

The Vegetable and Small Fruit Gazette

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Horticulture Department
The Pennsylvania State University

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Tip for the Month-- "Kindness in words creates confidence; kindness in thinking creates profoundness; kindness in feeling creates love." Lao Tzu

Comments from the Editor

Bill Lamont, Department of Horticulture

We have been experiencing our share of rain and cloudy weather. It makes work in the field and harvesting very interesting. We had a successful Vegetable and Small Fruit Field Day on July 14th at the Horticulture Farm at Rock Springs, PA in spite of the thunderstorms that raced around us. Kathy and Elsa are in to blueberries. Mike has a whole host of crops that we are harvesting or floating off the fields. I have vine-killed my potatoes on plastic and will harvest in another week, if the weather cooperates. I will be promoting the Penn State "Blue and White" Potato Salad. Time to start getting the tailgating crowd ready to buy. I want to thank Jeff Mizer for his excellent article "**Tomato Disorders**" and I look forward to receiving Emelie Swackhamer's article for the September 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

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

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Tomato Disorders

Jeff Mizer, Extension Agent, Snyder County

According to the Pennsylvania Agricultural Statistics Service, approximately 1,000 Pennsylvania farmers grow more than 4,000 acres of tomatoes each year. Tomatoes are grown for both fresh market and processing and in field, greenhouse, and high tunnel. The farm-gate value of this crop exceeds all other vegetables except potatoes. Since the tomato is such an important crop, it is fitting that we review some problems common to tomatoes wherever they may be grown.

Many growers are familiar with **blossom end rot or dry rot** as it is sometimes called. By the time it is usually discovered, there is a tan-colored dead spot on the blossom end about the size of a quarter. Although the dead tissue extends deep into the flesh, it does not become mushy. During wet weather, a black, sooty mold sometimes grows on the dead tissue. The cause of blossom end rot is calcium deficiency; it is often initiated by drought, high temperatures, a lack of calcium in the soil, or an excess of certain nutrients (nitrogen or potassium) which might suppress calcium uptake. To avoid the problem, make sure you always supply adequate moisture through irrigation and that the calcium levels in your soil are adequate.

A similar problem is **graywall**. Graywall is the presence of dead tissue beneath the tomato skin that gives a gray appearance to the sides of the fruit. This problem also goes deep into the flesh; it could be caused by potassium deficiency, excessive nitrogen, compacted soil, low light conditions, or possibly by viruses. Obviously, these conditions are frequently encountered in a greenhouse or high tunnel.

Blotchy ripening is caused by the same conditions as graywall. The symptoms are different in that the sides of the fruit actually look blotchy--the fruit does not ripen at the same rate. There is dead tissue under the skin. Monitor nutrient levels and correct imbalances immediately. Do not grind your soil too finely with tillage equipment and do not work the soil when it is too wet. Keep plastic film clean on your greenhouses and high tunnels and change it when its life expectancy is up.

Catfacing is a cracking or distortion of usually the blossom end of the fruit. The first fruits formed on the plant usually show the most severe symptoms. Sometimes it appears that the fruit is ruptured--exposing the locules and the seeds. The catfacing usually heals over, though, so the wound seldom gets mushy. Catfacing seems worse if the first blossoms were exposed to night temperatures of below 60 degrees F.

Growth cracks can be a serious problem during rainy weather or when excessive irrigation water is applied after a dry spell. The cracks may be either concentric, creating a bull's-eye pattern around the stem end, or radial, when the cracks radiate out from the stem like the spokes of a wheel. Keeping your tomatoes constantly moist throughout the growing season will be the best thing you can do to avoid growth cracks. Using plastic mulch and trickle irrigation and growing in high tunnels will enable you to control the moisture more accurately. Several varieties are resistant to cracking.

