



WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

Volume 25, Issue 7

May 12, 2017

Vegetable Crops

Seed Vigor in Sweet Corn Revisited -Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu

Uneven or poor stands may be caused by reduced seed vigor in a specific lot of sweet corn seed. This results in reduced yields in fresh market sweet corn and may cause losses in processing corn if differences in growth are significant.

By its nature, sweet corn has lower stored food reserves compared to field corn. With the advent of different endosperm types than the traditional sugary (su), such as homozygous sugary enhanced (se), shrunken supersweets (sh2), and the more recent augmented shrunken types, vigor became even more of an issue. In general, vigor of sweet corn rated from highest to lowest is: normal sugary su > se heterozygous > se homozygous > sh2 augmented > shrunken sh2. Synergistic sweet gene varieties may have seed with vigor characteristics of a se or a su sweet corn depending on the specific genetics (check with your sweet corn seed company for specifics on the vigor of these hybrids). Supersweet hybrids (shrunken sh2) are noted for having inherently low seed vigor due to reduced food reserves and it has been a standard recommendation to plant these varieties only when soil temperatures are above 60°F.

This inherent lower vigor of sweet corn becomes magnified when a specific seed lot has problems. Sweet corn seed vigor will be affected by seed growing conditions, seed conditioning practices,

storage conditions, and length of storage. Seed companies spend significant resources evaluating sweet corn seed for quality (viability and vigor) prior to release and suspect lots are removed from sale. However, seed lots can decline between testing and sales. An acceptable seed lot can become problematic over time.

Sweet corn fields planted with reduced vigor seed will often have uneven stands with healthy plants next to smaller stunted plants. This pattern will often be present across the field. Low vigor plants are less productive and can actually act as weeds in a field, taking resources away from healthy plants and reducing the potential for compensation (producing bigger ears or multiple ears as occurs with remaining plants in fields with stand losses). Reduced vigor seed will produce these field patterns in warm weather but the effects are most severe in cold soils.

Stand reductions are also common with reduced vigor seed. Often, when digging up the seedlings and examining the seed remnants and mesocotyls of stunted plants, the kernels will be disintegrated and there will be darkening at the mesocotyl attachment. This means that the seeds deteriorated prematurely and the full content of the food reserves in the seed were not available for seedling development leading to the stand and vigor issues.

Seed viability is measured with a germination test which is done under optimum temperature, moisture, and light conditions. However, germination tests do not directly measure seed vigor, and seed vigor declines before germination is reduced. Therefore, it is possible

to have seed that will germinate in a field but be of low enough vigor that sweet corn plants do not grow properly.

If a seed lot is suspected of having low vigor, then seed vigor tests are recommended. Testing for vigor is also very important for carryover seeds or seeds stored for long periods in unfavorable conditions. Seed vigor testing is also useful when troubleshooting fields where seed vigor issues are suspected (testing left-over seed).

Tests that are used to evaluate seed vigor that are available from different state and private seed laboratories include:

The Cold Test - Seeds are germinated using a specific cold, moist treatment regime. This will be useful in selecting those lots that will perform the best under early cold soil conditions.

Seedling Vigor Classification Test (SVCT) - In this test seedlings from a normal germination test are rated visually according to vigor (strong or weak). Visual ratings are based on if the seedlings have normal developmental characteristics in all seedling plant parts. With sweet corn this would be the roots, the mesocotyl, and the coleoptile. In low vigor seed one or more of these parts will be abnormal. This is a good test to troubleshoot suspect low vigor seed lots.

Tetrazolium (TZ) Test - This is a quick biochemical test that essentially stains living tissue in a seed a red color. The more red staining, the more viable the seed. This test is good for spotting lots with significant differences in vigor between seeds.

Accelerated Aging Test (AAT) - In this test, seed is put under a high temperature and humidity regime for a period of time and then is evaluated using a standard germination test. This is often used to check the storability of seeds under less than ideal conditions but also will do a good job of evaluating seed vigor. Modifications to the Accelerated Aging Test have been made to do a better job of evaluating sweet corn types such as shrunken sh2 varieties.

