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New Jersey Agricultural Experiment Station

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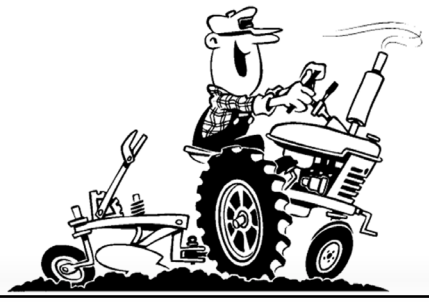
Cultivating Cumberland

May - 2022 Vol. 27, Issue 5



Attachments:

- Farm Cooler Checklist
- County Broadband Flyer
- PPA Signup
- Red Headed Flea Beetle

Wine Grape Twilight - I

May 4, 2022; 4:00 PM

Tomasello Winery, 225 N. White Horse Pike, Hammonton, NJ 08037

4:00 PM; Welcome Remarks and Updates and Social
Jack Tomasello, Owner, Tomasello Winery

Grapevine Grafting: Fundaments of Why and How
Dennis Rak, Owner, Double A Vineyard Nursery

Early Season Field Observations from the IPM Program
Dave Schmitt, IPM Program Associate, Rutgers NJAES

Early Season Disease Management
Peter Oudemans, Extension Specialist, Small Fruit Pathology, Rutgers NJAES

Integrated Management of Pests at Bloom
Dean Polk State-wide Fruit IPM Agent, Rutgers NJAES

Spring Weed Management for Vineyards
Thierry Besancon, Weed Specialist, Rutgers NJAES

Grape Cluster loosening using Plant Growth Regulator – A Disease Mgmt. Tool
Daniel Ward, Extension Specialist, Pomology, Rutgers NJAES

7:00 PM; Pesticide re-certification credits application and Adjourn

Light fare will be provided.

Please call Joan Medany jmedany@co.gloucester.nj.us or call 856-224-8030 if you are planning to attend. This site is accessible to the physically impaired. If any additional assistance is needed, please contact Hemant Gohil (Program Organizer) at 856-224-8029 prior to the meeting.

Pesticide Recertification Credits: CORE- 1 credit, PP2- 5 credits, 1A- 5 credits

Strategies for Effective Management of Botrytis and Anthracnose Fruit Rot in Strawberries

Dr. Mengjun Hu, Univ. of Maryland, and Kathy Demchak, Penn State Extension
Plant and Pest Advisory, April 22, 2022

Managing gray mold (*Botrytis*) on strawberries is increasingly challenging because of fungicide resistance development, plus a new *Botrytis* species that is less susceptible to fungicides is becoming common in the mid-Atlantic region. Resistance to certain fungicides is also a problem in management of anthracnose fruit rot. This article describes disease management strategies designed to slow further resistance development, while also providing specifics for managing our two most common fruit rots.

First, what's new with Botrytis. There are at least 4 species of *Botrytis* that can infect strawberries, but only two of them have been commonly found in the region. *Botrytis cinerea*, the species traditionally infecting strawberries, is present nearly everywhere and affects many horticultural crops. Recently another species, *Botrytis fragariae*, has also been found and as its name indicates, is more specific to strawberry plants. It appears to overwinter on strawberry plant tissue, and preferentially colonizes blossoms early in the spring, causing them to "turn brown and dry up". While sometimes only one of these species is present, both can be present at the same time in a field and even in the same blossom. Using certain fungicides selects for resistant strains of either species, and also preferentially selects for one species over the other. This means that both species have resistance to multiple fungicide groups, and both species can survive in fungicide-treated fields.

How can you tell if the newer species of Botrytis might be present in your fields? While B. cinerea (the traditional species) is often isolated from both flowers and fruit, *B. fragariae* (the new one) is often isolated from flowers, and it has been shown that *B. fragariae* infection was much more aggressive on strawberry flowers than fruit. If you see larger-than-usual numbers of blossoms turning brown and shriveling (not to be confused with frost damage, which blackens the center of the flower), it may be prudent to choose fungicides as if *B. fragariae* presence had been confirmed in your field. If you see no more symptoms on the flowers or buds than usual, you may be able to assume that the new species isn't present, or at least not to a great extent.

Which fungicides work for each *botrytis* species and which ones don't? Our traditional *Botrytis* species, (*B. cinerea*), is frequently resistant to iprodione (FRAC code 2, Rovral), fenhexamid (FRAC code 17, Elevate), boscalid (FRAC code 7, one of the active ingredients in Pristine), and cyprodinil (FRAC code 9, one of the active ingredients in Switch). Notably, *B. fragariae* seemed to be more tolerant/resistant to fludioxonil (FRAC code 12, the other active ingredient in Switch and also in Miravis Prime) and polyoxin D zinc salt (FRAC code 19, Ph-D or OSO), but it is less resistant to the above active ingredients with a high *B. cinerea* resistance frequency.