Skin checking is a condition that seems to have become more prevalent in recent years. Humid weather seems to be the cause, but perhaps it is associated with anything that affects the waxy cuticle of the tomato skin-- pesticides, adjuvants, cloudy weather, moisture or humidity. As a precaution, be careful about emulsifiable concentrate pesticides or the addition of adjuvants to your pesticides. Grow in greenhouses or under high tunnels to keep humidity off tomato fruits. Maintaining good air circulation, as with fans, adequate spacing, and proper staking and pruning, should help.

Zippering is the term used to describe a brass-colored zipper-like scar extending from the stem to the blossom end. Sometimes a remnant of the flower parts adhere to the scar. It is caused when the anthers of the blossom fuse to the ovary wall (the swelling tomato berry.) This often occurs when fruit set occurs during cool weather and fruits are developing slowly. It can happen even in high tunnels and greenhouses if you let the temperatures fall.

Yellow shoulder or green shoulder appears just as the name implies. Certain varieties are more prone to this condition; look for ones that possess the uniform ripening gene. If your favorite varieties lack the gene, you will need to maintain adequate foliage cover by your good cultural practices. Keep insects and leaf spot diseases controlled so the leaves don't drop off. Assure adequate nutrition so the top-most leaves are healthy enough to shade the fruits. This condition occurs when the shoulder of the fruit gets heated; at the high temperatures, yellow pigment develops instead of the red pigment. The tissue also gets thicker like a callous on your hand and, although not very deep, it is somewhat objectionable.

Sunscalding is caused by high temperatures on the skin as well. It can happen on any side that is exposed to the direct rays of the sun. Skin first appears discolored and wrinkled. The tissue eventually dries out, leaving a bleached, papery appearance. If fruits are exposed, cover them with a light covering of straw. Keep the foliage healthy and don't prune off the tops. Keep greenhouses and high tunnels ventilated so that temperatures don't exceed 88°F.

Cloudy spot looks like small bright yellow blotches on the skin. When the skin is peeled away, you can see a blob of colorless tissue that seems dry and corky. If you look carefully, you can see minute pin-prick scars toward the middle of each mass of corky tissue. This injury is the result of the feeding injury of stink bugs or plant bugs. It can appear in any position on the fruit. Often it occurs in droughty years when the bugs seem to be looking for a moist meal, but it occurs even in rainy growing seasons. Only insecticide treatments will prevent this injury.

Almost any of these injuries can be severe enough that alternaria fungus enters the cracks or dead tissue. Ugly black marks appear on the otherwise nice-looking tomato. The grade is immediately affected. In wet harvest seasons, the black spots may enlarge rapidly and the tomato must be culled.

As you noticed, most of the conditions we discussed were physiologic problems; we barely touched on diseases or insects. Yet even with all of these possible problems that tomatoes can get, I'll bet you will grow tomatoes again next year. In the mean time, don't stop reading about tomato problems. Check out the following web sites: <www.ppath.cas.edu> and <vegetablemndonline.ppath.cornell.edu>. If you don't have internet access, stop by your local library or extension office.

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Got Sweet Corn Worms???

Scott Guiser, Extension Educator, Bucks County

Penn State's pest monitoring program is a valuable tool for all sweet corn growers. A simple call to 1-800-PENN-IPM or a visit to the website www.pestwatch.psu.edu is all that's needed to keep track of damaging pests such as corn earworm, European corn borer and fall army worm.

Although estimating when these insects occur is somewhat predicable, closer attention to their activity means you know when you need to tighten (and loosen) spray intervals. This means better worm control without making wasteful, unnecessary pesticide sprays.

Recently, Penn State entomologist Shelby Fleischer's weekly, toll-free phone message has been added to the website. Look for it on the left side of the main page under "Timely Tips". Click on PA and you'll see a one page description of current insect activity and get recommendations for spray intervals. This message is updated weekly. The same message is available via the 1-800 PENN-IPM toll free line but those with Internet access will find the web-site fast and easy. If you're not web-savvy, have someone visit the site and print it out for you. Similar timely tips from the other states in the region are all linked – just click on the state of interest.

