

The Vegetable & Small Fruit Gazette

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I have never in my life learned anything from any man who agreed with me.

~Dudley Field Malone

Ensuring the Future of Pollination in Pennsylvania via Youth

Tom Butzler, Penn State Cooperative Extension, Clinton County

You all have probably seen the numbers and statistics as it relates to beekeeping in Pennsylvania. The number of beekeepers since the mid 1980's is down from 10,000 to ~ 2000 resulting in a decrease in the number of managed colonies from 80,000 to ~40,000. The reasons for the declines in those numbers have been well publicized in the popular press; mites (varroa and tracheal), American foulbrood, and Colony Collapse Disorder.

By no means is anyone sitting back and letting these problems go unanswered. Scientists at institutions such as Penn State University and the United States Department of Agriculture are utilizing dollars to find solutions to these problems. Private industry, such as Haagen-Dazs, is chipping in money but also alerting the general public about pollination issues through a marketing campaign.

Beekeeping clubs are also assisting in the effort by increasing the number of beekeepers. Clubs have always held Beginner Beekeeping workshops, to introduce the art and science of beekeeping to those interested, but are teaching to larger audiences than normal. Most of these classes are geared towards adults, who have the interest and finances.

But are we missing out on developing future beekeepers with our youth? Yes, youth are exposed to beekeeping at school field days or the occasional classroom visit by a beekeeper. The Pennsylvania Department of Agriculture funded a project the past few years to introduce beekeeping to youth through a ½ year hands-on program at the Penn State Extension office in Clinton County.

The program is an effort to be proactive before the state reaches a critical stage where we lack enough pollinators for Pennsylvania's growers. It is hoped that participants will carry on this knowledge as a hobby or part-time business. Eight youth are introduced into the art and science of beekeeping (10-15 year olds) each year by both lecture and hands-on activities. Participants meet weekly for the first several weeks to build equipment, install package bees, and monitor the early progress of their effort. Each class starts with a video and/or "chalk talk" before we move to the hands-on component. After the first five weeks, the youth take their hive home to manage the rest of the season. The groups meet throughout the spring/summer/fall season to talk about their experiences with their hive, discuss relevant beekeeping topics, and go on field trips. Other topics covered during the class are history of beekeeping, how bees make honey, diseases and pests of the honey bee, pollination, and division of labor. All participants the past three years have completed the class and had an increase in their knowledge about honey bees, equipment, and techniques. Each individual walks away from the class with an active hive and the knowledge to carry on beekeeping for years to come.

Table 1. Lessons for Youth Beekeeping Program

Lesson 1	Build Equipment
Lesson 2	Install Package Bees
Lesson 3	<ul style="list-style-type: none"> • Learn How to Light a Smoker • Check Hives • Release Queen (if not already)
Lesson 4	Check Hives and Identification of caste members
Lesson 5	Check Hives and Identification of colony organization
Lesson 6	<ul style="list-style-type: none"> • Check Hives and Identification of hive products. • Preparation for Travel (take hives home)
Lesson 7	Visit commercial beekeeper
Lesson 8	Report Back/Honey Nutrition
Lesson 9	Swarming Issues/Cooking with Honey
Lesson 10	Review Honeybee Pest Issues

That's a Berry Good Question!!!

Q. I have a really heavy cropload on my blueberry plants, and very few leaves. Why? Can these plants mature this crop? What should I do?? Will these plants survive? (Several blueberry growers, usually with 'Bluecrop').

A. Flower bud initiation in blueberries is influenced by many factors including cultivar, daylength, temperature, thickness of fruiting wood, and time of year that the fruiting wood formed. The flower buds for this year's crop were initiated last summer and fall, so everything that determined the flower bud to vegetative bud ratio on fruiting wood happened last year. The only thing that growers can do in the current year is adjust pruning practices to decrease the cropload, and adjust other cultural practices to try to encourage new cane and shoot growth.

