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Cultivating Cumberland

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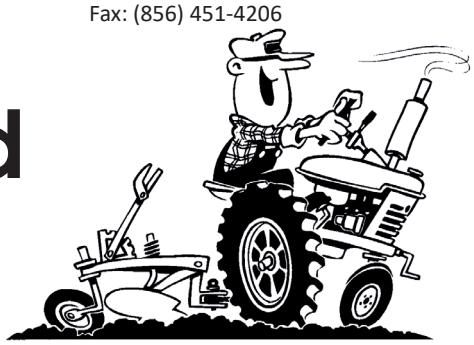

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- Agri-Technology and Vegetable Research Twilight Meeting
- Pesticide Container Recycling
- Snyder Research & Extension Farm's Open House and Tomato Tasting
- Root Cause Analysis
- Friday on the Farm: a Soil Health Outreach & Farm Tour Event
- GDD for August
- Redheaded Flea Beetle

Agri-Technology and Vegetable Research Twilight Meeting

Rutgers Agricultural Research and Extension Center (RAREC)
121 Northville Road, Room 146. Bridgeton, NJ 08302

Wednesday August 16, 2023 5 PM until dark

This meeting is free with no registration required. Refreshments and ice cream will be served.

This year's twilight meeting at RAREC will showcase new agricultural technologies including the newly installed agrivoltaics system established at RAREC. Discussions will include:

- New technologies for autonomous seeding and weeding
- Drone technologies for improving crop production and decision making
- Living mulch
- Production potential of fiber hemp
- Copper resistance and disease control in bell peppers
- Controlling Phytophthora blight

Note: Pesticide credits have been requested for CORE, PP2, 1A and 10

See the attached agenda for details.

Controlling Basil Downy Mildew in the Field in 2023

Andy Wyenandt; Plant and Pest Advisory; July 6, 2023

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 reintroduced 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 breakdown 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 acomprehensive list of conventional, organic, and biopesticides currently labeled for thecontrol of BDM in the US.

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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

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)

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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 (Aludeand 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.

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 tobe 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.

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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

Diagnosing Verticillium Wilt in Eggplant

Andy Wyenandt; Plant and Pest Advisory; July 3,2023

Verticillium wilt has been reported in eggplant this summer. It 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 and no effective fungicide control options so long crop rotations with non-susceptible crops are critically important. Some cultivars, such as ‘Classic’ and ‘Epic’ may maintain yield in infested fields.

Preparing for Pepper Anthracnose in 2023

Andy Wyenandt; Plant and Pest Advisory; July 2, 2023

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 over winters, 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. Over head 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.

Phytophthora and Pythium Control During Wet Weather

Andy Wyenandt; Plant and Pest Advisory; July 2023

Most of New Jersey has finally gotten some significant rain after many weeks of dry weather making current conditions ideal for pathogens such as Phytophthora and Pythium. Unfortunately, Pythium and Phytophthora blight can be found on most farms in the southern part of the state. Poor crop rotations with susceptible hosts only make matters worse. The Phytophthora pathogen has an increasing host range that now includes snap and lima beans; and all crops, other than a few resistant bell pepper cultivars, lack any resistance to the pathogen.

Control of Phytophthora blight and Pythium are extremely difficult (even with the use of fungicides) in the wet weather conditions. In the past few years a number of new fungicides, with new active ingredients, have become commercially-available for use on multiple crops. Mefenoxam or metalaxyl, both once widely-used to effectively control Phytophthora blight has been hit by resistance issues around much of Southern New Jersey the past decade. Growers with a known history of mefenoxam-insensitivity on their farm should use Presidio, Previcur Flex, or Ranman plus a Phosphite fungicide in rotation in their drip application programs. Importantly, if mefenoxam has not been used in particular fields on any crop for a number of years (more than 5+) the fungus may revert back to being mefenoxam-sensitive and control with these products may return. Mefenoxam, metalaxyl, Previcur Flex, and the phosphites are the most systemic of the group and should readily be taken up the by plant via application through the drip. Presidio has locally systemic and has translaminar activity and should offer some protection of the root system via drip. Ranman has protectant activity and thus will offer some root protection where it comes into contact with. Orondis Gold (oxathiapiprolin + mefenoxam, 49 +4) is the newest fungicide available with a new active ingredient in a new FRAC group. Additionally, in past research trials, mefenoxam, Orondis Gold, Presidio, Previcur Flex, Ranman, Revus and the phosphites in rotation and/or tank mixes have offered very good control of the fruit rot phase of phytophthora blight.

Recommendations

Mefenoxam–1.0 pt Ridomil Gold 4SL/A or 1.0 qt Ultra Flourish 2E/A or metalaxyl (MetaStar)–4.0-8.0 pt 2E/A at transplanting via drip and 30 days later.
Orondis Gold (oxathiapiprolin + mefenoxam, 49 +4) at 4.8 to 9.6 fl oz/A 1.67S attransplanting and 30 days after. If applied as drip application it can not be applied as a foliar.
Presidio (fluopicolide, 43) at 3.0-4.0 fl. oz 4SC/A at transplanting via drip and in rotation.
Ranman (cyazofamid, 21) at 2.75 fl oz 400SC at transplanting via drip and in rotation. (Ranman can be added to transplant water, see label for specific crop uses)
Previcur Flex (propamocarb HCL, 28) at 1.2 pt/A 6F at transplanting via drip or directed spray at base of plant. (Previcur Flex can be added to transplant water, see label for specific crop uses). Use in rotation.
Phosphite materials (FRAC code 33) such as Rampart, ProPhyt, or K-Khite may also be tank mixed with one of the above to help suppress Phytophthora blight.
If mefenoxam-insensitivity is present, only use Presidio, Previcur Flex, Ranman, Revus, and/or phosphite fungicides.

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Recommendations for Organic Growers

Applications of Double Nickel (*Bacillus amyloliquefaciens*) or Regalia (*Extract of Reynoutria sachalinensis*) as drenches or via the drip system prior to the onset of disease may help suppress phytophthora and pythium development. Other biopesticides, such as those containing Trichoderma spp. or Streptomyces spp. can also be used to help suppress these pathogens.

Losses Become High?

If Phytophthora losses become high because of the heavy rains, pre-emptive cultural practices need be taken immediately. Rogueing out, discing under, or hitting areas with gramoxone to burn infected plants down will help slow down and reduce the spread of potential inoculum to healthier areas of the block or farm. If beds are chronically wet, plastic can be cut or completely removed to help soils dry out.

Controlling Phytophthora Blight in Cucurbit Plantings

Andy Wyenandt; Plant and Pest Advisory; July 11, 2023

As the summer heats up in New Jersey, the control of Phytophthora blight in cucurbit plantings can be extremely difficult (even with the use of fungicides) as hot, wet weather finally sets in. Mitigating losses to Phytophthora blight in cucurbit crops begins with long crop rotations, where recommendations suggest crop rotations longer than 5 years if possible. Other cultural practices include avoid planting in low areas of the field where water may persist after rain or overhead irrigation, rogueing out infected plants as soon as possible, cutting the plastic to help dry out the soil, proper weed control, and proper preventative fungicide programs.