Close to 40 farms in Pennsylvania report data weekly to the website. You can click on specific farms and see what's happening in your area. If you'd like to monitor sweet corn insect activity on your farm and become part of the system, contact your County Agent.

If you're interested in sweet corn pest activity to our south... to anticipate insect immigration such as corn earworm, or to see what's happening in warmer areas of the state or region, go to the "interactive maps" section and see maps from insect trapping systems throughout the Northeast and Mid-Atlantic region. The first screen of the interactive maps tells you how to navigate through the maps. The default map is the last created map for corn earworm. Use the "Choose dataset button" to go to the other pests. Use the "Bar graph" button to see all traps lined up in descending order, in colors coordinated with the legend - to see what is happening through the region, just leave this button on while you move the timebar. Use the "Phenology" button to link to maps estimating the initiation of each European corn borer life stage. To see where traps are exceeding spray thresholds, just turn off the zero and 1-3 dots by clicking those dots on the legend. The web site is easy to use and contains information from the current year as well as previous years.

In addition to pest monitoring information, the **Pestwatch** web site contains fact sheets and information about insect and disease management for almost all vegetable crops. Links to other Universities gives you access to quality information about all aspects of pest management for vegetable crops in the Northeast. Check out www.pestwatch.psu.edu . It's a site worth visiting.

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Fruit & Vegetable Marketing- You Sell What!

Jon B. Laughner, Penn State Cooperative Extension, Indiana County

Who wouldn't like to sell \$360 per bushel apples? You really can, and it is not very hard. On the other hand, maybe you have more fresh product than sales. How would you like to make it even more profitable to sell the excess fruit?

Everybody loves to go to a farm market and pick his or her favorite produce from a bin. We know that just a short time ago the fruit or vegetable was in the field. The next best thing is to have a quality product made from that same fresh fruit, with all the natural full flavor of locally grown.

Whether you have a farm market, participate in a farmers market, or sell your fruit wholesale, there are probably marketing opportunities for the fresh product in another form. How about blackberry jam, raspberry salsa, or the infamous, \$360 chocolate covered apples?

Commercial Kitchen

Have you considered the use of a commercial kitchen facility? A commercial kitchen is designed to government regulations and receives regular inspections. Their commercial grade processing equipment is capable of doing everything you might do in your own kitchen and much more.

Commercial kitchens have many advantages. As mentioned, they are already inspected. They carry the appropriate insurance, handle bulk purchases of ingredients and packaging products, such as bottles and labels, thereby dramatically reducing costs. They have the ability to transform a favorite family recipe designed for several pints to the tricky portions of tens or hundreds of gallons.

Scaling the recipe up is difficult and often times does not translate with the expected results. Commercial kitchens have the knowledge and experience necessary to determine what will make it right. In addition, they are prepared to test the product to determine its shelf life and produce standardized nutritional labels. They have developed working relationships with freight haulers and belong to trade and industry organizations to stay current on the ever-changing regulatory environment.

Be Flexible

The types of customers that use commercial kitchens traditionally fall into several categories.

1. the individual with a secret family recipe for a favorite barbecue sauce, jam, or salad dressing. A commercial kitchen can procure the ingredients and produce, test, bottle, and label the new successful product. Now it is ready to be marketed.
2. a customer may be a fruit or vegetable producer with excess product. Many commercial kitchens already have a repertoire of products that they can produce. The recipes have already been tested and approved. They may make suggestions to the producer for use of the raw product and then produce it in the kitchen.

Or perhaps, as the producer of the raw product, you already know what you would like to produce and you have customers clamoring for more.

Idea Person?

Let your imagination roam-----

cherry peach conserve

hot pepper peach jelly

peach nectarine butter

black bean & corn salsa

onion garlic jam	apple mango spread
pumpkin pie butter	pickled peaches
ramp & hot pepper vinegar	tomato pepper butter

The list can go as far as your mind will let it.

