
PENNSYLVANIA WEEKLY VEGETABLE DISEASE UPDATE

JULY 15, 2008

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NOTE: This is the third 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 if you have any questions, concerns or suggestions. Please feel free to include this information in your various newsletters and outreach programming.

DOWNY MILDEW CONTINUES TO SPREAD AROUND THE SURROUNDING STATES

This past week, the weather patterns were again conducive for the repeated movement of downy mildew spores up and down the east coast. This extended period of favorable weather has led to a number of new downy mildew outbreaks mainly on cucumber. Sources of downy mildew are now in Ohio, Michigan, New York, Delaware, North Carolina, South Carolina, Louisiana, Mississippi and Texas. To-date, there have been no reported or confirmed cases of downy mildew in Pennsylvania. It is critical that growers continue to be vigilant about scouting for symptoms. Although less favorable conditions are being forecasted for this week, symptoms from the movement and infection of spores last week may become visible this week.

Initially, symptoms are found on the top surface of the leaves. The small angular spots that are delineated by the leaf veins are pale green to begin with before turning yellow in color. On the underside of the leaf, the spots look water soaked at first and under very humid conditions the lesions will sporulate giving them a purplish gray color. See the pictures from Gerald Holmes (NCSU) below. Keep in mind that symptoms can vary between types and varieties of cucurbits.



Symptoms of downy mildew (caused by *Pseudoperonospora cubensis*) on the upper leaf surface of cucumber.



Downy mildew symptoms on the lower leaf surface of cucumber.

With the presence of downy mildew in many of the surround states, it is important that a protectant fungicide spray program is in place for your most susceptible cucurbits if you have not already done so.

Tank mix one of products listed in the table below with a protectant such as Bravo (chlorothalonil), Dithane (mancozeb), or Maneb (maneb) for resistance management:

Trade name	Common name	FRAC code	Recommended rate/ A
Ranman	cyazofamid	21	2.1 to 2.75 fl. oz. 400SC
Previcur Flex	propamocarb	28	1.2 pt 6F
Gavel *	mancozeb + zoxamide	M3 + 22	1.5 to 2 lb 75DF
Curzate	cymoxanil	27	3.2 oz. 60DF
Tanos	cymoxanil	27	8 oz. 50WDG

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

It is important to also alternate between different modes of action (FRAC codes) for resistance management.

A number of phosphonate products are registered for cucurbit downy mildew in Pennsylvania. They are mobile systemic fungicides whose active ingredient, the phosphite ion, remains stable in the plant and affects the fungal pathogen directly and promotes the defense system of the plant. Collective research in the Southeast and Mid-Atlantic states indicate that these products are not very effective at managing downy mildew of cucurbits. Stay tuned for more information on this topic in upcoming newsletters and updates.

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 AS OF JULY 15TH 2008

LATE BLIGHT UPDATE

This past week there have been two confirmed cases of potato late blight in Erie County. The growers are working with county extension educators and Penn State faculty to effectively manage these disease outbreaks. Please scout your fields often and continue with a protectant spray program. In addition to the recommended spray schedule below, there is a brief article on **Potato Early and Late Management After Planting**.

Below are the recommended spray schedules for managing LATE BLIGHT as determined on July 15th 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.

Town	County	7 day rainfall total (9 to 15 July)	Blightcast spray message*
Fairview	Erie	0.94	Spray if none July 7
Corry	Erie	1.26	since..... July 10
Sweden Valley	Potter	1.33	July 10
Butler	Butler	1.77	July 10
Finleyville	Washington	0.49	July 10
Loretto	Cambria	1.10	July 10
Rock Springs	Centre	0.35	July 10
Jersey Shore	Lycoming	2.12	July 10
Montandon	Northumberland	1.27	July 10
Clarks Summit	Lackawanna	0.32	July 10
Wyoming Valley	Luzerne	1.27	July 10
Germansville	Lehigh	2.91	July 10
Kutztown	Berks	0.97	July 10
Ringtown	Schuylkill	0.67	July 10
Gratz	Dauphin	1.84	July 10
Maddensville	Huntingdon	1.11	July 10
Waynesboro	Franklin	1.06	July 10
Leola	Lancaster	0.64	July 10
Mt. Joy	Lancaster	1.70	July 10

*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.

POTATO EARLY AND LATE BLIGHT MANAGEMENT AFTER PLANTING

Excerpts from “Potato Late and Early Blight Management for Pennsylvania, 2007” written by Barb Christ and Sara May, Plant Pathology, Penn State.

