RUTGERS
New Jersey Agricultural Experiment Station

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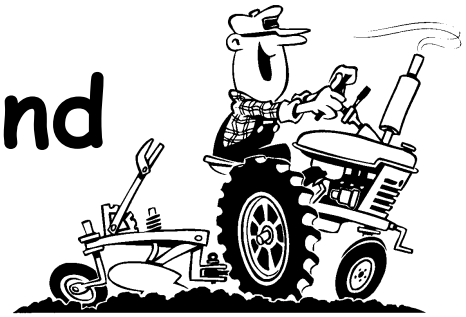
Cultivating Cumberland



August - 2015 VOL. 20, ISSUE 8

Inside this issue:

Attachments:

Tomato Tasting, Vegetable Twilight Meeting & Research Plot Tours

Thursday, August 20, 2015

Tomato Tasting starts at 5:30 p.m.

Vegetable Twilight Meeting and Tours

Start at 6:00 p.m.

AT

Rutgers Agricultural Research & Extension Center

121 Northville Road

Bridgeton, NJ

Pesticide credits have been awarded for this event:

5 credits each for categories 10, 1A and PP2

Bring your insects and plants for identification purposes

See page 7 for complete details

Citing Fecal Contamination, FDA Issues Import Alert for Some Mexican Cilantro

By News Desk | July 28, 2015

The U.S. Food and Drug Administration (FDA) issued an Import Alert on Tuesday about cilantro from the state of Puebla, Mexico, due to concerns about fecal contamination which investigators reportedly found in fields and in cleaning and processing facilities in that area.

The alert affects cilantro being imported to the United States between April 1-Aug. 31, 2015, (*and every year unless on an approved list)* with the agency's action linked to annually recurring outbreaks of cyclosporiasis.

According to FDA, the U.S. Centers for Disease Control and Prevention (CDC) and state public health officials have identified annually recurring outbreaks (in 2012, 2013, and 2014) of cyclosporiasis in the U.S. associated with fresh cilantro from the state of Puebla.

CDC has reported that, as of last August, 304 people were sickened in the 2014 outbreak. About 210 people in Texas have reportedly been sickened so far this year. In 2013, a cyclosporiasis outbreak linked to imported salad mix and fresh cilantro sickened 631 people in 25 states.

There has been an ongoing outbreak of cyclosporiasis in the U.S. since May, and the Texas Department of State Health Services and the Wisconsin Department of Health Services and the Wisconsin Department of Agriculture, Trade and Consumer Protection have identified cilantro from Puebla as a suspect vehicle with respect to separate illness clusters, FDA stated.

FDA noted that it is "extremely unlikely" that these outbreaks are due to isolated contamination events because of their recurring nature, the timing (typically April to August of each year), and because of the association with cilantro from Puebla.

No single supplier, packing date, shipping date, or lot code can explain all the illnesses, the agency added.
Further, "FDA believes the source of C. cayetanensis contamination is likely attributable to a broader source of contamination. Sources of contamination may include fecal contamination of growing areas, irrigation of fields with water contaminated with sewage, cleaning or cooling produce with contaminated water, and/or poor hygienic practices of workers that harvest and process the produce, and lack of adequate cleaning and sanitizing of equipment that comes in contact with the product."

The agency and its regulatory counterparts in Mexico have been investigating farms and packing houses in Mexico, including those in Puebla, to check on conditions and practices which may have resulted in contaminating the cilantro.

From 2013-2015, officials with agencies from both countries inspected 11 farms and packing houses that produce cilantro in the state of Puebla, 5 of them linked to the US C. cayetanensis illnesses, and observed objectionable conditions at 8 of them, including all five of the firms linked through traceback to the U.S. illnesses, FDA stated.

"Conditions observed at multiple such firms in the state of Puebla included human feces and toilet

paper found in growing fields and around facilities; inadequately maintained and supplied toilet and hand washing facilities (no soap, no toilet paper, no running water, no paper towels) or a complete lack of toilet and hand washing facilities; food-contact surfaces (such as plastic crates used to transport cilantro or tables where cilantro was cut and bundled) visibly dirty and not washed; and water used for purposes such as washing cilantro vulnerable to contamination from sewage/septic systems," the alert stated.