Searching for sources of resistance to Phytophthora blight in cucurbit crops

Research is continually ongoing for discovering and introducing phytophthora-resistance into cucurbit crops; where resistance has been identified and used breeding programs in crops such as bell pepper for decades now. In cucurbit crops, ontogenic, or age-related resistance, to the fruit rot phase of Phytophthora blight has been identified; however, its onset differs by crop. Where summer squash, zucchini, and melon fruit remain susceptible over time; developing fruit of acorn, butternut, some cucumber, and pumpkin become less susceptible to P. capsici as they age (i.e., mature) (Perla et al., 2023). Pumpkin fruit with hard, gourd-like rinds are less susceptible to Phytophthora fruit rot than pumpkins producing conventional (e.g., softer) rinds (Sanogo et al., 2023). Research for introducing phytophthora blight resistance into squash is ongoing (LaPlant et al., 2020). Watermelon germplasm with resistance Phytophthora blight has been identified and used in breeding programs in the past few years, unfortunately, its been difficult to bring this resistance to market (Sanogo et al., 2023). Recently, the USDA has developed and released five resistant germplasm lines which should prove useful for developing watermelon cultivars with broad resistance to P. capsici (Kousik et al., 2022).

Identifying and Controlling Common Leaf Spot in Strawberry

Andy Wyenandt; Plant and Pest Advisory; July 10, 2023

Strawberry leaf spot, caused by the soil-borne fungal pathogen, *Mycosphaerella fragariae,* can infect leaves, petioles, runners, fruit stalks (pedicels), and berry caps or calyxes. Small, dark purple to reddish-purple, round spots, 1/8 to 1/4 inch in diameter (3 to 6 millimeters), appear on the upper leaf surfaces. The center of the spots soon become tan or gray and eventually almost white, while the broad margins remain dark purple. Later in the season, dark specks (sclerotia and/or perithecia) may be seen in the older lesions. Tannish areas form on the undersides of infected leaves. The symptoms on the other plant parts, except the fruit, are almost identical to those that develop on the upper leaf surface.

Microsclerotia and conidia from infected leaves that survive the winter can lead to infections of new growth in the spring. The period between infection and the appearance of lesions on the upper leaf surface can range from 10 to 14 days depending on weather conditions. Large numbers of conidia can cause secondary infections during prolonged periods of damp to wet, moderately warm weather. Temperatures between 65 and 75 F (18 to 24 C) are optimal for the growth of fungus and for lesion development. Infections can continue to occur throughout the growing season. Young, expanding leaves are much more susceptible to infection than mature leaves. If frequent rains occur during early- and mid-spring, a few infection sites can start an epidemic.

Control of strawberry leaf spot begins with recognizing symptoms and preventative fungicide applications. All strawberry fields need to be scouted on a regular basis. Especially, during periods of wet weather or during heavy use of overhead irrigation. Weekly applications rotating the following should be done as long as symptoms are present and weather conducive for disease development persists. For more information please see the 2022/2023 Mid-AtlanticCommercial Vegetable Recommendations Guide. Fungicide applications for strawberry leaf spot will be effective for strawberry leaf scorch and strawberry leaf blight.

For organic strawberry growers, weekly applications of an OMRI-approved copper or potassium bicarbonate have been shown to be effective in mitigating strawberry leaf spot. Please see link to MSU's fungicide efficacy table for organic and conventional fungicide use.

For more information on Neopestalotiopsis go to https://plant-pest-advisory.rutgers.edu/neopestalotiopsis-something-to-scout-for-in-fall-transplanted-strawberry/

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For information on controlling angular leaf spot in strawberry go to https://plant-pest-advisory.rutgers.edu/angular-leaf-spot-in-strawberries-2/

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For information on controlling fruit rots in strawberry go to https://plant-pest-advisory.rutgers.edu/controlling-strawberry-fruit-rots-2017-2-2-2/

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For more information on strawberry leaf spot please see the following:

University of Illinois – http://ipm.illinois.edu/diseases/series700/rpd702/index.html

University of Wisconsin – https://hort.extension.wisc.edu/articles/common-leaf-spot-of-strawberry/

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Michigan State University, 2015 – Information on diseases and fungicide efficacy – https://www.canr.msu.edu/news/protect_strawberries_from_foliar_diseases_after_renovation

Cornell University, 2013 – Information on diseases and fungicide efficacy – https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/0/7265/files/2017/01/strleafdisidmgmt-yjcu5n.pdf

Please remember, the label is the law!

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
M04	Captan 50W	6.0lb/A	captan	0	24	N
M04	Captan 80WDG	3.7 lb/A	captan	0	24	N
M04	Captan 4L	3.0 qt/A	captan	0	24	N
M04+ 17	Captevate 68WDG	3.5 to 5.25lb/A	captan + fenhexamid	0	24	N

Do not apply the same FRAC code more than twice in a row or in a season

1	Topsin M	1.0 lb/A	thiophanate-methyl	1	24	N
2	Meteor^2	1.5 to 2.0 pt/A	iprodione	n/a	24	N
2	Nevado 4F^2	1.5 to 2.0 pt/A	iprodione	n/a	24	N
2	Rovral 4F^2	1.5 to 2.0 pt/A	iprodione	n/a	24	N
3	Rally 40WSP	2.5 to 5.0oz/A	myclobutanil	0	24	N
11	Cabrio 20EG	12 to 14 oz/A	pyraclostrobin	0	12	N
3+11	Quadris Top1.67SC	12 to 14 floz/A	difenoconazole +azoxystrobin	0	12	—
3+11	Quilt Xcel 2.2SE	14 fl oz/A	propiconazole +azoxystrobin	0	12	N
7+11	Merivon 2.09SC	4 to 7 fl oz/A	fluxapyroxad +pyra-clostrobin	0	12	N
7+11	Pristine 38WG	18.5 to 23.0oz/A	boscalid + pyraclos-trobin	0	12	—

Cucurbit Powdery Mildew Control in 2023

Andy Wyenandt; Plant and Pest Advisory; July 4,2023

Cucurbit powdery mildew (CPM), caused by *Podosphaera xanthii*, is one the most important diseases of cucurbit crops throughout the world. The pathogen is an obligate parasite, just like cucurbit downy mildew, meaning it needs a living host in order to survive. In northern regions that have a killing frost in the fall the pathogen will die out when the crop freezes. Not being able to overwinter, the pathogen must be reintroduced each spring or summer in the mid-Atlantic region. The pathogen accomplishes this by reinfecting cucurbit crops in the spring as they are planted up the east coast starting in Florida, then the Carolina's, Virginia, and so forth. By late May, as soon as cucurbit crops begin to germinate in the mid-Atlantic region, the potential threat for potential powdery mildew infections begin.

