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

Insect Trap Catches.
The decision to treat peppers, snap beans and sweet corn for corn borers and corn earworm is based on a combination of field scouting and trap catches. Be sure to check our website, http://www.udel.edu/IPM/latestblt.html, for the most recent BLT and pheromone trap catches in your area. Trap catches are updated 3 times per week on the website. You can also call the Crop Pest Hotline at 1-800-345-7544 (in-state only) or 302-831-8851. Trap catches are updated on Tuesday and Friday.

Cucumbers.
With the current hot, dry weather, both pickles and slicers should be watched for increases in aphid populations. A treatment should be applied for aphids if 10 to 20 percent of the plants are infested with aphids. Actara, Fulfill, Thiodan or Lannate will provide control. Be sure to watch for bees foraging in the area and avoid insecticide applications on blooming crops. You should also watch for increase in thrips populations. In New Jersey, damage has appeared as silverying on the leaves followed by bumpy warts on the fruit. Although no thresholds are available, a treatment may be needed if hot temperatures continue, populations continue to increase and plants are starting to set fruit. Capture, Lannate or SpinTor should help to reduce populations.

Lima Beans.
Continue to scout fields for lygus bugs and stinkbugs. Treatment should be considered if you find 15 adults and/or nymphs per 50 sweeps. Lannate, Capture or Mustang can be used if both species are present. A higher rate of Capture (4 oz/A) or Mustang (4.3 oz/A) will be needed if stinkbugs are the predominant insect present.

Melons.
Although spider mites can still be found, economic levels are not widespread. However, as the temperatures increase, be sure to watch for increases in populations. A treatment will be needed if you find 20-30% of the plants infested with 1-2 mites per leaf. Agri-Mek and Capture have both provided effective control this season. With the hot, dry weather, be sure to watch for an increase in aphid populations. A treatment is needed if 20% of the plants are infested with 5 or more aphids per leaf. High numbers of thrips can still be found in later planted melons. Again, no thresholds are available, but a control may be needed if plants are stressed and populations continue to increase. A pyrethroid or dimethoate should help to reduce populations.

Peppers.
Corn borer controls are needed in areas where pepper fruit is ½ inch in size or larger. If Orthene is not being used, then dimethoate should be added to the mix for pepper maggot control.
Tomato spotted wilt virus (TSWV), which is vectored by thrips, has been detected in one tomato field in Delaware and there is a suspect pepper field as well. Although other states in the region continue to report high thrips numbers on peppers, thrips populations on peppers in Delaware are generally low to moderate at this time. Information from North Carolina and other southern states indicates that management of the TSWV is not possible once a plant is infected. Because of the wide host range, including many perennial ornamentals and weeds, it is extremely difficult to eradicate this disease. Therefore, many growers attempt to focus on management of the insect vector, with very limited success. Insecticide sprays that have good efficacy against the vector have not been effective in controlling TSWV. This is due to populations of thrips that migrate from adjacent non-treated areas or are blown in from long distances. However, if TSWV has not been detected, you may still want to monitor for thrips and make a single application to help reduce the severity of the disease. In a recent Rutgers University newsletter, growers were advised to manage thrips populations before they reach an unmanageable level instead of trying to eliminate them. Insecticide treatments will not eliminate all thrips so they will not completely prevent the spread of the disease. Acephate (Address/Orthene), dimethoate, SpinTor, Baythroid, and Lannate will help reduce thrips populations in peppers.

Snap Beans.
Once corn borer catches start to increase again, fresh market and processing snap beans in the bud to pin stage will need to be sprayed for corn borer control. Seedling beans should still be watched carefully for thrips and leafhopper activity. If both insects are present, the threshold for each should be reduced by 1/3. The thrips threshold is 5-6 per leaflet and the leafhopper threshold is 5 per sweep.

Sweet Corn.
Fresh market silking sweet corn should be sprayed on a 5-day schedule except in the Harrington area where sprays are needed on a 3-4 day schedule. Low levels of corn earworm are starting to show up in late whorl to pre-tassel stage fresh market sweet corn. In order to avoid movement into the ear zone area, a tassel treatment will be needed if 15% of the tassels are infested and again in 3-4 days. Be sure to sample your latest planted fields for fall armyworm larvae. We expect to see the first larvae during the next 7-10 day period. No controls will be needed until 15% of the plants are infested.

