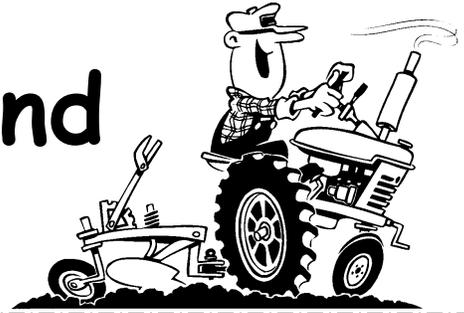


# Cultivating Cumberland

July - 2012 VOL. 17, ISSUE 7



## Inside this issue:

Twilight Day	1
Center for Produce Safety	2
Maintaining Drip Irrigation Systems	3-7
Orvego (BAS 651)F	7
Public Health Pesticides	7
Jersey Fresh Interns Wanted	7
Nutrients Cost Per Pound	8
Calendar of Important Events	9-12
Regularly Scheduled Meetings	13
Attachments:	
Vegetable Alert—Late Blight	

## Twilight Day-Neutral Strawberry Meeting in Southeastern Pennsylvania

Scott Guiser ([sxg6@psu.edu](mailto:sxg6@psu.edu)), Penn State Extension Bucks County

Linvilla Orchards was awarded a Pennsylvania Specialty Crops Grant to investigate the feasibility of commercial scale production of day-neutral, also known as everbearing strawberries. You are invited to see more than 4 acres of production, including 3 acres of the variety Seascape established in the spring of 2012. Harvest should be in full swing at the meeting date of July 12. There is no charge for the meeting but please call Linvilla Orchards at 610-876-7116 before July 11 so we can get a head count for refreshments. Linvilla Orchards is located at 137 West Knowlton Rd, Media, PA, Delaware County.

Norm Shultz, orchard manager, will discuss management practices he has used and his vision for day-neutral strawberry production in Pennsylvania. Kathy Demchak, Penn State Extension small fruit specialist will be on hand to discuss her research experiences with strawberries. Pesticide credits will be provided.

The meeting will begin at 5:30 with light refreshments. We will head to the fields at 6:00. In addition to strawberries, Linvilla grows approximately 30 acres of apples, peaches, pears, blackberries and blueberries and market them at their farm market in Delaware County, southeastern Pennsylvania.

Don't miss this opportunity to get a first-hand look at a new strawberry production system as well as a premier retail marketing operation at Linvilla Orchards.

## Center for Produce Safety

There are a large number of projects and organizations involved in food safety research and education. The Center for Produce Safety (CPS) is unique in that it is a collaborative effort among industry, government and the scientific community and focuses on the practical questions that affect the produce industry. They try to identify gaps in food safety knowledge and provide funding to address those gaps. The Center is located at the University of California at Davis, but funds research across the United States. In three years, they have awarded \$9.2 million and funded 54 one-two year research projects at 18 universities and organizations. These applied projects must come up with answers in a short time that is directly applicable to the industry. Following are examples of projects which will be discussed this week at their annual meeting:

- How far will *E. coli* 0157:H7 travel in the air from cattle production areas to a leafy green field
- Ways to reduce *E. coli* in irrigation water
- Evaluation of risks for *Salmonella* contamination in irrigation water from a mixed produce farm
- Risk assessment of *Salmonella* preharvest internalization in relation to irrigation water quality standards for melons and other cucurbits (squashes)
- Pathogen transfer risks associated with specific tomato harvest and packing operations
- Developing and validating practical strategies to improve microbial safety in composting process control and handling practices
- Evaluation and optimization of postharvest intervention strategies for reduction of bacterial contamination on tomatoes
- Improving produce safety by stabilizing chlorine in washing solutions with high organic loads

These are just a few of the presentations that are directly applicable to New Jersey growers. The more we can find out about how pathogens contaminate produce the better the chance is to focus on those areas. This will help reduce the need for some recordkeeping and make food safety plans simpler. Over the next few issues, I will discuss the results of these research topics as they apply to New Jersey conditions.

## Maintaining Drip Irrigation Systems

Bill Lamont ([wlamont@psu.edu](mailto:wlamont@psu.edu)), Penn State Horticulture and Extension

Drip irrigation systems are becoming more widely used for horticultural crop production, especially vegetable crops. The system must function efficiently during the entire growing season. Failure at a critical point in the crop production cycle can cause loss of the entire crop. System failures are often due to inadequate maintenance of the system especially if fertigation is being utilized to supply nutrients to the plant's root zone. Maintenance of the drip irrigation system does take time and understanding; however, maintenance is critical for successful use of drip irrigation systems. This article should help one understand how to maintain drip irrigation systems.

### Water Quality

Water for drip irrigation can come from wells, ponds, rivers, lakes, municipal water systems, or plastic-lined pits. Water from these various sources will have large differences in quality. Well water and municipal water is generally clean and may require only a screen or disc filter to remove particles. **However, no matter how clean the water looks, a water analysis/quality test prior to considering installation of a drip irrigation system should be completed to determine if precipitates or other contaminants are in the water.** This water quality analysis should identify inorganic solids such as sand and silt; organic solids such as algae, bacteria, and slime; dissolved solids such as iron, sulfur, and calcium; and pH of the water. Water testing can be done by a number of laboratories in the state. Your local Cooperative Extension Service (CES) County Agent can supply a list of laboratories or suggest a local lab that can do water quality analysis. Check with the lab first to obtain a sample kit containing a sampling bottle that is clean and uncontaminated.

