

Cultivating Cumberland

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Cultivating Cumberland Subscription Renewal

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Reactivation forms are **for mailed newsletters only**.

Due February 14th, 2020. Effective for the March 2020 issue.

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Cultivating Cumberland Mailed Subscription Renewal

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Damping-off: Identifying and Controlling Pathogens in Transplant Production

Andy Weynandt,
Plant and Pest Advisory
January 19, 2020

It is extremely important to know which pathogen is causing damping-off problems and which fungicide to properly apply. The key to controlling damping-off is being proactive instead of reactive. Always refer to the fungicide label for crop use, pathogens controlled, and application rates.

Damping-off is caused by a number of important vegetable pathogens and is very common during transplant production. Damping-off can kill seedlings before they break the soil line (pre-emergent damping-off) or kill seedlings soon after they emerge (post-emergent damping-off). Common pathogens that cause damping-off include Pythium, Phytophthora, Rhizoctonia and Fusarium spp.

Control of damping-off depends on a number of factors. First, is recognizing the conditions which may be leading to the problem (i.e., watering schedule/greenhouse growing conditions) and second, identifying the pathogen causing the problem. Reducing the chances for damping-off always begins with good sanitation practices prior to transplant production.

Conditions Favoring Damping-off

Although all four pathogens are associated with damping-off, the conditions which favor their development are very different. In general, Phytophthora and Pythium are more likely to cause damping-off in cool, wet or overwatered soils that aren't allowed to dry out due to cloudy weather or cooler temperatures. Conversely, Rhizoctonia and Fusarium are more likely to cause damping-off under warmer, drier conditions especially if plug trays are kept on the dry side to help reduce transplant growth.

The two root rots causing the most problems in New Jersey during transplant production are Pythium and Rhizoctonia. In general, Pythium tends to kill seedlings before or right after emergence where as Rhizoctonia tends to kill seedlings after emergence. If you are recycling old transplant flats with organic matter left on them from the previous season you may bring pathogens such as Rhizoctonia back into the operation. There are exceptions to the rules, but none the less, all damping-off pathogens can cause serious losses if not controlled properly.

Pathogen Identification

In root systems infected by Pythium, the outer cortex of the roots will slough-off if you pull the transplant out of the plug or if you simply pull on the roots with your fingers. If your soil has been excessively wet for periods of time because cool, cloudy weather hasn't allowed plug trays to dry out for extended periods (i.e. days) you may be dealing with a Pythium problem. Pythium also tends to show up in low spots on irregular benches or the floor where plants have been sitting in water for extended periods causing 'wet feet' (i.e.,

water-logged root systems).

In root systems infected by *Rhizoctonia*, the outer cortex of the root system won't slough off. In many cases under ideal conditions, the mycelium of the fungus growing on the surface of infected roots can be seen with a 10x hand lens. *Rhizoctonia* produces distinct, brown hyphae that always branches at nearly 90 degree angles. This is a diagnostic feature of the fungus. *Rhizoctonia* often shows up on transplants where the plug remains on the dry side for extended periods when growers reduce water to control plant growth. In the field this can occur shortly after transplanting when the drip irrigation system is not hooked up.

Treatment Options

Why is recognizing the different symptoms and diseases so important? The fungicides applied to prevent or control damping-off are specific in the pathogens they control. Fungicides used to control *Pythium* or *Phytophthora* won't control the other damping-off pathogens. Why is this? The biology of the fungus and the mode of action of the fungicide dictates fungicide efficacy.

For example, Ridomil Gold and Ultra Flourish (mefenoxam, FRAC code 4), MetaStar (metalaxyl, 4), Previcur Flex (propamocarb, 28), Ranman (cyazofamid, 21), Presidio (fluopicolide, 43), and Phosphites (33) help control the "water molds" (i.e., *Pythium* and *Phytophthora*). Azoxystrobin (FRAC code 11) help control damping-off caused by *Rhizoctonia* root rot. Ranman, Previcur Flex, and phosphites have greenhouse use labels for *Pythium* control (see labels for specific crops and uses in Table E-11 in the upcoming 2020/2021 Mid-Atlantic Commercial Vegetable Production Recommendations Guide).

