 season, we will continue to test the strawberry production system with the focus on developing ideal fertility plans.

Red Druplet Disorder in Blackberries

Editors’ Note: *Although we normally don’t have much problem with blackberries except actually getting fruit (!) this year has been an exceptional year for blackberries. Still, there have been a few calls about coloring etc. The following is edited from a blog post by Dr. Gina Fernandez at North Carolina State University. You can see the entire post, and access other Team Rubrus posts at: <http://teamrubrus.blogspot.com/2016/07/red-druplet-disorder.html>.*

Now that we are reaching peak harvest and peak summer temperatures, red drupelet disorder is starting to appear in harvested fruit. After the fruit is harvest-



Photo of red drupelet disorder courtesy [Team Rubrus blogspot](http://TeamRubrus.blogspot)

ed, individual black drupelets will revert back to a red color. Red drupelet disorder is also called reversion, reddening or red cell. Here are some of thoughts from Penny Perkins-Veazie, a researcher that has worked on this problem for years:

- Harvest before 10 am, get to cooler within an hour of harvest.
- Remove heat quickly or delay field heat development.
- Forced air cool may need to be set 5 F higher than usual to avoid excess coldness at top of pallet.
- Least susceptible variety continues to be Navaho. Those showing problems are Natchez, Tupi. Ouachita can be

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problematic if rainfall has been high and harvest is going into afternoon.

- Trellising or using E-W row orientation helps to keep fruit in shade longer, decreases exposure to light/heating. (GF: our shift/RCA trellises seem to have less red and white drupelets in general)
- We are not yet sure of production practice issues on red drupe although some reports with tunnel grown blackberries indicate keeping nitrogen rates lower and avoiding heat buildup help with the problem.
- Environmental possibilities for exacerbating the prob-

lem seem to be water stress (high rainfall within a few days of harvest, or high rainfall in spring followed by very hot temperatures), nitrogen imbalance, and possibly calcium/potassium availability.

Max Edgley, from the University of Tasmania, has an excellent slide show on this disorder. Max attended the Rubus and Ribes Symposium last year and has shared some of his findings here:

http://www.utas.edu.au/_data/assets/pdf_file/0003/792363/Red-drupelet-disorder-Presentation.pdf

Reminder to Growers in the Northeast to Observe ENTRUST SC Resistance Management

Teresa Rusinek, CCE ENYCHP

Last year, Dow AgroScience, manufacturer of Entrust, sent out a letter to University researchers and extension personnel asking for assistance in alerting growers to the over use of Entrust against Spotted Wing Drosophila and Colorado potato beetle. Their letter addressed issues with “noncompliance with labelled resistance management restrictions for Entrust SC in organic cropping systems”. The letter stated that “they have been made aware that Entrust SC is allegedly being used at a greater frequency than the label allows per crop. Dow is monitoring the situation to understand if these were isolated cases or more widespread occurrences... if the non-compliance issue continues then Dow will pursue corrective action which could include a withdrawal of the product from the Northeastern United States.

Dow is concerned that resistance to Entrust SC (group 5 insecticide) will translate into pest resistance to their conventional spinosadanalogue products, Radiant SC and

Delegate (also Group 5 chemistry), resulting in the loss of efficacy for conventional growers as well. The possibility of resistance developing in Colorado potato beetle and Spotted Wing Drosophila to Entrust will eliminate one of the most effective tools organic growers have in managing these pests. Withdrawal of Entrust from the Northeast would also eliminate its use for a host of other hard to control pests.

The threat of resistance to this material is real. Already, Western Flower Thrips, a serious pest in ornamentals, vegetable, field crops and greenhouse production, are known to be resistant to spinosad.

Resistance management directions on the label state that rotation to other insecticide classes should occur after two consecutive applications, check the label for details. Please pay attention to resistance management directions on the label for each crop so we do not lose this material.

Recommended Timing & Frequency of Nutrient Testing- Guidelines for growers

Soil Sampling

- Prior to planting: Always do a baseline soil test one year before planting. This will allow you to add the necessary amendments well before planting so that soil nutrient conditions will be optimal when the plants go in the ground. This is especially a concern for blueberries as lowering soil pH can be a problem in our soils.
- Problem situations: Use a soil nutrient test, or better yet, spring for a Cornell Soil Health evaluation, to help you determine if there are overlaying issues with the soil. When diagnosing problems soil tests should be used in concert with foliar testing if at all possible.
- Routine maintenance – soil tests only need to be done every 3 or so years and not annually. Tissue sampling is how annual fertility is monitored.

