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Berry News

ENYCH Program Educators:

Vegetables

Chuck Bornt

Cell: 518-859-6213

Email: cdb13@cornell.edu

Amy Ivy

Phone: 518-561-7450

Email: adi2@cornell.edu

Teresa Rusinek

Phone: 845-691-7117

Email: tr28@cornell.edu

Crystal Stewart

Cell: 518-775-0018

Email: cls263@cornell.edu

Maire Ullrich

Phone: 845-344-1234

Email: mru2@cornell.edu

Fruit

Laura McDermott

Cell: 518-791-5038

Email: lmg4@cornell.edu

Berries

James O'Connell

Phone: 845-691-7117

Email: jmo98@cornell.edu

Berries & Grapes

Dan Donahue

Phone: 845-691-7117

Email: djd13@cornell.edu

Tree Fruit

Steve Hoying

Phone: 845-691-6787

Email: sah19@cornell.edu

Tree Fruit

Business and Marketing

Bob Weybright

Phone: 845-797-8878

Email: rw74@cornell.edu

Layout:

Carrie Anne Doyle

Content Editor:

Laura McDermott

Regional Update

Berry phenology continue to move forward at a nice clip. Interestingly there is not a lot of difference from south to north. The New England coast may even be slightly behind the Capital District and Long Island is slightly behind the Hudson Valley. Weather this past two weeks has been seasonably warm with heavy to moderate showers in some areas – but not all. A few growers have been irrigating – and not just for frost protection. Frost events have been spotty and relatively mild but we have had a bit of injury in cold spots – mostly to strawberries that were not protected. Unfortunately the thunderstorms also brought hail to a few areas – I haven't heard of major damage.

June bearing strawberry harvest will begin just barely in southernmost regions on early varieties. This is great for them as Fathers' Day weekend is a big berry weekend and we will likely be short on local fruit. The weekend of the 14-15 should see picking commence in every patch south of Albany and many in the north. Day-Neutral plants wintered from last year and covered also have some fruit, and the annual system of Chandler and Flavorfest is pushing out lovely fruit for Farmers' Markets in Washington County. Some clipper activity and some TPB nymphs were seen lately, but no huge problems with either. Most growers were able to get Botrytis sprays on in a timely fashion, so hopefully that won't be a major problem. Bloom has looked very strong so yield should be excellent!

Blueberries are mostly all in bloom. Some northern plantings have a lot of winter injury – and even some plantings in the Capital District will need to be pruned in order to prevent Phomopsis from getting a foot-hold. Bloom looks surprisingly strong – especially when compared with how the plants looked in March.

Caneberries fared the worst this winter, but raspberries are now coming on strong with bloom starting in the south and plenty of buds showing up north. Blackberries still look rugged – but they are also bouncing back. Those growers with swing arm trellis' report little winter injury – they may have the most blackberry fruit in the entire region.



Ripe 'Flavorfest' strawberries under bird net at Pleasant Valley Farm in Argyle, NY.

Berry 'To Do' List

All crops

- Plan for SWD control – see article in this newsletter.
- Keep eyes out for evidence of voles –control throughout season.
- What are you going to do to prevent bird damage?

Blueberries

- Water blueberries (1-2" each week) in early season to encourage shoot elongation.
- Prune out winter injured dead wood to prevent canker. Scout for scale insects, weevil

continued on next page

Berry 'To Do' List, continued from previous page

- notching, blueberry gall midge, crown gall, witches broom etc. while pruning.
- Apply bloom applications to prevent fruit molds.
- Treat for Mummyberry as needed.

Blackberries

- Most blackberries took a hit from winter injury this season. When you determine the extent of injury, prune out the dead.
- If you have flowers – bring in bees if possible. They should be introduced at 10% bloom. Improving pollination will be worthwhile this year as there is so little crop out there.

Raspberries

- Make sure that you have thinned plantings adequately. Pest control in brambles depends on good air flow so a well pruned planting with excellent weed control is important.
- Scout for cane insects.