**Table 1: Criteria for Plugging Potential of Drip Irrigation System Water Sources**

Factor	Plugging Hazard		
	Slight	Moderate	Severe
	[in parts per million (ppm)* except pH]		
<b>Physical</b>			
Suspended Solids	<50	50-100	>100
<b>Chemical</b>			
pH	<7.0	7.0-7.5	>7.5
Manganese	<0.1	0.1-1.5	>1.5
Iron	<0.1	0.1-1.5	>1.5
Hardness	<150	150-300	>300
Hydrogen sulfide	<0.5	0.5-2.0	>2.0

\*Some water reports list results as milligrams per liter - mg/L which is equal to parts per million-ppm

In addition to these factors, it is desirable to ask for any additional tests that might be necessary. If the water is also to be used as a household supply or might be used as a drinking water source, the analysis should also include the basic drinking water analysis which includes bacterial counts, nitrates, or other suggested tests. Also salts, Chlorides, Sodium, Calcium (for general irrigated water quality).

Hydrogen sulfide can often be detected by a bad "rotten egg" smell. If a review of your water test indicates factors that may cause potential plugging (Table 1), then special care in drip system maintenance needs to be practiced. High levels of a factor might not render a well unsuitable for drip irrigation but will make appropriate water treatment a requirement before successful use in a drip irrigation system.

**grooved-disk filters, they are highly recommended for water sources that have high levels of suspended organic and inorganic materials.**

### **Maintenance of the System Filters**

Both screen and sand media filters in a drip irrigation system should be checked during or after each operating period and cleaned if necessary. A clogged screen or grooved-disk filter can be cleaned with a stiff bristle brush or by soaking in water. A sand media filter should be backflushed when pressure gauges located at the inlet and outlet sides indicate a five psi difference. Check drip irrigation lines for excessive leaking, and look for large wet areas in the planting area indicating a leaking tube or defective emitter. It is also a good practice to flush submains and laterals periodically to remove sediments that could clog emitters. Systems can be designed with automatic backflushing devices and automatic end line flushing devices, but still require manual checks.

### **Chemical Control Measures**

Unfortunately, filtration alone is not always adequate to solve all water quality problems. Chemicals are necessary to control algae, iron and sulfur bacteria, and disease organisms. Chemicals can cause some materials to settle out or precipitate out of the water while causing other materials to maintain solubility or stay dissolved in the water. Chlorine is a primary chemical used to kill microbial activity, to decompose organic materials, and to oxidize soluble minerals, which causes them to precipitate out of solution. Acid treatments are used to lower the water pH to either maintain solubility or to dissolve manganese, iron, and calcium precipitates that clog emitters or orifices. Potassium permanganate also is used to oxidize iron under some conditions. It is recommended to place the filtration system after the chemical treatment to remove any particles formed. Chemigation protection and injection equipment requirements vary with toxicity class of the injected chemicals.

### **Bacterial Slimes/Precipitates**

Bacteria can grow in the absence of light within the system or in a contaminated well. The bacteria can live on iron or sulfur and produce a mass of slime that quickly clogs emitters and filters. This slime can also act as an adhesive to bind other solids together to cause clogging. They also can cause soluble iron and sulfur to precipitate out of the water.

Bacteria cause iron precipitation by oxidizing soluble ferrous oxide to form insoluble ferric oxide. Iron concentrations as low as 0.1 ppm can be troublesome, whereas levels of 0.4 ppm can be severe. The iron precipitate forms as a red filamentous sludge, which can attach to PVC and polyethylene tubing and completely block emitters.

Sulfur in amounts over 0.1 ppm of total sulfides can be troublesome in irrigation water. Bacteria that live on sulfur can produce white stringy masses of slime, which can completely block the emitting devices. Interactions of soluble iron and sulfur can lead to a chemical reaction forming insoluble iron sulfide. Stainless steel filter screens used in high sulfide water can cause iron sulfide precipitation.

Chlorination is the usual treatment to kill bacteria or inhibit their activity. A continuous residual rate of 1 to 2 ppm of free available chlorine at the distant end of the irrigation system or an intermittent rate of 10 to 20 ppm for 30 to 60 minutes per treatment cycle should be effective. The initial injection rate may need to be higher to achieve the desired residual level in the system. Treatment cycles may be required at the end of each irrigation cycle for severe water sources or after every 10-20 hours of irrigation for cleaner water sources.

Sometimes, wells are contaminated with bacteria and shock chlorination is necessary to reduce or solve the problem. This is done by injecting chlorine at a rate of 200 to 500 ppm into the well. The volume of water to be treated must be estimated from the diameter and depth of the well. Consult a local well driller for exact procedures and regulations prior to attempting this activity.