Electric Conductivity Test - This test measures cell membrane integrity which is correlates well

with seed vigor and sweet corn seed emergence. As seeds age and cell membranes deteriorate, cell contents leak, the more leakage, the higher the electrical conductivity and the lower the seed vigor. This is most useful in comparing different lots after extended storage.

Most seed companies also grow out sweet corn lots in field tests prior to sales (commonly in winter nurseries) to confirm results from germination and vigor tests that have been performed.

Dickeya dianthicola Update - Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; keverts@umd.edu

Several plants with **suspected *Dickeya dianthicola*** symptoms have been reported in the mid-Atlantic region in spring 2017 and sent for diagnosis. The results of the tests are still pending. Growers should be vigilant in scouting their fields. If you see any suspect symptoms of blackleg, or your potatoes had poor emergence, or you believe that you have *Dickeya* in your field, it is important to submit the plants for diagnosis. Suspect samples should be sent for testing to your county extension educator or to Dr. K. Everts (keverts@umd.edu), or Dr. N. Kleczewski (nkleczew@udel.edu) for submission to a diagnostic lab. Remember that this disease results from infected seed pieces. We have no evidence that the bacterium can overwinter in soils here in the region, which means it is introduced to field through infected seed pieces.



Figure 1. Potato plant exhibiting symptoms of *Dickeya dianthicola* infection. Note darkened aerial stem lesions

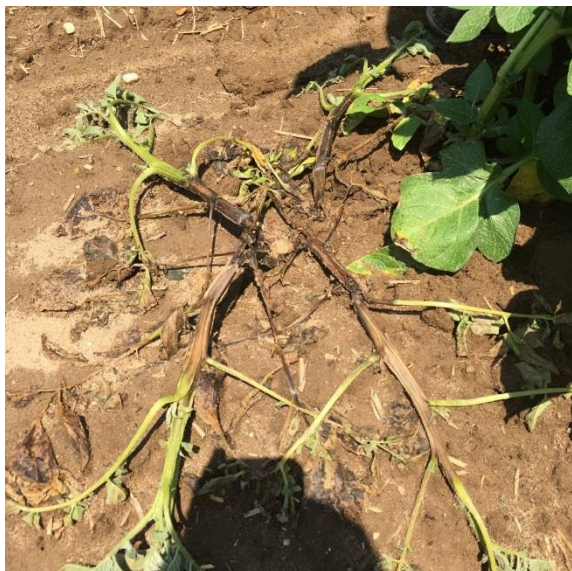


Figure 2. Potato plant exhibiting symptoms of *Dickeya dianthicola* infection. Note lesions emanating from the soil line

In addition to testing, it is important that you have your seed health certificate. This certificate will indicate the source of your potatoes and the lot of origin. Information on best management practices for buying seed can be found here:

(<http://vegetablemdonline.ppath.cornell.edu/NewsArticles/Potato%20Dickeya%20recommendations-Northeast-2017.pdf>)

Agronomic Crops

Got Slugs? - Bill Cissel, Extension Agent - Integrated Pest Management; bcissel@udel.edu

I have seen a few corn fields with slug feeding injury. Slugs use their rasping mouthparts to feed on corn leaves, giving them a shredded appearance. Under heavy slug pressure, slugs can kill seedling plants resulting in stand reductions. No-till fields, fields with high organic matter, and with a history of manure tend to be at greatest risk, especially if the field has a

history of slug activity. The best cultural control practice to manage slugs is tillage but this is counterproductive to no-till and conservation tillage practices. Planting early, before slug egg hatch occurs can also allow plants to get a head start. However, what is early this year wasn't early last year and probably won't be considered "early" next year so this is a moving target. Lastly, anything that will promote seedling vigor and growth will also give plants an advantage, but under heavy pressure, slugs can still outcompete seedling plants.

