Vegetable Insects - Joanne Whalen, Extension IPM Specialist; jwhalen@udel.edu

Cabbage.
Continue to sample for diamondback and cabbage looper larvae. We can find economic levels of both insects in fall cabbage fields. The treatment threshold is 5% of the plants infested. If both species are present, Avaunt (3.5 oz/acre), a Bt, Proclaim (3 oz/acre), or Spintor (4-5 oz per acre) will provide control. If cabbage looper is the predominant species, a pyrethroid, Intrepid (8 oz/a) or Confirm (8 oz/acre) will also provide control.

Cucumbers.
Consultants have started to report an increase in aphid populations in pickling cucumbers. We are also starting to see an increase in fresh market cucumbers. A treatment should be applied if 10 to 20 percent of the plants are infested with aphids. Lannate (3 days to harvest) should provide aphid control. Fulfill will also provide control. A penetrating surfactant (e.g. LI-700 or AD-100) is recommended with Fulfill (14 days to harvest). Thiodan has also provided control as long as populations are not exploded at the time of application.

Lima Beans.
Continue to scout fields for lygus bugs, stinkbugs and corn earworm. For lygus and stink bugs, treatment should be considered if you find 15 adults and/or nymphs per 50 sweeps. A treatment is recommended for corn earworm if you find one worm per 6 foot of row.

Peppers.
At the present time, all peppers that have fruit ½ inch in size or larger should be sprayed on a 5-7 day schedule for beet armyworm, corn borer, corn earworm, and fall armyworm. Consultants are also starting to see an increase in aphid populations. If aphids are present and leaves are not curling, Lannate at 1.5 pt/A (3 days to harvest) should provide control. Actara (0 days to harvest), Assail (7 days to harvest), Fulfill (0 days to harvest), and Provado (0 days to harvest) will also provide aphid control. A penetrating surfactant should be used with Fulfill. We have also had a report of spider mites in peppers. Agri-Mek, Capture or Kelthane are labeled for spider mite control in peppers.

Snap Beans.
Sprays are still needed at the bud and pin stages on processing snap beans for corn borer control. A corn earworm material will also be needed at the pin spray for corn earworm. After the pin spray, sprays will be needed on a 5-day schedule until harvest, except in the Greenwood area, where sprays are needed on a 4-day schedule. Since this can change quickly, be sure to check our website for the most recent trap catches and information.
on how to use this information to make a treatment decision in processing snap beans (http://www.udel.edu/IPM/traps/latestblt.html and our link to http://www.udel.edu/IPM/thresh/snapbeanecbthresh.html). As soon as pin pods are present, fresh market beans should be sprayed on a 5 to 7-day schedule. Lannate, Capture, Mustang MAX or Warrior should be used.

Spinach.
As soon as plants emerge, fields should be scouted for webworm and beet armyworm larvae. Controls should be applied when worms are small, and before they have moved deep into the hearts of the plants. Also, remember that both insects can produce webbing on the plants. Confirm, Intrepid or Spintor will be needed for beet armyworm control. If webworms are the predominant species, Ambush, Pounce, Confirm (6-8 oz/acre), Intrepid (8-10 oz/acre) or Spintor (4-8 oz/acre) should be used. Generally, at least 2 applications are needed to achieve control of webworms and beet armyworm.

Sweet Corn.
Fresh market silking sweet corn should be sprayed on a 2-3 day schedule throughout the state. Be sure to check our website for the most recent trap catches and information on how to use this information to make a treatment decision in fresh market sweet corn (http://www.udel.edu/IPM/traps/latestblt.html and http://www.udel.edu/IPM/thresh/silkspraythresh.html).

**UD IPM Black Light and Pheromone Trap Counts**

**Average Number of Moths per Night: August 22 to August 25, 2003**

<table>
<thead>
<tr>
<th>Trap Location</th>
<th>European Corn Borer Black Light</th>
<th>Corn Earworm Black Light</th>
<th>Corn Earworm Pheromone Trap</th>
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<tbody>
<tr>
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<td></td>
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</tr>
<tr>
<td>Dover</td>
<td>1</td>
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</tr>
<tr>
<td>Harrington</td>
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<tr>
<td>Killens Pond</td>
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<tr>
<td>Little Creek</td>
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<td>-</td>
</tr>
<tr>
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<td>16</td>
</tr>
<tr>
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<tr>
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<tr>
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<tr>
<td>Seaford</td>
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</tbody>
</table>

*Numbers can change quickly.* For the most recent trap counts, access the website at (http://www.udel.edu/IPM/traps/latestblt.html) or call 1-800-345-7544 (in-state); 1-302-831-8851 (out-of-state). Counts are updated on Tuesday and Friday.

