

The Vegetable and Small Fruit Gazette

Vol. 8, No. 6- July 2004

Horticulture Department
The Pennsylvania State University

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Tip for the Month-- "Wisdom comes with age, but sometimes age comes alone"-unknown.

Comments from the Editor

Bill Lamont, Department of Horticulture

July is a hectic here in Happy Valley and throughout the commonwealth for those engaged in the noble profession of agriculture. We are looking forward to the upcoming Vegetable and Small Fruit Field Day to be held July 14th at the Horticulture Farm at Rock Springs, PA. We have plenty to show you both in the fields and in the high tunnels. Kathy is finally finished harvesting her strawberry crops and she is breathing a short sigh before she heads into blueberries. We will show you the red, white and blue potatoes at the field day. I want to thank Eric Oesterling, for his excellent article "**Thoughts on Sweet Corn Weed Control Problems – Plastic Mulch and Other Issues**" and I look forward to receiving Jeff Mizer's article for the August issue. I want to thank colleagues from other departments who contributed articles to this issue and I want to encourage others to join us in upcoming issues. If you have an event that you would like to advertise, please send it to me. As always, the Vegetable and Small Fruit Gazette Team encourages your feedback so that we can better serve your needs and address your concerns.

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Schedule for Agent Articles

Bill Lamont, Department of Horticulture

August	Jeff Mizer
September	Emelie Swackhamer
October	Cheryl Bjornson
November	John Esslinger
December	Andy Muza

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2004 Vegetable and Small Fruit Field Day set for July 14

Bill Troxell, Executive Secretary, PVGA

The 2004 Pennsylvania Vegetable and Small Fruit Field Day is scheduled for July 14, 2004. It will be held at Horticulture Farm located at Penn State's Russell E. Larson Agricultural Research Center at Rock Springs located 11 miles west of State College on PA Route 45. The Horticulture Farm is just east of the AgProgress Days site. This event is being sponsored jointly by Penn State University's College of Agricultural Sciences, the Department of Horticulture and the Pennsylvania Vegetable Growers Association. Growers will have the opportunity to see first-hand the research projects being conducted by Penn State researchers at the Research Center. The general itinerary is as follows:

8:00 a.m. Registration and Refreshments

9:00 a.m. Field demonstrations of equipment. This will include a new prototype transplanting unit for plasticulture that has been developed by Matt Lawrence, a Masters Degree candidate and Dr. Dennis Buckmaster from the Department of Biological and Agricultural Engineering. The unit can make a single, double or four holes and vary the in-row spacing on a plastic mulched bed with out changing any wheels. Also, from the Department of Biological and Agricultural Engineering, Jim Garthe, will demonstrated the Used Plastics Combustion Unit from South Korea and the Plastofuel Nugget maker, that should offer a solution to the tons of agricultural plastic waste generated, not only, in Pennsylvania but the country and the world.

12:30 p.m. Lunch: A hearty sandwich accompanied chips, beverage will be provided.

- 1:30 p.m. Tour of Vegetable and Small Fruit Horticulture and Entomology Research Plots. Researchers and support staff will be in the field to answer questions and comment about their current research.
- 4:30 p.m. Adjourn

To pre-register call PVGA at 717-694-3596 or email PVGA at wt.pvga@tricountyi.net by July 12th. Registration is \$15 per person to cover the costs of lunch, morning and afternoon refreshments, and other costs for persons registering before July 12, 2004. Late registrants will be charged an extra \$5. Children under 16 will be charged \$10 registration. Pre-registration is important to obtain good estimates of the food needed.

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Thoughts on Sweet Corn Weed Control Problems- Plastic Mulch and Other Issues

Eric Oesterling, County Extension Agent, Westmoreland County

I recently had the pleasure of spending a couple of days with Dr. Brad Majek, weed specialist for fruit and vegetable crops with Rutgers University. Brad is based out of the Rutgers Agricultural Research & Extension Center in Bridgeton, New Jersey. Brad has a great practical outlook on weed control in horticultural crops - anything I say in this article is based on conversations with him.