Vegetable Update - Ed Kee, Extension Vegetable Crops Specialist; kee@udel.edu
Pickling cucumber harvest has begun, with full harvest in swing by the end of next week. Lima bean plantings are proceeding well, as are sweet corn plantings. Watermelon fields look excellent, with tremendous growth obtained during this week of hot weather.

Irrigation Notes - Ed Kee, Extension Vegetable Crops Specialist; kee@udel.edu
During hot weather, remember that many of our vegetable crops, especially as they reach the full vegetative stage or the reproductive stage, will use as much as one quarter to one-third of an inch daily in evapotranspiration. This is true for sweet corn, watermelons, pickling cucumbers and slicing cucumbers, peas, and many other crops. Keeping soil moisture levels above the wilting point is critical to the plants ability to function properly and achieve profitable yields.
Vegetable Diseases - Kate Everts, Extension Vegetable Pathologist, University of Delaware and University of Maryland; everts@udel.edu

Watermelons.

From the University of Maryland and University of Delaware
Latest EFI values from local weather stations
Any questions please call (410) 742-8788

MELCAST for Watermelons
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>06/26/02</th>
<th>06/25/02</th>
<th>06/24/02</th>
<th>06/23/02</th>
<th>06/22/02</th>
<th>06/21/02</th>
<th>06/20/02</th>
<th>06/19/02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridgeville, DE</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Charles Co.</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Collins Farms</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Galestown, MD</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Georgetown, DE</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Glenville, MD</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Hebron</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hog Creek Rd.</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Salisbury, MD</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Vincent Farms</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Westminster</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>White Marsh</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</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.

Tomato Spotted Wilt Virus Alert.
Tomato spotted wilt virus (TSWV) has been confirmed in commercial tomatoes grown on the lower shore and in tobacco in southern Maryland. TSWV has also been confirmed in one tomato planting in Delaware. This virus, typically not a problem in our area, causes numerous small brown spots on foliage and leaf petioles, and subsequently wilted and severely stunted plants. Infected fruit have chlorotic ring spots that are
more evident as the fruit matures. TSWV has a wide host range, including pepper, tobacco, potato, eggplant, legumes, lettuce, ornamental plants and some weeds. Weeds serve as overwintering reservoirs of the virus, as well as hosts to the thrips. Several species of thrips are vectors of TSWV. Thrips become viruliferous (carriers of the virus) in the larval (immature) stage. They are able to transmit the virus once they become adults.

Previous outbreaks of TSWV in our area resulted from use of southern-grown transplants that were infected with TSWV or infested with thrips. Use of locally grown transplants from greenhouses with good thrip control solved the problem. The 2002 outbreak however, occurred on locally grown transplants and may have resulted from large populations of overwintering thrips that obtained the virus locally.

To reduce damage from TSWV destroy weeds in and near field. Use of silver reflective mulch will repel thrips however; maturity of the crop may be delayed. Thrips can be controlled early season using imidacloprid at planting, followed by SpinTor, Monitor or Warrior, and SpinTor again. While these measures are good management practices, thrips control is not highly effective in reducing damage due to TSWV because the thrips can transmit the disease in as little as 5 minutes of feeding.

Once TSWV is established in fields, rogue diseased plants if possible. Although most of the damage comes from primary infections and secondary spread appears to be minimal, removal of diseased plants may not reduce in-season infections but it will help to reduce inoculum for the future. If TSWV is widespread, adjust management inputs to minimize economic losses.

Vegetable Diseases - Bob Mulrooney, Extension Plant Pathologist; bobmul@udel.edu

Potato Disease Advisory.