The first step in mitigating CPM begins with planting powdery mildew tolerant (PMT) or resistant (PMR) cultivars if they meet your needs. It is important to remember that these cultivars are not "immune" to CPM; they will become infected at some point in the growing season depending on disease pressure. Hopefully, this will occur later in the season when compared to CPM susceptible cultivars. Organic growers hoping to mitigate losses to powdery mildew should always chose CPM tolerant or resistant cucurbit cultivars first. There are a number of OMRI-approved fungicides labeled to help suppress CPM development, these should always be used in concert with CPM tolerant or resistant cultivars and a preventative fungicide program. Cultural practices such as increasing in-row plant spacing to improve air flow and cultivation to keep weeds to a minimum will also be advantageous. Avoiding the use of overhead irrigation will help reduce disease pressure from another important pathogen, cucurbit downy mildew. Thus, growing cucurbits on a mulch with drip irrigation has its advantages, but also increases costs.

Over the past 15 years, there have been a number of new fungicides released with new modes of action (i.e., new FRAC groups) for CPM control in cucurbit crops. Unfortunately, all have a moderate to high-risk for resistance development because of their specific modes of action. The good news are these new fungicide chemistries have less effects on humans, non-target organisms, and the environment. These fungicides offer new strategies when it comes to controlling and mitigating losses to CPM. Instead of rotating two fungicides with a moderate to high-risk for resistance development every other week (A – B – A – B), growers now have option to reduce the total number of times any single fungicide might be applied during the production season; further reducing the risk for resistance development to any one mode of action. For example, in pumpkin, a new CPM preventative fungicide program may look like this:

A – B – C – D – E – A – B – C – D – E

Where each letter above equals a fungicide from a different FRAC group.

A protectant fungicide such as chlorothalonil or mancozeb should be added to the tank mix with each high-risk fungicide to reduce selection pressure and to help control other important diseases such as anthracnose and Plectosporium blight.

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In this type of CPM preventative program any one high-risk fungicide would only be applied twice per growing season and 5 weeks apart greatly reducing the risk for fungicide resistance development. Importantly, for cucurbit growers, the easiest method to mitigate the potential for fungicide resistance development are to reduce the total number of applications of any one high-risk fungicide during the production season.

Dr. Sally Miller, from The Ohio State University and Dr. Meg McGrath, from Cornell University have written excellent articles for controlling CPM in 2022. 'Preparing for cucurbit powdery mildew'and 'Cucurbit powdery mildew'.

For more information on fungicide use, FRAC groups, and specific control recommendations please see the 2022/2023 Mid-Atlantic Commercial Vegetable Production Recommendation Guide.

To register use this URL
or QR code!
https://go.rutgers.edu/1ete46go

RUTGERS
New Jersey Agricultural Experiment Station

From the Ground Up: Produce Safety Planning for Beginning Growers

September 27, 2023; 10:00-2:00PM
$30.00 registration & includes lunch

Class Location: Rutgers Specialty Crop Research and Extension Center
283 Route 539
Cream Ridge, NJ 08514

Who is this program for?

- New and beginning fresh produce growers
- Growers who want to improve produce safety practices on their farms
- Growers who want to work to develop a food safety culture on their farm
- Growers whose operations don't fall under the FSMA Produce Safety Rule yet but who will as they expand
- Next generation growers taking over a family farm
- Anyone thinking about starting a fresh produce farm

Individuals who participate in this course will gain a working understanding of:

- Food Safety Culture and Why It Is Important
- Five Things Growers Can Do Right Away to Reduce Risk
- Cleaning and Sanitizing
- Key points of FSMA: PSR that growers need to know.

Hands-On Activities!

For more information contact: Jennifer Matthews
jmatthews@njaes.rutgers.edu
609-675-4221

on-farm food safety team

What Can Summer Cover Crops do for Soil Health and Future Crops?

Michelle Infante-Casella; Plant and Pest Advisory; July 14, 2023

Now that some of our spring planted crops have finished, rather than leaving fields fallow or replanting fields that may have had some issues with plant diseases or insect pests, consider replanting with a summer cover crop. It is not too late to take advantage of summer cover crop benefits. What do summer cover crops do for soil health or future crop improvements? See below:

1. Increase Soil Organic Matter – One of the best attributes of having organic matter in the soil is improvement in soil structure. Adding organic matter improves tilth, water infiltration, water holding capacity, nutrient holding capacity and reduction of soil crusting. Also, as important is the increase in beneficial soil microbes and earthworms. Beneficial microbes can compete with pathogens and help release nutrients. Earthworms can cycle nutrients and improve pore spaces in the soil.

2. Reduce Soil Erosion – Just like with winter cover crops, summer cover crops can also reduce wind and water erosion in fields, especially those with slopes. During summer rainfall events, that can be significant if resulting from tropical storms, runoff may not just include soil loss, but also fertilizer and chemical movement. Therefore, keeping cover on a field during non-production times in any season is an excellent practice.

3. Nitrogen Cycling in the Soil – Nitrogen is often the most limiting nutrient for crop production, since it is so readily lost through nitrification and leaching. Storing nitrogen through plant cycling is an excellent way to improve fertility management. Whether it is a grass or non-leguminous cover crops N is still kept in the mix by the cover crop taking up residual N that would otherwise be lost. The cover crop plant takes up the nitrogen and after the crop is incorporated it decomposes, thus releasing the N for subsequent crops to use. If legume cover crops are planted, they have the ability to “fix” nitrogen from the atmosphere and through the same decomposition process will provide N for subsequent crops. Be sure to inoculate legume seed just prior to planting with Rhizobium bacteria in order to gain the maximum N fixation benefits.

4. Reduce Weeds – When fields are left fallow after crops are harvested, weed growth can occur. If left to produce seeds, these weeds will multiply in subsequent crops. Therefore, managing the field by planting cover crops between cash crops is a great weed management option. As the cover crop grows, it will suppress the germination and growth of weeds through competition and shading. Some cover crop species can also suppress weeds biochemically, either while they are growing or while they are decomposing, which may prevent the germination or growth of other plants (allelopathy). Research has shown some cover crops like wheat, barley, oats, rye, sorghum, and sudangrass may suppress weeds. In some cases, it has also been reported that residues and leachates from crimson clover, hairy vetch, and other legumes have shown weed suppression.

Continue on next page

5. Impacts on Plant Diseases – Cover crop residues could possibly be beneficial when it comes to plant pathogens, or can in some cases increase plant disease organisms. Some cover crop species are in the same plant families as cash crops and may be susceptible to the same disease organisms. Therefore, carrying the pathogen to the next crop. This is why paying attention to crop rotations is so important. In other cases, the cover crop residue can improve soil health in order to produce a better environment for beneficial microbes. By improving soil health, water infiltration, air pore space and other positive attributes, some soil pathogens may not survive as well, as in the case of water molds and water fungi. Some cover crops, like sorghum-sudangrass and sunnhemp, have been reported to reduce nematodes in soils. There are multiple positive factors from cover crops that can combat plant diseases.