**Vegetable Crop Diseases** – Bob Mulrooney

*Bob Mulrooney*

*Extension Plant Pathologist; bobmul@udel.edu*

**Lima Beans.**

24(c) Issued for Ridomil Gold/Copper for downy mildew on lima beans. There is a 24 (c) now in effect for the use of Ridomil Gold/Copper for controlling downy mildew on lima beans in Delaware. Ridomil Gold/Copper is labeled for downy mildew control caused by Phytophthora. 
at the rate of 2.0 lb/A. Apply the product prior to disease development or in the early stages of disease. Up to four applications can be made on a 7-10 day schedule. Do not apply within 3 days of harvest. Ridomil Gold/Copper can be alternated with Champ or Kocide as well on a 7-day schedule as well. Coverage is important, so apply in a minimum of 20 to 50 gallons/A. A minimum of 5 gallons/acre is recommended for aerial application. This new label must be in the possession of the user at the time of application. County agents have copies if needed.

This addition to our fungicide arsenal will be very important this season if weather conditions become very favorable for downy mildew this fall. Ridomil Gold/Copper has been the best product for preventing and keeping downy mildew under control in four years of trials with varying disease conditions. Champ DP, Kocide 2000 and other copper fungicides have been good preventative fungicides for us, are inexpensive, but have no systemic activity. The copper fungicides are very good preventative fungicides for downy mildew for application when conditions are favorable for infection and should be used. Ridomil Gold/Copper will be very useful if downy mildew is detected in a field or when a non-infected field is close to an infected field. Unfortunately neither fungicide will provide any control of white mold, our other important disease of lima beans.

With the importance of lima beans to our processing vegetable industry on the Shore and trying to increase Fordhook-type varieties which are not resistant to races E and F that are present, disease control continues to be an important part of our production practices.

Field Crops

Field Crop Insects - Joanne Whalen, Extension IPM Specialist; jwhalen@udel.edu

Soybeans.
Continue to scout later planted soybeans for soybean aphids through the end of this week. At this point, the numbers of winged adults in most fields is very low. It appears that they could still be migrants and do not appear to be the result of crowding on the plants and movement from the field. We have not seen any nymphs with wing pads (“alatoid nymphs”). The good news is that we have only seen or heard reports of economic levels in 5 fields. Parasite activity has started to increase in some fields so watch for "mummies" (parasitized aphids) before making a treatment decision. The widely accepted threshold in the Midwest for soybean aphid is still 200-250 per plant on 80% of the plants or 25 per leaflet through the R-4 stage with low beneficial activity. Remember that R-4 stage can last 3 weeks in our area. Most universities feel that there is not enough local information to vary the threshold at this time. There has been small plot research from the University of Wisconsin that suggests thresholds could range from 200 per plant at full bloom (R2), 1000 per plant at beginning pod (R3) and 1500 per plant at full pod (R4). However, they also indicate that these thresholds have not been verified across multiple seasons, under a range of growing conditions, environments and soybean varieties. Therefore, given the range of guidelines and lack of a universally validated threshold they also indicate that 250 aphids per plant should be used as a minimum economic threshold. If a treatment is needed, you need to watch the days to harvest with insecticide treatments: Asana (21 days), Baythroid (45 days), Furadan (21 day), Lorsban (28 day), Mustang MAX (21 days), Penncap-M (20 days), Pounce (60 days) and Warrior (45 days).

The potential for podworms still remains moderate and this will be an important week to scout fields to detect small podworms. Begin scouting as soon as possible.
as blossoms are present for corn earworm (CEW), beet armyworm (BAW) and fall armyworm (FAW). Low levels of corn earworm (1-2 per 100 sweeps) have been found in all counties and an occasional BAW and FAW have been found in fields in Sussex County. As of last week, reports from Virginia indicate that economic levels of corn earworm are present in only a few fields. You should be sure to correctly identify the worm species present since control materials may vary. With the heavy fall armyworm populations in late-planted corn, emerging moths may be attracted to soybeans. Although they initially feed on leaves, they can move to the pods if pressure is moderate to heavy. Since weather conditions will determine if podworm populations increase or crash, it will be important to scout fields to determine when and if a treatment is needed. Although we generally see our greatest corn earworm outbreaks in drought stress years, soybeans may be more attractive in areas where corn has brown silks, plants have started to dry down and soybeans are blooming. The treatment threshold for podworms is 3 per 25 sweeps in narrow fields and 5 per 25 sweeps in wide row fields (20-inches are greater). The following materials will provide corn earworm control in soybeans: Ambush, Baythroid, Asana, Mustang MAX, Pounce, Warrior (all pyrethroids) Steward, or Larvin. If beet armyworm is present, Steward would be the preferred material. It now has a 2ee label for use on soybeans in Delaware. Lorsban also provided good beet armyworm control in 2002. In most years, the pyrethroids will provide control of low levels of fall armyworm in the mix. However, if fall armyworm is the predominant species and if worms are larger at the time of treatment, Steward, Larvin or Lorsban should be considered. Although we have gotten control of larger FAW larvae, the pyrethroids labeled for FAW generally say control of first and second instar only.