### **Algae and Aquatic Plants**

Algae and aquatic plants in surface waters can be great nuisances' because they reproduce rapidly during summertime blooms. They have a tendency to become entangled in screen meshes and clog the surface of sand media filters, resulting in frequent filter backflushing. Algae can be controlled in surface waters by adding copper sulfate or other chemicals in an approved manner. Care must be taken to avoid harming fish. Green algae can grow only in the presence of light, so they do not cause a problem in buried pipelines or black polyethylene. However, algae can grow in the white PVC pipe or fittings used to assemble aboveground pipelines and then be washed into laterals and emitters to cause clogging.

Chlorine is used to kill algae within the irrigation system. A chlorine concentration of 10 to 20 ppm for between 30 and 60 minutes is suggested. It is advisable to work section-by-section through the pipeline and flush the dead algae out of the pipes immediately after treatment, to prevent emitters clogging. If significant emitter clogging occurs, a higher concentration may be needed to decompose the organic matter in the emitter.

### **Chemical Precipitation of Iron**

Water with over 0.1 ppm of iron is quite likely to cause a problem in irrigation systems. The problem can be solved by either removing the iron from the water or by retaining the iron in solution. Several techniques are available:

Aeration and Settling. A reliable way of removing iron from irrigation water is to pump the water from the well and to spray it in the air over a pond or tank. During aeration of the water, iron is oxidized into its insoluble form, which can be settled out in the pond. The disadvantage is that the water must be double-pumped, requiring a second pump after the settling basin to re-pressurize the water. Energy costs are not increased, but two pumps must be purchased.

Chlorine Precipitation. Free chlorine will instantly oxidize ferrous iron to ferric iron and take it out of solution as a solid. The iron concentration must be determined, and chlorine must be injected at a rate of 1 ppm for each 0.7 ppm of iron. Some additional chlorine may be needed for other contaminants, such as iron bacteria and bacterial slime. Complete mixing of the chlorine and water is necessary and can be accomplished by creating turbulence in the system before the filter. A sand media filter is the most appropriate choice and should be backwashed frequently, preferably automatically.

If manganese is present in the water source, caution must be exercised, because oxidation of manganese by chlorine occurs at a much lower rate. Care must be taken to precipitate the manganese before the filter, or clogging problems could occur.

pH Control. Iron is more soluble at lower pH values. Acid can be continuously injected to keep the pH low in the irrigation system or can be used periodically to dissolve iron deposits. To dissolve the iron, the pH must be reduced to approximately 2.0 or less for a period of 30 to 60 minutes. The system must be flushed to remove the iron after treatment.

Iron precipitation can be caused by raising the pH. A solution to increase the pH can be prepared by mixing 3 pounds of soda ash (58 percent light grade) with 4 gallons of water. This neutralizing solution can be injected into the water system and can be mixed with chlorine solutions.

Iron Sulfide Precipitation. Sulfur-bearing minerals are common in most sedimentary rocks. A soluble form of sulfate is carried by water. Sulfates are difficult to precipitate and generally remain in solution. Sulfate can be used as a food source by bacteria which produces hydrogen sulfide gas as a by-product. If sufficient iron is present under moderate reducing conditions, iron sulfides can be precipitated, and a sand media filter is suggested to remove the precipitate.

### **Precipitation of Calcium Salts**

Calcium salts, particularly calcium carbonates, precipitate out as a white film or plating in the system. The salts are soluble at low pH. Acid can be used to maintain a pH of 4.0 or lower for 30 to 60 minutes which dissolves calcium deposits to clean emitters and pipelines. Hydrochloric (muriatic) acid is recommended for treating calcium blockages although sulfuric and phosphoric acid can also be used. Temperature, pH, and calcium concentration are all factors influencing calcium solubility, so conditions can vary throughout the irrigation system. Water sources differ in the amount of hardness and/or pH requiring different amounts of acid to lower the pH. The most common acid that growers will find available is muriatic acid (20% hydrochloric acid) at hardware and farm supply stores. It will require about 0.5 to 1 gallon in 100 gallons of water of this strength muriatic acid material to lower the pH to approximate 3.5 for several well and tap waters tested. Make sure that you flush and clean the injector after acid application since the acid may be corrosive to internal parts. Allow the acid treated water to remain in your lines for 30 minute to 1 hour, then flush with water. **Use extreme care in handling acids and always add acid to water.**

If the water hardness is excessive water softening equipment can be used to remove calcium and magnesium. Zeolite water conditioners soften hard water by removing dissolved calcium and magnesium by ion exchange in a tank, where they are placed in a deep bed. As hard water flows downward through the bed, the calcium and magnesium ions are withheld by the mineral and replaced by sodium ions. When the sodium ions are exhausted, the system must be regenerated by a flow of salt water through the exchange material. A backwash procedure is used to remove the calcium and magnesium ions. If the water contains iron, an iron-removal filter should precede the water softener.

### **Chlorination**

The common practice of chlorination is the addition of chlorine to purify drinking water supplies. Chlorine acts as a powerful oxidizing agent in water and vigorously attacks organic materials. Free available chlorine also reacts strongly with readily oxidizable substances such as iron, manganese, and hydrogen sulfide.