6. Impacts on Insects – Like with plant diseases, cover crops can be susceptible to the same insect pests as cash crops. However, they may also attract beneficial insects into an area. Insect pests should be monitored in cover crops, just like in cash crops in order to notlet populations get out of control and then move into nearby fields after the cover crop is killed.

Diagnosing Southern Blight and White Mold in Tomato and Pepper

Andy Wyenandt; Plant and Pest Advisory; July 13, 2023

There have been a few reports of Southern blight (*Sclerotinia rolfsii*) and White mold (*Sclerotinia sclerotiorum*) on tomato and pepper in New Jersey. Southern blight is much more common in vegetable areas south of the state where summer temperatures remainhotter (above 90°F) for longer periods of time. Like white mold, it can survive in the soil for many years. Symptoms of Southern blight include infection at the base of the stem at the soil line. The resulting infection will girdle the plant causing wilt and death. The fungus will produce white, cottony mycelium and very small, spherical sclerotia which are often have at annish, brown color.

White mold is more common than Southern blight in New Jersey, and like Southern blight, once introduced into a field or high tunnel it can very difficult to control. The pathogen produces large black sclerotia on the surface and inside infected stems. If sclerotia of either pathogen make their way back into the soil, both can survive for years causing significant problems.

All infected plants need to be removed immediately and disposed of properly to help reducethe chances of sclerotia returning to the soil.

For more information on chemical control please see the 2022/2023 mid-Atlantic Commercial Vegetable Production Recommendations Guide.

Controlling Cercospora Leaf Spot in Beet Crops in 2023

Andy Wyenandt; Plant and Pest Advisory; July 18, 2023

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 soilborne 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, 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 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.

Continue on next page

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 2022/2023 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 forover head 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.

For more information please see the 2022-2023 Mid-Atlantic Commercial Vegetable Production Recommendations Guide.

Food Safety Training Video for Field Workers

Wes Kline

The Produce Safety Alliance just released their new version of a training video for field workers. This can be used as part of your food safety training upon hiring. It is available in English and Spanish on YouTube.

English: https://youtu.be/ndwHxQAJ6_c

Spanish: https://youtu.be/Y44_0VyWS3o

Farm Credit East Report on Grants & Incentives Available for Northeast Agriculture Businesses

Rick VanVranken; July 18, 2023

One of the most frequent calls over the past few years has been, “I want to start a farm/business/value-added product (etc.).”

That is usually followed up with, “What grants/funding sources are available?”

After rattling off a list of a few common sources of funding for new farmers there’s an added caveat that I don’t know the current status of those programs or what restrictions they have regarding new farming ventures. There are more programs out there with available funding, but there’s no comprehensive list of all grant programs supporting agricultural businesses, until now.

Farm Credit East has just released a report “identifying federal, regional and state grants, loan guarantees, and other incentives available to assist Northeast producers of all types and sizes.”

“Grants can be a great resource to provide additional funds needed to take on larger projects,” said Chris Laughton, Farm Credit East Director of Knowledge Exchange. “Unfortunately, they’re often under-utilized because they can be time consuming and involve quite a bit of paperwork.”

The report, from Farm Credit East Knowledge Exchange, includes funding opportunities available in the eight states served by Farm Credit East. Programs are categorized by their main focus: beginning farmers; conservation, environment and forestry; energy; fisheries and aquaculture; organic; rural business development; and research, education and promotion.

The report titled Grants and Incentives for Northeast Agriculture is available at FarmCreditEast.com or by contacting Chris Laughton at (800) 562-2235 or Chris.Laughton@farmcrediteast.com for more information.

Farm Credit East also has grant writing assistance services. Information is available on their grant writing page.

Source: https://www.farmcrediteast.com/en/about/NewsRoom/press-releases/230717FundingforNortheastAgriculturalProducers

Controlling Anthracnose and Alternaria Leaf Blights in Cucurbit Crops

Andy Wyenandt; Plant and Pest Advisory; July 17, 2023

Anthracnose and Alternaria leaf blight can become problematic in cucurbit crops during long periods of wet, humid weather. Both can cause significant losses if not controlled properly. With the production season in full swing, now is a good time to review a few of these important diseases.

Anthracnose, caused by *Collectotrichum orbiculare*, and Alternaria leaf blight (*Alternaria cucumerina*) produce distinct spots on infected leaves, and in most cases, symptoms begin on the older leaves. With Alternaria, diagnostic concentric black rings will be develop within the spots on infected leaves, often there is a chlorotic (yellow) halo around margins. With Anthracnose, spots always develop on veins on the underside of infected leaves. Often, black setae (hair-like projections) will develop on the veins of infected tissue. These symptoms make for easily diagnosing which disease might be present.

Both pathogens can overwinter on infected plant tissue in the soil for 1 to 2 years, thus extended crop rotations are important. Conidia (spores) develop from dormant mycelium in the soil and are splashed into the canopy causing primary infections during prolonged periods of humid, wet weather causing extended leaf wetness. Secondary infections and spread of both diseases can occur during the production season under favorable conditions for disease development.

Deep plowing debris or the removing of plant debris after harvesting, avoiding overhead irrigation during the production season, and most importantly, choosing cucurbit varieties with resistance are important cultural practices all conventional and organic growers should consider.

Anthracnose and Alternaria are easily controlled with weekly protectant fungicides such as chlorothalonil and mancozeb as long as they are applied prior to the arrival of the pathogen and on a regular basis during favorable disease development. Organic growers can apply copper and other labeled products to help suppress development of these diseases. Complete foliar coverage is critically important for the control of these diseases.

For more information on the control of anthracnose and Alternaria leaf blight in cucurbit crops please see the 2022/2023 Mid-Atlantic Commercial Vegetable Production Recommendations Guide.

Additional Resources:

University of Florida: https://plantpath.ifas.ufl.edu/u-scout/cucurbit/alternaria-leaf-spot.html –Images of Alternaria

University of Florida: https://www.growingproduce.com/vegetables/aim-to-keep-anthracnose-out-of-your-cucurbit-crops/ – Additional information on anthracnose

University of MN: https://extension.umn.edu/diseases/anthracnose-cucurbits – Additionalinformation on anthracnose of cucurbits

Calendar of Events

- Indicates a newly added event

August 8-10
Ag Progress Days; Russell E. Larson Agricultural Research Center, 2710 W. Pine Grove Road, Pennsylvania Furnace, PA 16865; Free admission and free parking; PA's largest outdoor agricultural exposition; Over 400 exhibitors; The show is hosted by Penn State's College of Agricultural Sciences and showcases educational programs, current research, and the latest innovations in agricultural equipment and technology; Visit agsci.psu.edu/apd for more information.

