RUTGERS
New Jersey Agricultural Experiment Station

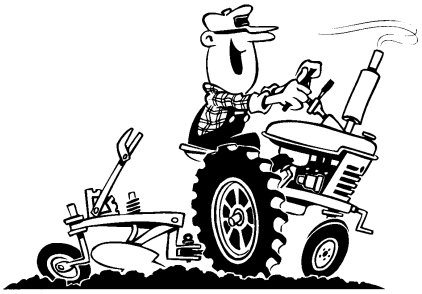
Cooperative Extension of Cumberland County
Extension Education Center
291 Morton Avenue
Millville, NJ 08332-9791

http://cumberland.njaes.rutgers.edu

Phone: (856) 451-2800 x1
Fax: (856) 451-4206

Cultivating Cumberland

August - 2021 VOL. 26, ISSUE 8



Inside this issue:

Survey Participants Needed
See page 12

The office remains closed to the public.

Vegetable Twilight Meeting and Research Tour

Thursday, August 19, 2021, 4:00 pm (meet at the shelter near the parking lot)

Rutgers Agricultural Research & Extension Center

121 Northville Rd., Bridgeton, NJ (Upper Deerfield)

4:00 – Discussion

Strawberry Soil Fertility – Bill Hlubik, Middlesex County Agricultural Agent

Silicon, Sulfur and Manganese Nutrition for Protecting Cucurbits from Powdery Mildew – Joe Heckman, PhD, Specialist in Soil Fertility

Rutgers Covid-19 Project – Rick VanVranken, Atlantic County Agricultural Agent

Sustainable Agriculture and Research and Extension (SARE) Farmer Grants a Way to Try New Things and Cover the Cost – Michelle Infante-Casella, Gloucester County Agricultural Agent

4:30 – Tour

Evaluation of Bell Pepper Varieties and Breeding Lines for Bacterial Leaf Spot and Phytophthora Blight Management – Wes Kline, PhD, Cumberland County Agricultural Agent

Cover Crops for Between Beds in Plasticulture Cucumbers – Thierry Besancon, PhD, Extension Weed Specialist for Specialty Crops

Update on Breeding for Fusarium Wilt Resistance in Basil – Kathryn Homa, IR-4 Program

Anthracnose Control in Peppers – Andy Wyenandt, PhD, Specialist in Vegetable Pathology

Phytophthora Blight Control Through the Use of Fungicides - Andy Wyenandt, PhD, Specialist in Vegetable Pathology

Control of Basil Downy Mildew with Organic Materials - Andy Wyenandt, PhD, Specialist in Vegetable Pathology

The Effects of Simulated Dicamba Drift on Cucumber and Snap Bean Yields – Maggie Wasacz, Rutgers Graduate Student

Sweet Corn Demonstrating the Differences/Effectiveness of Non-Bt, Providence Bt, and Attribute II Bt Varieties for Resistance to Corn Earn Worm and Fall Army Worm – Joe Ingerson-Mahar, PhD, Vegetable IPM Coordinator

Update on Industrial Hemp Research in South Jersey – Raul Cabrera, Specialist in Nursery Production and Management

Pesticide Credits Available		Units
1A	Agricultural Plant	9
10	Demonstration & Research	9
PP2	Private Applicator	9

Diagnosing Verticillium Wilt in Eggplant

Andy Wyenandt

July 7, 2021; Article from plant and pest advisory

Verticillium wilt is a common soil-borne fungal pathogen that once it has infested soil can remain for a very long time. Verticillium wilt is caused by either Verticillium albo-atrium or Verticillium dahlia and has a wide host range (over 200 plant species). Both pathogens can survive (overwinter) as microsclerotia in the soil. Verticillium wilt prefers cooler weather and drier soils and can be more severe in neutral to alkaline soils. Solanaceous weeds such as Nightshade may harbor the pathogen. Symptoms can vary between hosts, but on eggplant the leaves of infected plants will typically become lopsided where one side of the leaf will wilt and stop expanding while the other side continues to develop. Vascular tissue near the soil line will become discolored. Eventually the entire plant will collapse as the vascular tissue becomes more infected (clogged) and water movement up the plant stops. There is no resistance to Verticillium wilt in eggplant so long crop rotations with non-susceptible crops are critically important. Some cultivars, such as 'Classic' and 'Epic' may maintain yield in infested fields.

Diagnostic symptoms of Verticillium wilt in eggplant
Photo by Kris Holmstrom

New Rutgers Fact Sheets and Bulletin

The following new fact sheets and bulletins are available on NJAES Publications:

FS1331: Food Waste 101: Understanding the Basics. Elnakib, S., Rowe, A., and Shukaitis, J.
go to njaes.rutgers.edu/fs1331/

FS1332: Ways to Reduce Food Waste at Home. Elnakib, S., Shukaitis, J., and Rowe, A.
go to njaes.rutgers.edu/fs1332/

FS1333: Engaging Individuals with Developmental Disabilities in Virtual Programming. Rea-Keywood, J., Brill, M., and Libby, B.
go to njaes.rutgers.edu/fs1333/

E370 Important Links for Beginner Farmers - RU Ready 2 Farm Toolshed. Hlubik, W.; Errickson, W.; Pearsall, B.; Muehlbauer, M.; Melendez, M.; Polanin, N.; Nitzsche, P.; Bignell, H.; and Errickson, L.
go to https://njaes.rutgers.edu/e370

Preparing for Pepper Anthracnose

Andy Wyenandt, May 21, 2021; Posted on the Plant and Pest Advisory website

Pepper anthracnose caused by Colletotrichum spp. has become a significant problem on some farms in southern New Jersey.

