WEEKLY CROP UPDATE
UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

Volume 16, Issue 18 **July 18, 2008**

Vegetables

Vegetable Crop Insects – *Joanne Whalen, Extension IPM Specialist*; jwhalen@udel.edu

Lima Beans
Be sure to watch carefully for spider mites. Economic levels are still being detected and controls are only effective if treatments are applied before populations explode. We are staring to see an increase in stinkbug and plant bug populations. As soon as pin pods are present, be sure to watch carefully for plant bug and stinkbug adults and nymphs. As a general guideline, treatment should be considered if you find 15 adults and/or nymphs per 50 sweeps. Since earworm moths can be found laying eggs in fields, be sure to sample for larvae as soon as pin pods are present. A treatment will be needed if you find one corn earworm larvae per 6 ft of row.

Melons
Continue to scout all melons for aphids, cucumber beetles, and spider mites. We continue to hear reports of rind feeding – both from cucumber beetles and beet armyworms. Although the pyrethroids will help to reduce cucumber beetle populations, they will not control beet armyworm. Since this insect is difficult to control, be sure to select a material that is labeled for beet armyworm on melons such as Spintor, Radiant, or Intrepid. Be sure to check all labels for days between last application and harvest.

Peppers
As soon as the first flowers can be found, be sure to consider a corn borer treatment. Depending on local corn borer trap catches, sprays should be applied on a 7-10 day schedule once pepper fruit is ¼ - ½ inch in diameter. 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 visiting our website at (http://ag.udel.edu/extension/IPM/traps/latestblt.html). You will also need to consider a treatment for pepper maggot. Be sure to watch carefully for beet armyworm larvae since they can quickly defoliate plants. In addition, be sure to use a material that provides beet armyworm control – the pyrethroids will not control this insect.

Potatoes
Continue to scout fields for Colorado potato beetle (CPB), aphids and leafhoppers. Controls will be needed for green peach aphids if you find 2 aphids per leaf during bloom and 4 aphids per leaf post bloom. This threshold increases to 10 per leaf at 2 weeks from vine death/kill. If melon aphids are found, the threshold should be reduced by one half.

Snap Beans
As corn borer and corn earworm populations start to increase, you will need to consider treatments for both insect pests. Sprays are needed at the bud and pin stages on processing beans for corn borer control. As earworm trap catches increase, an earworm spray may also be needed at the pin stage. 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://ag.udel.edu/extension/IPM/traps/latestblt.html and http://ag.udel.edu/extension/IPM/thresh/snapbeanecbthresh.html). Once pins are present on fresh market snap beans, a 7 to 10-day schedule should be maintained for corn borer and corn earworm control.

Sweet Corn
Continue to sample seedling stage fields for cutworms and flea beetles. You should also sample all fields from the whorl through pre-tassel stage for corn borers, corn earworms and fall armyworm. A treatment should be considered when 12-15% of the plants are infested. Since fall armyworm feeds deep in the whorls, sprays should be directed into the whorls and multiple applications are often needed to achieve control. The first silk sprays will be needed for corn earworm as soon as ear shanks are visible. Be sure 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://ag.udel.edu/extension/IPM/traps/latestblt.html and http://ag.udel.edu/extension/IPM/thresh/silkspraythresh.html). You can also call the Crop Pest Hotline (in state: 1-800-345-7544; out of state: 302-831-8851).

More on Premature Vine Death in Potato

– *Gordon Johnson, Extension Ag Agent, Kent Co.*; gcjohn@udel.edu

In the last issue of the Weekly Crop Update, two causes of premature vine decline in potatoes were presented. It was reported that Early Dying Syndrome caused by the verticillium fungus was confirmed in potato samples from Delaware. This problem is worsened if lesion nematodes are present. Air pollution (ozone) damage, which can be a problem in varieties such as 'Red Norland', was also detailed.

