



# WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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## Vegetable Crops

Vegetable Crop Insects - Joanne Whalen,  
Extension IPM Specialist; [jwhalen@udel.edu](mailto:jwhalen@udel.edu)

### Melons

As soon as plants are set in the field, be sure to scout for aphids and cucumber beetles. Low levels of aphids can be found in the earliest transplanted fields. When sampling for aphids be sure to watch for beneficial insects as well since they can help to crash aphid populations. As a general guideline, a treatment should be applied for aphids when 20% of the plants are infested, with at least 5 aphids per leaf.

### Potatoes

Low levels of the first emerged Colorado potato beetle adults continue to be found in fields where an at planting insecticide was not used. A treatment should not be needed for adults until you find 25 beetles per 50 plants and defoliation has reached the 10% level.

### Snap Beans

Be sure to sample all seedling stage fields for leafhopper and thrips activity. The thrips threshold is 5-6 per leaflet and the leafhopper threshold is 5 per sweep. If both insects are present, the threshold for each should be reduced by  $\frac{1}{3}$ .

### Sweet Corn

Be sure to scout emerged fields for cutworms and flea beetles. As a general guideline, treatments should be applied for cutworms if

you find 3% cut plants or 10% leaf feeding. In order to get an accurate estimate of flea beetle populations, fields should be scouted mid-day when beetles are active. A treatment will be needed if 5% of the plants are infested with beetles.

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Transplanting Time - Gordon Johnson,  
Extension Vegetable & Fruit Specialist;  
[gcjohn@udel.edu](mailto:gcjohn@udel.edu)

May is the month where the majority of vegetable transplants are set in the field. Successful crops start with transplants that get off to a good start. The following are some considerations when handling and setting transplants.

Make sure that transplants in trays are hardened off well before transplanting. Hardening off is most commonly done by exposing plants to outside conditions by moving the plants out of the greenhouse, in a protected area, for about a week. Wagons are ideal because they can be moved into sheds at night if temperatures drop too low or cold strong winds are expected. In greenhouses with roll-up sides, hardening off can be accomplished by increasing the day-time exposure to cross winds. Reduced watering and fertilization are also a part of hardening off the plants. During the hardening off process, the cuticle of the plant thickens. The cuticle is the outermost layer that covers leaf surfaces and is composed of wax, lipids, and hydrocarbon

polymers and protects the plant from water loss and desiccation.

We have thousands of plants that are shipped into the region from southern growers. When receiving transplants, make sure to inspect them well upon arrival for signs of disease or damage. For plants in trays, remove from trailers immediately upon arrival and place in a staging area that is protected from wind. Plants that have been pulled from trays and boxed should be transplanted within 2 days of receipt. Holding them longer risks severe defoliation and potential for heating in the boxes. If they must be stored longer, place in a cool but not cold place. Some plants are still shipped bare root in bundles. These also should be planting within 2 days and roots should not be allowed to dry out.

Currently, temperatures are not optimum for setting out warm season transplants. Ideally, you want to plant on a warming trend where nights do not drop below 45. Warm season vegetable transplants vary in their ability to withstand sub-optimal conditions depending on how well they have been hardened off and their inherent ability to withstand stress. Tomatoes, cucumbers, and squash are better able to handle early season stresses than cantaloupes, watermelons, or peppers. When temperatures are cool, soils are wet, and there is cloudy weather, soils stay cool, even under plastic mulch. Growth is minimal in these crops. We often see problems, especially the first few days when sunny weather returns, with plants wilting. This is because root systems have not established or are not functioning well. Root growth is slowed in cold soils and low oxygen in water soaked soils will also limit root growth. Average soil temperatures need to be 65° F or higher and average air temperatures should also be above 65° F (ideally above 70° F) for good establishment of these crops. Seed and root maggots and root diseases such as Pythium can further stress transplants and reduce stands.

Make sure transplants have well developed root systems. Transplants should pull easily from trays and have full root balls. Do not rush transplants into the field. Vine crops are very sensitive to root damage during transplanting.