Strawberries

- Scout for weevil adults and notching.
- Apply slug bait – especially important if you didn't do this last fall.
- Scout for two spotted spider mites and cyclamen mites.
- Scout for aphids as they vector some major new virus diseases.
- Scout for tarnished plant bug.

Postharvest Powerpoint for Raspberries and Blackberries

An excellent Powerpoint given by UC Davis's Marita Cantwell at a West Coast meeting this past April. According to the caneberry expert Mark Bolda from University of California Extension this might be one of the best postharvest handling of information that you will find. <http://ceventura.ucanr.edu/files/188522.pdf>.

Using a Refractometer

By Lisa Kitinoja and Adel A. Kader. University of California, Davis. From Postharvest Horticulture Series No. 8, November 2003. Small-Scale Postharvest Handling Practices: A Manual for Horticultural Crops (4th ed.)

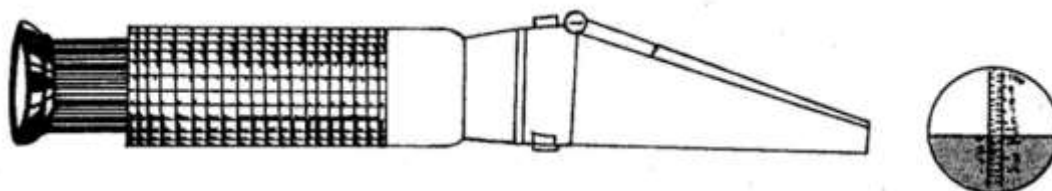
Sugars are the major soluble solids in fruit juices and therefore soluble solids can be used as an estimate of sweetness. A hand-held refractometer can be used outdoors to measure % SSC (equivalent degrees Brix for sugar solutions) in a small sample of fruit juice. Temperature will affect the reading (increasing about 0.5% SSC for every 5 °C or 10 °F), so you should adjust the measurement for the ambient temperature.

A garlic press works well to squeeze the juice from fruit samples. For small fruits, use the whole fruit. For large fruits, take a wedge for the stem end to the blossom end and to the center of the fruit. Remove any pulp by filtering the juice through a small piece of cheesecloth. You must clean and standardize the refractometer between each reading with distilled water (should read 0% SSC at 20 °C or 68 °F).

Here are some examples of proposed minimum % SSC for selected commodities. If your reading indicates a higher % SSC, then your produce is better than the minimum standard. Strawberries which are of excellent flavor, for instance, would measure 8% SSC or above.

Fruit	% Soluble Solid
Apricot	10
Blueberry	10
Cherry	14-16
Grape	14-17.5
Kiwifruit	6
Mango	5
Muskmelon	10-12
Nectarine	10
Papaya	11.5
Peach	10
Pear	13
Pineapple	12
Plum	12
Pomegranate	17
Strawberry	7
Watermelon	10

Source: Kader, A.A. 1999. Fruit maturity, ripening and quality relationships. Acta Hort 485: 203-208.



Spotted Wing Drosophila – An Update on Management

We expect that SWD will continue to be a problem for berry growers in 2014. According to Dr. Hannah Burrack of NC State University, who spoke to northeast berry educators recently, they have been trapping SWD adults throughout the winter in Georgia. However, there is some speculation that due to the cold winter in many parts of the country, the breeding population size might be lower than in recent years. As we don't yet know if SWD adults are successfully overwintering this far north, and because we had a good snow cover most of the year, the cold winter may not mean anything to upstate NY populations.

The strategy that we will be following in eastern NY will be the same for the entire state. In the next 2 weeks we will be deploying traps in many of the counties throughout the region. We will be using the yeast/flour/sugar bait and an apple cider vinegar drowning solution. In all locations traps will be checked weekly and will be anonymously reported on a federal reporting site for invasive insects, but most importantly will be reported on NYS IPM SWD blog <http://blogs.cornell.edu/swd1/>. You can subscribe to get blog posts through your email by visiting that site.

