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

Springtails.
As the first sweet corn and potatoes emerge from the ground, we have heard comments regarding high numbers of "flea beetles" present on the soil surface. On closer inspection, what folks are finding are garden springtails. They are tiny wingless insects with distinctive heads and a hump-backed appearance. Their name comes from a forked structure attached to the underside of the abdomen that acts like a spring to flip them into the air. This behavior gives them the appearance of tiny flea beetles or fleas. In most cases, they rarely cause enough damage to warrant control measures. Most springtails live in rich soil or leaf litter, under bark or decaying wood, or associated with fungi. Many are scavengers, feeding on decaying plants, fungi, molds, or algae. Springtails become abundant in wet soil and plant material. Most springtails do not survive in dry conditions. As the soil dries out, populations should decline rapidly.

Asparagus.
We have started to see an increase in asparagus beetle egg laying activity on spears. A treatment is recommended if 2% of the spears are infested with eggs. Since adults will also feed on the spears, a treatment is recommended if 5% of the plants are infested with adults. Sevin, Lannate, Ambush, or Pounce will provide control.

Potatoes.
If Admire, Platinum or Tops MZ Gaucho were not used at planting, begin sampling for recently emerged Colorado potato beetle adults. A treatment should not be needed for adults until you find 25 beetles per 50 plants and defoliation has reached the 10% level. Actara, Spintor or Provado will provide good control of adults and larvae. Although corn borer moth catches are light at this time, they are experiencing extremely heavy flights on the Eastern Shore of Virginia.

Sweet Corn.
As soon as the first plants emerge be sure to look for cutworm feeding damage. Variegated cutworm is often present in early-planted fields. In general, this species is the first cutworm causing damage to early-planted sweet corn. Regardless of the species, a cutworm treatment should be applied if you find 10% leaf feeding or 3% cut plants in one-two leaf stage corn. A pyrethroid or Lorsban will provide control. Fields should be treated early in the morning or early evening when cutworms are close to the soil surface to achieve the best control. In addition to cutworms, be sure to watch for flea beetles on your earliest planted corn. In order to get an accurate estimate of flea beetle populations; fields should be scouted mid-day when beetles are active. A treatment will be needed if 5% of the plants are infested with beetles. A pyrethroid or Sevin will provide control.
**Watermelons.**

As soon as plants are set in the field, you should begin scouting for cucumber beetles, aphids and spider mites. The winter conditions should have helped to reduce cucumber beetle populations; however, be sure to check for beetles on field edges near overwintering sites. Foliar products can provide good cucumber beetle control; however, multiple applications of a pyrethroid or Sevin may lead to spider mite outbreaks later in the season. So be sure to scout fields and only treat if populations are causing damage. Admire and Platinum can also be applied through the drip and should provide both beetle and aphid control. There have been reports of low levels of aphids on plants in the greenhouse. If plants are ready to set out, the best option is to check plants for aphids as soon as they are set in the field. The treatment threshold for aphids is 20% infested plants with at least 5 aphids per leaf. Fulfill, Lannate and Thiodan are labeled on melons and will provide melon aphid control. These materials should be applied before aphids explode. We also have had a report from a consultant of very low levels of spider mites in the earliest planted watermelons. Therefore, it will also be important to sample for spider mites within a week of transplanting. If populations increase gradually and you find a high percentage of immature mites, Agri-mek has provided good control.

However, if populations explode quickly and you are finding mostly adult mites, Capture, Danitol or Kelthane should be used. No controls should be needed until 20-30% of the crowns are infested with 1-2 mites per leaf.

**Tomato spotted wilt virus and Thrips Management (information from Tom Kuhar, VPI, Eastern Shore).** Since thrips have already been detected on spring planted vegetables, this information from Tom Kuhar is very timely.

“Last year commercial tomato producers were plagued by tomato spotted wilt virus (TSWV), particularly in the warmer regions of Virginia. Research from NC State and Georgia has shown that numerous plants, including many winter weeds can serve as a reservoir for the virus. Chickweed appears to be particularly important.