There are several chemical control options available as rescue treatments, such as metaldehyde baits (Deadline M-Ps), Sluggo, and Iron Fist. There are no established thresholds for when a rescue treatment is warranted. However, if slug injury is severe and the weather is unfavorable for corn growth (cool and wet), a control measure may be necessary.

Here are several links to our efficacy trials evaluating these products:

<https://cdn.extension.udel.edu/wp-content/uploads/2013/12/29043617/2016-Season-Insect-Management-Reports-final.pdf> (page 4)

<https://s3.amazonaws.com/udextension/ag/files/2013/12/Chemical-Management-of-Slugs-in-No-Till-Corn-and-Soybean-Systems-final.pdf>

Last year, I followed two plants to visually show how metaldehyde baits can reduce slug injury on seedling corn. In this particular field, about half of the field was treated with Deadline M-Ps at 10 lb/A and the other half was untreated. I flagged two plants with similar levels of slug feeding injury, one in the treated portion of the field and another in the untreated. I then went back every week and took a picture of each of the plants to see how the plant was responding to the treatments (treated versus untreated).

Does Slug Bait Work?

Photos began on May 13, 1 day after Deadline M-Ps application, and ended on May 27, 15 days after treatment.



To determine if your field is at risk for slug injury and to determine the species and abundance of slugs you have, you can sample fields for slugs using shingle trapping methods or residue sampling prior to planting.

Here are several Youtube videos demonstrating how to sample for slugs:

How to sample for slugs:

<https://www.youtube.com/watch?v=5YD2BArGOg>

When and where slugs can be a problem:

<https://www.youtube.com/watch?v=yJAiut5IHqY>

How to sample for slug eggs:

<https://www.youtube.com/watch?v=JM2xTfw7z-M>

Here is a link to more information on identification, biology, and management of slugs in field crops:

<http://extension.udel.edu/blog/slugs-in-field-crops/>

Field Corn Cutworm - Bill Cissel, Extension Agent - Integrated Pest Management; bcissel@udel.edu

Scout seedling corn for cutworm damage, even if an at-planting insecticide application has been made. Fields at greatest risk include no-till, late planted, poorly drained fields, and fields with heavy weed growth before planting. Fields should be scouted from spike through 5 leaf stage by examining 10 plants in 10 random locations for the presence of cut plants and or leaf feeding (small, irregular holes from larvae too small to cut plants). To confirm the damage is from cutworms, you should also look for live cutworms in the soil around the base of the plants. A rescue treatment should be considered in 1-2 leaf stage corn if you find 3% or more of the plants with leaf feeding injury and or cut plants. Once the corn reaches the 2-4 leaf stage, a rescue treatment is recommended when 5 % or more of the plants are cut and larvae are present. For chemical control options, refer to our Field Corn Insecticide Recommendations:

<https://cdn.extension.udel.edu/wp-content/uploads/2012/05/13055805/Insect-Management-In-Field-Corn-final-20171.pdf>

Small Grain Insects: Sawflies, and Armyworms, and Aphids, Oh My ... - Bill Cissel, Extension Agent - Integrated Pest Management; bcissel@udel.edu

Sawflies and True Armyworms

Sample small grain fields for grass sawflies and true armyworms. A sweep net can be a quick and effective way to initially detect grass sawflies. Once you start finding sawflies, beat two rows of small grain together to dislodge any larvae and examine the inner space between the rows. Sample 5 linear feet of inner row space in ten random locations throughout the field. The threshold for sawflies in wheat and barley is 0.4 larvae per foot of row. True armyworms are active at night and seek refuge at the base of plants, under crop residue, and under weeds during the day. To sample for armyworms, examine 5 linear ft of row in at least 10 locations throughout the field. Also note any head clipping and leaf defoliation. The threshold for armyworms is 1 per ft/row in barley and 2 per ft/row in wheat. Fields with mixed infestations of armyworms and sawflies may require treatment even if worm counts of each pest do not exceed threshold levels.

