



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

Cole Crops

Continue to sample for cabbage looper, diamondback larvae, beet and fall armyworms and Harlequin bug. Although the pyrethroids will provide control of Harlequin bugs they are not effective on beet armyworm or diamondback. Be sure to scout and select controls options based on the complex of insects present in the field.

Lima Beans

Continue to scout for stink bugs, lygus bugs, and corn earworm. A treatment will be needed if you find one corn earworm larvae per 6 ft-of-row. With the increase in local corn earworm pheromone trap catches we are starting to see an increase in larval populations. We have also found soybean loopers in fields. Remember that they are a migratory pest, difficult to control and pyrethroid resistance has been documented in states to our south. If they are present in the mix, you will need to select a material labeled for soybean loopers. Be sure to check the label for rates, restrictions (including plant back/rotational crop restrictions) and days from last application to harvest.

Melons

Continue to scout all melons for aphids, cucumber beetles, and spider mites. We continue to see a significant increase in aphid populations. Treatments should be applied

before populations explode and leaf curling occurs.

Peppers

At this time of year, corn borer, corn earworm, beet armyworm and fall armyworm are all potential problems in peppers. So be sure to select the material that will control the complex of insects present in the field. Be sure to check local moth catches in your area by calling the Crop Pest Hotline (in state: 1-800-345-7544; out of state: 302-831-8851) or our webpage at <http://agdev.anr.udel.edu/trap/trap.php>.

We continue to see aphid populations increasing, especially in fields where pyrethroids have been used on a weekly basis. Labeled materials are only effective if applied before populations explode.

Snap Beans

At this time, you will need to consider a treatment for both corn borer and corn earworm. You should also watch for beet armyworms and soybean loopers. Sprays are needed at the bud and pin stages on processing beans for worm control. With the diversity of worm pests that may be present in fields, be sure to scout fields and select materials that will control the complex of insects present. You will need to check our website for the most recent trap catches to help decide on the spray interval between the pin stage and harvest for processing snap beans:

<http://agdev.anr.udel.edu/trap/trap.php>

<http://extension.udel.edu/ag/insect-management/insect-trapping-program/ecb-and->

[cew-moth-catch-thresholds-for-processing-snap-beans/](#)

We are also hearing reports of fields with economic levels of whiteflies. Be sure to check the Vegetable Crop Recommendations for materials labeled for whitefly control on snap beans (<http://extension.udel.edu/ag/vegetable-fruit-resources/commercial-vegetable-production-recommendations/>)

Spinach

Be sure to watch for webworms and beet armyworms. Both moths are active at this time and controls need to be applied when worms are small and before they have moved deep into the hearts of the plants. As a reminder, the pyrethroids have not provided effective beet armyworm control in past years. Remember that both insects can produce webbing on the plants. Generally, at least 2 applications are needed to achieve control of webworms and beet armyworm.

Sweet Corn

With the increase in corn earworm trap catches, be sure that a spray is applied as soon as ear shanks are visible on plants. If fall armyworms are present in the whorl, you will need multiple whorl sprays for this insect before the ear shank spray to achieve effective control and to prevent larvae from dropping into the ear zone. Once fields are silking, you will need to check both blacklight and pheromone trap catches for silk spray schedules since the spray schedules can quickly change. Trap catches are generally updated on Tuesday and Friday mornings:
<http://agdev.anr.udel.edu/trap/trap.php>

<http://extension.udel.edu/ag/insect-management/insect-trapping-program/action-thresholds-for-silk-stage-sweet-corn/>

You can also call the Crop Pest Hotline (in state: 1-800-345-7544; out of state: 302-831-8851). Be sure to check all labels for days to harvest and maximum amount allowed per acre.

Vegetable and Fruit Fungicide Coverage in a Disease Year - Gordon Johnson, *Extension Vegetable & Fruit Specialist*; gcjohn@udel.edu

In this heavy disease pressure year, we are seeing issues with disease control related to fungicide choice, rates, timing, and coverage.