"In addition, at one such firm, water in a holding tank used to provide water to employees to wash their hands at the bathrooms was found to be positive for C. cayetanensis. Based on those joint investigations, FDA considers that the most likely routes of contamination of fresh cilantro are contact with the parasite shed from the intestinal tract of humans affecting the growing fields, harvesting, processing or packing activities or contamination with the parasite through contaminated irrigation water, contaminated crop protectant sprays, or contaminated wash waters," FDA stated.

Because of these problems, FDA has concluded that imported fresh cilantro (whether cut or chopped) from Puebla, Mexico, appears to be adulterated and is therefore subject to refusal of admission into the U.S.
However, FDA noted, multi-ingredient processed foods that contain cilantro as an ingredient are not covered under this alert and neither is cilantro that has been processed in other ways besides being cut or chopped (e.g., dried).

Cyclospora cayetanensis is a human-specific protozoan parasite that causes a prolonged and severe diarrheal illness known as cyclosporiasis. In order to become infectious, the organism requires a period outside of its host. Illnesses are known to be seasonal and the parasite is not known to be endemic to the United States.

Cyclosporiasis occurs in many countries, but it seems to be most common in tropical and subtropical regions. People become infected with C. cayetanensis by ingesting sporulated oocysts, which are the infective form of the parasite. This most commonly occurs when food or water contaminated with feces is consumed. An infected person sheds unsporulated (immature, non-infective) C. cayetanenis oocysts in the feces.

Heat-Related Illnesses and Agricultural Producers

Linda M. Fetzer, Penn State Extension

Farmers and ranchers perform job responsibilities in all types of weather conditions including excessive heat and humidity. It is important for agricultural producers to understand risks associated with working in high heat work environments, potential heat-related illnesses, precautionary steps, and appropriate medical responses.

Understanding the Body's Response to Heat:

Our body's primary defense against heat is through sweating. Sweating allows moisture to collect on the skin and evaporate. Sweating happens when the surrounding environment becomes greater than skin temperature. When this occurs, an internal body system called the sympathetic nervous system releases a chemical called acetylcholine which turns on sweat glands in the skin in an area called the dermis. The sweat glands release moisture and move it to the outer surface of the skin for cooling. However, in hot, humid weather, the moisture does not always evaporate and can collect on the skin causing the body to warm up and the heart to pump more blood to the skin. When this happens, the body starts to sweat excessively and depletes the body of water and electrolytes, which can lead to a heat-related illness.

The range for normal body temperature is between 96° to 100°F. Hard exercise, strenuous work, or fever will usually put the body in a range between 101° to 105°F. At 105° to 107°F, cooling treatment or fever therapy may be needed, and at even higher body temperatures, heat exhaustion and heat stroke usually occur. Heat exhaustion and heat stroke indicate a serious impairment to the body's cooling system and is a definite signal for medical assistance. Heat stroke or body temperatures beyond 110°F may result in death.

Risk Factors for Heat-Related Illnesses:

Everyone is at risk for heat-related illness if they do not follow standard precautionary measures. The following factor(s) can increase the chance for developing one of the five main heat-related illnesses:

- Being elderly or an infant.
- Having certain medical conditions such as circulatory problems, heart conditions, or Pregnancy.
- Being physically unfit or overweight.
- Consuming alcohol and/or drugs (including prescription medication; for example, the medication atropine interferes with the ability to sweat).
- Having lower heat tolerance levels or not becoming acclimated to working in high heat and humidity.
- High temperatures and humidity levels in the environment (as well as sun radiation or heat -conducting surfaces like black asphalt).
- Not having adequate fluid intake levels needed to hydrate the body.

- Limited air flow or breeze to aid in the cooling process.

Breakdown of Common Heat-Related Illnesses

There are five heat-related illnesses: heat rash, syncope, cramps, exhaustion, and stroke. Heat exhaustion and heat stroke are typically the most severe and require immediate medical attention. Figure 1 outlines each illness, typical symptoms, and treatment.