For information on identification, biology, and management, view our Grass Sawfly and True Armyworm Fact Sheet:

<http://extension.udel.edu/factsheets/grass-sawfly-and-true-armyworm-management-in-small-grains/>

For chemical control options, refer to our Small Grain Insecticide Recommendations below.

Aphids

Watch out for aphids moving into small grain heads. The warm winter/early spring favored aphid reproduction. The English grain aphid is the only species that will infest small grain heads. Its feeding injury can result in shriveled kernels and reduced test weight. The threshold is 15-25 aphids per head when beneficial insect activity is low. One beneficial insect (lady beetle adults and larvae, syrphid fly maggots, lacewing

larvae, damsel bugs, and parasitic wasps) per 50-100 aphids is often sufficient to keep aphid populations in check.

Aphid control in small grains in the spring Fact Sheet:

<http://extension.udel.edu/factsheets/aphid-control-in-small-grains-in-the-spring/>

Small Grain Insecticide Recommendations:

<https://cdn.extension.udel.edu/wp-content/uploads/2012/05/18063827/Insect-Control-in-Small-Grains-final-2017.pdf>

Corn Height Restrictions for

Postemergence Herbicides - Mark VanGessel, *Extension Weed Specialist*; mjv@udel.edu

Corn herbicides need to be applied at the correct timing to avoid crop injury; and the weeds need to be small (3-4 inches depending on the herbicide) for effective control. Many labels state from corn emergence to a certain size corn. However, some herbicides require the crop to be at a certain size before the herbicide can be applied (i.e. Status require corn to be at least 4 inches tall or V-2 stage). Almost all herbicides have a maximum crop size and this can range from V-2 to V-8. Maximum size depends on the herbicide and can vary based on whether the herbicide is applied over the top of corn or with drop nozzles. Applications after this time can result in crop injury and possibly yield reduction. Some labels refer to crop size based on height of corn in inches, collar stage, or leaf stage. Refer to the herbicide label to ensure applications are made at the appropriate crop stage. When corn height and collar number are given for the same herbicide, base decision on whichever feature is first attained. If tankmixing, use the guidelines based on the most restrictive herbicide.

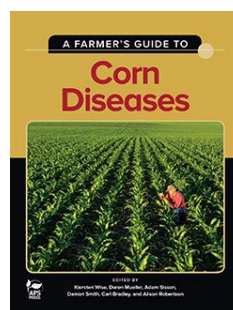
General

Wanted: Samples of Powdery Mildew on Hops - Nancy Gregory, *Plant Diagnostician*; ngregory@udel.edu

Samples Wanted: Powdery Mildew on Hops has not been confirmed in Delaware. Bill Weldon, a graduate student at Cornell University, is tracking the dispersal of this fungal disease across the US. There are “male” and “female” strains of the pathogen, and it’s important to everyone that we know where they are located, because it is relevant to how we control the disease. Contact the UD Plant Diagnostic Clinic and send in a sample if you encounter powdery mildew in your hop yard this season. All grower-specific information will remain confidential.

Guess the Pest! - Bill Cissel, *Extension Agent - Integrated Pest Management*; bcissel@udel.edu

Congratulations to Kyle Serman for identifying the insect and damage as seedcorn maggot and for being selected to be entered into the end of season raffle for \$100 not once but five times. Everyone else who guessed correctly will also have their name entered into the raffle. Kyle will also receive a FREE copy of A Farmer’s Guide to Corn Diseases. Click on the Guess the Pest logo below to participate in this week’s Guess the Pest! For Guess the Pest # 6, we will also be giving away A Farmer’s Guide To Corn Diseases (\$29.95 value) to one lucky participant.



