

The Vegetable and Small Fruit Gazette

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Horticulture Department
The Pennsylvania State University

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Tip for the Month--My wish for each of you: "That each passing day culminates another successful step climbed in your ladder of life and that your goals become brighter and warmer the longer you strive for them".

Comments from the Editor

Bill Lamont, Department of Horticulture

I have enjoyed being editor of the Vegetable and Small Fruit Gazette for the last 84 issues or 7 years. My philosophy is that change is good and it is time to change editors and bring in some fresh ideas to the publication. I am pleased that Dr. Elsa Sanchez, Assistant Professor of Horticultural Systems in the Department of Horticulture will be taking over the reins. As you know, Elsa developed the monthly "Organic Way" column and has a lot of good ideas that she wants to try out. I want to thank Andy Muza for finishing out the year 2004 his excellent article "Phomopsis Twig Blight and Canker on Blueberry" and Elsa looks forward to Emelie Swackhamer starting off 2005 with a bang. I want to thank colleagues from other departments who contributed articles to this issue and over the years 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.

Finally I want to wish each of you a Merry Christmas and a Happy and Prosperous New Year.

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Water Soluble Fertilizer Available for Free

Mike Orzolek, Department of Horticulture

Olympic water-soluble fertilizer 20-10-20 in 25-pound bags is available for free. We have a large inventory at Horticulture Research Farm. Please contact Robert Oberheim, Manager Horticulture Farm, at (814) 692-5262 during the day to make arrangements to pick up this free fertilizer. Spread the word.

Schedule for Agent Articles

Bill Lamont, Department of Horticulture

January– Emelie Swackhamer	February – Tim Elkner
March – Steve Bogash	April – Eric Oesterling
May– George Perry	June– Jeff Mizer
July– Scott Guiser	August– Tom Butzler
September– Lee Young	October– Cheryl Bjornson
November– John Esslinger	December– Andy Muza

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Phomopsis Twig Blight and Canker on Blueberry

Andy Muza, Extension Educator, Erie County

The fungus, *Phomopsis vaccinii*, causes the disease known as Phomopsis Twig Blight and Canker. This disease can be common in blueberry plantings in Pennsylvania, Michigan, New York, Ohio, New England and North Carolina. Chances are good that inoculum levels are building in Pennsylvania blueberry plantings after back to back wet growing seasons. So what can you do?

Disease Cycle - In order to manage any disease the first step is to know the disease cycle.

The Phomopsis fungus overwinters in previously infected blueberry wood. Rainfall is required for spores to be released from black pimple-like fruiting bodies (pycnidia) on infected canes. These spores are spread by splashing rain and wind beginning at bud break and continuing through August. Ideal conditions for disease spread are during prolonged periods of wet, windy weather with mild temperatures (70 – 80 F). The majority of spores are released from bud break through the bloom period if wet weather exists. Infections can occur through flower buds, leaves and injured stems.

Symptoms - Wilting and dieback of shoots in the early summer are the most noticeable symptoms of this disease. Leaves turn brown and remain on the infected shoots. Cankers on shoots start as small reddish-brown areas. Cankers expand and become discolored, grayish areas with small black dots (pycnidia). Cankers forming at the base of shoots, near the crown, can girdle and kill the entire shoot.

Management - Although most blueberry growers are probably not thinking about diseases during the winter, the first step in management of Phomopsis begins during the pruning process. Pruning out diseased canes is extremely important to reduce inoculum levels. Look for discolored canes with bleached out, grayish areas (cankers). Remove infected wood from the field and burn it. This is important because infected canes left on the ground will still emit spores which can be rain splashed onto new susceptible tissues in the spring. Good pruning practices alone will not be adequate to manage Phomopsis if inoculum levels are moderate or high. Fungicide applications, especially during a wet spring, will be required. In Pennsylvania, fungicides currently registered for management of Phomopsis twig blight and canker on blueberry include: Lime sulfur (dormant application); Abound Flowable; Cabrio EG; Pristine; Switch 62.5WG; and Ziram 76DF. Consult the most recent Commercial Berry Production & Pest Management Guide and current pesticide labels for crop uses, timing of treatments, rates, restrictions, and resistance management information.