Small Grains.
After this past season, we all know that it is difficult to predict what will happen with insect populations. Even though the recent weather has been warm, the overall cooler summer temperatures could result in heavier aphid populations in small grains this fall, especially in early planted fields. With delayed plantings of corn and soybeans, most fields will be planted later and less susceptible to attack; however, early-planted fields should be watched carefully. Factors that increase the potential of a return from applying an insecticide to control aphids and to reduce barley yellow dwarf virus (BYDV) infection in wheat include: (1) normal-cool summer temperatures with adequate rainfall; (2) intensive wheat management including high fertility; (3) use of BYD susceptible varieties; (4) planting before the Hessian fly free date; and (5) a late, warm fall. We are still using a threshold for fall treatment for aphids (except greenbug) of 15-25 aphids per foot of row in combination with a known history of BYDV. Direct damage from green bug aphid has also been an issue in recent years. If you are able to scout, be sure you plan to sample your fields at emergence. Although we do not have any thresholds developed in our area for green bug, thresholds from Arkansas say a treatment will be needed in the fall if you find 10 aphids per foot of row. This aphid is a very difficult one to control. Foliar materials labeled for aphid control in wheat include dimethoate, Lannate, malathion, Mustang MAX, Penncap-M and Warrior. The materials labeled for barley include Lannate, malathion and Penncap-M. The Warrior label says 3.84 oz/acre are needed for greenbug and the Mustang label states only aids in control. Lower rates of pyrethroids can be used if the predominant aphid species is not greenbug. Remember that these pyrethroids are only labeled on wheat.

Waiting to plant after the fly-free date (Oct 3 - New Castle County; Oct 8 - Kent County and Oct 10- Sussex County) in 2002 resulted in the inability to plant many fields due to the extremely wet fall. Therefore, some producers have indicated that they plan to plant as soon as possible this fall. If you are unable to scout or plan to use a preventative treatment, Gaucho and Cruiser are both labeled on wheat and barley and have provided very good aphid control. These products can not be applied like a hopper-box treatment in corn and soybeans. Cruiser must be applied by a
commercial seed treater with commercial application equipment to ensure uniform seed coverage and good product performance. Information from Gustafson indicates the following about Gaucho: "Gaucho XT (applied at 3.4 fl.oz./cwt. seed) has both fungicide and insecticide combined in the formulation so is more appropriate for the wheat market. It works well in commercial and on-farm total slurry treaters (TST). A grower would dilute 1:1 or 2:1 water: product to secure good coverage. With dryer seed, one may need the extra moisture for coverage. Gaucho 480 is marketed for the wheat and barley market. With commercial application, delivery is good, due to the slurry tanks and sophistication of treatment equipment in a plant. Achieving proper rate and coverage is ideal in this scenario. When one looks at the grower-applied market, proper application may not be as accurate. A TST treater can be used, but the grower must be careful in the application to achieve the proper rate and coverage to secure insect protection. The rate of application is 1 - 3 fl.oz., with 1 fl.oz. having shown excellent protection against fall aphids."

Field Crop Diseases – Bob Mulrooney Extension Plant Pathologist; bobmul@udel.edu

Wheat.
I have had some questions about planting seed from possibly scab (head blight) infected fields. After consulting with Dr. Arv Grybauskas at the University of Maryland we agreed on some guidelines for growers who may be contemplating planting saved seed this fall. (1) Have the seed cleaned very well to remove light chaffy kernels. (2) Have a sample tested for germination at the state seed lab in Dover. It is important that you request that the seed be treated before running the test. The state lab can do that for you. Germination rates with treatment should run around 80% or better, before using for seed. The state lab can give you a seed count as well which might be helpful. Weathering of the grain in the field was as big a problem as scab and other diseases and will reduce test weight and vigor as well. (3) It will be important to plant in a timely manner this year, if the weather allows, so that conditions favor rapid emergence for seed lots that might have reduced vigor from low test and/or scab.