Unlike in tomato, where symptoms are only present in mature (red) fruit, pepper anthracnose can infect pepper fruit at any growth stage. Currently, there are no commercially-available bell or non-bell peppers with known resistance to anthracnose. The pathogen overwinters, albeit, not very well on infected pepper fruit left in the field or on infected plant material at the end of the production season. Because pepper anthracnose does not overwinter very well, it always starts out as a 'hot spot' in the field and then fans out directionally with the prevailing direction of the wind and driving rain. Hot weather along isolated afternoon and evening showers are ideal conditions for anthracnose development.

On farms with a history of pepper anthracnose, precautions should to be taken each year. The first, if possible, is to rotate away from those areas of the farm with anthracnose for as long as possible. Remember, it can survive (although not very well) in the soil for many years. Importantly, the same pathogens that cause tomato anthracnose and strawberry anthracnose are the same species that infect pepper, so rotating away from fields heavily used in tomato and/or strawberry production is extremely important. Fields need to be scouted as soon as fruit start to develop to locate 'hot spots'. If 'hot spots' are found, all fruit from the immediate and surrounding area need to be strip-picked (or entire plants can also be removed). Growers who have adopted this practice have had success in reducing their losses by reducing the inoculum pressure before the pathogen begins to fan out across the field. Overhead irrigation should not be used in fields with anthracnose problems.

Reducing the amount of inoculum in the field is critical for managing pepper anthracnose. Infected fruit left in the field during and after the production season have the potential to act as a source of inoculum. Therefore, it is critically important to take the appropriate steps to help reduce that chance. During the season, all infected fruit need to be removed from the field. After harvesting, all fields should immediately mowed or hit with gramoxone. All plant debris should be thoroughly worked back into the soil so it can start to break down as quickly as possible. Abandoned fields with plants still standing going into the fall/winter only act as an increased source for inoculum. It's a misnomer to think that the cold winter weather will help breakdown and reduce inoculum found on infected plant material left on the soil surface. It's much better if infected plant material is worked back into the soil where other soil microorganisms can help with the process.

Fungicide programs do work for controlling pepper anthracnose. Fungicide programs should begin as soon as plants start to flower. The key to controlling anthracnose is to get the fungicide to where it is needed the most, on the developing fruit. Planting peppers in a single or double-row fashion may greatly affect your ability to control the disease. Your fertility program may also affect your ability to control the disease. Fertility programs high in N that promote tall, lush, dense canopies will greatly impact how much fungicide gets to where it needs to be. Growers should apply high rates of chorothalonil or manzate in a weekly rotation; or tank mix either with azoxystrobin (11); Cabrio (pyraclostrobin, 11); Priaxor (fluxapyroxad + pyraclostrobin, 7 +11); Quadris Top (3 + 11); Aprovia Top (3 + 7); or Topguard (flutriafol + azoxystrobin, 3 + 11) with a high volume of water (50 gal/A +) to ensure adequate coverage. Organic growers need to be extremely diligent with proper crop rotations, regular scouting to detect 'hot spots' early and make sure to remove all potential sources of inoculum. Weekly OMRI-approved copper applications may help suppress anthracnose. Other organic products have shown little or no efficacy against pepper anthracnose.

For more information please see the 2020/2021 Mid-Atlantic Commercial Vegetable Production Recommendations Guide.

Controlling Cercospora Leaf Spot in Beet

Andy Wyenandt, May 27, 2021

Cercospora leaf spot (CLS), caused by *Cercospora beticola*, is an important and emerging disease in beet and swiss chard production in New Jersey. Efforts to control this disease has become more difficult in the past few years in some areas of southern New Jersey. The soil-borne fungal pathogen, once established in fields, can survive in the soil for up to 2 years on infected debris and on weed hosts such as *Chenopodium* (lambsquerters), goosefoot, and pigweed. The pathogen may also be seed-borne. Symptoms of infection include numerous, small tan leaf spots with distinct dark purple margins that are easily diagnosed. Overhead irrigation and rainfall help spread the pathogen throughout the field. *Cercospora beticola* is most damaging in warm weather (day temperature of 77 to 90° F and night temperature above 60° F).

Controlling Cercospora leaf spot with preventative fungicide applications has become challenging for some growers in New Jersey. The pathogen is known to have developed resistance to important fungicide classes in recent years, such as the QoIs (FRAC code 11) and the DMIs (FRAC code 3) in different regions of the country, based on fungicide use. This is not surprising since resistance development can occur when fungicides in these groups are used extensively over many years. In New Jersey, azoxystrobin has been used extensively for years to manage this disease.

Cultural practices to help mitigate losses to Cercospora leaf spot

There are a number of cultural practices growers can do to help reduce losses to CLS.