- **August 16**

Agri-Technology and Vegetable Research Twilight Meeting; Rutgers Agricultural Research and Extension Center (RAREC), 121 Northville Rd. Bridgeton, NJ 08302 5 PM until dark. This year's twilight meeting at RAREC will showcase new agricultural technologies for stakeholders in the state. We will showcase the newly installed agrivoltaics system established at RAREC and discuss new technologies for autonomous seeding and weeding as well as drone technologies for improving crop production and decision making.

August 16
Summer Plant Symposium; Duke Farms, 1112 Dukes Pkwy W., Hillsborough Township, NJ; Hosted by the New Jersey Nursery and Landscape Assocation (NJNLA); Pesticide Credits will be available; Find more inforamtion at www.njnla.org

August 23-25
Farwest Show; The biggest green industry trade show in the West Oregon Convention Center Portland, OR. There is a Wholesale Growers Tour and a Garden Center Retail Tour avaliable on Aug.22. 777 NE MLK Jr. Blvd., Portland, OR. More information at farwestshow.com

- **August 25**

Hidden Creek Farm; Friday on the farm: a soil health outreach & farm tour event from 4P.M.-7P.M. RSVP to alyssa.bright@njaudubon.com by August 18th.

- **August 30**

Snyder Research & Extension Farm's Open House and Tomato Tasting; Take a wagon tour of the farm to learn about the research and extension programs. To register go to www.snyderfarm.rutgers.edu

- **September 7**

Root Cause Analysis "What & Why"; Join Dr.Jennifer McEntire, of Food Safety Strategy, for a crash course in RCA with an emphasis on practical applications for industy. To register go to https://go.rutgers.edu/tefa2bdw

September 25-27
Florida Fruit & Vegetable Association Annual Convention Ritz Carlton Hotel Naples, Fl; Find more info at www.ffva.com/page/convention

September 26-29
IPPS ER Annual Conference; Get ready for an extraordinary experience at the IPPS Eastern Region's Annual Conference! Brace yourself for four exhilarating days of reconnecting, recharging, and immersing yourself in the wisdom of industry legends. Sheraton Hamilton, Ontario, Canada. Visit https://ena.org for more information.

September 27

From the Ground Up: Produce Safety Planning for Beginning Growers; Rutgers Cooperative Extension of Mercer County, 1440 Parkside Ave., Ewing, NJ 08638; 10AM-2PM; $30.00 each; Lunch provided; Gain basic understanding of Food Safety Culture and why it is important, five things growers can do right away on their farm to reduce risk, cleaning and sanitizing, and key points of FSMA: PSR the growers need to know; Find more info and register at https://go.rutgers.edu/kcx1n6bj

- **October 5**

Root Cause Analysis "How"; Join Dr.Jennifer McEntire, of Food Safety Strategy, for a crash course in RCA with an emphasis on practical applications for industy. To register go to https://go.rutgers.edu/tefa2bdw

October 18

From the Ground Up: Online Food Safety Plan Writing Workshop; Online Food Safety Plan Writing Workshop; Work through the components of a food safety plan with our help from your home office! By the end of this class you will have a draft plan and a more robust food safety program for your farm; $15.00 per person or free for the attendees of our Septemeber 27 program; Any questions contact Jenn Matthews at jmatthews@njaes.rutgers.edu; Register online at https://go.rutgers.edu/kcx1n6bj or go to https://go.rutgers.edu/5iua7ve7 to see more events.

October 18-28

IPPS International Tour 2023; Tour starts in Washington DC, ends in Durham NC**;** Join IPPS Southern Region of North America for exceptional food, drink, and friendship from our nation's capitol to the mountains of NC! Experience innovative nursery tours, unique cultural experiences, fabulous gardens, and Southern Region" hospitality. Space is limited, so sign up early! Visit https://ipps.org to register and find more information.

November 8-9

Northeast Greenhouse Conference and Expo; Doubletree by Hilton, Manchester, NH; Educational sessions focusing on advanced biocontrol, disease managment, business and marketing, greenhouse vegetables, perennial production, and some sessions in Spanish will be offered. Come visit vendors at the trade show with three dedicated hours in each day of the program. Learn more at www.negreenhouse.org

November 27-December 1

Irrigation Show & Education Week Henry B. Gonzalez Convention Center San Antonio, Texas; Find more info at www.irrigation.org/

December 5-7

Washington State Tree Fruit Association Annual Meeting Three Rivers Convention Center Kennewick, Wash; Find more info at www.wstfa.org/annual-meeting/

January 6-13, 2024

Pennsylvania Farm Show; Harrisburg, PA; The largest indoor agricultural exposition under one roof in the nation; Save the date, more info to come

Regularly Scheduled Meetings

Pesticide Credit Exams

November 14th, 9:30A.M.-2:30P.M.
RCE - Cumberland, NJ

Virutal testing available.

Sign-up, exam schedule,
and find more information at
https://pacer.rutgers.edu/

Manuals avaliable for purchase at
291 Morton Ave
Millville, NJ 08332

Cumberland County Agriculture Development Board

Meetings are held on the 3rd
Tuesday of each month.
Meetings start at 7 p.m.

Virtual Meetings Information
can be found on the
Public Meeting Calendar on
cumberlandcountynj.gov/calendar

For more information call the Dept.
of Planning, Tourism,
and Community Affairs
at 856-453-2175

Chair: Al Caggiano, Jr

Commissioner Liaisons:
Victoria Groetsche-Lods

Cumberland County Board of Agriculture

Meetings are held on the
3rd Thursday of September - May
at 7 p.m. in-person at RCE

Next meeting
September 21, 2023

Virtual Meeting Information
https://rutgers.zoom.us/my/smangia
Meeting ID: 529 557 9817
Passcode: Sal2020
or call in at 1 (646) 558 - 8656

President: Keith MacIndoe

Commissioner Liaisons:
1. Victoria Groetsche-Lods
2. Joseph Sileo
Alt. John Capizola Jr.

Cultivating Cumberland Newsletter

https://go.rutgers.edu/lr39fky

Plant & Pest Advisory

https://go.rutgers.edu/8ookejzo

Sincerely,

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WE R HERE WHEN YOU NEED US

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...
https://Cumberland.njaes.rutgers.edu/

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Cooperative Extension of Cumberland County

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Cooperative Extension of Cumberland County
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New Jersey Agricultural Experiment Station

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Agri-Technology and Vegetable Research Twilight Meeting
Rutgers Agricultural Research and Extension Center (RAREC)
121 Northville Rd.
Bridgeton, NJ 08302

Wednesday August 16, 2023
5 PM until dark

Refreshments and ice cream will be served

This year's twilight meeting at RAREC will showcase new agricultural technologies for stakeholders in the state. We will showcase the newly installed agrivoltaics system established at RAREC and discuss new technologies for autonomous seeding and weeding as well as drone technologies for improving crop production and decision making.