In seedless watermelon systems, time production of pollenizer transplants so that they coincide well with the seedless transplants. Pollenizers are often planted a number of days after seedless because they emerge quicker. However, pollenizer root balls may not be well formed compared to the seedless transplants and they can suffer excessive losses in the field when planted in stressful conditions. The opposite can also be true if pollenizers are ready but the seedless plants do not have good root balls.

Leggy or tall plants will be a problem in stressful conditions and should not be used if at all possible. Leggy plants are more susceptible to damage in transplanting and wind damage after planting thus subjecting them to additional stress.

Transplants should be planted at the proper depth. This is particularly critical for watermelons and cantaloupes. There should be enough soil to cover the root ball of these crops but they should not be planted so deep so that the stem is covered. Deep planting in cold wet soils will result in additional stress on melons. Watermelons and cantaloupes should not be set deeper even if they are leggy. Other crops such as tomatoes and peppers can tolerate deeper planting. Extra care should be taken during transplanting during stressful periods to reduce injury to plants, particularly to root balls. Damage to roots will reduce establishment success especially in melons, cucumbers, and squash. Train planting crews so that they do minimal damage to transplants.

If conditions are not favorable for planting and plants will hold, it is best to wait until more favorable weather returns. Often there is no earliness gained by planting in the stressful period; or gains are negated by stand losses and the need to replant areas.

Provision for water at transplanting is critical for plant survival. Planting hole watering is recommended at planting. Mechanical transplanters with water tanks are ideal for this. With hand plantings, provision to irrigate overhead immediately after transplanting may be necessary. In plastic mulch systems with drip irrigation, having adequate water at planting can sometimes be difficult. Running the drip

irrigation system so that the planting area is saturated often leads to leaching of fertilizer nutrients from the bed and can keep beds cold in adverse weather. Adding dilute fertilizer solutions in the transplant water is also a common practice. Follow manufacturer's recommendations and make sure the fertilizer is dissolved well if using dry soluble sources. Fertilizers are salts and excess fertilizer or fertilizer that is unevenly mixed or dissolved can cause salt injury to transplants.

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**Regrowth Cropping of Lima Bean** - Gordon Johnson, *Extension Vegetable & Fruit Specialist*; [gcjohn@udel.edu](mailto:gcjohn@udel.edu)

Lima beans have the ability to put on significant growth after harvest (pod stripping). New stems are produced from lateral buds and plants can flower and set a second set of pods. This provides the potential for having two crops from the same planting in one season. This potential has been demonstrated both in research plots and on-farm in commercial plantings.



Plant stubble after harvesters have stripped the pods.

A re-cropping system starts with an early May planting using a short season variety. Target the first week in May and use a variety such as Cypress, Meadow, or M-15. Cypress is particularly well adapted to early planting

because it was bred to tolerate cooler soil conditions for Canadian production. Longer season varieties such as C-elite Select will not work in this system.

Because this planting will be flowering and setting pod during hot conditions in June and July, the first crop will be limited, with a high end potential of around 2000 lbs/A. Locating regrowth fields where temperatures are more moderate, (near the bay for example) and irrigating well during hot periods will help to achieve this yield. The crop will be ready to harvest the last week in July or first week in August.



Regrowth near harvest

At harvest, limit field activity to the harvesters and keep trucks off of the stubble to reduce damage to the plant stems.

Research has demonstrated that the regrowth crop has the potential to yield well over 3000 lbs. (in hand-harvested small plots we were able to achieve yields over 5000 lbs per acre on the regrowth). After harvest, Apply an additional 60-80 lbs of Nitrogen and cultivate the field to reduce weed populations and aerate the soil. We have also looked at applying fungicides to the new growth but this has not shown any positive benefit on yield. Post emergence herbicides will also be sprayed after cultivation. Particular attention to herbicide programs will be needed to avoid using the same herbicides in May and for the regrowth crop.

In two years of research, we have harvested the second crop by the second week in October. Because the plant is regrowing from existing plants, the second crop is produced much more quickly than if it was replanted.

