WEEKLY CROP UPDATE
UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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Vegetable Crops

Avoiding Watermelon Pollenizer Mix-Ups – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

Each year we get questions about how to reduce the chance of errors with pollenizers when planting seedless watermelon fields. If pollinizer trays are mixed in with seedless plant trays or if pollinizers are left unplanted this will lead to yield losses or delayed fruiting if pollenizers need to be planted later.

Syngenta seeds has approached this issue with their "Full Count Deuces" program where pollenizers are planted in the same trays in rows with the seedless plants. Transplanting crews then will just pull plants in order from the vertical rows.

One concern with such a system is that if the pollenizers go in every fourth hole, the number of seedless plants per acre will be lower than if pollenizers are planted between every third and fourth plant and there may be a small decrease in yield.

Another option is to mark the pollenizer plants so that they are easy to tell from the seedless. We did a demonstration where pollenizers were sprayed with one of the clay particle film materials (such as Surround or Screen Duo) which coats them white temporarily. Coated and uncoated plants were transplanted and performance evaluated (days to flower, initial flower production). There was no difference between particle film coated and uncoated plants.

This demonstration showed that using a white particle film coating on pollenizers as a marker is a viable way to reduce confusion during planting.

Using Growing Degree Days to Schedule Sweet Corn Plantings – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

To ensure a steady supply of sweet corn, the most accurate way to space plantings in the spring is by the use of growing degree days.

Growing Degree Days (GDD) are calculated as follows GDD = ((Maximum Temperature + Minimum Temperature)/2) -50°F. So if the daytime temperature is 68 and the nighttime temperature is 48, you would add 68+48=116 then divide 116/2 = 58 and then subtract 58-50= 8 GDD. Negative numbers are not counted. You can find growing degree days already calculated for nearby weather stations at this DEOS site: http://www.deos.udel.edu/agirrigation_retrieval.html

To schedule sweet corn by growing degree days you will need the following information:

1.) How much corn you plant to sell per day and the amount of acres or row feet to plant to supply that amount

2.) How many days you expect to harvest from that planting (1-4 days usually)

3.) The GDDs required to harvest for the varieties of sweet corn that you grow (an alternative is your records of the first harvest for the varieties you use)

4.) The average GDDs during the expected harvest period

5.) GDDs during your planting season (calculate daily). Having your own maximum and minimum thermometer is the best way do this. Information from the nearest weather station is an acceptable alternative.

So, for example, you have determined that you need 200 dozen ears per day. This requires 2400 ears or about 3000 seeds accounting for germination losses and unmarketable ears. At 24000 seeds per acre this is 0.125 or ⅛ acre and if you plan to harvest over three days this would be 0.375 or ⅜ acres to plant.

Historically, your records indicate that the specific variety you plant April 10 matures July 1. Or you can use historical GDD information and GDDs for that variety from your seed supplier to calculate first harvest (a 1300 GDD corn will mature on average between July 1 and July 4 when planted in early April in southern Delaware).

Average growing degree days in July for southern Delaware are 25 per day (from weather records). To have the corn you require every 3 days, you would multiply 3 x 25 = 75 growing degree days. Therefore, you would space your plantings in the spring 75 growing degree days apart. As you move into August, the growing degree days are similar but for September corn the growing degree days drop to 20 per day and plantings should be 60 GDD apart. This means that the first 20 plantings should be spaced 75 GDD's apart (April through early June) and after that you would space plantings 60 GDD apart (mid-June onward).

In summary:

• Make the first planting as you normally do for you first intended harvest date.

• Estimate the time of harvest and calculate average GDD per day in the harvest period.

• Determine the number of days you plan to harvest the planting (three in our example).

• Calculate the GDD that will accumulate during the harvest period (3 days x 25 GDD/days) = 75.

• Record maximum and minimum temperatures and calculate GDD = ((Maximum Temperature + Minimum Temperature)/2) -50° F

• Add daily GDD from planting until they equal the GDD in the intended harvest period (75).

• When GDD equal those in the harvest period, make the next planting.