Fungicide choices involve evaluating cost, efficacy, and disease spectrum in relation to the type of crop and stage of growth. Additional factors include synergism between fungicides, fungicide classes and need for rotation of fungicides, maximum application allowances, and preharvest intervals. Additional decisions will be needed on rates where labels offer a range, critical timings for applications, spray volumes, and frequency of application. A complicating factor can be the loss of efficacy by fungicides or development of resistance in pathogens to specific fungicide chemistries. In each of these cases, decisions can affect the disease control obtained.

Coverage is always a concern with vegetable crops and fruits. Inadequate coverage leaves unprotected plant areas, and depending on the type of fungicide, this can increase the risk for infections and disease development.

Fungicides can be grouped into four basic mobility categories.

1) Protectant or contact fungicides are those that stay on plant surfaces. Included are many of our older fungicides (such as chlorothalonil) with many being very broad spectrum with low risk of resistance development. Contact fungicides can be used as basic disease control programs and they are added in rotation or with other classes of fungicides to improve disease control spectrums. Contact fungicides are most effective when they are evenly applied to foliage and stems. Crops where contact fungicides are used are most susceptible to disease control failures if coverage is poor. New growth will be unprotected until a new application of fungicide is made. Longevity will depend on the chemical nature of the fungicide and the susceptibility to environmental degradation, any additives used to delay degradation, additives or adjuvants that act as stickers, and rainfall.

Contact fungicides must be applied so that a large number of droplets reach the target area. Applying more water will dilute the effect of each droplet (reduced concentration) but may result in more droplets per surface area. Best protection is obtained when susceptible leaf and stem surfaces have about 500 to 600 droplets per square inch, sprayed with fine-to-medium droplets, with a concentration no less than label rate. Manufacturer's recommendations for spray volumes and rates should be followed.

2) Locally systemic fungicides are those that are absorbed into the plant but that move very short distances such as across a leaf (often called translaminar). Examples are some of our strobilurin fungicides such as pyraclostrobin. Local systemics also require extensive coverage to be effective. Recommendations are 400 to 500 droplets per square inch, sprayed with fine-to-medium droplets, with a concentration no less than label rate. Manufacturer's recommendations for spray volumes and rates again should be followed.

3) Xylem mobile systemic fungicides are those that move longer distances in the plant. When applied to the root system they will move to actively transpiring leaf, stem, and reproductive tissue. When applied to leaves they will move throughout the leaf they were deposited on but will not move out of that leaf. If sprayed on stems they can move to nearby leaves. Spray volumes and droplet numbers are less critical with xylem mobile systemics; however, missed leaves or leaves with lower fungicide concentrations will not be protected or may have too low of rate of fungicide to be efficacious. Examples of xylem mobile systemics would be DMI fungicides such as tebuconazole.

4) Phloem mobile systemics or amphimobile systemics move in the phloem upward or downward in the plant. They have the potential to be translocated out of the leaf where they were deposited and move to other areas of the plant (in contrast, xylem mobile systems do not move out of leaves where they were deposited). Coverage is not as critical with these products, but overall concentration received by each plant is, so rates are critical. Examples of these type of systemics would be the phosphonate

fungicides (examples are Phostrol, K-Phyte, ProPhyte).

It should be noted that all systemics cannot move again after translocation. That means that new growth that occurs after systemic fungicides have been translocated will not be protected.

Improving coverage for all fungicides involves paying attention to droplet size (nozzle type), nozzle number, pressure, and airflow with air assist, air blast, blower, or fan sprayers. Ground speed is also critical as well as provisions to minimize spray boom bounce. Increased rates with increased spray volume can provide more droplets thus maximizing coverage. Higher pressure or air flow can improve canopy penetration if it does not affect droplet size or drift.

In a high disease pressure year, more frequent applications will be needed to reduce the risk of new growth being infected because inoculum levels will be much higher.

Lima Bean Pod Diseases Now Present -

Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu

Downy mildew, *Phytophthora capsici* and white mold have been found in Delaware lima bean fields in the last 7 days.

Preventative applications of fungicides for Downy mildew may be justified at this time in fields that have not yet shown signs of the disease. Use one of the following in fields that are flowering or in early pod set stage.