Recent reports from growers indicate that some varieties have declined rapidly in the past two weeks. In addition to the Early Dying Syndrome and ozone damage there may be additional reasons for vine decline. There are a number of diseases other than Early Dying Syndrome that can lead to vine decline including seed piece decay (leading to weaker plants); Fusarium, Rhizoctonia, and aerial blackleg diseases; and a number of viruses.

Heavy European corn borer damage can cause portions of vines to die and excessive Colorado potato beetle damage can cause added stress on plants leading to decline.

Injury by wind, wind-blown sand, or hail can open up wounds in potato vines that then can be infected by secondary bacterial and fungal invaders setting up conditions for vine decline. Senescence of lower leaves in heavy vining varieties due to shading can also be a wound source. Hot weather will speed up losses by these secondary invaders on wounded plants.

Fertility problems, such as inadequate nitrogen and excessively low pH can be factors. Nitrogen deficiencies occur commonly in heavy soils through denitrification losses in areas that had periods of water-logging and in sandy soils that had heavy leaching rains. I have seen low pH (below 5.0) cause stunting and reduced plant health in large areas of potato fields. Excessive salt and salt injury from fertilizers banded near potatoes is another cause of extra stress, especially in sandy soils and can be a contributor to reduced plant longevity.

Variety and temperature interactions are also critical. One of the varieties now being grown for early acreage in Delaware is 'Envol'. This variety was bred and selected in Quebec, Canada and released in 1999. It is moderately susceptible to verticillium wilt and rhizoctonia and susceptible to late blight and common scab. It is rated as very early. A variety such as 'Envol' will have a quick decline naturally after tubers have bulked up. Hot weather and water stress can often lead to vine decline in these very early varieties before tuber bulking has completed. 'Envol' is a Canadian potato bred under cooler growing conditions than Delaware. Our Delaware environment gets much hotter during critical growth stages than Canada and extended high

temperatures in June may lead to early vine decline.

It is important to understand variety characteristics as they relate to the potential for premature vine decline including breeding background, area of adaptation, maturity, and disease susceptibility.

Air Pollution Injury in Vegetable Crops II–

Gordon Johnson, Extension Ag Agent, Kent Co.; gcjohn@udel.edu

Here are some additional photos of the ozone injury we are seeing in vegetable crops right now. See the article titled Air Pollution in Vegetable Crops in WCU 16:17 for more information on air pollution injury.

Ozone injury in watermelons. Note how leaves initially turn white in color. They will darken as the injury progresses.

Ozone injury in muskmelons. Note the yellowing of the older leaves.

Ozone injury in melons is often seen as a yellow strip down the middle of melon beds where interior leaves have been damaged.

Ozone injury on summer squash.

Skin Set in Potato *–Gordon Johnson, Extension Ag Agent, Kent Co.*; gcjohn@udel.edu

Potato harvest is underway in Delaware and each year problems with potato skin set occur in some fields leading to skinning and reduced tuber quality and potential load rejections. The potato tuber is a swollen tip of a stolon, which is an underground stem. The tuber is comprised of an inner storage area, the vascular ring, the cortex, and the periderm or skin. The skin protects the inner parts of the tuber from moisture loss, invasion from disease organisms and other pests, and physical damage. It is analogous to the bark on the outside of a stem.

As the tuber enlarges, the periderm (skin) must continue to develop and cover the outside of the tuber. The skin is therefore in a state of constant growth until tuber bulking is completed. While the periderm is still growing, it is not yet in a fixed state because the underlying cells are still meristematic, that is, they have not matured. This means that the skin can slip when exposed to mechanical forces causing skinning.

The periderm or skin in a potato has three different zones. The critical zone is a meristematic region called the phellogen where skin cells are dividing. To the outside of phellogen are five to six tiers of phellum cells that were produced by the phellogen meristem and are arranged like a stack of blocks. To the inside of phellogen is the phelloderm region which provides the raw materials for the skin growth process.