One of the most difficult weed control situations is where plastic mulch is used on crops such as sweet corn. Providing for good weed control both beneath the plastic and between rows of plastic needs to be approached as two separate operations according to Dr. Majek. A broadcast application over the whole field, followed by the plastic laying operation, will result in poor weed control along the edges of the plastic where the soil was disturbed to cover the plastic. The best way to treat soil under the plastic is to have nozzles set up on the plastic layer to spray the soil beneath the plastic just before the plastic is covered. Be sure to use materials that are not too volatile or phytotoxic under the plastic. For sweet corn Dr. Majek likes atrazine and alachlor (Micro-tech, Lasso) under the plastic because there is little chance of injury to the crop even with cool spring soil temperatures and slow growth. The condensation caused by the plastic over the wet soil does a good job of activating those chemicals under the plastic. No mechanical incorporation is needed or recommended.

For between the row weed control Dr. Majek suggests a directed spray over the bare soil between plastic strips. One of the best ways farmers have been able to accomplish this is with a home made sprayer mounted on a tractor that straddles the plastic and sprays bare soil on both sides of one row of plastic. The first nozzle is mounted on each side to just cover the outside edge of the plastic with other nozzles mounted outward to evenly cover the bare soil to the center between rows of plastic. With an arrangement like this you spray from the plastic edge to the center of the bare soil on both sides of one row of plastic. Broadcast applications over the whole field of plastic are not recommended because the chemical sprayed over top the plastic is likely to accumulate either along the edges of the plastic or in planting holes or both - at much higher than labeled rates, risking crop injury.

Another problem that has plagued us when it comes to chemical weed control in sweet corn has been triazine resistant lambsquarters. We have relied on Aim or 2,4-D amine early post but with some risk of crop injury. Farmers need to pay careful attention to fields and treat early when weeds and corn are still

small for better weed control and reduced risk to the crop. There is some hope that a new herbicide product will get a label for sweet corn in time for next season. This would give us a tool that we could use preemergence to control triazine resistant lambsquarters and other broadleaf weeds. It could be used with a combination of atrazine and a grass herbicide using reduced rates of atrazine. This new product is not labeled yet but the manufacturer is pushing for the sweet corn label. With luck it may be available next year.

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One More Workshop for Training Extension Professionals and Vocational Agriculture Teachers on High Tunnel Technology to be conducted in 2004

Bill Lamont, Department of Horticulture

We are offering one more workshop this year funded by a Professional Development Grant from Northeast SARE Program to train extension specialists, county agents and vocational agriculture teachers on the use of high tunnel technology. The objective of the program is to train the trainers. The final workshop will be for one day and one nights lodging and mileage up to 500 miles will be covered for participants. **The date and location of the final workshop is: August 3, 2004 at the University of New Hampshire Horticulture Farm, Durham, NH.** The states we are soliciting participants from are Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, Virginia, Ohio and Washington, D.C. Class size will be limited to 50 per workshop. The workshop will be one day with presentations on the different components of high tunnel technology, and presentations by growers utilizing this technology. A high tunnel manual will be given to each participant and will serve as a handy reference on all aspects of this technology. To sign up for the workshop or for more information contact Bill Lamont, Phone: 814-865-7118 or E-mail: wlamont@psu.edu or George Hamilton County Extension Educator, 603-641-6060 or E-mail: george.hamilton@unh.edu

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The Organic Way- Selecting Green Manure Crops for Soil Fertility

Elsa Sanchez, Assistant Professor of Horticultural Systems Management

In organic growing the philosophy behind soil fertility is to feed the soil and the soil in turn will feed the cash crop. Cover crops, green manures, animal manures and sound crop rotations are used to improve and/or maintain soil fertility. This article focuses on the use of green manures.