If a very heavy cropload remains on the plant after pruning, the plant will try to mature the crop. Berries on very heavily cropped plants are small, and ripen slowly. The plants probably will mature the crop, but will do so very slowly. Since the leaves do the work of producing the sugars for the berries, and there were few leaves relative to the amount of fruit to ripen, plus little new vegetative growth, there just isn't much sugar to go around. Often the plant tries to conserve resources by producing less vegetation, and the plant declines. So, would these blueberries get into a biennial bearing cycle, as happens with fruit trees, or does the stressed plant just continue to fruit? My own observation is that 'Bluecrop' does not give itself a rest. Luis Valenzuela, a Ph.D. student here in the department, looked at this question, and found that 'Bluecrop' plants that produced a heavy crop in one year still produced a heavy crop the next year. Other cultivars may be different.

So, what should you do at this point? Next year's (and future years) crops are being determined right now, which is why we're discussing this in the summer, so it's important to keep the plants as healthy as possible in order to encourage them to produce vegetation. This means keeping them watered, controlling leaf-feeding insects, and keeping existing foliage healthy by minimizing diseases (i.e., don't let the tomatoes and pumpkins make you forget about your blueberries after harvest). It's getting a little late for applying nitrogen fertilizers, however. In order to have a "heads-up" for what might happen next year, take a look at your blueberry canes this fall. You should be able to tell what your fruit bud to leaf bud ratio is like (flower buds will be plump-looking, and leaf buds will be narrow).

Then, when you're doing your dormant pruning this winter, be ready to make some adjustments, quite likely pruning heavier than you have in the past. You will need to make different adjustments for different cultivars. Among Northern highbush cultivars, 'Bluecrop' in particular has a tendency to overcrop, and in our cultivar trial in Luzerne County, it appeared that 'Bluegold' also could form a very heavy cropload relative to the amount of foliage. Then take a close look, and make sure that you are removing enough flower buds. Some detail pruning to remove flower buds may also be in order. After that, pay attention to fertilization (you may need to increase nitrogen rates somewhat), and mulch and water to encourage new growth.

Now, what can you do if you just can't seem to get the plants back into balance? Well, I had some 'Bluecrop' plants that I'd struggled with for five years or so, and they just would not send up new canes. I figured they were taking the slow train to the hereafter, and decided to speed up the process.

So, we whacked them off at ground level last fall, and rather than finishing them off, I found out why this process is sometime referred to as “rejuvenation”... Each one of those plants that had refused to send up new canes now has fifteen to twenty healthy new canes. I do need to point out I don’t recommend you try “whacking off” all of your plants. I’d try getting them into balance by other means first, or try this with just a few of the worst plants, and see what happens.

All of the above adjustments will help if a heavy crop load was the primary problem. Another factor such as disease, insufficient watering or nutritional difficulties may negatively influence the amount of foliage produced, so those issues may need to be corrected also. However, even plants that have problems in these areas may also benefit from your “lightening the load” while pruning and correcting the other problems.

Got a question? Chances are that someone else has the same question, but isn't asking! Send your question to Kathy Demchak, at 102 Tyson Bldg., University Park, PA 16802, or via email to kdemchak@psu.edu. You will be credited with the question, or can remain anonymous, as you wish.

Fungicide Sensitivity Assay Provides Information to Guide Cucurbit Powdery Mildew Management in PA in 2008

Margaret T. McGrath, Cornell Plant Pathology

Project cooperators: Tim Elkner, Emelie Swackhamer, Jeff Stoltzfus

Selecting the best fungicide program for powdery mildew is challenging because the pathogen has proven adept at developing resistance to the most important fungicides. These are the mobile fungicides due to their ability to get to the lower surface of cucurbit leaves where the disease develops best. Mobile fungicides are prone to resistance development because of their single-site mode of action.

A seedling fungicide sensitivity bioassay was conducted in three spring squash crops in Lancaster and Berks counties on 10 and 11 July. This assay entails treating seedlings with different fungicides that are prone to resistance development and then putting these seedlings in cucurbit crops with powdery mildew for a few hours to catch spores. The seedlings are then kept in a greenhouse until symptoms develop.

