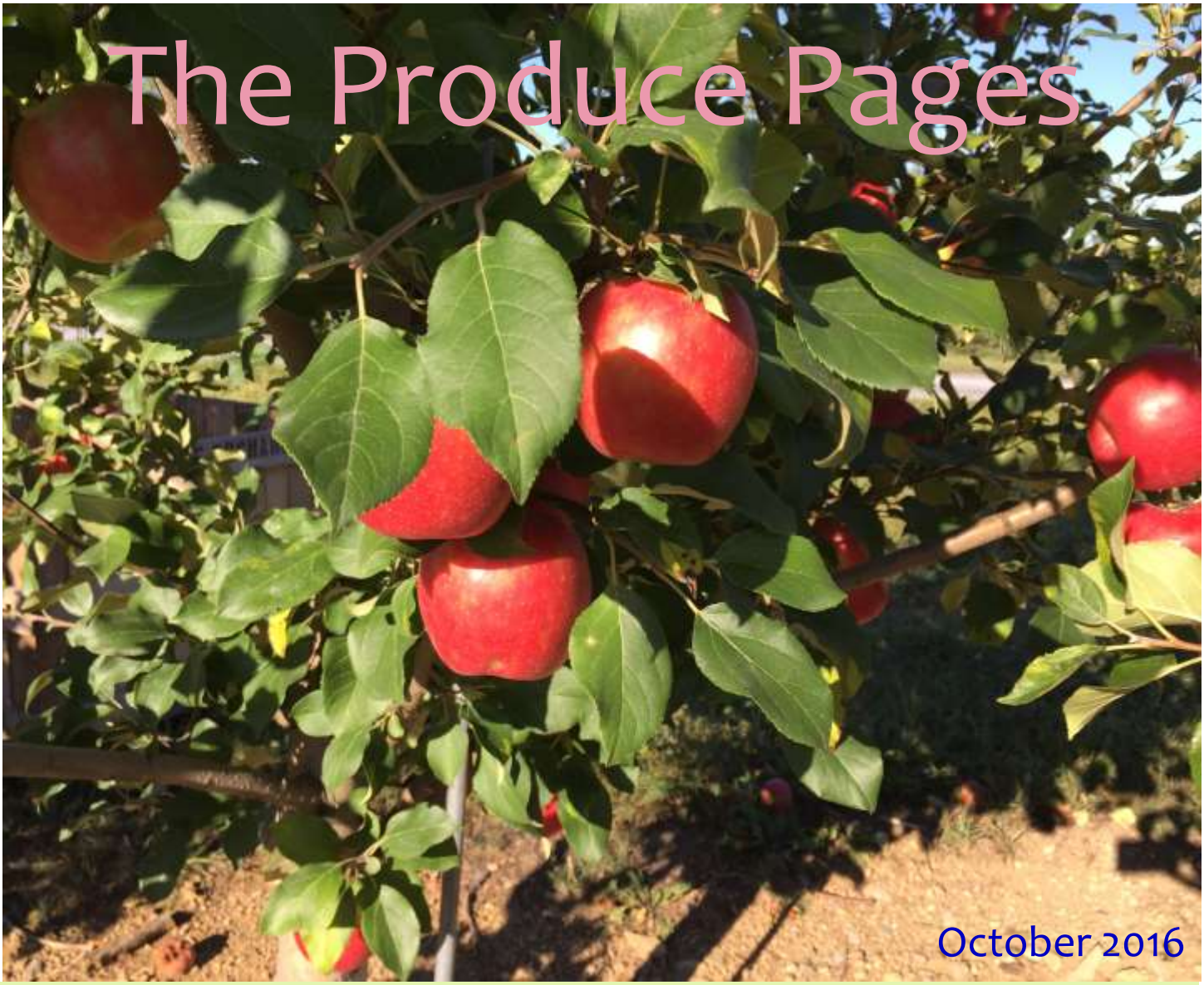

Agricultural Water Withdrawal Annual Reporting

MAIRE ULLRICH

selected from DEC website: http://www.dec.ny.gov/lands/86904.html

All agricultural facilities withdrawing water equal to or in excess of an average of 100,000 gallons per day in any thirty day consecutive period (3 million gallons during a 30 day period) must file an annual report with the New York State Department of Environmental Conservation by March 31st of each year. Facilities should also submit annual reports in years that the threshold volume was not exceeded in order to maintain continuity. Please note that multiple non-contiguous parcels of land under the ownership or control of the same person are considered to be one agricultural facility although there

continued on page 3

Cornell University
Cooperative Extension
Eastern New York Commercial Horticulture

The Produce Pages

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Contents

General Updates

Vegetable Production

Berry & Grape Production

Calendar of Events

The *Produce Pages* is a monthly publication of the Eastern New York Commercial Horticulture Program. For more information about the program, please visit our website at http://enych.cce.cornell.edu/.

Serving the Educational and Research Needs of the Commercial Small Fruit, Vegetable and Tree Fruit Industries in Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Montgomery, Orange, Putnam, Rensselaer, Saratoga, Schoharie, Schenectady, Ulster, Warren and Washington Counties

are exceptions.

Water use must be reported by completing the Agricultural Water Withdrawal Reporting Form, (http://www.dec.ny.gov/docs/water_pdf/wwrag1215.pdf) Please note that this form does not work with "Chrome" internet browser. If you have trouble accessing or need a paper copy, call Maire at 845-344-1234 or e-mail mru2@cornell.edu and we'll get it to you. DEC prefers submission email; but you may mail a completed paper form. Required information on the form includes:

- The water source, location of the water source and the source capacity if known;
- The amount of water withdrawn for the reporting period, including the average and peak withdrawals;
- A description of the use of the water withdrawn;
- The estimated amounts of water returned, if any, the locations of such returns, and the method of such returns;
- The actual or estimated average monthly and annual volumes and rates of water lost or consumptively used from the withdrawal; and
- The water conservation and efficiency measures undertaken during the reporting period.

Please note that water withdrawal applies to both groundwater or surface water.

For more information on water withdrawals and reporting see:

http://www.dec.ny.gov/lands/55509.html

Plan Now for Next Year's Weed Management Program

ETHAN GRUNDBERG

Though weed management may seem like a distant memory in mid-October, now is a great time to reflect upon the control tactics that you used this year and begin outlining a plan for 2017.

