

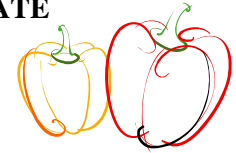


## PENNSYLVANIA WEEKLY VEGETABLE DISEASE UPDATE

SEPTEMBER 9, 2008

BETH K. GUGINO

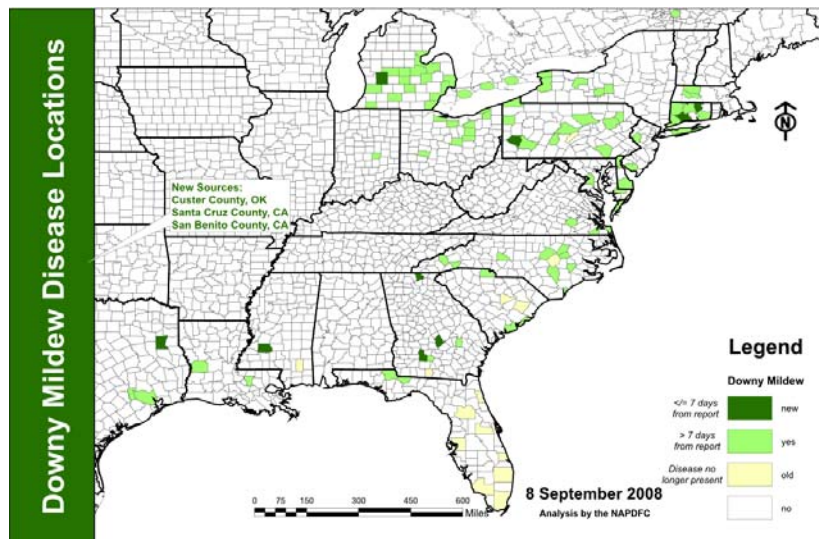
PENN STATE VEGETABLE PATHOLOGIST



**NOTE:** This is the twelfth in a series of weekly disease updates that will be made over the remainder of the 2008 growing season. Please feel free to contact me at 814-865-7328 or [bkgugino@psu.edu](mailto:bkgugino@psu.edu) if you have any questions, concerns or suggestions. Please feel free to include this information in your various newsletters and outreach programming.

### WEEKLY UPDATE ON CUCURBIT DOWNY MILDEW

Yesterday, Tim Elkner, extension educator in Lancaster Co., confirmed downy mildew on the cantaloupe 'Hales Best Jumbo', the pumpkin 'Big Max' and on the second more susceptible cucumber variety 'Poinsett 76' in the sentinel plot located at the Southeast Agricultural Research and Extension Center near Landisville, PA. To my knowledge this is the second report of downy mildew on pumpkin in PA. Keep in mind that the downy mildew lesions on pumpkin and winter squash crops are not as distinct as on cucumber. The lesions are not as angular and the purplish sporulation may not be as noticeable especially if powdery mildew is also present. Please scout your pumpkins and winter squash carefully. When conditions are favorable for the pathogen this disease can spread rapidly through a cucurbit field and lead to severe defoliation. Spores will develop with a dew period of at least 6 hrs at an optimum temperature of 59 to 77°F and are released with a decrease in the relative humidity. Infection occurs when optimum temperatures are between 59 and 77°F and the dew period is 2 to 6 hrs depending on the inoculum concentration. Higher concentrations of spores require fewer hours of dew. A downy mildew infection can produce more spores within as little as 4 days which explains the explosive nature of the disease when the conditions are favorable.



*This map is from the NCSU downy mildew forecasting website as of 8 Sep 2008. The counties are shaded based on whether the outbreak is less than 7 days old (dark green), more than 7 days old (light green) or no longer present because the field was harvested or destroyed (yellow).*

Due to the movement of a cold front through the area, the risk of downy mildew movement from infected fields is high for the entire state of PA. This means that conditions today, Tuesday, will be favorable for the sporulation, movement, deposition and infection of downy mildew spores

especially around existing infected fields. If cucurbit crops became infected this past week as the result of spore movement in the remnants of Hanna, then symptoms should be visible in as little as 5 to 7 days.