When the skin on an immature tuber "slips" due to mechanical pressure it is because the walls of the cells in the phellogen meristem are still soft and easily damaged. When the tuber finally stops growing, due to vine death and/or other factors, the "skin set" process is initiated. The meristem stops producing new cells, the cell walls harden off, and everything from the former meristem area to the outside (the entire phellum region) becomes heavily suberized. Cell walls thicken and change chemically to be resistant to shearing. During this process, the periderm becomes tightly bound to the underlying tissues and is then very resistant to mechanical damage and skinning.

The major factors that contribute to final skin set include variety, soil type, cultural and environmental conditions, vine maturity and duration from vine kill to harvest. Varieties differ in their rate of skin set. This is primarily a function of genetics but also late season bulking rates and how the variety responds to the conditions in the field. Early, round, smooth-skinned varieties, such as 'Red Norland', do not set a skin as rapidly as a russet type potato.

Since the tuber essentially needs to be no longer bulking or expanding for skin set to begin, you should avoid practices that encourage vine growth late in the season. Nitrogen should not be applied past mid-May with only a few exceptions (excessive leaching rains in sandy soils would be an exception). Vines should be dead for 10 to 21 days prior to harvest depending upon vine maturity or "greenness" at the time of vine kill and variety. Early, red-skinned potato varieties are notorious for having

poor skin set, even with adequate time between vine killing and digging. Some early, round, white varieties can also have this problem.

It is common practice to use herbicides, such as diquat, to kill potato vines prior to harvest in Delaware. Vine kill will initiate the skin set process. However, adequate time must be given for this process to be completed. Digging too soon will risk that the potato phellogen cells in the skin have not matured and therefore the tubers will be subject to skinning damage.

We have had instances in Delaware where potatoes that had good skin set after vine kill reversed and had bad skinning losses in digging. Most commonly this has occured where vines were killed for several weeks and potatoes were subsequently exposed to a wet period. The extra soil moisture caused a reactivation of the phellogen cells in the skin. The tubers where exposed to conditions where growth could reoccur and the phellogen cell walls changed chemically to be meristematic again and thus became more subject to shearing damage and skinning.

Some information in this article was taken from "What is skin set and how do we achieve it?" by Phil Nolte and Nora Olsen, Kimberly Research and Education Center, University of Idaho.

Potato Disease Advisory #18 – July 17, 2008 – *Bob Mulrooney, Extension Plant Pathologist*; bobmul@udel.edu

Disease Severity Value (DSV) Accumulation as of July 16, 2008 is as follows:
Location: Broad Acres, Zimmerman Farm, Rt. 9, Kent County
Greenrow: April 27

	LATE BLIGHT			EARLY BLIGHT
Date	**Daily DSV**	**Total DSV**	**Spray Recs**	**Accumulated P days***
6/30-7/2	0	45	10-day interval	482
7/2-7/3	0	45	10-day interval	489
7/4-7/5	1	46	10-day interval	496
7/5-7/6	2	48	10-day interval	505
7/6–7/7	3	51	7-day interval	514
7/7-7/9	0	51	7-day interval	536
7/9-7/10	2	53	7-day interval	544
7/10-7/13	0	53	10-day interval	566
7/13-7/14	1	54	10-day interval	575
7/14-7/16	0	54	10-day interval	589

*** P days**- We use the predictive model WISDOM to determine the first fungicide application for prevention of **early blight** as well. The model predicts the first seasonal rise in the number of spores of the early blight fungus based on the accumulation of 300 physiological days (a type of degree-day unit, referred to as P-days) from green row. To date, **589 P-days** have accumulated at the site.

Maintain fungicide applications. There have been no reports of late blight on either potato or tomato in the region.

For specific fungicide recommendations, see the 2008 Delaware Commercial Vegetable Production Recommendations Book.