Thus far, no resistance to SDHI fungicides (active ingredients in FRAC code 7) has been detected in the newer *Botrytis* species *B. fragariae*. These include pydiflumetofen (the other active ingredient in Miravis Prime besides fludioxinil, which has little effect), isofetamid (Kenja), penthiopyrad (Fontelis), and fluopyram (Luna series). Boscalid, one of the active ingredients in Pristine has less intrinsic activity on *botrytis*

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species in general compared to other newer group 7 (SDHI) fungicides and as mentioned, resistance within *B. cinerea* is high. Strobilurins (FRAC code 11) and DMIs (FRAC code 3) are ineffective against *Botrytis*.

All of the active ingredients above are single-site fungicides, as indicated by a single number in their FRAC code, aka activity group, or simply "group" as they appear on labels. They target a single step in the fungus' processes, so simply put, the fungi find it rather easy to develop workarounds. Thiram, which works for *Botrytis* (and Captan) are multi-site fungicides as indicated by the "M" in their FRAC codes, so workarounds are less likely. Both play an important role in delaying resistance development to single-site fungicides. They are protectants, meaning that they form a protective layer on the surface of plant tissues, thus preventing diseases from growing into the plant. However, new growth that does not have this protective layer is vulnerable, and while the materials may simply be redistributed with light rains, heavy rains may wash the fungicides off.

More information related to fungicide resistance and categorization of products can be found at the Fungicide Resistance Action Committee web site (https://www.frac.info/).

What can you do to manage *Botrytis* and *anthracnose*? First, use all cultural methods that you can to minimize inoculum and maximize foliage drying. Having less inoculum around means less disease on your plants, and also fewer chances for resistance development. So, remove those dead and half-dead leaves from plasticulture strawberry plants in the spring, and if at all possible, remove the debris from the field. Keep weeds under control as much as possible. Weedy fields stay wet longer, and *Botrytis* of any type loves that moisture. The optimum temperature for growth of *Botrytis* is 65 to 72 degrees F – great temperatures for strawberry growth too, resulting in lots of tender easy-to-infect tissue. If foliage stays wet for 14 hours or longer, *Botrytis* infections are favored and spores are produced that easily waft around infecting blossoms, fruit, and leaves. *Anthracnose* is favored by wet conditions of 7 hours or longer, and its optimum temperatures for development are warmer (75 to 82 degrees F). Since its spores are produced in a liquid slime, it is primarily a rain-splashed disease that does not get spread over long distances unless extreme wind-driven rains occur, such as with hurricane events.

Second, target *Botrytis* early in the season (i.e., during bloom) when applying fungicides and *anthracnose* later when temperatures are warmer using these strategies: 1) Use multi-site fungicides as the backbone of your spray program to minimize resistance development to the single-site fungicides mentioned above. Maintain continuous use of thiram (more effective for gray mold) and captan (more effective for *anthracnose*) during the critical disease control periods of bloom and fruit ripening. Use these products alone during drier spells when disease pressure is lower. Apply before rain events to have the material affixed onto the foliage before the rain occurs. 2) Add single-site fungicides only when disease pressure is high (extended periods of moisture). Recommended single-site fungicides during bloom for either Botrytis species are newer category 7 (SDHI) fungicides (Merivon, Kenja, Fontelis, and certain products in the Luna series). They can also be applied during ripening if needed. If conditions conducive to *anthracnose* development occur earlier than usual, products effective against *anthracnose* may be applied. 3) Save Switch or Miravis Prime for late-season *Botrytis* management since gray mold fruit rot is mainly caused by B. cinerea – and these products also have good effectiveness against fruit *anthracnose*. Other fungicides effective on *anthracnose* appear in the table below. Ph-D or OSO is another good choice for *B. cinerea*

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control during harvest. While strategies numbered 2 and 3 are helpful in targeting specific species/diseases, strategy 1 improves fungicide resistance management.

Overall, how you deploy these strategies will vary with your production system. Growers in plasticulture with *anthracnose-susceptible* varieties may need to focus more on *anthracnose* management, while growers using matted row production with *anthracnose*-resistant cultivars may need to focus on controlling *Botrytis*. Growers with *anthracnose*-susceptible day-neutral cultivars, which continually bloom and fruit over a long period, should try to focus on using the multi-site protectants thiram and captan prior to major or consecutive rain events.

All growers should use single-site fungicides only when necessary, such as when protectant sprays were missed prior to rain events. Rotate chemistries carefully, and minimize fungicide use during warm dry spells when fungicides are less likely to be needed.

Here is a diagram of what these management strategies would look like for June-bearing cultivars:

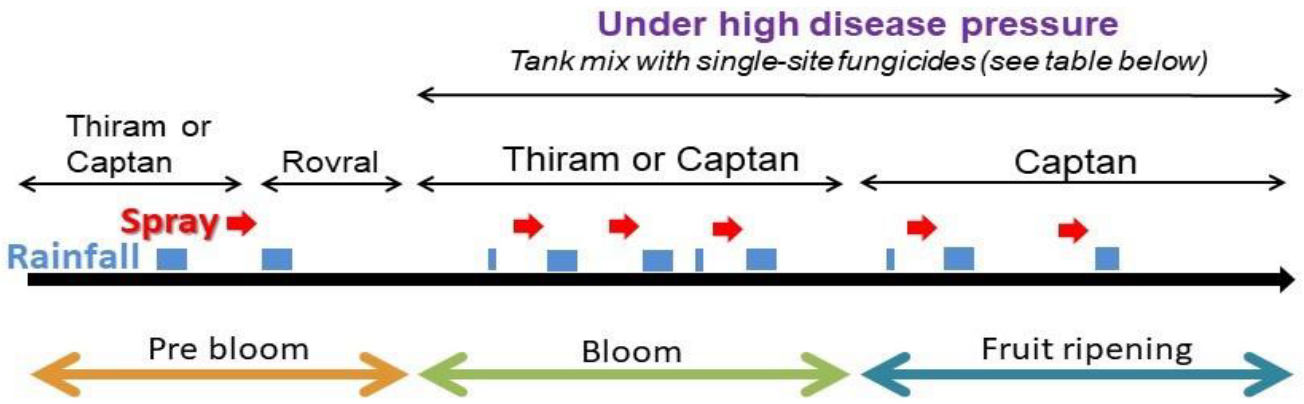

Diagram credit: G. Schnabel, Clemson Univ.; used with permission.

The table below summarizes the information presented in this article with details on specific recommended fungicides, considerations for making the best use of them while minimizing resistance development, and their activity groups. Check individual product labels for rates, pre-harvest intervals, re-entry intervals, and any other restrictions before applying (for example, Fontelis may not be applied on ‘Jewel’, ‘Clancy’, or ‘L’Amour’) and make sure the products are registered for use in your state. Specimen labels can be found at CDMS (http://www.cdms.net/LabelsSDS/home) and Agrian (https://home.agrian.com/label-lookup/), in addition to company web sites.

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Early Bloom →		Late Bloom →	Green Fruit →	Early Harvest →		Late Harvest
Maintain continuous coverage with thiram (group M3) or captan (group M4)*						
thiram or captan	thiram or captan	thiram or captan	thiram or captan	captan	captan	captan
*If in matted row production and gray mold is the major concern, utilize thiram more and captan less. If in plasticulture and when growing anthracnose-susceptible varieties, captan may be needed to a greater extent.						
If weather is wet, add one of the following single-site fungicides to the above, making not more than 2 applications of any activity group over the season.						
Primarily for early season gray mold control				***Save for use during harvest***		
- Fontelis, group 7, or				*For gray mold and anthracnose fruit rot:*		
- Kenja, group 7, or				- Switch, group 9 + 12, or		
- Luna Tranquility, group 7 + 9, or				- Miravis Prime, group 7 + 12, or		
- Merivon Xemium, group 7 + 11**, or				- Luna Flex, group 7 + 3		
- Luna Sensation, group 7 + 11**						
**While these products can be used for gray mold, their use will increase selection pressure for anthracnose resistance to group 11 materials.				*For gray mold but not anthracnose fruit rot:*		
				- Ph-D or OSO, group 19		
				For anthracnose fruit rot but not gray mold:		
Alternatives to group 7 fungicides if needed:				- Tilt, group 3		
- Rovral, group 2 (pre-bloom only)***, or				- Inspire Super, group 3 + 9		
- Elevate, group 17***				- Cabrio, group 11***		
				- Pristine, group 7 + 11***		
				- Quadris Top, group 11 + 3***		
				- Quilt Xcel, group 3 + 11***		
***May be used once per season if resistance to active ingredients in these products is known to be low on your farm. Do not, however, make more than 2 applications of any activity group over the course of a season.						

Understanding Protectant Fungicides (FRAC groups M01 – M12) in 2022

Andy Wyenandt, April 21, 2022
Plant and Pest Advisory

Protectant (contact) fungicides, such as the inorganics (copper, FRAC group M01) and sulfur (FRAC code M02); the dithiocarbamates (mancozeb, M03), phthalimides (Captan, M04), and chloronitriles (chlorothalonil, M05) are fungicides which have a low chance for fungicide resistance to develop. Protectant fungicides typically offer broad spectrum control for many different pathogens.

“ Why wouldn’t fungi develop resistance to protectant fungicides? Protectant fungicides are used all the time, often in a weekly manner throughout much of the growing season. “

The answer is in their modes-of-action. Protectant fungicides have modes-of-action that prevent fungal development in different manners. In inorganic compounds, sulfur (M02) prevents fungal growth (i.e., spore germination) by disrupting electron transport in the mitochondria. Coppers (M01), on the other hand, cause non-specific denaturation of proteins. Importantly, the overuse of copper on certain diseases on can lead to copper resistance development (e.g., copper use and bacterial leaf spot in tomato and pepper). Chlorothalonil (M05) inactivates amino acids, proteins, and enzymes by combining with thiol (sulfur) groups. In all cases, a protectant fungicide’s chemistry disrupts fungal growth and development either non-specifically or in multiple manners. Because of this, there is a much lower chance for fungi to develop resistance to them.