To be effective, a residual of active chlorine in parts per million of available chlorine should be measurable near the end of the lateral lines of the irrigation system. The amount of chlorine added to the system will be the residual desired plus the amount needed by the water to oxidize the materials present. This amount can vary considerably over a season. Contact time between chlorine and the water should be maximized to get the most benefit.

**Table 2: Common chlorine compounds used in microirrigation**

Compound	Form	Percent
calcium hypochlorite	dry	65 - 70
sodium hypochlorite	liquid	5.26 - 15
chlorine gas	gas	100

The gas and liquid forms of chlorine are more commonly used (Table 2). Common household bleach, 5.25% sodium hypochlorite, is used in many small operations. Chlorine gas is more dangerous (very poisonous and very corrosive). A commercial dealer should install the gas metering device called a chlorinator and train the operators. Chlorine gas is heavier than air, so adequate ventilation is recommended.

The pH of the water greatly affects the effectiveness of chlorination. Acidic water causes greater availability of hypochlorous acid (HOCl), which has an efficiency for killing microorganisms that is 40 to 80 times greater than that of hypochlorite (OCl<sup>-</sup>). When chlorine is dissolved in water, HOCl and OCl<sup>-</sup>, which together are referred to as "free available chlorine", co-exist in an equilibrium relationship influenced by temperature and pH.

A general formula for calculating the amount of chlorine to inject in liquid form (sodium hypochlorite, NaOCl) is:

where:

IR	=	Q x C x 0.006/S
IR	=	Chlorine injection rate (gal/hour)
Q	=	Irrigation system flow rate (gal/min)
C	=	Desired chlorine concentration (ppm)
S	=	Strength of NaOCl solution used (percent)

Example: A grower wishes to use household bleach (NaOCl at 5.25% active chlorine) to achieve a 3 ppm chlorine level at the injection point. The flow rate of his irrigation system is 90 gpm. At what rate should he inject the NaOCl?

$$IR = 90 \text{ gpm} \times 3 \text{ ppm} \times 0.006/5.25$$

$$= 0.31 \text{ gallon per hour}$$

At an irrigation flow rate of 90 gpm, the grower is pumping (90 x 60) 5400 gph. The goal is to inject 0.31 gallon of bleach into 5400 gallons of water each hour that injection occurs.

If the injector is set for a 300:1 ratio, it will inject 5400/300 or 18 gallons per hour. Then, 0.31 gallon of bleach should be to 18 gallons of water in the stock solution.

Note: be careful to use the same time units (hours) when calculating the injection rate.

**Iron Removal by Potassium Permanganate**

Iron also can be removed from water by an oxidizing filter charged with manganese- processed sand. The filter retains oxygen when regenerated with potassium permanganate. As water flows through the oxygen-charged fiber bed, iron unites with the oxygen and is changed to rust or iron oxide. The sand retains the iron oxide until the filter is backwashed and recharged with potassium permanganate. The filter will operate for water with a pH value between 7 and 8. The iron should not exceed 20 parts per million.

Water containing more than 20 parts per million iron or water with organic complexed iron can be treated best by chlorination and filtration. Super chlorination plus pH adjustment may be necessary. Complexed iron causes a condition where humic acids or other organic matter make oxidation difficult.

### **Commercial Drip Maintenance Treatment Solutions**

Several commercial solutions are available, which contain a mixture of ingredients to deal with pH, iron, and hardness water problems. These commercial products come with instructions on dilution concentrations for daily maintenance or "shock" treatment to unclog plugged lines. For small producers getting started with drip irrigation, these commercial products should be considered as a water treatment.

### **Summary**

Drip irrigation is an extremely efficient method of controlling processes, such as availability and uptake of water and minerals. The correct use of a drip irrigation system requires different approaches or methodology than those used in conventional irrigation systems. This involves thinking in terms of frequent irrigation intervals, correct emitter selection and spacing for soil type and topography, control of irrigation depth, and **more exacting maintenance of the system**. It is important to consult an irrigation specialist in designing a drip irrigation system, so that the system will indeed perform as expected.

## **Orvego (BAS 651)F**

IR-4 Email Alert June 2012

Orvego (BAS 651)F, a combination of amectotradin and dimethomorph, was registered in May 2012 for the management of downy mildew, foliar Phytophthora diseases including Ramorum Blight and root and crown rots caused by Phytophthora species. IR-4 contributed downy mildew and Phytophthora efficacy data to broaden the listed diseases.

## **Public Health Pesticides**

IR-4 provided critical regulatory support for the following important actions:

\*First registration of a neem oil-based product for control of bed bugs.

## **Jersey Fresh—Interns Wanted**

The NJDA-Division of Markets has three summer intern positions available to assist the Jersey Fresh Promotional Marketing Program and to promote NJ-produced specialty crops. Applicants must be enrolled in post-secondary educational institution; business including marketing and agricultural majors are preferred. Salary rate is \$14/hour. Contact NJDA through the Secretary's office at 609-292-3976.