1. Create and organize notes on this year's weed problems. Be as specific as possible, recording the species, time of year, and portions of fields where weeds were present.
2. Do your research. If you are unfamiliar with the biology of the weed species that you listed in step one, consult reference guides like Weeds of the Northeast and the Cornell Weed Ecology and Management Laboratory website (https://weedecology.css.cornell.edu/). Be sure to find out whether the weeds are perennials or annuals and whether they spread mostly by seed or by rhizomes in the soil.
3. Plan your crop rotation with weed management in mind. Quick turn crops like radishes and lettuce can provide opportunities to control weeds with mid-season tillage or densely seeded cover crops, like sudex and buckwheat, that can outcompete weeds. These short-season crops should be rotated into fields with heavier annual weed problems and out of slower maturing crops, especially winter squash and tomatoes, and crops that don't compete well with weeds, like alliums.

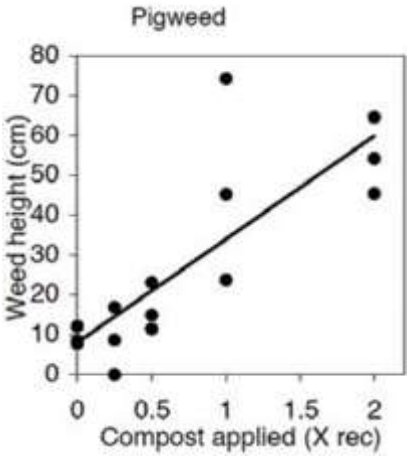

Figure 1: From Overly Fertile Soil Grows Large Weeds, Bjorkman 2008

4. Create a fine-tuned fertility management plan that is crop specific. Weeds

continued on next page

are opportunistic by nature and thrive in over-fertilized soils (see figure 1). Creating a holistic fertility plan and nitrogen budget that takes into account mineralization from organic matter, nitrate concentration in irrigation water, contribution from cover crops, in addition to supplemental fertilization will help keep fertility levels close to your cash crop demand without providing additional fertility for weeds.

5. Begin to craft a sequential in-season plan that matches the problem. Not all weeds can be effectively controlled using the same tools! For example, Hairy Galinsoga (*Galinsoga quadriradiata)* is difficult to control just with mechanical cultivation since the species is so adept at re-rooting from cut stems and uprooted plants even a couple of days after cultivation. Galinsoga seeds also germinate quickly in lightly disturbed soil, meaning that passed with a cultivator may lead to more of the weed emerging. So, step one may be to use a stale seed bed approach by tilling the field, irrigation up a flush of weeds, then either spraying them down with herbicide or, if growing organically, using a flame weeder. You can hope that step one will be enough for effective control, but have your next step planned out in case the problem persists. Step two could be the use of shallow mechanical cultivation equipment, such as a Buddingh basket weeder or finger weeders, to eliminate weed seedlings at the "white thread" stage. Step three might include the use of post-emergent herbicide, even for organic growers who might find spot use of products like GreenMatch EX effective as part of a broader weed management plan. As a last and inevitable resort, step four can be to hand weed or hand hoe.

6. Assess whether you have what you need to execute the plan. If you take the example plan from above, each step requires the right equipment to safely, efficiently, and effectively do the job. If you don't have the appropriate equipment, either revise your plan to use what you have (or can borrow) or begin to create a shopping list for the off-season.

7. Know when to accept defeat. Even the best developed management plans can be ineffective in fields with excessively large weed seed banks or in wet years that don't allow for effective herbicide applications and mechanical cultivation. Sometimes it's better to send out a crew with machetes and weed whackers to prevent weeds from producing more seed than to stick to a plan that isn't working.

8. Start the process over. Every year, keep track of what worked in which crops and fields to control which weed species.

For those of you interested in discussing weed management approaches and seeing some mechanical cultivation equipment demonstrated, join us for a twilight meeting at the Poughkeepsie Farm Project (51 Vassar Lane, Poughkeepsie, NY) on Wednesday, October 19th from 3:30-5:30 PM. There is no fee for the event, but please pre-register at http://enych.cce.cornell.edu/event.php?id=610.

Visit the ENYCHP Website

For online class registrations, announcements, previous issues of our newsletters, and more, visit the ENYCHP website at

http://enych.cce.cornell.edu/

Email or call any of the educators with questions or comments on the website – we want to make it work for YOU!

Global SWD (Spotted Wing Drosophila) Research: Updates & Review

TESS GRASSWITZ, EXTENSION ASSOCIATE, LAKE ONTARIO FRUIT PROGRAM, CORNELL COOPERATIVE EXTENSION

Source: Fruit Notes, Vol 16, Issue 18, August 18, 2016

Spotted wing drosophila (SWD) is native to South East Asia. It was first recorded as an invasive species in Hawaii in 1980, and in both California and parts of Europe in 2008. Since then it has spread rapidly throughout temperate North America and Europe, mainly due to global trade combined with an initial lack of regulatory controls. Its annual rate of range expansion has recently been estimated at approx. 1000 km (~620 miles) per year, and it is now established in parts of South America and the Middle East.

As a result of its global economic impact, spotted wing drosophila is the target of an intense global research effort encompassing various aspects of its biology and control. This article summarizes the results of some of this recent research that offers potential for the development of future pest management strategies. Please note that these reports do not constitute recommendations at this stage.

SUMMARY OF LIFE-CYCLE

Spotted wing drosophila overwinters as a specialized (darker) adult morph that has greater cold tolerance than the summer form. Overwintered flies emerge in spring and feed on nectar from early flowering weeds and crops. Overwintering adults may live for more than 200 days, but the longevity of the summer form is considerably less. Reproductively mature female flies lay eggs in the ripening fruits of a wide range of host plants, including many wild, uncultivated species. Each female may produce 100–400 eggs, laying approximately 20 per day (depending on host availability and environmental conditions).

Recent research from Italy has shown that spotted wing drosophila can complete its lifecycle at temperatures as low as 53 °F; however, adult activity is highest at temperatures between 68 and 77 °F, and is reduced at temperatures above 86 °F. Adults are most active at dawn and dusk.

Larvae develop inside the fruit and complete their development in 3-13 days (depending on temperature). Pupation can occur in the fruit or in the soil, and the entire life-cycle can be completed in approx. 7–10 days (again, depending on temperature). Under optimal conditions, up to 13 generations per year are possible, although in the US and Canada 3–9 generations are more typical. Canadian research suggests that the lower lethal temperature for adult flies is in the region of 19 °F, although cold tolerance depends on the extent of prior exposure to fluctuating cool temperatures. There is evidence to suggest that females are more cold-tolerant than males.

