Vegetables

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

Blacklight and Pheromone Trap Information. Throughout the summer, timing of insecticide applications and spray intervals for corn earworm and corn borer control on peppers, potatoes, snap beans, lima beans and sweet corn are often based on local trap information. Trap catches are updated three times per week and can be found at our IPM website: http://www.udel.edu/IPM/latestblt.html. You can also call the Crop Pest Hotline at 800-345-7544 (in-state) or 302-831-8851 (out of state).

Cabbage.
If you are growing cabbage varieties that are susceptible to thrips, be sure to watch for an increase in feeding activity. A treatment should be applied when 20% of the plants are infested. Dimethoate, Metasystox-R, Spintor or Warrior will provide control.

Melons.
As vines begin to run on the earliest plantings, be sure to watch for increases in aphid and mite activity. Spider mites have reached economic levels in a number of fields. When sampling for mites, be sure to check the entire plant if plants are small or the crown area on larger plants for signs of stippling and the presence of mites. Controls should be applied if 10–15% of the crowns are infested. If populations of mites have exploded, Capture should be used. A second miticide application may be needed in 7-10 days. Agri-Mek should be used for the second application. In general, dimethoate has provided very poor control. In recent trials, Danitol and Kelthane have also provided good mite control and should be rotated with Capture and Agri-Mek to avoid resistance. Remember Capture and Danitol are both pyrethroids and therefore should not be used in successions. If populations are heavy or numerous eggs are present at the time of treatment, at least 2-3 miticide applications may be needed. As the warm weather returns, be sure to sample melons for aphids. The treatment threshold for aphids is 20% infested plants with at least 5 aphids per leaf. Lannate and Thiodan are the only materials labeled on melons that provide melon aphid control. These materials must be applied before aphids explode to be effective. Dimethoate will not control melon aphids.

Peppers.
No corn borer controls will be needed until ½ inch size fruit are present. At that point, sprays will be needed on a 7-10 day schedule when corn borer catches are above 2 per night in local blacklight traps. If trap catches exceed 20 per night, sprays will be needed on a 5-7 day schedule.

Potatoes.
The first infested terminals can be found in the Felton/Harrington areas on the earliest planted
potatoes. If BLT trap catches are being used to
time ECB sprays, all of the earliest planted
potatoes should receive an ECB treatment by May
26-27. Potato leafhopper activity is starting to
increase and adults can be found in the earliest
planted fields. Furadan or a pyrethroid will
provide leafhopper control. Colorado potato beetle
larval activity is starting to increase. The
treatment threshold for Colorado potato beetle is 4
small larvae per plant or 1.5 large larvae per plant.
If both small and large larvae are present, the
threshold of each should be reduced by ½ for
each. Provado, Agri-Mek or Spintor will provide
beetle control. Spintor has provided effective
control of Colorado potato beetles (CPB) and
European corn borer. However, it will not provide
potato leafhopper control. Provado will provide
control of leafhoppers and Colorado potato beetle
but not European corn borer. Agri-Mek will
control small and medium CPB larvae but is not
very effective on high populations of adults.

Snap Beans.
Continue to monitor fresh market and processing
snap beans for leafhopper and thrips activity. A
treatment is needed if you find 5-6 thrips per
leaflet or 5 leafhoppers per sweep. If both insects
are present, the threshold of each should be
reduced by ½ the level for each insect. In seedling
beans, fields should be treated if plants are
drought stressed and you can find leafhopper
nymphs feeding on plants. Lannate, Capture,
Asana or dimethoate can be used on fresh market
snap beans. Lannate, Capture, Asana, dimethoate
or Orthene can be used on processing snap beans.

