



WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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Vegetable Crops

Fruit Set Problems and Pollination Disorders in Fruiting Vegetables - Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu

Vegetable harvest is peaking on Delmarva. Unfortunately, we often see pollination problems in fruiting vegetables when weather conditions are unfavorable and 2015 is no exception.

Signs of incomplete pollination in cucurbits include bottlenecked fruit or fruit with a pinched end, crooked or lopsided fruit, fruit small in size or nub-like; and fruits with prominent lobes or that are triangular in shape. Causes of incomplete pollination may be inadequate pollen transfer by pollinating insects; inadequate pollen sources (pollenizers); or hot, dry weather that reduces pollen viability or that desiccates flower parts during pollination. Research has shown that a minimum of 1,000 grains of pollen are required to be distributed over the three lobes of the stigma of the female flower of a watermelon to produce a uniformly shaped fruit.

Hollow cavities in fruit and vacant seed cavities are related to lack of seed formation, again traced back to poor pollination. Fruit tissue separation, such as hollow heart in watermelon, has also been linked to inadequate pollination and may be worsened by rapid fluctuation in

environmental conditions affecting fruit development.

Each year we see pumpkin fields with poor fruit set or fruit carry. Remember that in larger pumpkin sizes, each plant will only carry 1-2 fruits. The large vining plants also need considerable space - 25 to 50 square feet per plant. While planting Jack-o-lantern types at higher densities might at first seem to be a way to achieve higher yields, interplant competition will increase and you can decrease fruit carry because of this competition.

Too much available nitrogen can also delay pumpkin fruit set so that many of pumpkins that are produced do not reach maturity in time. Pumpkins do not normally need more than 80 lbs/acre N to grow a crop. Anything above 100 lbs/acre N will cause the pumpkins to put on excessive vine growth and limit fruiting.

A major reason for poor fruit set in some years is high temperatures during flowering in July. Day temperatures in the 90s or night temperatures in the high 70s will cause flower and small fruit abortion. For pumpkin growers that do wholesale and start shipping right after Labor Day, this will limit early pumpkin availability. Varieties vary considerably in their ability to tolerate heat and to set under hot conditions. Inadequate irrigation and excessive water stress can also reduce fruit set, increase abortions, and reduce fruit carry. High temperatures and water stress reduce photosynthesis and the ability of the plant to carry fruits. Drought can also cause a higher than normal male/female flower ratio, thus affecting the number of fruits per plant.

Sweet corn growers often see quality problems related to poor pollination as a result of high temperatures. This problem is more severe in less stress tolerant varieties and where irrigation is inadequate.

In corn silk elongation begins 7 to 10 days prior to silk emergence from the husk. Every potential kernel (ovule) on an ear develops its own silk that must be pollinated in order for the ovary to be fertilized and develop into a kernel. The silks from near the base of the ear emerge first and those from the tip appear last. Under good conditions, all silks for an ear will emerge and be ready for pollination within a span of 3 to 5 days and this usually provides adequate time for all silks to be pollinated before pollen shed ceases.

Pollen grains are borne in anthers, each of which contains a large number of pollen grains. The anthers open and the pollen grains pour out after dew has dried off the tassels. Pollen is light and can be carried considerable distances (up to 600 feet) by the wind. However, most of it settles within 20 to 50 feet. Pollen shed is not a continuous process. It stops when the tassel is too wet or too dry and begins again when temperature conditions are favorable.

Under favorable conditions, a pollen grain upon landing on a receptive silk will develop a pollen tube containing the male genetic material, develop and grow inside the silk, and fertilize the female ovary within 24 hours. The amount of pollen is rarely a cause of poor kernel set. Each tassel contains from 2 to 5 million pollen grains, which translates to 2,000 to 5,000 pollen grains produced for each silk of the ear shoot.

Poor seed set is often associated with poor timing of pollen shed with silk emergence (silks emerging after pollen shed). Shortages of pollen are usually only a problem under conditions of extreme heat and drought. Extreme heat and desiccating winds can affect pollen germination on silks or pollen tube development leading to poor seed set. Insects that clip silks during pollination can cause similar problems.

In tomatoes, day temperatures over 95° F and/or night temperatures in excess of 80° F can cause pollination problems due to reduced pollen production, reduced pollen viability, or reduced

pollen germination or pollen tube production. This can lead to flower drop, smaller fruit, misshapen fruit, or reduced gel formation inside the fruit producing hollow areas. To manage these pollination related problems in tomatoes use “hot-set” type tomatoes bred for better production under heat conditions. Use hot-set varieties for plantings where high temperatures are expected during pollination.