• The process can be repeated for subsequent plantings and other varieties.

• To obtain specific variety GDD information, contact your seed supplier

High Tunnel Planting Scheduling – Working Out a Schedule for Successive Plantings

– *Rose Ogutu, Horticulture Specialist, Delaware State University* rogutu@desu.edu

High tunnels offer flexibility in crop production and can handle diverse crops from asparagus to zucchinis and many crops in between. High tunnels create an environment, one hardiness zone warmer than the field. The only time not to plant is when daylight does not allow any growth at all, but one can schedule crops in high tunnel to continue all year long. Once day length exceeds 10 hrs per day in late January, seeding of plants in high tunnels can commence, especially with adequate soil temperatures (>55°F). The cropping system should take advantage of season extension while ensuring good use of high tunnel space. The capability of starting your own seeds or having a source of seedlings or planting material whenever needed is important. Growers involved in supplying their CSAs, local restaurants and wholesale markets are always thinking ahead and should develop a good successive planting schedule.

At this time high tunnel producers are done with winter production season and have moved on to spring production. In hind sight, and with this past winter season in mind, early planting and establishment of crops is very important. October 15 should be the latest fall planting date considered for winter harvesting. Having gone through a long, comparatively cold winter, some lessons have been learned. Provision of minimal supplemental heating during extreme cold situations and an inside layer of row covers help a great deal. During the winter months, one needs reliable production of spinach, lettuce, radish, carrots etc. Cultivars of these crops that may be tolerant of freezing temperatures should be considered. Part of the winter's activities involves pulling out some fall plantings in January or February to open space for re-seeding. The crops to be removed could be lettuce, cilantro, Asian greens, claytonia, corn mache, kale or any other crops in the decline. End of winter and spring management of the high tunnel is often marred with uncertainties of what best to plant and plans for the main planting season.

Succession planting can continue in spring. Crops that could be planted between end of winter and summer include leaf lettuces, spinach, bulbing onions, spring carrots, cilantro, kale, baby chard, and arugula, which may reach maturity in the 12th week window (May 1 to June 1). Tomatoes should be in the high tunnel by May 15. (The last day of frost in Delaware is May 1, but attention has to be paid to the weatherman.)

Summer high tunnel crops considerations. Temperatures in the hot summers soar high. Temperatures can rise well above 90°F and temperatures above 85°F reduce pollen formation in most crops. For the 2012 growing season, high tunnel temperatures at Smyrna Outreach and Research Center (DSU-SORC) averaged 12.0°F warmer than the outside air with the maximum averaging 18.3°F and the minimum averaging 5.2°F. Good ventilation depends on high tunnel design and orientation with regard to adequate air flow. Growers normally wonder about a summer high tunnel crop that will yield in a three-month window with an advantage of being grown inside, rather than in the field. Eggplants (oriental) and hot pepper tolerate the high temperatures. Use of shade cloth (30-50%) lowers air temperatures within the high tunnel by as much as 5 – 8°F. Shade fabric will reduce light intensity and air temperatures and reduce water and nutrient uptake by plants. Evaporative cooling with mist nozzles can be used to keep leafy greens cool.

Fall high tunnel production. A succession planting plan for direct seeded spinach or leaf lettuce in the fall, followed by transplanted heading varieties in the early spring can be used to achieve a nice, diverse crop offering. Carrots and scallions must be planted early in August to size up for winter. For success, crops should be seeded by October 1 or transplanted by October 15. Note that there are some fall plantings that can be left until the summer crop is planted. These are crops like spinach, parsley, dill, chamomile, chard, scallions, beet root, kale and leafy lettuce (var. Tango).

Table 1. High Tunnel Cultivar and Scheduling Examples from the Delaware State University (DSU), Smyrna Outreach Research Centre (SORC).
Cultivar suggestions are based on experiences from DSU-SORC and other high tunnel locations within Delaware. The cultivars are not a result of extensive comparison trials, other varieties can be considered with good or better results.