Once the crop is planted it is important to scout the fields twice a week or more, especially if there have been several days of fog or rainy weather. Check areas where dew periods are prolonged by natural obstructions, such as overhanging tree lines, which can induce ideal conditions for infections. Check areas where it is difficult to get adequate coverage when applying fungicides. Also, check the early maturing varieties first and more frequently.

Remember, the ideal conditions for the development of blight are: daytime temperatures between 60-75°F and nighttime temperatures between 50-60°F, accompanied by fog, heavy dews or rain over a four or five day period. Extended periods of high relative humidity are also important for this disease.

During the season proper hilling and avoiding excessive nitrogen will reduce early blight susceptibility. Make sure to thoroughly kill the vines and keep fungicides on the plants until the plants are completely dead will help reduce tuber infection. Also harvest those fields with a high incidence of late blight that might have resulted in tuber rot last. This will allow rotting potatoes to decay prior to harvest. Take all feasible measures to avoid harvesting rotted potatoes.

By now, a protectant fungicide program should already be in place. The first five categories have efficacy for both early and late blight. Check with Commercial Vegetable Production Recommends for specific rates and tank mixing recommendations. Also, always check the label for chemical use restrictions.

- **EBDC products** (Dithane, Penncozeb, Manzate, Polyram and Maneb)
- **Chlorothalonil** (Bravo, Equus, and Echo)
- **Tin-based products** (Super Tin and Agri Tin)
- **Copper-based products** (Kocide, Champ and others)
- **Strobilurins** (Quadris, Amistar, Gem and Headline) – excellent control of early blight and has activity towards late blight.

- **Fungicides specific for LATE BLIGHT:**
 - **Cymoxanil** (Curzate) – the cymoxanil compound provides the kickback activity from the time of application.
 - **Propamocarb** (Previcur) – Propamocarb has limited anti-sporulant activity and may be able to hold the infection for several days. However, the infection is not cured.
 - **Dimethomorph** (Acrobat) – Dimethomorph has anti-sporulant activity.

Remember the best management of any disease will incorporate scouting, weather monitoring, performing appropriate cultural practices combined with a fungicide program. A fungicide program using protectants for the majority of the applications with one of the late blight specific chemicals for critical periods should do a good job. When disease pressure is high, it is important to use the higher recommended rates and the shorter recommended spray interval.

EARLY BLIGHT UPDATE

Over the past two weeks the 35 cumulative disease severity value threshold to initiate a fungicide spray program based on the Tom-FAST disease model for early blight was reached for the 19 locations across Pennsylvania. Subsequent fungicide spray recommendations are now based on the accumulation of disease severity values.

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.

Early blight has been confirmed on several tomato samples (commercial and homeowner) sent to the Plant Disease Diagnostic Clinic over the past week.

Town	County	Tom-FAST spray message*	
Fairview	Erie	Spray if none	July 10
Corry	Erie	since.....	July 15
Sweden Valley	Potter		July 12
Butler	Butler		June 30
Finleyville	Washington		July 10
Loretto	Cambria		July 15
Rock Springs	Centre		July 15
Jersey Shore	Lycoming		July 14
Montandon	Northumberland		July 12
Clarks Summit	Lackawanna		July 5
Wyoming Valley	Luzerne		July 10
Germansville	Lehigh		July 15
Kutztown	Berks		July 10
Ringtown	Schuylkill		July 11
Gratz	Dauphin		July 14
Maddensville	Huntingdon		July 15
Waynesboro	Franklin		July 15
Leola	Lancaster		July 14
Mt. Joy	Lancaster		July 14

*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. Tomato and potato disease updates will also be updated weekly and also available via the 1-800-PENN-IPM hotline.

OTHER DISEASE NOTES

The warm humid weather the past couple weeks has been very favorable for disease development in general. Bacterial diseases are on the increase with the confirmation of bacterial canker, spot and speck of tomato. A case of bacterial wilt of cantaloupe was also confirmed in the Plant Disease Diagnostic Clinic this week. Managing cucumber beetle is the key to managing this disease.

I cannot emphasize enough the importance of scouting your fields regularly!

Information provided is intended for consideration by the user, but is not intended to be a recommendation. Production decisions should be based on consideration of many types of information (scientific, experimental, economic, legal, etc.) available to the user.

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