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Vegetable Crops

Vegetable Crop Insect Scouting - David

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Peas

Scout peas for aphids. We have seen unusually high numbers of aphids in other crops. Paraphrasing from my predecessor: "On small plants, sample 10 plants in 10 locations, on larger plants, 10 sweeps...5-10 aphids per plant or 50 per sweep is a good action threshold for aphids in peas."

Watermelon

Some of the first melon transplants are going out soon. Be advised that striped cucumber beetle may be active earlier this year than in recent years past due to the unusually warm weather.

Vegetable Disease Results from 2018 Field

<u>Trials</u> - Kate Everts, Vegetable Pathologist, University of Maryland; <u>keverts@umd.edu</u>

Some of the applied research results of trials on management of vegetable diseases that were conducted in Maryland and Delaware, are now available online. These results include evaluations of 1) foliar fungicides for gummy stem blight and anthracnose on watermelon, 2) cultivars and foliar fungicides for downy mildew of processing cucumber, 3) impact of cultivar selection on Phytophthora blight on watermelon, and 4) drip vs. foliar application of fungicide for managing Phytohthora blight on watermelon. The compiled research reports are available at <u>https://extension.umd.edu/mdvegetables/veget</u> <u>able-plant-pathology/disease-management</u>

Click on 2018 Season - Applied Research Results on Vegetable Crop Disease Management.

Calcium and Potato Tuber Development -

Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu

Several disorders of potatoes are associated with localized calcium deficiencies in the tubers. This includes internal rust spot, internal browning, heat necrosis, hollow heart, and bruising. Calcium is a component of plant cell walls and the pectin in the middle lamella that cements cells together. Local deficiencies of calcium during the development of potato tubers can cause collapse of cells leading to these disorders.

In plants, calcium moves from the soil exchange sites into soil water and to plant roots by diffusion and mass flow. At plant roots, the calcium moves into the xylem (water conducting vessels), mostly from the area right behind root tips. In the xylem, calcium moves with the transpirational flow, the movement of water from roots, up the xylem, and out the leaves through stomata. Calcium is taken up by the plant as a divalent cation, which means it has a charge of +2. It is attracted to negatively charged areas on the wall of the xylem, and for calcium to move, it must be exchanged off the xylem wall by other positively charged cations such as magnesium (Mg++), potassium (K+), ammonium (NH4+), or other calcium cations (Ca++). This cation exchange of calcium in the xylem requires continuous movement of water into and up through the plant. It also requires a continuous supply of calcium from the soil. The main sink for calcium is developing shoot tips.

In potatoes, tubers develop below ground on the tips of underground plant stems called stolons. Because calcium movement in the plant is driven by transportation there is limited movement of calcium through root uptake to the developing tubers. It is therefore necessary to have adequate available (exchangeable) calcium around stolons as tubers are formed and adequate moisture to maintain calcium levels in the soil water. To get the full benefit, calcium needs to be in the zone of tuber development and moisture needs to be maintained at optimal levels critically during early tuber development (cell division) and then through the growing season. To have adequate calcium it is important to apply lime to bring the pH to acceptable levels; however, this often is not sufficient for potatoes. One reason is because of the need in scab susceptible varieties to keep soil pH below 5.4 to control this soil-borne disease.

To deal with this issue, additional calcium is often added in the form of gypsum (calcium sulfate) at the rate of 500-1500 lbs per acre. Gypsum supplies calcium without changing the soil pH. An application of 900 lbs of gypsum will supply approximately 200 lbs calcium/A. Foliar applications of calcium and sidedress applications of calcium nitrate (at rates commonly applied on Delmarva) do little to provide adequate calcium to prevent disorders. Gypsum can be applied pre-plant or during hilling.

Calcium needs to in the tuber development zone during the cell division stage. Once tubers reach ¼ inches in diameter there is very little new cell formation. For Ca to be able to get in the tuber it needs to be available between the hook and initiation stages (see figure).



Photo showing hook and tuber initiation stages in potatoes.