## Know the Cost Per Pound of Nutrients in Organic Fertilizers

Tianna Dupont, Educator Sustainable Agriculture  
Penn State Cooperative Extension, Northampton and Lehigh Counties

A recent article by Vernon Grubinger, Vermont Extension, made me think to remind folks to price compare their organic nutrients. Below are a couple of thought from Dr. Grubinger and some price per pound comparisons from sources I know of locally. There are many more sources out there. The point is—Price it out! Dr. Grubinger points out that if your soil test indicates that a field has adequate phosphorus (P) and potassium (K), then you should avoid blended fertilizers and only use those that are high in nitrogen (N) content. But if you need multiple nutrients i.e., N-P-K, then a blended fertilizer is usually a better deal.

A lot of fields where you have been using manure or compost are high in P and K. In that case, you are mostly looking for nitrogen and so that makes the math easy. For example, an 8-1-1 at \$19.50 for a 50 pound bag would be \$4.80 a pound of nitrogen. A 5-1-1 at \$19.50 per 50 pound bag would be \$7.80 per pound of nitrogen. Bloodmeal (13-0-0) at \$53 per 50 pound bag would be \$8.80 per pound of N. Feather-meal (13-0-0) at \$32.25 would be \$4.96 per pound of N. Composted poultry manure pellets (6-2-2) at \$8.75 per 50 pound bag would give you nitrogen at \$2.92 per pound of N. Keep in mind that the price per pound should not be the only consideration. Some of the single nutrient products might be hard to spread, due to their texture, with a tractor-mounted spreader.

If you are confused, remember that the numbers on a fertilizer bag or analysis mean the percent N-P-K in the product/substance. For example, Bloodmeal (13-0-0) has a guaranteed analysis of 13% nitrogen (13 pounds per 100 pounds of product). If it is a 50 pound bag, there are only 7.5 pounds of nitrogen in that bag.

Other fields are high in P, but need N and K. So custom mixes make sense. Grubinger talks about a custom 6-0-6; at \$25 per 50 pounds the cost is \$8.33 per pound of N or K. Alfalfa meal 2.6-0-2.3 at \$21 per bag has a N cost of \$16.15 per pound and K at \$18.26 per pound. I have not seen those available around here. The Natural No Phos 4-0-4 at \$17 per 50 pound bag would be \$8.50 per pound of N or K.

If you only need K, then potassium sulfate 0-0-51 is the best deal; \$51 per bag equals K at \$2 a pound. Sulpo-mag 0-0-21 at \$31 per bag has K at \$2.95 per pound; but it also supplies magnesium (Mg), so if that is low and you will not be liming with high mag lime, it may be a better choice.

Keep in mind that nutrient availability varies among organic fertilizers. For example, 50 pounds of greensand 0-1-7 at \$11.50 has a price per pound of K of \$3.30, but most of this will not be available to plants in the short term.

I generally cost out a couple of different sources and combinations for what is recommended by the soil test for a field. Sometimes it is easier to think about the cost per bed instead of per acre. Either way, take a couple of recommendations into consideration, do the math and if it conflicts with a recommendation ask them why. There might be a difference in the product, like release rate, that you have not thought about.

Of course, this article only refers to granular organic nutrient sources. Most of us are also using compost, manure and/or cover crops. Make sure you take the nutrient contributions from these sources into consideration.

The Rutgers Soil testing laboratory can offer organic recommendations. The fertilizer finder can help you determine appropriate fertilizers to use by plugging in the recommended ratio (such as 10-10-10). There is an organic check box so that only organic recommendations are given. You can access this site at: <http://rci.rutgers.edu/~soilslab/FertProducts/>

## **Calendar of Important Events**

📅 Indicates the newly added event since last calendar

### **July 2012**

#### 📅 **July—December**

**Basic Pesticide Training for CORE Certification**, For dates and more info call 866-851-4389 or email: [classes@njpma.com](mailto:classes@njpma.com)

#### **July 12**

**Day Neutral Strawberry Production Meeting**, Linvilla Orchards, Media, PA, 5:30-8:30 p.m. For more info contact Scott Guiser at [sxg6@psu.edu](mailto:sxg6@psu.edu) or call (215) 345-3283.

#### 📅 **July 14-17**

**OFA Short Course**, Greater Columbus Convention Center, Columbus, OH. For more info contact the Ohio State Florist Association email: [ofa@ofa.org](mailto:ofa@ofa.org) or visit: <http://ofa.org/shortcourseinfo.aspx>

#### **July 15**

**Farm Service Agency**, Reporting deadline for all crops except small grains. Last day to report prior year production for 2012 NAP APH's.

#### 📅 **July 26-27**

**2012 Quebec Study Tour**, Quebec, Canada. For more info visit: [www.ifruittree.org](http://www.ifruittree.org) (International Fruit Tree Association)

#### 📅 **July 27-29**

**Florida Small Farms & Alternative Enterprises Conference: Educating Entrepreneurs to Strengthen Local Food Systems**, Osceola Heritage Park, Kissimmee, FL. For info visit: <http://smallfarms.ifas.ufl.edu>

### **August 2012**

**Farm Serv. Agency**, Aug. 1 Last day to file County Committee election nomination forms (FSA-669A). NAP closing for strawberries.

