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Spring Berry "To Do" List

-STRAWBERRIES-

- Remove straw from June bearing strawberries as soon as possible. Studies have shown that delaying the removal of winter straw mulch results in a yield decrease of as much as 27% mostly in terms of total berry numbers, not individual berry size. The decrease in loss caused by delay of straw mulch removal can be as much as the loss caused by winter injury if you had never mulched them at all. Research indicates that straw applied late in the winter (Dec. to February) and then removed at the earliest possible time in the case of this study at the end of February—consistently results in best winter survival and best overall productivity because plants get access to light early.
- Phytophthora control Wet fields last fall has resulted in a higher than normal incidence of Phtyophthora root infection. If your fields were consistently wet last fall, and if plants are showing the classic burnt orangey coloring in the crown and down into the root, it could be helpful to apply either Ridomil or a phosphoric acid product (ie ProPhyte etc.). Apply when the plants are showing green growth. A low rate of nitrogen may also help keep it between 10 and 20 pounds of actual N per acre definitely not more because too much vegetation will result at the expense of the fruit yield.
- **Spray early for best leaf spot control** If leaf spot incidence has been climbing, spring is the time to spray plants. See Kerik Cox's article in this issue.
- **Plan for frost protection** inspect irrigation equipment and row cover. Make sure you have an adequate temperature detection system at the field level. More on this in next issue.
- **Apply early season herbicides** Late winter or early spring after winter annual broadleaf weeds have broken dormancy, but before strawberries begin to grow, is a key time for

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herbicide application. Apply 2,4-D amine, Formula 40 or other labeled 2,4-D formulations, in late winter or early spring to control emerged winter annual broadleaf weeds.

Add Chateau for residual annual broadleaf weed control. Use 1 quart of Formula 40 per acre and 3 dry ounces of Chateau after the soil in no longer frozen but before strawberries break dormancy and begin to grow. Chateau can be used once in each calendar year. If Chateau was used in the fall, it can be reapplied in March or early April but not used again in the calendar year. The crop will "out-grow" small application injury that may occur, but do NOT apply after the crop has broken dormancy and begun to grow or lasting injury may result.

Note the pre-harvest interval (PHI) for Sinbar in strawberries is 110 days. This effectively eliminates late winter and early spring applications of Sinbar to strawberries before harvest. A typical strawberry field grown using the matted row system begins to bloom about May 1st and harvest begins in late May or early June. The cut-off date for the 110 day PHI would be sometime in February and has already passed.

-BLUEBERRIES-

- Prune blueberries before bud break Blueberry buds are swelling slowly, resulting in some extra time for pruning. But just a little bit of sustained warmth will push bud development quickly. I haven't seen any indication of wide spread winter damage to buds – despite some early winter temperatures that were very cold.
 - While pruning, *look for evidence of canker*. Shoot dieback that goes down the entire cane and looks like the death happened last season could indicate canker. Canker diseases can be controlled by spraying before budbreak with many different products including with lime-sulfur, Quilt Xcel, Quash, Pristine and several different copper formulations. See the 2019 Berry Crop Guidelines for specific information.
 - Scout for mummyberry disease Mummyberries look like tiny black pumpkins. They can be on the ground or still hanging on the plant. If you saw mummyberry strikes last year, then you should plan to spray for this disease as buds break, but physically disrupting the soil will help as will a dormant spray of lime sulfur. Ground sprays of urea have been shown to burn the developing apothecia as well.
 - Look for scale insects. Dormant oil will help control them as will Brigade, Triple Crown or Esteem.

- Inspect for Insect Stem Gall not a huge problem, but in specific instances has become a challenge especially in young plantings. Look for large bulbous galls form on the stems, often near the terminals. These are caused by the larvae of a tiny flightless wasp. The adults overwinter in the galls, emerge in early June, and crawl or hop to other stems to deposit eggs. Prune out the galls to control.
- Apply early season herbicides Casuron 4G must be applied before May 1st. If you are applying it in April, make sure to apply before soil temperatures exceed 45 degree F and before any annual weed seeds germinate. Casoron CS can be applied a bit later but still needs to be incorporated by rainfall before weed germination; it is labeled for 1 year old blueberries. Casoron controls annual grasses and broadleaves, as well as some perennial grasses. Follow Casuron with a post-emergent such as paraquat to kill pre emerged weeds or apply glyphosate when weeds are actively growing. Princep, Devrinol, Axxe, Solicam or Sinbar can all be applied for pre-emergent weed control. If you have a nutsedge problem, consider using Sandea.
- Apply sulfur if soil pH is higher than 5.2 200#/A is the maintenance rate that should be applied 1-2 times annually to prevent soil pH from creeping up. Remember that the target pH is 4.5.