In snap beans and lima beans, plantings that flower and set pods during summer conditions when day and night temperatures are high will be susceptible to reduced sets and yields, split sets, small pods, and misshapen pods. Most of our currently grown lima bean varieties and many commercial snap bean varieties are susceptible to heat stress related yield losses due to reduced pollen production when nighttime temperatures are high before and during flowering. This is why bean crops are planted in certain periods to avoid pollination related losses (snap beans planted for spring and fall crops but avoiding summer crops, lima beans planted in June and early July for fall harvest).

Agronomic Crops

Results from 2015 Delaware Small Grain Trials - *Bob Uniatowski, Associate Scientist;* bobuni@udel.edu

Preliminary results from the 2015 Delaware Small Grain Trials are available online at <http://extension.udel.edu/ag/field-crop-resources/variety-trials-corn-hybrids-small-grains-soybeans/#grains>.

The available 2015 reports are as follows:

[2015 New Castle County Small Grain Report](#)

[2015 Kent County Small Grain Report](#)

[2015 Sussex County Small Grain Report](#)

[2015 High Organic Matter Soil Small Grain Report](#)

Announcements

Ag Law Webinar

Thursday, August 6, 2015 12:00 noon (EST)

The Northeast Extension Risk Management Education Center at the University of Delaware will sponsor a webinar featuring Dr. Shannon Ferrell, Oklahoma associate professor of agricultural economics, Department of Agricultural Economics, Oklahoma State University, discussing the implications of the Resource Conservation and Recovery Act (RCRA) and Clean Air Act (CAA) on animal agriculture, recent litigation, and other legal issues:

<https://webmeeting.umd.edu/aglaw>

Poultry Grower's Disease Control Workshop: Keeping Disease Off of the Poultry Farm

Wednesday, September 30, 2015

If you missed the first workshop on June 11th, the same program will be presented on September 30 at the following times and locations:

10:00 a.m. – 12:00 noon

VFW Worcester Post 93

2017 Bypass Rd., Pocomoke City, MD

2:00 p.m. – 4:00 p.m.

Bridgeville Fire Hall

311 Market St., Bridgeville, DE

6:00 p.m. – 8:00 p.m.

Ruthsburg Community Club

105 Damsontown Rd., Queen Anne, MD

TOPICS INCLUDE:

Avian Influenza Outbreaks in Commercial Poultry in the U.S.

Dr. David Shapiro, *Veterinarian, Perdue Farms*

Practical Biosecurity Best Management Practices for Broiler Growers

Dr. Jon Moyle, *Extension Specialist, University of Maryland Extension*

Ms. Jenny Rhodes, *Ag Extension Educator, University of Maryland Extension*

Mr. Bill Brown, *Poultry Extension Agent, University of Delaware Cooperative Extension*

Avian Flu Response and Control Plan on Delmarva Dr. Don Ritter, *Veterinarian, Mountaire Farms*

REGISTRATION DEADLINE is September 25, 2015

Please register online by visiting:

<http://ag.udel.edu/rec/>. When registering, please be sure to choose the location of the workshop you would like to attend.

For more information, please contact Lisa Collins at lcollins@udel.edu or call (302) 856-2585 x702

This event is hosted by University of Delaware Cooperative Extension and University of Maryland Extension, in cooperation with Delmarva Poultry Industry, Inc., Delaware Department of Agriculture and Maryland Department of Agriculture.

WANTED

Phytophthora Samples from Vegetables

Samples of vegetable crops such as cucumbers/pickles, watermelons, squash, pumpkins, peppers, lima beans, or tomatoes infected with *Phytophthora capsici* are needed for a research project looking at the diversity and virulence of the disease organism in Delaware. Please email or phone Gordon Johnson at gcjohn@udel.edu, 302-545-2397 or Heather Baker at hnbaker@udel.edu if you have infected plants (stems, roots, or fruits) that can be collected.

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of July 23 to July 29, 2015

Readings Taken from Midnight to Midnight

Rainfall:

1.17 inch: July 27

0.03 inch: July 28

Air Temperature:

Highs ranged from 91°F on July 28 to 82°F on July 23.

Lows ranged from 70°F on July 29 to 58°F on July 24.

Soil Temperature:

80.1°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
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Crops***

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