Traps will be monitored until a location sees 2 straight weeks of adult fly capture. We are recommending that growers start doing fruit evaluation as soon as fruit starts turning color. There will be more information about exactly how to do that in future newsletters. We will also be having a few field meetings to discuss SWD management in early July.

There are several research projects being conducted throughout the region that will help us discover more about this damaging pest. Research dollars are being directed at this pest in all states that have berry production and headway is being made towards full understanding of the pest.

Active questions yet to be answered:

- Local vs. long-distance: are there established populations present, which take time to build during the season, OR are large populations carried northward on the wind?
- Local movement of flies and contribution of local habitat.
- Host utilization and preference performance: what do they like to eat, underlying mechanisms, can this be modulated?

- Season long management programs: Insecticides; lots of info on single active ingredients (ai), but not much information on season long combinations of ai.

Insecticide Efficacy and SWD

Remembering that we only have a few years of information, Dr. Burrack reports that initial trials indicated organophosphates, pyrethroids, spinosyns, and diamides (Group 28 materials) have good efficacy. They also have suitable short PHI intervals (blueberries 3 days maximum, blackberries 1 day PHI). One to two materials from any given class are registered for use in any given cropping system; there are limitations however:

- Lb ai/growing season
- Number of applications/growing season
- Not acceptable for export trading partners
- Short life span of bug (SWD)

Rotational programs

The two products presumed to be most effective with the shortest PHI are zeta-cypermethrin (Mustang Max) and Malathion; these would make an ideal rotation. This rotation is not export friendly, so in fruit export states they are recommending a reduced risk

rotation of Exirel rotated with Assail and Delegate.

NOTE: Exirel is NOT labelled for use in NY at this point. This is a very promising, but expensive material. It has shown excellent control on a 7 day schedule. Malathion is working well in the Pacific Northwest and in lab trials, but the lack of rainfastness is a big problem.

A few other management notes:

- Spraying non-crop areas not a good strategy; more likely to be a recipe for additional problems.
- Getting really good coverage on fruit means adults are getting a killing dose.
- Negative impacts on beneficials hasn't been observed yet, but the strategy above would likely increase the chances of beneficial insects also receiving a killing dose.
- Spraying at dusk or early morning might make the most sense. These insects are not active in the middle of the night; they appear at sunrise, seem to be most active between 8 Am to 10 Am then disappear. This behavior suggests diurnal activity patterns.

Please call Laura or Jim if you have any questions about SWD management. Look for more information in this publication. -LGM



Fungicide Resistance in Strawberries

By Kathleen Demchak, Penn State Extension, published in *Vegetable and Small Fruit Gazette*, June 2, 2014

Editors' Note: I referred to this work in the last issue of the Berry News. Kathy Demchak wrote an excellent article about the problem of resistance and what Dr. Guido Schnabel at Clemson University lab is finding. If you have reason to believe you might be seeing resistance, please contact me immediately and we'll arrange to get samples sent. -LGM

Botrytis or gray mold is a major disease for strawberry growers, and there is some new information on fungicide resistance that growers should have. This information is summarized from work being conducted in the southeastern U.S. - at the Univ. of FL and Clemson Univ. - where researchers have been testing botrytis isolates from strawberry fields for resistance to commonly-used fungicides. They tested over 1800 samples from 183 farms in 2012 and 2013, and found the following:

1. More than 75% of the isolates tested were resistant to thiophanate-methyl (Topsin M). Resistance to this material is not a big surprise, as this is an older material that was known to be at high risk for resistance development.
2. Roughly half of the isolates tested in each year were resistant to pyraclostrobin (the active ingredient in Cabrio, and one of the active ingredients in Pristine), though a smaller percentage (29% and 5% in 2012 and 2013, respectively) were resistant to boscalid, the other active ingredient in Pristine.
3. Resistance to both thiophanate-methyl and pyraclostrobin were found in essentially every location in both years, though not in all samples, meaning that resistant isolates existed on nearly every farm.
4. In 2012 and 2013, respectively, 29 and 17% of isolates were resistant to cyprodinil, which is one of the active ingredients in Switch, with very low levels of resistance to fludioxinil, the other active ingredient in Switch.
5. About 1/4 of botrytis isolates were resistant to fenhexamid (the active ingredient in Elevate).