- Fixed Copper (Champ DP, 2.0 lb 58DF/A, Kocide 3000 1.25 lb DF/A or other labeled fixed copper product),
- Forum - 6.0 fl oz 4.18SC/A,
- Headline - 6.0 to 9.0 fl oz 2.1 EC/A,
- Phosphonate Fungicide (ProPhyt -3.0 to 4.0 pts/A, K-Phyte -1.0 to 3.0 qt/A, Rampart -1.0 to 3.0qt/A, or Phostrol -4.0 pt/A, or other labeled phosphonate fungicide)

- Ridomil Gold Copper-2.0 lb 65WP/A.
- Omega - 8.0 fl oz/A (use only if white mold is also present)

If downy mildew has been confirmed in a field then use Ridomil/Gold Copper, or the phosphonate fungicides (ProPhyt, K-Phite, Phostrol, Rampart and others).

In fields that are being sprayed for downy mildew prevention Ridomil Gold Copper 2.0 lb 65WP/A or Forum 6.0 fl oz 4.18SC/A may suppress *Phytophthora capsici*.

In fields with white mold history, a preventative approach similar to snap beans can be used with a fungicide applied at 10-20% bloom and a second spray 10 days after if the soil remains wet. Later applications, when disease is present have also provided benefits.

Use one of the following fungicides for white mold control in lima beans:

- Endura--8.0 to 11.0 oz 70W/A
- iprodione--1.5 to 2.0 pts 4F/A or other labeled formulation
- Omega--8.0 fl oz 500F/A (also has good activity against downy mildew)
- thiophanate-methyl--1.5 to 2.0 lb 70WP/A or other labeled formulation
- Switch--11.0 to 14.0 oz/A 62.5WG

Agronomic Crops

Agronomic Crop Insects - Joanne Whalen, Extension IPM Specialist; jwhalen@udel.edu

Soybeans

Be sure to continue to scout carefully for earworms, especially in double crop soybeans, as well as defoliators during the next few weeks. Be sure to check all labels for the days between last application and harvest.

Consultants are starting to find small corn earworm larvae that are most likely the result of the recent increase in pheromone trap moth activity. Although we can find a few larger

larvae in the mix, in most cases they are still relatively small. With the recent increase in pheromone trap catches, we will continue to see a new hatch of small larvae.

We continue to see an increase in stinkbugs, especially in full season fields. The population levels, as well as species, vary from field to field depending on your location in the state. In Sussex County, the predominant species are native green and brown stink bugs, although brown marmorated (BMSB) are in the mix. From the Milford and Harrington areas in Kent County through New Castle County, the BMSB is more commonly found in the mix. We are just starting to find a few hot spots of BMSB with the highest populations along woods edges. You will need to continue to scout for stinkbugs in fields that are in the pod development and pod fill stages. Economic damage is most likely to occur during these stages. You will need to sample for both adults and large nymphs when making a treatment decision. Available thresholds are based on beans that are in the pod development and fill stages. Thresholds are based on numbers of large nymphs and adults (native green and/or brown stink bugs), as those are the stages most capable of damaging pods. As a general guideline, current thresholds are set at 2.5 per 15 sweeps in narrow-row beans, or 3.5 per 15 sweeps in wide-row beans. *In Virginia, the threshold has been increased to 5 stink bugs in 15 sweeps.*

Once again we are finding a few fields with whiteflies; however, populations are not as high as past years when soybeans were under heat and drought stress. Although we have limited experience with whiteflies in our area, whiteflies have generally not been a problem in the past, especially if moisture is adequate. They are related to aphids (that is they are in the same order of insects) and so can cause yellowing on the leaves if populations are high enough. The following links provides pictures of whiteflies and some additional comments regarding whiteflies in soybeans:

<http://bulletin.ipm.illinois.edu/article.php?id=832>

<http://ipcm.wisc.edu/blog/2012/07/questions-about-whiteflies-in-soybean/>

We continue to find a variety of defoliating caterpillars in soybeans including beet armyworm, yellow striped armyworm, green cloverworm, and soybean loopers. We are also seeing an increase in grasshopper populations in a few fields. All of these insects are defoliators and you will need to use percent defoliation to make a treatment decision. There are no available thresholds for the number of the above insects per sweep. Remember, that in addition to defoliation, grasshoppers can feed on and/or scar pods. In full season soybeans in the pod fill stage, the threshold is 10-15% defoliation. Remember, double crop soybeans cannot tolerate as much defoliation since they often do not reach the leaf area index needed for maximum yields. As a reminder, the pyrethroids have not provided effective control of beet armyworm or soybean loopers so a product labeled for these 2 species in soybeans will be needed if defoliation is present.