Different Causes for Wilting in Watermelon and Pumpkin Fields – *Jerry Brust, IPM Vegetable Specialist, University of Maryland*; jbrust@umd.edu and *Karen Rane, Plant Diagnostic Clinic Director, University of Maryland;* rane@umd.edu

Traveling around the Maryland and Delmarva area it is obvious that this is a particularly good year (bad for growers) for wilts in watermelon and pumpkin fields. The previous two seasons had been relatively dry, with last year being a drought. This year has seen moderate to heavy rains on a weekly basis. Overall this is good for crops, but in some fields for some cucurbits it has led to an increase in root and crown rot problems. The symptoms in watermelon fields usually begin with leaves flagging on a few plants down a row and then a few days later a total collapse of these same plants. Sometimes the wilting occurs within certain rows while in adjacent rows the watermelon plants look fine (Fig 1a). If wilted plants are dug up you can see reddish-brown discoloration of the crown of the plant (Fig 1b). The roots will be decayed as well. There are several fungi that can cause crown and root rot diseases, including Fusarium, Pythium and Phytophthora. To identify the specific fungi involved, samples should be sent to a diagnostic laboratory for testing. The disease often starts with a few plants in one row then moves down that row. Water, either through irrigation or heavy rains is usually responsible for the movement of the disease down a row. High plant loss can occur in the lower areas of fields where water stands after heavy rains. The weather conditions we had back in June when we had temperatures over 95° F for several days followed by heavy rains (with water sitting in fields) probably stressed young plants and allowed root rot diseases to get started.

Figure 1a. Watermelon rows with and without Fusarium crown rot

Figure 1b. Watermelon plant with crown rot

In pumpkin fields, the wilting symptoms can look a bit different than in watermelon. Leaves usually turn yellow and then necrotic at the margins (Fig 2a) or may simply wilt down with little foliar discoloration (Fig 2b). Both Fusarium and Phytophthora have been recovered from these plants.

Wilting and foliar symptoms in cucurbits also can be caused by squash bug feeding or squash vine borer (SQVB) damage. Close examination of the plant will show whether it is insect damage or disease. If squash bugs are responsible, you will see many of them on the plant and actually

smell the insects as they release a bitter scent. If it is SQVB you will often see leaves with yellow and necrotic margins, as in Figure 2a, and an enlarged cracked stem at the base of the plant (Fig. 3a). If this stem is split the area within the stem is usually entirely brown and a fat SQVB larva can be found (Fig. 3b). With Fusarium crown rot or Phytophthora blight the crown of the plant near the soil line will turn brown (Fusarium) or become soft and water-soaked (Phytophthora). Both diseases will allow the stem to detach easily from the roots, which may or may not be decayed.

Figure 2a. Pumpkin with yellow and necrotic leaf margins

Figure 2b. Pumpkin plant wilting

Figure 3a. Swollen cracked pumpkin stem due to SQVB

Figure 3b. Same stem now split showing SQVB and brown area

Wilting due to root diseases and/or insect damage can look similar to symptoms caused by Fusarium wilt. Fusarium wilt is caused by a different fungal species than Fusarium root and crown rot. Discoloration of the vascular system within infected stems is a diagnostic symptom for Fusarium wilt. Plants with Fusarium wilt usually have no external discoloration of the crown, and the roots usually appear healthy.

There are a few things that can be done to alleviate some of these wilt problems during the season. I talked about chemical control for squash bugs in the article titled Squash Bugs in Pumpkins in WCU 16:14. One thing growers can do for root and crown rot diseases is to be sure to not over water the plants or apply excess

nitrogen. Rotation may help (next year), especially for Fusarium wilt, but the root and crown rot pathogens can infect many hosts, making crop rotation less effective in reducing disease. Environmental conditions are probably the most important component for the development of root and crown rot diseases. Well drained fields will have less of a problem than poorly drained fields. Kate Everts talked about these and other controls for Phytophthora blight in cucurbits the article titled Phytophthora Blight Management in Cucumber in WCU 16:17. For squash vine borer little can be done this year, but if the grower can rotate next year's field ≥¼ mile away from this year's field it will greatly reduce SQVB problems. If rotation is not possible then sprays (Warrior or bifenthrin) directed at the base of the plant 2-3 weeks after plants are up and repeated for the next 3 weeks will reduce SQVB damage. Pheromone traps that trap adult males can help determine when moths are flying and when insecticide sprays should start and how long they should continue.

