Vegetables

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

Sweet Corn.
A soil insecticide should be considered for flea beetle control on early-planted varieties that are susceptible to Stewart's Wilt. If you are using a soil insecticide for flea beetle control, the only two labeled products providing flea beetle control are Counter and Furadan. Regent is not labeled on sweet corn. A Section 18 for Gaucho is also available for a limited quantity of sweet corn seed that has been commercially treated. Our results from last year demonstrated excellent flea beetle control and management of Stewart's Wilt. It also provided seed corn maggot and early stage wireworm control in our field corn study. If you are finding economic levels of grubs (one grub per square foot of soil) or the field has a history of grubs (especially for fields following soybean); a soil insecticide will be needed for grub control. Counter or Force will provide control. Gaucho should have a full federal label for next use season.

New Uses For Select Herbicide on Vegetables – Ed Kee, Extension Vegetable Crops Specialist; kee@udel.edu

Select, a post-emergence grass control herbicide manufactured by the Valent USA Corporation, has received supplemental Federal Labeling for several vegetable and fruit crops. The vegetable crops include: potatoes, sweet potato and yam, tomatoes, peppers (bell and non-bell), eggplants, celery, carrot, radish, squash, pumpkins, cucumber, cantaloupes, and watermelons. It is also labeled for strawberries and cranberries.

Select provides excellent control of many annual grasses, and offers control of some perennial grasses such as Bermudagrass, Johnsongrass, and others. All grasses are better controlled when smaller. Applications should be made only to actively growing grasses at recommended weed heights. Generally, weed heights greater than 6 to 8 inches are the maximum. Application rates are dependent on the size of the weed. Check the label for details and for the Pre-Harvest Interval requirements.
Vegetable Diseases - Bob Mulrooney, Extension Plant Pathologist, bobmul@udel.edu

Peas.
To avoid root rot and other disease problems such as Fusarium, Aphanomyces, and Ascochyta blight rotate for 4-5 years before planting peas again. For damping-off caused by Pythium apply Ridomil Gold 4E to the soil after seeding.

Spinach.
Be sure to check for white rust in overwintered spinach. If seen, apply Quadris according to the label.

Potatoes.
Be sure to use seed treatments containing mancozeb to protect against late blight infections. Use Tops MZ or Maxim MZ if you have had problems with Rhizoctonia stem cankers.

Sweet Corn.
As mentioned in the first issue, apply Counter 15G on Stewart’s wilt susceptible varieties at planting to control flea beetles that vector Stewart’s wilt and nematodes.

Phytophthora Blight and Fruit Rot.
Phytophthora blight and fruit rot caused by the fungus Phytophthora capsici was identified for the first time on several crops in Delaware last year. The fungus is favored by wet conditions and flooded soil. It was seen on lima bean pods from wet areas of fields in Kent County. On limas it can look like downy mildew but it is different. It has never been reported on lima beans from anywhere before this season. It caused significant loss of a small patch of watermelons in Sussex County, and pumpkins in New Castle County. This was the first time I have seen it on watermelons in Delaware, although it occurs in other parts of the country. It has caused significant losses in cucumbers, both slicers and pickles, and summer squash in past years when we get lots of rain in a short period of time.

The best control is to grow the plants on beds, if practical, to get them out of the water and to rotate for long periods of time (3 years or more) away from susceptible crops. For vegetable growers this is difficult because many crops are susceptible and irrigation availability limits rotation intervals. But a combination of rotation and other horticultural practices combined with fungicides may provide some relief. Fungicides alone have not provided a solution as results from New Jersey on Phytophthora blight on peppers has shown. What drives this disease is water. Choosing well-drained fields, avoiding planting wet areas, and planting on high beds combined with fungicides that are labeled for the crop, such as Ridomil on peppers, have provided a measure of control.

Be aware that this soil borne fungus is out there and could become a problem if introduced or identified on your farm. It infects a wide number of vegetables including cucurbits (cucumbers, cantaloupes, watermelons, pumpkins and summer and winter squash), peppers, eggplant, tomatoes and now lima bean pods.

Some Tips For Accurate Disease and Disorder Diagnosis - Bob Mulrooney, Extension Plant Pathologist, bobmul@udel.edu

Accurate and timely diagnosis of plant diseases and disorders is critical to disease management. Cooperative Extension has always emphasized accurate pest diagnosis. Knowledge of the specific problems that occur in a given field or on a certain variety allows the grower to incorporate the appropriate controls into a total disease control program. Without a sound diagnosis, the control programs will likely be unfocused or even "shots in the dark", which can be costly and lead to irresponsible use of pesticides. Growers should not under-estimate the importance of this issue.