Since many of our pests in soybeans migrate to us from the south, the following two links provide information on what is occurring in Virginia and North Carolina:

<http://www.sripmc.org/Virginia/>

<http://www.nccrops.com/>.

Choosing Wheat Varieties for 2014 - Nathan Kleczewski, Extension Specialist - Plant Pathology; nkleczew@udel.edu

As you make your final decisions on wheat varieties, check with dealers for their level of resistance to Fusarium head blight (FHB). There are several varieties to choose from that should yield well and provide decent resistance to FHB. Research tells us that moderately resistant varieties provide additional protection against DON accumulation in heads, and when coupled with properly applied FHB-labeled fungicides, can reduce blight and DON by 70% or more. Conversely, fungicides applied to a susceptible variety only provide around 50% control if applied properly. Other management practices that can help reduce local buildup of FHB inoculum and effects of the disease include avoiding planting wheat after corn and residue management where practical. These practices

may have subtle effects on disease but can reduce overall levels of head blight. You should not rely solely on fungicides to manage this disease.



Two wheat varieties showing differing levels of Fusarium head blight.

Soybean Disease Updates - Nathan Kleczewski, Extension Specialist - Plant Pathology; nkleczew@udel.edu

Sudden Death Syndrome in Soybeans

There have been a couple of reports of SDS in Delaware and Maryland, and the UD Plant Diagnostic Clinic confirmed one sample earlier this week. This disease is rare in Delaware, but does pop up from time to time. SDS is caused by the soilborne fungus *Fusarium virguliforme*. Plants infected with *F. virguliforme* typically do not present symptoms until after flowering (R1). Early symptoms of the disease include mottling and crinkling of the leaves. Tiny yellow to white flecks appear between leaf veins. As the disease progresses the leaf tissue between the veins turns yellow/brown, while the veins remain green (Figure 1). Soon thereafter the leaves shrivel and fall from the plant, but the petioles remain intact. If the plant is removed from moist soil tiny blue structures may be visible at the base of the stem. These are spore masses produced by the fungus. In most cases diagnosis is completed by sectioning the lower portion of the stem lengthwise. The cortex of a stem infected with SDS will be streaked with tan/light

brown lesions, whereas healthy plant stems remain white. The pith of infected plants also retains a white coloration. Symptoms of SDS can be confused with other pathogens of soybean including charcoal rot. Stems infected with charcoal rot fungus contain round black/gray structures that look like tiny bits of coal (hence the creative name) or zones delineated by sharp black margins. The roots of SDS infected plants will also be rotted. You will not see the combination of symptoms with plants with nutrient issues, chemical burn, or insect damage.

F. virguliforme overwinters in the residue or free soil as recalcitrant spores, which are resistant to a wide range of temperatures and stresses. The pathogen typically infects plants while they are in the seedling stage, and infect the cortex between V1 and V6. When plants begin flowering the pathogen colonizes the cortex more thoroughly, and toxins are produced that are translocated to foliage. These toxins are responsible for the characteristic interveinal necrosis. Symptoms often appear during heavy rains during the reproductive stages and disease is favored by high soil moisture. Consequently, the disease typically is present in areas of the field that are poorly drained (low lying or compacted areas). The disease is spread short distances on mechanical equipment, workers boots, etc., and spores can be disseminated very short distances in rain.

An interesting twist to the story is that SDS is often found in association with Soybean Cyst Nematode and the pathogen can be isolated from within cysts of SCN. Thus the nematode may play a role in pathogen spread or infection. Consequently, if you detect SDS in your field you should consider sending a soil sample to the UD Diagnostic clinic to determine SCN levels and drive future planting considerations.

The options for management of SDS are limited. Some soybean cultivars are more tolerant to SDS than others and resistance ratings can be obtained from seed dealers or directly from seed companies. A variety should be used that has both SDS and SCN resistance. Avoid planting soybean into cool, wet soils. If you have a field with a history of SDS consider planting it last to

minimize the chance of infesting additional soybean fields. If you have a chronic issue with poor drainage in areas of your field, consider improving drainage in the area. A combination of rotation to corn and minimal tillage has been shown to reduce SDS levels in some cases. Overall SDS is not a major issue in Delaware. Plants can recover from this disease and I have only heard about isolated parts of the field having disease.