RECENT RESEARCH RESULTS

Host plants

Fruits of susceptible host plants are liable to attack as soon as the fruit begins to soften and show color. Research with both raspberries and blueberries has shown that green, hard fruits are not at risk. The likelihood of egg-laying increases as the force needed to penetrate the fruit decreases: hence egg-laying is consistently high in raspberry and other thin-skinned fruits. In a recent US study, calcium treatments applied to blueberries in a field experiment produced firmer fruits that harbored fewer SWD eggs than fruits from untreated plots.

The wide host plant range of spotted wing drosophila can influence population levels at the landscape scale. In one US study, the abundance of wild hosts in nearby woods and hedgerows was implicated in the increased early-season risk of spotted wing drosophila in adjacent raspberries. However, it did not appear to influence the subsequent rate of population development in those crops.

As an indication of the wide host plant range of spotted wing drosophila, in recent field surveys in Europe, more than 24,000 adult flies successfully emerged from the fruits of 84 plant species from 19 different plant families, 38 of which were non-native species. The highest infestations were found in species of *Cornus* (dogwoods), *Prunus* (relatives of stone fruits such as cherries, plums, etc.), *Rubus* (raspberries, blackberries, and relatives), *Sambucus* (elderberry) and *Vaccinium* (blueberries and relatives). US research has shown a similarly wide

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range of hosts, including many of the above, as well as *Morus* (mulberry), edible blue honeysuckle (also known as haskap or honeyberry), and some common herbaceous weeds such as *Solanum dulcamara* (bittersweet nightshade). In Europe, spotted wing drosophila has also been found infesting mistletoe berries (*Viscum album*) – probably one of the earliest host fruits available for spring egg-laying.

In another European study, the fruits of several plants stimulated egg-laying by SWD females, but did not support full larval development and successful adult emergence. If these lab reports are supported by future field studies, such plants might be a useful component of an integrated control strategy as trap plants or so-called 'dead-end' hosts. For such an approach to be successful, however, the fruits must either be significantly more attractive than the crop being protected, or be present either earlier or later than the fruits of the target crop.

Interactions with yeast

Once mated, adult female spotted wing drosophila respond strongly to odors produced by wild yeast species associated with fruit. These yeast odors are used as feeding cues, and may form the basis for developing an "attract-and-kill" strategy: in recent research, exposing flies to a mixture of yeast and insecticide reduced egg-laying and increased the mortality of adult flies compared to insecticide treatments alone. However, related work has shown that the effect is dependent on both the insecticide used, and the species of yeast. In some cases, there was no additional benefit from adding yeast to an insecticide spray that was also supplemented with cane sugar.

A rather more advanced approach to exploiting the attraction of SWD to yeasts involves the use of a genetically modified yeast strain to disrupt the expression and regulation of some of the pest's critical genes by interfering with the normal functioning of its ribonucleic acid (RNA). Such 'RNA interference' techniques (RNAi) are being developed for many important crop pests. Recent lab-based research in California involved feeding a genetically modified yeast strain to adult spotted wing drosophila and recording mortality, activity and post-treatment egg-production: while there was no increase in fly mortality as a result of the treatment, the flies were less active and laid fewer eggs, prompting speculation that further refinements of the technique might have a future role in pest management.

Environmental factors

Previous research has shown that SWD trap catches decline when humidity is low. Several research groups are now investigating whether different pruning and irrigation practices can reduce within-crop temperature and humidity and hence slow the rate of SWD population increase. Other research groups are comparing the survival of SWD in blueberry plantings with or without black plastic weed mats: the higher temperatures associated with the mats may reduce the survival of pupae in infested fruit that falls to the ground.

Biological control

Various research groups in both North America and Europe have addressed the possible impact on spotted wing drosophila of both native natural enemies and a range of commercially available predators, parasitic nematodes and fungal pathogens. However, many of the studies have been conducted only under laboratory conditions and the results have been rather variable.

Two species of parasitic wasps (parasitoids) (*Trichopria drosophilae* and *Pachycrepoideus vindemiae*) have been found attacking SWD pupae in both the USA and Europe, as well as in the pest's native range (various parts of Asia, including Japan and Korea). *Trichopria drosophilae* has a narrower host range than *P. vindemiae* and may have potential for mass-rearing for use in augmentative release programs. Additional parasitoids collected from South Korea are currently undergoing evaluation under quarantine in California, but it will be some time before such tests are completed.

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Chemical control

At present, commercial producers rely heavily on season-long applications of a rather limited range of insecticides for spotted wing drosophila. With a pest such as this, with rapid rates of development and multiple generations per year, the risk of selecting for insecticide resistance is high. This is particularly true for enclosed tunnel systems (because of limited fly movement) and in organic plantings, where there are few effective chemical control options. There is already some evidence of reduced susceptibility to spinosad (Entrust®) in some organically managed berries in the western US. On the other hand, a recent study in Canada showed no increase in resistance to malathion in a laboratory population of SWD exposed to sub-lethal concentrations for 30 generations. Baseline monitoring for resistance to the most widely used insecticides is currently being conducted in fruit-producing regions in various parts of the US. Such monitoring will provide a valuable early-warning system if and when resistance develops.

In the meantime, a recent report from Georgia on the efficacy of insecticides used for SWD in blueberries showed that the adjuvant Nu Film P had some effect on prolonging the activity of spinetoram and spinosad after a simulated rainfall equivalent to 0.5″, and of malathion after a rainfall of approx. 1″. Nu Film P is listed by the Organic Materials Review Institute (OMRI) as suitable for use in organic production.

Future prospects

In conclusion, the heavy investment in research on spotted wing drosophila is now starting to produce results that at the very least will provide some additional management tools, and which in future may form the basis of a multi-tactic, integrated approach to the management of this pest.

Universal Municipal Building Code

MAIRE ULLRICH

The New York municipal building code exempts agricultural buildings but ag buildings are defined as:

> *A structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products, excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.*

Clearly you can see that this may create issues for ag buildings, and it has. The heart of the problem it seems is at the town level where if it's not residential or agricultural, it is considered commercial and then very expensive planning and building requirements start coming into play.