In addition, Frankliniella fusca, the primary thrips vector of the disease in Virginia can survive on and reproduce on chickweed and many of the other plant reservoirs. However, severe winter temperatures will help to knock back overwintering thrips populations. We did have a relatively severe winter in many regions of Virginia this year. So, after all that, your guess is as good as mine. Last week in Northampton County, Jack Speese and I picked up a few thrips, including F. fusca, by sweep netting the rye windbreaks in commercial tomato fields. They’re out there. We just don’t know how many and how fast their populations will build.

We know of one commercially available tomato variety that is resistant to TSWV: Amelia VR, formerly HMX 0800, by Harris Moran Seeds http://www.harrismoran.com/products/tomato.htm. According to the company description, Amelia VR combines an armor-plate disease package along with high fruit quality and high yields. Multiple disease resistance, including TSWV and fusarium F3. Firm and aromatic fruit, ideal for green and vine ripe harvest. Crack tolerant skin. Vigorous determinate plant with an excellent leaf canopy, and well adapted to stake culture. This new tomato produces a vigorous plant that can yield extra large and large-sized fruit. Harris Moran field testing shows it performs best under moderate to heavy pruning. Dr. Herman Hohlt (ESAREC, emeritus) tested this variety on the Eastern Shore a couple years ago and it yielded well.

Regarding TSWV management, here is some information based on scientific research studies: Reflective (silver) mulch has been shown to reduce TSWV disease incidence by confusing and repelling thrips before they can orient to plants. Early-season control of thrips, particularly with a systemic insecticide such as imidacloprid (Admire 2F) applied as a transplant drench can substantially reduce disease incidence in tomato, pepper, and tobacco based on studies conducted in the southeastern U.S. The plant activator,
Actigard, has been effective in suppressing TSWV symptoms, but has no effect on thrips."

Sandea in Snap and Lima Beans - Mark VanGessel, Extension Weed Specialist; mjv@udel.edu

Gowan has received a registration for Sandea in snap beans and lima beans as a preemergence herbicide. We have tested this product for a couple of years and it has looked good. It provides good control of common ragweed, pigweed, velvetleaf, smartweed, cocklebur, jimsonweed, and lambsquarters. Nutsedges will be suppressed. It provides no grass control. I would not apply Sandea with Pursuit, since they are very similar chemistries and as a result there is a good chance of injury. What does Sandea offer compared to Pursuit? Pursuit is not labeled for snap beans (due to injury). Sandea is better on ragweed and lambsquarters than Pursuit. The down side is that there are a number of rotational restrictions with Sandea, so you need to check your label. Sandea will not control Pursuit-resistant pigweeds. In fact since Sandea and Pursuit have the same mode of action, selection pressure for ALS-resistant weeds is the same whether Sandea or Pursuit are used. Use rate is 0.5 to 1.0 oz/A with the 0.5 oz/A rate recommended for sandy soils with low organic matter.

Diet Changes?

The USDA announced that for the first time since the 1950s, the average American’s annual consumption of flour has decreased to below 140 lbs, hitting 139 for the second year in a row. Trade association professionals from the wheat industry attribute this to the Atkins diet phenomenon, which focuses on reducing carbohydrates and concentrating on protein.

Field Crops

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

Alfalfa.
Alfalfa weevil populations are still below threshold levels in most areas of the state, although development is ahead in Sussex County. With the recent warm weather, we could see fields reach threshold levels by the end of this week or early next week. The following thresholds, based on the height of the alfalfa, should be used at this time to make a treatment decision: 13 to 15 inches tall - 1.5 larvae per stem; 16 inches tall - 2.0 per stem and 17-18 inches tall - 2.5 per stem. Early harvest may be the best option for control this year. As alfalfa approaches harvest, cutting should be considered a control option if the field can be harvested within 5 days of finding an economic infestation level. However, if cutting is not an option and economic levels are found, a short residual material should be used. We are currently cooperating with ZedX, Inc. and Penn State to develop prediction maps for alfalfa weevil in the region. If you would like to view these maps, you can use the following link: http://www.agfleet.com/map/regional/region.php?region=5. Since we are still working on evaluating the system, any comments or feedback would be helpful.