Figure 1: Breakdown of Heat-Related Illnesses

Heat-Related Illnesses	Cause	Symptoms	Treatment
Heat rash	Excessive sweating during humid weather	Red, blotchy skin rash; clusters of pimples or small blisters	Keep the affected area dry, and treat with cornstarch or powder. Work in a cooler, less humid work environment.
Heat syncope	Prolonged standing or rising suddenly from a sitting or lying position	Light-headedness, dizziness, or fainting	Move person to a cool place to lie down, elevate the feet, and give liquids to drink.
Heat cramps	Loss of body salts and fluids from sweating during strenuous activity	Pain in stomach, arms, and/or legs	Stop activity, drink clear or sports beverage. Massage affected muscles.
Heat exhaustion	Excessive loss of body salts and water from sweating	Cool, pale skin, dizziness, headache, cramps, nausea, sweating, weakness, confusion, high body temperature, and unconsciousness	Have the person drink plenty of cool fluids, remove excess clothing, and apply cool compresses. Call for medical attention.
Heat stroke	System that regulates body temperature fails and the body temperature rises to critical levels	High temperature, hot dry skin, slurred speech, confusion, loss of consciousness, and seizures	Immediately call for medical assistance. Move the person to a cool place, and slightly elevate the head and shoulders. Remove outer clothing, and cool the body with water, wet towels or sheets.

Recommendations to Avoid Heat-Related Problems:

- Do not wait until you are thirsty -- drink approximately eight ounces (one cup) of water every 15 to 30 minutes.
- Take a 15-minute break in a shaded area every two hours.
- Monitor the weather, and schedule strenuous work activities accordingly to reduce exposure to high heat situations.
- Wear light-colored, lightweight, and loose-fitting clothing.
- Avoid the use of alcohol, drugs, caffeine, and large amounts of sugar when exposed to heat because they can increase your rate of dehydration.
- Check your prescriptions and over-the-counter medications to determine if there are any side effects when you are exposed to heat.
- Appropriately wear specialized protective gear such as cooling vests to reduce your risk of a heat illness; if used inappropriately, heat illness can actually increase.
- Learn about prevention of heat illness and teach your workers about health & safety instructions related to working in hot weather and appropriate responses to heat-related illnesses.
- Gradually build up a tolerance to working in the heat. If a person has a severely low tolerance to heat, that person may need to perform tasks that limit exposure to the heat.
- Certain types of personal protective equipment (PPE) can increase the risk of heat stress, such as protective suiting. Schedule jobs that require PPE during cooler times of the day.
- Recognize the conditions that can affect body heat such as fever, physically strenuous work, and even time of day (for example, body temperature is higher in late afternoons).
- Talk to your physician if you have a chronic health condition or disability (e.g., spinal cord injuries, multiple sclerosis) before working in the heat.

More information including a video about the risk of heat-related illnesses for outdoor workers can be found at the Occupational Safety and Health Administration website at < http://www.osha.gov/SLTC/heatillness/index.html >.

Heat-related illnesses and agricultural producers. (2012) Farm and Ranch eXtension in Safety and Health (FReSH) Community of Practice. Retrieved from < http://www.extension.org/pages/62261/heat-related-illnesses-and-agricultural-producers >.

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Vegetable Twilight Meeting and Research Tour

Thursday, August 20, 2015, 5:30 p.m. (meet at trailer near parking lot)
Rutgers Agricultural Research & Extension Center
121 Northville Road, Bridgeton, NJ (Upper Deerfield)

We will have tomato tasting and tour research plots

5:30 p.m. – **Taste the new tomato breeding lines that will be released soon and tour the tomato plots** – Tom Orton, PhD, Specialist in Vegetables

Check out a mobile market/portable cooler trailer with CoolBot™'s alternative to high cost refrigeration units– Rick VanVranken, Agricultural Agent Atlantic County

6:00 – ***Summer/Winter Squash and Cucumber fungicide evaluations for Downy and Powdery Mildew Control** - C. Andrew Wyenandt, PhD, Specialist in Vegetable Pathology

6:30 – **Advances in breeding lines and fungicide evaluation for basil Downy Mildew Control** – Rob Pyne, Graduate Student, Rutgers and C. Andrew Wyenandt, PhD

7:00 – **Fungicides for controlling Phytophthora Blight control in cucurbits** – C. Andrew Wyenandt, PhD

7:30 – **Evaluation of Bell Peppers cultivars and breeding lines for Phytophthora tolerance** – C. Andrew Wyenandt, PhD

8:00 – ***Slicing and pickling cucumber variety evaluation for yield and Downy Mildew tolerance** – Wes Kline, PhD, Agricultural Agent

8:30 – **Phomopsis Blight control in eggplant** – C. Andrew Wyenandt, PhD

*Note: The cucurbit studies are funded in part through the Charles E. and Lena Maier Fund, the Vegetable Growers Association of New Jersey and the New Jersey Agricultural Experiment Station

Pesticide credits assigned: 5 credits each for categories 10, 1A and PP2.

