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

BEET ARMYWORM ALERT

Beet armyworms can be found in many fall vegetable crops including cabbage, lima beans, snap beans and spinach. Moths can be readily observed laying eggs in fields. Identification is critical because pyrethroids will not provide control. Young larvae will often web the leaves together and larger larvae can produce significant amounts of defoliation. Please refer to the description of larvae under the field crops section of the newsletter. Labeled products will vary with the crop so please refer to controls under each vegetable. See page 9 for photos.

Cabbage.
Diamondback (DBM) and cabbage looper (CL) larval populations continue to increase. We are also seeing an increase in beet armyworm populations. The treatment threshold is 5% of the plants infested. If DBM and CL 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 or Confirm (8 oz/acre) will also provide control. If beet armyworm is the predominant species, Avaunt, Confirm or Spintor should be used.

Lima Beans.
Be sure to sample fields carefully for corn earworm, beet armyworm, lygus and stinkbugs. A treatment should be applied if you find one corn earworm per 6 foot of row or 15 tarnished plant bugs and/or stinkbugs per 50 sweeps. There are no thresholds for beet armyworm; however, a spray should be considered when worms are small and you can find 20% of the plants defoliated.
Lannate, Mustang or Capture can be used to control corn earworm, lygus and stink bugs. If beet armyworm is causing problems, Lannate will only work if worms are small at the time of treatment. Spintor is also labeled on lima beans and will provide good beet armyworm control.

Peppers.
At the present time, all peppers should be sprayed on a 5to7-day schedule for corn borer, corn earworm, and beet armyworm control. Orthene or Address will not provide satisfactory earworm control. A pyrethroid or Lannate will be needed for earworm control. If beet armyworms are present, Avaunt, Spintor, or Confirm will provide the best beet armyworm control. Depending on the pest complex present, a combination of products will be needed.

Snap Beans.
Processing snap beans in all areas of the state should be treated at the bud and pin stages for corn borer control. Orthene or Address should be used at the bud and/or pin stages for corn borer control.
control. In all areas, a pyrethroid should be combined with Orthene at the pin spray for earworm control. Beet armyworm can also be found defoliating snap beans. There are no thresholds for beet armyworm; however, a spray should be considered when worms are small and you can find 20% of the plants defoliated. Orthene should provide good control of beet armyworm. Lannate will only provide control of small larvae. Spintor is also labeled on snap beans and will provide good reduction in beet armyworm numbers. After the pin stage, Lannate, Capture or Mustang should be used for corn borer and earworm control. Sprays will be needed on a 5-day schedule from the pin spray until harvest. 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 decisions in processing snap beans (http://www.udel.edu/IPM/traps/latestblt.html and http://www.udel.edu/IPM/thresh/snapbeanecbthresh.html). You should treat fresh market snap beans for corn borers, corn earworm and beet armyworm on a 5-7-day schedule from the pin stage until harvest. Lannate should be used if beet armyworms are small. Lannate, Capture or Mustang should be used if corn borer and corn earworm are the predominant species.

**Spinach.**
Fields should be scouted at emergence 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. Since beet armyworms are more difficult to control and populations are increasing in our area, chemical selection is important. Since Lannate cannot be applied before plants are 3-inches in diameter and it only provides control of small larvae, Confirm or Spintor will be needed for beet armyworm control. If webworms are the predominant species, Ambush, Pounce, Confirm (6-8 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 in all areas of the state. Since corn earworm catches continue to be high and fall armyworm can be found in silk stage corn, you should consider combining Lannate LV at 1 to 1.5 pt/A with the highest rate of a pyrethroid. 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).

**Vegetable Diseases** - Kate Everts, Extension Vegetable Pathologist, University of Delaware and University of Maryland; everts@udel.edu

**MELCAST for Watermelons.**
From the University of Maryland and University of Delaware

Latest EFI values from local weather stations

Any questions please call (410) 742-8788

EFI Values (Environmental Favorability Index)
Do not use MELCAST if there is a disease outbreak in your field, it is a preventative program.