Late Blight Advisory

Disease Severity Value (DSV) Accumulations as of June 26, 2002 are as follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>Total DSV</th>
<th>Spray Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/1</td>
<td>12</td>
<td>None</td>
</tr>
<tr>
<td>5/11</td>
<td>19</td>
<td>5 days, low rate</td>
</tr>
<tr>
<td>5/19</td>
<td>23</td>
<td>10 days, low rate</td>
</tr>
<tr>
<td>5/22</td>
<td>23</td>
<td>10 days low rate</td>
</tr>
<tr>
<td>5/27</td>
<td>27</td>
<td>10 days low rate</td>
</tr>
<tr>
<td>5/29</td>
<td>30</td>
<td>7 days, low rate</td>
</tr>
<tr>
<td>6/3</td>
<td>33</td>
<td>7 days, mid-rate</td>
</tr>
<tr>
<td>6/5</td>
<td>33</td>
<td>10 days, mid-rate</td>
</tr>
<tr>
<td>6/9</td>
<td>38</td>
<td>7 days, high-rate</td>
</tr>
<tr>
<td>6/13</td>
<td>39</td>
<td>10 days, high-rate</td>
</tr>
<tr>
<td>6/16</td>
<td>58</td>
<td>5 day mid-rate</td>
</tr>
<tr>
<td>Date</td>
<td>Rate</td>
<td>Remarks</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>6/19</td>
<td>60</td>
<td>10 day mid-rate</td>
</tr>
<tr>
<td>6/23</td>
<td>63</td>
<td>7 day high rate</td>
</tr>
<tr>
<td>6/26</td>
<td>64</td>
<td>10 day high rate</td>
</tr>
</tbody>
</table>

All potatoes have reached more than 18 DSV’s. The Wisdom potato software program generates spray recommendations.

Late blight has not been a problem here in Delaware for many years and unless you have seed from an unknown source the risk of late blight is very low.

**NOTE:** For this greenrow date and location we have accumulated 562 P-days as well. P-days are a measure of potato plant growth somewhat similar to growing-degree-days. When **400 P-days** have been exceeded conditions for **early blight infection** are more favorable and disease may begin to show up 5-7 days later. Continue fungicide sprays for early blight.

The hot and muggy weather is favorable for **ozone damage** on susceptible varieties especially reds. Ozone damage appears as black flecks on the upper surface of the older leaves, if severe, necrotic sunken areas develop on the undersides of the leaves.

**Note:** Late blight has not gone away completely. There was a recent report this week of late blight in Crawford County, PA, just south of Erie, PA. The infected area in the field was destroyed. There was no information on the source of the infection.

**Cucumber Fruit Rots.**

**Phytophthora fruit rot control on pickling cucumbers.**

Phytophthora fruit rot can be a devastating disease of pickles. The fungus is soilborne and the overwintering oospores can remain viable in the soil for long periods of time. Cultural practices that help control Phytophthora are (1) as long a rotation away from susceptible crops (tomatoes, peppers, eggplants, lima beans, cucurbits) as possible, (2) plant only well-drained fields, (3) use as wide a row spacing as possible to allow drying and reduce humidity. In Michigan, fungicides have been used successfully in combination with cultural controls. The fungicides that they have tested are Ridomil Gold/Bravo or Ridomil Gold Copper 2 lb/A, Acrobat and Gavel. Their experience has shown that applications should be made when fruit are present and can be as soon as several days after pollination. Growers should make at least two applications and maybe more depending on the field history, weather, and economics. If the Phytophthora population is not sensitive to Ridomil, full rates of Acrobat (6.4 oz/A) plus full rate of copper also provides good control and is another alternative to Ridomil Gold Bravo or Ridomil Gold Copper. Gavel has recently been labeled, but according to work in Michigan has not performed as well as Ridomil and Acrobat. As a reminder, cull fruit should not be spread on production fields that get planted to cucurbits or other susceptible crops. If cull fruit need to be dumped, restrict the dumping to a single field that gets planted to corn, small grains, sorghum or other non- susceptible crops. If you have to plant a field with a history of Phytophthora fruit rot, a Ridomil Gold 4E treatment at planting would also be advised. Another disease management strategy for fields within several days of harvest when thunderstorms are forecast or a good chance of heavy rain (more than an inch) is early harvest. It may mean harvesting less compared to possibly harvesting nothing. Something to think about.
**Belly Rot** caused by the soilborne fungus *Rhizoctonia* can also cause pickle growers problems. Cucumber fruit are infected on the underside and the fungus produces water-soaked, tan to brown lesions, which become sunken, cratered, irregular and dried as they enlarge. The fungus can infect over a wide temperature range with the optimum being 80°F. High humidity near the soil surface under dense foliage promotes infection. Fungicide control has been inconsistent over the years. Fungicide sprays of Quadris (11-15.4 fl. oz/A) at the 1-3 leaf stage and a second at vine tip-over or 10-14 days later is labeled for belly rot control. The high rate of chlorothalonil use is no longer labeled. Deep plowing will also help bury any fungus residing on the soil surface or in debris from a previous crop. Unfortunately, I don't think a grower could expect to get much, if any control of belly rot from a Ridomil Gold/Bravo application for Phytophthora fruit rot.