- Start with certified, disease-free seed, or treat seed using hot water seed treatment method.
- Avoid fields with a known history of CLS.
- Rotate to non-host crops (outside of the Chenopodium family) for 2-3 years.
- Bury infected crop residues and destroy volunteer plants and weed hosts.
- Burn down fields after harvesting.
- Avoid planting succession crops close together (at least 100 meters or 325 feet apart).
- Avoid overhead irrigation if it will result in prolonged leaf wetness periods (e.g., late evening or at night); irrigate early to mid-day when leaves will dry fully or use drip irrigation for small plantings.
- Using the proper fungicides, rates, and fungicide rotations.

Fungicides for controlling Cercospora leaf spot

In recent years a number of new fungicides have been labeled for CLS control. Many of these fungicides contain two different active ingredients with more than one mode of action. Growers who have relied on managing CLS with azoxystrobin (FRAC code 11) for years and suspect a loss in efficacy should consider removing it from their fungicide program. There is a good chance fungicide resistance has developed. In 2019, a field study was done at RAREC to examine the efficacy of different fungicides for CLS control (Table 1). The fungicide efficacy trial was established in field with a history of CLS; where the field was inoculated with infected debris collected from a farm in southern New Jersey. Fungicides were applied weekly for 5 weeks with overhead irrigation to help promote disease development.

Continued on next page

Fungicide program (application timing)	FRAC code	active ingredient(s)	Rate per acre	Labeled for beet	AUDPC value
Untreated control	n/a	n/a	n/a	n/a	617 a
Kocide 3000 (1-5)	M01	copper hydroxide	1.0 lb	Yes	564 ab
Quadris 2.08F (1-5)	11	azoxystrobin	15.5 fl oz	Yes	538 bc
Fontelis 1.67SC (1-5)	7	penthiopyrad	30.0 fl oz	Yes	510 bcd
Miravis Prime 3.34SC (1-5)	7 + 12	pydiflumetofen + fludioxonil	13.4 fl oz	Yes	497 bcd
Merivon 2.09SC (1-5)	7 + 11	fluxapyroxad + pyraclostrobin	5.5 fl oz	Yes	471 cd
Tilt 3.6EC (1-5)	3	propiconazole	4.0 fl oz	Yes	445 d

Cercospora leaf spot development was extremely high during the course of the study. Area Under Disease Progress Curves (AUDPC) were calculated to determine the amount of disease development under each fungicide program (Table 1). CLS development was highest in the untreated control (UTC), with no significant differences between the UTC and weekly copper applications suggesting that weekly copper applications did not help reduce CLS in this study (Table 1). Weekly applications of Quadris, Fontelis, Miravis Prime were not significantly different, but significantly lower than the UTC (Table 1). Control of CLS was best with weekly applications of Tilt and Merivon, but these were not significantly different from weekly applications of Miravis Prime or Fontelis (Table 1). Results of this study suggest that growers with resistance concerns who have relied heavily on copper and azoxystrobin for CLS control should consider using other fungicides in their weekly preventative fungicide programs. Control programs should focus on applying fungicides with more than one mode of action and focus on rotating fungicides with different modes of action. For example: (please see 2020/2021 Commercial Vegetable Production Guide), Apply Tilt (FRAC code 3) followed by Miravis Prime (7 + 12), then tebuconazole (3), then Merivon (7+ 11), then Tilt (FRAC code 3), then Luna Tranquilty (7 + 9). Remember, resistance development to FRAC code 11 fungicides (QoIs) is qualitative and controlled by single point mutations, once resistance develops the fungus is completely resistance (to all fungicides in the group). Resistance development in FRAC code 3 fungicides (DMIs) is quantitative which often characterized as a gradual loss of resistance over time. As a note, FRAC code 3 fungicides should always be applied at the highest rate, using lower rates may increase selection pressure.

Organic Control Options

Controlling CLS in organic production systems starts by following and executing good cultural practices listed above. Always purchase certified seed. Use the hot water seed treatment method to help disinfested seed. Avoiding fields with a history of the disease. Producing beet on mulch and drip irrigation in small operations should be considered. This will help reduce weed pressure (as well as potential hosts) and reduce the need for overhead irrigation. Organic copper applications may not be effective in some operations where disease pressure is extremely high. Unfortunately, control of CLS with organic and biopesticides has been difficult, therefore good cultural practices must be followed accordingly.