<table>
<thead>
<tr>
<th>Location</th>
<th>08/21/02</th>
<th>08/20/02</th>
<th>08/19/02</th>
<th>08/18/02</th>
<th>08/17/02</th>
<th>08/16/02</th>
<th>08/15/02</th>
<th>08/14/02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridgeville, DE</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

The first fungicide spray should be applied when the watermelon vines meet within the row. Additional sprays should be applied using MELCAST. Accumulate EFI (environmental favorability index) values beginning the day after your first fungicide spray. Apply a fungicide spray when 30 EFI values have accumulated by the weather station nearest your fields. Add 2 points for every overhead irrigation. After a fungicide spray, reset your counter to 0 and start over. If a spray has not been applied in 14 days, apply a fungicide and reset the counter to 0 and start over. The first and last day listed above can be partial days so use the larger EFI value of this report and other reports for any specific day.

If, for some reason, a serious disease outbreak occurs in your field, return to a weekly spray schedule. More detailed information concerning MELCAST and sample data sheets are available on the web at http://www.agnr.umd.edu/users/vegdisease/vegdisease.htm.

Field Crops

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

CORN EARWORM AND BEET ARMYWORM ALERT

Soybeans.
Corn earworm moth activity and egg laying has significantly increased in full season and double crop fields throughout the state. Significant populations can be found on the eastern shore of Maryland and a number of fields have reached threshold levels in Kent and Sussex Counties. Larvae can be found feeding both on blossoms and pin pods. In addition to corn earworm, we can find beet armyworm (BAW) in numerous fields and high levels can be found in a few fields. It will be critical to know how to tell the difference between the two species.

Beet Armyworm (BAW): The beet armyworm is a light-green to black larva with four pairs of abdominal prolegs and a darker head compared to corn earworm. There are many fine, white wavy lines along the back and a broader stripe along each side. There is usually a distinctive dark spot on each side just above the second pair of true legs. See page 9 for photos.

Corn Earworm: (CEW): The corn earworm larvae can vary from light green or pink to brown or nearly black. You can also see alternating longitudinal dark and light stripes marking its body. Coblration is so variable that it is not dependable for identification.
Short microspines, which are visible through a hand lens, can be seen on the skin. In general, the head capsule is yellow to amber in color. See page 9 for photos.

As indicated in previous newsletters, the pyrethroids WILL NOT control beet armyworms. There have been a few fields sprayed in Maryland with pyrethroids with NO CONTROL. Unfortunately, Lannate only works on small larvae. Although Larvin has worked well in the past, current reports from the south say it is not doing the job --- especially if worms are large. So the control options for beet armyworm on soybeans is very limited. At this point, beet armyworms are mainly acting as defoliators. However, if populations increase they will begin feeding on pods. We have been trying for the last 2 weeks to see if we can get Steward labeled in Delaware and Maryland. Just today we did get a label for Stewart in Delaware. We wish to express sincere thanks to Secretary Scuse, Grier Stayton and DuPont for making this happen. Data from Virginia indicate it will provide good control of beet armyworm and corn earworm. The Steward rate range is from 5.6 to 11.0 oz/acre. Good results have been achieved with 5.6-8.0 oz/A. However, product will not be in the area until Monday, August 26, 2002.

Therefore, all fields should be scouted for pod feeders as soon as blossoms are present. Although many producers feel that their beans are too “far-gone” and not worth treating, you will need to consider treating if you plan to harvest the field. A potential yield of even 8-10 BU/A justifies a treatment. In addition, if you have purchased Crop Insurance you can not abandon a field on your own, since you risk loosing your payment. You should have both your insurance agent and adjuster come to your field to make a decision. If you plan to salvage the field, you will need to control worms if they reach economic levels.

Since earworms can also act as defoliators, a treatment may be needed prebloom if 30% of the plants are defoliated or if 15% of the plants are defoliated during bloom. This defoliation threshold should also be used for beet armyworm. The treatment threshold for pod feeders is 3 per 25 sweeps in narrow fields and 5 per 25 sweeps in wide row fields (20-inches are greater). At the present time, there is no threshold for beet armyworm pod feeding; however, once pod feeding is detected, you may want to consider the same threshold used for corn earworm. A drop (shake) cloth can also be used to estimate populations. The drop cloth should be placed between 2 rows and then the plants are shaken over the cloth in 6 foot of row. A treatment is needed if you find 1-2 larvae per foot of row.