Powdery mildew developed well on plants treated with Flint, a QoI (FRAC code 11) fungicide, and on plants treated with Topsin M, an MBC (FRAC code 1) fungicide. This was not surprising because resistance to these groups of fungicides is thought to be common. It is qualitative, thus resistant pathogen strains are completely resistant and therefore increasing the application rate will not improve control. Therefore Topsin M, Amistar, Cabrio, Flint, Quadris, and other related fungicides are not recommended for managing powdery mildew in PA.

Powdery mildew developed on all rates tested of the DMI (code 3) fungicide Nova, including the highest rate of 120 ppm, and also Procure, which was tested at 80 ppm. Resistance to this group of fungicides is quantitative (rather than qualitative as with QoIs); therefore pathogen strains exhibit a range in the concentration of fungicide they can tolerate. Procure at the highest label rate (8 oz/A) is recommended because it will provide twice as much active ingredient as Rally (aka Nova) at its highest rate.

Some powdery mildew developed on seedlings treated with 50-175 ppm boscalid, an active ingredient in the fungicide Pristine. Severity was much lower than on non-treated and also Nova-treated seedlings, suggesting that there is a much lower frequency of isolates in the pathogen population able to tolerate boscalid than DMI fungicides. However, this could change during the season where Pristine is used. Some powdery mildew also developed on seedlings treated with 1 ppm Quintec but not 10 ppm.

Relating fungicide sensitivity results to field applications is not easy because pathogen assays are based on fungicide concentration in the solution whereas fungicides are applied in the field on an area-treated basis (e.g. rate per acre). Fungicide concentration that a grower sprays depends on the gallonage used. When these fungicides are applied at their highest label rate and at 50 gpa, the field spray dose of active ingredient is 212 ppm for Quintec, 300 ppm for Nova, 600 ppm for Procure, and 700 ppm for boscalid in Pristine. Thus the field spray dose for Nova, Procure, and Pristine is only 2

to 4 times greater than the high dose tolerated in the bioassay. Additional differences between the bioassays and field applications that need to be recognized include more thorough spray coverage with the bioassay and the fact pathogen spores land on the bioassay plants one day after treatment rather than over several days as the spray dose declines. Thus control failure could occur with pathogen isolates able to tolerate less than the field spray dose.

The mobile fungicides (Procure, Quintec and Pristine) should be tank mixed with protectant fungicides (e.g. chlorothalonil, copper, oil, sulfur) and applied in alternation on a weekly schedule for resistance management. Use Procure and Pristine at highest label rates. Start applications at the action threshold of 1 of 50 old leaves with symptoms. Quintec is expected to be the most effective fungicide for cucurbit powdery mildew in 2008. It is only labeled for use on melons. Pristine likely will be more effective than Procure in PA in 2008. Suggested fungicide alternations for melon include Quintec, Pristine, Quintec, Procure, Quintec. Two consecutive applications of Quintec can be made before alternating. Crop limit is 4 applications. Examine the lower surface of leaves routinely during the season to assess whether the mobile fungicides are suppressing powdery mildew development and thus it is worthwhile to continue using them. Control good on upper leaf surfaces but poor on lower surfaces is an indication that application timing was good (protectant fungicides controlling mildew on upper surfaces) and that there is a problem with the mobile fungicides used (e.g. rate too low or pathogen has become sufficiently insensitive to the fungicide that it is resistant).

Grower assessment of their powdery mildew control in 2008 is requested to relate to the bioassay results. Please contact us with your comments.

This assay was done as part of a project supported by PVGA.

Plant & Pest Advisory: Vegetable Alert!

Andy Wyenandt, Extension Specialist Plant Biology and Pathology, Rutgers

Date: 7/9/08

Pest: Cucurbit Downy mildew

Found: Cucurbit downy mildew has been confirmed on cucumber in southern Delaware (Georgetown, Sussex Co.) on July 9th. This is the first report of cucurbit downy mildew in the mid-Atlantic region this growing season! Downy mildew has also been confirmed in central and western New York.

Crop(s) at risk: all cucurbit crops in the area.

Potential impact: Significant losses will occur if not controlled properly

What growers should do: Control of Downy mildew begins with regular scouting, recognizing symptoms and weekly protectant fungicide applications. The following are the most effective materials.