Controlling Basil Downy Mildew in the Field

Andy Wyenandt, June 1, 2021

For over a decade, basil downy mildew (BDM) has caused significant losses in basil grown in organic and conventional field and greenhouse production across the United States. At the time of its introduction, there were very few fungicides labeled for its control making it nearly impossible to grow a successful crop in many areas of the country. The pathogen, *Peronospora belbahrii*, is an obligate parasite, meaning it needs a living host in order to survive. Thus, in more northern regions of the country that experience a freeze (i.e., winter), the pathogen will die when the host freezes during the fall. Because of this, the pathogen must be re-introduced the following spring or summer from southern regions of the country. This is similar to cucurbit downy mildew, where the pathogen can survive on the host that is growing in the field during the winter months (e.g., southern Florida or Mexico). The exact timing of when basil downy mildew may show up in your geographic region depends on a number of factors. The more southern you are located in the continental US, the more likely the pathogen will show up earlier in the spring or summer. In New Jersey the pathogen has been reported as early as 12 June and as late as 2 August. The first step in mitigating losses to basil downy mildew is in your selection of the best varieties. In recent years, there have been a number of new commercial sweet basil varieties released with a high level of resistance to basil downy mildew. Sweet basil varieties without BDM resistance should always be grown prior to the expected arrival of the pathogen in your region. There is a BDM monitoring website, led by Cornell University, which tracks the movement of the pathogen across the country each year. Growers can use the website to see where BDM has been reported across the country. Once BDM has been detected in your area you can expect it to remain active until the end of the production season. BDM resistant sweet basil varieties should always be grown after BDM has been detected in your region to help mitigate losses due to the disease. If you are located in the southern US, the easiest approach would be to use BDM resistant sweet basils the entire production season. All basil growers must remember that any of the new BDM resistant sweet basils are not “immune” to the disease. If disease pressure becomes extremely high or environmental conditions become highly conducive for disease development over a long period of time BDM resistance will break down for that season. Thus, it is extremely important to **still initiate** a fungicide program when using any DMR resistant sweet basil, especially if disease pressure is expected to be high.

For several years, the IR-4 Project has been working diligently with stakeholders and registrants to facilitate the registrations for a number of fungicide products (conventional, biopesticide, and organic) to control basil downy mildew. These efficacy studies have been done by Extension personnel at many Universities across the country. The following is a comprehensive list of conventional, organic, and biopesticides currently labeled for the control of BDM in the US.

Continued on next page

Conventional fungicides currently labeled for basil downy mildew control:

- Ranman 400 SC, FMC Agricultural Products
  - ⇒ cyazofamid, FRAC Group 21
  - ⇒ Can be used in a greenhouse, 0-day PHI

- Revus, Syngenta Crop Protection,
  - ⇒ mandipropamid, FRAC Group 40
  - ⇒ Micora labeled for use in the greenhouse; 1-day PHI

- Ridomil Gold, Syngenta Crop Protection
  - ⇒ mefenoxam, FRAC Group 4
  - ⇒ Field use only; 21-day PHI

- Orondis Ultra, Syngenta Crop Protection (not yet approved by EPA)
  - ⇒ oxathiapiprolin (FRAC Group 49) + mandipropamid (FRAC Group 40)
  - ⇒ Field use only (foliar); 0-day PHI

- Segovis, Syngenta Crop Protection
  - ⇒ oxathiapiprolin, FRAC Group 49
  - ⇒ Greenhouse use only; transplants for retail sale

- Presidio, Valent USA
  - ⇒ fluopicolide, FRAC Group 43
  - ⇒ Field use only; 1-day PHI;
  - ⇒ Adorn labeled for use in the greenhouse

- Reason 500SC, Gowan Company and Bayer CropScience LP
  - ⇒ fenamidone, FRAC Group 11
  - ⇒ Field and greenhouse use; 2-day PHI

Continued on next page

Organic Materials Review Institute (OMRI Listed) federally registered fungicide products for basil downy mildew control include:

- Actinovate AG (*Streptomyces lydicus*, Novozymes BioAg Inc.)
- Double Nickel 55 and LC (*Bacillus amyloliquefaciens* strain D747 Certis U.S.A.)
- Aviv (*Bacillus subtilis* strain IAB/BS03, STK Bio-Ag Technologies)
- Regalia (extract of *Reynoutria sachalinensis,* Marrone Bio Innovations)
- Trilogy (neem oil, Certis U.S.A.)
- Milstop, Carb-O-Nator (potassium bicarbonate, BioWorks Inc., Certis USA LLC)
- Oxidate (hydrogen dioxide, BioSafe Systems LLC)
- Oxidate 2.0 (hydrogen dioxide; peroxyacetic acid, BioSafe Systems LLC).
- Cueva Fungicide Concentrate (copper octanoate, Certis USA, LLC)
- Romeo (cell walls of *Saccharomyces cerevisiae* strain LAS117, Lesaffre Yeast Corporation)

Biopesticide products federally registered for basil downy mildew control that are not OMRI listed include:

- mono- and di-potassium salts of phosphorous acid (K-Phite, Plant Food Systems)
- phosphorous acid, mono- and dipotassium salts (Confine Extra, Winfield Solutions LLC)
- phosphorous acid, mono- and dibasic sodium, potassium, and ammonium salts (Alude and Phostrol, Nufarm Agricultural Products)
- potassium phosphite (Fosphite, JH Biotech, Inc.; Fungi-Phite, Plant Protectants, LLC; Prophyt, Helena Chemical Company; Rampart, Loveland Products, Inc.)
- potassium bicarbonate (Armicarb 100, Helena Chemical Company)
- a combination of potassium phosphate and potassium phosphite (Phorcephite, Loveland Products, Inc.)
- sodium tetraborohydrate decahydrate (Prev-Am Ultra ORO Agri, Inc.)
- hydrogen peroxide, peroxyacetic acid (Rendition, Certis USA LLC)
- hydrogen peroxide; phosphorous acid; mono- and dipotassium salts (Oxiphos, BioSafe Systems LLC)
- citric acid (Procidic, Greenspire Global Inc.)
- hydrogen peroxide; peroxyacetic acid (Sanidate 12.0, BioSafe Systems, LLC)
- Sodium tetraborohydrate decahydrate (Prev-Am Ultra, ORO Agri, Inc.)
- Laminarin (Vacciplant, UPL NA Inc.)