The following materials will provide corn earworm control in soybeans: Ambush, Asana, Mustang, Pounce, Warrior (all pyrethroids) or Larvin. If population pressure is heavy, the higher rate of the older pyrethroids will be needed. You should use 2.56 of Warrior and 3.2 oz may be needed if mixed size larvae are present at treatment time. If beet armyworm is the predominant species, Steward should be used at 5.6-8.0 oz/A.

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

Commodity Markets Undergo Major Correction
Commodity prices for U.S. corn, soybeans, and wheat have taken a major hit this past week due to recent rains in the Midwest and to the mentality among traders that commodity prices had become over bought. The September crop report will be important to ascertain any improvement in U.S. yield prospects from the August estimates. Most agree that we are not likely to see any improvement in the U.S. corn crop. Reactions are mixed as to what impact recent rains may have on U.S. soybean yield estimates. The prevailing consensus appears to be that improvement in the size of the soybean crop estimate is likely. Due to
the variability in crop conditions throughout the nation, the exact size of this year's crop is not likely to be known until it is harvested.

Currently, the U.S. corn crop is forecast at 8.886 billion bushels, with a carryout estimate of 767 million bushels. The carryout is projected to be less than half of last year's carry. USDA increased their season average price estimate by 50 cents per bushel, now placed at $2.30 to $2.70 per bushel.

The U.S. soybean crop is currently forecast at 2.628 billion bushels, with a carryout of only 155 million bushels. In 1996 the soybean carryout was 132 million bushels and in 1973 the carryout was 103 million bushels. In 1996, U.S. soybean prices averaged $7.35 and in 1973 prices averaged $6.81 per bushel. USDA increased their average U.S. soybean price estimate by $1.00 per bushel, now estimated at $5.15 to $6.05 per bushel.

This year's U.S. wheat crop is now estimated at 1.686 billion bushels, with carryover projected at 467 million bushels, the lowest since 1996 when carryover supplies were 444 million bushels. The season average price estimate for U.S. wheat was increased by 45 cents per bushel, now projected at $3.20 to $3.80 per bushel.

**General Comments**
Commodity prices are currently reacting to major uncertainty concerning the eventual size and quality of this year's crop. As the days get shorter and autumn draws near, time will be running out for that portion of the U.S. corn and soybean crop that was planted late. There is a possibility that an early frost could reduce yields on that portion of the crop that was planted late. So, $3.00 corn and $6.00 soybeans remain a distinct possibility.

**Questions on Irrigating Soybeans** -
*Richard W. Taylor, Extension Agronomist, rtaylor@udel.edu*, Bob Uniatowski Associate Scientist, *bobuni@udel.edu*

In the last week or two, I’ve been asked several questions with regard to the irrigation management of soybeans. I’ll list them below along with some information to consider if you have a similar question.

If you have full-season soybeans and have been irrigating them since planting, you may be surprised by the amount of vegetative growth the crop has achieved. On a good fertile soil, beans can become nearly six feet tall so long as outside factors do not cause them to begin lodging. You might think that with beans that large, you will see tremendous flower production and pod set with the potential for record yields. More often than not what happens is that you will have a second but unpleasant surprise by how few beans are ever set by the plants. Without some stress early in the season, full-season (and only full-season) beans often yield half to two-thirds of that of full-season beans that were allowed to undergo stress prior to the bloom stage according to our research conducted with the assistance of the Delaware Soybean Board (DSB). In soybean survey work for the DSB, we found examples of well-watered beans on fertile soil that produced yields below 20 bu/A.