Once Downy mildew has been detected in the region, basic fungicide maintenance programs for cucurbit crops should be adjusted to include fungicides for downy mildew control. Check all labels to verify that materials can be used in your area.

Tank mix one of the products listed below with a protectant fungicide such as chlorothalonil (M5), or maneb (M3), or mancozeb (M3) (see label for rates and specific crop uses):

Ranman (cyazofamid, 21) at 2.1 to 2.75 fl. oz. 400SC/A, or

Previcur Flex (propamocarb HCL, 28) at 1.2 pt 6F/A, or

Gavel (zoxamide + mancozeb, 22 + M3) at 1.5 to 2.0 lb 75DF/A (some muskmelon may be sensitive)

Curzate (cymoxanil, 27) at 3.2 oz 60DF/A, or

Tanos (famoxodone + cymoxanil, 11 + 27) at 8 oz 50WDG/A, or

Remember that downy mildew materials should always be tank mixed with a protectant fungicide and rotated weekly with fungicides from a different FRAC code to reduce the chances for fungicide resistance development.* *For more information on Downy mildew control for specific cucurbit crops please see the 2008 Commercial Vegetable Production Recommendations Guide.

All abandoned cucumber and summer squash fields should be sprayed with gramoxone or disced under immediately after last harvest to kill the foliage! Abandoned fields left unattended after use will only serve as a source of inoculum for other fields once downy mildew makes it way into our area.

If you suspect downy mildew on your farm, please contact Andy Wyenandt (856) 455-3100 ext 4144 or your local Extension educator so we can confirm its presence.

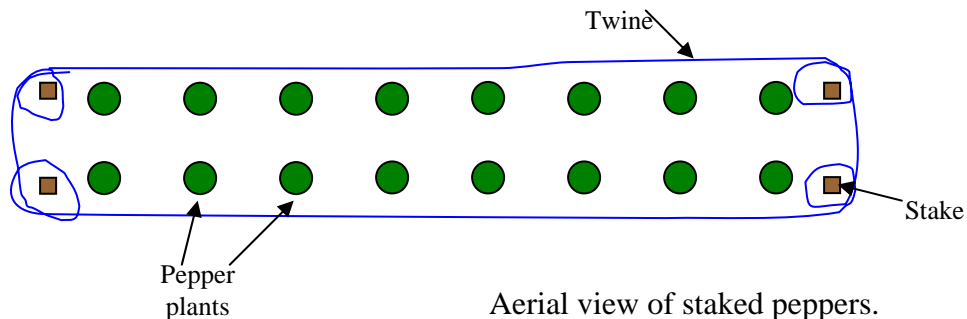
To track the progress of cucurbit downy mildew in the eastern US and to keep up with reports of Downy mildew from other states please visit North Carolina State University's Cucurbit Downy Mildew Forecasting Center at <http://www.ces.ncsu.edu/depts/pp/cucurbit/>.

Staking Peppers in Pennsylvania: Is it Worth the Effort?

Elsa Sánchez and Mike Orzolek, Penn State Horticulture

This year a group of specialists and educators at Penn State have initiated a statewide cultivar trial on bell peppers. A question that has arisen is: should the bell pepper plants be staked or not? For us the short answer was no, but read on for more information to use when making your own decision.

Staking is done primarily to decrease the number of peppers with sunscald. By holding the plant upright, lodging is minimized as well as the exposure of peppers to the sun. A few methods for staking exist. The Commercial Vegetable Production Recommendation guide describes a couple (pg. F68). Generally, with a double row plasticulture system place stakes 6-8 inches deep in the soil every 8-12 feet within each plant row. Then, when plants are about 12 inches tall, take twine (polyethylene string) and wrap it around the stakes, rolling it around each individual stake. When the plants get about 18 inches tall, a second length of twine can be secured around the stakes in the same way.



Aerial view of staked peppers.
The first twine is about 12 inches above ground; second about 18 inches.

Staking is a common practice in New Jersey; although, not all growers there stake. New Jersey soils are very sandy compared to our soils in Pennsylvania resulting in the amount of nutrients and frequency of irrigation for producing a bell pepper crop being different. This leads to differences in plant growth and lodging can be a concern in New Jersey. With our heavier soils, lodging is a lesser concern.