Michelle Infante-Casella
Agriculture Agent, RCE
Gloucester County

Wesley Kline
Agriculture Agent, RCE
Cumberland County

Richard VanVranken
Agriculture Agent, RCE
Atlantic County

Heat Effects on Vegetable and Fruit Crops

Gordon Johnson, Extension Vegetable & Fruit Specialist
WCU Volume 23, Issue 18 – July 24, 2015

2015 has not been an excessively hot year. However, we have recently had some typical July weather with high temperatures and high humidity. The following are some effects of high temperatures on vegetable and fruit crops.

The plant temperature at which tissue dies is around 115°F. Normally, plant temperature is just above air temperature. However, plant temperature can rise to a critical level under certain conditions. Plants have 3 major ways in which they dissipate excess heat: 1) long-wave radiation, 2) heat convection into the air and 3) transpiration.

A critical factor is transpiration. If transpiration is interrupted by stomatal closure due to water stress, inadequate water uptake, injury, vascular system plugging or other factors, a major cooling mechanism is lost. Without transpiration, the only way that plants can lose heat is by heat radiation back into the air or wind cooling. Under high temperatures, radiated heat builds up in the atmosphere around leaves, limiting further heat dissipation.

Dry soil conditions start a process that can also lead to excess heating in plants. In dry soils, roots produce Abscisic Acid (ABA). This is transported to leaves and signals to stomate guard cells to close. As stomates close, transpiration is reduced. Without water available for transpiration, plants cannot dissipate much of the heat in their tissues. This will cause internal leaf temperatures to rise.

Vegetables can dissipate a large amount of heat if they are functioning normally. However, in extreme temperatures (high 90s or 100s) there is a large increase the water vapor pressure deficient (dryness of the air). Rapid water loss from the plant in these conditions causes leaf stomates to close, again limiting cooling, and spiking leaf temperatures, potentially to critical levels causing damage or tissue death.

Very hot, dry winds are a major factor in heat buildup in plants. Such conditions cause rapid water loss because leaves will be losing water more quickly than roots can take up water, leading to heat injury. Therefore, heat damage is most prevalent in hot, sunny, windy days from 11 a.m. to 4 p.m. when transpiration has been reduced. As the plants close stomates to reduce water loss, leaf temperatures will rise even more. In addition, wind can decrease leaf boundary layer resistance to water movement and cause quick dehydration. Wind can also carry large amounts of advected heat.

Photosynthesis rapidly decreases above 94°F, so high temperatures will limit yields in many vegetables and fruits. While daytime temperatures can cause major heat related problems in plants, high night temperatures can have great effects on vegetables, especially fruiting vegetables. Hot night temperatures (nights in the 80s) will lead to greater cell respiration. This limits the amount of sugars and other storage products that can go into fruits and developing seeds.

High temperatures also can cause increased developmental disorders in fruiting vegetables. A good example is with pollen production in beans. As temperatures increase, pollen production decreases leading to reduced fruit set, reduced seed set, smaller pods, and split sets.

Heat injury in plants includes scalding and scorching of leaves and stems, sunburn on fruits and stems, leaf drop, rapid leaf death, and reduction in growth. Wilting is the major sign of water loss

which can lead to heat damage. Plants often will drop leaves or, in severe cases, will "dry in place" where death is so rapid, abscission layers have not had time to form.

There are three types of sunburn which may effect fruits and fruiting vegetables. The first, sunburn necrosis, is where skin, peel, or fruit tissue dies on the sun exposed side of the fruit. Cell membrane integrity is lost in this type of sunburn and cells start leaking their contents. The critical fruit tissue temperature for sunburn necrosis varies with type of fruit. For cucumbers research has shown that the fruit skin temperature threshold for sunburn necrosis is 100 to 104°F; for peppers, the threshold is 105 to 108°F, and for apples the critical fruit skin temperature is 125-127°F. Fruits with sunburn necrosis are not marketable.

The second type of sunburn injury is sunburn browning. This sunburn does not cause tissue death but does cause loss of pigmentation resulting in a yellow, bronze, or brown spot on the sun exposed side of the fruit. Cells remain alive, cell membranes retain their integrity, cells do not leak, but pigments such as chlorophyll, carotenes, and xanthophylls are denatured or destroyed. This type of sunburn browning occurs at a temperature about 5°F lower than sunburn necrosis (115 to 120° F in apples). Light is required for sunburn browning. Fruits may be marketable but will be a lower grade.