Crop	Cultivar Suggestions	Direct Seed (DS) or Transplant (TP) Seeding Date*	Calendar Week
Asian greens; Tatsoi, chois, komatsuna, Chinese cabbage	Various	TP: Jan 14	3
Baby Salad mix and baby leaf crops; red and green oakleaf lettuces, mizuna or waido, red mustard, red	Various fast and slow	DS: Jan 14 to Feb 1	3-5

Russian kale, spinach, bull's blood beets, arugula etc.			
Beets	Kestrel, Red Ace, Ruby queen, Zeppo	DS: Jan 14 to Feb 1	3-5
Broccoli	Arcadia, Belstar, DeCicco, Eureka	TP: Feb 21	7
Brussels Sprouts	Jade Cross E	TP: Feb 21	7
Carrots	Envy, Moonraker, Sugar Snax, Napoli	DS: Feb 1	5
Cabbage	Quick Start, Ramada	TP: Jan 14	2
Chard	Bright Lights	TP: Jan 14	2
Cilantro	Santo	DS: Feb 1	5

SPRING

Collards	Champion, Flash	TP: Jan 14	2
Cucumber	Cortez, Indy	TP: Mar 27	12
Egg plant	Epic, Nadia, Orient Express	TP: Mar 1	9
Kale	Vates, Red Russian, Blue Knight	TP: Jan 14	2
Lettuces	Aruba, Emosa, Various	TP: Jan 14	2
Pepper	Ace, Carmen	TP: Feb 21	7
Raddichio	Indigo	TP: Jan 14	2
Radish	Easter Egg, D'avignon, Cheriette	DS: Feb 21	7
Scallions	Evergreen Hardy White	DS: Feb 1	5
Spinach	Space, Tyee, Renegade	TP: Jan 14	2
Summer Squash	Zephyr	TP: Mar 13	10
Tomato	Various, Better Boy, Prudens Purple, Mountain fresh	TP: Feb 21	7
Turnips	Hakurei, Scarlet Queen	DS: Feb 1	5
Zucchini	Sultan	TP: Mar 13	10

FALL/WINTER

Baby Salad	various	DS: Aug 27 to Oct 1	34-39
Beet	Ace, Golden	DS: Aug 8 to Sept 15	31-37
Carrots	Sugar Snax, Napoli	DS: Aug 6	31
Chois	Various	TP: Jul 24 to Aug 7	29-31
Cilantro	Santo	DS: Sept 4 to Sept 20	35-38
Collards	Flash	TP: Jul 24 to Aug 7	29-31
Kale	Red Russian, Winterbor	TP: Jul 24 to Aug 7	29-31
Lettuce	Aruba, Emosa, Winter Density	TP: Aug 13	33
Radish	D'avignon, Cheriette	DS: Sept 1 to Sept 30	35-39
Scallion	Evergreen Hardy White	DS/TP: Aug 6	31
Spinach	Space, Tyee, Renegade	DS/TP: Aug 20 to Oct 15	33-41
Swiss Chard	Bright Lights	TP: Jul 24 to Aug 7	29-31

*Dates refer to approximate date of seeding, whether you are direct seeding or transplanting at a later date. Consider dates as ranges.

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Taunya Ernst, Dan Drost and Brent. March 2012. High Tunnel Winter Spinach Production. http://extension.usu.edu/files/publications/publication/Horticulture_HighTunnels_2012-02pr.pdf

Fruit Crops

Winter Injury in Fruits – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

We are finally seeing bloom in fruit crops. Plums and apricots are in mid-bloom, peaches and nectarines are just starting to bloom. This is about 2 weeks later than the average.

As bloom occurs, winter damage to buds will become evident. Cold susceptible plants such as blueberries, wine grapes, peaches, blackberries and nectarines can have bud damage when winter temperatures drop below -10˚F. There is a lot of variation between grape varieties. Many of the European wine grapes will have damage between zero and -10 F, hybrids and American types can withstand lower temperatures. Other fruits are more cold-hardy. Cherries and European plums can withstand -20 to -25˚F and apples and pears go to -25˚F without damage. Delaware had temperatures approaching -10˚F in some areas. Initial observations indicate that sensitive peach and grape varieties have bud damage.