For pictures of disease symptoms and information on fungicides and state registered pesticides see web sites listed under references.

Acknowledgement: I would like to thank Kathy Demchak for discussion on fungicides registered for Phomopsis Twig Blight and Canker on blueberry in Pennsylvania.

References:

Blueberry Production Guide. NRAES-55. 1992. M. Pritts and J. Hancock (eds.). 200 pp.
Compendium of Blueberry and Cranberry Diseases. 1995. F.L. Caruso and D.C. Ramsdell (eds.). 87 pp.
Blueberry Diseases in Michigan at <http://www.msue.msu.edu/vanburen/e-1731.htm>
Diseases of Blueberry at <http://www.hort.uconn.edu/ipm/fruit/htms/bluestem.htm>
End of the Season Blueberry Diseases at <http://www.hort.uconn.edu/ipm/fruit/htms/blueberry.htm>
Twig Blight of Blueberry at <http://www.ces.ncsu.edu/depts/pp/notes/Fruit/fdin010/fdin010.htm>
NPIRS State Pesticide Information Retrieval System at <http://state.ceris.purdue.edu>
Agriculture Labels and MSDS at <http://www.cdms.net/manuf/manuf.asp?t=1>

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Bug vs. Bug- Identification of Whitefly Species in Greenhouse Vegetable Production

Cathy Thomas, Integrated Pest Management Program
PA Department of Agriculture

There are several species of whiteflies that attack greenhouse crops, especially greenhouse vegetables. The most common whitefly found to infest greenhouse vegetables is Greenhouse Whitefly (*Trialeurodes vaporariorum*). In a fall crop, the outdoor species, Bandedwinged whitefly (*Trialeurodes abutilonia*), is observed on yellow sticky cards and occasionally feeds on plants. Another more serious whitefly species is Silverleaf whitefly (*Bemisia argentifolii*), a common pest on Poinsettias is difficult to control due to its higher reproductive rate and resistance to insecticides.

Whiteflies have sucking mouthparts and cause direct plant damage by feeding on plant sap. Both the adult and nymphal stages feed on plant sap and secrete the excess in the form of a sticky, sweet substance called honeydew. Honeydew serves as a substrate for sooty mold development that can occur

on foliage and fruit. Sooty mold can reduce plant yields by interfering with photosynthesis and residue on fruit creates extra handling time. Indirect damage is caused by transmission of several viral diseases.

Identification

Whiteflies in general have six life stages, namely the adult, egg, three nymphal instars and the fourth instar or pupa, all occurring on the underside of the leaves. During the pupal stage you may see the red eyes of the developing adult. After the adults emerge from the pupal case, a t-shaped opening can be observed. Development time varies with species, host plant and environmental conditions. Identification of these species is critical since they respond differently to control strategies, both chemical and biological. Experienced growers may be able to identify species in the adult stage; however, a more reliable method is to examine the pupal stage. Identification requires a 10 – 20x magnification.

Greenhouse whitefly

Greenhouse whitefly is the most common species to infest greenhouse vegetables. Widespread resistance to many different classes of insecticides has created the need for a biocontrol approach. The adults have wings that are held flat (horizontal) over their body. The pupal stage is white, with straight elevated sides and a fringe of wax filaments around the edge.

Bandedwinged whitefly

Bandedwinged whitefly is a species found outside in high populations in the fall on weeds and ornamental plants. As their host plants decline, they begin to seek plants and commonly make their way into the greenhouse through vents and doors. This species may feed on plants and lay eggs at a low rate, however they usually do not complete their life cycle. High levels on sticky cards may alarm growers resulting in needless pesticide applications. The adult looks much like a greenhouse whitefly adult with the horizontal wing span, however they can be distinguished by the two gray bands that form a zigzag pattern across each forewing. The pupal stage is similar as well except for a black band down the center of the pupal case.