There are many organic options that can be used to suppress these pathogens in transplant media. These biologicals include *Bacillus subtilis* (Companion), *Streptomyces lydicus* (Actinovate), *Streptomyces griseoviridis* (Mycostop), *Trichoderma harzianum* (PlantShield, Rootshield), and *Trichoderma virens* (SoilGard). These products can either be drenched on or incorporated into the media prior to seeding and/or transplanting. These products work by colonizing root surfaces and competing with the pathogen for space and resources. The mechanisms of control by biologicals include some form of antibiosis, parasitism, induction of host defense responses, or competition.

Disinfectant products such as Zerotel and Oxidate (hydrogen dioxide) may also be used to help suppress pathogens in organic or conventional transplant production. It's important to understand that disinfectant products also kill biological agents, therefore caution should be used when using these in rotation with organic products. The same holds true for all conventional products. For a list of options for use in greenhouses on specific crops please see Table E-11 in the upcoming 2020/2021 Mid-Atlantic Commercial Vegetable Production Recommendations Guide. **See individual crop section for of options in the field.**

Always refer to the fungicide label for crop use, pathogens controlled, and application rates

Organic Transplant Production: Suppressing Soil-borne Pathogens

Authors: Andy Wyenandt and Jim Simon, Department of Plant Biology, Rutgers University
Plant and Pest Advisory

Pathogens such as *Fusarium*, *Pythium*, *Phytophthora*, *Thielaviopsis* and *Rhizoctonia* that cause pre- and post-emergent damping-off can cause serious problems in organic (and conventional) transplant production. The key to controlling and/or suppressing damping-off pathogens with biological controls is keeping the biological populations high and continually present on root surfaces of the host, and by following good cultural practices.

A Quick Review

Phytophthora and *Pythium* are more likely to cause damping-off in cool, wet soils. While, *Rhizoctonia* and *Fusarium* are more likely to cause damping-off under warmer, drier conditions. In general, *Pythium* tends to kill seedlings before they emerge whereas *Rhizoctonia* and *Fusarium* tend to kill seedlings after emergence. There are exceptions to the rules in some cases, but none the less, all damping-off pathogens can cause serious losses if not identified and controlled properly.

Adjust Watering Schedules

Remember seeds or transplants that sit in cold, wet soils for prolonged periods of time are more prone to damping-off. Outside weather conditions also play an important role in potential disease development in spring transplant production. Most importantly, daily watering schedules need to be monitored and/or adjusted so as not to overwater during cool, cloudy periods or underwater during bright, warm, sunny days. Always do your watering early enough in the day so leaves are dry going into the overnight.

Taking preventative measures to mitigate potential problems caused by damping-off pathogens is the best approach; and is one everyone needs to consider prior to and during the organic transplant production season.

Specific OMRI-Approved Products

There are a number of OMRI-approved biological controls that can be incorporated into the soil media prior to seeding, as a seed treatment, or as a drench. Biological control agents can be fungi or bacteria that work by various mechanisms which include antibiosis, parasitism, induction of host-plant resistance, and competition.

- SoilGard 12G (*Trichoderma virens*, Certis USA) colonize host roots and is antagonistic to *Pythium* and *Rhizoctonia*.
- Plantshield HC and Rootshield WP (*Trichoderma harzianum*, Bioworks, Inc.) also colonize roots and provide protection against root pathogens such as *Pythium*, *Rhizoctonia*, *Fusarium*, *Cylindrocladium* and *Thielaviopsis*.
- Actinovate (*Streptomyces lydicus*, Natural Industries, Inc.) is a bacterium labeled for *Pythium*, *Phytophthora*, *Fusarium*, *Rhizoctonia*, and *Verticillium*.
- Mycostop (*Streptomyces griseoviridis*, Agbio, Inc.) also colonizes roots and is labeled for control or suppression of many root rot and wilt pathogenic fungi such as *Pythium*, *Fusarium*, *Rhizoctonia*, and *Phytophthora*.