Green manures are crops that are turned into the soil while they are young and succulent, rather than harvested, to improve the organic matter content. As the organic matter is decomposed nutrients are released that can be used by subsequent crops. Several factors influence the release of nutrients from green manure crops including soil temperature and moisture and placement. In general, nutrient release will be slower at lower soil temperatures because the soil organisms that breakdown organic matter have lower biological activity or work slower at lower temperatures. Nutrient release is slower when soil is dry or waterlogged for the same reason. When green manure crops are not turned into the soil and left on the soil surface, breakdown and release of nutrients will be relatively slow due to drying of the plant tissues.

When the green manure crop is incorporated into the top 6-8 inches of the soil, it will breakdown more rapidly because this is the area of the soil where most of the organisms that breakdown plant tissues are. When the green manure crop is soil incorporated deeper than 8 inches, it will decompose more slowly because lower oxygen levels at deeper soil depths limit the number of organisms that breakdown plant tissues.

Selecting a green manure crop to incorporate into a cropping rotation involves three steps:

1. Decide on the purpose of the green manure crop.
2. Identify a planting niche.
3. Select a green manure crop that meets your goals.

Green manure crops can be used to provide nitrogen, increase the organic matter content and/or scavenge nutrients in the soil. Legume species are the best choice for adding nitrogen to the soil because they are able to establish relationships with bacteria in the soil that turn nitrogen in the atmosphere into a form that the plant can use. As illustrated in the table below, legume species differ in the amount of nitrogen they can add to the soil.

Legume Species	Nitrogen-fixing Capacity
Alfalfa	High*
Hairy vetch	High
Cowpeas High	High
Crimson clover	Moderate
Field peas	Moderate
White clover	Moderate
Red Clover	Moderate
Common Bean	Low

*High = greater than 150 lb/acre/yr; moderate = 50 to 150 lb/acre/yr; low = less than 50 lb/acre/yr. Table adapted from Northeast Cover Crop Handbook.

When growing a green manure crop to increase the organic matter content in the soil, non-legume species or mixtures of grasses and legume species are good options. The tissues of legume species have a low carbon to nitrogen ratio, which results in a relatively quick release of nitrogen as the plants breakdown. Because of this they add nitrogen relatively quickly to the soil but the amount of organic matter contributed to the soil is limited over the long-term. Green manure crops grown to increase the soil organic matter content are generally those with large above-ground plant canopies and include annual ryegrass, cereal rye, triticale, sorghum/Sudan grass and hairy vetch. Green manure crops can also be grown to scavenge nutrients left in the soil after the cash crop is harvested and thereby prevent the loss of those nutrients through leaching. In this case, select a crop with a large, deep root system that develops quickly because deep-rooted crops can recycle nutrients from deep in the soil. Options include small grains, cereal rye, triticale, rapeseed, annual ryegrass, oil seed radish, mustard and some legume species.

Once the purpose for growing the green manure crop is decided, the next step is to identify where the green manure crop fits into a cropping rotation. If it will be grown in the fall, cool season crops including vetches, peas, annual and perennial clovers, ryegrass or barley are good choices. If it will be grown in the late spring or summer, warm season crops including sorghum/Sudan grass, cowpeas or buckwheat are good choices. Land can be devoted exclusively to growing a green manure crop or it can be interplanted or undersown along with the cash crop.

These are some final tips to consider when selecting a green manure crop. Determine characteristics that are undesirable and avoid plants with those characteristics. For example, some plants with large above ground canopies are difficult to manage if the proper equipment is unavailable. Also, consider cost and seed availability in the final decision. Finally, it can be difficult to find a green manure crop that meets all soil fertility goals and likely trade-offs will have to be made.

References

Chaney, D., L. Drinkwater and S. Pettygrove. 1992. Organic Soil Amendments and Fertilizers. University of California Davis Division of Agriculture and Natural Resources Publication 21505.
<http://www.sarep.ucdavis.edu/pubs/Soil.htm>.

