PENNSYLVANIA VEGETABLE MARKETING & RESEARCH PROGRAM

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Pennsylvania Vegetable IPM Weekly Update

August 25, 2021

These are cooperative projects involving Penn State University researchers, Penn State Cooperative Extension educators, growers, the Pennsylvania Department of Agriculture, the Pennsylvania Vegetable Marketing and Research Program and the Pennsylvania Vegetable Growers Association.

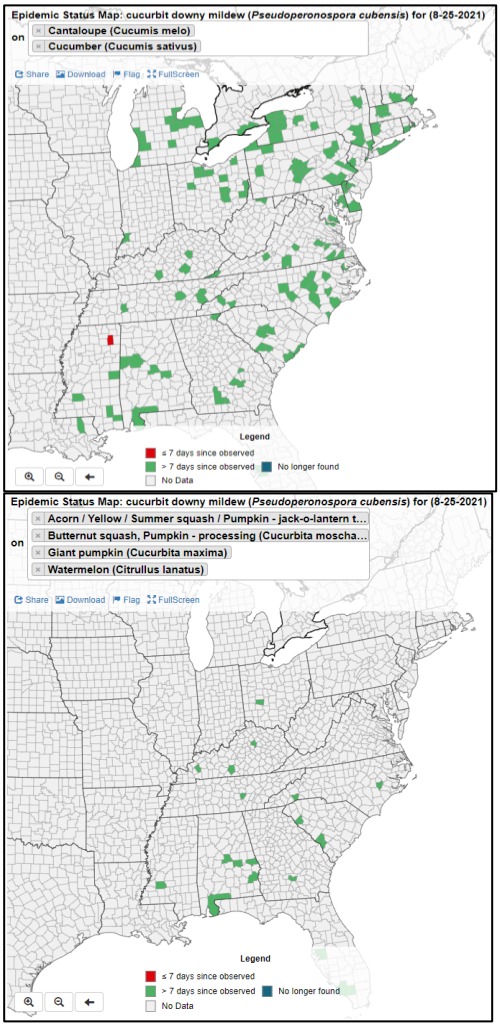
Vegetable Disease Updates

Beth Gugino, Extension Vegetable Pathologist, Penn State University

GENERAL UPDATES:

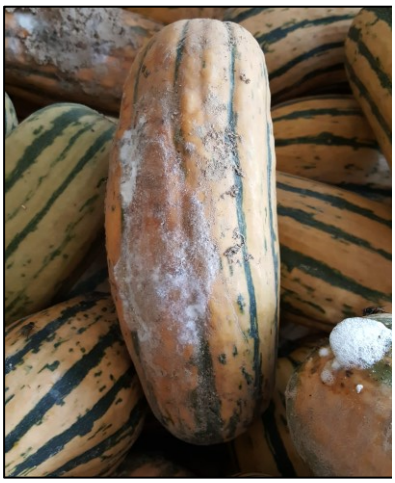
- There continue to be no reports of late blight on tomato or potato in the mid-Atlantic region but this week there was a confirmed report on tomato in eastern Tennessee determined to be caused by the US-23 genotype. This makes a total of six confirmed reports so far in 2021. Late blight is favored by temperatures between 65 and 70°F and high relative humidity or leaf wetness. If you suspect late blight on your farm, please let me know either by email at bkgugino@psu.edu or by phone at 814-865-7328 or contact your local Extension Office. Additional information about late blight can be found on the USABlight website (https://usablight.org).

- This week there have been no new reports of cucurbit downy mildew across the region. So, to date in PA, it has been confirmed on cucumber and/or cantaloupe in Centre, Huntingdon, Mifflin, Juniata, Luzerne, Lehigh, Bucks, Lancaster, Chester, and Lackawanna, Erie, and Butler Counties. There have also been no new reports of downy mildew on jack-o-lantern pumpkin in central Ohio or Kentucky. The closest report on butternut squash is remains in eastern North Carolina. As crops mature, the threat of downy mildew impacting yield decreases since it is a foliar disease that does not directly impact the fruit. Scouting is still highly recommended. Inclusion of a downy mildew specific fungicide in a fungicide program should be considered for crops that are not close to harvest. It is important to maintain a regular fungicide program on cucumbers and cantaloupes. As you finish with a planting, burning down the crop will reduce spread other succession plantings. Once the plant tissue is dead, the pathogen is dead. If you suspect downy mildew on your farm, please let me know either by email at bkgugino@psu.edu or by phone at 814-865-7328 or contact your local Extension Office. Knowing where



Cucurbit downy mildew monitoring map as of 8:30 am 25 August 2021. Top map represents confirmed reports on cucumber and cantaloupe. Bottom map is all other cucurbit hosts including pumpkin, watermelon, and squash (https://cdm.ipmpipe.org).