Delaware’s County Extension Agents have all been trained to assist growers to obtain accurate and timely diagnosis of diseases and disorders. They have had many years of experience and they have access to specialists and the Plant Disease
Diagnostic Service that is provided by Cooperative Extension in the Plant and Soil Sciences Department.

County Extension Agents will need growers' help in sorting out the problems and obtaining good samples. **Everyone needs to understand that an inadequate sample or poorly timed one will usually result in an incomplete or misleading diagnosis.** Moreover, growers sometimes set themselves up to receive bad advice by attempting to have problems diagnosed over the phone or months after the event occurred. Try that phone call sometimes with your local physician or veterinarian. "Doc, what is causing my left arm to wilt? Or, I lost three cows last year, what should I do next year to keep them from dying?" Instead, growers should take the time while the problem is developing to collect good samples and get them to the agents or field persons. This will ensure that the problem will have a good chance at being properly diagnosed. The following are some tips to guide your efforts:

1. Scout every planting frequently and regularly. This is especially true for vegetables. If you do not know what is causing the symptoms you are seeing, get help, and get it accurately diagnosed. Watch for changes in plant appearance. Identify the specific problem(s) and note when and where they are occurring. Be watchful for both disorders that appear to be spreading to other plants and those that appear to make some individual plants worse but do not spread. They may be the ones that will be waiting next year! Make a record of what was found - field by field.

2. Pay careful attention to patterns. It is critical to diagnosis. If nearly all plants have the problem, the cause is usually something other than an infectious agent, or infected plants were set to the field. Infectious diseases usually start with a few plants or as a small cluster and spread with time. Determine whether a pattern exists among the affected plants. If so, can anything be correlated with the pattern? Specifically, look at drainage, soil type, shade, cultivation patterns, transplanting patterns, spray patterns, etc.). When a pattern is present, the samples should be collected from both the "good" and "bad" areas so that the findings can be directly correlated with the patterns. The pattern, more often than not, will yield the key clues needed in the diagnosis and the control!

3. Knowing when things are happening is also critical to diagnosis and the timing of control. So maintain excellent records of what was done and when it was done, and share them with those involved in diagnosis. Do not expect to receive the right answers when important clues are hidden. Previous events become valuable clues to predicting predisposing agents and determining why a control failed. Sometimes the grower has selected the correct control for the problem but has used it poorly. The greatest help we give following many diagnoses is to aid in better timing of controls. An "old-timer" once said after a long career in agriculture: "Timing is the main difference between success and failure in farming."

4. Examine the plant carefully for symptoms (all of the plant including the roots). Collect several whole plants (by digging, not by pulling) representing a range of stages of the disease or disorder, plus at least one healthy plant. Why the healthy plant? Because the healthy plant may not be as healthy as it appears (especially to the new grower) and poor health can predispose plants to certain other problems. Overall health of the crop needs to be considered when considering control cost-benefit issues. Be sure to include soil and roots with the samples (half the plant is underground). Plant samples should be placed in plastic bags and refrigerated.

5. Be sure to rule out soil nutrient problems - both deficiencies and toxicities. No commercial vegetable or field crop should be planted without a soil test. Soil test results and fertilizer use should be made...
available to the person making the diagnosis. Additional nutrient analysis may be required when making the disease assessment.

6. Know the variety. Know what pesticides were used (when and how much).

7. Take the plant samples and all the information available to the County Extension Office or to another plant health professional. If the agents are unable to identify the problem and the grower has collected the samples carefully, the agents have what they need to submit samples to specialists at the University. There is no charge to Delaware growers for this service. Usually the biggest cost is lost time, if good samples are not taken the first time.

This article was adapted from Kentucky Pest News, #882, 5/15/00, written by Dr. Bill Nesmith, Extension Plant Pathologist.

Field Crops

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

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

Field Corn.
Low levels of the first black cutworm moths were collected last weekend. Larvae will be large enough to begin cutting when about 300 base-50 degree-days have accumulated since peak moth activity and egg laying. By calculating cutworm hatch and development over time, we can anticipate when to look for damage. Pheromone trap catches help us determine when peak moth flight and egg laying occurs; however, they cannot predict the amount or magnitude of cutting that will occur. The presence of a major flight only means that the potential for an outbreak exists. Adverse weather, lack of adequate food for newly hatched larvae, predation, and disease can reduce larval populations. You can use pheromone trap and degree-day information to estimate or predict when first cutting will occur. Scouting of seedling corn near the first cutting date is the best way to determine whether a problem exists. For the most recent pheromone trap catches, please check our website at www.udel.edu/IPM. Trapping data is provided courtesy of UAP, Seaford, and Syngenta Inc.