Fruit Crops

<u>Bruising on Strawberry Leaves</u> – Jerry Brust, IPM Vegetable Specialist, University of Maryland; jbrust@umd.edu</u>

Over the last few weeks I have been sent pictures of and have seen dark spots on the foliage of strawberry plants (Figures 1 and 2). These spots can look pretty bad at times and are thought to possibly be the start of some disease, such as angular leaf spot or anthracnose. The dark spots are usually on the upper or lower surface of the leaf, but at times can be found on both surfaces of a leaf. These damaged areas of strawberry foliage can be very disconcerting when they appear as dark spots on the stems (Fig. 3). No bacteria or fungi have ever been found associated with these dark spots. I have seen this type of discoloration in strawberry foliage early in the season many times over the years and have never seen the spots turn into any disease problem or any other type of problem. The best that we can come up with is that the plant has 'bruised' foliage. And as you look at the spots this is exactly what the damage looks like (kudos to Karen Rane for coming up with this description of the damage). This damage usually appears within a short time span after high winds occur. Figure 4 shows a good example of this as you can see the bruised areas of the leaves that appeared a few days after a very windy period on April 15. Also notice the tattered appearance of the leaf edges demonstrating that these leaves were knocked around a great deal. It is possible that disease organisms might enter the plant through this damaged tissue, but I have never seen this occur to any extent in the field-even during the wettest spring. Nothing needs to be done about this bruising, growers just need to be aware of the possibility occurring after wind events.



Figures 1 and 2. Dark spots on strawberry leaves often mistaken for the start of foliar diseases



Figure 3. Strawberry stem with dark spot



Figure 4. Strawberry leaf with bruises and tattered margins

Agronomic Crops

Agronomic Crop Insect Scouting - David

Owens, Extension Entomologist; owensd@udel.edu

Early Season Moth Activity

Trap Location	True Armyworm per night	Black Cutworm per night
Willards, MD	0.4	0.7
Salisbury, MD	0	1.4
Laurel, DE	0.3	2.3
Seaford, DE		4.9
Bridgeville, DE	2.7	3.7
Harrington, DE	1.3	2.3
Smyrna, DE (Wilson)		5.4
Kenton, DE (Owls Nest)	3.4	1.0
Pearson's Corner, DE	0.5	0.4
Sudlersville, MD	0.3	0.3

Alfalfa

Keep checking alfalfa fields for weevils and aphids. Aphid pressure needs to be high, around 50-100 per stem without natural enemies before a treatment is advised. If going out with an insecticide, pay attention to pre-harvest intervals. Lorsban works well against weevils but has longer PHIs than other insecticides and is rate dependent. Virginia reports very high aphid counts in fields treated earlier, especially when treated with a pyrethroid. Alfalfa recommendations can be found here: <u>http://extension.udel.edu/ag/insectmanagement/alfalfa/</u>.

Small Grains

Generally, cooler weather favors aphids. I don't see how the weather could favor aphids any more by being cool than what we have had the past couple of weeks. Aphid counts continue to remain high in some fields. This week, reports have come in of small sawflies and early instar armyworm presence. Cereal leaf beetle egg lay has hit its peak, and eggs are beginning to hatch out. We are still seeing some fields with unusually high aphid activity. Although not a concern for right now, this is also a good time to remember some products have long pre-harvest intervals. You can find threshold and insecticide recommendations by scanning Crop cards passed out at Delaware Ag Week with a QR reader or by following this link:

http://extension.udel.edu/ag/insectmanagement/small-grains/

Corn

There have been reports of corn infested with aphids, probably from nearby small grain. In most cases, seed treatment on the corn should provide good control of these aphids until natural enemies build up in the small grain and begin to control the source population.

<u>Wheat and Barley Disease Updates</u> - Alyssa Koehler, Extension Field Crops Pathologist; <u>akoehler@udel.edu</u>

The Fungicide Efficacy for Control of Wheat

Diseases Table developed by the North Central Regional Committee on Management of Small Grain Diseases has been updated for 2019 and can be used as a tool when making fungicide decisions. The table is at the end of this issue of WCU. A pdf version of the table is online at <u>https://cdn.extension.udel.edu/wpcontent/uploads/sites/12/2019/04/25191900/N</u> <u>CERA2019WheatTable.pdf</u>.