-BRAMBLES-

- Brambles are still dormant in most locations, but like blueberries, things will change quickly when we get some sustained warmth. Complete the necessary Pruning: After you finish blueberry pruning you can begin with brambles. Remember to keep cane density at no more than 4 canes per square foot. There may be some winter injury so look for that and prune it out.
- Apply early season herbicides Casuron 4G (granular) can be used in caneberries. The same caveats listed in the blueberry section of this 'To Do' list apply. Casoron CS can be applied a bit later but still needs to be incorporated by rainfall before weed germination; it is labeled for blackberry and raspberries if applied before new shoot emergence. Another pre-emergent is Surflan. Again there are two formulations. Surflan AS can be used in non-bearing and bearing brambles at a rate of 20-40 gallons per acre. To broaden the spectrum of weed control, tank mix Gramaxone, Princep or Solicam. Irrigate product in to activate material. Surflan XL 2G can only be applied to non-bearing brambles.

Understanding Strawberry Leaf Spot Management

By Kerik D. Cox, Cornell University

Leaf spot diseases of strawberries

There are several leaf spot diseases of strawberry endemic to NY, common leaf spot, leaf scorch, and leaf blight. While these are caused by different fungal pathogens and vary a bit in the symptoms they produce on the leaves and fruit, they are easy to distinguish from one another even by the causal observer. In many instances, the impacts of leaf spot disease are minor, and producers can manage these diseases costeffectively with a unified disease management program

focusing on horticulture practice and applications of modern fungicides. Of the leaf spot diseases, common leaf spot is most prevalent, and plants can become quite severely infected at the end of the season. Such high levels of strawberry leaf spot at harvest can cause growers to question the impact of the diseases on plant productivity.

Common Leaf Spot epidemiology

There has been a considerable amount of epidemiological research conducted by the program of Odile Carisse at Agriculture and Agri-Food Canada in Quebec. While her team has principally looked at the factors influencing black seed disease, a seed infection of fruit rarely observed in NY, they have provided an understanding on the impact of leaf symptom severity on photosynthesis and berry weight. According to their early studies, it seems that when leaves have more than 15% disease severity (Figure 1), photosynthesis can become compromised, and if the disease left completely unmanaged berry weight could be reduced by almost half. In later studies, Odile's team

are not needed: 1) if there has been less than 4" of rain 31 days prior to bloom, or 2) if there are less than 10 spots per leaf less than 21 days prior to bloom.

Common Leaf Spot field trials

It may be that the grower standard disease management programs in NY cover these early season management thresholds mentioned in Odile's work. However, leafspot epidemics continue to increase later in the season towards the fall when harvests are mostly over (esp. for June bearing

> strawberries), but the plants are still producing young susceptible leaves. In this case, crop load impacts may be of less concern than impacts on overwintering of severely affected plants. As part of the research funded by the New York Berry Growers Association, we were able to conduct two years of field trial research on strawberry leafspot management in Geneva. Studies were conducted on plantings of day neutral 'Albion' strawberries planted on white on black plastic in the open or covered with low tunnels from Dubois Agrinovation. Trials where started in late July after first cropping to focus on disease development from August to October where growth seem to slow, but risk of fruit room is reduced with cold weather despite season extension under cover. In 2017, we examined the influence of cover and fungicide program on the development of leaf spot. We tested three fungicides programs (timed to managed pre-harvest Botrytis fruit rot - not common leaf spot) focusing on copper soap (Cueva from Certis; 2qts/A), a soluble silica fungicide

miticide (Sil-Matrix from Certis; 1% solution), and a convention standard of fludioxonil-cyprodinil (Switch from Syngenta, 11 oz./A) alternated with fenhexamid (Elevate by

(Continued on page 4)

Healthy



Save Analyzed Image

strawberry leaf in the field with approximately 15%

common leaf spot severity as determined by the

Figure 1: Mobile phone screen capture of a

Leaf Doctor app (Pethybridge et al. 2015).