However, do not worry if you are not the creative food type. These local, state-of-the-art commercial kitchens are usually operated and staffed by people that can guide your decision-making process.

If you build it,

It is an absolute must to let your customers know what you have. Don't forget marketing. Remember, there are many more dollars to be captured in the marketing end than the production side. If you will be selling your new product through a farm market where you already have product, your incremental marketing cost will be little. In addition, it gives customers a reason to come back to see what you have new. Let them know when you have something special. It differentiates you from the big box and other competitors.

Options

A commercial kitchen just may provide a way to utilize the excess produce and return a nice profit. Give the kitchen your fruit in a bin and they give it back to you in a labeled glass jar. Your customers will appreciate knowing the quality jam, fruit butter, or salsa were made with your produce and is nutritionally superior to the local grocery name brand.

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Row Covers- Do They Work?

Mike Orzolek, Department of Horticulture

I transplanted my squash (zucchini and straightneck) variety trial (14 items) this year on 18 inch blue plastic mulch beds on May 27, 2004. However, since temperatures in early 2004 had been cooler than normal, I decided to place a row cover over 9 of the 15 plants in each row using metal hoops placed 6 ft apart in the row. A row cover from Amoco Fiber and Fabrics was placed over the 9 squash plants/variety/rep immediately after transplanting. The 6 uncovered squash plants/variety/rep served as the control or check. The row cover was removed from the zucchini squash varieties on June 16, 2004. Zucchini plants that were under the row cover were twice the size as the check plants and had no cucumber beetle feeding damage. The earliest yield from the zucchini varieties was harvested from plants under the row cover (about 10 days earlier). For the first 7 harvests, three zucchini varieties (Cashflow, Golden Dawn, and Spineless Beauty) doubled the number of fruit from plants that were covered with the row cover compared to plants with no row cover. Also, fruits from plants covered with a row cover were also larger compared to plants with no row cover. On the average, zucchini plants that were not covered with a row cover had 25% less yield compared to plants that had row covers. I also observed that all

varieties did not respond the same to the use of row covers. Spineless Beauty had the highest response of the 3 varieties analyzed to date and Golden Dawn the least response. While no one can predict very accurately weather in Pennsylvania, row covers appear to be a good insurance policy for guaranteeing a marketable harvest in the spring and fall.

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Penn State High Tunnel Research and Education Facility Grower's Workshop

Bill Lamnot, Department of Horticulture

A workshop for growers will be held at the High Tunnel Research and Education Facility Horticulture Research Farm, Gate H, Rock Springs, PA on Monday September 13th.

The schedule is as follows:

9:00-9:30 AM: Introductions: Dr. Bill Lamont, Department of Horticulture, Penn State

9:30-10:15: Constructing A High Tunnel: Options and Considerations: Dr. Mike Orzolek, Bruce Dye and Thomas Plummer, Department of Horticulture, Penn State.

10:15-11:00: The Production of Vegetables in High Tunnels: Dr. Mike Orzolek, Department of Horticulture, Penn State University

11:00-11:45: Water and Nutrient Management in High Tunnels: Jay Baratelli, T-Tape International and Dr. Bill Lamont, Department of Horticulture, Penn State

11:45-1:00: LUNCH –Provided (Travel 1 mile to Livestock Evaluation Facility)

1:00-1:30: Transitioning to Organic Production in High Tunnels: Adam Montri, Graduate Student, Department of Horticulture, Penn State and Dr. Elsa Sanchez, Department of Horticulture.

1:30-2:00: The Production of Cut Flowers in High Tunnels: Lisa White, Facility Manager, Department of Horticulture, Penn State

2:00-2:30: IPM in High Tunnels using Biological Control: Lisa White, Facility Manager, Department of Horticulture, Penn State.

2:30-3:00: Small Fruit Production: Kathy Demchak, Department of Horticulture, Penn State.