Sweet Corn.
Corn planted under plastic should be sprayed on a
5-6 day schedule for earworm control. On the
earliest planted sweet corn, continue to look for
ECB in the whorls. European corn borer whorl
infestations range between to 20-30% infested
plants in the earliest planted fresh market sweet
corn fields. The treatment threshold is 15%
infested whorls or tassels. If you plan to wait and
treat just as tassels are emerging, timing of sprays
will be important. Treatments must be applied just
as tassels are emerging from the whorls to be
effective. On later planted corn, flea beetle and
cutworm activity has increased. The treatment
threshold for flea beetles is 5% infested plants and
the cutworm threshold is 3% cut plants in 1-2 leaf
stage corn and 5% cut plants in 3-4 leaf stage
corn.

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

Muskmelon and Watermelons.
The weather has been excellent for development
of muskmelon and watermelon leaf spots. Apply
a protective spray of chlorothalonil (Bravo or
Terranil) before the coming rain.

We would like to thank everyone who
responded to our Melcast survey. We are currently faxing or e-mailing
information to 42 respondents.

MELCAST for Watermelons.
The weather based forecasting program
MELCAST has begun for 2000. If you signed up
to receive a report, it should have started this
week. If you have not received any reports please
call Mrs. Edna Marvil at (302) 856-7303 or
Vanessa Fitzmaurice at (410) 742-8789 and give
us your name and fax number or e-mail address.
In addition, the report is available on the web at
http://www.agnr.umd.edu/users/vegdisease/vegdisease.htm or http://www.udel.edu/IPM/ (see
sample on page 9).

The website provides more detailed information
concerning each model and the disease(s) that it is
designed for, detailed information regarding each
weather station or skybit location, a sample record
sheet, as well as a blank record sheet that you can
print out for use at your location. If you do not
have access to the website, please contact Edna
Marvil at the Research and Education Center at
302-856-7303 to request that this information be send to you.

To use MELCAST for Watermelons (gummy stem blight and anthracnose), apply the first fungicide spray 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, reset the counter to 0 and start over.

If, for some reason, a serious disease outbreak occurs in your field, return to a weekly spray schedule.

**Melcast for Watermelons**

EFI Values (Environmental Favorability Index)

<table>
<thead>
<tr>
<th></th>
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<td>(Collins Farms)</td>
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<td>(Vincent Farms)</td>
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</tbody>
</table>

**MELCAST for Cantaloupes and TOMCAST for Tomatoes.**

In addition to MELCAST for Watermelon, we have added two additional models that are designed to help you make decisions on when to spray for diseases. **MELCAST for Cantaloupes** is a fungicide application program for (Alternaria leaf blight) that is similar to the watermelon model, but uses a different program to calculate EFI’s. It can be used by anyone growing a powdery mildew resistant variety such as Athena. To use MELCAST for Cantaloupe, apply the first fungicide spray when the cantaloupe 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 20 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.

**TOMCAST** is a spray forecaster for leaf blights and fruit diseases of processing tomato (early blight, septoria leaf spot, anthracnose). In fields that are not rotated away from tomatoes and in late planted fields begin sprays shortly after transplanting. In all other areas begin sprays when crown fruit are one-third their final size. Additional sprays can be scheduled using TOMCAST. Sprays should be applied after accumulating 18 DSV’s (disease severity values) since the last fungicide application. TOMCAST does not work for bacterial diseases or late blight. Scout fields for these diseases. If they occur, additional sprays are warranted (see Delaware Extension Bulletin 137).
If you are interested in more information about these weather-based models or to sign up to receive information call Mrs. Edna Marvil at (302)856-7303 or Vanessa Fitzmaurice at (410)742-8789 and give us your name and fax number or e-mail address. In addition, the reports are available on the web at http://www.agnr.umd.edu/users/vegdisease/vegdisease.htm or http://www.udel.edu/IPM/.