And, of extreme interest...

6. More than half of the isolates were resistant to fungicides in more than one chemical class. 33% of the isolates were resistant to fungicides in either three or four different chemical classes.

This cannot be dismissed as purely a problem in other states – Dr. Schnabel has done limited testing in MD and PA, with the help of Bob Rouse, and found significant resistance in those samples, too.

The first question some folks might have is whether you could buy plants infected with resistant isolates. Nurseries are very aware of potential resistance issues, and are generally very careful about fungicide rotations – after all, they have a lot at stake if they can't control diseases. Also, some materials that are at high risk of resistance development are prohibited from nursery use. So I'm more concerned about use on individual farms. Every now and then, I talk to someone who thinks they are rotating fungicides, but then when asked which ones they use, lists the names of 2 or 3 products with ingredients in the

same fungicide class. I also know that when you have small acreages, it's tempting to buy one or two products at a time, and use those until they are gone, rather than accumulate products in your pesticide shed. So, those practices are a concern. Please read on for what you can do to help.

First, be sure to use any cultural controls that you can to avoid disease issues, cut down on botrytis inoculum on your farm, and minimize the need for sprays. Every spray avoided is avoidance of an opportunity for resistance development. Cultural controls consist of removing dead leaves from plasticulture fields in the spring (that's where a lot of inoculum overwinters), and basically, anything that helps the field to stay dry, because diseases need moisture to sporulate. So, keep weeds controlled, rows narrowed back, and possibly consider a wider row spacing in matted-row production, or slightly wider plant spacing on plasticulture beds. Keep fields picked to the greatest extent that you can, and encourage harvesters to remove rotten fruit from the field. Cultural controls generally have other benefits like improving plant growth and fruit quality.

Second, don't just spray on a schedule – spray only when you have a reason. Even if you don't see botrytis, inoculum is out there, and every spray exposes what inoculum is there to the material you are using. This applies to any crop – not just strawberries. If the weather



Photo courtesy of Cornell Berry Diagnostic Tool, <http://www.fruit.cornell.edu/berrytool/strawberry/STRparts.htm>

Continued on next page

Fungicide Resistance in Strawberries, continued from previous page

is dry and no rain is forecast, there is probably no reason to spray, at least not for diseases.

Third, consider a break from any at-risk fungicides that you have used more commonly in the past. Dr. Schnabel mentioned that resistance development has not progressed on farms where growers moved to other products and then were careful about how they used them.

Fourth, either rotate at-risk products with a broad-spectrum fungicide like captan (0-day PHI but 24-hr REI) or thiram (3-day PHI and 24-hr REI), or include them in a tank mix. You may have seen last month's article about concern with captan use during bloom and bees, but by now, you should be past bloom, and so for any disease issues for the remainder of the year, you should be able to use broad-spectrum materials, IF you need to spray.

Finally, be sure to consult FRAC codes on the fungicide package, or Table 6.14 in the Mid-Atlantic Berry guide for information on the fungicides that fall under different chemical classes.

References:

Fernandez-Ortuno, D., A. Grabke, P. K. Bryson, A. Amiri, N. A. Peres, and G. Schnabel. 2014.

Fungicide Resistance Profiles in *Botrytis cinerea* from Strawberries Fields of Seven Southern U.S. States. *Plant Disease* 98(6):825-833. Online at <http://dx.doi.org/10.1094/PDIS-09-13-0970-RE> with access limited. A summary of the work can be found here: <http://apsjournals.apsnet.org/doi/abs/10.1094/PDIS-09-13-0970-RE?journalCode=pdis>

Enrollment Reminder — **Don't Miss Out!**

Thank you to those of you that have enrolled in CCE Eastern NY Commercial Horticulture Program—we appreciate your support. You should have received your complimentary Cornell University Integrated Pest Management Guidelines and the seasonal newsletters you chose as part of your enrollment.