Other strategies exist for minimizing lodging, and therefore sunscald. By using proper spacing of 12-18 inches between plants in a row, surrounding plants help support an individual plant. Also, practices that promote a deep, healthy root system will anchor plants. Irrigation practices are important in promoting a deep root system; watering deeply encourages roots to grow beyond shallow soil depths. Selecting cultivars with good fruit cover from leaves also minimizes sunscald. Cultivars that get taller than about 2 feet or that produce very heavy crop loads may require staking.

The bottom line is that staking is an added production expense; it requires extra materials (stakes and twine) and labor to complete. Consider these costs compared to the cost of peppers lost to sunscald when making the decision to stake or not.

It's a Business

Bill Lamont, Penn State Horticulture

This year is certainly the year to really recognize that our farming activities are indeed first and foremost a business enterprise. I fully realize that there are many other important benefits gained from engaging in a farming enterprise but decisions need to be made on financially sound information. I can remember the days when a grower would be happy if at the end of year there was some cash in their pockets. There wasn't really any economics attached to this balance sheet but just that there was cash in one's wallet. That was a model that survived through many years but now the world has changed and growers are being challenged as never before to farm and still make a profit. The concept of cheap food has made the consuming public lazy and they have come to expect it as if it is a fundamental right written in the constitution. Well the growers that I have been talking to recently know that this is indeed not the case. Every input into their farming operations has exploded and these costs have to be passed on to the consumer or wholesaler or else one has to review if their farming operation is indeed a viable economic enterprise. I have always challenged growers to be able to tell me how much you have invested in a product at any given time in the life of the crop. Without this kind of detail you are shooting in the dark as far as pricing goes. You as a producer have to have your balance sheet and cost of production for your product down to the penny so you know how to fairly price your product for yourself and your buyer. You are certainly not in the business to sell produce at a loss, which is what you may be doing if you do not really put the economic pencil to your operation. The business of farming especially vegetables and fruits will require not only good books but also education of the consumer as to why the price of your produce has to go up.

Upcoming Meetings

If you have a meeting you would like to announce, please send the meeting title, date, location and contact information to esanchez@psu.edu.

Local

- ✓ Aug. 7, 2008. **Building a High Tunnel Hands-On Workshop**, Josie Porter Farm, Stroudsburg, PA. Pennsylvania Women's Agricultural Network (PA-WAgN) sponsored event. Registration \$15, which includes lunch. For more information visit <http://wagn.cas.psu.edu/Register0810.html>.
- ✓ Late August – early September. **Regional Potato Field Day**, James Hite Farm, in Patton, Cambria County. Sessions will focus on the Snack Food Variety Trials planted at the farm as well as Insect & Disease Management in Potatoes and Pesticide Safety. For more information contact Thomas Ford at 814-940-5989 or tgf2@psu.edu. This is a Pennsylvania Vegetables Growers and Penn State Cooperative Extension sponsored event.
- ✓ Sept 2, 2008, **Twilight Potato Meeting**, 6:30 pm, Neffs, PA Lehigh County at Tim Geiger Farm. For more info contact Bob Leiby 610-391-9840 or rleiby@psu.edu.
- ✓ Sept. 3, 2008. **Southwest Pepper Variety Twilight Meeting**, Janoski Farms in Clinton, Beaver County. A twilight meeting will be held at the farm to discuss variety selection, pest management, and probably also nutrient management. Depending on how a cucurbit trial at the farm goes, the twilight meeting may also cover downy mildew in cucurbits. Contact Lee Young for more information at 724-837-1402 or ljs32@psu.edu. This is a Pennsylvania Vegetables Growers and Penn State Cooperative Extension sponsored event.
- ✓ Sept. 3, 2008. **Organic Vegetable Production Pest Walk**, Liberty Gardens in Coopersburg, PA. The pest walk will be held from 5:00-8:00 p.m. The featured speaker will be Brian Caldwell, Research Technician with Cornell University's Organic Cropping Systems Project. The tour host will be Jeff Frank, Liberty Gardens <http://www.libertyorganic.com> in Coopersburg, PA. The goal for the evening will be to review current pest problems and discuss solutions in an organically managed system. Contact Emelie Swackhamer at 610-391-9840 for information. This is a Pennsylvania Vegetables Growers and Penn State Cooperative Extension sponsored event.
- ✓ Sept. 11, 2008. **Taste of Harvest Winery Tour**, J. Maki Winery at French Creek Vineyards, Chester Co. Pennsylvania Women's Agricultural Network (PA-WAgN) sponsored event. Registration \$15, which includes wine tasting. For more information visit <http://wagn.cas.psu.edu/Register0813.html>.
- ✓ Sept. 11, 2008. **Cucurbit Disease Twilight Meeting**, Buza's Greenhouses in Easton, PA from 5-8 pm. The featured speaker will be Dr. Meg McGrath, Associate Professor of Plant Pathology, from Cornell University's Long Island Horticultural Research & Extension Center. The tours hosts are Bev and Bob Hoyer, proprietors of Buza's Greenhouses. The goal for the evening will be to discuss diagnosis of cucurbit diseases, disease cycles and current management options, with an emphasis on a small powdery mildew research study and recent