Figure 1. A leaf with symptoms of SDS. Foliar symptoms are not diagnostic of the disease and can be caused by other agents.

More Reports of Frogeye Leafspot on Soybean
Frogeye leafspot has been detected throughout the region, and may be more prevalent than in normal years. I detected the disease at low levels in full season soybeans in mid-July (<http://extension.udel.edu/weeklycropupdate/?p=6038>). Symptoms of the disease include tan to brown spots with a purple/dark red halo (Figure 2). When inspecting lesions with a hand lens, it may be possible to see black dots with grey/silver-colored spores at the center. The pathogen infects young leaves more readily than older leaves, but it can take up to two weeks for symptoms to develop. As a result, plants may have a layered appearance. Warm wet conditions, especially warm nights with heavy dews, favor disease development.

Typically this disease moves in late in the season and within season management is not required. However, this year we have many fields of late-planted double-crop beans. These fields should be scouted for frogeye. In general, if the disease is detected in the mid canopy at early reproductive stages (R1-R3) and your risk level is high, a fungicide may be warranted. Factors that

increase disease risk in double crop beans include: 1) the use of a Frogeye susceptible soybean variety; 2) presence of a significant level of disease in the field; and 3) favorable weather. Research indicates that applications made at R3 tend to be most effective in states where this disease is common. Economic factors should also be weighed carefully when making any decision to spray fungicides.

Frogeye can be managed between seasons by selecting varieties with resistance to Frogeye leaf spot. Ratings can be obtained from seed companies or dealers. Most varieties with resistance to Frogeye leafspot are group V or higher, so your selection may be somewhat limited. Rotation with non-hosts, such as corn and small grains will help reduce inoculum levels and disease severity. Residue management, when practical, can also help reduce the impacts of this disease.



Figure 2. A leaf with symptoms of Frogeye leaf spot

Update on Soybean Rust

Several people have asked about the status of soybean rust this year, particularly because planting of double crop soybeans was delayed due to inclement weather. Earlier in the season there was some concern from the South that soybean rust may be a greater concern than in years past, mainly because the environment was conducive to the development of the disease. Consequently, the pathogen was detected in sentinel plots and commercial fields 2-3 weeks ahead of schedule. The disease has developed more slowly than anticipated, although disease progress is still ahead of pace for many Southeast soybean growing regions and has spread more rapidly in August. As of August 19,

80 counties in 8 southern states have reported soybean rust (Figure 3). At this time last year 50 counties reported soybean rust, and during the dry season of 2011, only 5 counties reported the disease. Currently the disease has not been detected in our neighboring states.

Soybean rust moves via spores blown from the south. Recent forecasts from the SBR ipmPIPE website (<http://sbr.ipmPIPE.org/cgi-bin/sbr/public.cgi>) indicate that Delaware is not likely to receive any spores in the near future. It is not likely that rust will make it here in time to cause any damage to our soybeans, even late-planted double-crop beans, but I'm not quite ready to throw in the hat quite yet. The take home message: we are not at risk for soybean rust at the current time. We are closely monitoring the situation and will keep you informed of the status throughout the remainder of the soybean growing season.

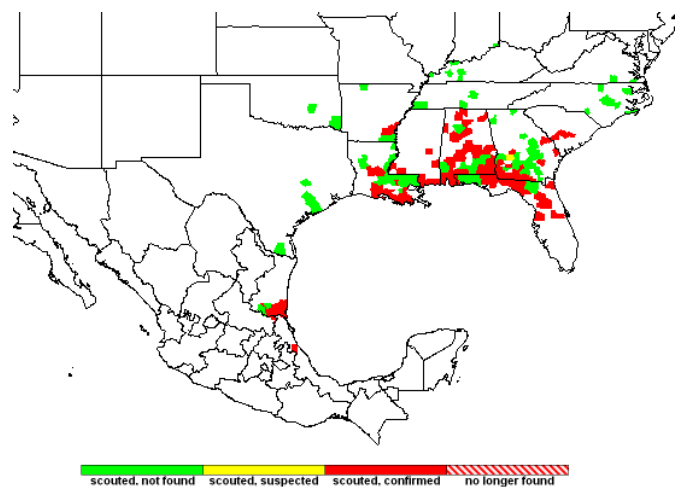


Figure 3. Soybean rust confirmations as of August 19, 2013

Field Crops Disease Blog

Check out my field crops disease management blog article for the week: Faux Cercospora leaf blight (AKA sunscald):

<http://extension.udel.edu/fieldcropdisease/>.