Agronomic Crops

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

Alfalfa
Continue to scout fields on a weekly basis for leafhoppers.

Soybeans
We continue to see a number of defoliators (grasshoppers, blister beetles, Japanese beetles, green cloverworm, etc.) present in full season and double crop beans. As fields enter the bloom to pod fill stages, remember that the defoliation threshold drops. In addition, bean leaf beetle populations and defoliation significantly increased, especially from Greenwood north on the western side of the state. This insect can also feed on pods. Bean leaf beetles can clip pods or plant diseases may enter the pod through their feeding sites. This can result in seeds that appear shrunken, discolored, and moldy, resulting in a reduction in seed quality. Although we have not established thresholds for pod feeding in our area, the following link provides information that is used in the Midwest. (http://www.ipm.iastate.edu/ipm/icm/2000/8-21-2000/lblroof.html)

As indicated last week, continue to watch full season beans that are starting to set pods for stink bugs. We continue to see an increase in both brown and green stink bug populations. Economic damage is most likely to occur during the pod development and pod fill stages. You will need to sample for both adults and nymphs when making a treatment decision. Available thresholds are based on beans that are in the pod development and fill stages. We are currently following the same guidelines that are being used in Virginia. Thresholds are also based on numbers of large nymphs and adults, as those are the stages most capable of damaging pods. As a general guideline, current thresholds are set at 1 large nymph/adult (either brown or green stink bug) per row foot if using a beat sheet, or 2.5 per 15 sweeps in narrow-row beans, or 3.5 per 15 sweeps in wide-row beans.

Spider mites can still be found in fields throughout the state. Remember, early detection and multiple applications are often needed to achieve control.

Soybean Rust Update – *Bob Mulrooney, Extension Plant Pathologist*; bobmul@udel.edu

On July 10th, two new counties in Florida, Hamilton and Columbia, were confirmed to have rust-infected kudzu. On July 9th, the first report of soybean rust in Georgia (Brooks County) was confirmed on soybean. Kudzu collected on July 2nd in Jefferson County, Florida (just east of Tallahassee) was found positive for soybean rust. The county was positive earlier in 2008, but the disease could no longer be found later in the winter. Also, soybean rust was found in a soybean sentinel plot in Gadsden County. Rust had already been detected in Gadsden County on kudzu at the end of May.

Since the beginning of 2008, soybean rust has been reported in one county in Alabama; one county in Georgia, 13 counties in Florida; three counties in Louisiana; one county in Mississippi, and three counties in Texas. Rust was also

reported in three states (5 municipalities) in Mexico on yam bean and soybean. These have been destroyed or are no longer active.

Grain Marketing Highlights - *Carl German, Extension Crops Marketing Specialist*; clgerman@udel.edu

Commodity Prices Decline - Temporarily?
News of further banking problems sent non-commercial speculators to the sidelines and commodity prices tumbling this week. Dec corn futures closed at $6.77 per bushel in yesterday's trading, $1.19 per bushel off of the recent high that was made on June 27th. November soybean futures hit a high mark of $16.35 per bushel on July 3rd and closed at $15.48 per bushel on July 16th. It should be noted that yesterday's close in Nov futures was higher than the previous day's close, indicating that the soybean market's current uptrend may not be over.

Growing conditions in the U.S. Corn Belt continue to improve according to the weekly crop conditions report. Late planting is likely to become an issue nearer the end of the growing season.

Weekly Export Sales Report

Corn
Export sales for the week ending July 14th for both old crop and new crop corn totaled 32.7 million bushels (mb), within and on the high side of pre-report estimates. In the 44th week of the marketing year, export sales for corn are running slightly ahead of the 2.45 billion bushels (bb) needed to stay on pace with USDA projections.