#### **August 3-4**

**Pennsylvania Organic Farm Fest**, Centre County Grange Fair Grounds, Centre Hall, PA. For more info visit: [www.paorganic.org/farmfest2012](http://www.paorganic.org/farmfest2012).

#### **August 12-16**

**Potato Assoc. of America Annual Meeting**, Crowne Plaza-Denver Airport Conference Center, Denver. For more info visit: [www.potatoassociation.org](http://www.potatoassociation.org)

#### **August 14-15**

**North American Strawberry Growers Assoc. Summer Tour**, Halifax, Nova Scotia. For more info visit: [www.nasga.org](http://www.nasga.org)

#### **August 14-16**

**Penn State Ag Progress Days**, Russell E. Larson Agricultural Research Center, 2710 West Pine Grove Rd, Pennsylvania Furnace, PA, located 9 miles SW of State College, PA. Free admission and parking. For more info call 814-865-2081 or email: [agprogressdays@psu.edu](mailto:agprogressdays@psu.edu).

#### 📅 **August 17-20**

**NAFDMA Advanced Learning Retreat**, Tanners Orchard, Speer, Ill. For more info call 413-244-5374 or visit: [www.nafdma.com](http://www.nafdma.com)

**August 29**

**Great Tomato Tasting**, Snyder Research and Extension Farm, 140 Locust Grove Rd., Pittstown, NJ; 3 pm-dusk; \$7 admission. RSVP online at: <https://njaes.rutgers.edu/rsvp/tomato> or call 908-713-8980.

**September 2012****September 1**

**Farm Service Agency**, NAP closing for Christmas trees, Fin Fish, Flowers and grass (SOD).

**September 11-12**

**Food Use Workshop: Setting Priorities for 2013 Research**, St. Louis. For more info contact Van Starner by email: [starner@aesop.rutgers.edu](mailto:starner@aesop.rutgers.edu) or visit: [www.ir4.rutgers.edu](http://www.ir4.rutgers.edu)

**September 18-20**

**Fresh-Cut Products: Maintaining Quality and Safety Workshop**, University of California, Davis. For info contact Penny Stockdale 530-752-7672, email: [pastockdale@ucdavis.edu](mailto:pastockdale@ucdavis.edu) or visit: <http://postharvest.ucdavis.edu>

**📅 September 20**

**7A Category Exam Training**, Westfield, Union County, \$140. For more info call 866-851-4389 or email: [classes@njpma.com](mailto:classes@njpma.com)

**September 30**

**Farm Service Agency**, NAP closing for Barley, Clover, Grass, Mixed Forage, Rye and Wheat. Final date to report value loss crops for 2012: ornamental nursery, Christmas trees, aquaculture, ginseng & turfgrass sod.

**October 2012****📅 October 4-5**

**7B Category Exam Training**, Westfield, Union County, \$270. In lieu of 40 hours on-the-job-training. For more info call 866-851-4389 or email: [classes@njpma.com](mailto:classes@njpma.com)

**📅 October 18**

**3A Category Exam Training**, Westfield, Union County, \$140. In lieu of 40 hours on-the-job-training. For more info call 866-851-4389 or email: [classes@njpma.com](mailto:classes@njpma.com)

**📅 October 23**

**3B Category Exam Training**, Freehold, Monmouth County, \$140. In lieu of 40 hours on-the-job-training. For more info call 866-851-4389 or email: [classes@njpma.com](mailto:classes@njpma.com)

**October 28-31**

**Pack Expo**, McCormick Place, Chicago. For more info visit: [www.packexpo.com](http://www.packexpo.com)

**November 2012****📅 November 2-6**

**2012 Irrigation Show & Ed Conf.**, Orange Cty Conv. Center, Orlando, FL. For info visit: [www.irrigation.org](http://www.irrigation.org)

**📅 November 4-6**

**International Pepper Conference**, Naples, FL. For info visit: <http://conference.ifas.ufl.edu/Pepper2012/>

**November 5-6**

**UCGAPs Practical Skill-Building for On-Farm Assessments Workshop**, University of California. For more info contact Penny Stockdale 530-752-7672 or email: [pastockdale@ucdavis.edu](mailto:pastockdale@ucdavis.edu).