3:00-3:45: Penn State Energy Recovery Program-Recycling Energy from Used Agricultural Plastics: Jim Garthe, Department of Biological and Agricultural Engineering

3:45-4:00: Questions and Answers

Registration:

\$25.00 per person or \$40 for a couple. Registration includes lunch and a 157- page high tunnel manual. **Please pre-register by September 9th.** Make checks payable to Penn State University and mail to Lisa White, Department of Horticulture, 102 Tyson Building, The Pennsylvania State University, University Park, PA 16802

For further information contact Lisa White at 814-692-4635 or e-mail: ldw112@psu.edu.

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That's a Berry Good Question!!!

Kathy Demchak, Small Fruits Specialist, Department of Horticulture

Q. I planted a new blueberry patch this year, did everything according to the recommendations, and the leaves fell off the plants like hair off of my head! What went wrong? (Anon.)

A. Well, I know nothing about hair, but I'd bet the two weren't related. Fortunately, we could figure out what was wrong with the plants, after a couple of conversations. The cause in this particular case is something I really need to clarify. When you read the recommendation on how to fertilize blueberries (PA Guide this time, but some other info is similar), there's a table with the column "Age of Planting" at the top. The first line is "1", which was meant to mean "1 year old", but to others could mean "the first year", or "year of planting". If a grower interprets this line as meaning the year of planting, brand new plants end up getting 3 oz of ammonium sulfate per plant. This might not be so disastrous in cases where the plants had been mulched, but if the grower hasn't mulched yet, and puts the extra fertilizer on, the roots can get burned. And, when the roots get burned, guess what happens to the tops... The plants should actually only get a light dose (1/2 oz. of ammonium sulfate per plant a month after planting, and again 4 weeks later, according to the NRAES "Highbush Blueberry Production Guide"). The information will be changed to be clearer in our next version of PA's guide, which, by the way, will be a multi-state guide with other states in the MidAtlantic region.

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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Potato Musings

Bill Lamont, Department of Horticulture

Late Blight Warning

Alan MacNab, Veg. Pathologist at Penn State

This is the 16th blight message updated through Thursday, July 29/04, by Alan MacNab, Veg. Pathologist at Penn State. I have 4 additional reports of LATE BLIGHT since Tuesday's message; these include Michigan, Prince Edward Island, and in PA, both Northumberland and Lebanon counties. In summary, LATE BLIGHT is present in a number of widespread areas including NC, NY, PA, Maine, Michigan, and eastern Canada. To date, in PA, LATE BLIGHT has been confirmed in the counties of Erie (now near the lake in addition to inland), Lancaster, Berks, Lehigh, York, Clarion, Dauphin, Lebanon and Northumberland. In NY, LATE BLIGHT is reported in the western part of the state including at least the counties of Erie next to Lake Erie, Orleans near Lake Ontario, Steuben just north of Potter, PA; Yates & Ontario in the Finger Lakes area; and in Tioga, just north of Bradford, PA. This means LATE BLIGHT will almost certainly appear in many additional fields. If you think you do NOT yet have LATE BLIGHT, scout your fields to make sure. At this time, regardless of whether there are any symptoms, all potato and tomato growers in PA should be on a regular 5-7 day spray schedule. It is important to have good

coverage on plants before infection occurs & symptoms appear. Remember that LATE BLIGHT spores can infect plants after being wind-blown 50 miles or so. Fungicide materials, rates, and related information is presented in the 2004 Vegetable Recommendation Guide available from PSU Extension offices. Materials with some systemic activity should be tank mixed with protectants like Bravo, mancozeb and fixed coppers.

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 it's 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.

And what about EARLY BLIGHT and SEPTORIA LEAF SPOT? Fungicide protection is suggested wherever symptoms have appeared on the oldest leaves, and this likely includes most fields at this time. And whenever any fruit are ripe, regular protection is needed. The strobilurin materials like Quadris, Flint, and Cabrio provide excellent control.

Finally, if you hear any reports of LATE BLIGHT present in states or PA counties not noted above, 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

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

National

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