The third type of sunburn is photo oxidative sunburn. This is where shaded fruit are suddenly exposed to sunlight as might occur with late pruning, after storms where leaf cover is suddenly lost, or when vines are turned in drive rows. In this type of sunburn, the fruits will become photo bleached by the excess light because the fruit is not acclimatized to high light levels, and fruit tissue will die. This bleaching will occur at much lower fruit temperatures than the other types of sunburn.

Leaf scald occurs most commonly when temperatures are in the high 90s. At these air temperatures, crop leaf temperatures may rise to a critical level where plant cells are damaged and they desiccate quickly, leaving the scalded appearance. Upper leaves are the most exposed to radiation from the sun and therefore the most susceptible. Drying winds and low humidity will make scald more severe. Any interruption in transpiration during this period will increase leaf temperature even more and make scald more severe.

On black plastic mulch, surface temperatures can exceed 150°F. This heat can be radiated and reflected onto vegetables causing tremendous heat loading. This is particularly a problem in young plants that have limited shading of the plastic. This can cause heat lesions just above the plastic. Heat lesions are usually first seen on the south or south-west side of stems. High bed temperatures under plastic mulch can also lead to reduced root function limiting nutrient uptake. This can lead to increased fruit disorders such as white tissue, yellow shoulders, and blotchy ripening in tomato fruits.

High heat and associated water uptake issues will cause heat stress problems. As heat stress becomes more severe a series of event occurs in plants starting with a decrease in photosynthesis and increase in respiration. As stress increases, photosynthesis shuts down due to the closure of stomates which slows or stops CO_2 capture and increases photo-respiration. This will cause growth inhibition. There will be a major slow-down in transpiration leading to reduced plant cooling and internal temperature increase. At the cellular level, as stress becomes more severe there will be membrane integrity loss, cell membrane leakage and protein breakdown. Toxins generated through cell membrane releases will cause damage to cellular processes. Finally, if stress is severe enough there can be plant starvation through rapid use of food reserves, inefficient food use, and inability to

call on reserves when and where needed.

Another negative side effect of reduced plant photosynthate production and lower plant food reserves during heat stress is a reduction in the production of defensive chemicals in the plant leading to increased disease and insect vulnerability.

The major method to reduce heat stress is by meeting evapotranspiration demand with irrigation. Use of overhead watering, sprinkling, and misting can reduce of tissue temperature and lessen water vapor pressure deficit. Mulches can also help greatly. You can increase reflection and dissipation of radiative heat using reflective mulches or use low density, organic mulches such as straw to reduce surface radiation and conserve moisture. In very hot areas of the world, shade cloth is used for partial shading to reduce advected heat and total incoming radiation.

Control of sunburn in fruits starts with developing good leaf cover in the canopy to shade the fruit. Fruits most susceptible to sunburn will be those that are most exposed, especially those that are not shaded in the afternoon. Anything that reduces canopy cover will increase sunburn, such as foliar diseases, wilting due to inadequate irrigation, and excessive or late pruning. Physiological leaf roll, common in some solanaceous crops such as tomato, can also increase sunburn.

In crops with large percentages of exposed fruits at risk of sunburn, fruits can be protected by artificial shading using shade cloth (10-30% shade). However, this is not practical for large acreages. For sunburn protection at a field scale, use of film spray-on materials can reduce or eliminate sunburn. Many of these materials are Kaolin clay based and leave a white particle film on the fruit (such as Surround, Screen Duo, and many others). There are also film products that protect fruits from sunburn but do not leave a white residue, such as Raynox. Apply these materials at the manufacturer's rates for sunburn protection. They may have to be reapplied after heavy rains or multiple overhead irrigation events.