At this time, grubs can easily be found in the top six inches of soil. Fields can still be sampled for grubs before planting but it should be done before a field is tilled. At each site, sample one square foot of soil dug six inches deep. At least one sample, preferably two, should be taken for every 10 acres with no less than 5 samples per field. A treatment is recommended if you find 1-2 grubs per square foot in heavy soil or 0.5 – 1 grub per square foot in sandy soil. Counter or Force have provided the most consistent grub control in our area. The highest labeled rate should be used if populations are heavy. Regent and Fortress are also labeled but we do not have a lot of data or experience with grub control with these products in our region. Regent still has a 12- month rotational restriction with small grains planted for grain or forage.

Wheat.
Low levels of cereal leaf beetle adults continue to be detected. Based on degree-day information and predicted weather conditions, we should begin to see our first eggs by the end of this week in Sussex County and by the middle of next week in Kent County. Treatment should not be considered until you find at least 50% egg hatch if you are using the threshold of 25 eggs and or larvae per 100 tillers.

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

Wheat.
Wheat is considerably behind compared to last year at this time. Little if any powdery mildew
Weekly Crop Update

Barley.

Barley yellow dwarf virus was identified in one field of barley. Look for yellow stunted plants in scattered patches. No control is possible at this time.

New Soybean Products for Weed Control -
Mark VanGessel, Extension Weed Specialist; mjv@udel.edu

Backdraft 1.5 E (from BASF) When used at 1.5 qt/A you get: Roundup Original at 15 oz and 8 oz Scepter 1.5 S

Boundary 7.8 EC (from Syngenta) When used at 1 pt/A you get: Dual Magnum 0.83 pt and 4.0 oz Sencor 75 DF

Canopy 75 DF (from DuPont) When used at 4 oz/A you get: 3.43 oz of Lexone/Sencor 75 DF and 1.71 oz Classic 25 DF

Command Xtra (CoPack from FMC) When used at 1 copack/12 A, you get 21.3 oz Command 3 ME and 8 oz Authority 4 F

Domain 60 DF (from Bayer) When used at 9oz/A you get: 3.6 oz of Define 60 DF and 4.3 oz Sencor 75 DF

Extreme 2.17 EC (from BASF) When used at 3 pt/A you get 1.44 oz Pursuit 70 DG and 0.75 qt Roundup Original 4 EC

Gramoxone Max 3L (Syngenta) is a more concentrated formulation of Gramoxone. The rate use of Gramoxone Max will be less than Gramoxone Extra 2.5L. Both will be available this season so be cautious of use rates.

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

Commodity Analysts Base Price Hopes On Weather Developments

World stocks of grain and soybeans are viewed as more than adequate to slightly burdensome by commodity traders at the Chicago Board of Trade. Meanwhile, there is a school of thought that says world stocks are dangerously low. Nevertheless, it appears that the traders have it in regard to what effects farmer's commodity prices and marketing decisions.

Not much has changed since last week's update; USDA issued its April 10 stocks report with little to no surprises contained therein. The April 10th stocks estimate for U.S. soybeans reduced the carryout by 30 million bushels, now projected for the 2000/01 marketing year at 300 million bushels. For U.S. corn, USDA projected a 10 million bushel increase in the level of carryout over last month's estimate, now projected at 1.951 billion bushels. The U.S. wheat carryout projection was reduced 5 million bushels from the March report, and now stands at 829 million bushels.

Commodity Prices Remain Stagnant

New crop corn, soybean and wheat prices remain extremely low, providing little to no incentive to make forward cash sales. Some private grain analysts have written 2001 (new crop) price hopes off to a pending weather market. Meanwhile, back at the ranch, corn plantings across the U.S. are currently about 4 to 5% complete, which is behind last year.

Nitrogen Management on Dryland Corn -
Richard W. Taylor, Extension Agronomist; rtaylor@udel.edu

Studies involving corn nitrogen (N) management in rotations of corn and soybeans have recently been reported by Cornell researchers in an article

Because of the dramatically increased price of N and continuing low commodity prices, growers need to carefully manage inputs and especially N fertilizer on corn this year. Bill Cox and others at Cornell University reported that on corn following soybeans, yield was actually greater when the corn was side-dressed with 100 lb N/A rather than 150 lb N/A. All corn had received 25 lb N/A as a starter. This difference was true even in 2000 when wet conditions boosted yields to 170+ bu/A. Even N applications of 200 lb/A did not improve yield in 2000. The yield of the previous soybean crop also did not impact the optimum N sidedress rate.