changes to fungicide recommendations. Contact Emelie Swackhamer at 610-391-9840 for more information. This is a Pennsylvania Vegetables Growers and Penn State Cooperative Extension sponsored event.

- ✓ Nov. 13, 2008. **Vegetable and Small Fruit Agricultural Educators Roundtable**, Sam Hays Livestock Evaluation Facility, Rock Springs, PA. For more information contact Bill Lamont at (814) 865-7118 or wlamont@psu.edu.
- ✓ Nov. 18, 2008 (tentative date). **Western Pennsylvania Vegetable & Berry Seminar**, Butler, PA. For more information contact Eric Oesterling at (724) 837-1402 or reol@psu.edu or Lee Young at (724) 228-6881 or ljs32@psu.edu.

Regional

- ✓ Jan. 13 – 15, 2009. **Atlantic Coast Agricultural Convention and Trade Show** (NJ Vegetable Meeting); Trump Taj Mahal. For more information contact Mel Henninger at (732) 932-9711 x 120 or henninger@aesop.rutgers.edu.
- ✓ Feb. 3-5, 2009. **2009 Mid-Atlantic Fruit and Vegetable Convention**, Hershey Lodge and Convention Center, Hershey, PA. For more information contact William Troxell at 717-694-3596 or visit www.mafvc.org.
- ✓ Nov. 6-8, 2008. **Southeast Strawberry Expo**, Charlotte, NC. Workshops (“Strawberry Plasticulture for New Growers” and “Are You Making a Profit”), tour, educational sessions and trade show. For more information call 919-542-4037, email info@ncstrawberry.com or visit www.ncstrawberry.com.

National

- ✓ August 10-14, 2008. **92nd Annual Meeting of The Potato Association of America**; Buffalo, NY. For more information contact Don Halseth at (607) 255-5460 or deh@cornell.edu or the website at <http://www.hort.cornell.edu/PAA2008/>.

International

- ✓ Sept. 7-10, 2008. **19th International Pepper Conference**; Sheraton Hotel and Conference Center, Atlantic City, New Jersey, USA; contact Dr. Wesley Kline by phone (856) 451-2800 or email wkline@aesop.rutgers.edu or Dr. Andy Wyenandt by phone (856-455-3100 X4144) or email wyenandt@aesop.rutgers.edu.
- ✓ Dec. 8-9, 2008. **North American Raspberry & Blackberry Conference**; Grand Rapids, MI, in association with the Great Lakes Fruit & Vegetable Expo (Dec. 9-11). For more information email info@raspberryblackberry.com, call 919-542-4037 or visit www.raspberryblackberry.com.

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The newsletter is also posted within three days on the Department of Horticulture Vegetable program website at: <http://hortweb.cas.psu.edu/extension/veg crops/newsletterlist.html>.

Where trade names appear, no discrimination is intended, and no endorsement by Penn State Cooperative Extension is implied.

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