



# WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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**Last Issue of Weekly Crop Update for 2014**  
*Emmalea Ernest, Associate Scientist - Vegetable Crops; [emmalea@udel.edu](mailto:emmalea@udel.edu)*

This is the last issue of Weekly Crop Update for the 2014 season. I hope that this newsletter has been a useful resource to you as you dealt with the challenges of this past growing season. My thanks to the Extension specialists and agents who have contributed articles this year – the WCU would obviously not be possible without them. My thanks as well to our office staff at the REC, who make sure the WCU gets to our fax and mail subscribers.

As editor of WCU, I appreciate your comments and suggestions for improvement of this publication. You can contact me at the email address above or at (302) 856-7303.

Best wishes for a safe and prosperous fall harvest season. I look forward to seeing many of you at meetings this winter.

Kind regards,

Emmalea



## Vegetable Crops

**Serendipity in Research - Hollow Heart in Watermelon** - *Gordon Johnson, Extension Vegetable & Fruit Specialist; [gcjohn@udel.edu](mailto:gcjohn@udel.edu)*

Much of research is tedium, the repetitive collection of data. A number of years ago, I had a conversation with a colleague about the value of being in the field to collect data. She stated that while most of the activities were tedious, she prefers to be there in person when data is collected. This is because of the unexpected, new observations that are often made by a trained eye. She termed it the serendipity factor.

The definition of serendipity is a “fortunate happenstance” or “pleasant surprise”. This is exactly what has happened with the discoveries that the University of Delaware vegetable program has made regarding hollow heart disorder in seedless watermelon.

If you look at any reference up to 2 years ago, the stated cause for hollow heart in seedless watermelon was a stress related change in the growing environment, excess nitrogen, or wide fluctuations in water uptake by the plant. However, no watermelon researcher was able to replicate hollow heart by stressing plants, by giving excess nitrogen, or by fluctuating water.

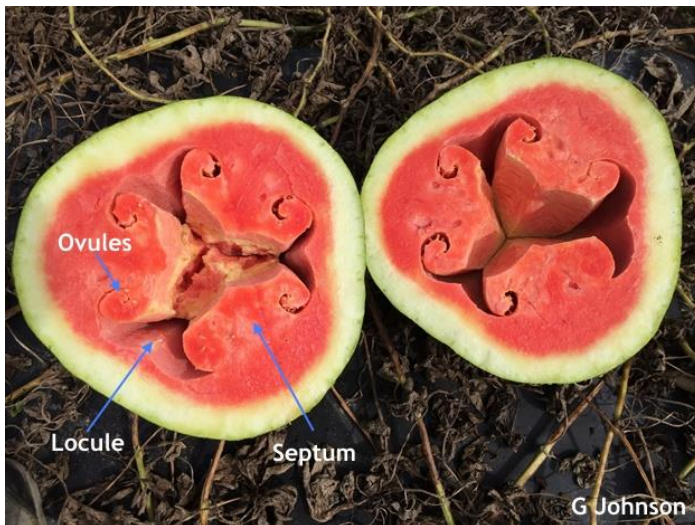
On hearing a watermelon researcher several years ago observe that seedless watermelon hollow heart is often found in stray melons away from a pollen source, and another researcher

postulate that plant hormones might be involved I set up some simple side experiments to look for hollow heart.

To make a long story short, these side projects have led to the discovery that hollow heart can be induced by limiting pollen. Seedless fruit will set, but will not develop properly under reduced pollen levels and hollow heart incidence will be increased dramatically.

Back to the idea of serendipity; we just had a “fortunate happenstance” occur this year with striking results. We had planted 4 blocks of seedless watermelons with no pollenizers to do some hand pollination research. We separated this trial from another trial with pollenizers by 50 feet, feeling this was adequate to avoid stray pollen. We did not have the time to do the hand pollination research and just recently decided to kill the plots with non-selective herbicide.

Lo and behold, once the vines were killed back, we found that one of the varieties that was nearest to the other trial 50’ away had some fruit set. There were no other pollenizers or stray pollen sources nearby. I decided to cut these melons to look for hollow heart. Nearly all had severe hollow heart, and showed where development of the fruit occurred and where it did not.