Field Corn.
The first small-variegated cutworms were found feeding on spike stage corn this week. As you can see (table at end of newsletter), black cutworm moth catches have significantly increased. Looking at degree-day accumulations, we should not see significant cutting from black cutworm before May 15. Although variegated cutworms

Americans consume 195 pounds of red meat, poultry, and fish per year, 57 pounds higher than the 1950s. What are the long-term implications for wheat produced at the farm level?
generally feed on leaves and can sometimes be found in the whorls of small corn, the same thresholds apply to both species. A treatment is recommended in 1-2 leaf stage corn when you find 3% cut plants or 10% leaf feeding. A pyrethroid or Lorsban will provide control.

Small Grains. 
You should begin sampling barley and early planted wheat for grass sawfly and true armyworm larvae. Since sawflies can quickly clip heads in both crops, early detection is critical. Be sure to shake plants to dislodge sawfly larvae feeding on the plants during the day. In both crops, the treatment threshold for sawflies is 2 per 5 foot of row innerspace or 0.4 per foot of row. The armyworm threshold is one per foot of row in barley and two per foot of row in wheat. In barley, your control options include Lannate or Parathion. In wheat, your options include Lannate, Mustang, Parathion or Warrior. Remember, Parathion can only be applied by air and has numerous set back restrictions.

2003 Black Cutworm Pheromone Trap Counts
Found on page 8.

Field Crop Diseases - Bob Mulrooney, Extension Plant Pathologist, bobmul@udel.edu

Wheat. 
Soil-borne wheat mosaic and wheat spindle streak mosaic virus were detected in the Milford area last week. Both viruses produce very similar symptoms on the leaves and infected plants were observed in a large irregular shaped area. Both viruses are transmitted by the fungus *Polymyxa graminis*, which infect the wheat plants in the fall and transmit the virus. Both of these viruses are usually not yield limiting here especially if the weather warms quickly and the temperature stays above approximately 68°F. Both viruses can produce dashes and streaks on the leaves along with some mottling and mosaic patterns as well. The only way to positively identify virus diseases in wheat is with an ELISA test provided by companies that provide diagnostic services such as Agdia, Inc. None of the university Extension diagnostic labs in our area including mine provide this service. I always sent my samples to Agdia. I would recommend them if you need a visual diagnosis of a virus disease confirmed. A single wheat sample tested for the virus diseases that we see here in DE, MD, PA and NJ which would include wheat spindle streak mosaic, soil-borne wheat mosaic, barley yellow dwarf, and possibly wheat streak mosaic would cost approximately $60 plus overnight shipping (FedEx, UPS, etc.). If agents, consultants, or farm service personnel want to send samples, their phone number is Toll Free: 800-62-AGDIA (800-622-4342), or 219-264-2014, Agdia, Inc. 30380 County Road 6, Elkhart, IN  45614. All the information for submitting samples can be found on their website at http://www.agdia.com/testing/.

Barley.
Barley is heading all over the state and the *spot blotch form of net blotch* is evident on some varieties. The dark brown oval spots often have yellow halos and can be very numerous on susceptible cultivars. Usually we do not see enough damage to reduce yields.

Soybean Cyst Nematodes.
It is still not too late to check for soybean cyst nematode. Soil test bags with the submission form can be purchased at the Extension offices. If you have a fax machine and need results quickly, test results can be sent via FAX if you provide the number on the Nematode Assay Information Sheet.