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**Food Safety Survey for Local Tomato and Leafy Greens Growers** - *Sasha Marine, University of Maryland Postdoctoral Research Associate, [scmarine@umd.edu](mailto:scmarine@umd.edu); Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland, [keverts@umd.edu](mailto:keverts@umd.edu)*

Thanks to a multi-state grant from the USDA Specialty Crop Research Initiative, researchers at four Mid-Atlantic institutions (the University of Maryland College Park, the University of Maryland Eastern Shore, the University of Delaware, and Rutgers University) are working to develop scientifically-based consensus food safety protocols (or “metrics”) for tomatoes and leafy greens. The project aims to generate scientific and technological knowledge to develop, refine or defend food safety protocols that can then be implemented on a national or regional basis for both domestic and imported produce. This goal can only be achieved by combining data from experimental research trials with data from local growers.

As part of the project, Professor Erik Lichtenberg at the University of Maryland College Park is conducting an electronic survey of small- and medium-sized farms to determine the cost-effectiveness of different food safety risk-reduction strategies for tomatoes and leafy greens (including lettuce, spinach, kale, mustard greens and cabbage). The survey is completely voluntary and responses are kept confidential. If you grow tomatoes or leafy greens, please take a few minutes to complete the online survey (<http://www.foodumd.org>). Responses are kindly requested by June 30, 2013. Questions about the food safety survey should be directed to Erik Lichtenberg at [elichtenberg@arec.umd.edu](mailto:elichtenberg@arec.umd.edu) or (301) 405-1279.

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**Water Management Plan for Your High Tunnel** - *Rose Ogutu, Horticulture Specialist, Delaware State University [rogutu@desu.edu](mailto:rogutu@desu.edu)*

A uniformly moist soil is ideal for most horticultural crop production, yet high tunnels receive no external rainfall. It is important to maintain adequate soil water content during pollination and fruit development right up to harvest. Most irrigated vegetable crops develop shallow roots with no more than 10 to 12 inches of rooting depth (onions develop about 6 inches). This depth is achieved within 30 to 40 days from planting. Extreme fluctuations of wet and dry conditions cause yield loss and reduce quality of produce. Overwatering produces much shallower than anticipated rooting depth, and encourages N-leaching from the root zone and can result into root rots and slow growth. The high humidity caused by the free water and high temperatures also enhance disease incidence. Incidences of blossom-end-rot and cracking of tomatoes can be a result of overwatering. It is important to always refill the soil profile at every irrigation event. Frequent light watering causes shallow root systems.

Drip irrigation is the most effective watering system in plasticulture production as it helps maintain uniform soil moisture.



Water distribution from drip tape between rows of lettuce

A full season crop like tomatoes or cucumbers may require 14 to 20 inches of soil water to meet the crop's daily evapotranspiration (ET) throughout the growing season (1 inch of soil water from a 100-foot row with an average canopy of 18 inches = 94 gallons or for 24 inches = 125 gallons). Soil water can be extracted by a plant and evaporated at a rate of 0.05 to over 0.30 inches per day, depending on the stage of plant growth, tunnel temperature and amount of sunshine (equivalent to approximately 5 to 50 gallons per day per 100 ft of plant row dependent on plant width).

To adequately plan your irrigation system:

- Evaluate the crops water needs, water use at peak periods, fertility needs, soil type, plant row layout and water supply.
- Ensure adequate drainage of your soil. If possible, keep organic matter at 5 to 6 percent.
- Make sure you have an adequate water supply. A typical drip system for a 30 x 96 ft high tunnel may need a water supply pumping rate of 2.5 to 4 gallons/minute of the selected drip tubing. For multiple tunnel units, a larger well and dedicated pump may be required. Sources from lake or stream may require more filtration to prevent the drip irrigation system from plugging. The main line from the water source should be sized to provide adequate pressure and flow rate. For a single high tunnel unit, a ¾ to 1 inch pipe should be adequate to deliver 3 to 4 gpm at an operating pressure within 30 to 40 psi so that one can easily operate a fertigation system along with the drip system.
- Choose the right drip tubing to ensure uniform delivery. Drip tubing comes in various wall thicknesses (4 mils to over 15 mils). Thinner tubing types (4 to 10 mils) are commonly used in mulch row beds found in high tunnel systems. Emitter spacing of 8 to 12 inches deliver uniform and continuous wetting patterns along the plant row to give 0.2 to 0.6 gallons/min per 100 feet tubing. Tubing emitters should always be placed facing upwards and placed in shallow groove. For single row plants (e.g. tomatoes and cucumbers), place drip tape in the center or 4 to 5 inches from the center of the bed. For double row crops (e.g. pepper, egg plants, strawberries), a single irrigation tube in the center, slightly buried should be adequate.