Late Blight Update - - Bob Mulrooney, Extension Plant Pathologist; bobmul@udel.edu

Disease Severity Value (DSV) Accumulations as of May 24, 2000 are as follows:
Remember that 18 DSV’s is the threshold to begin a spray program

<table>
<thead>
<tr>
<th>Emergence Date</th>
<th>DSV’s May 24</th>
<th>DSV’s May 21</th>
<th>Recommendation</th>
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<tr>
<td>April 14</td>
<td>76</td>
<td>64</td>
<td>5-day, low rate</td>
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<tr>
<td>April 21</td>
<td>49</td>
<td>37</td>
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</tr>
<tr>
<td>April 22</td>
<td>29</td>
<td>17</td>
<td>5-day, low rate</td>
</tr>
<tr>
<td>April 27</td>
<td>29</td>
<td>17</td>
<td>5-day, low rate</td>
</tr>
<tr>
<td>May 20</td>
<td>16</td>
<td>17</td>
<td>5-day, low rate</td>
</tr>
</tbody>
</table>

Accumulated 12 DSV’s since the last report.
After today’s severity value accumulation all potatoes that have reached greenrow before May 20 will need to be protected with fungicide.

Although the predictor is calling for low rates, I would suggest a medium rate for potatoes that are approaching bloom.

New fungicides labeled. Agtrol International has recently introduced a new fungicide called Fluronil, and expanded the label for UltraFlourish. Fluronil is a wettable powder that contains two fungicides, mefenoxam and chlorothalonil. Mefenoxam is the active ingredient of Ridomil Gold and UltraFlourish. You probably recognize chlorothalonil as the active ingredient in Bravo. Fluronil contains the same active ingredients as Ridomil Gold Bravo.
UltraFlourish is now labeled as an in-row treatment at planting for pink rot and leak just like Ridomil Gold. UltraFlourish is a two lb./gallon formulation of mefenoxam while Ridomil Gold EC contains 4 lb./gallon.

Section 18 Labels Approved in Delaware for Sinbar on Watermelons & Reflex on Snap Beans - Ed Kee, Extension Vegetable Crops Specialist; kee@udel.edu

The EPA granted a Section 18 Emergency Use Label for Sinbar on Watermelons as a pre-emergence treatment at 2-3 ounces.

Also granted was the use of Reflex on Snap Beans as a post-emergence treatment for control of many broadleaf weeds. Please check the label for the correct rate, which is dependent on the size of the weed.

Field Crops

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

Field Corn.
Cutworms are still active so be sure to continue to scout for leaf feeding and cut plants. In addition, slug activity can be found as a result of the recent cool weather. Deadline bullets and liquid N are still the only available control measures. If nitrogen is used to reduce slug populations, you should apply 20 gallons per acre of 30 % N in the evening when slugs are active. The best results are obtained when applied on spike to 1-leaf stage corn. Deadline bullets banded at 6-8 pounds per acre has given fair to good control. It can also be applied on larger corn. True armyworm larvae can
be found in fields that were planted into a burned
down small grain cover or where a small grain
cover was not completely plowed under before
planting. The treatment threshold is 20 – 25%
infested plants. A pyrethroid will provide control
of cutworms and armyworms.

Small Grains.
Although sawfly larvae are still present and
clipping heads in wheat, activity has generally
peaked in most areas of the state. Fields should be
checked one last time for this insect pest. The
treatment threshold is 2 per 5 foot of row
innerspace. It is generally too late to treat for
sawflies if the number of clipped heads is 3 to 4
times the average worm count and most
caterpillars are greater than one-inch long.
Armyworms are still active, especially in barley.
Continue to watch for larvae feeding on the
leaves and grain kernels. Remember that
armyworms like to clip heads just before the grain
matures. The treatment threshold in barley is one
per foot of row and 2 per foot of row in wheat. On
barley, Parathion or Lannate will provide
armyworm control. On wheat, Warrior, Parathion
or Lannate will provide armyworm control.
Although parathion can still be used on wheat and
barley, it has a number of restrictions including:
(1) aerial application only, (2) set back
restrictions, and (3) closed system requirements.