You can now subscribe to my blog and receive updates via email by clicking the "contact me" button under my picture and entering your information into the pop up that appears. Make sure that you check off the box at the bottom to subscribe to blog updates.

Announcements

Farm Protection and Risk Management Workshop

Tuesday, August 27, 2013 9:00 a.m.
Carvel Research & Education Center
16483 County Seat Highway
Georgetown, DE 19947

Are you are looking to better protect the revenue you earn from commodities and to keep cash flow constant for your operation? This workshop will feature Clif Parker, formerly of the Risk Management Agency, speaking about available crop insurance options and Dave Goeller, of the University of Nebraska addressing farm financial issues including succession planning. Topics of discussion may also include grain marketing, proper record keeping, and compliance.

If you are interested in attending, please call 877-673-2767 to register and indicate areas of risk management you are interested in learning more about at the workshop. Registration is not required but does ensure enough materials for all attendees will be available.

Sponsored by USDA Risk Management Agency
&
Delaware Department of Agriculture

Wye Research and Education Center Horticultural Crops Twilight Meeting

Wednesday, August 28, 2013 5:00 – 7:30 p.m.
WyeREC, 211 Farm Lane
Queenstown MD 21658

This educational meeting is intended to provide producers and the general public the opportunity to get a firsthand look at several of the ongoing Horticultural crops projects at the University of Maryland's research facility in Queenstown.

Highlights include, but not limited to:

- Updates from University of Maryland Extension and University researchers and specialists
- The latest on the Brown Marmorated Stink Bug (BMSB) and Spotted Wing Drosophila on Fruit and Vegetables
- Updates on disease control in vegetable crops

- Tour of ongoing projects, including
- Pumpkin IPM Spray Trials
- Asian Pear Variety Trial
- NC140 Size-Controlling Rootstock Evaluation
- Aronia Trials
- Impact of Buckwheat on the mortality of exotic and native Pentatomids in Organic Sweet Corn planting

Sandwiches and refreshments will be provided. Registration is not required, but will help us to plan for handouts, food and drinks.

Reply to: Debby Dant, 410-827-8056 x115, ddant@umd.edu or Michael Newell, 410-827-7388, mnewell@umd.edu

High Tunnel Fall Plantings with Fruits and Vegetables

Wednesday, August 28 6:00-8:00 p.m.
Delaware State University
Smyrna Outreach & Research Center
884 Smyrna Leipsic Road
Smyrna, DE 19977

This workshop is designed for you to immediately implement techniques that you observe and learn on DSU's Outreach and Research Farm. We will address what it takes to successfully extend your growing season into the fall and early winter, as well as preparing to have early strawberries ready for next spring. We now showcase five different types of high tunnels and you can walk through and compare each one. During this workshop, we will be planting strawberries and vegetables as well as providing classroom presentations.

More information is online at:
<https://extension.udel.edu/weeklycropupdate/files/2013/08/DSUFall2013HighTunnelWorkshop.pdf>

Light snacks and beverages will be provided. We hope to see you there!

To register or for more information contact Jason Challandes at (302) 388-2241 or jchallandes@desu.edu

Organic and Sustainable Agriculture Field Tour

Wednesday, September 4, 2013

Hold this date for a late afternoon or evening field day highlighting research and demonstration projects for organic and sustainable agricultural production. More details to follow.

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of August 15 to August 21, 2013

Readings Taken from Midnight to Midnight

Rainfall:

0.24 inch: August 18

Air Temperature:

Highs ranged from 86°F on August 21 to 70°F on August 18.

Lows ranged from 66°F on August 21 to 52°F on August 16.

Soil Temperature:

74.8°F average

Additional Delaware weather data is available at 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 Agent - Vegetable Crops

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