All of these products work best if they are incorporated or applied before any damping-off occurs. This means incorporating them into the media mix prior to seeding, or applying them as a seed treatment, or as

a drench shortly after seeding and continuing with follow-up treatments during the remaining transplant production season. The key to controlling and/or suppressing damping-off pathogens with biological controls is keeping the biological populations high and continually present on root surfaces of the host and by following good cultural practices. For more information on the products mentioned above and other labeled products please see Table E-14 in the upcoming 2020/2021 Mid-Atlantic Commercial Vegetable Production Recommendations. Applications of the products mentioned above should be done according to the manufacturer's label.

Controlling basil downy mildew in the greenhouse

Basil downy mildew (BDM) can cause significant losses in the greenhouse. Once introduced into the greenhouse it can be very difficult to manage and eliminate. In the past few years, a vast amount of research has been done on understanding BDM biology and controlling it in the greenhouse using different cultural practices. Before we get to control strategies, let's review what we know about the pathogen.

First, basil downy mildew is an obligate parasite – meaning it needs a living host to survive. As long as basil is in production in the greenhouse there will be a potential source of inoculum. Sources of inoculum can include fresh intact leaves, but also leaves discarded and fallen on the floor or in an open garbage container. This is important for greenhouse growers who produce basil year round or growers who are looking to extend basil production to later into the fall or earlier in the spring. The simplest method to break the disease cycle would be to stop growing basil for a short period of time and keeping your greenhouse as clean as possible. This would help break the disease cycle by removing the host. Sporangia produced by BDM are short-lived. Without a host their survival is only a few hours to a few days depending on the temperature and environmental conditions. The latent period (the time between infection and symptom development) can range from 5 to 10 days depending on the temperature and environmental conditions. This informs us that plants which appear uninfected may actually be infected without symptom development. Therefore, it is critically important to remove all plants from the operation before restarting production (especially if BDM is already present). A good time to stop greenhouse production (i.e., in the mid-Atlantic region or more northern regions) would be after the first hard freeze in the fall – after the freeze kills all potential sources of inoculum that could come from sources outside the greenhouse.

Control strategies using cultural practices in the greenhouse

Reducing relative humidity in the greenhouse

Basil downy mildew requires high relative humidity (>95%) for 7.5 hrs and at least 4 hrs of leaf wetness for sporulation. Sporulation has been shown to be significantly reduced, or not capable when relative humidity is less than 85%. Thus, maintaining relative humidity below 85% in the greenhouse can significantly help reduce spore production. If this is not possible interrupting the dew cycle (i.e., leaf wetness) with 10 minute periods of drying via fanning/venting every 2 to 4 hours can help reduce spore production.

Control using light

Research has shown that infected plants kept under 24 hours of continual light are unable to sporulate, this was also shown to be temperature-dependent. The type of lighting is also important. Incandescent light was fully inhibitory at 15 to 25oC, but not 10oC. Narrow band LED illumination with red light has been shown to be more inhibitory than blue light. Thus, lighting basil during the night every few hours at short periods of 10 minutes can help reduce sporulation.

Control using fanning and ventilation

Continuous fanning during the night has been shown to dramatically reduce BDM development by reducing leaf wetness (i.e., dew) and reducing relative humidity (keeping it below 95%). Recommendations from Israel are to initiate fanning when relative humidity reaches 70% in the greenhouse and to stop it when it is below 60%.

The key to controlling and mitigating BDM development in the greenhouse is controlling relative humidity and periods of leaf wetness to help reduce potential sporulation. Using a combination of cultural practices mentioned above can help reduce BDM development, but it will come at a cost to you in the form of additional hardware, temperature and relative humidity monitoring equipment and the cost of electricity. The first step in this process involves understanding where the initial source of inoculum may be coming from. Evidence for BDM being seed-borne is mixed. During the spring-summer-fall, greenhouse basil production will always be at-risk from infections coming from an outside source, including diseased seedlings you may be purchasing. Successfully breaking the BDM disease cycle (without the use of chemical inputs) in greenhouse operations has limited opportunities (e.g., in northern regions where freezing weather occurs). This can only occur in the fall, after freezing weather which can kill all outside sources of inoculum and by not carrying over infected plant material into the winter season, thus the need for a basil-free period during the production cycle. This is especially important in small greenhouse operations that produce basil organically or without the use of chemical input.