5:00 PM - Agrivoltaics Research at Rutgers – Dan Ward, Director of Rutgers Agricultural Research and Extension Center (RAREC) and the New Jersey Wine Center for Wine Research and Education; and Dave Specca, Rutgers Agrivoltaics Program lead
The demand for clean energy and the development of new technologies for solar electricity generated on producing agricultural land (Agrivoltaics) has driven Rutgers/NJAES to investigate this hybrid technology. We are investigating the effects of putting elevated photovoltaic panels above numerous cropping systems to see what effects the panels have on the crops; and what effects the crops have on the panel's electrical productivity. Our results will be used in economic models and other recommendations to assist farmers, landowners, and solar developers in deciding whether these combined technologies are a good choice for them.

5:30 PM - Presentation and demonstration of Naio OZ autonomous seeding and weeding platforms - Thierry Besançon, Extension Weed Science Specialist for Specialty Crops, Rutgers
The use of small-size electrical autonomous weeders such as the Naio Oz multitask and multi crop robot may help growers to lessen their reliance on fossil fuels for weeding vegetable productions. Using an autonomous weeder can also help alleviating some of the issues with labor availability, especially for burdensome activities such as manual weeding. The GPS guided Naio Oz platform is 100% electric (8 hours autonomy) and versatile through the use a variety of tools (drill, brushes, harrows, hoes blades…) that allow it to weed within and between the crop rows, make furrows, sow, and carry loads to the field. We will present and demonstrate the use of the Naio Oz for autonomous seeding and weeding, and discuss trials currently conducted at RAREC to evaluate weed control efficacy with this system as compared to conventional herbicides.

6:00 PM - In-crop cereal cover crop and living mulch trials for vegetables at RAREC – Thierry Besançon, Extension Weed Science Specialist for Specialty Crops, Rutgers

Row-middle weed control in plasticulture vegetable production is becoming increasingly difficult due to a lack of effective herbicides, a need for multiple cultivations, or hand labor. Alternative solutions that integrate multiple weed control tactics are needed to address these issues. One solution is to use cover crops to aid in weed suppression along with an effective herbicide program. A field study is being conducted at RAREC in 2023 to assess the effects of integrating spring-seeded grass cover crops with herbicide treatments for weed control in watermelon. Results from 2023 and from previous studies conducted in 2021 and 2022 show that spring seeded grass cover crops can successfully be integrated with effective herbicide programs for improved weed control between plastic beds.

6:30 PM - The potential applications of using drones in agricultural production in New Jersey – Peter Oudemans, Professor and Director P.E. Marucci Center for Blueberry and Cranberry Research and Extension, Rutgers
Drones or UAVs can be used to detect anomalies in agricultural fields to directly determine the impacts of disease, pests, weeds, and soil conditions on crop production. This information can be used to determine economic crop losses, pest management strategies, and provide a wealth of other information that can be used to improve crop production and management decisions by the grower. The potential benefits and drawbacks of using drones in agricultural production will be discussed along with a flight demonstration.

7:00 PM - Assessing the production potential of fiber hemp in New Jersey – Raul Cabrera, Extension Specialist in Nursery Production and Management, Rutgers
The recent re-introduction of agricultural/industrial hemp (*Cannabis sativa*) to New Jersey (2020 season) was initially focused on production of cannabinoid-rich (CBD, CBG) flowers. Saturation of the floral hemp market has abruptly and significantly dropped its economic viability and interest, and focus has shifted to hemp for grain and fiber production. The New Jersey Department of Agriculture funded a pilot program with Rutgers to evaluate the potential of hemp for fiber production, including the viability of agronomic production and potential industrial end uses (bioplastics, textiles, etc.). To this end, three experimental fiber hemp plots are being planted and evaluated at different locations in the state (north, central and south).

7:30 PM - Syngenta Product Update – Erin Hitchner, Senior Research and Development Scientist, Syngenta
An update will be given on upcoming product registration and overall pipeline development for new Syngenta active ingredients. An overall description of the pesticide registration process and timelines will also be presented.

8:00 PM - Understanding copper resistance development and controlling bacterial leaf spot of bell pepper with resistant varieties – Andy Wyenandt, Extension Specialist in Vegetable Pathology, Rutgers University
Over the past three years the pepper and tomato fields throughout New Jersey have been surveyed to determine what species of bacterial leaf spot caused by *Xanthomonas*

spp. are present in the state and if copper resistance is present. Copper based fungicides have been used for decades for the control of bacterial diseases across many different vegetable crops, especially in tomato and pepper. Thus, it is not surprising that ~60% of the bacterial isolates collected throughout the state are resistant to copper fungicides. We will discuss how to control bacterial leaf spot and the benefits of adopting the use of X10R bell pepper varieties to help mitigate losses due to the pathogen.

9:00 PM - Controlling Phytophthora blight in cucurbit and other vegetable crops – Andy Wyenandt, Extension Specialist in Vegetable Pathology, Rutgers University
Phytophthora blight, caused by *Phytophthora capsici*, is the most economically damaging vegetable disease in the state. It can cause significant losses in cucurbit, pepper, and tomato crops in any given year. We will discuss the most up-to-date information on how to control *P. capsici* in cucurbit and other crops using genetic resistance, cultural practice and fungicide chemistry.

Note: Following pesticide credits have been requested: CORE, PP2, 1A and 10

Pesticide Container Recycling

Helena Chemical 440 N. Main St. Woodstown, New Jersey	Helena Chemical 66 Route 206 Hammonton, New Jersey	Rutgers Fruit and Ornamental Research Extension Center 283 Route 539 Cream Ridge, NJ 08514-9634
August 18 September 22 October 20	August 11 Sept. 15 Oct. 13	August 25 September 29 October 27

Plastic Pesticide Container Processing Steps and Size Limits

- All pesticide containers must be either triple rinsed or pressure rinsed, drained and dry inside;
- All pesticide containers must be free of residue (other than stains);
- The booklet must be removed (it is not necessary to remove the paper labels glued to the container);
- Foil seal must be removed;
- Only non-refillable pesticide containers will be accepted – you must drill a ¼-inch hole in the bottom of the container or with a utility knife make a 6-inch slit in the bottom of the container so the container will not hold liquids;
- Only pesticide containers embossed with HDPE or the recycling #2 will be accepted;
- Pesticide containers up to 55-gallons in capacity will be accepted. 5-gallon pales must be cut in half; 30-gallon containers into at least 4 pieces; and 55-gallon containers into at least 8 pieces. This can be accomplished using a sawszall, chainsaw, circular saw, or reciprocating saw. It is not necessary to cut up containers less than 5-gallons; and Pesticide containers must have originally held an EPA registered pesticide.

Items that Will Not Be Accepted and Will Be Returned to the Participant

- Pesticide containers with dried formulation on the container, pour spout or the spout threads;
- Pesticide containers with any liquid residue;
- Pesticide containers where the insides are caked with dried residue;
- Mini-bulk, saddle tanks and nurse tanks, which can be made of fiberglass;
- Pesticide containers with lids; or
- Containers that held any type of petroleum oil product or antifreeze.