![Pickle fruit with Phytophthora capsici.](image1)

*Note* that it is not fluffy like Pythium.

![Summer squash with crown rot phase and fruit rot.](image2)

*Note* that Phytophthora does not have a crown rot phase on cucumbers here, just on squash and pumpkins.

---

**Field Crops**

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

**Alfalfa.**

Although all alfalfa should be sampled for leafhoppers, be sure to pay close attention to fields that were damaged by weevils earlier in the season. If regrowth was held back by weevils then leafhoppers can cause significant losses and potentially weaken the stand. Nymphs can cause the greatest damage and often go undetected. The nymphs appear similar to adults but they do not have wings and often walk sideways on a net. The shorter the alfalfa the greater the damage from leafhopper feeding. Alfalfa 3 inches or less in height should be treated when you find 20 leafhoppers per 100 sweeps. The threshold increases to 50 per 100 sweep in 4-6 inch tall alfalfa and 100 per 100 sweeps in 7-11 inch tall alfalfa. Also, if treatments are applied on small alfalfa, especially as a stubble spray, you may need more than one application per cutting.

**Field Corn.**

Grasshopper populations continue to increase, especially along field edges. In corn, a treatment is justified if you find 5-8 grasshoppers per square yard. Asana, dimethoate, Furadan, Lorsban or Warrior will provide control. As corn begins to silk, watch for Japanese beetles and corn rootworm adult beetles feeding on silking corn. Both can be found in pretassel stage corn. The decision to treat should be based on the number of beetles per silk as well as how far you are in the pollination period. In recent years, large numbers of rootworm beetles feeding on silks before 50% pollination have resulted in yield losses, especially along field edges. A treatment is recommended on
silking corn if you can find 4-5 beetles per plant and they are clipping silks to less than ½ inch long before 50% pollination.

**Soybeans.**

Continue to scout for grasshoppers and spider mites in seedling stage beans. Grasshoppers can be controlled with Asana, Dimethoate, Furadan, Lorsban or Warrior. Spider mites can be managed with Dimethoate, Lorsban or Parathion. With both pests, multiple applications may be needed. In addition to grasshoppers and spider mites, Japanese beetles and green cloverworm populations are starting to increase in soybeans. Although we rarely see economic losses from Japanese beetle feeding, losses have occurred in recent years from green cloverworm, especially on double cropped soybeans. Small cloverworm larvae produce "window-pane" feeding holes in the leaves. As larvae increase in size, the damage will appear as large holes between the veins. In general, no controls are needed prebloom unless you find 15 larvae per foot of row and 30% defoliation. A pyrethroid will provide effective control.

Thrips can also be found on seedling stage soybeans. In some cases, plants appear stunted and growth has been reduced. A spray may be needed if you can find 8 or more thrips per leaflet, plants are drought stressed and appear stunted. Dimethoate or Warrior will provide control.

---

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

**U.S. Wheat in Short Supply**

The wheat market should have some price strength in the near term, with chart analysts expecting another 20 cents per bushel. Wheat acres have been lost to poor stands and severely dry weather in the west. USDA's weekly crop update rated 42% of the U.S. crop poor/very poor as of June 16th, a 2% decline in the condition of the crop from the week before. This is a short crop year. Short crops generally peak early, just before, during, or right after harvest. Farmers are likely to be aggressive wheat sellers during the next month.