In the picture above, note how the fruit developed normal size, but when cut, the fruit tissue showed extreme developmental abnormalities. The rind developed normally. The septa of the fruit developed, but not completely. The locules did not fill around the

ovules (seedless watermelon ovules do not fertilize, even though there is a fertilization-like event during pollination). This resulted in severe hollow heart.



In the picture above, the septum was more developed and the locules filled more completely, making the hollow heart less severe.



In the picture above, the locules were more filled around the ovules but not completely and the septa were not completely developed leading to the triangular shaped hollow heart in the middle of the fruit. Note that hollow heart was already present in this immature fruit. We find hollow heart in immature fruit, suggesting that hollow heart occurs very early in fruit development.

**Grafting Heirloom Tomatoes for Increased Yields and Quality** - Jerry Brust, IPM  
Vegetable Specialist, University of Maryland;  
[jbrust@umd.edu](mailto:jbrust@umd.edu)

Grafted vegetables are produced by joining the top part of one plant (the scion) to the root system of another plant (the rootstock). The subsequent plant is more vigorous and productive. Several studies have been done over the last 10 years that show the benefits of using grafting for soil disease control in tomato production, but there is not much research that examines the influence of rootstocks in non-diseased tomato high tunnel production systems. In general, grafting has been shown to enhance yield and improve crop tolerance. We looked at what would be the benefit, if any, of grafting an heirloom tomato variety, *Cherokee Purple*, (Fig. 1) onto a more vigorous rootstock (*Maxifort*) in a high tunnel production system. The data from this first year of study are still being worked on so this will act as a general summary as to what was done and what was found.

**Methods:** Grafting treatments consisted of three combinations: a rootstock/scion graft, a non-grafted control, and a self-grafted control (the scion and root stock were from different plants but the same variety (*Cherokee Purple*) to test for any 'grafting effects'. Seedlings were grafted using the Japanese tube-grafting method. Six weeks after grafting, all grafted and non-grafted plants were transplanted into the HT on March 15<sup>th</sup>. Black plastic mulch and drip irrigation were used. There were six rows that were 40ft long. Each row (plot) was divided into 20 ft sections, 10 tomatoes spaced 2 ft apart per plot. There were 4 replications.

Leaf tissue samples were taken at first flower bud and every two weeks throughout the study. Fruit harvests were conducted two-three times per week and sorted into marketable and non-marketable components. Non-marketable fruit categories consisted of: yellow shoulders, uneven ripening, cat-facing, blossom end rot, fruit cracking and 'other'. Fruit number and weight were recorded.

**Results:** Overall grafted plants (mean of 18.3 lbs/plant) had significantly greater yields of marketable fruit compared with non-grafted

(14.5 lbs/plant) and self-grafted plants (13.8 lbs/plant). Grafted plants had on average 18% greater leaf tissue nutrient concentrations for N and P. The all-important nutrient K was 23% greater in grafted plants vs. self-grafted and non-grafted plants. Grafted plants had 25% greater overall yields, with ~30% greater marketable fruit yield compared with the non-grafted and self-grafted plants. Early, middle and later harvests were all about equal among the grafted and non-grafted plants, although there was a trend for grafted plants to have lower early yields compared with non-grafted plants. It does look possible, at least from this 1<sup>st</sup> year of study to increase yields and quality in heirloom tomatoes just by grafting the heirloom plant onto more vigorous root stock. But more data from different sites and in multiple years will be needed before we can say it is consistently cost-effective to graft heirloom plants in the absence of any disease problems.



Figure 1. An example of a *Cherokee Purple* tomato from [http://www.tsflowers.com/seeds2/tomato\\_cherokee\\_purple\\_tomato\\_seeds.html](http://www.tsflowers.com/seeds2/tomato_cherokee_purple_tomato_seeds.html)

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

**Are your High Tunnel Side Vents still open during fall production?**

Fall temperatures in Delaware (2012 USDA hardiness zone-7A) are characterized by falling temperatures (Table 1). Although we have not documented the average high tunnel temperatures during these months, it is commonly agreed that whether your high tunnel

is single or double poly covered, they are above the temperatures listed in Table 1. The Fall season is less than 60 days long and high tunnel growers go for quick maturing cool season crops, some of which are suggested in Table 2.

Table 1: Average Fall months' temperatures (°F) in Delaware, based on weather data collected from 1981 to 2010 by National Oceanic and Atmospheric Administration (NOAA) National Climactic Data Center.