- When placing different plants on the same row consider their watering needs.
- Use soil moisture sensors and establish a schedule for reading them. Work the tensiometers at different depths based on soil type. A soil feel damp/moist method can help, and for a silt loam soil can be fairly accurate.
- Examine the root development of several plants 40 to 50 days after planting to observe how they interact with the soil profile and the irrigation zone.

For more information on water management in high tunnels refer to:

<http://www.extension.umn.edu/distribution/horticulture/components/m1218-7.pdf>



A tensiometer at a correct depth will help guide watering needs.

## Fruit Crops

**Be Cautious When Using Glyphosate Around Perennial Fruits** - Gordon Johnson, *Extension Vegetable & Fruit Specialist*; [gcjohn@udel.edu](mailto:gcjohn@udel.edu)

Glyphosate has been a very useful tool for weed management and is used in commercial fruit plantings. However, it can cause some unwanted injury to perennial crops under certain situations.

Glyphosate should not be allowed to contact leaves, young green bark, fresh trunk wounds,

root suckers, open buds, immature fruit tissues, or fresh pruning cuts. All of these can allow for absorption of the herbicide and injury to the plants.

Dormant and spring applications are recommended and there is less chance of injury. Late summer and fall applications have more risk. This is because in the fall, if glyphosate is taken up by the plant, it will be stored in the bark and wood of the stems or canes, as well as the root system. If glyphosate is taken up by the perennial fruit plant, damage symptoms often do not appear until the following spring. When regrowth occurs in the spring the glyphosate in the plant tissue can be translocated and cause injury to new growth. New growth will be yellow and stunted. In fruit trees, lower branches may appear to have strapped leaves and short internodes.

Fruit plants that have absorbed glyphosate will often be weaker and more susceptible to diseases and insect pests.

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### Spotted Wing Drosophila (SWD) Monitoring Will Begin Soon - Joanne Whalen, *Extension IPM Specialist*; [jwhalen@udel.edu](mailto:jwhalen@udel.edu)

Spotted Wing Drosophila continues to pose a serious threat to small fruit grown in our region. I plan to start trapping by mid-May in a few blueberry and grape locations. As you will see on the following links, researchers working with this insect are now recommending using yeast and sugar baits versus apple cider vinegar in traps. Traps only give an idea of the presence or absence of SWD in an area, but are not good predictors of population sizes and trap captures do not always occur before fruit infestation. Therefore, preventative spray programs are being recommended in states to our south. They are recommending that growers time treatments to host susceptibility (ripening, meaning fruit that is beginning to color, and ripe fruit) rather than to trap captures. Please see the following link from North Carolina for more information on monitoring and management:

<http://strawberries.ces.ncsu.edu/2013/04/more-on-spotted-wing-drosophila-monitoring-how-many-traps-should-growers-use/>.

## Agronomic Crops

### Agronomic Crop Insects - Joanne Whalen, *Extension IPM Specialist*; [jwhalen@udel.edu](mailto:jwhalen@udel.edu)

#### Alfalfa

Be sure to check for alfalfa weevil adults and larvae within a week of cutting, especially if populations were above threshold before cutting. Feeding from both stages can hold back re-growth. After cutting, there needs to be enough “stubble” left to control the weevils with a cutting. A stubble treatment will be needed if you find 2 or more weevils per stem and the population levels remain steady.