Sulfur Deficiencies and Sulfur-Magnesium Deficiencies Show Up on Wheat and Barley - Richard W. Taylor, Extension Agronomist; rtaylor@udel.edu

Quite a few small grain fields located on sandy soils in both Delaware and Maryland are showing large areas of yellowed, stunted plants of wheat...
and barley. This year, symptoms often have occurred after spring fertilization with nitrogen (N). In many cases, consultants have taken tissue samples that indicate N levels of sometimes 5 percent and greater, but insufficient concentration of sulfur (S) and possibly magnesium (Mg). Many such fields are showing classic deficiency symptoms for S (Photo 1, 2, 3, and 4). The symptoms include stunting of plants, general yellowing or chlorosis especially of the new growth (remember that S is immobile in the plant causing symptoms first to occur on new growth, but when deficiencies are severe, symptoms can involve the whole plant), and poor root development. In the barley shown in Photos 1 to 4, the root system of the affected plants was limited to the upper 2 to 4 inches and the soil type was loamy sand.

Photo 1. Field view of barley showing sulfur (S) deficiency (tissue test indicated 0.11 percent S and >5 percent nitrogen) on very sandy soil that had been fertilized with 20+ pounds per acre of S (Photo by R. Taylor).

Photo 2. Barley showing sulfur (S) deficiency symptoms of stunted plants with general yellowing, but beginning with newly emerged leaves (tissue test indicated 0.11 percent S and >5 percent nitrogen) on very sandy soil that had been fertilized with 20+ pounds per acre of S (Photo by R. Taylor).

I think in some cases, the severity of the symptoms can be attributed to the very high N content of the tissue. With inadequate S uptake, the plants are unable to synthesize the S-containing amino acids and that limits the ability of the plant to make proteins and enzymes that do much of the work in the crop. In essence, the high N content worsens the S deficiency.

Why might we be seeing S deficiency? The severe winter weather and very cold spring limited root development while the excessive rainfall on the sandy soils that are usually involved leached S well below the crop rooting zone. Many of the fields are low in soil organic matter (SOM) that might supply S during mineralization. Also, cold spring conditions have inhibited mineralization of SOM. In the above case (Photo 1 to 4), S was applied along with N, but I speculate that rainfall quickly leached much of the S below the shallow rooting depth of the crop.
Other fields also with very sandy soil have been showing both S and Mg deficiency symptoms for both barley (Photo 5 and 6) and wheat (Photo 7 and 8). In some cases, the soil pH was about 6.0. A pH of 6.0 indicates that generally both calcium (Ca) and Mg soil test levels are adequate. So why is Mg deficiency showing up if soil test levels are adequate? Grasses, which both wheat and barley are, often are unable to absorb adequate Mg in cool, wet springs. In particular, this is seen in forage grasses. It leads to a condition in grazing cattle called “grass tetany” characterized by low blood serum Mg levels due to poor absorption of Mg by the grass under certain environmental conditions.

Can anything be done about the problem or should anything be done? A S, Mg, and potassium (K) containing fertilizer (KMag or Sul-Po-Mag—potassium magnesium sulfate)—can be applied at a very low additional cost and will provide both K, Mg, and S both to the small grain crop and more importantly to the following soybean crop. Another fertilizer option that contains S and Mg is Epson salts or magnesium sulfate. The choice between the two depends on the costs of each compound and whether soil test K levels are high or not. High levels of soil test K can inhibit the uptake of Mg by grass crops. Even with this addition of S and Mg, the upcoming soybean or other crop should be observed carefully for deficiency symptoms so early intervention can occur to solve any developing deficiencies before yields are severely depressed. For the current crop, if the crop has headed out there may be only a minimal potential for yield increase and much of the benefit will come from the double-crop.
portion of the rotation. If applied prior to heading, the crop should respond enough to cover the cost of both the application and the fertilizer according to cost estimates I’ve heard.

The value of tissue testing has certainly been confirmed this year with the results from these fields. When evaluating the tissue test results, be sure not only to pay attention to the absolute values of each nutrient, but also the relative ratios of certain nutrients. In the above cases, the relative high N content in relation to the S content confirmed the problem with S. A high K content with respect to Mg would also indicate a problem with Mg even if the absolute number were not below the critical level.