**Corn Exports Remain Strong**

Corn exports are currently running above year ago levels, although originally forecast to be less than last year. The weekly export sales report for corn, for the week just ended, was reported at 925,300 metric tons, on the high side of trade estimates of 750,000 to 1 million mt. An issue for the corn market to decipher, appears to be actual 2002 crop acreage planted and the resulting crop size being forecast. Current private forecasts call for a crop size between 9.656 to 10 billion bushels, with a carryout between 1.3 to 1.6 billion bushels. Tomorrow morning's Crop Acreage Report could take some of the guess work out of predicting the size of this year's corn crop.

**Soybean Acres Likely to Increase**

Soybean exports were reported to be solid for the week just ended at 278,400 metric tons. The big question for soybeans this week is how much will USDA increase the planting acres estimate for the 2002 crop. Any increase from the June 10th crop report is likely to increase the ending stocks estimate for the current marketing year ('02/03).

**Marketing Strategy**

Overall the June 28th Acreage and Stocks in all Positions reports are not expected to have much impact on the commodities markets. Most of the commodities trader's attention has focused on the weather, the impact on this year's crop size, and on demand. Locally, wheat growers are likely to have some opportunity to make some needed wheat sales in the near term, as indicated above. The Delaware loan rate for wheat is $2.43 per bushel.

For corn, Dec '02 futures are currently at $2.40 per bushel. For those who have not already done so, it is likely to be prudent to forward price at least 1/3 of intended production. Basis bids of 10
over Dec. are being reported this morning for delivery into Seaford. The Delaware loan rate for corn is $2.20 per bushel.

Soybean sales are not recommended at this time. With the lateness of the crop planted in the Eastern Corn Belt and the dryness being reported in the Western Corn Belt, good hedging opportunities, if any should come later. The price level remains too low for making any forward cash sales. Nov '02 soybean futures are currently trading at $4.90 per bushel. The Delaware loan rate for soybeans is $5.11 per bushel.

Spraying Postemergence Herbicides and Dry Weather - Mark VanGessel, Extension Weed Specialist; mjv@udel.edu

The severely dry weather we have been having comes at a time when many fields need a postemergence herbicide application. For irrigated fields, be sure the field is well watered before spraying, so that weeds are not under stress and the herbicides have a chance to work well. For dryland fields the situation is not so easy. The best advice is to wait for rain, then spray as soon after the rain as possible. Spraying during the dry weather reduces the herbicides’ effectiveness because the weeds are not undergoing normal metabolism and the leaf surfaces have thicker layers of waxy cuticle to prevent water loss. The thicker cuticles make it more difficult for herbicides to penetrate into the leaf. Some weeds may not look stressed in the field, but chances are they are not going to be effectively controlled. I have not had very good luck with adding a lot of different surfactants, oils, or nitrogen solutions and having a significant amount of improvement in weed control over normal adjuvant use. Based on greenhouse research, drought affects contact herbicides (i.e. Reflex, Blazer, Basagran) similarly to translocated herbicides (i.e. Roundup, Poast, Classic, Pursuit). Also there were no generalities that we could make based on effectiveness. For instance, herbicides that are expected to have good to excellent control of a given species would perform better under drought than herbicides that typically are rated as fair. But the research showed this was not the case. So my advice is wait for rain if the field is dryland. If you feel you must spray, at least spray in the early evenings as the plants begin to unroll so that there is more leaf area exposed, and the humidity is higher so that the droplets do not evaporate as quickly.

Spraying The Horseweed (Marestail) That Is Surviving In Soybeans - Mark VanGessel, Extension Weed Specialist; mjv@udel.edu

A number of fields have horseweed in the fields after the fields were treated with Roundup or Touchdown. Due to the prevalence of glyphosate-resistant horseweed, we have to assume these weeds are resistant (particularly if all the other weeds are dead or dying). Our options are limited and the level of control is suppression at best. FirstRate or Classic is the only viable choices with FirstRate slightly better than Classic. The use rate of 0.3 oz/A is as effective as higher rates. Once the horseweed is over 15 inches and has been treated at least once with glyphosate, the effectiveness is going to be very low. I do not know if I can tell when it is no longer worth trying to spray the horseweed, because the control will be so low. But it is probably not worth spraying horseweed plants over 20 inches tall and have survived at least one application of glyphosate.