Fruits that were under stress in 2013 may also show more winter injury. We had significant water damage in lower areas of fields last year and trees, vines, or canes with root damage from waterlogging may also have increased winter injury. Trees with high or excessive fruit loads in 2013 may also show increased winter damage.

Agronomic Crops

Boost Spring Pasture and Hay Field Productivity - *Richard Taylor, Extension Agronomist;* rtaylor@udel.edu

Many equine and animal producers are running close to the edge this year with hay supplies since the frequent and heavy rainfall last summer either resulted in lower quality hay or prevented hay making completely. Grazers as well as hay producers should consider fertilization of their fields as soon this spring as soil conditions permit. The heavy rainfall last fall and over the winter months has leached nitrogen (N) and sulfur (S) from the upper rooting zone in pastures and hay fields.

Nitrogen application boosts the growth rate of the grass component in pastures and hay fields and with the very cold start to spring this year and the short hay supplies most producers will want to get their pastures and hay fields off to a rapid start. At least in the northern portion of Delaware, pastures and hay fields are just beginning to green up and start spring growth. With warmer temperatures and drier conditions expected until Tuesday of next week, now is the time to fertilize pasture and hay fields. Many producers will be using urea (46-0-0) as their primary N source but since S has leached out of the upper rooting zone in the soil, I suggest that producers consider applying at least a portion of the required N as ammonium sulfate. Application of both nutrients will ensure that the proper N to S ratio is available so that the sulfur containing amino acids are produced by the plant. Ammonium sulfate is the most acidifying of the N fertilizers but the proper N:S ratio is required by pasture plants.

If the pasture or hay field has a significant amount of legume (white, red, or alsike clover or alfalfa) present, you should limit the N rate to 20 to 30 lbs N/acre and in that case I would use 100 percent as ammonium sulfate. For pure grass hay fields or pastures with less than 25% legumes, apply about 50 lbs of N/acre per ton of expected yield. Apply about half of the N from ammonium sulfate but once the S application rate reaches about 40 lb S/acre change back to

pure urea or other N source. You are unlikely to see a response past the 40 lb S/acre/year rate.

Finish Wheat Fertilization Right Away

- *Richard Taylor, Extension Agronomist;* rtaylor@udel.edu

With the onset of somewhat warmer temperatures, winter wheat is beginning to advance in its stage of development rapidly. At least in northern Delaware, many wheat fields appear to be between Feeke's growth stage 5, leaf sheaths lengthened and erect, and stage 6 where the first node of stem elongation is felt above the soil surface. This is the last stage where we suggest that a nitrogen (N) application will produce a substantial yield increase if the plants are deficient in N. Later applications tend to increase the protein content of the finished grain but do not give you the yield increase seen with the early application of N fertilizer.

We have seen increases in yield (5 to 8 percent) for split applications of nitrogen and this increase appeared to be relatively independent of the total rate of N applied. The increase was found when the total application was 60 lb N/acre as well as when the total application was 140 lb N/acre. If you were successful earlier this spring in applying the first split of N to the field and did not reach the maximum rate allowed by your nutrient management plan, an additional application prior to growth stage Feeke's 6 should provide you with a yield increase. Unless you have not been able to apply any N to the wheat up to this point, avoid traffic on wet fields as the damage done through compaction and rutting of fields can easily add up to the small yield increase seen when N applications are split.