These management practices should significantly reduce your BDM problems though will require more of your attention and potentially additional equipment and supplies. Coupling best management practices with new downy mildew resistant basil varieties will further provide protection to you. Try the new basil downy mildew resistant varieties including Rutgers Obsession DMR, Rutgers Devotion DMR, Rutgers Passion DMR, and Rutgers Thunderstruck DMR or other DMR resistant sweet basil varieties such as Prospera, and see which ones work best for you.

For information on Rutgers DMR sweet basil varieties, 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.

Resources:

Tracking basil downy mildew in the US

Managing basil downy mildew

Fungicides for the control of BDM

Controlling basil downy mildew in the greenhouse

More Recent Articles

Understanding Protectant Fungicides (FRAC groups M01 – M11)

Got humidity in the greenhouse? Get rid of it!

Understanding The Differences Between FRAC Group 11 and FRAC Group 3 Fungicides

Copper Resistance in Bacterial Leaf Spot Found in New Jersey

Andy Wyenandt, January 9, 2020; plant-pest-advisory.rutgers.edu/

Copper resistance has been detected in bacterial leaf spot (*Xanthomonas euvesicatoria*) on tomato and pepper and in *Pseudomonas chicorii*, the causal agent of bacterial leaf spot in basil as well as multitude of other hosts in New Jersey. While not surprising, copper resistance has been known to develop for decades now; however, this is the first time it has been confirmed in vegetable crops in New Jersey. Copper applications for the control of bacterial diseases in many crops has been a mainstay for decades now and is often applied in weekly protectant fungicide programs. In 2019, with help from Dr. Nrupal Patel and Dr. Don Kobayashi, bacteriologists in the Department of Plant Biology located on the New Brunswick campus, a survey was begun to determine which species of bacterial leaf spot are most prevalent in New Jersey vegetable crops. Bacterial leaf spot can be caused by four species of *Xanthomonas*: *X. euvesicatoria*, *X. vesicatoria*, *X. perforans*, and *X. gardneri*. Currently, there are four races of BLS found in tomato (T1-4) and eleven races found in pepper (0-10). Differential tests in southern New Jersey using various bell pepper lines over the past 15 years has suggested that the number of races of BLS in pepper has increased over time; with all races present in the State to date. Early lab testing results from samples collected on a small number of NJ vegetable farms last summer has shown the presence of *X. euvesicatoria*, which can infect both pepper and tomato crops, with some of the samples testing positive for copper resistance.

How do you know what species of bacteria are present on your farm?

The only way to determine which species of bacteria are present in tomato or pepper crops on your farm are to have them identified through laboratory methods.

How do you know what races of the pathogen are present on your farm?

That's a difficult question to answer. Up to now, the only way to know is through differential testing. That means planting a number of different bell peppers with varying BLS resistance packages and monitoring which cultivars develop symptoms. For example, if you detect BLS development in Aristotle X3R (which has resistance to races 1,2, & 3); then you possible have races 4-10 present on your farm. If you were to plant Turnpike in that same field and you have BLS development in it, then you possibly have race 6 or 10 present, because Turnpike has resistance to BLS races 0-5 and 7,8,9. It's extremely important to know what races of BLS are present so you can chose the proper cultivars to grow. Choosing the proper cultivar will do two things: significantly reduce the chances of BLS development and significantly reduce the number of copper applications on your bell pepper crop. As a note, there are a few non-bell peppers available with BLS resistance packages (see 2020/2021 Commercial Vegetable Production Recommendations Guide).

How do you know if copper resistance is present on your farm?

Growers who have used copper applications for controlling bacterial leaf spot in crops such tomato or pepper for many years should always monitor for efficacy. If you notice or have noticed a loss in copper efficacy over time, then there is a good chance copper resistance is present. Once copper resistance is detected, further applications will be unwarranted and ineffective. The only method to truly determine if copper resistance is present is through laboratory testing, however growers who pay close attention to efficacy should have a good idea if copper is still effective.