Protectant fungicides are contact fungicides, meaning they must be present on the leaf surface prior to the arrival of the fungus and must then come into direct contact with the fungus. Protectant fungicides can be redistributed on the leaf surface with rainfall or overhead irrigation, but can also be washed off by too much of either. Remember, that with protectant fungicides, any new growth is unprotected until the next protectant fungicide is applied, in other words, protectant fungicides are not systemic and do not have translaminar activity like some of the newer fungicide chemistries. For some diseases its difficult to get protectant fungicides where they are needed the most – on the undersides of leaves. Thus, tank mixing protectant fungicides with systemic fungicides or fungicides with translaminar activity is important when disease pressure is high.

Protectant fungicides should be tank-mixed with fungicides with high risks for resistance development. Protectant fungicides used in this manner will help slow (or reduce the chances for) fungicide resistance development on your farm. In any case, it’s best to always follow the label and tank mix protectants with high risk fungicides when suggested or required to do so.

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 May 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 college or technical school pending acceptance and enrollment

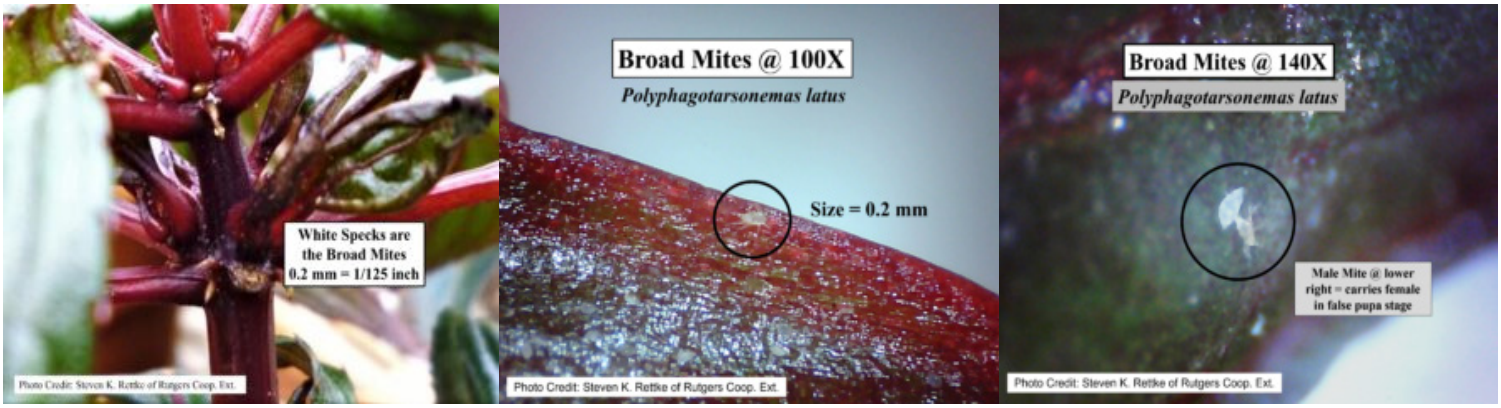
Signed : _____ Date : _____
(Applicant)

Singed : _____ Date : _____
(Parent/Guardian)

Scouting for Broad Mites in the Greenhouse

William Errickson, April 21, 2022
Plant and Pest Advisory

Broad mites (*Polyphagotarsonemus latus*) are an extremely small species of mites that affect many ornamental crops. At this point in the season they may be active in the greenhouse and should be included in all greenhouse IPM scouting programs. Broad mites are only 0.2 mm long, which is about half the size of a two-spotted spider mite. This makes them nearly impossible to spot with the naked eye during regular routine scouting and challenging to locate, even with the use of a hand lens. They have a translucent yellow-green appearance and a short but rapid life cycle ranging from 5 to 13 days.



Broad mites feed on new growth and emit saliva that is toxic to the plants. This results in leaf curl, stunting, and deformity that may be mistaken for herbicide damage, physiological disorders, or a fungal pathogen. Broad mites tend to favor New Guinea impatiens, Sunpatiens, and dahlia in the greenhouse this time of year, though they may also cause damage to gerbera, ivy, lantana, standard impatiens, snapdragon, verbena, begonia, and zinnia. They can spread via plant-to-plant contact and may even hitchhike on whiteflies or aphids to reach a new destination.

Broad mite damage on Sunpatiens. Notice the stunted growth and leaf curling. Photo: W. Errickson

Control can be achieved using miticides that are labeled specifically for broad mites, as some materials that are effective against two-spotted spider mites and spruce spider mites may not work as well on broad mites. Effective materials include Akari, Avid, Dormant Oil, Judo, Magus, Pylon, SanMite, Sirocco, Summer Oil, and Triact. Always follow the instructions on the label and take note of any sensitivities for use on specific plant species. Rotating chemical classes is also very important when treating broad mites because their rapid life cycle has the potential to lead to the development of resistance in a short period of time. Biological controls involving the release of predatory mites that feed on broad mites have also demonstrated success. Predatory mite species that are effective against broad mites include *Amblyseius swirskii*, *Neoseiulus cucumeris*, and *N. californicus*. Broad mites can be effectively managed in the greenhouse if they are detected early and correctly identified as part of a regular IPM program.