If you have had issue with this definition and/or are interested in helping expand that definition, please seek advice from your local Farm Bureau.

SPECIAL Report — White Rot: a Returning Problem for Garlic in New York

Crystal Stewart, CCE Eastern New York Commercial Horticulture Program and Frank Hay, Ph.D., Department of Integrated Plant Sciences, NYSAES, Geneva NY

White rot is the most significant disease affecting allium production world-wide, and has resurfaced in the New York garlic industry after a long period of eradication. Positive samples were collected in 2016 from Eastern, Central and Western New York, indicating that the disease is widespread. As with other soilborne pathogen, white rot can be persistent and devastating. However, careful management can reduce inoculum, and because the pathogen is spread by seed and soil, it is also possible to prevent its spread into uninfested fields.

WHAT IS WHITE ROT?

White Rot is caused by *Sclerotium cepivorum,* an ascomycete fungus which is related to white mold fungi (*Sclerotinia* family). The pathogen is spread through mycelia and sclerotia movement in the soil and on seed garlic, but not as airborne spores. Only 1 sclerotium per 10 liters of soil is enough to cause disease, and 10-20 sclerotia will cause upwards of 90% infestation. Generally these levels of sclerotia in the soil can be reached in 2-4 cropping cycles of alliums grown under favorable conditions (Crowe, 1980). One of the primary reasons this disease is of critical concern is that once sclerotia are in the soil, they can remain viable for up to 40 years (Schwartz and Mohan, 2008).

THE DISEASE CYCLE OF WHITE ROT:

White rot sclerotia will remain dormant in the soil until a suitable host (an allium) is detected through sulfur compounds secreted by the plant. Soil temperature is the greatest factor contributing to the speed of disease movement; at 48° F germination is very slow; optimum at 57-64°F, and terminates at 70°F (Schwartz and Mohan, 2008). Ideal moisture levels for disease development are the same as for crop growth.

White rot damage is generally detected first as yellowing or wilting of the foliage just prior to scape emergence, though the infestation started much earlier. The above ground symptoms can correspond with underground symptoms including degradation of the roots and basal plate, formation of black sclerotia the size of poppy seeds, and briefly a white mycelial mat on the bulb extending up to the soil line.

HOW DO I KNOW IT'S WHITE ROT?

Garlic can be affected by other pathogens right around scape emergence, including *Fusarium* and *Botrytis porri.* Fusarium does not form sclerotia, and is therefore easy to differentiate. Botrytis sclerotia are normally significantly larger than White Rot sclerotia (see right image on this page). However, if you are unsure about the cause of symptoms you are seeing, you can email your local extension specialist a picture or submit a sample to the diagnostic lab for identification.

CONTROL MEASURES FOR WHITE ROT:

The best control for white rot is to not bring the pathogen onto the farm. As we see with many other diseases, transmission on seed is a serious concern. Limit introduction of new seed onto your farm if possible, and purchase seed from trusted sources. Discard any seed which is visually diseased. It is also important to limit the movement of soil onto your farm, e.g. through sharing uncleaned cultivation or harvesting equipment.

If white rot is found on your farm, there is no one best answer for control. Various options have been effective in different parts of the world and under a variety of environmental conditions. A management approach which involves multiple strategies will likely be most effective.

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White rot briefly forms a dense white mat of mycelia. This image was taken June 22. Image: Crystal Stewart

Poppy-seed sized sclerotia appear in June as the garlic sizes up. Image: Crystal Stewart

Botrytis sclerotia, by contrast, are generally significantly larger (see arrow). Image: Crystal Stewart

Quarantine: Ideally the infested field should be removed from cultivation through establishment of pasture or uncultivated perennial crop. This will prevent the movement of long-lived sclerotia into other parts of the farm. If this is not possible, the infested field (or part of the field) should be taken out of garlic/onion production. Allium spp. are the only hosts of the white rot fungus, so this strategy will prevent inoculum building up in soil. If the field remains in cultivation then considerable care will be required in terms of cleaning equipment in an isolated part of the farm after it is used in the infested field, to prevent further spread to other parts of the farm.

Biofumigation: Isothiocyanates released by incorporation into the soil of biofumigant brassica cover crops or dried commercial preparations of brassica material will kill a proportion of sclerotia. While unlikely to eradicate white rot, if utilized over a number of years, this strategy may be a means of reducing the number of viable sclerotia in the soil.

Solarization: In Mediterranean climates solarization has proven the most effective control for white rot (Melero-Vara et al, 2000). The technique commonly used is to cultivate and irrigate the soil, then cover it with a transparent polyethylene sheet for approximately one month. This technique could be effective during hot, sunny summers, but would likely be ineffective during cool summers. Viability of sclerotia is reduced in the laboratory by 95% if exposed to 1 day at 113°F or 8 days at 95°F (McLean et al 2001). However, in nature longer periods of fluctuating sublethal temperatures can also reduce viability. In New Zealand, periods of solarization of 1-2 months leading to a maximum soil temperature (4 inches depth) of 103-109°F and mean soil temperature of 77-84°F led to significant reductions in recovery and viability of sclerotia in the topsoil (Mclean et al. 2001).

Biological controls: The use of both *Trichoderma* and *Bacillus subtilis* have provided some control of white rot in some years. As with all biologicals, effectiveness varies depending on environmental conditions. Biologicals are a promising addition to a control program, but are not being recommended as a stand-alone control.

Sclerotia Growth Stimulants: Sclerotia of white rot germinate in the presence of exudates from garlic or onion plants. However, if they germinate and fail to find a host they will die. A synthetic allium compound called diallyl disulfide was developed to 'trick' sclerotia in the soil to germinate in the absence of a suitable host, resulting in 90 percent reductions of the number of viable sclerotia in a single season (Davis, 2007). Unfortunately, this compound is no longer commercially available. Garlic powder may similarly stimulate sclerotia germination. Garlic

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Biofumigant mustard cover crop. Image: Justin O'Dea, CCE Ulster

powder applied at 125-135 lb/A incorporated to 6 inches reduced sclerotial viability by >95% (Crowe et al. 2000). However, note that this treatment did not result in eradication of White Rot, and application must be made when soil temperatures and moisture are adequate for germination of sclerotia (i.e. 50-72°F) and in the absence of Allium host plants.