Soybeans.
Bean leaf beetles and Mexican bean beetles can be
found in the earliest emerged soybean fields. Bean
leaf beetle damage appears as small circular holes
in the leaves. In comparison, Mexican bean beetle
feeding will appear as a lacy pattern on the
leaves. No controls are needed unless you find at
least 2 beetles per plant and they are reducing the
stand by 25 percent. A pyrethroid or Sevin will
provide control. Grasshopper nymphs continue to
be found in no-till fields and along field edges.
Treatment of non-crop areas may also help to
prevent whole field infestations at a later date. As
a general guideline, non-crop areas should be
treated if you find 20 or more grasshoppers per
square yard. As we approach barley harvest, soybeans planted after barley harvest should be
checked carefully for grasshopper activity. Early
control of nymphs will provide the best control.
Once grasshoppers are found in a field, a
treatment is needed if you find one grasshopper
per sweep and 30% defoliation. Asana, Sevin or
Warrior have provided the most consistent
control. Slugs can also be found feeding on newly
emerged fields. Unfortunatley, there are no
effective controls for slugs in soybeans.

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

Normal Trade Relations Bill for China Passes House
The U.S. House of Representatives strongly
passed the Permanent Normal Trade Relations bill
this week (237-197). The next stop is the Senate
where easy passage is expected. This is good news
for the grain markets, not so much in the short run
but passage of the bill is likely to have a very
positive impact on commodity prices in the not
too distant future. China, with a population of 1
billion, is the largest market in the world. House
passage will not provide much impetus for a rally
in the commodities markets, however, a down
vote would have resulted in immediate negative
pressure on commodity prices.

That turns our attention to the driving force behind
this week’s market, strong export sales and the
weather. The weekly export sales report was
viewed by traders as strong for corn, good for new
crop wheat, and strong for soybeans. Commodity
traders will be positioning themselves for a long
Memorial Day weekend, with futures markets
closed Monday. Great interest is being shown in
the weekend forecast, especially for the western
corn belt, which now calls for precipitation
amounts to be pared back from previous
guestimates. The current level of commodity
prices and the 'still too early to tell' status for 2000
crop development, continues the grain sellers
"wait and see mode". Due to extremely early row

Weekly Crop Update 5
crop planting in the midwest, the size of this year's corn crop will be determined in the month of June. June is widely perceived as the month that will 'make or break' the corn crop. Overnight trade placed December corn at $2.52, November beans at $5.50, and July wheat at $2.80 per bushel. These price levels are likely to result in tight farmer holding.

Morningglory control with Roundup Ultra will be reduced if the morningglories have begun to vine. However, tank-mixing with other herbicides has not improved control. For maximum morning glory control, either spray Roundup Ultra at 3 weeks after planting (when the weeds are the smallest) or apply two applications of Roundup Ultra.

For perennial weeds (horsenettle, Canada thistle, hemp dogbane, common milkweed, johnsongrass, and bermudagrass), our research has shown applying Roundup Ultra late as possible (4 to 6 weeks after planting) has given better control than early applications. There has been no advantage to two applications. It is difficult to achieve 100 percent control with most perennial weeds, regardless of the weed control program used. We often achieve 80 to 85 percent control with the program described here.

Finally, we have not seen differences in weed control or yield when using Touchdown in place of Roundup Ultra, and there are generic formulations of Roundup available.

Experiences With Roundup Ready Soybean Weed Control - Mark VanGessel, Extension Weed Specialist; mjv@udel.edu

The Delaware Soybean Board has funded a series of studies for weed control in Roundup Ready® soybeans. A summary of the results follows.

For full-season soybean with annual weeds, start with a clean field using either tillage or a good burndown program. Although we have tried to time our Roundup Ultra sprays for both burndown and in-crop weed control for no-till soybeans, we have not been successful with this approach. Time your postemergence spray during the period 3 to 4 weeks after planting with conventional tillage soybeans or 3 to 5 weeks after planting with no-till soybeans. The moisture conservation with no-till allows for the wider window of application. If you foresee problems with spraying during this window, consider using a reduced rate of a preemergence herbicide or spraying prior to 3 weeks after planting and including a residual herbicide.