Time to Sign Up for Fusarium Head Blight Prediction Center Updates

- *Nathan Kleczewski, Extension Specialist - Plant Pathology*; nkleczew@udel.edu

Fusarium head blight (FHB) epidemics are episodic, but when they do occur they can cause significant reductions in quality and yield. FHB will continue to be an issue for small grains due to corn production and the widespread use of conservation tillage. Thus, this disease, which historically caused few, localized outbreaks every 15-20 years now is seen more frequently across much larger areas. FHB should be on your radar if you are planting small grains. Current research indicates that suppression of FHB is achieved by using 1) a moderately resistant variety; 2) a recommended triazole fungicide applied at Feekes 10.5.1 or 4-5 days after Feekes 10.5.1; and 3) planting wheat following soybean. **None of these practices used alone will provide sufficient suppression of FHB in a disease favorable year and must be integrated to maximize their suppressive effects.**

Obviously rotation choices and variety selection are things that occur prior to the planting. However, the use of a fungicide is a within-season decision. One tool available to growers is the Fusarium head scab prediction website: http://www.wheatscab.psu.edu/. The website accurately predicts FHB outbreaks of >10% field severity roughly 80% of the time. Based on a current survey, the use of the website and its alert system has saved producers of small grains over $170 million.

How can you use this site? **First, sign up for updates**. Extension plant pathologists provide updates throughout the growing season. In Delaware I will be providing weekly updates until the crop starts to approach flowering, and every 3-4 days thereafter. **Second, understand how to use the website**. It is best to check the forecast around noon as this will allow the most current environmental data to be included into the forecast. The map will generate colors that indicate the level of risk for **flowering wheat.** Green = low risk; yellow = moderate risk; red = high risk (Figure 1). Thus, if your region is red, indicating high risk for FHB, but your crop is at boot, a fungicide application directed for suppression of FHB is not recommended. One weakness of the model is that it does not do a great job at predicting severe outbreaks during cool, wet conditions. Remember, anything above 60°F is sufficient for FHB as long as it is wet enough as wheat approaches flowering and there is a source of inoculum in the region (i.e. fields with small grains or corn residue). To account for this I suggest keeping a close eye on the commentary and local forecasts. Remember, the

website is a tool to help you make informed management decisions but it is not an answer. Use all available resources when deciding to make fungicide applications to your wheat.

Another site I suggest you visit is ScabSmart: http://www.scabsmart.org/graincr.html. This is a great site with excellent information on FHB management. Lastly, sign up for updates from my Field Crops Disease Management Blog for alerts on diseases including FHB throughout the growing season: http://extension.udel.edu/fieldcropdisease/. I also post articles on important and new research, resources, and recommendations. This week's blog entry is Fungicide use in Small Grains

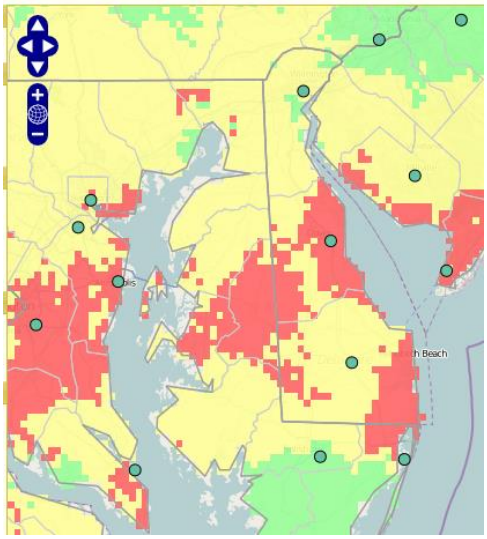

Figure 1. An example of the FHB prediction website map during the FHB epidemic of 2013. Flowering wheat in yellow and red were at risk for FHB infection at this point in time.

There is no way to know if 2014 will be another FHB favorable year. The aforementioned resources will help keep you informed of potential outbreaks in the future.

New Fact Sheets on Field Crop Disease Management

- *Nathan Kleczewski, Extension Specialist - Plant Pathology*; nkleczew@udel.edu

Although the field crops disease page has yet to be launched due to a revamping of our webpages across the college, I have posted several new factsheets on field crop diseases, which are available on the University of Delaware Extension Website http://extension.udel.edu/factsheet/. The following can be currently found under the "Field Crops" heading.