Be sure to plant treated seed. For loose smut and seed-born scab control, request seed treatment of Raxil/Thiram, Dividend Extreme at the 4 oz/cwt. rate, or Vitavax 200 plus LSP(thiabendazole) at 0.25 fl oz/cwt. They will perform the best for this disease combination. If you want early season powdery mildew control as well, Dividend at the 4 oz. rate will provide that. If scab is not an issue, treat with Baytan 30 plus thiram or captan for early season powdery mildew, loose smut and a reduced level of control of seed born scab.

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

U.S. Crop Size Unknown Through Harvest.
The size of this year's corn and soybean crops are likely to remain unknown until well into harvest. Weather uncertainty and the impact that prolonged dry spells will have upon eventual yield outcomes is creating price volatility in commodities trading. This week produced a crop condition report that declined overall for corn and soybeans, greatly exceeding trader expectations. The impact from this was a large rally on Tuesday morning, only to be taken out that afternoon by an isolated thunder storm passing through LaSalle Street at the Chicago Board of Trade. Since then traders have been speculating on the effect that current weather conditions are likely to have upon production forecasts. Currently it is fair to say that the corn and soybean pits are trading a 10 billion bushel corn crop and a 2.7 billion bushel soybean crop. If these approximate numbers are taken lower in the September 11th crop report then we could see prices for both commodities bidding slightly higher. If the September USDA production
estimates come in at or near the August numbers, then we possibly have already seen the pre-harvest highs for the ’03 corn and soybean crops.

**U.S. Wheat Exports Strong.**
Net wheat export sales hit a marketing year high for the week ending August 21, at 47.3 million bushels. This level was more than double the total expected. Corn and soybean sales were also better than the trade expected. New crop corn sales registered at 37.4 million bushels for corn and 20.8 million bushels for soybeans Old crop sales tallied at 7.7 million bushels for corn and 1.9 million bushels for soybeans.

**Market Strategy.**
New crop corn and soybean sales should be placed on hold this week, assuming 50% of intended production is already on the books. Commodity traders are likely to trade the markets both sides of unchanged going into the long holiday weekend. There will be large interest in next Tuesday’s crop condition report. If conditions decline again, then we could see some added volatility to these markets next week.

**Alfalfa and Potato Leaf Hopper Injury in 2003**
- **Richard W. Taylor,** Extension Agronomist, rtaylor@udel.edu and **Joanne Whalen,** Extension IPM Specialist, jwhalen@udel.edu

The 2003 growing season has been a difficult one for alfalfa producers. Not only has hay making been very difficult with the frequent rains, but potato leaf hoppers (PLH) have continued to attack the crop time and time again throughout the summer. Some growers with PLH resistant alfalfa varieties may have thought that they did not need to worry about the need to spray for PLH. However, the one thing to remember about alfalfa is that an alfalfa variety is a population and each seed and resulting seedling is genetically different. In a PLH resistant variety, alfalfa plant will express the full range of phenotypes for this particular trait. Some of the older PLH resistant varieties only had 25 to 45 percent of the plants that would show resistance. The very newest varieties may show 60 to 80 percent resistant plants. In 2003, researchers working with some of the new so-called 4th generation indicate that the resistant varieties performed very well. They still had a lot of hoppers in the crop and some yellowing was visible, but looked great side-by-side a nonglandular-haired variety. The consensus among researchers evaluating these varieties is that the newer varieties are good, but insecticides may still be justified under extreme outbreaks. Unfortunately, economic threshold level for the new PLH-resistant varieties is not clear at this time.

**How much effect will 2 or 3 consecutive cycles or injury from PLH have on a stand of hopper resistant and non-resistant alfalfa variety?**

If an infestation of PLH leads to the typical leafhopper burn that causes a u- or v-shaped lesion to appear at the apex of the alfalfa leaflet (See Photo 1) and that can cause plant stunting, the effects can impact yield from one or more cuttings. This is typically what happens in a moderate to slight infestation season.