Spraying earlier than 3 weeks after planting often requires either a second Roundup Ultra application or tank-mixing a residual herbicide to reduce the need for a second application. Three tank mix options we have tried include FirstRate, Classic, or Pursuit. However, our research has not shown a benefit to tank-mixing another herbicide with Roundup Ultra if sprayed 3 to 4 weeks (after planting) for conventional tillage or 3 to 5 weeks for no-till.

Height Restrictions and Rainfastness For Postemergence Corn Herbicides - Mark VanGessel, Extension Weed Specialist; mjv@udel.edu

Rainfastness is number of hours needed between time of application and rainfall or irrigation to ensure sufficient absorption in the plant.

Broadcast applications refer to an over the top application and directed refers to use of special spray equipment to direct the spray and avoiding the spray coming in contact with the whorl of the corn. When using corn height or collar number to base your decision to spray on, use whichever feature is first attained.
<table>
<thead>
<tr>
<th>Herbicides</th>
<th>Rainfast interval (hr)</th>
<th>Maximum corn size</th>
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<tbody>
<tr>
<td>Accent</td>
<td>4</td>
<td>broadcast: 6 collars or 24&quot; directed: 10 collars or 36&quot;</td>
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<tr>
<td>Aim</td>
<td>1</td>
<td>broadcast: up to 8 collars directed: when necessary</td>
</tr>
<tr>
<td>Atrazine</td>
<td>2</td>
<td>12&quot; tall</td>
</tr>
<tr>
<td>Banvel Clarity</td>
<td>4</td>
<td>more than ½ pt/A: broadcast: 5 lbs or 8&quot; directed: 36&quot; tall ½ pt/A or less: 36&quot; tall</td>
</tr>
<tr>
<td>Basagran</td>
<td>8</td>
<td>No restrictions listed</td>
</tr>
<tr>
<td>Beacon</td>
<td>4</td>
<td>broadcast: min- 4&quot; tall max- 20&quot; tall or 6 collar directed: pre-tassel</td>
</tr>
<tr>
<td>Bladex 90 DF</td>
<td>4</td>
<td>prior to when 5th leaf is visible</td>
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<tr>
<td>Buctril</td>
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<td>pre-tassel</td>
</tr>
<tr>
<td>2,4-D Amine</td>
<td>6-8</td>
<td>broadcast: 8&quot; tall directed: pre-tassel</td>
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<tr>
<td>2,4-D Ester</td>
<td>2-3</td>
<td>broadcast: 8&quot; tall directed: pre-tassel</td>
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<td>Evik</td>
<td>-</td>
<td>directed only: 12&quot; tall do not apply 3 weeks before tasseling</td>
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<td>Liberty</td>
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<td>broadcast: 24&quot; tall or 7 collars max directed: 20&quot; to 36&quot; tall</td>
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<td>Lorox</td>
<td>-</td>
<td>directed only</td>
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<tr>
<td>Permit</td>
<td>4</td>
<td>broadcast: 48&quot; tall directed: when necessary</td>
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<td>Post</td>
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<td>broadcast: emergence to start of pollen shed directed: when necessary (depending on corn canopy and weed ht.)</td>
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<tr>
<td>Roundup Ultra</td>
<td>1-6</td>
<td>up to 30&quot; or 8 collars max</td>
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<tr>
<td>Stinger</td>
<td>6-8</td>
<td>24&quot; tall</td>
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<tr>
<td>Tough</td>
<td>1-2</td>
<td>until 68 days pre-harvest</td>
</tr>
</tbody>
</table>

**Be Mindful of Surfactants**  
*Mark VanGessel, Extension Weed Specialist; mjv@udel.edu*

The rainfall and cloudy skies this past week has resulted in less leaf waxes than usual. Follow this with projected warm weather and growing conditions should be optimal. But this also means that using a crop oil concentrate and/or liquid nitrogen can increase injury for postemergence sprays. To minimize crop injury, consider using only a non-ionic surfactant for postemergence sprays under these optimal growing conditions.
Nutrient Deficiencies on Corn Appear - Richard W. Taylor, Extension Agronomist; rtaylor@udel.edu

Recently, I have noticed several corn fields showing problems which may be manganese (Mn) deficiency. The corn is at the 5 to 7 leaf stage and was planted in early April. The fields were limed this past spring or last fall. The texture varies from a loam to loamy sand. The percentage organic matter is 1 to 1.5 and the soil pH is only slightly elevated (mid-6’s).