There has been some experimentation with using composted onion waste to stimulate germination of sclerotia as well (Coventry, 2002). This technique shows some promise, but should be combined with other control measures. If there is interest in trying this technique, please see the complete paper cited below for protocols, or contact your local garlic specialist.

CONCLUSIONS

White rot is the most significant disease affecting allium production worldwide, and should be recognized and understood by commercial garlic growers. The best control technique is avoidance of the disease, followed by leaving infested fields and infected seed sources in favor of clean soil and seed. If these are not options, combining different control techniques may significantly reduce disease pressure. Any grower who has a history of white rot should not sell garlic for seed until moving to clean seed stock and soil.

Sources:

Coventry E, Noble R, Mead A, and Whipps JA (2002) Control of *Allium* white rot (*Sclerotium cepivorum)* with composted onion waste. Soil Biology and Biochemistry 34: 1037-1045.

Crowe FJ, Hall DH, Greathead AS and Baghout KG (1980) Inoculum density of *Sclerotium cepivorum* and the incidence of white rot of onion and garlic. Phytopathology 70: 64-69.

Crowe F, Davis, M, Nunez J, Smith R, Darnell T, Parks R. Dehydrated garlic powder used to reduce *Sclerotium cepivorum* in Dield soil. http://oregonstate.edu/dept/coarc/sites/default/Dles/publication/00_sclerotium_garlic_powder.pdf

Davis RM, Hao JJ, and Romberg MK (2007) Efficacy of germination stimulants of sclerotia of *Sclerotium cepivorum* for management of white rot of garlic. Plant Disease 3 5: 648-208.

McLean KL, Swaminathan J, and Stewart A (2001) Increasing soil temperature to reduce sclerotial viability of Sclerotium cepivorum in New Zealand soils. Soil Biology and Biochemistry 33: 137-143.

Melero-Vara JM, Prados-Ligero AM, and Basallote-Ureba MJ (2000) Comparison of physical, chemical and biological methods of controlling garlic white rot. European Journal of Plant Pathology 106: 581-588

Schwartz H and Mohan SK (2008) Compendium of Onion and Garlic Diseases and Pests, Second Edition. APS Press: 22-25.

What's Up with the "GMO Bill"?

MAIRE ULLRICH

Recent media has been talking about a new "GMO bill" and its passage in Congress. As of mid-September HR1599 had passed the House only. The bill details and progress can be seen at: https://www.congress.gov/bill/114th-congress/house-bill/1599

I have summarized the information here:
The Bill has 3 parts, each impacting different agencies and/or current laws/regulations.

- Continued FDA oversight of evaluating and regulating the fitness of a GMO for human consumption. That is not a new role for FDA. New is the addition to the FDA oversight in that it may require a food processor/manufacturer to label the product as a GMO if they determine the disclosure is in the best interest of the consumer. The disclosure may be necessary to prevent label from being false or misleading. They restate that "The use of a GMO does not, by itself, constitute a material difference".
- Amends the Plant Protection Act, overseen by USDA, to only allow the sale of GMO food, domestic and imported, that has been approved by FDA. Both agencies must cooperate and report on implementation of this process. GMO plants or microorganisms may be sold for research or other use in nutrient, enzyme or drug manufacturing without meeting these requirements. USDA must publish a list of GMO plants that can be sold as food and the determinations made by the FDA and USDA regarding those foods.
- The final portion is mostly about marketing. The bill would amend the Agricultural Marketing Act of 1946 to require the Agricultural Marketing Service (AMS, part of USDA) that seems to be similar to the organic rule. They would establish a voluntary non-GMO certification program that would be overseen by accredited 3rd party agencies and have trace-back on the supply chain to unsure no contamination with GMO crops. For food derived from livestock to be sold as non-GMO, the product, livestock, feed, and products used in processing the feed must be produced without GMOs. A food's label or advertising cannot suggest that non-GMO foods are safer or of higher quality than GMO foods. In the reverse, GMO foods cannot suggest it is of higher quality or safer. And if it is GMO, the producer/processer is allowed, on the label, to state what kind of modification occurred. Labeling rules apply for domestic and imported products.

Overall, state and local requirements for the labeling of GMO products are preempted unless the state or local government establishes a program that matches above. And, producers/processors have 36 months to comply with the law after it is enacted.

And not necessarily a GMO issue, but also include in this bill is the requirement for the FDA to oversee the use of the word "natural" in food labeling, also preempting any state regulations on such.

Bulb Mites , Now?

MAIRE ULLRICH

We expect to see bulb mites in the spring doing their damage but a few onions have been seen with internal damage. Often the damage is at the basal plate because they got in at the root but these examples show that they somehow got in the neck. Take a closer look at bacterial infections to make sure that the damage is not originally from mites. Look closely at the photo, all of those bead-like spots are mites.

"Your Produce Made Me Sick...."

ERIK SCHELLENBERG & MAIRE ULLRICH

This is the letter /e-mail you get:

> *I shopped at the Downtown Market on last Saturday and purchased quite a bit of vegetables, some $65 worth. But then, almost immediately after eating, my whole family has had stomach upset. It seems to go away if we don't eat your vegetables. We have tried them a couple of times now and the same results. Then I noticed a smell, a very chemical smell coming from them when I opened the bag. Especially the cabbage and carrots. The smell is almost like gasoline. We don't know what to do because we think the food is not safe to eat.*
>
> *-Sally Concerned*

The example of the chemical smell and taste in produce is a real-life issue. In some cases, fertilizers can affect the taste of crops. Stressed or older crops can express off flavors or bitterness. Stressed carrots with green shoulders are often described as having a chemical taste and of course, green potatoes actually do contain solanine, which is toxic. There are also real risks of chemical contamination that can come from a variety of sources. Fertilizer applied incorrectly, or spilled could cause chemical contamination. Any agricultural chemical applied incorrectly, drift from a neighbor or within the labeled DTH could cause chemical contamination. Additional possibe sources of contamination are from fuel or oil leaks on a tractor or harvesting truck, and from improper mixing of sanitizers in wash water. Although these issues are rare, a food safety plan will help get everyone involved in growing, harvesting, processing, and delivering the produce on the same page to minimize risks of chemical contamination.

One of the most important aspects of the food safety plan is a traceability system. If you have a good traceability system in place, then you will know exactly which field the carrots and cabbage in the example came from, what date they were harvested, who picked them, how much was brought to the market, and how much came back. It may sound like a lot, but the traceability system has helped many farms run better markets because they know exactly what sells, and how much they sold. No more guessing about important business decisions. Knowing this, if you have multiple people complaining about a similar issue, you will be able to go back to the area where the produce was harvested and investigate any potential chemical spills or other possible points of contamination.