#### Field Corn

We are starting to get the first reports of cutworm damage in the earliest planted no-till and minimum till corn. In addition to black cutworm, which generally attack later planted corn, we can find a number of other cutworm species present in corn fields at planting time including the dingy cutworm, claybacked cutworm and variegated cutworm. Information from the Midwest indicates that the claybacked cutworms can cause economic loss in corn. They overwinter as half-grown larvae in the soil so they can get a “jump” on black cutworms when it comes to cutting each spring. Since they are larger in size, this species can damage very young corn plants. Scouting fields at plant emergence is important, even if at planting materials were used, to catch any potential problems. In addition, a higher rate of an insecticide will be needed to control larger cutworms. As a general guideline, a treatment is recommended if you find 10% leaf feeding or 3% cut plants.

#### Small Grains

The first grass sawflies and true armyworms have been found in fields in Kent and Sussex counties. In addition, cereal leaf beetle adults have been found laying eggs. Population levels remain variable throughout the state, so scouting fields will be the only way to determine if an economic level is present. Depending on the temperature, cereal leaf beetle larvae will feed for up to 3 weeks. Research from Virginia and North Carolina indicates that the greatest damage can

occur between flowering and the soft dough stage .Although armyworm can attack both wheat and barley, they can quickly cause significant losses in barley.

## General

### Black Light and Pheromone Trapping Program Has Begun for the Season - *Joanne Whalen, Extension IPM Specialist;* [jwhalen@udel.edu](mailto:jwhalen@udel.edu)

Our black light and CEW pheromone traps are now up and running for the season. The traps are generally checked on Monday and Thursday and counts are posted by early Tuesday and Friday morning. This season we will be trapping for corn earworm, European corn borer and 3 stink bug species. Please use the following link to access all trap information:

<http://agdev.anr.udel.edu/trap/trap.php>. In addition to the new look to the page; you will also see that we have added a new feature -- historical information in both a tabular and graph format. Please try out the new feature and provide feedback to me on its usefulness. I will also begin the Crop Pest Hotline in mid-May (instate: 800- 345-7544; out of state: 302- 831-8851).

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### Funds Available to Sussex County Farmers to Help Improve Water Quality in the Clear Brook-Nanticoke River Watershed

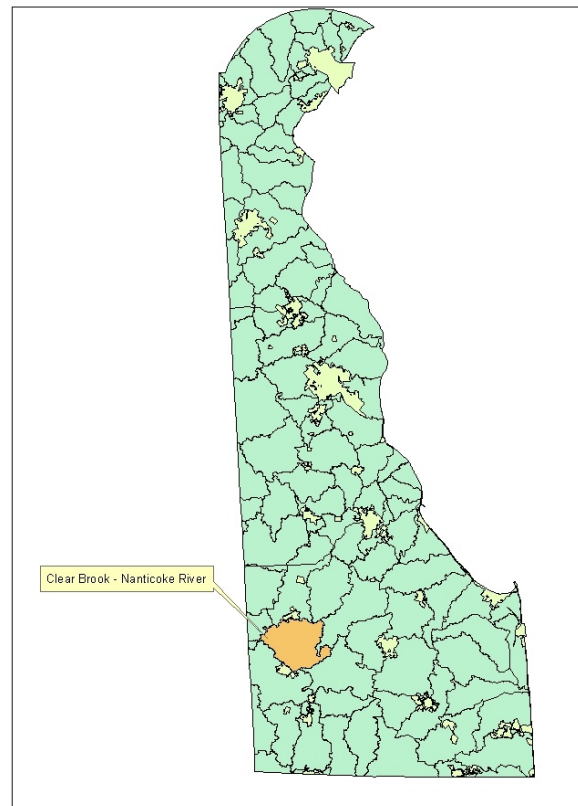
State Conservationist Russell Morgan has announced additional funding for an initiative to improve water quality in the Clear Brook-Nanticoke River Watershed in Delaware.