Most barley is heading out and wheat is getting close. There is quite a bit of rain in the forecast, which puts us at higher risk for FHB. Continue to scout and utilize the Fusarium Head Blight Prediction Center

http://www.wheatscab.psu.edu/ as we approach flowering. Recommended timing of fungicides applied for FHB management is at Feekes 10.5.1. You want to look for flowers at the center of the head to identify 10.5.1. and there is a 5-6 day window for optimal application.

Growing Degree Days (GDD) Through April

<u>23</u> - Jarrod O. Miller, Extension Agronomist, jarrod@udel.edu

With the warmer mid-April temperatures, there were some fields planted a little earlier than usual (or at least earlier than last year). It takes 120 growing degree-days (GDD) to see corn emergence. Anyone who planted by Sunday, April 14th should already have seen 120 GDD in all three counties, although it took almost nine days to get there.

Below are accumulated GDD for each county, with the dotted line showing expected emergence. There is an obvious inflection point around April 18th that shows a strong warming trend, before temperatures cooled back off. Had the trend remained in place, it would only have taken about a week to hit 120 GDD. The weather outlook in Georgetown over the next week remains conducive for corn germination, while the northern end of the state may see a few nights below 50°F. However, soils are insulated so we can expect soil temperature to remain in the upper 50s to low 60s. With this weather, we can still expect to see germination and emergence within 7-9 days.







General

<u>Guess the Pest! Week 3 Answer: Spotted</u> <u>Lanternfly Quarantine Zone</u> - David Owens, Extension Entomologist, <u>owensd@udel.edu</u>

Congratulations to Bob Leiby for correctly guessing this week's GTP as Delaware's spotted lanternfly quarantine zone. Bob will be sent a sweep net for lanternfly collecting and destroying.



Spotted lanternfly was accidentally introduced into Pennsylvania from Asia around 2014. It feeds on phloem sap, which is high in sugar and low in protein. This is a large, charismatic insect that needs a lot of protein; thus it filters out enormous amounts of sap. This results in a 'rain' of honeydew and sooty mold growth underneath infested branches. In Pennsylvania, these insects are causing serious damage to vineyards, and can potentially impact other orchard crops as well as the silviculture industry by weakening trees over time.

Lanternflies lay eggs in the fall and are not choosy about where they lay eggs. Eggs can be laid on any flat, vertical surface such as rusty metal, equipment, tree trunks, stone slabs, etc. Egg masses look like patches of mud. Nymphs should be hatching now, and will look like small dominos on legs - black with white spots. Later this summer they will transition to red with white spots.



The Delaware Department of Agriculture quarantine is in place in an attempt to slow the spread of lanternflies, allowing university personnel, private collaborators, state governments, and USDA time to identify impacts, management tactics, and natural enemies from Asia that might help bring SLF under control. What does the guarantine mean for you? It means that if you enter these areas and stop for more than just a typical I-95 headache, you should check your vehicle or your goods for potential hitchhiking SLFs. Residents are strongly encouraged to go through a compliance checklist, essentially a visual examination to ensure you are not carrying any life stages with you. This checklist can be found here: https://agriculture.delaware.gov/wpcontent/uploads/sites/108/2019/03/DDA-Spotted-Lanternfly-Residential-Compliance-Checklist.pdf.

Businesses and organizations, however, that move materials inside the quarantine zone or out of the quarantine zone need to have a permit. This can be done by having a designated company employee or representative work through an online training module (https://extension.psu.edu/spotted-lanternfly<u>permit-training</u>). After completion, they are required to train other company employees and select the number of permits their company will need for vehicles.

If you think you have SLF, take a photo and send to <u>HitchHikerBug@delaware.gov</u>, or call (302) 698-4632. For more information, please visit: <u>https://agriculture.delaware.gov/plant-</u> <u>industries/spotted-lanternfly/</u> and <u>https://www.agriculture.pa.gov/Plants_Land_W</u> <u>ater/PlantIndustry/Entomology/spotted_lanternf</u> <u>ly/Pages/default.aspx</u>. Do your part to help prevent the spread of this extremely noxious pest from getting established, for your quality of life, for your neighbor's, and for the farmer down the road.

<u>Guess the Pest! Week 4</u> - David Owens, Extension Entomologist, owensd@udel.edu

Test your pest management knowledge by clicking on the GUESS THE PEST logo and submitting your best guess. For the 2019 season, we will have an "end of season" raffle for a \$100.00 gift card. Each week, one lucky winner will also be selected for a prize and have their name entered not once but five times into the end of season raffle. A lucky winner will also receive a heavy duty sweep net.