Some important points to consider:

1. Some of the conventional fungicides listed above are sold under different product names, depending on whether the product can be used in the field or greenhouse or for greenhouse transplant use. Other products have both a field and greenhouse use on the same product label.
2. Although a product is listed as a biopesticide, it does not mean it has an OMRI-approved label. All growers should follow labels accordingly. Remember, the label is the law.

Continued on next page

Proper control of BDM depends on a number of factors including the environment, disease pressure, and the timing of fungicide applications. Prolonged periods of wet weather and high relative humidity during the production season will make BDM control more difficult regardless of the products used to control it. The amount of disease pressure present in your field will also have an impact on your ability to control BDM. This is especially important in organic production systems where organic products often have better chance of working if disease pressure remains low. This is why growing a basil downy mildew resistant sweet basil is so important; as many organic products as reported by growers have not shown to be as effective as needed.

Research has shown that fungicide applications (e.g., conventional, bio-, or organic) initiated after the start of disease development most often leads to poor control and crop loss. Therefore, it is important to anticipate the arrival of BDM and initiate a fungicide program prior to the onset of disease development. This is also why monitoring the progress of the pathogen in the US is so important. In some areas, the disease might arrive on infected basil transplants from southern states. If this happens, the basil downy mildew will be in present long before the anticipated arrival of the pathogen due to weather patterns.

How products work against basil downy mildew

Conventional fungicides often work by inhibiting spore germination or spore production. Thus, the importance of having them applied prior to the arrival of the pathogen. Some of these products, such as mefenoxam or oxathiapiprolin, move within the plant, giving them an advantage when applied as drip applications. Biopesticides, such as the phosphites, are truly systemic and move up and down within the plants vascular system; however, research has shown that phosphites are more effective as foliar applications than when applied as drip applications. Some biopesticides, such as Oxidate and hydrogen peroxide, act as disinfestants killing spores they come into direct contact with. Because BDM sporulates on the underside of the leaf, these products (and most other fungicides) must reach the undersides of leaves during application in order to be effective. The same holds true for copper products. Copper is a protectant fungicide inhibiting spore germination. Therefore, it must reach the undersides of leaves. Organic products, such as those containing *Bacillus* and *Streptomyces*, act as an antigonist against BDM on the leaf surface and must be remain present in high enough populations on the leaf surface to provide control. This is often difficult to do because it requires multiple applications per week with short retreatment intervals. Often, these products are ineffective due to unfavorable environmental conditions. For growers trying to reduce conventional fungicide use, these products as well as disinfectant products will also kill off any biological control agents, so beware.

For information on Rutgers DMR sweet basils, where to purchase seed, as well as control strategies, and ongoing research efforts please follow the Rutgers basil downy mildew breeding program on Instagram at #Rutgersbasil.

RUTGERS
New Jersey Agricultural Experiment Station

New Jersey Center for Wine Research & Education
New Jersey Agricultural Experiment Station
Rutgers, The State University of New Jersey

https://njvines.rutgers.edu

NORTH JERSEY GRAPE CAMP

Wednesday, August 4th @ 4:30 PM

Alba Vineyard
269 County Rd 627, Milford, NJ 08848

4:30 pm Gather at the parking-lot and then drive to demonstration vineyard.

4:45 pm **Demonstration of Vineyard Sprayer Technologies**
BDi Machinery, Macungie, PA

Grapevine Development and Canopy Management.
Daniel Ward, Extension Specialist, Pomology.

Spotted Lantern Fly Update
Anne Nielsen, Extension Specialist, Fruit Entomology.

Diagnostics – Identifying Grapevine Diseases
Peter Oudemans, Extension Specialist, Small Fruit Pathology.
Megan Muehlbauer, Hunterdon County Extension Agent

Weed Identification and Management
Thierry Besancon, Extension Specialist, Weed Science.

Pesticide Safety Update
George Hamilton, Professor and Extension Specialist

Nematode Diagnosis in Vineyard and Management
Gary Pavlis, Atlantic County Extension Agent
Hemant Gohil, Gloucester County Extension Agent

Soil Fertility Update
Megan Muehlbauer, Hunterdon County Extension Agent

8:00 pm **Pesticide re-certification credits application**

Light fare will be provided. Contact Kim Crommelin (Rutgers Cooperative Extension – Hunterdon County) at 908-788-1338 or kfrey@co.hunterdon.nj.us This site is accessible to the physically impaired. If an additional assistance is needed, please contact **Megan Muehlbauer** muehlbauer@njaes.rutgers.edu prior to the meeting.

PLEASE SUBSCRIBE TO THE RUTGERS
PLANT AND PEST ADVISORY
visit: https://plant-pest-advisory.rutgers.edu/category/landscape-nursery-turf/
WE R HERE WHEN YOU NEED US

SCAN ME!