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North and South Jersey Twilight Winegrape Meetings

	When	Where
South Jersey	August 12 Wed. 6:00 PM	Salem Oak Vineyards 60 N Railroad Ave, Pedricktown NJ 08067
North Jersey	August 13 Thus. 6:00 PM	Beneduce Vineyards 1 Jeremiah Ln, Pittstown NJ 08867

6:00 pm. **Welcome Remarks and Introduction**
Daniel Ward, Extension Specialist, Pomology and Viticulture, Rutgers

6:05 pm. **Root Zone Management for Sustainable Grape Production**
Michela Centinari, Assistant Professor, Viticulture, Penn State

6:30 pm. **Current Survey Results and Management Options for Grape Berry Moth**
*Anne Nielsen, Extension Specialist in Fruit Entomology, Rutgers

6:50 pm. **Grape Root Borer, Biology, Monitoring and Management**
Dean Polk, Statewide Fruit IPM Agent, Rutgers Cooperative Extension

7:10 pm. **A word About Foliar Macro Nutrient Applications**
Gary Pavlis, Small Fruit Extension Agent, Atlantic County

7:30 pm. **Evaluating Fruit Maturity in the Vineyard**
Daniel Ward, Extension Specialist, Pomology and Viticulture, Rutgers

7:50 pm. T**raining Canes for Managing Fruit Zones – Options.**
Hemant Gohil, Wine grape and Tree Fruit Extension Agent, Gloucester Co.

8:00 pm. **Adjourn**

***will be presenting only at North Jersey meeting on August 13.**

Pesticides credits for private applicator (1A # 6 credits) and agricultural area (PP2 # 6 credits) will be provided

SPIDER MITES IN VEGETABLES

Dr. Wesley Kline, Agricultural Agent

Two Spotted Spider Mites *Tetranychus urticae* (Koch) suck plant juices from leaves causing them to turn yellow then brown. When populations are high, webs will be visible on the plants. Two Spotted Mites are generally a problem during hot dry weather in fields. However, anyone who is growing in high tunnels can have spider mites any time. Tomatoes, cucumbers, raspberries and blackberries are especially susceptible to infestations in high tunnels.

There is a second mite which we see on occasion the Cyclamen mite *Steneotarsonemus pallidus.* This mite is more of a concern in cool weather (early spring or fall). They can be found on flowering annuals and strawberries. Peppers are the main place we see them in vegetables. They inject a toxin into the plant during feeding which causes the foliage to be distorted. The fruit will show russeting and distortions especially if feeding takes place on the blossoms and very young fruit.

Weather and Cultural Influence on Mite Problems

The spider mite population depends on many factors, including the weather (or weather pattern over time), host crops, beneficial predators, cultural practices, crop stress, and the insecticide/miticide usage. When field margins, weedy ditches and hedgerows, nearby wheat and soybean fields, grass and alfalfa pastures start to dry down rapid mite population buildup and migration into nearby vegetable fields may occur. Mowing green weeds around field borders is an important management tactic for control of spider mites. Early infestations, usually confined to field borders, can be monitored and controlled by spot treatments. Dry weather is an important factor because high numbers of natural predators develop in wet seasons to keep the spider mites more in balance.

Dust and Spider Mite Problems

Dirt lanes may partially create conditions that are favorable to spider mite outbreaks. As the lane becomes dry, they serve as a source of readily disturbed dust, which is distributed throughout a field by vehicle operation during hot, dry weather. The dust settles on the leaves of the crop, and reduces predation by natural predators such as lacewings, spiders, predatory mites, etc. Spider mites also spin a complex web that entraps the dust particles, providing an excellent refuge for mites to avoid predation. Also, spider mite populations thrive in dusty areas regardless of host plant, and dusty plants enable the mite population to rapidly increase.

Most importantly, a layer of dust on the leaves prevents an application of a miticide (pesticides that are toxic primarily to certain species of mites) from effectively reaching the target, i.e., the mites. Most miticides work though contact activity, and if the sprayed material is not able to reach the pest, it will most likely not be effective.

Pesticide Usage

Insecticides do not control mites, a miticide must be applied for control. If a miticide is necessary, apply only on an as-needed basis. Spot treat the areas where mites are becoming a problem. Through coverage of leaves, especially the leaf underside is necessary to obtain adequate control. Heavy mite infestations or infestations where webbing has occurred are much more difficult to bring under control. Consult the 2015 New Jersey Commercial Vegetable or Fruit Recommendations for controls.

Biological Control

Research in New Jersey has shown that the predatory mite *Neoseiulus fallacis*, if deployed under favorable conditions is capable of providing satisfactory suppression of Two-Spotted Mites (TSSM) in high tunnel vegetable production. The mite should be deployed when TSSM are first detected. If there are no TSSM in the high tunnel the predatory mite may leave searching for prey.