Lloyd Murdock from the University of Kentucky reported in his article that maximum corn yield following a soybean crop occurred around 100 lb N/A (the 200 lb N/A rate decreased yields slightly). For corn after corn, yields increased slightly (5 bu/A) at 200 lb N/A as compared with 100 lb N/A.

Both studies reported very large rotation effects. In New York, a corn-soybean rotation increased corn yield by about 20 bu/A at the recommended N rate. The rotation effect decreased with increasing N fertilization going from 44 bu/A at 60 lb N/A sidedressed to 20 bu/A at 120 lb N/A sidedressed (both with 25 lb N/A as starter). In Kentucky, the rotation effect also varied with N rate ranging from 44 bu/A at 0 lb N/A to 19 bu/A at 50 lb N/A, 12 bu/A at 100 lb N/A, and 4 bu/A at 200 lb N/A.

Murdock also reported significant changes in soil test values after 7 years of N and different crops. The values of soil test P, K, and pH were 76 lb/A, 307 lb/A, and 6.6, respectively, for continuous corn with no N applied to the corn and 41 lb/A, 211 lb/A, and 5.3, respectively for P, K, and pH, for continuous corn with 200 lb N/A. Continuous soybeans decreased soil test P slightly to 63 lb/A, soil test K to 211 lb/A, but did not affect soil pH. In a corn/soybean rotation with no N applied to the corn, soil test values were 72 lb P/A, 230 lb K/A, and the pH was 5.9 compared with the rotation with 200 lb N/A on the corn where soil test values fell to 40 lb P/A, 201 lb K/A, and pH of 5.9. The above research is notable for the effects on soil pH. Certainly in all rotations with heavy applications of N, soil testing should be used to monitor soil pH and soil buffer pH to determine when lime additions are needed.

In the upcoming season, growers should remember the lessons highlighted above. Keep in mind that rotations can significantly improve corn yields. In dryland corn, carefully estimate or calculate your yield goal and account for N benefits from rotation crops such as soybeans, peas, lima beans, string beans, alfalfa, and other legume crops before deciding on your N fertilization program. With high N costs and low commodity prices, this is not the year to apply extra just in case it might help yields.

Foliar Fertilization of Soybeans - Greg Binford, Extension Nutrient Management Specialist; binfordg@udel.edu, Mark Isaacs, Director, U of D Research & Education Center; isaacs@udel.edu, Richard W. Taylor, Extension Agronomist; rtaylor@udel.edu, and Dave Hansen, Extension Nutrient Management Specialist; djhansen@udel.edu

In recent years, Delaware soybean growers have inquired about the benefit of adding small amounts of fertilizer with either Roundup or Synchrony when these herbicides are applied to the foliage of these herbicide-resistant soybeans. In fact, some companies have developed fertilizer combinations that can be used for this purpose at a relatively low cost of $3 to $4 per acre. Growers have questioned how much yield increase can be expected from these foliar fertilizer applications. As a result, studies were initiated during the 2000 growing season to address this question.
Two studies were conducted at the University of Delaware Research and Education Center near Georgetown; one was an irrigated site planted after Barley and the other was a dryland site planted after wheat. We also had two strip trials on separate farms in the state (one in Sussex County and one in Kent County). The two studies at the research station included the following treatments, with each treatment being replicated eight times:

<table>
<thead>
<tr>
<th>Treatment #</th>
<th>Treatment</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>control</td>
</tr>
<tr>
<td>2</td>
<td>Norcop at 1 qt/acre</td>
</tr>
<tr>
<td>3</td>
<td>Norcop at 2 qt/acre</td>
</tr>
<tr>
<td>4</td>
<td>Nutrition Plus at 1 qt/acre</td>
</tr>
<tr>
<td>5</td>
<td>Nutrition Plus at 1.5 qt/acre</td>
</tr>
<tr>
<td>6</td>
<td>Elemental Manganese 1pt/acre</td>
</tr>
<tr>
<td>7</td>
<td>Coron 28-0-0 at 2 gal/acre</td>
</tr>
<tr>
<td>8</td>
<td>Coron 12-0-0 plus B at 3 qt/acre</td>
</tr>
<tr>
<td>9</td>
<td>Coron 28-0-0 at 1 gal/acre + Coron 12-0-0 plus B at 2 qt/acre</td>
</tr>
</tbody>
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Treatments 2, 3, 4, 5, & 6 were all applied in combination with the foliar Roundup application. Roundup was applied at 1 qt/acre and no other herbicides were used on these plots. Treatments 7, 8, & 9 were applied several weeks after the Roundup application during the early stages of pod fill. The grain yield results are shown in the table below. Weed control was excellent with all herbicide combinations, indicating no antagonism from the addition of the foliar fertilizer solutions.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Grain Yields (bu/acre)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Irrigated Site</td>
</tr>
<tr>
<td>1</td>
<td>38.6</td>
</tr>
<tr>
<td>2</td>
<td>33.9</td>
</tr>
<tr>
<td>3</td>
<td>36.9</td>
</tr>
<tr>
<td>4</td>
<td>35.0</td>
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<tr>
<td>5</td>
<td>41.4</td>
</tr>
<tr>
<td>6</td>
<td>37.2</td>
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<tr>
<td>7</td>
<td>36.1</td>
</tr>
<tr>
<td>8</td>
<td>35.0</td>
</tr>
<tr>
<td>9</td>
<td>39.2</td>
</tr>
<tr>
<td>LSD(0.05)</td>
<td>4.8</td>
</tr>
<tr>
<td>CV</td>
<td>12.9</td>
</tr>
</tbody>
</table>