Tissue Sampling

- Annual fertility information: use results from annual foliar

analysis to inform ongoing fertility program. Berry crops should be sampled every year at the same time – late July through the middle of August for blueberries and caneberries and first fully enlarged leaves after renovation for June Bearing strawberries. For Day Neutral strawberries you can monitor the plant fertility several times during the season. These plants have such a long bearing season that closer monitoring can be very helpful.

- Problem situations—take samples from both healthy and unhealthy areas of the field for comparing. The soil tests for these areas should also be considered when trying to diagnose nutritional problems.

Collect leaf samples NOW! Refer to past Berry News for instructions or visit the Agro One website for information and forms. <http://dairyone.com/analytical-services/agronomy-services/plant-tissue-testing-services/>

Current Average Farmers Market Prices

Product (NC = nonconventional)	Unit	Mid-Hudson	Capital	Saratoga - Lake George	Northern
Blueberries	pint	\$4.00	\$4.25	\$4.00	\$3.50
Blueberries NC	pint	\$5.00	\$4.60	\$6.67	
Raspberries	1/2 pint	\$4.50			\$4.50
Raspberries NC	1/2 pint	\$4.00			
Strawberries	pint	\$4.00			\$5.50
Strawberries NC	pint		\$3.63	\$5.50	

Site	2016 Weekly Total 8/3-8/9	2016 Season Total 3/1-8/9	2015 Season Total 3/1-8/9	2016 Weekly Rainfall (inches) 8/3-8/9	2016 Total Rainfall (inches) 3/1-8/9	2015 Total Rainfall (inches) 3/1-8/9
Albany	163.5	1921.9	1829.5	0.6	15.17	15.05
Castleton	153.7	1854.7	1716.6	0.4	16.32	15.79
Glens Falls	153	1726.0	1562.0	0.1	20.96	15.22
Griffiss	153.6	1604.1	1457.5	0.18	21.75	23.29
Guilderland	150.0	1732.5	1646.5	0.5	17.75	21.03
Highland	164.2	2026.2	NA	0.05	16.73	NA
Hudson	166.5	2004.2	1838.3	0.18	22.63	18.49
Marlboro	156.5	1929.1	1768.6	0.00	16.79	14.11
Montgomery	156.5	1937.6	1815.5	0.00	16.22	15.79
Peru	152.5	1606.6	1477.2	0.1	9.35	18.26
Red Hook	154.1	1901.6	1743.2	0.14	13.81	15.33
Willsboro	152.3	1583.6	1434.1	0.11	12.69	22.38
N. Adams, MA	132.5	1540.5	1408.5	0.9	17.16	17.32

Upcoming Events

August 15th, 2016 - IPM Climate and Weather Conference, 9am - 4:15pm. Albany County Cornell Cooperative Extension, 24 Martin Rd., Voorheesville, NY 12186. Organized and hosted by the NYS IPM. Cost: \$45. Pre-registration closes on August 10. If you have questions, please contact Amanda Grace at arw245@cornell.edu or 315 787-2208 or visit <https://nysipm.cornell.edu/resources/nys-ipm-conferences/climate-and-weather-conference>.

August 17 – 18, 2016 - North American Strawberry Growers Association Summer Tour, Quebec City Quebec Canada. For more information go to <http://www.nasga.org/n-american-strawberry-growers-summer-tour.htm>.

November 2, 2016 - Managing Phosphorus in Organic Residuals Applied to Soils 8:45-4pm. Holiday Inn, 265 Lakeside Ave. Marlborough, MA 01752. Approval has been requested for the following professional certifications: CGCS, CSFM, MCH, MCLP, and AOLCP. For more information contact: Kelly Kraemer, 413-545-5221, kkraemer@umass.edu or visit: <https://www.regonline.com/phosphorus>.

ENYCH Program Educators:

Fruit

Dan Donahue
Phone: 845-691-7117
Email: djd13@cornell.edu
Tree Fruit

Anna Wallis
Phone: 443-421-7970
Email: aew232@cornell.edu
Tree Fruit & Grapes

Laura McDermott
Cell: 518-791-5038
Email: lmg4@cornell.edu
Berries

James O'Connell
Phone: 845-691-7117
Email: jmo98@cornell.edu
Berries & Grapes

Vegetables

Chuck Bornt
Cell: 518-859-6213
Email: cdb13@cornell.edu

Amy Ivy
Phone: 518-561-7450
Email: adi2@cornell.edu

Teresa Rusinek
Phone: 845-340-3990 x315
Email: tr28@cornell.edu

Erik Schellenberg
Phone: 845-344-1234
Email: jk2642@cornell.edu

Crystal Stewart
Cell: 518-775-0018
Email: cls263@cornell.edu

Maire Ullrich
Phone: 845-344-1234
Email: mru2@cornell.edu

Business and Economics

Jesse Strzok
Phone: 518-429-1464
Email: js3234@cornell.edu