The USDA Natural Resources Conservation Service (NRCS) will make \$282,000 in assistance available this year to help farmers and forestland owners install conservation practices that manage nutrients, pathogens and sediments. Funding comes through the agency's National Water Quality Initiative (NWQI).

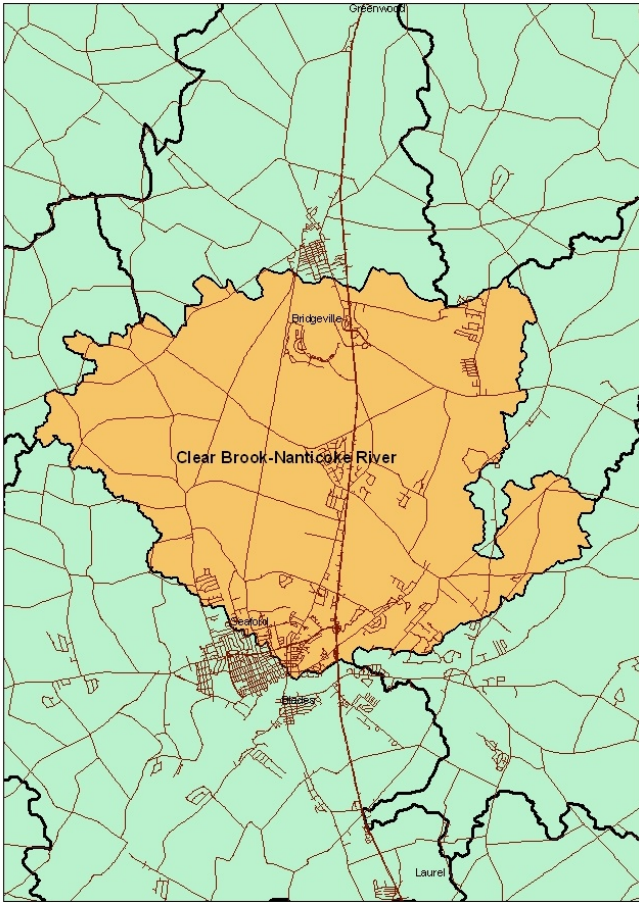
Agricultural producers in the Clear Brook-Nanticoke River Watershed will be able to participate. Eligible producers will receive

assistance for installing conservation systems that include practices such as nutrient management, cover crops, No Till, filter strips, heavy use area protection pads and composting facilities, among many others.

“Improving water quality in the Clear Brook-Nanticoke River Watershed is a priority of NRCS, state agencies and other key conservation partners, which is why we selected it for the second year in a row,” said Morgan. “Strategically targeting our resources in this watershed provides the best chance for maximum improvement in water quality.”



The Clear Brook-Nanticoke River Watershed is located in the western region of Sussex County between Bridgeville and Seaford. Of the 24,000 acres that make up the watershed, 14,000 acres or 60 percent are in agricultural land. The watershed is on the State of Delaware's list of impaired watersheds due to excess nutrients. State and federal agencies have been extensively monitoring water quality in select areas of the watershed and are looking into new strategies to address agricultural related water quality issues.



Through this water quality initiative, NRCS is also piloting its new Water Quality Index for Agricultural Runoff. The tool will help landowners determine how alternative conservation systems they are considering will impact water quality improvement. Additionally, state water quality agencies and other partners will do in-stream and watershed-level monitoring to track water quality improvements in many of the project watersheds.

NRCS accepts applications year round; however, the first application deadline for the 2013 NWQI is June 21; followed by a second cutoff date of July 12, 2013. The sooner you apply the better chance you will have to receive funding.

For more information about NRCS's programs, initiatives and services in Delaware, visit [www.de.nrcs.usda.gov](http://www.de.nrcs.usda.gov) or contact your local USDA Service Center. In Sussex County, call 302-856-3990 x 3.