(Continued from page 3)

Arysta Life Science 24 oz/A). We found that incidence of common leaf spot was lower open plots compares to those under cover, irrespective of the fungicide programs tested (Figure 2). Regarding fungicide program, we found that three fungicide programs greatly reduced leaf spot incidence on uncovered strawberries, but leafspot incidence was much higher in copper (Cueva) plots covered with low tunnels. In 2018, the experiment became more complex and examined the influence of cover (uncovered vs low tunnel), fungicide program (conventional vs organic), and timing (Calendar; 7-10 days vs NEWA strawberry fruit rot model; "High" risk). The conventional program was the same as in 2017, but the organic program consisted of applications of *Bacillus* amyloliquefaciens (Double Nickel LC from Certis; 1qt/A) alternated with Bacillus mycoides isolate J (Lifegard from Certis; 4.5 oz/100 gal). Similar to 2017, we found that the incidence of leaf spot was higher under plots covered with low tunnels irrespective of the fungicide program or the timing program (Figure 3 & 4). Although the incidence of leaf spot was higher in 2018 than 2017, the use of NEWA system for timing fungicide applications for fruit rots reduced the level incidence of leaf spot since applications where likely better matched to wetting events.



Figure 3. Mean percent incidence of common leaf spot at harvest in October 2018 in a day-neutral planting of 'Albion' strawberries planted on open plastic (cover) or under low tunnels (no cover) for organic (green) and conventional (orange) fungicide programs. Values represent means and standard errors of six plots. Columns denoted by the same letter for plots under "cover" (low tunnels) or "uncovered" are not significantly different (P < 0.05) according to the LSMEANS procedure in SAS 9.4 with an adjustment for Tukey's HSD to control for family-wise error.



Figure 2. Mean percent incidence of common leaf spot at harvest in October 2017 in a day-neutral planting of 'Albion' strawberries planted on open plastic (violet) or under low tunnels (orange) for different fungicide programs. Values represent means and standard errors of six plots. Columns denoted by the same letter capital ("covered" plots) or lowercase ("uncovered" plots) are not significantly different (P < 0.05) according to the LSMEANS procedure in SAS 9.4 with an adjustment for Tukey's HSD to control for family-wise error.



Figure 4. Mean percent incidence of common leaf spot at harvest in October 2018 in a day-neutral planting of 'Albion' strawberries planted on open plastic (cover) or under low tunnels (no cover) for calendar timings (yellow 7-10 days) and NEWA strawberry fruit rot systems (blue "High" risk). Values represent means and standard errors of six plots. Columns denoted by the same letter capital (plots under tunnels) or lowercase (uncovered plots) are not significantly different (P < 0.05) according to the LSMEANS procedure in SAS 9.4 with an adjustment for Tukey's HSD to control for family-wise error. (Continued from page 4)

Preparing for leaf spot in 2019

To date, the impact of late season leaf spot on the overwintering of strawberries is still largely unknown. To start with the best leafspot management program, scout for leaf spot in the month before bloom and be mindful of the rain the month before bloom. If there's been more than 4" of rain (that level of rainfall will likely leave a lasting impression) a pre-bloom fungicide application may be warranted. It's possible that leaf spot may be higher in covered plantings, but the benefits of cover production for general disease management will far outweigh the additional leaf spot. Finally, managing leaf spot is possibility for both organic and conventional operations and there are several biopesticides that are effective.

Literature

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Congratulations to Hand Melon Farm and Rulf's Orchard!

John Hand, the owner of the Hand Melon Farm in Greenwich, NY was presented the Century Farm Award at the January meeting of the NYS Agricultural Society in Syracuse, NY. A Century Farm must be in continuous operation for 100 years or more by the same family on the same land. Hand Melon Farm produces a signature sweet melon that was first trademarked in 1937. Today the operation is in the "hands" of the fourth and fifth generations who have focused exclusively on growing vegetable and berry crops on their 425-acres, in addition to operating two retail stands.