Extended periods of high temperature (above 85°F) and corresponding low relative humidity levels (below 50%) that favor the rapid increase of TSSM on host crops are not ideal conditions for *N. fallacis*. These conditions are common late in June and into July in New Jersey high tunnels. As a result, first or second releases of *N. fallacis* late in the high tunnel crop cycle are not likely to be successful. Attempts to manage late season TSSM populations with the ladybird beetle *Stethorus punctillum* was unsuccessful and was likely due to high temperatures as well. Suppression of TSSM is achieved with releases of *N. fallacis* in April through early June.

Under reasonable conditions for *N. fallacis*, one release at a rate of 9-15 predators per yd^2 of high tunnel floor space is sufficient to achieve at least suppression of TSSM in high tunnel vegetables. Crops with favorable leaf surfaces like pepper or zucchini are more likely to retain *N. fallacis* in the presence of TSSM than is tomato. Successful suppression of TSSM in tomato may be achieved if *N. fallacis* is deployed when TSSM is initially discovered at low levels.

There are other predatory mites which may control mites under higher temperature conditions such as *N. californicus* and *Phytoselulus persimilis.*

Calendar of Important Events

Indicates the newly added event since last calendar

August 2015

August 8-11
10th Annual NAFDMA Advanced Learning Retreat, Alstede Farms, Chester, NJ. For more information visit: www.farmersinspired.com

August 11-12
North American Strawberry Growers Association Summer Tour, Maryland. For more information visit: www.nasga.org

August 11-14
US Potato Board summer meeting, Canad Inn, Grand Forks, North Dakota. For more info email: Caitlin@uspotatoes.com

August 17-21
Introduction to Food Science, Rutgers Continuing Education, 102 Ryders Lane, New Brunswick; $1,495 by 8/3. For more information visit: www.cpe.rutgers.edu or call 732-932-9271

August 19-21
Agricultural Plastics Recycling Conference & Trade Show, San Diego, California, Private $497; Farmers/Government/non-profit $397 and students $127. For more information visit: agplasticconference.com

August 20-21
Apple Crop Outlook & Marketing Conference, The Ritz-Carlton, Chicago. For more information visit: www.usapple.org

August 20
NJ Pest Management 68th Annual Clinic, Tradeshow and Clambake, Rutgers Cont. Ed., 102 Ryders Lane, New Brunswick. For registration and pesticide recertification credits call Claudine Oleskin 732-932-9271 x614 or email: coleskin@rci.rutgers.edu

August 20
Vegetable Twilight Meeting, Research Tour and Tomato Tasting, Rutgers Agricultural Research & Extension Center, 121 Northville Road, Bridgeton, NJ; 5:30 p.m.—8:30 p.m. Free event; pesticide credits have been requested.

August 20
NJPMA's 68th Annual Clinic, Tradeshow & Clambake, Rutgers Continuing Education, 102 Ryders Lane, New Brunswick. For more information call 848-932-9271 or visit: www.cpe.rutgers.edu/njpma

September 2015

September 23-24
Sensory Evaluation, Rutgers Continuing Education, 102 Ryders Lane, New Brunswick; $845 by 9/9; $895 after. For more information visit: www.cpe.rutgers.edu/food or call 732-932-9271

September 25
Statistics for Food Scientists, Rutgers Continuing Education, 102 Ryders Lane, New Brunswick; $395 by 9/11; $425 after. For more information visit: www.cpe.rutgers.edu or call 732-932-9271.

October 2015

October 16-17
Fall Flower & Garden Fest, Truck Crops Experiment Station, Crystal Springs, Mississippi. Free, open to the public 9am - 2pm. For more information call 601-892-3731 or visit: www.msucares.com/fallfest/

October 23-25
Produce Marketing Association Fresh Summit 2015, Atlanta, Georgia, World Congress Center. For more info visit: www.pma.com

November 2015

November 4-6
HACCP Plan Development for Food Processors, Rutgers Cont. Ed, 102 Ryders Lane, New Brunswick; $945 by 10/21; $995 after. For more information visit: www.cpe.rutgers.edu/food or call 732-932-9271

November 5-7
2015 American Agri-Women Convention, Double Tree by Hilton, Portland, Maine. For more info email: pam@countysuperspuds.com

November 9-13
2015 Irrigation Show & Education Conference, Long Beach, California. For more information visit: www.irrigation.org

November 11-13
Better Process Control School, Rutgers Continuing Education, 102 Ryders Lane, New Brunswick; $995 by 10/28; $1,095 after. For more information visit: www.cpe.rutgers.edu/food or call 732-932-9271