# Announcements

## High Tunnel Mixed Vegetable Production Workshop

Tuesday, May 21, 2013 5:00pm -8:00pm

Delaware State University

Smyrna Outreach and Research Center

(884 Smyrna Leipsic Road Smyrna, DE 19702)

To register & if you have any questions or special needs, please contact Dr. Rose Ogutu at (302) 857-6397 or [rogutu@desu.edu](mailto:rogutu@desu.edu), or Jasmine Porter at 302-857-758 or [jporter@desu.edu](mailto:jporter@desu.edu).

## Retail Farm Market School

Wednesday, May 29, 2013 9:30 a.m.-3:30 p.m.

Carvel Research and Education Center

16483 County Seat Hwy

Georgetown, DE 19947

Delaware Cooperative Extension will conduct a day-long Retail Farm Market School for anyone who handles, processes or merchandises fresh market produce, such as local farm market vendors. The school is sponsored by the University of Delaware Cooperative Extension, Penn State University, Delaware Department of Agriculture and Delaware Agritourism Association. Instructors will be Gordon Johnson from UD and John Berry from Penn State. The tuition is \$45.

Topics will include produce handling and merchandising, customer service, sanitation and fresh cut produce. The course will be comprised of several delivery modes including professionally produced video segments, take-home text, post-harvest handling references, hands-on activities and a "certification quiz."

Each school participant will receive a full-day of retail farm marketing education and networking, a 40-page text that follows the *school* curriculum, a professional produce knife, a digital produce thermometer, sign blanks and the opportunity to receive a Retail Produce Professional certificate.

Program details are online at:

<http://extension.udel.edu/weeklycropupdate/files/2013/04/RetailFarmMarketBROCHURE.pdf>



Registration deadline is Friday, May 17. Please contact Karen Adams at [adams@udel.edu](mailto:adams@udel.edu) or call (302) 856-7303 ext. 540 to register, obtain additional information and directions. Class is limited to the 35 seats.

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### Blueberry Educational Meeting and Field Tour

Saturday, June 8, 2013 9:00 – 11:00 a.m.  
Bennett Orchards  
31442 Peach Tree Lane  
Frankford, DE 19945

Do you currently grow blueberries or are you considering commercial blueberry production?

This meeting will be a great opportunity to tour the eight acre blueberry planting at Bennett Orchards and hear from Hail Bennett about his experiences establishing a commercial blueberry planting.

Gordon Johnson, University of Delaware Extension Vegetable Specialist, and Emmalea Ernest will discuss recommendations and research on establishment practices and variety selection.

Joanne Whalen, University of Delaware IPM Specialist, will provide the latest information on Spotted Wing Drosophila management.

Refreshments will be served.

Please preregister by contacting Karen Adams at [adams@udel.edu](mailto:adams@udel.edu) or call (302) 856-7303 ext. 540.

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### 2013 University of Delaware Cooperative Extension Horticulture Short Course: Pest and Beneficial Insect Walks

June 26, 2013 4:00-6:00p.m.  
UD Carvel Research & Education Center  
Sussex County Extension Office  
16483 County Seat Hwy.,  
Georgetown, DE  
Cost: \$15

Tour the grounds of the Sussex County Extension Office in Georgetown to identify insects, diseases and beneficial insects in the landscape.

Instructors: Nancy Gregory, Brian Kunkel, Carrie Murphy, and Tracy Wootten

Register with Tracy Wootten: (302) 856-7303 or [wootten@udel.edu](mailto:wootten@udel.edu)

## Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of April 24 to May 1, 2013

Readings Taken from Midnight to Midnight

### Rainfall:

1.13 inch: April 29

0.33 inch: April 30

### Air Temperature:

Highs ranged from 68°F on April 28 to 57°F on April 30.

Lows ranged from 53°F on April 29 to 37°F on April 26.

### Soil Temperature:

58.4°F average

Additional Delaware weather data is available at [http://www.deos.udel.edu/monthly\\_retrieval.html](http://www.deos.udel.edu/monthly_retrieval.html) and <http://www.rec.udel.edu/TopLevel/Weather.htm>

*Weekly Crop Update is compiled and edited by Emmalea Ernest, Extension Associate - Vegetable Crops*

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