	September		October		November		December	
	High	Low	High	Low	High	Low	High	Low
<b>Dover</b>	79	60	69	49	59	40	47	31
<b>Georgetow</b>	78	59	68	47	58	39	48	30
<b>Lewes</b>	79	63	69	52	59	43	49	34
<b>Milford</b>	78	57	68	46	58	37	47	29
<b>Newark</b>	80	57	69	45	58	36	46	28
<b>Wilmington</b>	77	58	66	46	56	37	45	29



R Ogutu



R Ogutu

High tunnels make a difference. Inside and outside the high tunnel in Hartly Delaware on Oct15, 2012

### Tips for Managing Your High Tunnel in the Fall

**Avoid over-applying nitrogen.** High N-levels keep plants soft and less hardy. Various stresses and health conditions can also lessen hardiness.

**Beware of extreme cold forecasts.** Roll down the high tunnel sides and make sure your high tunnel is not letting in cold fronts. The use of floating row covers and hoop supported row covers is highly recommended to help reduce heat loss by convection thus maintaining higher temperatures within the high tunnels. Overhead irrigation using micro sprinklers prevents frost damage. It is important to remember not to

irrigate before cold spells as water stress enhances frost tolerance.

**What about pests in fall?** Although most major pests have cycled out by the fall season, the relatively warmer temperatures in the high tunnels can be a hub for pests and they can thrive and need to be managed. When using biological control, avoid using chemicals. Put in place yellow and/or blue sticky cards just above the plants to monitor pests. Keep up with good sanitation in the high tunnels, removing weeds and diseased or unwanted plant material.

**Table 2: Suggestions for high tunnel fall and winter production**

Crop		Approximate harvest times and harvest frequency	Preferred varieties* proven to meet the thresh-hold damage temperatures and additional comments
Arugula		Every 3 weeks	-Var 'Sylvetta' -Cooler air temperatures below 35° F slows growth
Beets	Seed as early as Feb 15	April	-Var 'Early Wonder Tall' -Seeds need soil temperatures of 60 - 65° F to germinate
Broccoli	Transplant by Mid to late October		
Cabbage	Transplant by Mid to late October		
Cauliflower	Transplant by Mid to late October		
Collards			Var 'Champion', 'Vates'
Spinach	Directly sow by late October	Harvest weekly over a 6 week period	Var 'Space'
	Directly sow by mid-October	Lasts till April	
Carrots	Directly sow by Early to Mid-October	January	-Var 'Napoli' can overwinter, varieties 'Sugar snax and 'Bolero' hold up well -Very unique flavor develops due to the slow growth by the cool temperatures that concentrates sugars
	Seed as early as Feb 15	April	
Mesclun - baby lettuces and greens mixes	Directly sow October through November (3 weeks to harvest)	Recut weekly	Transplant production for late fall and late winter
	Directly sow by December	3 weeks between cuttings	Cooler air temperatures below 40 F slows down growth
Scallions	Directly sow by October	January	
Brussel sprouts	Transplant by Mid to late October		
Leeks	Transplant by Mid to late October		
Kale	Transplant by Mid to late October		Var 'Red Russian ' and 'White Russian', Toscano, 'Winterbor' 'Wild garden Kale'
Garlic	Plant cloves by late October	Mid to late June	Var 'Mchadizauri', 'German white', 'Romanian Red',

\*The varieties listed are not an all-inclusive list

# Agronomic Crops

## Nematode Sampling vs Egg Assessments for Soybean Cyst Nematode - Nathan Kleczewski, Extension Specialist - Plant Pathology; [nkleczew@udel.edu](mailto:nkleczew@udel.edu)

I previously mentioned that egg assays are more sensitive than larval extractions for assessing populations of soybean cyst nematodes. Below is an example of two actual samples that were

processed by the University of Delaware Nematode assay service. A quick look at the Soybean cyst nematode vs SCN egg results illustrates the difference in sensitivity between egg counts and nematode counts when SCN populations are low. Although soybean cyst nematodes were detected in field 1, which contained a high population of SCN, none were observed up in field 2. This result may lead the individual to assume that SCN is not present in a field when in actuality it is present, just at lower levels.