Potash Deficiency on Soybeans - Richard W. Taylor, Extension Agronomist, rtaylor@udel.edu

Potash (K) deficiency has begun to show up in some soybean fields. Soil test results confirm low to very low K values in the soil. Adequate K nutrition is important in soybean production especially when the crop faces stress conditions as
exist in southern Delaware where only limited rainfall has occurred recently. Unlike corn where only severe K deficiency affects yields, even moderate K deficiency appears to impact yield levels in soybeans.

Potash deficiency symptoms on soybeans begin as small yellowed or chlorotic spots on the margins of each leaflet of the lower trifoliate leaves. These combine until the entire leaf edge or margin yellows and then progresses to dead or necrotic areas giving the leaflet a tattered or scorched appearance. Yields can be affected in severe K deficiencies so early application of additional K is essential for optimum yields.

Photo 1. Leaf margin chlorosis on drilled single-crop soybeans caused by low soil potassium (K) levels. Note that symptoms progress toward the center vein of the soybean leaflet as the severity of the deficiency increases (Photo by R. Taylor).

Generally, K deficiency occurs on the lower leaves of the crop although in severe cases the entire plant can be affected. The symptoms can sometimes be confused with drought injury that also begins on the leaflet margins although in the case of drought, it is usually seen only on one edge of the leaflet (imagine the leaflet split into two halves by the center vein). Both these causes of yellowing beans can occur in small areas, but K deficiency can be confirmed with a soil or tissue test. Between the two causes, K deficiency is also the likely cause if regular (man-made) patterns appear in the field.

Photo 2. Leaf margin chlorosis on drilled single-crop soybeans caused by low soil potassium (K) levels. Note that symptoms appear most severe on the lower leaves as K is mobile in the plant (Photo by R. Taylor).

Photo 3. Leaf margin chlorosis on wide-row single-crop soybeans caused by low soil potassium (K) levels. Note that although symptoms appear most severe on the lower leaves, even the new fully expanded leaves appear affected due to very low soil K levels (Photo by R. Taylor).

For K deficiency, application of muriate of potash (0-0-60) can help increase yields. In the soil, K is not as mobile as nitrogen nor as immobile as phosphorus, so responses to fertilization depend on adequate rainfall to move dissolve the fertilizer and move in deep enough into the root zone to be taken up by the crop. I also recommend that in addition to potash you add 1 lb/A boron if boron has not been applied earlier. This will be
especially useful in dryland soybean systems and on soils with low organic matter content.

**Follow-up on Clarity Injury on Soybeans**
*Richard W. Taylor, Extension Agronomist, rctaylor@udel.edu, and Derby Walker, Jr. Extension Ag Agent, Sussex County derby@udel.edu*

Last week we discussed the symptoms associated with dicamba injury on soybeans and possible options available to try to avoid injury. For those interested in the possible yield effects of this type of injury, the reader should refer to a paper entitled “Effect of Dicamba on Soybean Yields” by Dr. Bob Hartzler. The article is located at the following web site: [www.weeds.iastate.edu](http://www.weeds.iastate.edu) Look in the right column for the paper under the above title.

For those without access to the web, we’ll summarize the paper below.

The research on dicamba injury has generally focused on simulating dicamba drift. The data show that environmental conditions have a strong influence on possible yield reduction as does the stage of growth at the time of injury and soybean cultivar.

Keeping these factors in mind, researchers have reported that soybean injury ratings up to 30 percent injury at 21 days after application (DAA) show little to no yield reductions. The injury scale went from 0 (no injury) to 100 (complete kill) with a severe injury rated at 60 to 70 (terminal bud kill and axillary bud release resulting in short, bushy beans and delayed maturity). At a severe injury level with early season dicamba drift, one cultivar showed little yield loss while a second cultivar showed 16 to 23 percent yield loss.