As stated in previous updates, remember to alternate between different modes of action (FRAC codes) for resistance management. The numbers and letters are used to distinguish the fungicide groups according to their cross resistance behavior. The numbers were assigned generally according to the time the product was introduced to the market (numbers 1 to 43, as of 2007). The letters refer to P = host plant defense inducers (e.g. Actigard), M = multi-site inhibitors (e.g. mancozeb), and U = unknown mode of action or unknown resistance risk.

Keep in mind that fungicides with mefenoxam (FRAC code 4) and QoI fungicides (FRAC code 11) are no longer recommended for downy mildew because of resistance. These products provided little to no control in recent university trials despite their previous performance. These products include Ridomil Gold Bravo, Ridomil Gold Copper, Quadris, Amistar, Cabrio, Flint, and Pristine. Copper also provides little to no control.

#### CUCURBIT DOWNY MILDEW FUNGICIDE TABLE

Trade name	Common name	FRAC code	PHI	Recommended rate/ A
Ranman	cyazofamid	21	0 day	2.1 to 2.75 fl. oz. 400SC
Presidio*	fluopicolide	43	2 days	3 to 4 fl. oz.
Previcur Flex	propamocarb	28	2 days	1.2 pt 6F
Curzate	cymoxanil	27	3 days	3.2 oz. 60DF
Tanos	cymoxanil	27	3 days	8 oz. 50WDG
Forum*	dimethomorph	40	0 days	6 fl. oz.
Revus*	mandipropamid	40	5 days	8 fl. oz.
Gavel **	mancozeb + zoxamide	M3 + 22	5 days	1.5 to 2 lb 75DF

\* Presidio and Revus received EPA registration in Feb 2008 so they are not listed in 2008 PA Vegetable Recommends. Forum is a new formulation replacing Acrobat.

\*\* Gavel already contains mancozeb so it does not need to be tank mixed for resistance management.

Please visit the Cucurbit Downy Mildew Forecasting website (<http://www.ces.ncsu.edu/depts/pp/cucurbit/>) for the latest list of disease outbreak locations and forecasts. This information is updated by the end of the day on Monday, Wednesday and Fridays.

Please report any suspect cases of downy mildew in cucurbit fields and bring or send a sample (overnight delivery) for confirmation to Beth Gugino, Department of Plant Pathology, 219 Buckhout Lab, University Park, PA 16802. We will examine the sample under a microscope and look for the characteristic downy mildew spores.

#### TOMATO AND POTATO DISEASE UPDATE

##### LATE BLIGHT UPDATE

There are no new reports of late blight this week in Pennsylvania or in the surrounding region.

Below are the recommended spray schedules for managing LATE BLIGHT as determined on September 9<sup>th</sup> using the BLITECAST forecaster for 19 locations across the state of Pennsylvania (thanks to Ellen Hay – Penn State). These suggestions are run using site specific SKYBIT weather data provided by ZedX (Bellefonte, PA) and are based on the assumption that late blight inoculum is nearby. With the increased rainfall statewide, most locations are on a 5-day spray schedule for late blight. The exceptions are Ringtown in Schuylkill Co. and Gratz in Dauphin Co. which are on a 7-day spray schedule and Leola in Lancaster Co. which on a 10-day spray schedule. It is important to scout for late blight and take action if you suspect the disease is present. Destroy hot spots by either discing in the crop or vine-killing the infected plants. Make sure to then apply systemic fungicides to all the tomato and potato fields on your farm.

Town	County	7 day rainfall total (2 Aug to 9 Sep)	Blightcast spray message*
Fairview	Erie	3.76	Spray if none Sep 4
Corry	Erie	0.56	since..... Sep 4
Sweden Valley	Potter	2.37	Sep 4
Butler	Butler	1.23	Sep 4
Finleyville	Washington	0.48	Sep 4
Loretto	Cambria	0.67	Sep 4
Rock Springs	Centre	2.13	Sep 4
Jersey Shore	Lycoming	1.64	Sep 4
Montandon	Northumberland	4.01	Sep 4
Clarks Summit	Lackawanna	0.50	Sep 4
Wyoming Valley	Luzerne	0.60	Sep 4
Germansville	Lehigh	0.35	Sep 4
Kutztown	Berks	0.13	Sep 4
Ringtown	Schuylkill	2.79	Sep 2
Gratz	Dauphin	0.96	Sep 2
Maddensville	Huntingdon	0.60	Sep 4
Waynesboro	Franklin	0.16	Sep 4
Leola	Lancaster	0.13	Aug 30
Mt. Joy	Lancaster	3.81	Sep 4

\*As a general rule of thumb, if you have not applied a fungicide in the past 14 days then one needs to be applied to protect the new vegetative growth especially wherever there is a history of late blight.