Silverleaf Whitefly

Silverleaf whitefly is a common pest of poinsettias, foliage and ornamental plants. If ornamentals are grown in vegetable production houses (not a recommended practice), this pest will also colonize on vegetable plants. The silverleaf adult is smaller than greenhouse whitefly and holds its wings close to the body. The pupal stage is a bright yellow with a few waxy filaments. The pupa does not have a high profile like greenhouse whitefly.

If you cannot identify the species attacking your crop, contact the cooperative extension service, the PA Department of Agriculture or explore web sites that provide pictures of the different whitefly species.

Identification websites:

<http://www.ifas.ufl.edu/~ent2/wfly/index.html>

USDA's Whitefly Knowledgebase

<http://www.imok.ufl.edu/entlab/projects/whitefly.htm>

Information on silverleaf whitefly from the University of Florida

Biological Control

Whitefly development can be controlled with several different natural enemies. It is important to identify the species attacking your crop before ordering a biocontrol.

Encarsia formosa

Encarsia is a parasitic wasp, commercially available that feeds on nymphal stages and parasitizes nymphs. Parasitism results in a new generation of parasites. *Encarsia* is effective in controlling greenhouse whitefly and bandedwinged whitefly, however control of silverleaf whitefly is not as effective. *Encarsia* is the mainstay for controlling greenhouse whitefly. Greenhouse whitefly and bandedwinged pupae appear black when parasitized compared to Silverleaf whitefly which will turn brown. A new wasp will emerge from the pupa through a round hole chewed in the pupal skin.

Eretmocerus eremicus

Eretmocerus is also a parasitic wasp, commercially available that feeds on nymphal stages and parasitizes nymphs. *Eretmocerus* attacks greenhouse whitefly, and silverleaf whitefly. It is resistant to many insecticides and the adult is more active than *Encarsia* at higher temperatures.

This parasite is a good choice in the spring when greenhouse temperatures exceed 80° F. When parasitized, greenhouse whitefly pupae turn yellow and silverleaf whitefly turn yellow-brown. A new wasp will emerge from the pupa through a round hole chewed in the pupal skin.

Delphastus pusillus

This whitefly destroyer is a very tiny ladybird beetle that attacks all stages of whiteflies, but prefers eggs and nymphs. Adults can consume 160 eggs or 12 large nymphs per day. These predators can control all species of whiteflies and can be used with parasitic wasps. *Delphastus* beetles require high levels of whitefly life stages to reproduce.

Prevention

The best defense against whiteflies is sanitation. Start the crop cycle with a clean greenhouse, eliminate weeds within and outside the greenhouse, and grow disease and insect free transplants.

If someone else is growing your transplants, inspect plants for insect development and treat appropriately. Use yellow sticky cards to monitor for adult whiteflies in the propagation and production houses. Inspect plants each week of the crop cycle for whitefly development and for proper timing of natural enemy introductions.

Please phone or email me if there are specific issues you would like me address in this

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The Organic Way- Some Ideas for Weed Management in Strawberries

Elsa Sánchez, Assistant Professor of Horticultural Systems Management and
Kathy Demchak, Senior Extension Associate, Small Fruits

Weed management is difficult in strawberry production, particularly in organic strawberry production where the few herbicides that are available for non-organic production are generally prohibited. This article describes some alternative weed management strategies to herbicides and mechanical and hand cultivation. Good site selection is an important weed management strategy. Select a site with minimal weeds and suppress the weeds in the site prior to planting. Green manure crops are good options for weed suppression. Select green manures that establish quickly and have large above ground canopies.

Quite a bit of research on weed management has been conducted at Cornell University. In one study on matted-row strawberries, critical times during the growing season when plants are most susceptible to weed competition were determined. Weed management efforts can be intensified during those key times. As expected, a key time for weed management is in the first few months during plant establishment. When weeds were not managed for longer than one month following planting, yield and runner production were lower than when plots were kept weed-free during the same time. When weeds were not managed late in the growing season (September) there was little effect on yield and the number of runners compared to when plots were kept weed-free during the same time. While this indicates that early-season weed management is most critical when establishing a new planting, key times of the year for weed management may vary depending on the weed species typically encountered and on soil moisture levels. In the study predominant weeds encountered included yellow nutsedge, common groundsel, purslane and numerous grass species. In no case should weeds be allowed to go to seed and suppress perennial weeds, regardless of the time of year, to prevent them from establishing.