Is there anything that can be done in a situation like the one described below? After the beans reach the reproductive stage, they will use about 0.28 inches of water per day. This rate declines gradually reaching 0.2 inches per day at pod filling or the R6 (full seed) growth stage in mid- to late-August. If you tried stressing the crop at this stage, you would only further reduce yield potential so about all you can do is to keep enough water on the crop to prevent stress and hope they remain upright as long as possible. One of the factors that may reduce yield potential in these beans is the lack of sunlight penetration into the lower canopy. This is especially a problem when the beans begin to lodge.
Another question asked is how much water beans are using and whether one could reduce the amount of irrigation applied on double-crop beans. Double-crop beans (wheat beans more so than barley beans) use a little less water than full-season beans. The water use curve is steeper than with full-season beans but from about the fifth node stage through R5 stage (beginning seed), double-crop beans use from 0.2 to 0.26 inches of water per day. During pod fill R5 through R7, the rate of water use declines from about 0.15 inches per day to less than 0.1 inch per day. The exact amount of water used per day and when the beans reach different maturity stages varies by cultivar and the specific cultural practices used on a particular field. Use your best judgment to decide how much water to apply but until the beans begin to mature (one normal pod on the main stem has reached its mature pod color—R7 stage), water stress will cause yield reduction. As a general rule in mid-August, figure beans will be using about 1.5 to 2.0 inches of water per week and by mid-September water use will be around 1.25 inches per week (and declining swiftly).

**Maturity Groups Selection in Soybeans** -
*Richard W. Taylor, Extension Agronomist, rttaylor@udel.edu, Bob Uniatowski, Associate Scientist, bobuni@udel.edu*

If you have never taken the time to stop at the soybean variety evaluation plots, this year would be an ideal time to do so. On a visit to the plots in Middletown yesterday, you could easily see the value to planting varieties from each of the maturity groups on your farm. In full-season beans, many of the group III varieties were either rapidly dying with few pods left on the plants or had finished blooming and only a timely rain would save the few pods still on the plants (Photo 1 below).

**Photo 1.** Maturity group III soybean cultivar trial at Middletown, DE in mid-August showing severe drought injury on group III beans during a prolonged drought (Photo by R. Taylor).

Group IV varieties were still alive at the Middletown location and had pods set but were under severe stress (Photo 2 below). You would expect many of the pods to begin to abort if rains do not come soon. Also, most varieties had finished blooming by mid-August.

**Photo 2.** Maturity group IV soybean cultivar trial at Middletown, DE in mid-August showing severe drought injury on group IV beans during a prolonged drought (Photo by R. Taylor).

In a sustained drought like the one we’ve had this year, the best hope for yield if rains do occur soon are the group V varieties since many of they are still in the bloom stage of growth and with
sufficient rain could still produce reasonable yields (Photo 3 and 4 below).

Photo 3. Maturity group V soybean cultivar trial at Middletown, DE in mid-August showing severe drought injury on group V beans during a prolonged drought (Photo by R. Taylor).

Photo 4. Maturity group V soybean cultivar trial at Middletown, DE in mid-August showing flowering potential even after a prolonged drought (Photo by R. Taylor).

Even within a maturity group, some individual varieties are able to tolerate the drought a little better than others, so take a little time out of your schedule and run by the nearest test plots to see the differences yourself. If you’d like directions or a list of varieties in the test and a field map of the site, email us or call one of us at 302-831-2531 (Dept. of Plant and Soil Sciences).

Managing Pastures During Prolonged Drought Conditions - Richard W. Taylor, Extension Agronomist, rtaylor@udel.edu

From a hay point of view, the aggressive growers have been pretty lucky so far. Many of you have gotten as many as four cuts off alfalfa and three cuts off orchardgrass and some of the other grasses. Unfortunately, unless the weather pattern changes drastically and soon and a tropical storm heads this way, there is unlikely to be enough of either alfalfa or grass for an additional harvest. Those producers who started cutting later in the spring or did not hold tight to a schedule have one or more fewer cuttings of hay and have little chance of another later this fall. Alfalfa is very deep rooted and grasses such as tall fescue, bromegrass, reed canarygrass, and Kentucky bluegrass have rhizomes that help them survive long periods of drought. I am worried about orchardgrass as it must come back from the crown and in some cases I see little life left even in the crown area. Let’s hope for rain soon so we can see which fields will be able to recover and which ones we may need to plan renovating.