What can you do to mitigate bacterial leaf spot development on your farm?

In crops such as bell pepper, it comes down to growing cultivars with resistance to BLS and knowing what races are present on your farm. Many of the recommend commercial cultivars have varying resistance packages to the different races of the pathogen. Some cultivars, such as Paladin which has Phytophthora resistance has no resistance to BLS. Other “older” cultivars such as Aristotle X3R has resistance to races 1-3; newer cultivars such as Turnpike has resistance to races 0-5,7-9; while cultivars such as Playmaker and 9325 have resistance to 0-10 (also known as X10R cultivars). Unfortunately, BLS resistance in commercial tomato varieties are lacking, but efforts from around the world are making progress.

Moving forward in 2020.

More sampling and surveying are planned for the 2020 production season in New Jersey. Growers who are interested having tomato or pepper samples collected from their farm for species determination and copper resistance testing are encouraged to contact their county agent this coming summer so arrangements can be made. For those interested in learning more about BLS, Dr. Wesley Kline will be giving an update in Atlantic City in February on the X10R bell pepper variety trial done at RAREC and at an on-farm site in Vineland this past summer.

Controlling Cercospora Leaf Spot in Beet

Andy Wyenandt, Plant and Pest Advisory, January 10, 2020

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*, 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 (Fig. 1). 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. 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.

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 Tranquility (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.

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

Cumberland County Board of Agriculture Scholarship

Student must be a Cumberland County resident pursuing a degree in Production Agriculture/Horticulture, Agricultural Education, Agronomy or related field.

The purpose of this scholarship is designed to support the general welfare of agriculture in Cumberland County. Through this program, the board wishes to encourage the scientific study of agriculture and promote as a useful, profitable, and dignified career. Education in production agriculture is a necessary tool in today's intensified agriculture field. The scholarship program hopes to encourage students to avail themselves of agriculture and related programs in higher education.

\$2,000 Scholarship

Return to:
Cumberland County Board of Agriculture, 291 Morton Ave., Millville, NJ 08332 by April 15th

Name: _____ Age: _____

Address: _____

High School / College: _____ GPA: _____

Phone: _____ Email: _____

Clubs and or volunteer work in the community: _____

Name of College or Technical School: _____

Address: _____

Course of Study: _____

Why have you chosen a career in agriculture:

What are your plans after college:

Why should the scholarship committee select you for this scholarship:

References: (at least 3)

Name: _____ Phone: _____

Name: _____ Phone: _____

Name: _____ Phone: _____

Please provide one letter of recommendation

Payment of the scholarship will be made directly to the college or technical school pending acceptance and enrollment

Signed: _____ Date: _____
(Applicant)

Signed: _____ Date: _____
(Parent/Guardian)

Purchasing Pesticide Manuals Online

Purchase manuals in our office or purchase pesticide manuals online through Rutgers and have them shipped to you. Orders will be fulfilled Wednesday and ship on Thursday of each week. Shipping UPS 2nd Day. Visit <https://ce-catalog.rutgers.edu/checkoutsigin.cfm>

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13. Enter your payment information

Please note, manuals can still be purchased in our office.

The following fact sheets are now available on NJAES Publications: <https://njaes.rutgers.edu/pubs/>

FS1313	Assessing and Addressing Soil Compaction in Your Yard. Yergeau, S., Raabe, C. and Murphy, S. https://njaes.rutgers.edu/fs1313
FS1314	Ultra-Niche Crops Series: Beach Plum Enterprise Budget. Brumfield, R. and Carleo, J. https://njaes.rutgers.edu/fs1314
FS1315	Best Management Practices for Copper Fungicide Use. Melendez, M. njaes.rutgers.edu/fs1315
AGRS-13D	Mid-Atlantic Field Crop Weed Management Guide, 2020. Produced by Penn State Extension in cooperation with University of Delaware, University of Maryland, Rutgers University, Virginia Tech, and West Virginia University njaes.rutgers.edu/pubs/publication.php?pid=AGRS-13D
GROW1	A Practical Guide for Integrated Weed Management in Mid-Atlantic Grain Crops. A collaboration among Penn State, Rutgers University, University of Delaware, USDA-Beltsville, Virginia Tech, and West Virginia University njaes.rutgers.edu/pubs/publication.php?pid=GROW1