In another study, the practice of growing different living mulches in the alleyways of strawberries in matted-row production was examined. Sudangrass, tall fescue or marigolds were direct seeded during renovation. Researchers found sudangrass to be the best of the three living mulch species for weed management because it rapidly established, was relatively drought tolerant and had a low fertility need. A disadvantage to the sudangrass was that it grew taller than the strawberry plants. However, to contend with this problem, it was mowed as it exceeded the height of the strawberry plants. Another drawback to using sudangrass was that a high level of strawberry clippers was observed compared to the other treatments.

Mulches can also be effective for weed management. In another study at Cornell, commercially available Planter's paper was found to be effective for weed management during the establishment year compared to not using mulch. Fabric weed barriers also are a good option for weed management. If using straw mulch for winter protection of the plants, placing the straw in the alleyways in the spring offers some weed control. If using the plasticulture system, the plastic may be advantageous for limiting weeds. All of these options should be carefully evaluated for suitability on individual farms prior to using them.

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Potato Musings

Bill Lamont, Department of Horticulture

Potato Session at Mid-Atlantic Fruit and Vegetable Conference

Bill Lamont, Department of Horticulture

Wednesday, February 2, 2005 AM and PM

Session E

Potatoes

Wednesday, February 2, 2005, AM

Topics and Speakers

Presiding: Bob Leiby, Lehigh County Cooperative Extension

9:00 AM The Changing Marketplace - The Changing Consumer- R. Mac Johnson, US Potato Board, 7555 East Hampden Ave., Suite 412, Denver, CO 80231

9:30 Monitoring Resistance in Colorado Potato Beetle Populations- Dr. Galen Dively, Department of Entomology, 4112A Plant Science, University of Maryland, College Park, MD. 20742-4454

10:00-10:15 Industry Show and Tell

10:15 Early Generation Breeding And Selection Strategies For Resistance To Biotic And Abiotic Stresses In Potatoes – Dr. Christian Thill, Department of Horticultural Science, 305 Alderman Hall, 1970 Folwell Ave., University of Minnesota, St. Paul, MN 55108.

11:00 Potato Insect Management-An Update- Dr. Joanne Whalen, Extension Specialist II, Entomology & Applied Ecology, University of Delaware, Newark, DE 19716

11:30 Update on Fungicides Available for Control of Potato Diseases- Dr. Thomas Zitter, Extension Plant Pathologist, Department of Plant Pathology, 334 Plant Science, Cornell University, Ithaca, NY 14853.

12:00-1:30 PM Lunch and Visit with Exhibitors

Session B

Potatoes

Wednesday, February 2, 2005, PM

Topics and Speakers

Presiding: George Perry. Schuylkill County Cooperative Extension

1:30 PM Update on Keystone Potato Products – Keith Masser,, Sterman Masser, Inc., Rt 25, Box 210, Sacramento, PA 17968

2:00 University of Florida Trials Using Pic Plus Fumigant on Potatoes and the Development of Low Carb Potatoes-Chad Hutchinson, Horticultural Sciences Department, POBox 110690, University of Florida, Gainesville, FL, 32611-0690

2:30 Fumigation Equipment and Strategies for Irish Potato- Steve Godbehere, Vice-President Business Development, Hendrix and Dail, Inc., 905 4th St., NW
Cairo, GA 39828-1910.

3:00-3:15 Industry Show and Tell

3:15 Breeding Specialty Potatoes- Dr. Christian Thill, Department of Horticultural Science, 305 Alderman Hall, 1970 Folwell Ave., University of Minnesota, St. Paul, MN 55108.