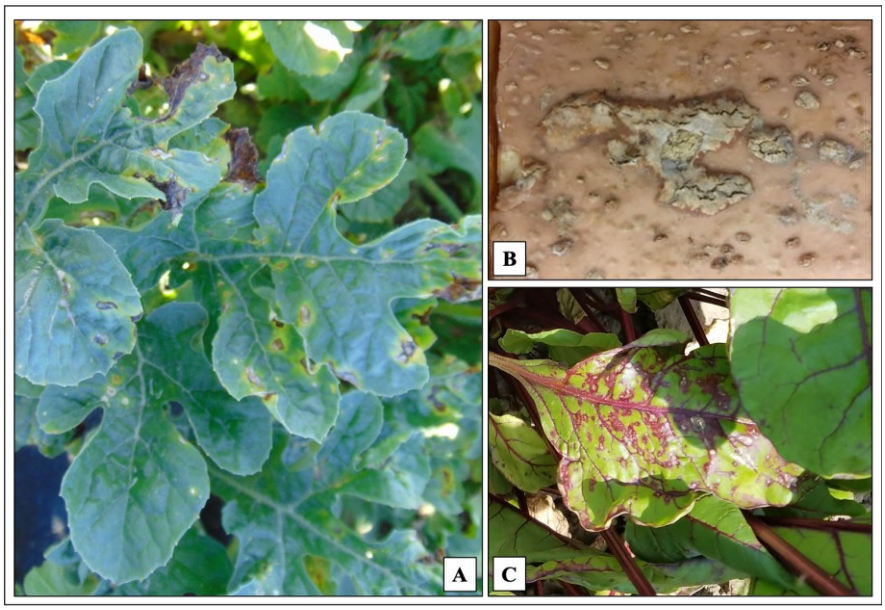
the disease is an important component for area-wide management. See https://cdm.ipmpipe.org for the latest reports and disease risk forecasts.



Fusarium fruit rot on Delicata squash that developed post-harvest in the bin (Photo: Tom Ford, Penn State Extension)

- There have been several reports of post-harvest fruit rots of cucurbit crops. The fruit visibly appear healthy at harvest however several days post-harvest in the bins fruit rot symptoms develop. Fruit rots can be caused by several soilborne fungal/oomycete pathogens including Phytophthora, Fusarium, Pythium, Didymella (gummy stem blight), Colletotrichum (anthracnose), and Plectosporium as well as several bacterial pathogens. Even though the symptoms develop post-harvest, the fruit were infected in the field typically on the side in contact with the soil. Management of any one of these diseases requires an integrated approach. No single method is going to adequately manage the disease. In the future consider using cover crops, mulches, or strip tillage to reduce direct contact between the fruit and the soil. Integrate practices that improve soil health and drainage. Also minimize drought stress to reduce potential cracking and minimize wounding at harvest. Reliance on fungicides for managing fruit rot is nearly impossible due to issues with coverage. Also keep in mind that post-harvest washing of the fruit will not "cure" a fruit that is already infected and the act of washing may actually spread the fruit rot pathogens in the wash water.

BACTERIAL LEAF SPOT OF CUCURBITS, BEETS, AND SWISS CHARD



Typical symptoms of bacterial leaf spots on beet, chard, and cucurbits. (A) Wart-like symptom on butternut squash fruit; Photo: C.T. Bull; (B) Leaf spots on watermelon, Photo: S. Da Silva, M.L. Paret; and (C) leaf spots on table beet, Photo: L. Coulter.

Bacterial leaf spot (BLS) on cucurbits and chenopods (beet and chard) is caused by strains of the seedborne bacterial pathogen Pseudomonas syringae. In beet and chard, the most common initial symptom of BLS is pale brown, irregular to circular shaped, water-soaked necrotic lesions surrounded by a red halo. Yellow lesions, that subsequently turn necrotic as the disease progress, may be observed on the leaf margins. Although BLS symptoms can be confused with Cercospora leaf spot (CLS), these can be differentiated by the shaped and size of the spots, as CLS tends to produce circular spots that are smaller in diameter. Another way to distinguish CLS from BLS is by looking for signs of the pathogen; for example, stromata (fungus fruiting bodies that appear as black dots) can be easily seen in the center of the spots with a hand lens in the case of CLS. In cucurbits, circular necrotic lesions are observed during early stages of disease development, but in later stages lesions become irregularly shaped and are delineated by leaf veins (Newberry et. al., 2016). Lastly, wart-like eruptions may be present on the fruit.

As part of a federally funded research project, that will lead to more effective integrated management strategies by enhancing understanding on this pathogen's genetic diversity and epidemiology, our research team will be searching for the disease on beet, chard, and cucurbits from vegetable producing regions in the state of Pennsylvania. You can contribute to our search and management of this important plant pathogen by reaching out to members of our team (see contact information below) and extension educators if you suspect you have BLS on beet, chard, and cucurbits in

your plantings or by sending your samples to the PSU Disease Clinic. For more information about this project, please visit the "Seedborne cucurbits and chenopods diseases caused by Pseudomonas syringae" website (https://dev.pseudosonseed.org/) or read the article published in Penn State News (https://news.psu.edu/story/591380/2019/10/03/research/plant-pathologist-awarded-grant-aid-global-study-seedborne).

For detailed information on how to prepare and send your samples, please visit the PSU Plant Disease Clinic website (https://plantpath.psu.edu/about/facilities/plant-disease-clinic/instructions) for more information.