Projected GDD50 accumulation as of 8/1/2021						
Region	Location	1-Aug	1-Sep	1-Oct	1-Nov	-
Southern	Upper Deerfield (NJ50)	2145	2931	3477	3682	-
Central	Howell / Freehold (NJ10)	1896	2630	3109	3249	-
Northern	High Point (NJ59)	1490	2045	2352	2384	-
Forecast: NOAA NCEP Coupled Forecast System model version 2 (CFSv2) forecast system (3.5 months) (USPEST.ORG)						

Pest Scouting Guide: (1600-3000 GDD_{50})

The information provided here gives **scouting ranges** for insect pests as well as forecasting of **GDD_{50} accumulation *predictions*** to help time scouting and treatment efforts. This document supports scouting, *it does **not** replace it*. Keeping good notes on pest development will help dial in scouting and treatment efforts at your local level.

Location specific GDD_{50} models
USPEST.org/dd/model_app and http://newa.cornell.edu/
E: twaller@njaes.rutgers.edu for information

Pest Scouting - Growing Degree-day Ranges (1600-3000 GDD50)

CROP TYPE	Common Name	Scientific Name	GDD Min (50F)	GDD Max (95F)	Reference	Developmental / Target Stage
Many	**Redheaded flea beetle**	*Systena frontalis*	1570	1860	Udel.	2nd generation egg hatch
Many	**Two-banded Japanese weevil**	*Pseudocneorhinus bifasciatus*	1644	2271	RU	Adults
Willow	**Willow twig aphids**	*Lachnus spp.*	1644	2271	5	Typical treatment window
Conifer	**Juniper webworm**	*Dichomeris marginella*	1645	1917	RU	Larvae Treatment
Euonymus	**Euonymus Scale**	*Unaspis euonymil*	1700	-	RU	Prophylactic 2nd generation treatments
Conifer	**Cryptomeria scale**	*Aspidiotus cryptomeriae*	1750	2130	RU, 4	Crawlers emerge (2nd generation)
Many	**Obscure scale**	*Melanaspis obscura*	1774	-	6	Egg hatch / crawler
Oaks	**Oak skeletonizer**	*Bucculatrix ainsliella*	1798	2155	RU	Larvae
Conifer	**Arborvitae leafminer**	*Argyresthia thuiella*	1800	2200	RU	Larvae Treatment (3rd generation)
Mimosa, Honeylocust	**Mimosa webworm**	*Homadaula anisocentra*	1800	2100	RU	Larvae (2nd generation)
Conifer	**Cooley spruce gall adelgid**	*Adelges cooleyi*	1850	1950	RU	Galls open (Spruce)
Many	**Redheaded flea beetle**	*Systena frontalis*	1878	2318	Udel.	2nd generation Adults feeding
Turf	**Hairy chinch bug**	*Blissus leucopterus*	1903	2160	RU	Second generation- 50%- 2nd instars
Tulip	**Tuliptree aphid**	*Illinoia liriodendri*	1917	2033	RU	Nymphs
Conifer	**Zimmerman pine moth**	*Dioryctria zimmermani*	1917	2154	5	Treatment window (adult flight-1700 GDD)
Mainly Oaks	**Orangestriped oakworm**	*Anisota senatoria*	1917	-	6	Egg hatch - early instars
Conifer	**White pine aphid**	*Cinara strobi*	1991	2271	RU	Adults
Rhododendron	**Azalea whitefly**	*Pealius azaleae*	2032	2150	5	Adults/nymphs (3rd generation)
Maple	**Sugar maple borer**	*Glycobius speciosus*	2032	2375	5	Typical treatment window
Conifer	**Maskell scale**	*lepidosaphes pallia*	2035	-	6	Egg hatch / crawler (2nd generation)
Mainly Tulip	**Tulip tree scale**	*Toumeyella liriodendri*	2037	2629	RU	Crawlers (1st generation)
Mainly Magnolia	**Magnolia scale**	*Neolecanium cornuparvum*	2155	2800	RU	Crawlers (1st generation)
Euonymus	**Euonymus Scale**	*Unaspis euonymil*	2235	-	6	Egg hatch / crawler (2nd generation)
Locust	**Locust borer**	*Magacyllene robiniae*	2271	2805	5	Typical treatment window
Poplar and Willow	**Poplar and willow borer**	*Crytorhynchus lapathi*	2271	2806	5	Typical treatment window
Conifer	**Spruce spider mite**	*Oligonychus ununguis*	2375	2806	5	Typical treatment window - fall activity
Many	**Southern red mite**	*Oligonychus ilicis*	2500	2700	5	Typical treatment window
Maple	**Japanese maple scale**	*Lopholeucaspis japonica*	2508	-	6	Egg hatch / crawler (2nd generation)
Yew, many conifers	**Fletcher Scale (Yew)**	*Parthenolecanium fletcheri*	2515	2800	RU	Fall control of overwintering stage
Conifer	**Elongate hemlock scale**	*Fiorinia externa*	2515	2625	RU	Typical treatment window - fall activity
Hardwoods	**Fall webworm**	*Hyphantria cunea*	2793	-	6	Egg hatch / crawler (2nd generation)
Conifer	**Cooley spruce gall adelgid**	*Adelges cooleyi*	2800	3000	3	Fall control of overwintering stage
Conifer	**Eastern spruce gall adelgid**	*Adelges abietis*	2800	3000	3	Fall control of overwintering stage

Note: Growing degree-day values utilize daily average air temperatures with a minimum temperature threshold (a.k.a. 'base') of 50F = GDD50 (max. temp. threshold set at 95F). These values are accumulated from a biofix date, such as January or March 1st in the NE USA. Provided GDD50 are scouting ranges and should be truthed.