### EARLY BLIGHT UPDATE

Once again, the conditions have been less favorable for early blight development across Pennsylvania therefore the early blight forecaster, FAST, only recommended a fungicide application for locations similar to Germansville in Lehigh Co., Montandon in Northumberland Co. and Mt. Joy in Lancaster Co. which are on a shorter 5 to 7-day fungicide spray schedule. For all other locations the spray message is the same as last week. However, early blight is now a common site in tomato fields and could spread quickly depending on the track of the hurricane remnants so maintaining a regular fungicide spray program is advisable in fields with ripening fruit. Disease development is favored by warm, humid weather with heavy dews or rain. If you

had trouble with early blight this year, make sure to rotate away from potatoes and tomatoes for at least 2 years and implement practices that reduce leaf wetness and minimize soil splashing. Keep in mind that this model is run using site specific weather data provided by ZedX. Since environment varies, sometimes within relatively short distances, the spray recommendation information should be considered in combination with your local environmental conditions. One way to evaluate how well this forecast information is likely to apply to your farm, is to record daily rainfall at the local site of interest and compare it to the nearest forecasted site (see late blight table for rainfall amounts). If the rainfall is similar to rainfall reported for a nearby weather-forecaster site, then the forecast could be quite accurate for use on the farm. When farm rainfall is higher than at the nearby weather-forecaster site, disease conditions could be more severe than reported, and more sprays could be necessary. Likewise, if farm rainfall is lower, farm disease conditions could be less severe, and fewer sprays could be possible.

Town	County	Tom-FAST spray message*
Fairview	Erie	Spray if none July 23
Corry	Erie	since..... Aug 1
Sweden Valley	Potter	Aug 5
Butler	Butler	July 16
Finleyville	Washington	July 20
Loretto	Cambria	July 30
Rock Springs	Centre	July 31
Jersey Shore	Lycoming	July 27
Montandon	Northumberland	Sep 2
Clarks Summit	Lackawanna	July 22
Wyoming Valley	Luzerne	July 20
Germansville	Lehigh	Sep 4
Kutztown	Berks	July 30
Ringtown	Schuylkill	July 28
Gratz	Dauphin	July 30
Maddensville	Huntingdon	Aug 1
Waynesboro	Franklin	Aug 24
Leola	Lancaster	Aug 2
Mt. Joy	Lancaster	Sep 2

\*As a general rule of thumb, if you have not applied a fungicide in the past 14 days then one needs to be applied to protect the new vegetative growth especially where there is a history of early blight.

\*For tomatoes, once any fruit start to ripen, regular fungicide applications may be warranted.

If you hear of any reports of early or late blight on tomato or potato in Pennsylvania or in the region, please report it to Beth Gugino at 814-865-7328 or [bkgugino@psu.edu](mailto:bkgugino@psu.edu). Tomato and potato disease updates will also be updated weekly and also available via the 1-800-PENN-IPM hotline.

## MANAGING THE UNMANAGEABLE...PHYTOPHTHORA BLIGHT

*Phytophthora capsici* causes a wide array of diseases ranging from seedling damping-off, leaf spots, foliar blight, root and crown rot, stem lesions to fruit rot on numerous vegetables including

pepper, tomato, eggplant and most cucurbits. The initial inoculum at the beginning of the season often comes from transplants and contaminated water or soil. The pathogen can survive overwinter on crop debris and if both mating types are present in the soil then oospores, the survival structure, are produced enabling the pathogen to survive for years in the soil.

Unfortunately, at this time there is not a complete management program to reliably manage Phytophthora diseases. Despite your best efforts, if inoculum is present this disease can spread rapidly under conditions of heavy rainfall. To reduce the risk of Phytophthora blight, the implementation of an integrated management program centered on water management is critical. Below is a list of management practices that should be considered:



Symptoms of Phytophthora blight (caused by *Phytophthora capsici*) on butternut squash, acorn squash and pumpkin. Photos from Chris Smart, Cornell University.