What has happened to this wheat field?



To submit your answer, please go to: https://docs.google.com/forms/d/e/1FAlpQLSfU PYLZnTRsol46hXmgqj8fvt5f8-JIOEEUHb3QJaNDLG_4kg/viewform. Please also

note, the form should now allow you to fill in your name and email. Sorry for any inconvenience the last couple of weeks.

Announcements

Spring Pasture Walk

Thursday, May 21, 2019 6:00 - 8:00 p.m. Whitehead Cattle Company 1303 Dexter Corner Rd, Townsend, DE 19734

Credits: Nutrient Management (0.75) Pesticide credit(1.0)

Come and see how Whitehead Cattle Company uses pasture to effectively feed their beef herd. Learn how to identify weeds and how to control them in a pasture setting. In addition, learn about soil health and how healthy soil is the key to making farms more productive, profitable and resilient—and better prepared to meet the challenges of the 21st century. Learn how to take a hay sample and visually evaluate hay. The workshop will also feature a talk on Pesticide safety - responsible decision-making and actions to protect pesticide users, public health, plant and animal health, and the environment

The meeting is free and everyone interested in attending is welcome. If you have special needs in accessing this program, please call the office two weeks in advance.

To register or request more information, please call our office at (302)831-2506. Please call to register by Friday, May 10.

<u>Agenda</u>

Welcome and Introductions

6:00-6:05 Dan Severson, University of Delaware Cooperative Extension

Tour of Pastures and Pasture Management

6:05-6:20 George and Lynda Whitehead, Whitehead Cattle Company

Weed Identification and Control in Pastures

6:20-6:50 Quintin Johnson, University of Delaware Cooperative Extension

Pesticide Safety

6:50-7:15 Dr. Kerry Richards, University of Delaware Pesticide Safety Education Program

Soil Health

7:15-7:40 Jayme Arthurs, NRCS Research Conservationist

Proper Hay Sampling and How to Visually Evaluate Hay

7:40-7:55

Dan Severson, University of Delaware Cooperative Extension

Wrap up and Evaluations

7:55-8:00 Dan Severson, University of Delaware Cooperative Extension

DSU Blueberry Field Day

Tuesday, June 18, 2019 8:30 a.m. to 2:30 p.m. Delaware State University Outreach & Research Center 884 Smyrna-Leipsic Road, Smyrna, DE

Topics:

- soil pH testing will be done before workshop starts
- blueberry planting and management
- post-harvest handling
- pest management

This workshop is free but please call 302-857-7796 or email <u>Lnpaudel@desu.edu</u> to register.

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of April 18 to April 24, 2019

Readings Taken from Midnight to Midnight

Rainfall:

0.60 inch: April 19 0.60 inch: April 20

Air Temperature:

Highs ranged from 81°F on April 18 to 67°F on April 21.

Lows ranged from 65° F on April 19 to 48° F on April 23

Soil Temperature:

63.8°F average

Additional Delaware weather data is available at <u>http://www.deos.udel.edu/monthly_retrieval.html</u> and

http://www.rec.udel.edu/TopLevel/Weather.htm

Weekly Crop Update is compiled and edited by Emmalea Ernest, Associate Scientist - Vegetable Crops

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Management of Small Grain Diseases Fungicide Efficacy for Control of Wheat Diseases (2019 Final Apr 3)

The North Central Regional Committee on Management of Small Grain Diseases (NCERA-184) has developed the following information on fungicide efficacy for control of certain foliar diseases of wheat for use by the grain production industry in the U.S. Efficacy ratings for each fungicide listed in the table were determined by field testing the materials over multiple years and locations by the members of the committee. Efficacy is based on proper application timing to achieve optimum effectiveness of the fungicide as determined by labeled instructions and overall level of disease in the field at the time of application. Differences in efficacy among fungicide products were determined by direct comparisons among products in field tests and are based on a single application of the labeled rate as listed in the table. Table includes most widely marketed products, and is not intended to be a list of all labeled products.