Rulfs Orchards in Peru, NY received the 'Next Generation

Farmer Award' which recognizes a long-time producer and those new to the industry who are farming in new and vibrant ways. Rulf's Orchard has the third generation working to create a year-round business which began as an orchard and traditional farm market. They have added a greenhouse, purchased a flower shop, and serve breakfast and lunch at their café.

Established in 1832, the NYS Agricultural Society's mission is to foster, promote, and improve the NYS food and agricultural industry through education, leadership development and recognition programs. Arguably one of the oldest organizations of its kind in the US, the Agricultural Society has played a vital role in the development of the NYS Department of Agriculture and Markets, Cornell University's College of Agriculture & Life Sciences, the NYS Agricultural Experiment Station, the NYS Fair, and the Empire State Food and Agricultural Leadership Institute (LEADNY). The NYS Agricultural Society Foundation was formed in 2011 to support the mission of the NYS Agricultural Society through a grant program.

Formidable Fruit Doyenne Earns Excellence in IPM Award

Dr. Juliet Carroll, Fruit IPM Coordinator, received an Excellence in Integrated Pest Management (IPM) Award from the New York State Integrated Pest Management Program (NYSIPM) at the Viticulture day of the B.E.V. (Business,

Enology, Viticulture) conference in Rochester. NYSIPM develops sustainable ways to manage pests and helps people to use methods that minimize environmental, health and economic risks. The award honors individuals who encourage the adoption of IPM in their businesses, schools, communities, and farms, and who develop new tools and tactics for sharing these practices.

Vital. Invaluable. These are words used to describe Julie Carroll's IPM contributions by her colleagues. Carroll spearheaded the expansion of NEWA, a website and network which allows growers to understand how the weather will affect fungal and insect pests, and takes the guess work out of their pest management strategy. Carroll ran

NEWA for over a decade. Timothy Weigle credits NEWA's growth in not only weather stations, but also the number of states participating, to Julie's guidance. Under her leadership NEWA went from 45 weather stations in New York State to over 500 in 12 states. He notes further that her work on improving the user experience with the grape disease and grape berry moth models on NEWA, along with Wayne Wilcox and Greg Loeb, had an enormous impact on the implementation of grape IPM in New York.

Laura McDermott, Regional Extension Specialist in Hudson Falls, NY, noted Dr. Carroll's passion for integrating pest management strategies, and called her "a determined perfectionist."

Carroll also led the development of Trac software. Introduced in the early 2000s, the software simplified and digitized pesticide recordkeeping for large and small growers and processors alike. It allows farmers to input the information once, and generate customized reports for different processors. The software also includes reference to "IPM Elements" for grapes and other crops—a tool that helps



growers assess their pest management practices. Grape processors across the state, including Constellation Brands, use TracGrape's reports for their pesticide reporting requirements. Carroll built Trac software for five fruit crops,

> and partnered with a colleague to create TracTurfgrass for golf, lawns, sports fields and sod farms.

> Luke Haggerty, of Constellation Brands, calls Carroll's TracGrape software "a true breakthrough" in record keeping. As a Grower Relations rep for Constellation, he relies on information provided by NEWA: "Julie has always been very proactive in developing and delivering the products needed for our growers to produce grapes in an environmentally and economically sustainable way."

Tim Martinson, Cornell Cooperative Extension Viticulture specialist, noted, "IPM is built on information and decision-making tools. Juliet has built TracGrape and NEWA into useful, practical tools for growers."

Dr. Carroll also co-edited Organic Production and IPM Guides for grapes and several berry crops, and has regularly presented at Lake Erie Regional Grape Growers' conferences and Coffee Pot meetings. She has conducted research on devastating pests such as the Spotted Wing Drosophila (SWD) —investigating whether hungry hummingbirds can provide meaningful control. Dr. Carroll has also chaired the Northeast IPM SWD working groups for the last decade, bringing research scientists, growers, industry reps, and extension educators from across the region together to help find solutions.