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Additional Resources

Broad Mites Fact Sheet, University of Tennessee
https://go.rutgers.edu/zg9kdzod

Broad Mites in Ornamental Crops, Michigan State University
https://go.rutgers.edu/56gic7up

Dealing with Broad Mite, Greenhouse Product News
https://go.rutgers.edu/6doflkwc

Broad Mite is Becoming an Increasing Problem, Greenhouse Management
https://go.rutgers.edu/1pftyvss

CUMBERLAND COUNTY FAIR
July 5—9, 2022

RUTGERS New Jersey Agricultural Experiment Station

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For the 2022 Cumberland County Fair

2022 Cumberland County Fair
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Thank you for your support. Proceeds will benefit the Cumberland 4-H Program.
Phone: 856-451-2800 ext. 3

Bacterial Leaf Spot and Copper Resistance in NJ Tomato and Pepper Crops More Widespread

Andy Wyenandt, April 22 2022

Plant and Pest Advisory

Copper resistance in bacterial leaf spot of tomato and pepper crops has been detected and more widespread than expected. While not surprising, copper resistance has been known to develop for decades now; however, this is the first time it has been confirmed in tomato and pepper crops across 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 2020 and 2021, with help from Dr. Nrupali Patel and Dr. Don Kobayashi, bacteriologists in the Department of Plant Biology located on the New Brunswick campus, a small (NJ-VGA funded) survey was initiated to determine which species of bacterial leaf spot are most prevalent in New Jersey tomato and pepper 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-T4; one for each of the 4 species stated above) 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. Lab testing results from samples collected from the small number of NJ vegetable farms the last two summers has shown the presence of X. euvesicatoria in pepper, as well as X. euvesicatoria and X. perforans in both tomato and pepper in the state, **with ~50% of all 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 2022/2023 Commercial Vegetable Production Recommendations Guide).

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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 2022.

More limited sampling and surveying are planned for the 2022 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 so arrangements can be made.**

For more information on this research and control options please visit https://plant-pest-advisory.rutgers.edu/wp-content/uploads/2022/04/Update-on-BLS-survey-2022.pdf to see presentation.

Damping-off: Identifying and Controlling Pathogens in Transplant Production in 2022

Andy Wyenandt, April 20, 2022
Plant and Pest Advisory

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).

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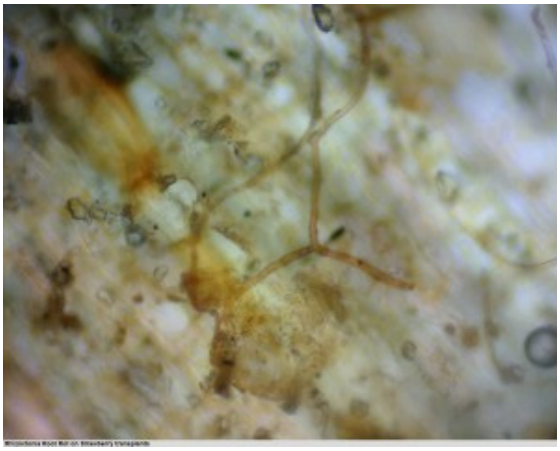
Pythium Root Rot. Photo: D. Groth, LSU

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.

Rhizoctonia: Note the brown "shoestrings" on the outside of the infected strawberry root



Rhizoctonia Root Rot on Strawberry Transplants

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.

Continued on next page

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 2022/2023 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 subtillus* (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 Zerotol 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 2022/2023 Mid-Atlantic Commercial Vegetable Production Recommendations Guide. **Table E-11 in the 2022/2023 guide has been significantly updated and now groups organic or conventional products by group. See individual crop section for options in the field. Always refer to the fungicide label for crop use, pathogens controlled, and application rates.**

Spotted Lanternfly egg hatch is coming or here now – Critical Knockdown in Nurseries

Tim Waller – twaller@njaes.rutgers.edu

Through conversations with nursery operators, state inspectors (NJDOA), and internal agent communications four shade trees represent the vast majority of nursery stock with adult SLF eggs. This means we should be targeting these trees early – treating for nymphs as they emerge from the egg masses and before they move on to more tender hosts.

The vast majority of shade trees with egg masses in NJ are: Red maple, Birch, Willow, and Styrax

Generally, adults are laying eggs on these four nursery crops late summer/fall, then as the nymphs emerge (April/May) they move to more tender growth, often onto understory plants, weeds, hedge rows, roses (wild and cultivated), and tender herbaceous and perennial plants (May, June, early July). This means we have a very short window to target a large percentage of nymph emergence on these four crops with Contact Insecticides. Scout these areas for nymphs over the next few weeks and be at the ready to treat immediately once observed.

Be ready to target nymph populations early this season with contact materials. Once the nymphs have moved on to their favored 1st-3rd instar crops (herbaceous, perennial, roses, grapes, etc.) they will then begin to move back to these four shade trees (and other woody hosts) as 4th instars (red-coloration, mid/late July) and adults (August) that will ultimately mate and lay eggs (September/October), repeating the cycle.