Okay, so how do you deal with the customer? Assuming this is the ONLY complaint of this nature this season…..

Now what do you do? Of course, you have time to think because this was not a face-to-face confrontation but what if it had been?

- Stay calm. Even if you feel someone is outright accusing you of harm, under all circumstance it is best to keep your cool. Sure, it is VERY HARD since you would never put anything but your best out for sale but do not take it personally. Save your opinions and frustrations for later.
- Listen to the full complaint. Do not cut them off, correct them or roll your eyes. Nodding and attentive listening will help diffuse their irritation. It will help keep voices and tempers down.
- Think about how you would like to be treated if you were the customer and what your remedies might be if you were not satisfied with how your complaint was remediated.
- Respond with a clear/concise no-blame statements like: "I'm sorry but can't imagine how that would happen, we practice food safety protocols to prevent such things. But you've had a bad experience and we'd like to remedy that. Would you like a refund or new products*?"

Continued on next page

Happy customers share their good experiences with 1 person, on average. Unhappy customers share their experiences with 8 people.

ENGAGE AS LITTLE AS POSSIBLE, ON THE SPOT.

Apologize for their experience but do not ask questions about how they stored it, or cooked it, or carried it home. That just makes them think you are accusing them and will anger the dissatisfied customer. Do not ask for the veggies back unless you are really curious and are really going to do something with them like send them off for lab testing. Just tell them to throw them out. This is not the time to play Sherlock Holmes. If they actually bring them back to you, just put them aside. Don't start examining them on the spot. If they ask "Don't you want a look/taste/smell for yourself?" A simple response is "I will/important other person back at the farm will examine them tonight". Move right on to the refund portion. You know you will look at them as soon as you can, out of sheer curiosity, but you cannot let the customer think you doubt them and it would be too hard to juggle all of that at a busy market.

Someone who has taken their time to address this is upset and even if you are not sure they will remain a customer, you want their frustration level to be low or they may seek additional remedy beyond your refund.

OFFER A REFUND*

Do not assume someone with a serious complaint wants anymore of what you have to sell. It is consumer instinct to assume that you don't have quality so why would they want more of what they have already had a problem with? Imagine you bought a car that was nothing but trouble and then it was recalled under the "Lemon Law"? You would want your money back, not only the option of a new car from the same company, right? Why? Because, you experiences tell you likelihood that the next car will be junk is MUCH higher. You can offer replacement product for little things here and there but in serious cases, like the one above, you want to give them their full monetary refund and end the conflict.

Empower your staff to do the same if you are not available. Have a policy of how much they can refund without putting a note in the box and/or get clearance from you. The dollar amount in the above will ensure that it is a one-time refund. No one in their right mind would come back to the same stand twice with the same large complaint. DO NOT let the customer leave unsatisfied. Figure out a way to have a secure transaction policy while not making customers tell their story 19 times to 32 different people or have to come back 3 times. If the customer called your farm stand on Monday to complain of glass in a jelly jar and they would be in on Wednesday to get another/money back, PLEASE be sure there is a note for staff somewhere with who is getting what refund. The customer called so this exchange would be quick, not so they would stand around for 30 minutes while everyone figures out what to do because you ran to the bank.

California Ag Worker Overtime

MAIRE ULLRICH

California passed an overtime bill for farmworkers on September 12, 2016. The bill phases in overtime pay for agricultural workers. Below is the roll-out timeline.. There are also some stipulations that change break/meal

	Date of Compliance	
Rate of Pay	Employer of >25 workers	Employer of <25 workers
1.5x (overtime) pay for anyone working more than 9.5 hrs in 1 day or 55 hrs in 1 week	1/1/2019	1/1/2022
1.5x (overtime) pay for anyone working more than 9.0 hrs in 1 day or 50 hrs in 1 week	1/1/2020	1/1/2023
1.5x (overtime) pay for anyone working more than 8.5 hrs in 1 day or 45 hrs in 1 week	1/1/2021	1/1/2024
1.5x (overtime) pay for anyone working more than 8.0 hrs in 1 day or 40 hrs in 1 week	1/1/2022	1/1/2025
2.0x(double pay) for anyone working more than 12 horus in a day	1/1/2022	1/1/2022

Source: California Legislative Information, AB1066 https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?