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

**New Crop Soybean Futures Reach New Highs**
With November soybeans trading at $5.52 per bushel this morning they are at the life of contract high for the new crop. The local basis on the Eastern shore is currently bidding at 10 under Nov, which is about 10 cents better than the historical average. That places forward pricing opportunities at $5.42 per bushel. The current price offering is 31 cents better than the 2003 loan rate. If we agree with the philosophy that a strong basis should be rewarded with sales then it is time to begin thinking about rewarding the recent gain in the soybean price and the strong basis with an initial sale of the new crop. Current bidding activity in the soybean pit is said to be based upon the 'old crop market'.

**New Crop Corn and Wheat Futures Drop to New Lows**
Dec ‘03 corn futures, now trading at $2.34 per bushel are about 17 cents per bushel off of the life of contract high achieved in October 2002. New crop corn basis on the Eastern Shore is being bid at 15 to 20 over Dec, within a few cents of the historical average, equating a forward price of $2.49 to $2.54 per bushel.

Jul ’03 wheat futures at $2.80 per bushel are $1.00 per bushel off of the contract high, achieved on September 9, 2002. New crop wheat basis is currently being bid at 20 under July. Commodity traders will now focus their attention primarily to new crop growing conditions and the release of the May crop report.

**UPCOMING EVENTS:**

**Annual Strawberry Twilight Meeting**

**Location:** University of Maryland Wye Research and Education Center, Queenstown MD

**When:** Thursday May 22, 2003
Program begins at 6:00PM
Directional signs will be posted to program area

**What will be seen:** All Strawberry research conducted as plasticulture production
- Herbicide trial
- Plug pre-plant conditioning trial
- Fall vs Spring planted systems
- Evaluation of Web-based weather forecasting service
- Advanced breeding selections from Maryland and Canadian programs

Experts from Maryland and USDA will be in attendance. For more information and/or directions contact:

Debby Dant 410-827-0831 or Mike Newell 410-827-7388
### 2003 Black Cutworm Pheromone Trap Counts

**Trapping date: April 22-28, 2003**

<table>
<thead>
<tr>
<th>Location</th>
<th>Count</th>
<th>Location</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridgeville</td>
<td>26</td>
<td>Magnolia</td>
<td>7</td>
</tr>
<tr>
<td>Delmar</td>
<td>12</td>
<td>Middletown</td>
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<tr>
<td>Ellendale</td>
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<td>9</td>
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<tr>
<td>Felton</td>
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<td>Millsboro</td>
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<tr>
<td>Frederica</td>
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<td>Milton</td>
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<tr>
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<td>Sandtown</td>
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<td>Kenton</td>
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<tr>
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<tr>
<td>Leipsic</td>
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<td>Wyoming</td>
<td>4</td>
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<tr>
<td>Lewes</td>
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<td></td>
</tr>
<tr>
<td>Lincoln</td>
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<tr>
<td>Little Creek</td>
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### Weather Summary

**Weeks of April 25 to April 30, 2003**

<table>
<thead>
<tr>
<th>Rainfall:</th>
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<tr>
<td>0.21 inches: April 25</td>
</tr>
<tr>
<td>0.07 inches: April 26</td>
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Readings taken for the previous 24 hours at 8 a.m.

<table>
<thead>
<tr>
<th>Air Temperature:</th>
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<tbody>
<tr>
<td>Highs Ranged from 83°F on April 29 to 61°F on April 26.</td>
</tr>
<tr>
<td>Lows Ranged from 55°F on April 29 to 41°F on April 28.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Soil Temperature:</th>
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</thead>
<tbody>
<tr>
<td>61°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

NOTE:
1. Moth catches of 9 to 15 moths per 7-day period =mod. to high potential for outbreaks.
2. You can expect to see cutting activity around 300 degree-days, base of 50 degree F from peak moth activity.