Systemic materials – Generally systemics are best utilized when targeting late instars and adult populations (both born at the nursery and flying in from outside), often requiring approximately 3-4 weeks prior to anticipated insecticidal activity. In the nursery setting we may already be utilizing systemic materials to treat other insect populations, offering some level of protection from the nymphs migrating away from these four shade trees, towards their favored feeding locations. In operations where egg masses have been abundant, treating with systemic materials, when appropriate should be considered to reduce local populations in addition to targeting nymphs with contact materials.

Note – applications during bloom for specific host crops should be avoided to protect pollinators. This message is meant for nursery operators only.

Please visit the Rutgers Plant and Pest Advisory for additional information: https://plant-pest-advisory.rutgers.edu/spotted-lanternfly-egg-hatch-is-coming-critical-knockdown-of-nymphs/

Calendar of Events

- Indicates a newly added event

May 24, 2022

North Jersey Tree Fruit and Vegetable Twilight Meeting II; Phillips Farm Milford, NJ; 4:30 PM-7:30 PM; Meetings will include tours of both research plots and commercial farm operations, and presentations by extension faculty and staff on current pests, horticultural issues and management techniques.; NJ Pesticide Recertification Credits are anticipated for all meetings. Please RSVP for the meetings with a call to Kim Crommelin at 908.788.1338 or kfrey@co.hunterdon.nj.us

July 16-19

Cultivate '22; Greater Columbus Convention Center, Ohio; Learn best practices and foster business connectionsso you and your business perform better, grow faster, than ever and are prepared for the future at this event. Visit www.cultivateevent.org for more information.

August 1-5

2022 Perennial Plant Association National Symposium, Lancaster Marriott at Penn Square, 25 S Queen St., Lancaster PA; Contact the Perennial Plant Association at 888.440.3122 or visit perennialplant.org for more information.

July 30- August 3

ASHS 2022 Annual Conference; Hyatt; Chicago, IL; This conference is where the latest science and technology is showcased related to horticulture. Our mission is to bring together researchers, scientists, industry, academia, extension, government, and students to cultivate ideas and share new techniques relating to horticulture and plant sciences; More info at https://ashs.org/page/GeneralConference

July 31- August 3

International Association for Food Protection; David L. Lawrence Convention Center, Pittsburgh, PA; Information on current and emerging food safety issues, the latest science, innovative solutions to new and recurring problems, and the opportunity to network with thousands of food safety professionals from around the globe; Find more information and register at www.foodprotection.org/annualmeeting/

- **August 24-26**

Farwest; Oregon Convention Center; Portland, OR; The biggest green industry trade show in the West. With nearly 400 exhibitors, nursery and retail garden center industry. Whether you're a grower, retailer, wholesale buyer, supplier, or landscape professional, you'll find that Farwest offers you the complete trade show experience; For more information visit https://farwestshow.com

August 29-30

International Carrot Conference; Mount Vernon, WA; its purpose is to bring together everyone and anyone interested in carrots: growers, packers, shippers, seed producers, breeders, pathologists, sellers, marketers, University and government researchers, extension specialists, students and anyone interested in the carrot industry; For more informationemail dutoit@wsu.edu or snolan@agmgt.com or visit InternationalCarrots.org.

September 26-28

2022 International Pepper Conference; Arizona; The academic program taking place in Tucson, Arizona and the chie pepper variety trial, mechanical harvest, field and equipment demonstrations occurring at the Curry Chile and Seed Co. in Pearce, Arizona. The deadline for early bird registration is August 26, 2022. Registration and additional information can be found at this link: https://extension.arizona.edu/ipc/

Regularly Scheduled Meetings

Pesticide Credit Exams

Testing is currently being held virtually because of the COVID pandemic.

Rutgers has taken over the pesticide exam program.

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

Cumberland County Agriculture Development Board

Virtual Meetings Information can be found on the Public Meeting Calendar on co.cumberland.nj.us

Meetings are held on the 2nd Tuesday of each month. Meetings start at 7 p.m.

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

Cumberland County Board of Agriculture

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

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

For more information call Keith MacIndoe, President at 856-207-7773

Sincerely,

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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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CULTIVATING HEALTHY COMMUNITIES

Farm Cooler Checklist

Whether your winter storage rooms are getting bare or you are making the transition from sweet corn to potatoes, what better time to do a good cleaning and even sanitizing than now?

Housekeeping - Start by emptying the room and removing all visible debris with sweeping or vacuuming. Next scrub with an appropriate detergent soap and rinse according to the cleaner's label. A final step of sanitizing surfaces according to the sanitizer's label may be prudent and could improve storage quality and food safety. If you've used water to rinse, wash or sanitize, be sure to allow time and air flow (and maybe even some heat) for complete drying before packing the cooler again.

This is also a good time to check over the construction and make some simple repairs that are not so simple when tons of produce are in the way. Some examples of maintenance items might include; finally connecting that evaporator drain so it doesn't drip condensate on the bin below, replacing damaged paneling and insulation to prevent rodent visitation and heat gain, replacing exposed light bulbs with shatter proof fixtures or energy efficient upgrades (http://go.uvm.edu/effvtag), or sealing up corners or other areas. More details are provided below and a quick reference checklist is provided on the reverse.

Smooth, clean and shiny, this CoolBot™ cooler used TrussCore™ twinwall PVC as a finish surface.