Managing Cover Crops Profitably 2nd Edition. 1998. Sustainable Agriculture Network.
<http://www.sare.org/publications/covercrops.htm>.

Sarrantonio, M. 1994. Northeast Cover Crop Handbook. Rodale Institute, Emmaus, PA.

Please mail or email ideas for future column topics or thoughts on organic production to Elsa Sánchez, Department of Horticulture, Penn State University, University Park, PA 16802 or elsasanchez@psu.edu.

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Bug vs. Bug - Bumble Bee Pollination in Greenhouse Vegetable Crops

Cathy Thomas, Integrated Pest Management Program
Pennsylvania Department of Agriculture

Symphylans (*Scutigera immaculata*) are not insects but are more closely related to centipedes and millipedes, sometimes called the “garden centipede”. The garden symphylan is serious pest of many vegetable and field crops and has been found to infest crops throughout PA, with most problems occurring in the eastern half of the state. Recent evidence suggests that the garden symphylan (*Scutigera immaculata*) can be a very problematic pest in high tunnel production that utilizes high amounts of organic matter.

The first indication of a symphylan infestation is relatively small area of stunted, unhealthy plants. They can feed on plant roots and root hairs preventing the development of a healthy root system. They are also decomposers that feed on decaying matter. High rates of raw to partially decomposed organic matter additions is the main stimulant to these pests

Life cycle

Mature symphylans are translucent to milky white, slightly less than $\frac{1}{2}$ of an inch in length, with 12 pairs of legs and a pair of long-beaded antennae. The entire life cycle is spent in the soil. The eggs are laid in clusters of 10 – 12 inches below the soil surface. The first instar nymphs emerge from the egg with 6 pairs

of legs and 6 antennal segments. The second instar looks more similar to the adult. Each of the six subsequent molts results in the addition of a pair of legs.

Symphs move very fast in soil. Too fragile to burrow their own tunnels, they appear to crawl through the soil in the trails of other soil dwellers.

Monitoring

There is no well established economic threshold for garden symphylans. Oregon extension recommends that a definite problem exists if five symphylans per shovelful of soil are found from 30 samples.

Control measures for symphylans in greenhouses/high tunnels will be discussed in the next issue.

Consult this website for pictures and further information:

[Http://www.foodnotlawns.com/symphs.html](http://www.foodnotlawns.com/symphs.html)

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Blueberry Scorch

Kathy Demchak, Department of Horticulture

Last year, 'Berkeley' blueberry plants in a grower's field in central Pennsylvania tested positive for Blueberry Scorch Virus. Because this virus can be disseminated through nursery stock, it's possible that other fields may be infected as well. Plants had been added into the planting over a number of years, making it difficult to pin down the original source. At any rate, growers should be on the lookout for symptoms of this disease. There are 2 different strains of this virus (West Coast and East Coast strains), with the Eastern version previously known as Sheep Pen Hill disease.

Identifying infected plants can be a challenge, since not all cultivars show classic symptoms, and plants don't necessarily show symptoms every year, though yields will be reduced over time. Common symptoms consist of blighted (scorched) blossoms and leaves, apparent during bloom, particularly with the cultivars Weymouth, Duke, Elliott, and Chanticleer. Blighted blossoms may remain attached to the plant for the summer, while blighted leaves drop off in a few weeks. Berries may start to develop, then shrivel and dry up, as is the case with Bluecrop. Along with the symptom of blighted blossoms, tips may also die back as with phomopsis.

This virus is transmitted by aphids, so good aphid control should be practiced. A virus sample from suspect plants should be submitted for an ELISA test. Suspect plants should be tagged and removed after being treated for aphids (you want the aphids to stay on the infected plants rather than moving to

uninfected ones during spraying) if the submitted samples test positive for scorch.