Carroll has also helped fruit growers with bird management. Tim Weigle noted that her bird-scaring tactics have saved everyone a lot of money and are more popular than the traditional neighbor-alienating air cannon.

Congratulations Julie!

Learn more about Integrated Pest Management at <u>nysipm.cornell.edu</u>

FOR YOUR INFORMATION:

• Strawberries took the top spot in the Environmental Working Group's (EWG) "Dirty Dozen" again this year. To assure consumers that fresh produce is safe, several organizations and retail markets have increased their efforts to counter the attention that the dirty dozen list receives. According to The Packer, The Alliance for Food and Farming and the U.S. Apple Association were among the orgs that spoke out in defense of conventional fruits and vegetables after the list emerged March 20.

Mainstream media including CNN, USA Today, Fox News and People covered the release of the list, but AFF executive director Teresa Thorne said coverage in recent years has at least become less one-sided. Two years ago, 43% of coverage included only the EWG perspective, but in 2018 that number dropped to 19%.

To read more about the response to the Dirty Dozen list, visit: The Packer.

• Organic blueberry imports have rocketed from \$2.9 million in 2011 to \$117.4 million in 2018. Likewise, U.S. Department of Agriculture statistics show that the volume of organic blueberry imports grew from 605 metric tons in 2011 to 16,031 metric tons in 2018. The USDA said Chile, Canada, Mexico, and Peru are the leading global suppliers of organic blueberries to the U.S.



Figure: U.S. Organic Blueberry Imports in 2018

• Recent Published Research from The USDA's Blueberry Harvest Mechanization Project:

Source: Northwest Berry Foundation Small Fruit Update, provided by Dr Fumi Takada of USDA.

Lots of really interesting information in these papers which we'll try to summarize periodically throughout the season and include in this Berry News – but if you want the entire article – here are the links!

Microbial quality of blueberries for the fresh market (6/19, ScienceDirect)

Microbial loads on selected fresh blueberry packing lines (6/19, ScienceDirect)

<u>Modified over-the-row machine harvesters to improve northern highbush blueberry fresh fruit quality</u> (1/8/19, Agriculture Journal)

Ergonomic evaluation of current advancements in blueberry harvesting (11/17/18, Agronomy Journal)

April 23 & 24, 2019—FSMA/PSA Food Safety Training 8:30am—5:00pm, CCE Greene County 6055 Route 23, Acra, NY 12405

Day 1: FSMA/PSA Grower Food Safety Training Course

- A grower training course developed by the Produce Safety Alliance (PSA) that meets the regulatory requirements of the Food Safety Modernization Act (FSMA) Produce Safety Rule. This one-day training is a requirement for farms growing more than \$25,000 worth of fruits and vegetables. Cost: \$35/person

Day 2: Food Safety Plan Writing Workshop

- A hands-on workshop that will help growers write a Food Safety plan that will allow the farm to be certified through the Good Agricultural Practice program (GAP). This day of the training is optional, but you must have completed a FSMA/PSA training to attend this portion of the two-day course. Cost: \$35/person

Registration to attend both days is \$50/person.

Visit the CCE ENYCHP website to register online.

The NYS Department of Agriculture and Markets is underwriting the cost of the training manuals and the course certificates for all NYS residents that attend the FSMA/PSA Training (Day 1). If you are NOT a NYS resident, you will be charged an additional \$50/ manual and \$35/certificate on the day of the course.

*All growers that produce more than \$25,000 annual gross should attend Day One of this class.

Interested in diversifying your farmers market, farm stand, or CSA offerings with specialty fruit crops?



Hardy kiwiberries in a kiwi vineyard in New Hampshire

Have you ever thought about growing currants, kiwiberries, goji berries, beach plums, or other "unusual" fruits? Tell us about it! The Eastern NY Commercial Horticulture Program is gauging grower interest in growing specialty fruit crops. Your input will help guide a project that will aim to develop growing recommendations and enterprise budgets for unusual fruit crops in New York.

Fill out our online survey by clicking on the following link: <u>https://cornell.qualtrics.com/jfe/form/SV_6MerCyXklTm7YlT</u>



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