4:00 Martin's Potato Chips- Ken Potter, Retired Chief Operating Officer, Martin's Potato Chips Inc, Phone:
, Fax: , E-mail:

4:30 Adjourn

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Upcoming Meetings

Bill Lamont, Department of Horticulture

Local

December 14, 2004. Farm Family Day, Lebanon Expo, Lebanon, PA. Contact: Ginger Pryor, (717)-270-4391.

January 8-15, 2005: Pennsylvania Farm Show, Harrisburg, PA. Contact: Dr. Pete Ferretti, (814) 863-2313.

January 17, 2005: New Holland Vegetable Growers Day, New Holland, PA. Contact: Tim Elkner (717) 394-6851.

January 20, 2005: Susquehanna Regional Vegetable Meeting, Mifflinburg, PA. Contact: Jeff Mizer (570) 837-4252.

February 10, 2005: Northeast Vegetable Growers Meeting, Thompson's Dairy Bar, Clarks Summit, PA. Contact: John Esslinger (570) 963-4761

February 21, 2005: Tri-County Vegetable, Small Fruit and Greenhouse Meeting, Shippensburg, PA. Contact: Steve Bogash (717) 263-9226

February 22, 2005: Schuylkill County Regional Vegetable Growers Meeting, Extension Office, Pottsville, PA. Contact: George Perry (570) 622-4225

March 3, 2005: Lehigh/Schuylkill County Potato Growers Meeting, Schnecksville Grange in Neffs PA. Contact: Bob Leiby (610) 391-9840

March 4-5, 2005. Passive Solar Greenhouse Workshop, 1522 Lefever Lane, Spring Grove, PA 17362. Contact: Steve and Carol Moore (717) 225-2489 or sandcmoore@juno.com.

March 12, 2005: North Central PA Vegetable Growers Meeting, Penns Valley Area High School. Contact: Tom Butzler (570) 726-0022. (Tentative Date).

March 15 or 16, 2005. Erie Vegetable Growers Meeting, Erie, PA. Contact: Andy Muza (814) 825-0900. (Tentative Date).

October 14-15, 2005. Passive Solar Greenhouse Workshop, 1522 Lefever Lane, Spring Grove, PA 17362. Contact: Steve and Carol Moore (717) 225-2489 or sandcmoore@juno.com.

Regional

January 11-13, 2005. Vegetable Growers Association Annual Meeting and Trade Show. Borgata Hotel in Atlantic City, NJ. Contact: Mel Henninger (732) 932 9711 Ext120

January 19-21, 2005. Ohio Fruit and Vegetable Growers Congress/Ohio Direct Marketing Conference. Toledo Sea Gate Centre, Toledo, OH. Contact: Tom Sach (614) 246-8292.

February 1-3, 2005. Mid-Atlantic Fruit and Vegetable Conference, Hershey, PA. Contact: Bill Troxell (717)-694-3596 or e-mail: wt.pvga@tricountyi.net

February 14-17, 2005. Empire State Fruit and Vegetable Expo, Omni Center, Syracuse, N.Y.

National

December 7-9, 2004. Great Lakes Fruit, Vegetable and Farm Market Expo, DeVos Place, Grand Rapids, MI. Contact: www.glexpo.com.

December 9-11, 2004. National Potato Council's Seed Seminar, Broadmoor Hotel, Colorado, Springs, CO. Contact: Chris Voigt, cvcpac@fone.net. (719) 852-3322.

January 9-11, 2005. Potato Association of North America Winter Meeting, Hilton Marco Island, FL.

February 15-17, 2005. Wisconsin Potato and Vegetable Growers Association Annual Meeting, Holiday Inn, Stevens Point, Wis.

March 2-5, 2005. 2005 Chip Seminar, Adams Mark Hotel, Jacksonville, FL. Contact: (303) 873-2334.

March 5-8, 2005. National Agricultural Plastics Congress. The Francis Marion Hotel, Charleston, SC. Contact: www.plasticulture.org/conginfo2005.htm.

International

September 5-9, 2005. Potato 2005. Emmeloord, the Netherlands. Contact: www.potato2005.com.