Daily GDD50 =
(Max + Min temp.) / 2 - 50 *(min temp. threshold)*

References

RU	Rutgers Cooperative Extension - Landscape IPM Notes
2	http://ccetompkins.org/resources/using-growing-degree-days-for-insect-management
3	https://extension.psu.edu/ipm-basics-for-christmas-trees#section-2
4	https://www.canr.msu.edu/ipm/agriculture/christmas_trees/gdd_of_conifer_insects
5	https://www.agriculture.nh.gov/publications-forms/documents/landscape-pests.pdf
6	https://extension.umd.edu/ipm/pest-predictive-calendar-landscapenursery
7	https://www.canr.msu.edu/ipm/agriculture/christmas_trees/gdd_of_landscape_insects
Unv. Del.	Coorespondance with Dr. Kunkel (University of Delaware)-*evolving GDD ranges*

Compiled 7-27-2021 - Timothy J. Waller, Ph.D. - Rutgers Cooperative Extension, Cumberland County Nursery Crops - twaller@njaes.rutgers.edu

Phytophthora in Conifers

Rutgers Cooperative Extension

Specialty Crop Block Grant Project

Timothy Waller – Cumberland County & Bill Errickson – Monmouth County

We are looking to select 30 NJ conifer producers to participate in a statewide Phytophthora project in order to characterize what pathogen species are present and how to ultimately manage them more effectively in our nurseries. The agents will schedule one to three visits this growing season to collect samples from roots, bark, soil, irrigation systems, and will perform soil testing.

RUTGERS
New Jersey Agricultural Experiment Station
COOPERATIVE EXTENSION CUMBERLAND COUNTY

LOOKING FOR **SAMPLE LOCATION PARTICIPANTS**

Phytopthora in Conifers - Sample Location Participants Survey

1. Please provide the following information:

- Farm name: _____
- County: _____
- Town: _____
- Contact number: _____
- Contact email: _____

2. Do you have conifers with suspected Phytophthora issues?
- (YES) (NO) (circle one)

3. Do you have broadleaf evergreens with suspected Phytophthora issues?
- (YES) (NO) (circle one)

4. Please rate perceived damages due to Phytophthora at your operation.
- Low - (1) (2) (3) (4) (5) - High (circle one)

5. Percentage of profits lost to Phytophthora?
- _____%

6. Would you participate in the Phytophthora project?
- (YES) (NO) (circle one)

7. If selected for the initial sample collection, would you be interested in follow-up studies?
- (YES) (NO) (circle one)

Please visit https://go.rutgers.edu/parhgf1u or use the QR CODE to fill out this form online or complete this form and mail, fax, drop-off, or call the number below to be considered.

Timothy James Waller, Ph.D. Agricultural Agent of Cumberland County
291 Morton Ave, Millville, NJ 08332 Phone: (856) 451-2800 ext. 1 Fax: (856 451-4206 Email: twaller@njaes.rutgers.edu

WE R HERE WHEN YOU NEED US

Calendar of Important Events

× Indicates a newly added event or more information since the last calendar
● Pesticide Recertification Credits Available

August 3-5

Empire Farm Days; 3149 Sweet Rd, Jamesville, NY 13078; 9:00 AM—4:00 PM; The event is the largest outdoor agricultural trade show in the Northeastern U.S., showcasing all the latest tractors, farm implements, dairy industry innovations alongside working demonstrations, live animal seminars, and more than 600 exhibits loaded with the latest agricultural information for successful farming; Find more information at http://www.empirefarmdays.com/

× August 4

• **North Jersey Grape Camp;** Alba Vineyards, 269 County Rd 267, Milford, NJ 08848; Starts at 4:30 PM; Light fare will be provided. Pesticide recertification credits available; To sign up or for more information contact Kim from Hunterdon County RCE at 908-788-1338 or by email at kfrey@co.hunterton.nj.us

September 14-16

Big Iron Farm Show; Red River Valley Fairgrounds, 1805 Main Avenue West, West Fargo, ND 58078; Held annually, 3 days of events and exhibits; Demonstrations and training sessions of farm equipment, agribusiness, health, innovation and technology; 900+ exhibits; Find more information at bigironfarmshow.com/

August 10-12

Penn State's Ag Progress Days Expo; Russell E. Larson Agricultural Research Center, Rock Springs, Centre County. Sponsored by Penn State's College of Agricultural Sciences. 9AM - 5PM Aug 10; 9AM - 7PM Aug 11; 9AM - 4PM Aug 12. Admission and parking are free. More information at https://agsci.psu.edu/apd