Calendar of Important Events

✓ Indicates a newly added event since the last calendar

February 4-6, 2020

2020 NJ Agricultural Convention & Trade Show; Harrah's Resort Hotel Convention Center, 777 Harrah's Blvd, Atlantic City, NJ 08401; Convention, trade show, and educational sessions. Find more information and registration details at <http://www.njveggies.org/convention.htm>

February 5-8, 2020

2020 Sustainable Agriculture Conference: Lancaster County Convention Center, Lancaster, PA; Food and farming workshops, vendor trade show, seed swap, receptions and tastings, farm innovation show, social and networking events; Find more information and register online at pasafarming.org/conference or by calling 814-349-9856

February 12-13, 2020

Women in Ag Conference 2020; Dover Downs Hotel & Casino, Dover, DE; The full conference agenda and additional details will soon be available at <https://extension.umd.edu/womeninag/annual-conference/2020-conference>

February 19, 2020

CORE Pesticide Training and Testing in one day; FREE; 8AM—12PM (before pesticide exam, check-in at 7:45AM); Klem Building at the Rutgers Cooperative Extension Office of Cumberland County, 291 Morton Avenue, Millville, NJ 08332; This course satisfies New Jersey's requirement of attending a basic pesticide training course for new applicants. February 19th is a scheduled testing date with the NJDEP at our office for the Pesticide Exam. **You must be registered for the NJDEP Exams by February 5th to receive a testing time for this date.** The registration paperwork can be obtained online at: <http://www.nj.gov/dep/> (Register for a test time of 12 or 2PM, indicate that you are taking this class) Instructor: Wayne Knerr; Register for this training (before the exam) by Feb. 17th, 2020, call 856-451-2800 x1

✓ **February 21, 2020**

2020 Salem County Pesticide Safety Meeting; Ware Agricultural Building, 51 Cheney Road, Woodstown, NJ 08098; 9:00 A.M.—12:30 P.M.; FREE, no pre-registration required; Morning refreshments provided, lunch not included; Pesticide Credits Available; Call Salem County RCE at 856-769-0090 for more information

February 25, 2020

Cover Crops in Vegetable Production Systems: Tools and Techniques for Building Soil Health to Maximize Profits; 9 AM—3 PM; USDA Service Center, 51 Cheney Road, Woodstown NJ 08098; Extension agents and industry representatives will share new techniques, equipment upgrades, and discuss firsthand experiences with local growers. Lunch will be provided. Pesticide CEU's available. Contact Brittany Dobrzynski, NJ Audubon Office: 609-400-3826 Email: brittany.dobrzynski@njaudubon.org

February 26-27, 2020

Delmarva Soil Summit; Delaware Technical Community College, Georgetown, DE; Join fellow farmers, researchers, and other experts to learn about the latest innovations in soil health and fertility. Learn more and sign up at DelmarvaSoilSummit.com

March 4 - March 24, 2020

GAPs Online Produce Safety Course; This course is intended to improve your understanding of GAPs to guide assessment of risks and implementation of practices to reduce risks on fresh produce farms. Next session dates: May 6 - May 26, Jul 8 - Jul 28, Sep 2 - Sep 22, Oct 28 - Nov 17. The Produce Safety Alliance website maintains a list of upcoming Grower Training Courses that meet the requirements in § 112.22(c) of the FSMA Produce Safety Rule. <https://producesafetyalliance.cornell.edu/training/grower-training-courses/upcoming-grower-trainings/> To register, visit the <https://www.ecornell.com/custom/gaps/>

March 11, 2020

Central Jersey Turf & Ornamental Institute; Battleground Country Club, 40 Millhurst Rd., Manalapan, NJ; \$100 per person and includes breakfast and lunch; A broad range of topics are presented on turfgrass, landscape, and nursery crops by Rutgers faculty and staff, as well as representatives from state agencies and organizations; Pesticide credits available: CORE - 2 units, 1A - 3 units, 2 - 3 units, 3A - 4 units, 3B - 7 units, 7A - 1 unit, 8A - 1 unit, 8B - 1 unit, 8C - 8 units, PP2 - 9 units; To find more information or to sign up online go to <http://www.cpe.rutgers.edu/cjtoi/>