Economics and Farm Policy: Part 1 – Farm Prices

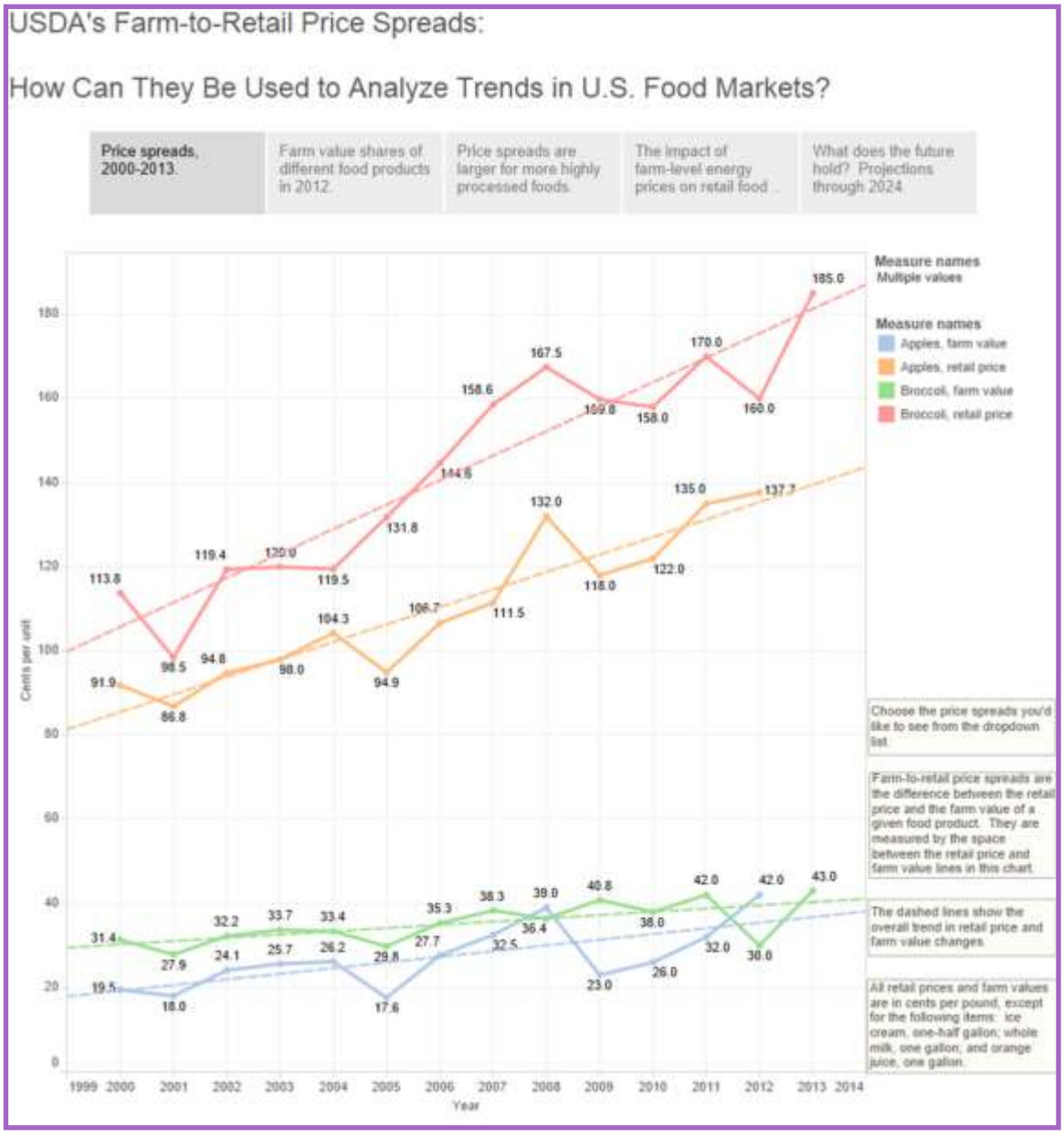
JESSE STRZOK

Over the next three ENYCH publications we will be taking a quick look into farm output prices received (farm prices for short) and farm policy (government intervention). In this first part we will look at an overview of farm prices. In the second we will look at the case for price support and in the third we will look at the case against price support. Economists rarely agree on more than a few things and most are not so keen on government intervention in agriculture. However, I read an article a couple of years ago and what stuck with me was the first sentence; "People may vote with their pocketbooks, but more often than not, they revolt with their bellies." Food is definitely a touchy subject and most people operate better knowing they have more than enough food, e.g., researchers and their arguments suggest one of several factors of the French Revolution was an increase in bread prices (more recently the Arab Spring – rise in food prices and conversion of crops to ethanol).

While looking at USDA farm prices (a wide range of common commodities/products; corn, beef, hog, soybeans, etc.) relative to a 1982 base year (using a consumer price index, CPI, to account for inflation) from 1950 through the early 2000s, two patterns emerge; farm prices have not kept up with inflation (using CPI) and farm prices are variable. I think the evidence suggests one of two possibilities:

- Farmers, in general, are "enjoying" a standard of living at 33% of their 1982 level, or;
- Farmers, in general, are far more productive (so farmers are not having to "enjoy" a standard of living at a third of what they were in 1982).

It is my opinion that the second possibility is far



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more convincing. I see this as a major compliment to agriculture as a whole – farms/farmers have been efficient, adapted to new challenges, and been extremely resourceful even while operating on slim margins. Have we seen some product's price increase steadily the entire time? Sure, I'd wager we could find a product which increased (at least most of the time) but this is not the story in general. If you'd like to try and figure this out, or search for one on your own, I'll walk you through the steps with an article on the ENYCH website.

How is this useful and applicable to us? Looking at the way back to the 1950s might not help with current trends of consumption patterns when forecasting prices and making decisions on what to grow. Most of this USDA data is fairly easily accessible via a simple web search but the USDA has also created some tools which you may find interesting. Once such tool is the Farm-to-Retail Price Spread which I have shown a snapshot of with apples and broccoli from 2000-2013. Of course we might like to look more in-depth on a particular variety and if the data is available I can help you do this.

The tool and summary information can be found at via the following: www.ers.usda.gov/data-products/price-spreads-from-farm-to-consumer/interactive-chart-price-spreads-and-food-markets.aspx

If you have any questions, please don't hesitate to reach out – js3234@cornell.edu

Do You Get American Farm Marketer?

MAIRE ULLRICH

American Farm Marketer is a new publication from the Growing Produce line of magazines and the editors of *American Fruit Grower* and *American Vegetable Grower.* Its focus is for medium- to small-sized growing operations that have turned to retail formats to supplement income and keep the farm in a healthy financial condition. Those of you who operate on-farm markets, wineries, farmers' markets, and other similar businesses would benefit from this print and electronic newsletter. It comes with the parent magazines listed above. There are also good e-mails with tips and tricks from legislative changes that impact direct marketing to designing corn mazes to engaging customers with pumpkin decorating ideas. Check it out http://www.growingproduce.com/magazine/american-farm-marketer/

Looking for Garlic with Fuserium

CRYSTAL STEWART

This year we received a grant to better understand and manage fusarium on garlic. We are looking for 40 samples of fusarium infested garlic which will be used to understand the genetics of fusarium. At the same time we are learning about the disease itself, we will also be conducting 4 trials across NY to understand which cultural management strategies help to minimize the disease.

You can send in your fusarium samples free of charge along with this form (on the next page), and when the study is complete you will receive information based on what we have learned. We will also be reporting on our trials over the next two years.

continued on next page

Fusarium Diagnostics Lab
Sample Submission Form

Cornell University Cooperative Extension

Please mail sample to: Cornell University, NYSAES, Barton Lab, c/o Frank Hay
630 West North Street Geneva, NY 14456

Location where the sample was taken

Business name: _____
Person to contact: _____
Address: _____
_____
Phone: _____
Email: _____
County: _____
Collection Date:

Referring Agent: (i.e. CCE educator)

Name: _____
Email: _____

Guidelines:

Samples can be collected anytime, but best close to harvest and before planting. Send 10 representative whole bulbs/ variety/ garlic sample. Pack garlic samples in separate bags and avoid exposure to direct sun light and high temperature. Send only during the week and by overnight delivery, if possible.