Finish Surfaces – How clean can you get the inside of your storage room? If you currently have untreated plywood or chipboard, think about upgrading to a smooth, cleanable surface (http://go.uvm.edu/smoothnclean). These finish materials make the space a whole lot easier to keep clean, can help prevent plant pathogens in storage, can improve food safety and make the space more pleasant to work in.

Envelope Check – You can improve energy efficiency, increase storage quality and reduce rodent damage by maintaining a solid envelope around your storage room. While you're cleaning, check all door seals to be sure they are in good repair and are functioning well. Replace worn rubber seals, make door closer and latching adjustments to ensure a proper seal, close the whole room up while standing inside with the lights off and look for daylight around the door or other areas. Seal those spots up. Any gaps in your sheathing or other holes in walls, corners, etc? Seal them up. Obvious signs of rodent intrusion should get extra attention and rodent control measures (http://go.uvm.edu/rats) should be taken.

Equipment Check – Now is a good time to make sure your refrigeration and other temperature control equipment is working as planned.

Connections - Check any visible electrical wiring and refrigerant lines. Any significant wear or obvious damage that should be repaired now? Are refrigerant lines still well-insulated?

This cooler has no floor drains. Instead the evaporator drain is plumbed to a bucket that is emptied according to an SOP.

Inside – Check the evaporator (the place the cold air comes from). Can you see through the fins clearly in every channel (you may need to shine a light from the opposite side)? Is the drain pan clean and free of debris? Is the drain connected to piping or hose and directed to the floor, a bucket or an outside drain? Is the drain clear, clean and functioning properly?

Outside – Are the compressor (generally a black cylindrical part) and condenser (radiator and fan) clean and clear of debris? Grass, leaves, dirt, etc. should be removed from the equipment. Condenser (radiator) fins should be cleaned with a vacuum and even pressure washed to provide for effective heat removal and improved energy efficiency. Is there good air movement possible around the condenser? Is this the year to put a roof on the compressor and condenser?

CoolBots™ (http://go.uvm.edu/coolbot) – Check the pitch of the AC unit. It should be pitched slightly to the outside and there should be a drain hole at a low point to allow water to drain out of the bottom. Are both heat exchangers clean and clear of debris and dust? Is there a good seal around the AC unit to prevent air infiltration? Does your AC unit have a "vent"? Check to be sure it is set in whatever position you want. Venting (or fresh air) will bring in some outside air which is good for higher ethylene producers or crops seeking lower RH storage. Otherwise, the vent should be closed. Also check your CoolBot wiring and especially your fin sensor to be sure they are securely fastened and in position.

Operation - Power up the system and adjust your thermostat to force a call for cooling. Inside - Are all evaporator fans coming on as they should? Is the unit producing cold air? Outside – Is the compressor coming on when there is a call for cooling? Is the refrigerant hot where it should be (between the compressor and the condenser or outside heat exchanger) and cold where it should be (going back inside to the evaporator)?

CoolBots – Does the AC unit power up? The fan should be blowing air. The compressor should come on within about 30 seconds. The CoolBot control should power up and indicate your set-point and current temperature. Does the AC unit produce cold air?

Controls / Thermostats – Is your thermostat as tired as you are? Does it allow you precise control of temperature? Is now the time to upgrade or replace it (http://go.uvm.edu/thermostats)?

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UNIVERSITY OF VERMONT EXTENSION
CULTIVATING HEALTHY COMMUNITIES

Farm Cooler Checklist

Lighting – Do you have functioning lights? Is now a good time to add them in? How about an automatic occupancy switch so they turn on or off automatically when your hands are full of that awesome produce? Have you considered shatter-proof lighting fixtures? Or energy efficiency upgrades (http://go.uvm.edu/effvtag)?

Plan for a Full Room – Think about last year's storage season and what you had a hard time reaching when you needed it. Can you change your loading this year to make access easier? Also remember that you likely have a variety of conditions in your storage room with the coldest, driest, highest airflow zone being close to the evaporator and the warmest, most humid, still zone being at the end furthest from the evaporator. Does your planned loading take that into account? Should crops be relocated to accommodate optimal storage? Any other lessons learned from last year that you can take action on now? Should you consider building additional storage space now to accommodate any expanding production?

CHECKLIST

Cleaning and Sanitizing

- ❑ **Empty** storage room completely.
- ❑ **Sweep / vacuum** inside of storage room from floor to ceiling.
- ❑ **Clean** inside surfaces of storage room with an appropriate cleaner or detergent, following manufacturer's label instructions.
- ❑ **Sanitize** inside surfaces of storage room with an appropriate sanitizer, following manufacturer's label instructions.
- ❑ **Dry thoroughly**. Allow time, provide ventilation and consider heating slightly to ensure complete and thorough drying after cleaning, sanitizing and/or rinsing.
- ❑ **Upgrade or Repair Finish Surfaces** to ensure a solid, smooth, cleanable interior. (http://go.uvm.edu/smoothnclean)