The strip trial in Sussex County involved the application of Nutrition plus at 1.5 pt/acre in combination with Touchdown on Roundup Ready Soybeans that were planted after wheat. These treatments were applied to strip plots using field-size equipment. The average yield for eight replications with Touchdown + Nutrition plus was 38.2 bu/acre, while the average yield for the Touchdown only treatments was 39.3 bu/acre; this difference is not statistically significant.

The strip trial in Kent County involved the application of Norcop at 2 qt/acre to STS soybeans. The Norcop was applied at early bloom, while Sychnony was applied about two weeks prior to the Norcop application. This Kent County trial involved six replications with and without Norcop. Unfortunately, four replications were lost before harvest so we have only two replications of yield data to report. The average yield for Roundup + Norcop was 40.7 bu/acre, while the average yield for the Roundup only treatment was 39.8 bu/acre; this difference is not statistically significant.

**Summary:** There was no statistically significant increase in yield from any of the foliar fertilization treatments at any of the locations last summer. Keep in mind, however, that last year was an ideal growing season with little, if any, opportunity for crops to experience drought stress. These studies will be continued this season to evaluate the use of these foliar treatments under other environments. Our hope is that we will not experience an opportunity to evaluate these treatments under drought-stress conditions this season. However, history tells us that we may have that opportunity someplace in Delaware this year.
**UPCOMING MEETINGS:**

**Alfalfa Twilight Field Workshop**

**Date:** Tuesday, April 24, 2001  
**Time:** 5:30 PM to 7:30 PM  
**Place:** Mike Bullock, Bullock Farms,  
1201 Bullock Road, Harrington, DE  
**Contact:** Gordon Johnson, Kent County  
Extension Office, 302-730-4000,  
gcjohn@udel.edu

**Directions:** From Harrington head West on Rt 16  
out of town about 1 mile; turn right onto  
Whiteleysburg Road; take Whiteleysburg Road  
about 5 ½ miles then turn left onto Bullock Road;  
the farm will be about 1 mile on the right.

All alfalfa producers and those interested in  
growing alfalfa are invited to attend an Alfalfa  
Twilight Field Workshop on Tuesday, April 24,  
2001, from 5:30 pm to dusk. The workshop will  
be held at Bullock Farms on Bullock road west of  
Harrington.

In this workshop we will be teaching how to scout  
for and control alfalfa insects such as alfalfa  
weevil and leafhopper, weed identification and  
control, alfalfa disease identification and  
management, stand evaluation, nutrient deficiency  
identification, fertilization and liming programs.

Anyone interested is welcome to attend. Please  
call (302) 730-4000 if you will be attending.

It is the policy of the Cooperative Extension  
Service, University of Delaware that no person  
shall be subjected to discrimination on the  
grounds of race, color, sex, disability, age or  
national origin. For special access to attend this  
meeting or additional assistance, please call 730-  
4000.

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**Weather Summary**

<table>
<thead>
<tr>
<th>Rainfall:</th>
</tr>
</thead>
</table>
| 0.01 inches: April 8  
| 0.39 inches: April 9  
| 0.01 inches: April 10  
| 0.58 inches: April 11  

Readings taken for the previous 24 hours at 8  
am.

**Air Temperature:**  

Highs Ranged from 85°F on April 9 to 54°F on  
April 11.  
Lows Ranged from 49°F on April 9 to 29°F on  
April 5.

**Soil Temperature:**  

55°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

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**Compiled and Edited By:**

Tracy Wootten  
Extension Associate - Vegetable Crops

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