In the last week or two, I’ve been asked questions about pasture management by several folks concerned with what their pastures look like. If you fertilized earlier this spring with potash fertilizer, you did as much as you could do for your pasture. At this point the only thing that you can do is to observe it carefully to see if there are weeds actively growing that should be mowed (Photo 1 and 2 below).

Photo 1. Lambsquarter actively growing in Kentucky bluegrass pasture during a prolonged drought (Photo by R. Taylor)
If there are patches of weeds that somehow are actively growing, mowing will reduce the leaf area of the weeds and help reduce the removal of soil moisture by the weeds. Also, mowing will help reduce the potential for these weeds to contribute to the weed seed bank in the pasture. When mowing though, try not to cause any more damage to the pasture than possible.

Since most pasture grasses are not growing much at this time, you should also consider limiting the use of pastures to protect the grasses and legumes. Do not graze any closer than that recommended for the species in your pasture. Grazing too close will further reduce the chance that the pasture will be able to successfully recover when rain returns.

Finally, hold off applying any additional fertilizer especially that contains either nitrogen or potassium since these fertilizers act as salts and would place additional water stress on the pasture plants.

**Triazine Carryover to Small Grains** - Mark VanGessel, Extension Weed Specialist; mjv@udel.edu

The lack of rain has made the potential of atrazine and simazine carryover to small grains a real threat for dryland fields. (Irrigated fields are not an issue because the herbicides would have adequate water.) Under normal rainfall patterns, atrazine and simazine levels are so low at this time of year that carryover to small grains in many areas are not a concern. However, with the limited rainfall in many areas, there has not been the chance for these herbicides to breakdown or become diluted. I do not have a good rule of thumb to say when to avoid planting small grains and when the risk is low. It will depend on rate of herbicide used, soil type, and amount of rainfall the particular field received. Carryover is a greater concern with simazine (Prinsep) because it has a lower water solubility level. Atrazine at levels over one pound per acre is a risk (some situations with less than a pound are at risk as well). Bicep Magnum at 1.3 qts/A contains 1 lb of atrazine, Harness Xtra at 2.3 qt/A contains 1 lb of atrazine, and Fultime at 2.4 qt/A contains 1 lb of atrazine.

As far as differences in small grain sensitivity to atrazine and simazine, oats are the most sensitive. Barley is next sensitive followed by wheat, and rye is the most tolerant. If you are considering planting small grains in a field treated with atrazine, you may want to do a bioassay. Collect soil cores to a depth of 6 inches throughout the field. Mix the soil, put it in a pot and plant oats or collard seeds into the pots. At the same time, pull some soil from a flowerbed or garden with no herbicide, put into a pot, and plant the same seeds. Plants should start to show symptoms within one to two weeks after emerging from the soil.
Beet Armyworm (BAW): 

[Images of beet armyworms]

Corn Earworm (CEW): 

[Images of corn earworms]
## Weather Summary

<table>
<thead>
<tr>
<th>Week of August 15 to August 21, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rainfall:</strong></td>
</tr>
<tr>
<td>NONE.</td>
</tr>
<tr>
<td>Readings taken for the previous 24 hours at 8 a.m.</td>
</tr>
<tr>
<td><strong>Air Temperature:</strong></td>
</tr>
<tr>
<td>Highs Ranged from 96°F on August 18 &amp; 19 to 85°F on August 21.</td>
</tr>
<tr>
<td>Lows Ranged from 77°F on August 16 to 64°F on August 21.</td>
</tr>
<tr>
<td><strong>Soil Temperature:</strong></td>
</tr>
<tr>
<td>90°F average for the week.</td>
</tr>
<tr>
<td>(Soil temperature taken at a 2 inch depth, under sod)</td>
</tr>
</tbody>
</table>

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

Compiled and Edited By:

Tracy Wootten  
*Extension Associate-Vegetable Crops*