Frogeye Leaf Spot on Soybean
Gray Leaf Spot on Corn
Stalk Rots on Corn
Anthracnose Leaf Blight and Stalk Rot of Corn

Hard copies of these factsheets will be available at your county extension office at the end of the month. Other factsheets on SDS and Fusarium Head Blight will be posted shortly. Additional factsheets will be posted throughout the growing season to help you with management of field crops diseases.

Soybean Cyst Nematode Distribution Update

- *Nathan Kleczewski, Extension Specialist - Plant Pathology*; nkleczew@udel.edu

Soybean Cyst Nematode Distribution Update

The 2014 SCN distribution was released earlier this year (Figure 1). For those of you who did not see this when I posted it on my blog in January, here it is again. No new news in the Mid-Atlantic, but some more counties have been confirmed in Virginia. Overall, you will see SCN has spread westward since 2008 (Figure 2). Maps are assembled by the SCN management working group.

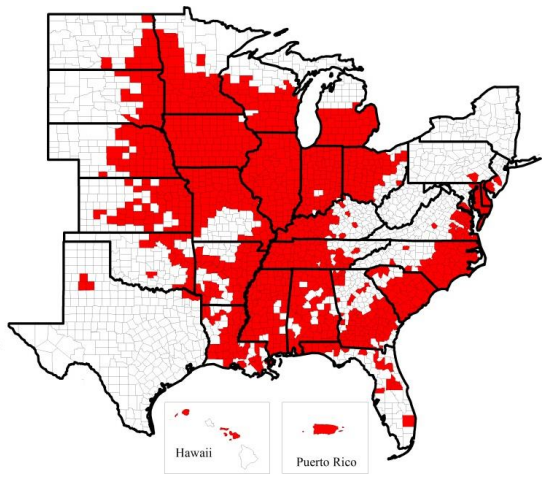

Figure 1. The distribution of Soybean Cyst Nematode as of January, 2014.

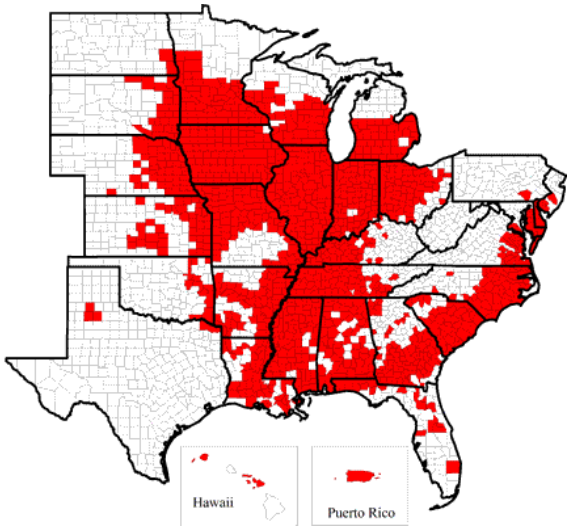

Figure 2. The distribution of Soybean Cyst Nematode in 2008.

Announcements

DSU High Tunnel Workshop & Field Day

Thursday, May 29, 2014 10:00 a.m. - 3:00 p.m.
Delaware State University
Smyrna Outreach Center
884 Smyrna-Leipsic Road
Smyrna, DE

Delaware State University will be having a High Tunnel Workshop and Field Day. The featured speaker will be Dr. Lewis W. Jett, who is the State Extension Vegetables and small fruit Crops Specialist, West Virginia University and has very valuable experience with high tunnels.

Talk Topics:

• Scheduling takeover crops (2nd warm season crop) into the fall- what works and what doesn't

• Heat management in the high tunnel

• High tunnel production economics etc.

More information concerning this event will be given at a later date. To register please email rogutu@desu.edu or call 302-857-6397.

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of April 3 to April 9, 2014

Readings Taken from Midnight to Midnight

Rainfall:

0.01 inch: April 3
0.36 inch: April 7
0.07 inch: April 8

Air Temperature:

Highs ranged from 65°F on April 8 to 55°F on April 4.

Lows ranged from 51°F on April 8 to 31°F on April 6.

Soil Temperature:

53.2°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, Associate Scientist – Vegetable Crops