Varieties (please label each sample with variety name)

Production History:

☐ Organic ☐ Conventional

How do you sell/use your garlic (if multiple channels, place % grown for each next to selection)

☐ Seed ☐ Food ☐ Seed and Food

☐ Seed for Replanting

Size of Planting:

☐ < ¼ Acre ☐ 1/4 – 1/2 Acre ☐ 1/2 -1 Acre

☐ 1-2 Acres ☐ > 2 Acres ☐ Area Affected: _____

Over the last 3 years, please recall whether you saw similar problems, and to what extent:

2015: ☐ No problems ☐ Yes, less than 5% ☐ Yes, 5-10% ☐ Yes, 10-20% ☐ Yes, more than 20%

2014: ☐ No problems ☐ Yes, less than 5% ☐ Yes, 5-10% ☐ Yes, 10-20% ☐ Yes, more than 20%

2013: ☐ No problems ☐ Yes, less than 5% ☐ Yes, 5-10% ☐ Yes, 10-20% ☐ Yes, more than 20%

Where did your seed come from originally, and when did you last buy in seed? If you do not recall, please leave blank.

NORTHEAST SARE Sustainable Agriculture Research & Education

Please fill out the form completely to help us understand the impact of this disease on the garlic industry in the Northeast. This project has been made possible through funding from Northeast SARE.

continued on next page

Calendar of Events

October 13, 2016. ***Cover Crop Field Days: Not What Grandpa Used to Plant.,*** Stanton's Feura Farm, Fuera Busch, NY. $5 per person. 10:30AM-2:30PM. *See hands on over 20 different species and combinations of cover crops planted no-till directly into standing sweet corn! Guest speakers will discuss species selection, and our host farm will demonstrate their Unverferth Ripper Stripper unit.*
http://enych.cce.cornell.edu/event.php?id=609

October 19, 2016. ***Vegetable Growers Twilight: Cultivation Equipment Demo.,*** Poughkeepsie Farm Project, 51 Vassar La., Poughkeepsie, NY Free. 3:30-5:30PM. *Various cultivation will implements will be demonstrated! Learn how these tools are used in conjunction with cover cropping, plastic mulching and stale seed-bedding for weed management on diversified vegetable operations.*
http://enych.cce.cornell.edu/event.php?id=610

October 20, 2016. ***Ag Tax Incentive Workshop,*** CCE Ulster County , 232 Plaza Rd., Kingston, NY Free. 6:30-8:30PM. 845-340-3990.

November 10, 2016. ***Farmland Rent Evaluation Workshop,*** CCE Ulster County , 676 Plaza Rd., Kingston, NY Free. 6:00-8:00PM. 845-340-3990.

November 17, 2016. ***Farm to Institution Market Readiness: A Workshop for Farmers.*** CCE Saratoga County, Ballston Spa, NY. $25, includes lunch 9:00AM-3:00PM. *Interested in taking advantage of the growing demand for New York foods in schools, colleges, hospitals, child care, and senior meal centers?* Registration: Ellie Hackett - (518) 885-8995 or eah29@cornell.edu

December 1, 2016. ***Table Grape Workshop,*** CCE Albany County, Voorheesville, NY. Watch for more details.

December 7, 2016. ***Grape Growers Pot-Luck Dinner,*** Red Maple Vineyard, West Park, Watch for more details.

December 7, 2016. ***Business Succession Planning for Farms (Part 1 of 2)*** CCE Albany County, 11:00AM-3:00PM $50 for up to 2 people per farm. Lunch included. Part 2 date TBD, end of February.

December 8, 2016. ***Business Succession Planning for Farms (Part 1 of 2)*** CCE Ulster County, Hudson Valley Lab, 3357 US HWY 9W, Highland, NY. 11:00AM-3:00PM $50 for up to 2 people per farm. Lunch included. Part 2 date TBD, end of February.

January 12&13, 2017. ***Long Island Ag Forum.*** Watch for More Info.

January 17-19. ***Empire State Producers Expo, Syracuse, NY***
http://nysvga.org/expo/information/

ENY COMMERCIAL HORTICULTURE LOCAL PROGRAMS

New Dates Added Regularly at:
http://enych.cce.cornell.edu/

VEGETABLE GROWERS TWILIGHT MEETING:

Cultivation Equipment

DATE: Wednesday, October 19th

TIME: 3:30 – 5:30 PM

LOCATION: Poughkeepsie Farm Project
51 Vassar Farm Lane
Poughkeepsie, NY 12603

There is NO FEE for this program.
The meeting will be held rain or shine.
Please Pre- Register by Monday October 17th at
http://enych.cce.cornell.edu/event.php?id=610
or call Abby Henderson at 518-746-2553
For more information, contact Ethan Grundberg at 845-956-4355 or eg572@cornell.edu

Join Leon Vehaba, Farm Manager at the Poughkeepsie Farm Project, and Ethan Grundberg, Vegetable Crops Specialist with ENYCHP, for a discussion of weed management systems and demonstration of cultivation equipment.

The demonstration will highlight the use of several cultivation implements, including :

- Buddingh Basket Weeder
- Williams Flex Tine Cultivator
- I & J Two Row 3-Point Cultivator
- HAK steerable S-Series hoeing machine
- Jean-Martin Fortier style flame weeder.

In addition to the equipment demo, we will discuss how these tools are used in conjunction with cover cropping, plastic mulching and stale seed-bedding for weed management on diversified vegetable operations.

COVER CROP FIELD DAY:

NOT WHAT GRANDPA USED TO PLANT!

ENYCHP would like to invite you to see hands on over 20 different species and combinations of cover crops planted no-till directly into standing sweet corn! Guest speakers will discuss species selection, and our host farm will demonstrate their Unverferth Ripper Stripper unit and discuss their reduced tillage and cover crop experiences used for vegetables.

Guest Speakers: Dr. Paul Salon, *Northeast Soil Health Specialist* & Dave Wilson, *Research Agronomist and Cover Crop Specialist*

DATE: Thursday, October 13,
10:30 am – 2:00 pm

Stanton's Feura Farm
210 Onesquethaw Creek Rd
Feura Bush , NY 12067

$5 per person
(lunch provided)
Please Pre-Register!

To register visit http://enych.cce.cornell.edu/event.php?id=609
or call Abby at 518-746-2553
For more information about the program, call Chuck Bornt at 518-859-6213