For those of you that have not enrolled, we invite you to do so as soon as possible by completing the enrollment forms that were mailed to you in early April. If you do not think you received them or misplaced them, contact Marcie Vohnoutka at 518-272-4210 or mmp74@cornell.edu for a copy.

Unless we receive your enrollment information by June 20th, any publications that you are currently receiving from the ENYCHP will end.

If you have questions about enrollment please contact one of the educators listed on the cover of this publication or call Chuck Bornt at 518-272-4210 or email cdb13@cornell.edu

Pricing for Profit Workshop

June 18 at 6 pm at the Hudson Valley Lab, 3357 Route 9W, Highland, NY 12528 Dinner Included

“What price should I charge?” “Where’s the best place for me to sell my produce?”

“How can I make a profit at this?” “What is a market channel anyway?”

Bob Weybright, Business Development Specialist from the Eastern NY Commercial Horticulture Team will be at the Hudson Valley Lab for a twilight presentation and discussion which will include some suggestions which can help you find answers to these and other questions you might experience over the course of your growing and selling season. Resources to help determine a price, where to find price comparisons, and the ins and outs of various market channels will be discussed to help you feel more comfortable with your selling decisions.

Cost: \$20/person for those enrolled in the ENY Commercial Horticulture Program, \$30 for those not enrolled.

A light supper is included. You can still enroll to get the discount; we will have enrollment forms available that night (or for information on enrolling contact Marcie Vohnoutka at 518-272-4210 or mmp74@cornell.edu).

We need a head count in order to have enough food so please mail your registration ASAP to Hudson Valley Lab, Attn: Teresa Rusinek/Pricing for Profit, PO Box 727, Highland, NY 12528. Make checks payable to CCE ENYCHP. With your registration, **include the following information:** Names of attendees, farm name and address, phone number where you can be reached, and email. If you have questions, call Teresa Rusinek at 845-389-3562 or email tr28@cornell.edu.

Directions: The Hudson Valley Lab is on the southbound side of Route 9W, about 1/4 mile north of the Route 299 intersection; there is a divider, so if you're heading from the south on the northbound side of 9W proceed to the traffic light just past the lab where you can make a legal U-turn.

Blueberry Canker Disease - FAST FACTS

*Editors Note – this article has been edited slightly from the original fact sheet written by Dena Fiacchino, Cathy Heidenreich, and Wolfram Koeller of Cornell. For the full fact sheet, visit <http://www.fruit.cornell.edu/berry/ipm/ipmpdfs/BB%20canker%20fast%20fact.pdf>. A recent report of an enormous amount of *Phomopsis* being found in NJ blueberries, and also the fact that despite really beautiful bloom this year on NY plants, we still have quite a lot of winter injured canes that could host canker fungi has prompted this article. **Prune out the dead wood!** -LGM*

There are two significant canker diseases caused by fungi found throughout New York State on highbush blueberries: *Phomopsis* canker/twig blight and *Fusicoccum* (Godronia) canker.

Phomopsis canker first appears as a twig infection of one year old stems that have flower buds (Figure 1). Single canes or whole section of plants wilt or die back (Figure 2). Circular lesions, gray and flat in appearance form around fruit buds, producing fungal fruiting bodies (Figure 3). Under favorable weather conditions, the fruiting bodies produce fungal spores throughout the growing season. The fungus enters the flower buds and moves into the stem. Infected stems wilt and die, or young stems die back from the canker.

Fusicoccum canker appears as individual stems exhibit ‘flagging’ or wilting during the summer (Figure 4). Dark red or brown infected areas form at the base of canes, become covered with pycnidia (Figure 5). Older dead canes develop the sexual fruiting bodies (apothecia) (Figure 6).

Symptoms of both cankers are most evident during the summer months. However, the infection period begins much earlier at bud swell and continues until leaf drop. Spores are disseminated by splashing rain to flower buds where the fungi grows through blossoms into stems. **Winter and mechanical damage greatly increase susceptibility to infection; spores may directly infect winter-injured wood.**

Phomopsis canker has been reported on highbush blueberries throughout the northeast and in a recent IPM survey was found to be the most prevalent canker disease in NYS.