March 12, 2020

2020 South Jersey Nursery Meeting; 9 AM - 4 PM; RCE Cumberland 291 Morton Ave., Millville, NJ 08332; Meet the new Rutgers Extension Agents working with the nursery industry: Tim Waller, of RCE Cumberland County, and Bill Errickson, of RCE Monmouth County. Educational presentations on spotted lantern fly, pesticide safety and regulations, irrigation schedules, weeds, and pathogens. Pesticide credits requested for: CORE, PP2, 1A, 3A, and 10.

Cover Crops in Vegetable Production Systems:
Tools and Techniques for Building Soil Health to Maximize Profits

SAVE THE DATE • Tuesday February 25, 2020 • 9:00 am to 3:00 pm
USDA Service Center • 51 Cheney Road, Woodstown NJ 08098

Want to learn more about incorporating cover crops, minimum or no-till planting, or companion cropping for your vegetable crops? New Jersey farmers are invited to attend a technical and educational workshop detailing best management practices to improve soil health and profitability in vegetable cropping systems.

Join extension agents and industry representatives in sharing new techniques, equipment upgrades, and discuss firsthand experiences with local growers.

Lunch will be provided
Pesticide CEU's available

For more information contact Brittany Dobrzynski, New Jersey Audubon
Office: 609-400-3826 Email: brittany.dobrzynski@njaudubon.org

CORE Pesticide Training and Testing in One Day

Instructor: Wayne Knerr

Wednesday, February 19, 2020
8 AM - 12 PM
Registration begins at 7:45 AM
Sign up for this training class by 2/17/2020

FREE 8 CORE Credits

Klem Activity Building
Behind the Rutgers Cooperative Extension
291 Morton Avenue, Millville, NJ 08332
Accessible through the back parking lot of the Extension Center
Limited parking at the Klem Activity Building, parking also available at the
Extension Center with walking access to the Klem Activity Building

Contact Katie or Brandi
(856) 451-2800 ext. 1
KatieSi@co.cumberland.nj.us
BrandiWi@co.cumberland.nj.us

- Required training for CORE test
- Discuss various category requirements
- Get answers to all of your questions
- Make pesticide testing easy
- Learn to read pesticide labels

All necessary paperwork required by the DEP will be distributed at the end of class.

DEP Pesticide Exam Testing

February 19th is a scheduled testing date at our office.
Register with the NJDEP by February 5th to receive a testing time for this date.
The registration paperwork can be obtained online at: <http://www.nj.gov/dep/>
You must request a test time of 12 or 2 p.m. and indicate that you are taking this class.



***on-farm food
safety team***

UPCOMING TRAININGS

**Food Safety Modernization Act (FSMA):
Produce Safety Alliance Grower Training and Third Party Audits**

March 3 & 4, 2020 MILLVILLE, NJ

Register by 02/28/20

Blueberry Grower Food Safety Training

March 18, 2020 CHATSWORTH, NJ

Register by 03/13/20

FSMA Produce Rule Training is required by the FDA on all farms that aren't exempt or qualified exempt. For more information on FSMA visit our website at onfarmfoodsafety.rutgers.edu
9 AM - 4 PM - Lunch Provided - \$50 Day 1 - \$25 Day 2

REGISTRATION AND MORE DETAILS

RUTGERSONFARMFOODSAFETY.EVENTBRITE.COM

**IF YOU ARE UNABLE TO REGISTER ONLINE CONTACT KATIE
AT (856) 451-2800 X 1 OR [KATIESL@CO.CUMBERLAND.NJ.US](mailto:katiesl@co.cumberland.nj.us)**

2020 Salem County Pesticide Safety Meeting

RUTGERS

New Jersey Agricultural
Experiment Station

Friday February 21, 2020

Ware Agricultural Building
51 Cheney Road
Woodstown, NJ 08098

9:00AM to 12:30PM

No Registration Needed, No Cost to Attend

**Meeting Coordinators: *William Bamka and Michelle Infante-Casella*
*Agricultural Agents, RCE of Burlington and Gloucester Counties***