COUNTY			(Meloitoglyne) ROOT-KNOT	(Pratylenchus) LESION	(Tylenchorhynchus) STUNT	(Helicotylenchus) SPIRAL	(Hoplolaimus) LANCE	(Xiphinema) DAGGER	(Trichodorus) STUBBY-ROOT	(Heterodera) SOYBEAN CYST	SOYBEAN CYST NEMATODE -Egg Count	(See explanation below) RECOMMENDATIONS
Sussex												
GROWER'S NAME												
Jack Bean												
ADDRESS												
CITY	STATE	ZIP										
Anywheretown	DE											
LAB NUMBER	FIELD NUMBER	CROP TO BE GROWN OR CURRENT CROP										
000-000	1	Soybeans	0	17	68	119	0	0	34	102*	8832*	D/E
000-000	2	Soybeans	0	0	51	34	51	0	119	0	48*	D/E

Figure 1. An example of a nematode assay report showing the difference in detection limits for soybean cyst nematode counts vs egg counts.

## Decisions Made in the Fall Can Impact Diseases of Small Grains in the Spring - Nathan Kleczewski, Extension Specialist - Plant Pathology; [nkleczew@udel.edu](mailto:nkleczew@udel.edu)

Small grains will be planted in the next few weeks. The decisions made at planting can and do significantly impact many diseases of small grains in the ensuing season. The following is a brief review of some of the more important planting decisions growers will make in the next 3-4 weeks that can impact diseases in 2015.

**Variety:** Variety selection is the most important part of an integrated disease management program. No two varieties are created equal in terms of disease resistance or tolerance.

Although it is not often possible to find a high-yielding variety with excellent resistance to all pathogens, it is possible to find some productive varieties with solid disease resistance to common diseases with the potential to reduce yield such as powdery mildew and leaf blotch or to contaminate grain such as Fusarium head blight. When selecting varieties, take into account what diseases tend to be issues in your fields and choose those that will help reduce the risk of severe disease epidemics through resistance. Disease resistance ratings for Mid-Atlantic small grain varieties can be found at the University of Delaware, The University of Maryland, and Virginia Tech Cooperative Extension websites. Seed companies also provide disease resistance ratings.

**Planting date:** Wheat planted before the Hessian fly-free date has a greater chance to be damaged by viruses such as Barley Yellow Dwarf. If you do plant before the Hessian fly-free date make sure you are planting a variety with tolerance to Barley Yellow Dwarf and follow IPM practices for aphid management. Early planting can also lead to higher levels of infection and overwintering of several foliar pathogens. This can result in more foliar and head diseases in the spring.

**Stands and fertilization:** Disease issues may occur in fields with excessive plant populations. Planting at excessive rates reduces airflow and increases canopy humidity, which favors the development of many diseases. Excessive fertilization promotes rapid, lush growth that can enhance disease issues. Not only does excessive fertilization result in dense canopies, but it also can cause internal metabolic shifts that influence the overall ability of the plant to defend itself against pests and pathogens.

## Announcements

### Fall Pasture Walk

Thursday, October 2, 2014 5:00 - 7:30 p.m.  
Whitehead Cattle Company  
1303 Dexter Corner Rd., Townsend, DE 19734

Come and learn about pasture management and renovation practices used at Whitehead Cattle Company. Hear about plant establishment and fall weed control. Get help with pasture design and rotation programs. Particulars on Natural Resource Conservation Service programs will also be covered. Experts will be on hand to answer specific questions.

DE Nutrient Management and Pesticide credits will be offered.

### AGENDA

#### Welcome and Introductions

Dan Severson, University of Delaware Cooperative Extension

#### Tour of Pastures and Pasture Management

George Whitehead, Whitehead Cattle Company

#### Pasture Renovation and Plant Establishment

Dr. Richard Taylor, University of Delaware Extension Agronomy Specialist

#### Weed ID and Fall Weed Control in Pastures

Quintin Johnson, University of Delaware Cooperative Extension

#### Pasture Design and Rotation

Dan Severson, University of Delaware Extension Agent

#### Overview of NRCS Programs

Marianne Hardesty, New Castle County NRCS District Conservationist

*The meeting is free and everyone interested in attending is welcome. If you have special needs in accessing this program, please call the office two weeks in advance. To register or request more information, please call our office at (302) 831-2506. Please call to register by Monday, September 29.*

## MidAtlantic Women In Agriculture Fall Farm Tour

October 9, 2014

9:00 a.m. **Fifer's Orchards**

[www.fiferorchards.com](http://www.fiferorchards.com)  
1919 Allabands Mill Road  
Camden-Wyoming, DE