Control Strategies: **Cultural practices designed to avoid winter injury and pruning out dead wood are more important than sprays in controlling these diseases.** That said, dormant applications of lime sulfur or copper hydroxides have shown some control of cankers. Applications of fungicides during bloom may also be beneficial as

temperatures are most conducive during that period for spread of the disease.

Other strategies include:

- Plant or less susceptible cultivars. For *Fusicoccum* canker ‘Rancocas’ is resistant; cultivars are ‘Jersey’, ‘Earliblue’, and ‘Bluecrop’. For *Phomopsis* canker there are currently no known resistant cultivars; ‘Coville’ and ‘Jersey’ are moderately susceptible cultivars. Weymouth, Earliblue, and Berkeley are particularly susceptible cultivars.
- Avoid planting on sites with frost pockets and provide frost protection.
- Minimize mechanical injuries to plants.
- Employ fertilization, irrigation, and weed control practices that discourage late season growth and promote early hardening. **(Stop fertigation by 3rd week of July!)**
- Prune out and destroy dead twigs and canes before bud break; cut as deeply into the crown as possible to ensure removing the canker.



Figure 1

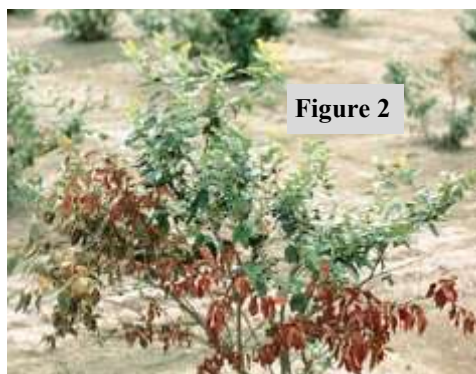


Figure 2



Figure 3



Figure 4

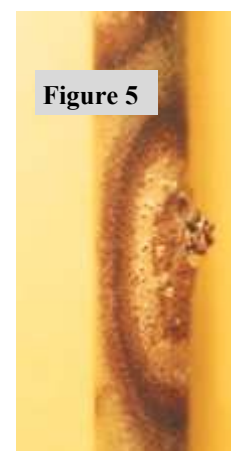


Figure 5



Figure 6

What to Do With Old Pesticides

The season is underway and so is pest management. You have a program in place, and the necessary products are stored safely in your pesticide shed. As you are inventorying your materials for that next spray, you come across some old pesticide. Companies will sometimes make changes to their products. A pesticides that once may have come in a powder form, was reformulated to a liquid. Sometimes too, the pesticide is removed completely from the market. The first question that comes to mind when you find an old pesticide is: *Can I still use it?* As long as the pesticide has a current New York State (NYS) pesticide label for the crop and pest, it can be used. All products labeled for use in NYS can be found on the PIMS website <http://pims.psur.cornell.edu/>. If the product is not listed there, then it is not legal to use. *What then do you do with the pesticide?* Because pesticides are regulated waste they must be disposed of properly and cannot be placed in the regular trash. New York Department of Environmental Conservation (NY DEC) has teamed up with Clean Sweep NY to properly dispose of cancelled, unwanted, unusable, or otherwise obsolete pesticide chemicals from agricultural or non-agricultural entities such as farmers and commercial pesticide applicators. The program was recently run in Western NY and there are plans to bring it to Eastern NY. In the meantime make sure all pesticides are properly labeled. Pesticides that are meant for disposal should be clearly marked as such (e.g. Clean Sweep Disposal) and grouped separately from the actively used materials in your sheds.

If you are not sure if a product is labeled and/or you are not sure how to find it on the PIMS site, contact your local extension agent.