<http://www.plantmanagementnetwork.org/book/cornfarmersguide/>

Guess the Pest # 5 Answer: Seedcorn Maggot



The photographs included in Guess the Pest # 5 are from an untreated check in one of my research plots evaluating labeled and experimental seed treatments. I did everything “wrong” to increase the likelihood of having seedcorn maggot damage. That is, I plowed under a cover crop (green manure), spread manure, planted early, and spread bone and

meat meal over the rows (not something I recommend doing at home or on your fields). Seed corn maggots (SCM) are about 3/16 of an inch in length, legless, and yellowish-white in color. Their body is tapered and they lack a head capsule but have a pair of small, black mouth hooks. Typically, they will feed on the seed and often tunnel into the stem of the plant. In other cases, they will bore directly into the stem of the plant below the soil surface, as was the case in many of the plants damaged in my plots this year.

Seedcorn maggots are not only a pest of field corn but can also attack soybeans, cole crops, peas, melons, sweet corn, and spinach. We tend to have more problems from SCM in cool, wet springs with delayed germination following a warm winter because adult flies become active earlier and for a longer period of time. Fields that favor egg laying are at greater risk for SCM injury. These include fields with heavy crop residue and/or manure applications, high organic matter, and freshly plowed fields. SCM feeding damage often kills the seedling by destroying the germ, resulting in stand reductions. In severe cases, replanting may be required.

There are no rescue treatments for SCM and in this case, “an ounce of prevention is worth a pound of cure”. Chemical control options include soil insecticides and commercially applied seed treatments. However, not all options are available among all crops so be sure to refer to the label before making an insecticide application.

Here is a link to our Field Corn Insect Management Recommendations with preventative seedcorn maggot chemical control options:

<https://cdn.extension.udel.edu/wp-content/uploads/2012/05/13055805/Insect-Management-In-Field-Corn-final-20171.pdf>

Guess the Pest # 6



Guess the Pest? Think you know the answer.... Click on the *Guess the Pest* Icon below or go to <https://goo.gl/forms/pWjHQUpmjABFB0v32> to submit your best guess.



Use Caution When Selecting Adjuvants - Mark VanGessel, Extension Weed Specialist; mjv@udel.edu

The weather patterns lately have resulted in situations where the risk of crop injury from

postemergence herbicides is higher. Specifically, prolonged periods of overcast skies, cooler weather, and plenty of rain. If postemergence herbicides are made as the days turn hot and sunny, the risk of injury is greater. This because the wax layer on the leaves has not developed and the leaf surface is "tender". If spraying during these sensitive periods, switch to "softer" additives if the label allows it; for instance MSO increases the risk of injury over COC; and non-ionic surfactants (NIS or 80-20's) reduces the risk further. Consider using the lower allowed rate of the surfactant or nitrogen. Be sure to read the label and see what is allowed by the manufacturer.

UPDATED: UD Extension Is Looking For Your Input On Our Two New Specialists - Mark VanGessel, Extension Weed Specialist; mjv@udel.edu and Amy Shober, Extension Nutrient Management and Environmental Quality Specialist; ashober@udel.edu

The University of Delaware is in the process of hiring an Extension Agronomist and an Extension Entomologist. These are vital positions for Delaware agriculture and we are hoping you can join us in this selection process.

Extension Agronomy candidates have visited Delaware but their Extension presentations are were taped and are available until Sunday May 21. Feel free to view these presentations and provide comments and feedback on the candidates. More details can be found at <http://sites.udel.edu/carvelnews/presentations/>

Extension Entomology candidates' schedules are below. They will be interviewing on Campus (at Townsend Hall) and at the Carvel Research and Education Center in Georgetown over the next two weeks. The seminars will be taped and made available after May 24 for approximately one week. We are inviting stakeholders to meet the candidates, participate in their seminars, ask questions, and provide us feedback. The times and locations for the presentations are listed below. These interviews are open to everyone.