Non-Waxy Cardboard

Helena Chemical will also be accepting non-waxy cardboard 1 p.m. to 3 p.m and during the scheduled pesticide container collection times. The clean non-waxy cardboard must be broken down and flattened. Cardboard delivered to the Atlantic County site must be tied. Clean Non-waxy cardboard will also be accepted year-round at the Cumberland County Solid Waste Complex's Convenience Center.

1 CORE credit given if you take your NJ Pesticide License with you to drop off.
More information can be found at www.nj.gov/agriculture/divisions/anr/nrc/processingsteps

Snyder Research & Extension Farm's Open House and Tomato Tasting

Wednesday, August 30, 2023 (rain or shine)
1 p.m. – 7 p.m.
Pittstown, NJ

Take a wagon tour of the farm to learn about the research and Extension programs being conducted.

Taste over 50 tomato varieties!

Rutgers faculty, staff and Master Gardener volunteers will be available to answer your gardening and research questions.

Registration Required, scan below or visit our website.

www.snyderfarm.rutgers.edu

RUTGERS
New Jersey Agricultural Experiment Station

PRODUCE SAFETY WEBINAR SERIES

Special 2-Part Kick Off

ROOT CAUSE ANALYSIS

Join Dr. Jennifer McEntire, of Food Safety Strategy, for a crash course in RCA with an emphasis on practical applications for industry. Of course she's bringing friends!

SEPT 7
"WHAT & WHY"
3:30 to 5:00PM ET

Dr. Mark Moorman
FDA

Natalie Dyenson
IFPA

Afreen Malik
Western Growers

Dr. Don Schaffner
Rutgers University

OCT 5
"HOW"
3:30 to 5:00PM ET

Felice Arboisiere
Dole

Greg Komar
CA LGMA

Vivien McCurdy
Indiana Dept of Health

Dr. Laura Strawn
Virginia Tech

To Register Visit:
https://go.rutgers.edu/tefa2bdw

CONTACTi

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Save the Date!
FRIDAY ON THE FARM:
A SOIL HEALTH OUTREACH &
FARM TOUR EVENT
Hidden Creek Farm
August 25th, 2023 from
4:00PM-7:00PM

JOIN USDA-NRCS, NEW JERSEY AUDUBON, AND NOFA-NJ FOR AN EVENING OF CONSERVATION EDUCATION AT HIDDEN CREEK FARM

- TOUR THE FARM TO SEE CONSERVATION IN ACTION
  - ROTATIONAL GRAZING
  - COVER CROPS
  - NO-TILL PLANTING
- WATCH THE RAINFALL SIMULATOR IN ACTION DISPLAYING RUNOFF AND INFILTRATION RATES OF DIFFERENT SOIL COVERS
- PARTICIPATE IN THE CONVERSATION ON DIFFERENT PRACTICES THAT BUILD AND PROTECT SOIL HEALTH LED BY THE HOSTING ORGANIZATIONS
- FIND OUT HOW YOU TOO CAN RECEIVE TECHNICAL AND FINANCIAL ASSISTANCE TO IMPLEMENT CONSERVATION PRACTICES ON YOUR LAND
  - APPLICATIONS WILL BE AVAILABLE

REFRESHMENTS WILL BE PROVIDED

PLEASE RSVP BY AUGUST 18TH:
ALYSSA.BRIGHT@NJAUDUBON.ORG
609-400-3857

Hidden Creek Farm
272 Marlboro Rd.
Bridgeton, NJ 08302

NEW JERSEY AUDUBON

N·O·F·A ORGANIC FARMING ASSOCIATION NORTHEAST NEW·JERSEY

USDA United States Department of Agriculture
Natural Resources Conservation Service

USDA IS AN EQUAL OPPORTUNITY PROVIDER, EMPLOYER, AND LENDER

Nursery, Landscape, Christmas Tree

Pest Scouting with Growing Degree-days – **August**

Contact: twaller@njaes.Rutgers.edu or 856-451-2800 ext.1

Projected GDD50 accumulation - August 2023							
Region	Location	31-Jul	7-Aug	14-Aug	21-Aug	28-Aug	4-Sep
Southern	Upper Deerfield (NJ50)	2022	2216	2405	2588	2763	2928

Group	Common Name	Scientific Name	GDD Min (50F)	GDD Max (95F)	Ref.	Developmental / Target Stage / Notes	Favored Host Plants
Adelgid	**Cooley spruce gall adelgid**	Adelges cooleyi	1850	1950	1	Galls open (Spruce)	Conifer
Adelgid	**Cooley spruce gall adelgid**	Adelges cooleyi	2800	3000	3	Fall control of overwintering stage	Conifer
Adelgid	**Eastern spruce gall adelgid**	Adelges abietis	2800	3000	3	Fall control of overwintering stage	Conifer
Aphids / Thrips	**Willow twig aphids**	Lachnus spp.	1644	2271	5	Typical treatment window	Willow
Aphids / Thrips	**Tuliptree aphid**	Illinoia liriodendri	1917	2033	1	Nymphs	Tulip
Aphids / Thrips	**White pine aphid**	Cinara strobi	1991	2271	1	Adults	Conifer
Borer - Roundhead / Longhorn	**Sugar maple borer**	Glycobius speciosus	2032	2375	5	Typical treatment window	Maple
Borer - Roundhead / Longhorn	**Locust borer**	Magacyllene robiniae	2271	2805	5	Typical treatment window	Locust
Caterpillar	**Juniper webworm**	Dichomeris marginella	1645	1917	1	Larvae Treatment	Conifer
Caterpillar	**Mimosa webworm**	Homadaula anisocentra	1800	2100	1	Larvae (2nd generation)	Mimosa, Honeylocust
Caterpillar	**Zimmerman pine moth**	Dioryctria zimmermani	1917	2154	5	Treatment window (adult flight-1700 GDD)	Conifer
caterpillar	**Orangestriped oakworm**	Anisota senatoria	1917	-	6	Egg hatch - early instars	Mainly Oaks
Caterpillar	**Fall webworm**	Hyphantria cunea	2793	-	6	Egg hatch / crawler (2nd generation)	Hardwoods
Caterpillar	**Oak skeletonizer**	Bucculatrix ainsliella	1798	2155	1	Larvae	Oaks
Hemiptera (true bugs)	**Hairy chinch bug**	Blissus leucopterus	1903	2160	1	Second generation- 50%- 2nd instars	Turf
Leafminer / Midge / Fly	**Arborvitae leafminer**	Argyresthia thuiella	1800	2200	1	Larvae Treatment (3rd generation)	Conifer
Mites	**Rust-mites**	Nalepella and Setoptus spp.	1644	2030	1	Nymphs / adults	Conifer
Mites	**Spruce spider mite**	Oligonychus ununguis	2375	2806	5	Typical treatment window	Conifer
Mites	**Southern red mite**	Oligonychus ilicis	2500	2700	5	Typical treatment window	Many
Scale	**Euonymus Scale**	Unaspis euonymil	1700	-	1	Continued 2nd generation treatments	Euonymus
Scale	**Cryptomeria scale**	Aspidiotus cryptomeriae	1750	2130	1, 4	Crawlers emerge (2nd generation)	Conifer
Scale	**Obscure scale**	Melanaspis obscura	1774	-	6	Egg hatch / crawler	Many
Scale	**Gloomy scale**	Melanaspis tenebricosa	2000	3000	6*	Crawlers emerge. (1 generation)	Maple, many
Scale	**Maskell scale**	lepidosaphes pallia	2035	-	6	Egg hatch / crawler (2nd generation)	Conifer
Scale	**Tulip tree scale**	Toumeyella liriodendri	2037	2629	1	Crawlers (1st generation)	Mainly Tulip
Scale	**Magnolia scale**	Neolecanium cornuparvum	2155	2800	1	Crawlers (1st generation)	Mainly Magnolia
Scale	**Japanese maple scale**	Lopholeucaspis japonica	2508	-	6	Egg hatch / crawler (2nd generation)	Maple
Scale	**Elongate hemlock scale**	Fiorinia externa	2515	2625	1	Typical treatment window - fall activity	Conifer
Scale	**Fletcher Scale (Yew)**	Parthenolecanium fletcheri	2515	2800	1	Fall control of overwintering stage	Yew, many conifers
Weevil	**Two-banded Japanese weevil**	Pseudocneorhinus bifasciatus	1644	2271	1	Adults	Many
Weevil	**Poplar and willow borer**	Crytorhynchus lapathi	2271	2806	5	Typical treatment window	Poplar and Willow
Whitefly	**Azalea whitefly**	Pealius azaleae	2032	2150	5	Adults/nymphs (3rd generation)	Rhododendron