Photo 1. Note typical potato leaf hopper burn on leaflets in the lower left corner of photo (Photo by R. Taylor).
In a severe PLH season as we’ve experienced this year, PLH burn may occur in multiple harvest cycles and lead to more significant long-term impacts. Several factors may come into play during repeated PLH infestations that lead to burn symptoms. First, the stunting that often accompanies the more visible leaf burn will reduce the photosynthetic capacity of the plant and reduce crop yields. Secondly, the lack of photosynthetic capacity diminishes the ability of the alfalfa plant to replace the root reserves it needs for the next growth cycle or for winter hardiness. Third, the stunting that often accompanies leaf burn allows germinating weeds to be more competitive against alfalfa. Competing weeds and especially summer annual grasses such as barnyardgrass, giant foxtail, giant crabgrass sometimes called water grass, and fall panicum can rapidly form a canopy over the stunted alfalfa plants further reducing their ability to manufacture food as well as increase the incidence of diseases due to shading, increased canopy humidity, and reduced plant vigor. Fourth, the visible stunting the grower sees is compounded by the fact that root growth can also be reduced. Poor root growth results in less nutrient uptake and less available water. These growth limitations then compound the previous problems the plant experiences.

What does this mean for the grower? On an immediate level, yields can be reduced significantly and crude protein levels of harvested forage will be lower than normal because of the loss of leaf tissue. Often with severe repeated PLH infestations, growers can expect diminished stand survival during periods of drought stress in late summer or during the winter if conditions are harsh. Stand life will be shortened and if the problems are severe enough stands in the year following multiple PLH infestations will be inadequate for maximum economic yield. New stands seeded either the fall before or this past spring will be at most risk but older stands nearing their expected life expectancy are also at severe risk.

What can a grower do to manage PLH?

First and most critical are new seedings of alfalfa planted either the fall-before or in the spring of the current year. These new seedings must be protected during the first summer’s growth. Pay strict attention to PLH thresholds and control PLH immediately when thresholds are passed. Part of the reason for this is to prevent PLH damage from limiting root growth during this important establishment phase and to ensure good root reserve development before the critical winter period. Growers should also limit the food supply of PLH by making a short, clean cut and harvesting the entire field at one time. Cutting an entire field cleanly at one time will eliminate at least temporarily the presence of PLH nymphs and cause the surviving adults to disperse to other fields. Generally, PLH populations tend to drop dramatically after a cutting and won’t begin to rebuild until about 10 to 15 days of regrowth is present in the field. Again, do not depend on averages but continue scouting to be sure PLH populations do not reach the threshold level. Another option is cutting slightly early and using 4 to 5 cutting cycles rather than 3 to 4 as this will limit the time during which PLH populations can buildup.

Human nature can come into play as well. Growers should avoid revenge sprays and should not spray alfalfa stubble until thresholds are exceeded. You should always plant alfalfa varieties that have good performance records even under heavy PLH pressure. Also, growers should adjust their action PLH thresholds based on crop conditions. In years where weather or other stresses may be unfavorable for rapid alfalfa growth, you should adjust thresholds downward to
help protect the health of the stand and increase the frequency with which you monitor PLH levels.

2003 Crop Management School On-line - Registration Opens - Richard W. Taylor, Extension Agronomist, rtaylor@udel.edu

Crop consultants and others interested in continuing education credits for CEU’s for Certified Crop Adviser, Nutrient Management Programs, or Pesticide Recertification can now register on-line for the 2003 Mid-Atlantic Crop Management School to be held at the Princess Royale Oceanfront Hotel and Conference Center in Ocean City, MD on November 18 to 20, 2003. To register on-line you only need a major credit card and access to the internet. The URL address for on-line registration is as follows:

https://crayola.hcs.udel.edu/conf/registration/crop_management/

If you would like a copy of the printed brochure or have not yet received one in the mail or your mailing address has changed during the past year, please call me at 302-831-1383 and leave a message with your name, the spelling of your name, your street or postal address, and a return phone number. I will send you a brochure immediately.

If you would like to view the brochure on-line before registering and do not want to wait for a mailed copy, go to the following URL web site compliments of Tom Basden at West Virginia University:

http://www.wvu.edu/~agexten/temp/Cropmanschl.pdf

Weather Summary

http://www.rec.udel.edu/TopLevel/Weather.htm

<table>
<thead>
<tr>
<th>Weeks of August 21 to August 27, 2003</th>
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<tr>
<td><strong>Rainfall:</strong></td>
</tr>
<tr>
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<tr>
<td>0.13 inches: August 26</td>
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<tr>
<td>0.80 inches: August 27</td>
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</tbody>
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Readings taken for the previous 24 hours at 8 a.m.

Air Temperature:

Highs Ranged from 91°F on August 22 to 77°F on August 24.

Lows Ranged from 71°F on August 22 to 54°F on August 25.

Soil Temperature:

77°F average for the week.

(Soil temperature taken at a 2 inch depth, under sod)

Web Address for the U of D Research & Education Center:
http://www.rec.udel.edu

Compiled and Edited By:
Tracy Wootten
Sussex County Extension Educator - Horticulture

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