**📅 November 7-8**

**Northeast Greenhouse Conference and Expo**, DCU Center, Worcester, MA. For more info visit: <http://www.negreenhouse.org/index.html>

**📅 November 8-10**

**Southeast Strawberry Expo**, Hilton University Place, Charlotte, N.C. For more info email: [info@ncstrawberry.com](mailto:info@ncstrawberry.com) or visit: [www.ncstrawberry.org](http://www.ncstrawberry.org)

**📅 November 15**

**3B Category Exam Training**, Westfield, Union County, \$140. In lieu of 40 hours on-the-job-training. For more info call 866-851-4389 or email: [classes@njpma.com](mailto:classes@njpma.com)

**November 14-15**

**Pacific Northwest Vegetable Association Conference & Trade Show**, Three Rivers Convention Center, Kennewick, Washington. For more info call 509-585-5460 or visit: [www.pnva.org](http://www.pnva.org)

**📅 November 28-29**

**Mississippi Fruit & Vegetable Growers Conference**, Jackson, Miss. For more info call 601-955-9298, email: [info@msfruitandveg.com](mailto:info@msfruitandveg.com) or visit: [www.msfruitandveg.com](http://www.msfruitandveg.com)

**December 2012****December 3-5**

**Washington State Horticultural Assoc. Annual Meeting**, Yakima Convention Center, Yakima, Wash. For more info contact Nicole Brunner by email: [Nicole@wahort.org](mailto:Nicole@wahort.org)

**December 4-6**

**Great Lakes Fruit, Vegetable & Farm Market EXPO**, DeVos Place Convention Center, Grand Rapids, Mich. For more info visit: [www.glexpo.com](http://www.glexpo.com)

**📅 December 6**

**3A Category Exam Training**, Morris Plains, Morris County, \$140. In lieu of 40 hours on-the-job-training. For more info call 866-851-4389 or email: [classes@njpma.com](mailto:classes@njpma.com)

**January 2013****January 7-8**

**Kentucky Fruit and Vegetable Conf.**, Embassy Suites Hotel, Lexington, Ky. For more info contact John Strang 859-257-5685 or email: [jstrang@uky.edu](mailto:jstrang@uky.edu)

**📅 January 8-10**

**Minnesota Apple Growers Winter Conference**, LaCrosse, Wis. For more info contact Ralph Yates, 507-895-2388, email: [info@minnesotaapple.org](mailto:info@minnesotaapple.org) or visit: [www.minnesotaapple.org](http://www.minnesotaapple.org)

**January 9-11**

**Illinois Specialty Crops, Agritourism and Organic Conf.**, Crowne Plaza Hotel, Springfield, Ill. For more info contact Diane Handley 309-557-3662 or email: [dhandley@ilfb.org](mailto:dhandley@ilfb.org)

**January 10-12**

**Great Plains Growers Conference and Trade Show**, St. Joseph, Mo. For more info contact Christy Dipman 785-532-6173 or email: [cdipman@ksu.edu](mailto:cdipman@ksu.edu) or visit: [www.greatplainsgrowers.org](http://www.greatplainsgrowers.org)

**January 10-13**

**Southeast Regional Fruit & Vegetable Conf.**, International Trade & Conv. Center., Savannah, Ga. For more info call 877-994-3842 or visit: [www.gfvga.org](http://www.gfvga.org)

**January 14-16**

**Ohio Produce Growers & Marketers Assoc. Congress**, Kalahari Resort, Sandusky, Ohio. For more info call 614-487-1117, email: [opgma@ofa.org](mailto:opgma@ofa.org) or visit: [www.opgma.org](http://www.opgma.org)

**January 15-16**

**Southeastern Apple Growers Meeting**, Crowne Plaza Resort, Asheville, NC. For more info contact Peggy Laughter 828-685-3241.

**January 17-18**

**Upper Midwest Regional Fruit & Vegetable Growers Conference**, St. Cloud Civic Center, St. Cloud Civic Center, St. Cloud, Minn. For more info call 763-434-0400, email: [info@mfvga.org](mailto:info@mfvga.org) or visit: [www.mfvga.org](http://www.mfvga.org)

**January 20-22**

**Wisconsin Fresh Fruit & Veg. Conf.**, Wisconsin Dells, Wis. Wisconsin Apple Growers. For more info call 800-722-3120, email: [office@waga.org](mailto:office@waga.org) or visit: [www.waga.org](http://www.waga.org).

**January 21-22**

**Northwest Michigan Orchard & Vineyard Show**, Grand Traverse Resort, Acme, Mich. For more info call 231-946-1510 or email: [nwmihort@msu.edu](mailto:nwmihort@msu.edu)

**January 21-23**

**Ohio Produce Growers & Marketers Association Congress**, Kalahari Resort, Sandusky, Ohio. For more info call 614-487-1117, email: [opgma@ofa.org](mailto:opgma@ofa.org) or visit: [www.opgma.org](http://www.opgma.org)

**January 22-23**

**Wisconsin Cranberry Growers School**, Holiday Inn Hotel & Convention Center, Stevens Point, Wis. For more info call 715-423-2070

**January 22-24**

**Indiana Horticultural Congress**, Wyndham West, Indianapolis. For more info contact Tammy Goodale 765-494-1296, email: [tgoodale@purdue.edu](mailto:tgoodale@purdue.edu) or visit: [www.inhortcongress.org](http://www.inhortcongress.org)

**January 22-24**

**Empire State Fruit & Vegetable Expo**, Oncenter Convention Center, Syracuse, NY. For more info contact Jeanette Marvin by email: [nysvga@twcny.rr.com](mailto:nysvga@twcny.rr.com)

**January 23-26**

**Practical Tools and Solutions for Sustaining Family Farms**, Little Rock, Ark. For more info visit: [www.ssawg.org](http://www.ssawg.org)