9:00 Algae Blooms in Irrigation Water and How to Control Them, *Sal Mangiafico, Agricultural and Natural Resources Agent, RCE of Cumberland/Salem Counties*

9:30 Managing Wireworms and Their Damage, *Joseph Ingerson-Mahar, Sr. Program Coordinator, Rutgers Vegetable IPM*

10:00 How the Produce Safety Rule Impacts Salem County Fruit and Vegetable Growers, *Wes Kline, Agricultural Agent, RCE of Cumberland County*

10:30 Important Farm Health and Safety Concerns related to Pesticide Application and Farm Equipment, *William Bamka, Agricultural Agent, RCE of Burlington County*

11:00 Managing Corn Earworm and Crop Damage, *Joseph Ingerson-Mahar, Sr. Program Coordinator, Rutgers Vegetable IPM*

11:30 Vegetable Crops Diseases Update, *Andy Wyenandt, Vegetable Pathology Specialist, RAREC*

12:00 New Options in Your Toolbox for Managing Weeds in New Jersey Vegetable Crops, *Thierry Besançon Extension Weed Specialist for Specialty Crops, PE Marucci Center*

12:30 Pesticide Credits (Credits TBD) and Adjourn

Cooperating Agencies: Rutgers, The State University of New Jersey, U.S. Department of Agriculture, and County Boards of Chosen Freeholders. Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.

REGULARLY SCHEDULED MEETINGS

✓ Indicates meeting will be held at RCE of Cumberland County

Extension Education Bldg., 291 Morton Ave, Rosenhayn, NJ (Between Carmel and Rosenhayn)

<p>✓</p> <p>Cumberland County Pesticide Certification Exam Schedule</p> <p>RCE of Cumberland County 291 Morton Avenue Millville, NJ 08332 (Between Rosenhayn & Carmel)</p> <p><u>2020</u></p> <p>Feb 19 Mar 25 Apr 8 May 6</p> <p>To Register call 609-984-6614 Information call 856-451-2800</p>	<p>Cumberland County Agriculture Development Board</p> <p>County Administration Bldg. Freeholder Room 164 W. Broad Street Bridgeton, NJ 08332</p> <p><u>2020</u></p> <p>Feb 11 Mar 10 Apr 14 May 12 Jun 9 Jul 14 Aug 11 Sep 8 Oct 13 Nov 10 Dec 8</p> <p>Reg. Meetings start at 7 p.m. Information call 856-453-2211</p>	<p>✓</p> <p>Cumberland County Board Of Agriculture</p> <p>RCE of Cumberland County 291 Morton Avenue Millville, NJ 08332 (Between Rosenhayn & Carmel)</p> <p><u>2020</u></p> <p>Feb 20 Mar 19 Apr 16 May 21 Sep 17 Oct 15 Nov 19 Dec 17</p> <p>Meetings start at 7 p.m. Information call Lew DePietro, President at 856-981-9843</p>
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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

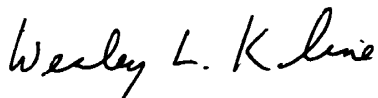
Cumberland County Solid Waste Complex

169 Jesse's Bridge Rd. (located off Route 55 Exit 29)

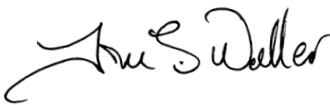
Deerfield Township, New Jersey

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

Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The user is responsible for the proper use of pesticides, residues on crops, storage and disposal, as well as damages caused by drift.

Use of Trade Names: Trade names are used in this publication with the understanding that no discrimination is intended and no endorsement is implied. In some instances the compound may be sold under different trade names, which may vary as to label.

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/>

Public Notification and Non-discrimination Statement

Rutgers Cooperative Extension is an equal opportunity program provider and employer. Contact your local Extension Office for information regarding special needs or accommodations. Contact the State Extension Director's Office if you have concerns related to discrimination, 848-932-3584.

Cooperative Extension of Cumberland County



1915-2019

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