Envelope

- ❑ **Inspect** envelope for damage, cracks or other openings and seal as needed.
- ❑ **Check for daylight** from the inside with the door closed and lights out. Note and repair any worn seals or other places where light comes in.
- ❑ **Adjust door closers and latches** for a secure seal when closed.
- ❑ **Check for signs of rodents** or other pests and make necessary changes to prevent them. (http://go.uvm.edu/rats)

Equipment

- ❑ **Inspect power wiring** and outlets or junction boxes for wear or other items needing repair. Take care to ensure power is off during this check.
- ❑ **Confirm or install working lights.** Consider efficiency upgrades to lighting and using an occupancy switch. (http://go.uvm.edu/effvtag)
- ❑ **Check insulation** and ensure good general condition of refrigerant lines.
- ❑ **Clean evaporator fins** to be sure air can move freely through them. You should be able to see clearly through each channel when a light is shown from the other side.
- ❑ **Clean evaporator drain pain** and look for signs of blockage (e.g. standing water, sediment, mold, etc.)
- ❑ **Ensure evaporator drain is functioning**, connected from pan to an intentional outlet (floor, bucket, outside drain, etc.) and allowing water to flow freely as intended.
- ❑ **Clear the compressor and condenser** (outside) of leaves or other debris.
- ❑ **Clean the condenser (radiator) fins** with a vacuum and/or pressure washer.
- ❑ **Protection the compressor and condenser** from the elements with possible a shed roof, etc.

Operation of Cooling

- ❑ **Confirm thermostat operation**, set a low temperature on the thermostat and listen for the "click" of a relay or note the output indicator light. Consider whether a thermostat upgrade is appropriate. (http://go.uvm.edu/thermostats)
- ❑ **Check operation of evaporator fans (inside).** Do they come on uniformly when the unit is powered up (or when summer cooling mode is selected)? Is the unit providing cold air? Evaporator fans are often a key efficiency upgrade that is likely supported by Efficiency Vermont (http://go.uvm.edu/effvtag).
- ❑ **Check operation of compressor and condenser fan (outside)**. Is the compressor running when there is a call for cooling. Is the condenser fan running. Are refrigerant lines hot between the compressor and the condenser and cold going back to the evaporator inside? You may also want to explore an upgrade of compressor and condenser for improved efficiency (http://go.uvm.edu/effvtag).
- ❑ **Heaters** - Note, these same checks can be used for heated spaces when applied to a heater.

CoolBots™ - (http://go.uvm.edu/coolbot)

- ❑ **Pitched down and out**, allowing for evaporator water to drain away toward the outside.
- ❑ **Ensure the drainage hole is open and clear** allowing water to drain.
- ❑ **Ensure both heat exchangers are clean** (inside / evaporator and outside / condenser).
- ❑ **Set the AC vent** according to whether you want outside air makeup or not.
- ❑ **Check location and condition of temperature sensors**, especially the fin sensor.
- ❑ **Check the seal around the AC unit** in the wall to make sure it is sound and preventing air infiltration.
- ❑ **Check operation of the unit** by forcing a call for cooling.

Capacity and Planning

- ❑ Do you have all the storage space you need for the coming year? Time for a quick expansion or a new zone?

Contact: Chris Callahan. UVM Extension, Agricultural Engineering. 802-773-3349. chris.callahan@uvm.edu. blog.uvm.edu/cwcallah.

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WE R HERE WHEN YOU NEED US

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

*Calendar date predictions for target range as of **4/7/2022***

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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-May**	30-May	**10-May**	5-Jun	**28-May**	20-Jun	**(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)
Adults (feeding / laying eggs)	1	517	1028	**25-May**	18-Jun	**31-May**	24-Jun	**15-Jun**	11-Jul	**(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	**GRANULAR APPLICATIONS and INCORPORATIONS** **Neonicotinoids [4A]** Imidacloprid (Marathon 1%G, Coretect tablets, Mallet 0.5G) ***(Initiate systemic treatments 1-month prior to adult activity)***
				POTENTIAL OVERLAP OF GENERATIONS / STAGES							
Egg hatch - larvae	2	1570	1860	**8-Jul**	17-Jul	**16-Jul**	26-Jul	**5-Aug**	19-Aug	**(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	**19-Jul**	3-Aug	**27-Jul**	13-Aug	**20-Aug**	16-Sep	**(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 - subject to change

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)

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)

BIOLOGICAL / BIORATIONAL

Azadirachtin (Aza-Direct, Azatin-O)
Beneficial nematodes (Millennium)
Entomopathogenic fungi (Ancora, BotaniGuard)
Adult Agitator (Captiva Prime)

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County Broadband

Website: www.countybroadband.info

1. Click the “Take the speed test” button
2. Enter your Address
3. Enter your E-Mail Address
4. Enter Your Phone Number (optional)
5. Select Business or Residential from the dropdown menu
6. Check the box to indicate you are not a robot
7. Click submit my address

After submitting your address, a speed test will be performed in the background allowing time to answer the following questions:

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2. How would you rate your current Internet provider (scale of 1 – 10)
3. How likely are you to switch to a faster and more reliable provider (scale of 1 – 10)
4. Is high speed internet from Comcast/Verizon available at your residence.