Soybeans
The weekly report indicated combined weekly sales at 3.8 mb, well below pre-report estimates. However, only 2 mb of soybean sales were needed to stay on pace with USDA's projection for 1.45 bb in the '07/'08 marketing year.

Wheat
Weekly export sales at 27.5 mb for old crop wheat, accumulated sales for the '08/'09 marketing year at 390 million bushels, and weekly shipments at 23.7 mb were running ahead of the pace needed to stay on pace with USDA's projections for wheat exports for both the old crop and new crop marketing years.

Marketing Strategy
Five political issues could have significant impacts upon commodity prices, or not, depending upon the direction that the U.S. Congress takes. They are: energy - specifically the renewable fuel mandates; position limits; margin requirements; conservation reserve program (crp); and import tariffs on ethanol. Further, acting upon a viable U.S. energy policy would greatly impact commodity prices. Nevertheless, at the present time these issues remain undecided. For the moment we can expect extreme commodity price volatility to continue.

For technical assistance on making grain marketing decisions contact Carl L. German, Extension Crops Marketing Specialist.

Announcements

Niche Market Opportunities
Thursday, August 14, 2008 6:00 p.m.
DSU Smyrna Outreach and Research Center
884 Smyrna-Leipsic Rd., Smyrna, DE

Learn about specialty crops to meet the needs of diverse populations in the Mid-Atlantic region.

Light refreshments served.

Please call (302) 857-6462 to register.

This workshop is part of the 2008 Small/ Beginning Farm Workshop Series held by Delaware State University. For complete information on the workshops planned, see the brochure at http://www.rec.udel.edu/update08/announcements/smallfarmbrochure2008.pdf

UD Watermelon Twilight Meeting

Wednesday, August 13, 2008 6:30 p.m.
Carvel Research and Education Center
16483 County Seat Hwy, Georgetown, DE

Watermelon Disease Control
Kate Everts – See Fusarium wilt control trials and learn about results from recent fungicide trials for gummy stem blight. Discuss Pristine resistance as it relates to the Delmarva.

Watermelon Weed Control
Mark VanGessel – See experiments on general weed control, experimental fumigant for under plastic mulch and recovery and response of watermelons to herbicide drift.

Watermelon Insect Update
Joanne Whalen

2008 Watermelon Variety Trial
Emmalea Ernest - See and sample varieties from the trial.

Meet at the picnic grove near the farm shop to board the wagon and begin the tour at 6:30 p.m. Stay to enjoy dessert and taste some of the varieties from the variety trial afterwards.

Please pre-register on or before August 11, 2008 by contacting Karen Adams at adams@udel.edu or (302) 856-2585 x 540.

For Current Agricultural Information from the UD Kent Co. Extension Office Visit
www.kentagextension.blogspot.com

Recent Topics:

Delaware State Fair Starts Today – What to See
Goats – Delaware State University is Taking the Lead
Controlling Weed Escapes in Roundup Ready Beans
Corn Pollination
Tissue Testing
Roundup Injury on Roundup Ready Corn
More on Arrested Ear Development in Corn
Watch for Stink Bugs
Avoiding Antagonism Between Glyphosate and Manganese
Silage Heating
Poultry – More on Nighttime Cooling Issues in Hot Weather
Pictures of Ozone Air Pollution Damage in Vegetable Crops
Pictures of Fusarium Crown Rot and Wilt of Squash
Cutting Teff Hay
Options for Volunteer Roundup Ready Corn in Roundup Ready Soybeans
Irrigating Soybeans
Know Your Soybean Diseases
Powdery Mildew Control in Cucurbits

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of July 10 to July 16, 2008

Readings Taken from Midnight to Midnight

Rainfall:

no rainfall recorded

Air Temperature:

Highs ranged from 90°F on July 16 to 78°F on July 14.

Lows ranged from 68°F on July 14 to 63°F on July 16.

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 Associate – Vegetable Crops

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