November 16-18
Southeast Strawberry Expo, Charlotte, N.C. For more information visit: www.ncstrawberry.com

November 18-19
Pacific Northwest Vegetable Association Conference & Trade Show, Three Rivers Convention Center, Kennewick, Wash. For more information call 509-585-5460 or visit: www.pnva.org

December 2015

December 1-2
30th Annual Southeast Vegetable & Fruit Expo, Myrtle Beach, South Carolina. For more information visit: www.ncvga.com

December 3-4
Practical Food Microbiology, Rutgers Cont. Ed, 102 Ryders Lane, New Brunswick; $795 by 11/19; $825 after. For more information visit: www.cpe.rutgers.edu/food or call 732-932-9271

December 7-9
Washington State Tree Fruit Association Annual Meeting, Yakima, Washington. For more information visit: www.wahort.org

December 8-10
Great Lakes Fruit, Vegetable and Farm Market EXPO, Grand Rapids, Mich. For more information visit: www.glexpo.com

January 2016

January 4-5
Kentucky Fruit and Vegetable Conference, Embassy Suites Hotel, Lexington, Ky. For more information call John Strang 859-257-5685 or email: jstrang@uky.edu

January 6-8
Illinois Specialty Crops, Agritourism and Organic Conference, Crowne Plaza Hotel, Springfield, Ill. For more information call 309-557-2107 or email: cblary@ilfb.org

January 18-20
2016 OPGMA Congress, Kalahari Resort & Convention Center, Sandusky, Ohio. For more information visit: www.opgma.org

January 19-21
Indiana Hort Congress, Wyndham Indianapolis West, Indianapolis. For more information visit: www.inhortcongress.org

January 19-21
Empire State Producers Expo, Syracuse, N.Y. For more information visit: www.hort.cornell.edu/expo

January 24-26
Wisconsin Fresh Fruit & Vegetable Conference, Wisconsin Dells, Wisconsin. For more information visit: www.wiberries.org

January 27-30
Practical Tools and Solutions for Sustaining Family Farms Conference, Lexington, Ky. Southern Sustainable Agriculture Working Group. For more information visit: www.ssawg.org

January 28-29
Iowa Fruit and Vegetable Growers Annual Conference, Ankeny, Iowa. For more information call Adam Hohl 319-316-2650 or email: info@ifvga.org

February 2016

February 2-4
Mid-Atlantic Fruit & Vegetable Convention, Hershey, PA. For more information visit: www.mafvc.org

February 6-12
IFTA 59th Annual Conference, Michigan. For more information visit: www.ifruittree.org

February 9-11
New Jersey Agricultural Convention & Trade Show, Harrah's Convention Center, Atlantic City, NJ. For more information visit: www.njveggies.org

February 25-27
MOSES Organic Farming Conference, La Crosse, Wis. For more info visit: www.mosesorganic.org

REGULARLY SCHEDULED MEETINGS

✔ Indicates meeting will be held at RCE of Cumberland County

✔	✔	✔
Pesticide Certification Exam Schedule—Cumberland County **291 Morton Avenue** **Millville, NJ 08332** **(Between Rosenhayn & Carmel)**	**Cumberland County Agriculture Development Board** **Soil Conservation Office** **1516 Highway 77** **Deerfield Street, NJ 08332**	**Cumberland County Board Of Agriculture** **291 Morton Avenue** **Millville, NJ 08332** **(Between Rosenhayn & Carmel)** **7 pm meetings**
2015	2015	2015
Oct 1	Aug 12 Sep 9 Oct 7 Nov 18 Dec 9	Sep 17 Oct 15 Nov 19 Dec 17
To Register call 609-984-6614 **For directions call 856-451-2800** **********	**Reg. Meetings start at 7 p.m.** **Call DeAnn at 856-453-2211** **********	**For info call Hillary Barile,** **President 856-453-1192** **********

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 609-292-5532

Aug 21
Sep 18 Oct 16 Nov 20

Sincerely,

James R. Johnson
Agricultural Agent
Nursery Management Commercial
Internet: jjohnson@njaes.rutgers.edu

Wesley L. Kline, Ph.D.
Agricultural Agent
Vegetable & Herb Production
Internet: wkline@njaes.rutgers.edu

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/

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Extension Education Center
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Millville, NJ 08332-9791

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