Entomology Candidates

May 16-17: Dr. David Owens

Date	Time	Location	Activity
Tuesday, May 16	8:30 am	Carvel Center (REC) Georgetown	Coffee and informal discussions
	9:00 am		Extension seminar
Wednesday, May 17	1:00 pm	Townsend Hall, Newark	Research (30 min) and Teaching (20 min) seminars

May 18-19: Dr. Jaime Pinero

Date	Time	Location	Activity
Thursday, May 18	8:30 am	Carvel Center (REC) Georgetown	Coffee and informal discussions
	9:00 am		Extension seminar
Friday, May 19	9:30 am	Townsend Hall, Newark	Research (30 min) and Teaching (20 min) seminars

May 23-24: Dr. Arturo Goldarazena

Date	Time	Location	Activity
Tuesday, May 23	8:30 am	Carvel Center (REC) Georgetown	Coffee and informal discussions
	9:00 am		Extension seminar
Wednesday, May 24	9:30 am	Townsend Hall, Newark	Research (30 min) and Teaching (20 min) seminars

Announcements

Twilight Tailgate Session

Thursday, June 8, 2017 6:00 p.m.

UD Cooperative Extension Research Demonstration
Area

3/4 mile east of Armstrong Corner on
Marl Pit Road -Road 429
Middletown DE

Join your fellow producers and the UD Extension team for a discussion of this year's demonstration trials and current production issues. Other topics will include nutrient management, pest management and weed management.

Bring: A tailgate or a lawn chair.

Credits: DE Nutrient Management (1) and Pesticide (1) credits .

We will wrap up with the traditional ice cream treat.

Please call our office at (302) 831-2506 or email sharonlu@udel.edu to register by Thursday, June 1, for additional information, or if you require special needs assistance.

Dan Severson, Extension Agent – Agriculture, New Castle County Cooperative Extension

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.

It is the policy of the Delaware Cooperative Extension System that no person shall be subjected to discrimination on the grounds of race, color, sex, disability, age or national origin.

Growing Farmers Workshops

Coverdale Farm Preserve is a 356-acre farm and nature preserve located in Greenville, DE. We are pleased to offer a series of free hands-on workshops for farmers of all levels of experience and scale of operation.

Registration is required. *To register please contact Michele Wales: michele@delnature.org.*

Spring 2017 Series: Protected Culture Growing includes the use of greenhouses, high tunnels, low tunnels, hoop houses, and caterpillar tunnels. Both high and low tech options are designed to help defend your crops against the extremes of nature from torrential rains, parching drought, scorching heat, and frigid cold. Protected Culture Growing extends your seasons, brings harvests earlier in spring and later in fall to your customers, and can be used on acres of open field to urban raised bed gardens. Engage in hands-on workshops that take you from construction to production targeting key topics for your growing success.

Vegetable Production in High Tunnels

Wednesday, May 17, 8:00am – 12:00pm

Rain Date: Friday, May 19, 8:00am – 12:00pm

Vegetables are the focus of this workshop with particular attention to selected varieties trailed for protected culture growing, operating and managing irrigation and fertigation systems, utilizing a vine clip trellis system, plant health, pruning, and planting schedules for maximized production.

Troubleshooting in High Tunnels

Wednesday, June 21, 6:00pm – 8:00pm

Keep your plants thriving and productive. Learn to identify common pests including insects, plant diseases, nutrient deficiencies. Discover preventative strategies, steps, and solutions to compromising conditions in order to maximize yields.

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of May 4 to May 10, 2017

Readings Taken from Midnight to Midnight

Rainfall:

1.43 inch: May 5

0.01 inch: May 6

0.12 inch: May 7

0.01 inch: May 8

Air Temperature:

Highs ranged from 72°F on May 10 to 60°F on May 8.

Lows ranged from 58°F on May 5 to 44°F on May 9.

Soil Temperature:

64.5°F average

Additional Delaware weather data is available at <http://deos.udel.edu/>

Weekly Crop Update is compiled and edited by Emmalea Ernest, Associate Scientist - Vegetable Crops with assistance from Don Seifrit.

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