**January 24-25**

**Iowa Fruit & Vegetable Growers & Marketers Conference**, Ankeny, Iowa. For more info contact Darrell Geisler 515-964-2640 or email: [dkgeisler@hughes.net](mailto:dkgeisler@hughes.net)

**January 29-30**

**Ontario Processing Vegetable Industry Conference**, London, Ontario. For more info call 519-681-1875, email: [opvg@opvg.org](mailto:opvg@opvg.org) or visit: [www.opvg.org](http://www.opvg.org)

Rutgers Cooperative Extension  
New Jersey Agricultural Experiment Station  
Plant & Pest Advisory  
**Vegetable Alert!**

Date: 6/23/12

Alert Author: Andy Wyenandt

Pest: Late blight

Found: Late blight has been confirmed on processing tomato in Salem County, New Jersey.

Notes: Late blight was confirmed on actively sporulating leaf lesions from an 70 acre processing tomato field outside of Elmer, NJ. All lesions were found on the upper most leaves in the canopy suggesting Late blight was carried in from an outside source. This is the second report of Late blight in NJ on potato or tomato this year.

Crop(s) at risk: All tomato and potato crops.

Potential impact: Significant losses may occur if not controlled properly.

What growers should do: Control of late blight begins with regular scouting, recognizing symptoms and preventative fungicide applications. All potato and tomato growers in NJ should scout fields and include a late blight specific fungicide in their regular fungicide program. Although the weather this past week has not been ideal for late blight development in many areas of NJ (i.e., too hot), weather this coming week is going to be considerably cooler in the evenings and overnight.

Symptoms of Late blight mildew can be found here.

[https://www.google.com/search?q=late+blight&hl=en&rlz=1C1CHKZ\\_enUS439US439&prmd=imvns&tbo=isch&tbo=u&source=univ&sa=X&ei=wvS8TqGl6rZ6gGvkq1B&ved=0CGoQsAQ&biw=1280&bih=702](https://www.google.com/search?q=late+blight&hl=en&rlz=1C1CHKZ_enUS439US439&prmd=imvns&tbo=isch&tbo=u&source=univ&sa=X&ei=wvS8TqGl6rZ6gGvkq1B&ved=0CGoQsAQ&biw=1280&bih=702)

Commercial fungicide recommendations for controlling late blight can be found in the 2012 Commercial Recommendations Guide below. All organic growers should consider applying a copper-based fungicide.

**Links to the 2012 Commercial Vegetable Production Recommendations Guide.**

**Potato:**

<http://niveg.rutgers.edu/assets/pdfs/ppg/12ppg/2012-Sect-F-WhitePotato.pdf>

**Tomato:**

<http://niveg.rutgers.edu/assets/pdfs/ppg/12ppg/2012-Sect-F-Tomatoes.pdf>

If you suspect late blight may be present on your farm, please let me know via email at [wyenandt@aesop.rutgers.edu](mailto:wyenandt@aesop.rutgers.edu).

Thanks - Andy

## REGULARLY SCHEDULED MEETINGS

✓ Indicates meeting will be held at RCE of Cumberland County

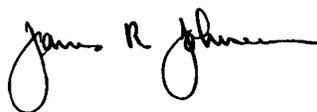
<p>✓</p> <p><b>Pesticide Certification Exam Schedule—Cumberland County</b> 291 Morton Avenue Millville, NJ 08332 (Between Rosenhayn &amp; Carmel)</p> <p><u>2012</u></p> <p>Sep 26    Oct 24 Nov 7     Dec 19</p> <p><b>To Register call 609-984-6614 For directions call 856-451-2800</b> *****</p>	<p>✓</p> <p><b>Cumberland County Agriculture Development Board</b> 291 Morton Avenue Millville, NJ 08332 (Between Rosenhayn &amp; Carmel)</p> <p><u>2012</u></p> <p>Jul 11 Aug 8    Sep 5    Oct 10 Nov 14    Dec 12</p> <p><b>*Meetings start at 10 a.m. Reg. Meetings start at 7 p.m. Call DeAnn at 856-453-2211</b> *****</p>	<p>✓</p> <p><b>Cumberland County Board Of Agriculture</b> 291 Morton Avenue Millville, NJ 08332 (Between Rosenhayn &amp; Carmel) 7 pm meetings</p> <p><u>2012</u></p> <p>Sep 20    Oct 18 Nov 15    Dec 20</p> <p><b>For info call Shirley Kline, President 856-685-3784</b> *****</p>
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**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 Karen Kritz, NJ Dept. of Ag 609-984-2506

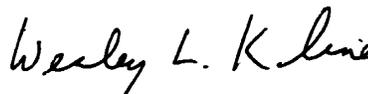
July 20                      August 17

September 21            October 19                  November 16

Sincerely,



James R. Johnson  
Agricultural Agent  
Nursery Management Commercial  
Internet: [jjohnson@njaes.rutgers.edu](mailto:jjohnson@njaes.rutgers.edu)



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

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

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

Have you visited the Cumberland County website for the Present and/or past issues of "Cultivating Cumberland"? It's a great resource for information and dates.....

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

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