Efficacy of fungicides for wheat disease control based on appropriate application timing

Fungicide(s)												
Class	Active ingredient	Product	Rate/A (fl. oz)	Powdery mildew	Stagonospora leaf/glume blotch	Septoria leaf blotch	Tan spot	Stripe rust	Leaf rust	Stem rust	Head scab⁴	Harvest Restriction
Strobilurin	Picoxystrobin 22.5%	Aproach SC	6.0 - 12.0	G1	VG	VG ²	VG	E ³	VG	VG	NL	Feekes 10.5
	Pyraclostrobin 23.6%	Headline SC	6.0 - 9.0	G	VG	VG ²	E	E ³	E	G	NL	Feekes 10.5
Triazole	Metconazole 8.6%	Caramba 0.75 SL	10.0 - 17.0	VG	VG		VG	E	E	E	G	30 days
	Tebuconazole 38.7%	Folicur 3.6 F⁵	4.0	NL	NL	NL	NL	E	E	E	F	30 days
	Prothioconazole 41%	Proline 480 SC	5.0 - 5.7		VG	VG	VG	VG	VG	VG	G	30 days
	Prothioconazole19% Tebuconazole 19%	Prosaro 421 SC	6.5 - 8.2	G	VG	VG	VG	E	E	E	G	30 days
	Propiconazole 41.8%	Tilt 3.6 EC⁵	4.0	VG	VG	VG	VG	VG	VG	VG	Р	Feekes 10.5.4
Mixed modes of action ⁶	Tebuconazole 22.6% Trifloxystrobin 22.6%	Absolute Maxx SC	5.0	G	VG	VG	VG	VG	E	VG	NL	35 days
	Cyproconazole 7.17% Picoxystrobin 17.94%	Aproach Prima SC	3.4 - 6.8	VG	VG	VG	VG	E	VG		NR	45 days
	Prothioconazole 16.0% Trifloxystrobin 13.7%	Delaro 325 SC	8.0	G	VG	VG	VG	VG	VG	VG	NL	Feekes 10.5 35 days
	Pydiflumetofen 13.7% Propiconazole 11.4%	Miravis Ace SE	13.7	VG	VG	VG	VG	VG	VG	VG	G ⁷	Feekes 10.5.4
	Fluxapyroxad 2.8% Pyraclostrobin 18.7% Propiconazole 11.7%	Nexicor EC	7.0 - 13.0	G	VG	VG	E	E	E	VG	NL	Feekes 10.5
	Fluoxastrobin 14.8% Flutriafol 19.3%	Preemptor SC	4.0 - 6.0			VG	VG	E	VG		NL	Feekes 10.5 and 40 days
	Fluxapyroxad 14.3% Pyraclostrobin 28.6%	Priaxor	4.0 - 8.0	G	VG	VG	E	VG	VG	G	NL	Feekes 10.5
	Propiconazole 11.7% Azoxystrobin 13.5%	Quilt Xcel 2.2 SE ⁵	10.5 - 14.0	VG	VG	VG	VG	E	E	VG	NL	Feekes 10.5.4
	Prothioconazole 10.8% Trifloxystrobin 32.3%	Stratego YLD	4.0	G	VG	VG	VG	VG	VG	VG	NL	Feekes 10.5 35 days
	Benzovindiflupyr 2.9% Propiconazole 11.9% Azoxystrobin 10.5%	Trivapro SE	9.4 - 13.7	VG	VG	VG	VG	E	E	VG	NL	Feekes 10.5.4 14 days

1Efficacy categories: NL=Not Labeled; NR=Not Recommended; P=Poor; F=Fair; G=Good; VG=Very Good; E=Excellent; -- = Insufficient data to make statement about efficacy of this product.

² Product efficacy may be reduced in areas with fungal populations that are resistant to strobilurin fungicides.

³Efficacy may be significantly reduced if solo strobilurin products are applied after stripe rust infection has occurred.

⁴Application of products containing strobilurin fungicides may result in elevated levels of the mycotoxin Deoxynivalenol (DON) in grain damaged by head scab.

⁵Multiple generic products containing the same active ingredients also may be labeled in some states.

⁶Products with mixed modes of action generally combine triazole and strobilurin active ingredients. Nexicor, Priaxor and Trivapro include carboxamide active ingredients.

⁷Based on application timing at the beginning of anthesis (Feekes 10.5.1)