× August 19

• **Vegetable Twilight Meeting and Research Tour;** RAREC, 121 Northville Rd., Bridgeton, NJ 08302; 4:00PM—9:30PM; Discussion and Tour; Several speakers about various topics including Anthracnose in Peppers, Basil Downy Mildew, Dicamba Drift on Cucumber and Snap Beans, Sweet Corn Demonstration, Bell Pepper Varieties and Breeding lines for Bacterial Leaf Spot and Phytophthora Blight Management, and many more. The front page shows the full agenda; Pesticide Credits available: 1A– 9 units, 10– 9 units, PP2– 9 units

September 15-16

FSMA Produce Safety Rule Training – ONLINE ONLY; This FSMA training is online only and attendance at both days is required to receive a certificate as required by the FDA. Class is limited to 20 attendees, so register in advance, refunds will not be provided as the manual will be mailed out in advance. The deadline to register is 9/1/2021, exceptions cannot be made due to the nature of the online program. Register and find more information at https://www.eventbrite.com/manage/events/141869362081/details

× September 20-22

United Fresh Conference; Grand Hyatt Washington, 1000 H St NW, Washington, DC 20001; The United Fresh Annual Washington Conference is the annual event that unites the produce industry to address our most pressing public policy matters; Find more information and register at unitedfresh.org

× September 27-29

Pack Expo; Las Vegas Convention Center, Las Vegas, NV; The World's most comprehensive packaging and processing event in 2021; State of the art packaging equipment, materials and containers, automation technologies, digital packaging solutions, and other supply chain solutions; Register and find more information at packexpolasvegas.com

× October 28-30

PMA Fresh Summit Convention and Expo; New Orleans, Louisiana; Fresh Summit brings together produce and floral industry leaders, retail buyers, food safety experts and importers/exporters from across the globe. From decision makers to market innovators, Fresh Summit attendees and exhibitors are the people you need to know; Find more information and register online at https://www.pma.com/events/freshsummit/attend

× December 1-2

Organic Grower Summit; Monterey, CA; Two days of information, education, and networking opportunities with organic growers; provides growers firsthand knowledge and information in a variety of areas ranging from Agtech to food safety to sustainability. Through engaging educational sessions, insightful Keynote presentations and a trade show floor featuring nearly 100 exhibitors offering supply chain and service provider opportunities for growers, OGS 2021 is an event not to be missed! Find more information and sign up at organicgrowersummit.com

× December 7-9

Great Lakes Fruit, Vegetable & Farm Market EXPO; Over three days, the program includes sessions on fruit crops, vegetable crops, other specialty crops, greenhouse crop production and marketing, farm marketing ideas and operations, farmers' markets and organic production and marketing. There will also be sessions covering a diversity of general interest topics, including food safety and labor; Registration opens in October; Find more information at glexpo.com

REGULARLY SCHEDULED MEETINGS		
Pesticide Certification Exams	**Cumberland County Agriculture Development Board**	**Cumberland County Board Of Agriculture**
Testing is currently being held virtually because of the COVID pandemic.	Virtual Meeting Information can be found on the Public Meeting Calendar on co.cumberland.nj.us	Virtual Meeting Information https://rutgers.zoom.us/my/smangia Meeting ID: 529 557 9817 Passcode: Sal2020 Or call 1 (646) 558-8656
Rutgers will be taking over the pesticide exam program.	Aug. 10 Sept. 14 Oct. 12 Nov. 9 Dec. 14	Sept. 16 Oct. 21 Nov. 18 Dec. 16
Sign-up and find more information at https://pacer.rutgers.edu/	**Meetings start at 7 p.m.** **For more information call the Dept. of Planning, Tourism and Community Affairs at 856-453-2175**	**Meetings start at 7 p.m.** **For information call Lew DePietro, President at 856-981-9843**

The program in Cumberland County is suspended until further notice.

Cumberland County Improvement Authority (CCIA)
Pesticide Container Recycling
9:00 a.m. to 12 Noon
Cumberland County Solid Waste Complex
169 Jesse's Bridge Rd. (located off Route 55 Exit 29)
Deerfield Township, New Jersey
Questions? Call Division of Ag & Natural Resources, NJ Dept. of Ag 609-292-2242

Sincerely,

Wesley L. Kline, Ph.D.
Cooperative Extension Agent
Vegetable Production and Food Safety
WKline@njaes.rutgers.edu

Timothy J. Waller, Ph.D.
Cooperative Extension Agent
Nursery Production
TWaller@njaes.rutgers.edu

Salvatore Mangiafico, Ph.D.
Extension Department Head &
Environmental and Resource Mgt. Agent
Mangiafico@njaes.rutgers.edu

RUTGERS
THE STATE UNIVERSITY OF NEW JERSEY

Have you visited the Cumberland County website for the

Present and/or past issues of “Cultivating Cumberland”?

It’s a great resource for information and dates...

http://Cumberland.njaes.rutgers.edu/

Cooperative Extension of Cumberland County

Since 1915

RUTGERS
New Jersey Agricultural
Experiment Station

Cooperative Extension of Cumberland County
Extension Education Center
291 Morton Avenue
Millville, NJ 08332-9791

NONPROFIT ORGANIZATION
U.S. POSTAGE PAID
VINELAND, NJ
PERMIT NO. 186