Information was obtained from the April 28, 2004 issue of the "Blueberry Bulletin" from Rutgers Univ., and from "Pest Alert and Fact Sheet – Blueberry Scorch Virus", found at http://www.geocities.com/martinr_97330/BISVweb/Pestalert.htm

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That's a Berry Good Question!!!

Kathy Demchak, Small Fruits Specialist, Department of Horticulture

Q. My chemical dealer tells me I can't get Formula 40 anymore, and it's time to renovate my strawberries. He said he couldn't come up with another formulation to use. IS there anything else I can use? (Anon.)

A. Clean Crop Amine 4 2,4-D Weed Killer (UAP – Loveland Products, Inc., EPA registration number 34-704-120) is registered in PA for use on strawberries at renovation.

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.

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Cedar Meadow Farm, Cornell University and Haygrove Tunnels will Co-host a Twilight Meeting

Ralph Cramer, Haygrove Tunnels

Cedar Meadow Farm, Cornell University and Haygrove Tunnels will co-host a twilight meeting at 6:00 PM, August 3. The meeting will give growers an opportunity to learn more about the benefits of tunneled tomato production and reduced tillage sweet corn.

Steve Groff, owner of Cedar Meadow Farm, is in his second season of using Haygroves to provide earlier harvest and rain protection for tomatoes. His reduced tillage sweet corn project is funded by SARE and coordinated by Cornell.

Although fairly new to the US, Haygrove's unique multi-bay high tunnel system has revolutionized the strawberry and raspberry industry in England. Since their 1996 introduction, Haygrove tunnels have been rapidly accepted by high value crop producers and currently protect over 4000 acres in 12 countries. Virtually every high value crop has been grown under Haygroves, including tree crops such as dwarf cherries.

Cedar Meadow Farm is located near Holtwood PA. Call 866-HAYGROVE for directions or more information. www.haygrove.com

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Potato Musings

Bill Lamont, Department of Horticulture

Late Blight Warning

Alan MacNab, Veg. Pathologist at Penn State

LATE BLIGHT has been confirmed in the states of PA and NY and I suspect it is present in many additional areas. In PA, LATE BLIGHT has been confirmed in potatoes in the counties of Erie (inland from the lake) on potatoes, Lancaster in tomatoes on two farms, and Berks in tomatoes on one farm; source of these infections is unclear. In NY, LATE BLIGHT was confirmed from two fields of potatoes, and a cull pile is suspected as the source. Where did inoculum for all this LATE BLIGHT come from? And why was LATE BLIGHT detected in so many locations (four counties within the PA-NY area) within the same period of time? Currently, I believe LATE BLIGHT was more prevalent than was reported last year during the fall of 2003, and that there could be numerous sources of inoculum, perhaps in many northern states east of the Mississippi River; we know that weather favored LATE BLIGHT last season. And the current LATE BLIGHT appearance is exactly as our forecaster, based on weather conditions, has predicted. I expect that LATE BLIGHT has already infected potatoes and tomatoes in many more fields than we are aware of. And this means LATE BLIGHT symptoms will appear and cause considerable concern in the coming weeks. Therefore, I am repeating this ALERT.

I strongly suggest that tomato producers apply a fungicide that has some systemic activity against the LATE BLIGHT fungus. This should be done as soon as possible. Here are comments about materials listed for tomatoes in the 2004 Vegetable Guide:

1. Acrobat 50WP is used at 6.4 oz/A; it has some systemic activity and must be tank mixed with a protectant like mancozeb or Bravo. Fruit can be harvested 4 days after Acrobat application.
2. Tanos 50WP is used at 8 oz/A; it has some systemic activity and must be tank mixed with a protectant like mancozeb or Bravo. Fruit can be harvested 3 days after Tanos application.
3. Curzate 60DF is used at 3.2-5 oz/A; it has some systemic activity and must be tank mixed with a protectant like mancozeb or Bravo. Curzate can be used in Pennsylvania under a Special Local Needs 24(c) Label throughout the 2004 season. Fruit can be harvested 3 days after Curzate application.
4. Bravo is an excellent protectant based on many research reports.
5. Mancozeb is a good protectant.
6. Gavel 75DF, a new material, is used at 1.5-2 lb/A; it is not a systemic; research indicates it is an effective protectant.
7. Prophyt, a new material, is a useful material for LATE BLIGHT but I do not have much research data on its performance.