- Avoid planting in poorly drained soils and low lying areas (plant cover crops instead)
- Break-up hard-pans and plow-pans by sub-soiling to increase drainage
- Plant peppers and tomatoes on ridges with plastic mulch to improve drainage and minimize soil contact (Note: planting vining cucurbits on a bed or ridge can result in severe fruit rot in the row middles)
- Avoid excessive overhead irrigation and do not irrigate from ponds that may contain water that drained from infested fields.
- Minimize the movement of people and equipment from infested to uninfested fields
- Immediately remove diseased plants and fruit from the field
- Never dump culls into production fields
- Consider planting hard rind varieties of pumpkins; select more tolerant pepper varieties
- Minimize splash dispersal of spores and surface water movement between rows
- Consider planting drive rows with clover to minimize water movement (being evaluated by Meg McGrath, Cornell)
- Avoid drainage of water from infested fields back into irrigation water sources
- Use fungicides as labeled when necessary – registered products only offer suppression not control and should not be relied upon for control. See the commercial vegetable recommends for suggested products.

## Upcoming Workshop this Fall...

### **DIAGNOSIS, VISUAL ASSESSMENT AND MANAGEMENT OF PLANT-PARASITIC NEMATODES OF VEGETABLES AND SMALL FRUIT IN THE NORTHEAST**

Ever wonder what plant-parasitic nematodes do to your crops and profitability, or how you can manage them on an as-needed basis? Then plan on attending one of our NE-SARE funded workshops titled “Diagnosis, Visual Assessment and Management of Plant-Parasitic Nematodes of Vegetables and Small Fruit in the Northeast”. This workshop has been designed to train participants (county extension educators, regional specialists, crop consultants, IPM practitioners, interested growers and other ag service providers) throughout the Northeast in nematode diagnosis and management and to provide hardcopy and electronic resources that can be used on-farm and in various outreach activities. The topics to be covered include: nematode biology and ecology (aka Nematology 101); signs and symptoms of nematode damage in the field and on vegetable, small fruit and some ornamental crops; soil nematode assessment (focusing on on-farm methods); and management options and managing nematodes on an as-needed basis. Workshop participants will receive a 3-ring binder containing printed resources, CD-ROM containing powerpoint slides, fact sheets, etc. for use as a future reference, and a soil nematode assessment that contains all the supplies necessary to conduct on-farm nematode assessments in several fields.

The three workshops will be held this fall on October 10<sup>th</sup>, 21<sup>st</sup> and November 18<sup>th</sup> in Newport, RI, Westampton, NJ and Allentown, PA, respectively. The first workshop on **October 10<sup>th</sup>** will be held in conjunction with the Northeast Division Meeting of the American Phytopathological Society (APS) Meeting. To accommodate this venue, the workshop will be slightly condensed and run from 8:30 am (registration) to 2:00 pm at the **Hyatt Regency Newport in Newport, RI**. The following two workshops will be held all day from 8:30 am to 5:00 pm on **October 21<sup>st</sup>** at the **Rutgers Cooperative Extension Office – Burlington County in Westampton, NJ** and on **November 18<sup>th</sup>** at the **Lehigh County Cooperative Extension Office in Allentown, PA**.

The workshop facilitators include George Abawi from Cornell University, Jim LaMondia from The Connecticut Agricultural Experiment Station, Deb Neher from the University of Vermont and Beth Gugino from the Penn State.

Although there is no fee to attend (and lunch and coffee breaks are provided), pre-registration is requested for planning purposes. The registration deadlines are September 30<sup>th</sup> for RI, October 14<sup>th</sup> for NJ and November 11<sup>th</sup> for PA. For additional information or to register for any of these workshops please contact Beth Gugino at (814) 865-7328 or [bkgugino@psu.edu](mailto:bkgugino@psu.edu). If you cannot attend any of these workshops, this workshop will be held 2 or 3 more times in the Northeast during spring 2009. For more specific information is also available at <http://www.ppath.cas.psu.edu/FACULTY/Gugino.htm>.



Funding for these nematode workshops is being provided through a grant from Northeast Sustainable Agriculture Research and Education (NE-SARE) Professional Development Program.

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