10:15 a.m. **Haass' Family Butcher Shop**

<http://www.haassmeats.com>  
3997 Hazletville Road  
Dover, DE

11:30 a.m. **Schmidt Family Farm**

1:00 p.m. **Lunch at Harvest Ridge Winery**

2:00 p.m. **Harvest Ridge Winery**

[www.harvestridgewinery.com](http://www.harvestridgewinery.com)  
447 Westville Road  
Marydel, MD  
Tour of the vineyard ending with wine tasting available. \* Wine Tasting will be an additional \$5\*

**RSVP by September 30 to Victoria: [vgc@umd.edu](mailto:vgc@umd.edu) or 410-708-5578 or register online at: [www.2014wiafarmtour.eventbrite.com](http://www.2014wiafarmtour.eventbrite.com)**

**Farm Tour Notes:**

- There is a \$20 charge for this tour which includes lunch. Please make checks payable to “QA EAC” and send payment to QA EAC Farm Tour, 505 Railroad Ave Suite 4, Centreville, MD 21617
- Make sure to dress for the FARM!- Closed toe shoes are a must.
- Bring a cooler for purchases you make along the tour

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**Margin Protection Program – Dairy Informational Meetings**

Tuesday, October 7, 2014 1:00-3:00 p.m.  
Kent County FSA Office

*or*

Tuesday, October 7, 2014 7:00-9:00 p.m. Sussex  
County FSA Office

MPP-Dairy is a risk management program for dairy producers authorized by the 2014 Farm Bill. It offers protection when the difference between the all milk price and the average feed cost (margin) falls below a certain dollar amount selected by the producer.

FSA will explain the eligibility requirements, the registration method, how to establish production history, coverage elections and premiums.

University of Delaware Extension will explain the web based decision making tools, selecting coverage elections and premiums based on projected margins, and will provide hands on help that will enable you to input your information to develop coverage scenarios specific to your dairy operation.

*For further information, or if you need special accommodations, contact: Lynn Manges (302)678-4253 or Dan Severson (302)831-8860*

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**2014 Mid-Atlantic Crop Management School**

November 18-20, 2014  
Princess Royale Hotel  
Ocean City, MD

Registration information and program are online at:  
<http://www.psla.umd.edu/extension/md-crops>

**Horticulture Industry Expo and Annual Pesticide Conference**

January 28 & 29, 2015  
Modern Maturity Center, Dover, DE

Contact: Valann Budischak at 1-888-448-1203 or  
[dnlainc@comcast.net](mailto:dnlainc@comcast.net)

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**Delaware Ornamental and Turf Workshop**

November 19, 2014  
Hockessin Memorial Hall  
1225 Old Lancaster Pike  
Hockessin, Delaware 19707

Contact: Valann Budischak at 1-888-448-1203 or  
[dnlainc@comcast.net](mailto:dnlainc@comcast.net)

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**Delaware Agriculture Week**

Monday, January 12 – Friday, January 16, 2015

Delaware Agriculture Week will be held in Harrington at the Delaware State Fairgrounds from January 12-16, 2015. Delaware “Ag Week” is in its 10th year and is an ongoing collaboration between University of Delaware Cooperative Extension, Delaware State University Cooperative Extension and the Delaware Department of Agriculture.

Delaware Ag Week provides useful and timely information to the agricultural community and industry through educational meetings and events. In addition, it is a great time for networking and fellowship with old and new acquaintances.

The associated trade show will take place in the Dover Building from Tuesday, January 13 to Friday, January 17.

Delaware, Maryland, and Pennsylvania Pesticide recertification credits, Nutrient Management credits and CCA credits will be offered.

For more information, detailed session agendas, exhibitors, sponsors, and directions visit the DE Ag Week website at:  
<http://sites.udel.edu/delawareagweek/>.



# Weather Summary

Carvel Research and Education Center Georgetown, DE

**Week of September 18 to September 24, 2014**

**Readings Taken from Midnight to Midnight**

## Rainfall:

0.35 inch: September 24

## Air Temperature:

Highs ranged from 78°F on September 21 to 64°F on September 23.

Lows ranged from 64°F on September 21 to 44°F on September 23.

## Soil Temperature:

69.0°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, Associate Scientist - Vegetable Crops***

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