Recent photo-rich pest posts on the Rutgers Plant and Pest Advisory:
https://plant-pest-advisory.rutgers.edu/

Landscape Pest Notes for July 2023
https://plant-pest-advisory.rutgers.edu/landscape-pest-notes-for-july-2023/

Christmas Tree Pest Notes for July 2023
https://plant-pest-advisory.rutgers.edu/christmas-tree-pest-notes-for-july-2023/

Redheaded flea beetle - life stage predictions for South, Central, and Northern New Jersey with material considerations in Nurseries

*Calendar date predictions for target range as of **4/27/2023***

WE R HERE WHEN YOU NEED US

Information compiled by Dr. Timothy J. Waller - Rutgers Cooperative Extension (2021)

Growth Stage	Gen.	GDD50 TARGET RANGE -LOW-	GDD50 TARGET RANGE -HIGH-	SOUTH Upper Deerfield (NJ50) LOW (DATE)	SOUTH Upper Deerfield (NJ50) HIGH (DATE)	CENTRAL Howell (NJ10) LOW (DATE)	CENTRAL Howell (NJ10) HIGH (DATE)	NORTH High Point (NJ59) LOW (DATE)	NORTH High Point (NJ59) HIGH (DATE)	NOTES (high infestation locations) *Systemic (S) - Contact (C) - Biologicals (B) - Herbicides (H)*	Material / Compound Considerations (*Examples = no endorsements implied*) [IRAC GROUP #]
Egg hatch - larvae	1	242	600	4/21	5/28	5/6	6/4	5/19	6/16	**(S) Initiate systemic treatments 1-month prior to adult activity** **(S) Systemic granular or granular incorporation @ planting is effective** (C) Contact materials may be used to knock-down larvae (B) Some bio-rational / logicals are effective on larvae - Look for larval activity on the outside of root balls - Larvae may be active prior to this GDD50 timeframe	**SYSTEMIC DRENCHES** **Cyantraniliprole [28]** (Mainspring) **Chlorantraniliprole [28]** (Acelepryn) **Organophosphates [1B]** - Acephate (Orthene, Acephate 97UP) **Neonicotinoids [4A]**- Dinotefuran (Safari 20SC) ; Thiomethoxam (Flagship 25 WG) ; Imidacloprid (Imidacloprid 2F, Marathon 1%G, Marathon II) **GRANULAR APPLICATIONS and INCORPORATIONS** **Neonicotinoids [4A]** Imidacloprid (Marathon 1%G, Coretect tablets, Mallet 0.5G) ***(Initiate systemic treatments 1-month prior to adult activity)***
Adults (feeding / laying eggs)	1	517	1028	5/22	6/17	5/30	6/25	6/11	7/9	**(S/C/B) Start adult contact sprays - continue systemic treatments** **(H) Control weeds - adults will hide-in and feed-on them** - Adult feeding damage will be apparent - Scout to determine best time for applications - Use of agitator compounds may drive adults from hiding	
				POTENTIAL OVERLAP OF GENERATIONS / STAGES							
Egg hatch - larvae	2	1570	1860	7/8	7/19	7/17	7/28	8/3	8/18	**(S) Continue systemic treatments** **(C/B) Contact materials to target larvae *AND* adults** - Potential for considerable overlap of larvae - adult stages **(H) Control weeds - adults will hide in and feed on them**	**CONTACT** **Bifenthrin** [3A] (UP Star SC, Talstar Select) **Clyfluthrin [3]** (Decathalon 20WP) - *Rotation partner* **Carbamates** [1A] - Carbaryl (Sevin SL) **Tolfenpyrad** [21A] (Hachi-Hachi SC) **Cyclaniliprole** [28] (Sarisa) + **Flonicamid** [29] (Pradia)
Adults (feeding / laying eggs)	2	1878	2318	7/19	8/4	7/28	8/15	8/18	9/15	**(C/B) Adult contact sprays** **(S) * If pest pressure is high *** - continue systemic materials **(H) Control weeds - adults will hide-in and feed-on them** - Adult feeding damage will be apparent - Use of agitator compounds may drive adults from hiding	**BIOLOGICAL / BIORATIONAL** **Azadirachtin** (Aza-Direct, Azatin-O) **Beneficial nematodes** (Millennium) **Entomopathogenic fungi** (Ancora, BotaniGuard) **Adult Agitator** (Captiva Prime)

*** A third generation of larvae and feeding adults is possible in the southern and central regions ***

Estimated using USPEST.org, 3.5-month CFSv2 based seasonal climate forecast, simple average growing degree-days, min temp: 50F, max temp: 95F.

Insect development growing degree-day ranges based on trials by Dr. Kunkel - Extension Specialist - University of Delaware. Insecticide selection based on research by Danny Luaderdale - Area Specialized Agent - Nursery Crops - NC State.

SYSTEMIC DRENCHES

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Chlorantraniliprole [28] (Acelepryn)
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GRANULAR APPLICATIONS and INCORPORATIONS Neonicotinoids [4A]
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