To repeat, application of a fungicide with some systemic activity is warranted now throughout Pennsylvania. Please do not underestimate the threat posed by the LATE BLIGHT disease. Once established, it can be very difficult if not impossible to control.

Finally, if you hear any new reports of LATE BLIGHT present in or near PA, please phone a report to Alan MacNab, at 814-692-7990. We will continue to monitor conditions in PA, and will update this message

weekly, or more frequently when necessary. This is a cooperative project involving PDA, PSU Extension, and growers.

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Upcoming Meetings

Bill Lamont, Department of Horticulture

Local

July 14, 2004. Vegetable and Small Fruit Field Day. Horticulture Research Farm, Gate H, Rock Springs, PA. Contact: William Troxell, Executive Secretary, Pennsylvania Vegetable Growers Association, (717)-694-3596.

September 13, 2004. High Tunnel Research and Education Facility Grower's Field Day, High Tunnel Research and Education Facility, Horticulture Farm, Rock Springs, PA. Contact: Lisa White (814) 692-4635 or e-mail: ldw112@psu.edu.

September 24-25, 2004. Passive Solar Greenhouse Workshop: Design, Construction and Year Round Production. Sonnewald Natural Foods, Spring Grove, PA. Contact: Steve Moore ((717)-225-2489 or sandcmoore@juno.com

September 28, 2004, 9:00 a.m. - 2 p.m., Grower Meeting on High Tunnel Production. Northampton County 911 Center, Nazareth, PA. Contact: Emelie Swackhamer (610) 391-9840 or (610) 746-1970.

Nov 3 and 4, 2004. 2004 Mid-Atlantic Vegetable Workers, Howard Johnson's in Newark, DE. Contact Joanne Whalen at jwhalen@UDel.Edu.

Regional

A high tunnel manual will be given to each participant and will serve as a handy reference on all aspects of this technology. To sign up for the workshop or for more information contact Bill Lamont, Phone: 814-865-7118 or E-mail: wlamont@psu.edu.

August 3-4, 2004. High Tunnel Workshop to be held at the Horticulture Farm, University of New Hampshire,, Durham, NH. The workshop is funded by Northeast SARE Professional Development Program to train extension specialists, county agents and vocational agriculture teachers on the use of high tunnel technology. **The workshop will be two days and two nights lodging and mileage up to 500 miles will be reimbursed for participants.** The states we are soliciting participants from are Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, Virginia, Ohio and Washington, D.C. The workshop will be a mixture of classroom presentations on the different components of high tunnel technology, "hands-on" participation, and presentations by growers utilizing this technology.

A high tunnel manual will be given to each participant and will serve as a handy reference on all aspects of this technology. To sign up for the workshop or for more information contact Bill Lamont, Phone: 814-865-7118 or E-mail: wlamont@psu.edu. or George Hamilton County Extension Educator, 603-641-6060 or E-mail: george.hamilton@unh.edu

September 13, 2004. Grower Workshop on High Tunnel Production. High Tunnel Research and

Education Facility, Horticulture Farm, Rock Springs, PA. Contact Person: Lisa White, Phone: 814-692-4635 or e-mail: ldw112@psu.edu.

National

July 17-20, 2004. Annual Meeting of the American Society for Horticultural Science, Austin, TX. Contact: (703)-836-4606 or visit the ASHS website: ashs.org.

International

August 28-31, 2004. 17th International Lettuce and Lettuce and Leafy Vegetable Conference, Quebec, Canada. Contact: Dr. Sylvie Jenni (450)-346-4494 ext. 213 or jennis@agr.gc.c