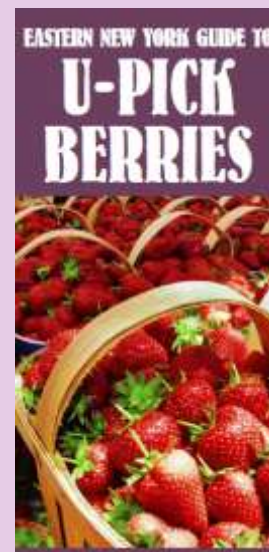
More information about NY DEC Clean Sweep: <http://www.dec.ny.gov/chemical/45366.html> -JMO

Have questions? Need something in the field or greenhouse checked out?

The Eastern NY Horticulture team has a number of expert educators throughout the region in the areas of vegetable, tree fruit, and small fruit production; business development and food safety/GAPS. Give one of us a call and we will get you in touch with someone who can help.

The Eastern NY Guide to U-Pick Berries is out!

Hard copies of this bulletin are being sent to all CCE and Tourism offices of counties in the region. Maire Ullrich, who headed up the effort, is also trying to get them placed at Thruway and Northway stops. We also have them available for download at http://counties.cce.cornell.edu/orange/U-Pick_Berries_14.pdf. If you missed this opportunity this year, please look for it – or give Maire or me a call and we can make a note of your interest. -LGM



Really interesting article in The Economist magazine about indoor farming. It's hard for many of us involved in traditional agriculture to wrap our heads around growing food in this manner, but it does help us gain perspective to learn about some 'out of the box' thinking that is happening throughout the world. Feeding the planet will continue to be an enormous task. So if you have any free time in the next few months....click the following link! <http://www.economist.com/news/science-and-technology/21602194-indoor-farming-may-be-taking-root-light-fantastic?fsrc=scn/tw/te/pe/thelightfantastic>



Farmer's Market Looking for Vendors

Held on Thursdays from 2pm to 7pm.

June 19th thru October 2nd.

Located on 1 Municipal Square in the Village of Walden (Orange County).

Contact: Kerri-Ann Lynch, phone 845-476-6241

email waldenfarmersmarket@yahoo.com



2014 Weather Table—This chart is compiled using the data collected by Northeast Weather Association (NEWA) weather stations. For more information about NEWA and a list of sites, please visit <http://newa.cornell.edu/>. This site has information not only on weather, but insect and disease forecasting tools that are free to use.

2014 Weekly and Seasonal Weather Information						
	Growing Degree Information Base 50 ^o F			Rainfall Accumulations		
Site	2014 Weekly Total 5/26-6/1	2014 Season Total 3/1 - 6/1	2013 Total 3/1 - 6/1	2014 Weekly Rainfall 5/26-6/1 (inches)	2014 Season Rainfall 3/1 - 6/1 (inches)	2013 Total Rainfall 3/1 - 6/1 (inches)
Albany	95.0	383.7	406.0	0.11	7.39	11.51
Castleton	87.0	365.2	409.5	0.33	8.61	7.45
Clifton Park	89.5	345.3	382.4	0.55	8.95	13.87
Clintondale	103.0	433.0	452.4	0.16	10.18	6.84
Glens Falls	74.9	372.9	349.0	0.34	8.49	9.63
Guilderland	93.5	362.5	359.5	0.03	1.31	1.99
Highland	100.1	432.1	459.5	0.07	10.20	5.56
Hudson	98.2	413.1	404.9	0.16	8.60	7.87
Marlboro	97.6	384.6	422.6	0.10	11.50	6.79
Montgomery	89.7	395.2	396.5	0.11	12.05	8.06
Monticello	73.8	264.2	300.0	0.01	5.48	0.12
Peru	70.4	307.3	377.1	0.25	7.96	4.13
Shoreham, VT	71.5	314.8	392.8	0.40	7.54	8.26
Willsboro	66.7	284.4	351.2	0.03	4.14	7.30

Cornell Cooperative Extension and the staff assume no liability for the effectiveness of results of any chemicals for pesticide use. No endorsement of any products is made or implied. Every effort has been made to provide correct, complete, and current pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly and human errors are still possible. These recommendations are not substitutes for pesticide labeling. Please read the label before applying any pesticide. Where trade names are used, no discrimination is intended and no endorsement is implied by Cornell Cooperative Extension.

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