In another study, the researchers reported little yield loss without height reduction in the beans. Yield reductions of greater than 10 percent occurred only at injury levels of 60 to 70 (see above scale). Application of up to 1.6 oz Banvel/A did not reduce yield when beans were at the 1 to 2 trifoliate leaf stage and only reduced yields by 20 percent even up to the 6 to 7 trifoliate leaf stage. Injury from application of 1.6 oz Banvel/A at early bloom reduced yields by 36 to 67 percent while a rate of 0.03 oz Banvel/A at early bloom reduced yields by 9 to 60 percent. The great range is indicative of the impact of environmental conditions.

Lastly in another study, application at the V2 to V3 growth stage of 0.5 oz Banvel/A that had a visual injury rating of 50 at 30 DAA and a 27 percent height reduction at 60 DAA caused only a 10 percent yield loss. A rate of 1.6 oz Banvel/A (equal to 0.05 lb dicamba/A) causing 33 percent injury at 7 DAA, 70 percent at 30 DAA, and a 50 percent height reduction at 60 DAA resulted in a 45 percent yield loss. An application of 5.3 oz Banvel/A or 0.165 lb dicamba/A resulted in 80 percent yield loss.

Again for more complete information, visit the web site [www.weeds.iastate.edu](http://www.weeds.iastate.edu) and look for paper on the “Effect of Dicamba on Soybean Yields.”

**Double-Cropping Soybeans in Delaware** - Derby Walker, Jr., Extension Ag Agent, Sussex County; derby@udel.edu and Soybean Facts – SF-31, University of Delaware Cooperative Extension

Just a reminder that planting date is more critical for double-cropped soybeans than for single-cropped soybeans. By late June, soybean yield potential will decrease by about 2 bushels per week. After July 1, the yield penalty for delayed planting will be 2-3 bushels per week or about ½ bushel per day.

Data from the University of Delaware cultivar performance trials show that rainfall amounts and patterns and planting date have a much greater
effect on yield than maturity group or individual cultivar differences.

Stand establishment is usually more difficult with double-cropped soybeans because soil moisture is often limiting in late June and early July.

The later the planting date, the greater the yield response to narrow rows. Growers should adjust the seedling rate for the row spacing to aim for a final soybean population of 125,000-150,000 harvestable plants per acre for June-planted beans and 175,000-200,000 harvestable plants per acre for July-planted beans. Generally, 60-80% of the planted seed will produce harvestable plants.

**Ag Fact**

Sweet Corn was first mentioned in American Agricultural writings in 1801. By 1888, seed catalogues circulated in Delaware listed 22 varieties of "Sugar Corn."

<table>
<thead>
<tr>
<th><strong>Weather Summary</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week of June 20 to June 26, 2002</strong></td>
</tr>
<tr>
<td><strong>Rainfall:</strong> None.</td>
</tr>
<tr>
<td><strong>Readings taken for the previous 24 hours at 8 a.m.</strong></td>
</tr>
<tr>
<td><strong>Air Temperature:</strong></td>
</tr>
<tr>
<td>Highs Ranged from 95°F on June 25 to 81°F on June 20.</td>
</tr>
<tr>
<td>Lows Ranged from 74°F on June 26 to 55°F on June 22.</td>
</tr>
<tr>
<td><strong>Soil Temperature:</strong></td>
</tr>
<tr>
<td>81°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*

**UPCOMING EVENTS:**

**Twilight Weed Tour**

July 1, 2002
6:30 p.m.
University of Maryland Wye Research and Education Center

Dr. Ron Ritter will provide the latest on new chemicals, timing, combinations and prices for corn and soybean herbicides. CCA credits will be awarded. Refreshments will be served. For more information, contact Mark Sultenfuss at 410-827-7388.

---

Cooperative Extension Education in Agriculture and Home Economics, University of Delaware, Delaware State University and the United States Department of Agriculture cooperating, Robin Morgan, Dean and Director. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. It is the policy of the Delaware Cooperative Extension System that no person shall be subjected to discrimination on the grounds of race, sex, disability, age or national origin.