For more information about the project contact: Raymond O. García-Rodríguez; rog5265@psu.edu; 814-865-7448; Carolee T. Bull; ctb14@psu.edu; 814-865-7448; or Beth K. Gugino; bkgugino@psu.edu; 814-865-7328.

Sweet Corn Insect Pest Monitoring

Shelby Fleisher, Extension Vegetable Entomologist, Penn State University

Corn earworm (Photo H. Fescmeyer)

Fall armyworm (Photo R. Bessin)

CEW (left) has a light-colored head capsule. FAW (right) has a prominent upside-down 'Y' on the head capsule, due to the light band on the edges of chitinous plates. Image: G. Dively, U. of MD

Corn earworm (CEW) catches remained very high. Counts rose to levels that suggest a 3-4-day spray interval in 17 of 24 sites, and an even tighter (2-3-day interval) at one site. We rarely see any site reaching a 2-3-day interval in PA.

Fall armyworm (FAW) also continues to be high. Most increases occurred within the last two weeks. We really don't have good thresholds for FAW. At this time of year larvae bore rapidly into the ear, from the base, side or tip. I suggest using the same thresholds as CEW, so I color coded the counts using the CEW thresholds.

I cannot recall any year where we had so many sites reaching a 3-4 day interval for CEW, plus very high FAW counts, all at the same time.

Pyrethroid resistance is important for both CEW and FAW late in the season. Other options include spinosysns (IRAC group 5: Blackhawk, Radiant), diamides (IRAC group 28: Coragen, Vantacor), or premixes that include pyrethroids and diamides (Beseige, Elevest). Diamides have low bee toxicity. Pyrethroids are needed in the mix if you need to also control sap beetles, silk-clipping beetles adult Western corn rootworm), or stink bugs.

If you are finding larvae in your corn, you can distinguish if it is CEW or FAW. CEW come in many color morphs but are usually lighter in color that FAW. A definitive character comes from looking closely at the chitinous plates that make up the head capsule. CEW will be light greenish or yellow/tan in color, with no strong band along the edge of the plates. FAW have a strong color band on the edge of the plates, resulting in an upside-down 'Y' pattern on their head.

European corn borer (ECB) is low. Sprays for CEW or FAW work against ECB.

One way to help distinguish fall armyworm (FAW) from the non-target wheathead armyworm, is to look at the 'hair pencils' at the tip of the abdomen. Hair pencils are tufts of hair at the that the male pushes out during mating efforts. Although wheatheads have white, bordered by brown, hair pencils, in FAW the white color is much more consistent among all the hair pencils, and much more prominent.

FAW trap catch in the bottom of a UniTrap, specimens exerting white hair pencils. Photos : S. Fleischer

Average weekly catch –moving average for the last 7 days.

		CEW				ECB				FAW		
County	**Trap Name**	**10-Aug**	**17-Aug**	**24-Aug**		**10-Aug**	**17-Aug**	**24-Aug**		**10-Aug**	**17-Aug**	**24-Aug**
Blair	Tyrone	6		90		4		10		4		15
Bedford	Martinsburg	10		215		0		0		10		182
Bucks	Bedminster	47	118	330		0	0			0	0	
Centre	State College	6	231	323		2	3	2		0		476
Centre	Rock Springs	0		132		0				5		301
Clinton	Loganton		0	2			1	0				
Erie	Fairview	3	400	194						1	292	414
Erie	Lake City	3	294	385						94	785	765
Indiana	Brush Valley	5	76	38						2	175	109
Indiana	Creekside	5	31	12						2	45	228
Juniata	Port Royal	24		100						1		1
Juniata	Greenbar	12		112								
Lancaster	Landisville	7	54	259		1	0	1			29	129
Lancaster	Neffsville	8	30	131		0	1	0		0	8	21
Lancaster	New Danville	3	42	142		0	0	0		0	12	37
Lehigh	Germansville	2	30	89		0	5	6		2	7	24
Luzerne	Drums		10				0				0	
Lycoming	Linden		0								2	
Lycoming	Montoursville		10	135							4	3
Lycoming	Muncy	4	7	110						0	0	0
Mifflin	Belleville	15		150		0		2		7		25
Montour	Washingtonville	6	75	98		0	0	4				
Northampton	Nazareth	2	92			0	0			0	21	
schuylkill	Tower City			0				4				
Susquehanna	Montrose	1	2	9		5	6	12		4	26	24
Union	Winfield	3	60	151		3	3	8				
Washington	Venetia	16	246									
York	York		35	51		0	0	0			42	50

THRESHOLDS: Reproductive (tassel/silk) and late vegetative corn attracts moths. Shorten spray schedules when populations increase. If CEW is not a problem, then consider ECB.

	CEW			ECB	
	Catch/Week	**Spray Frequency (days)**		**Catch/Week**	**Spray Frequency (days)**
Almost Absent	≤13	7 or more		<15	7 or more
Very low	14-35	5-6		15-35	6
Low	36-70	4-5		36-70	5
Moderate	71-349	3-4		>70	4
High	>350	2-3			