The symptoms began as interveinal chlorosis with the veins a dark green but in between the veins a light green or yellowish color. Symptoms progressed rapidly from the slight interveinal chlorotic cast to areas of bleached white to slightly yellow around the leaf margins about mid way up the leaf blade. The oldest leaves appear to be the most affected. Some necrosis or dead spots are appearing along the margins of the leaf blade and at the leaf tips.

The crop has been declining so rapidly that I had a foliar application of 1 to 2 lb Mn/A applied without waiting for a tissue test. Whole plant samples would allow you to make a more definitive diagnosis if your scouting program helps you spot such problems in the early stages.

Soybean Fields and Soil Crusting - Richard W. Taylor, Extension Agronomist; rtaylor@udel.edu

The strong storms that occurred during the past week could be impacting soybean stands. When heavy raindrops impact the soil surface, they break soil aggregates apart. This allows clay particles to move downward a short distance and leaves a concentration of sand and silt particles on the soil surface. The sand and silt can then combine to form a nearly impenetrable layer to some plants, especially broadleaf crops such as soybeans and alfalfa. Raindrop-impact crusts are typically only 1/4-inch thick but can severely impact emergence of soybeans.

Why be concerned with crust formation? Not only does a crust impact seedling emergence but it also reduces rainfall infiltration, increases runoff, reduces oxygen diffusion to seedlings by as much as 50 percent, reduces surface water evaporation, lowers soil surface temperatures, and increases wind erosion on sandy soils.

Soil crusting is most often a problem for growers with low organic matter soils or those who frequently use clean tillage (moldboard plow and frequent diskings to prepare a weed-free, residue-free finely worked seedbed). The impact of crusting is greatest for drill or broadcast planted beans but can become a problem even for row beans. Growers using no-till or conservation tillage practices will seldom experience crusting problems.

The most frequent solution to soil crust problems is the use of the rotary hoe or row cultivator. This equipment is used to shatter the crust and allow seedlings to emerge. When operated correctly, less than five percent (often only one or two percent) seedling loss will be attributable to the action of the rotary hoe. If done in a timely fashion, soybean emergence will be adequate to avoid the need for replanting. The row cultivator will likely result in higher seedling losses but also some weed control activity. Only the rotary hoe should be used on drilled beans.

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<thead>
<tr>
<th>Weather Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week of May 4 to May 11</strong></td>
</tr>
<tr>
<td><strong>Rainfall:</strong></td>
</tr>
<tr>
<td>0.14 inches: May 20, 2000</td>
</tr>
<tr>
<td>0.56 inches May 21, 2000</td>
</tr>
<tr>
<td>1.11 inches May 22, 2000</td>
</tr>
<tr>
<td>0.10 inches May 24, 2000</td>
</tr>
<tr>
<td>Readings taken for the previous 24 hours at 8 a.m.</td>
</tr>
</tbody>
</table>
Air Temperature:
Highs Ranged from 85°F on May 19 to 58°F on May 20.
Lows Ranged from 61°F on May 24 to 53°F on May 20.

Soil Temperature:
68°F average for the week.
(Soil temperature taken at a 2 inch depth, under sod)

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

Compiled and Edited By:

Tracy Wooten
Extension Associate - Vegetable Crops

Maryland Cooperative Extension
Vegetable Disease Forecasting Page

Welcome to the weather-based disease forecasting page from Maryland Cooperative Extension. It contains information on how to schedule fungicide applications for watermelon, muskmelon and tomato crops. If you are using one of these models for the first time, you may want to apply it on a limited area to become comfortable with the model. As always be sure to scout your field regularly, and if a disease outbreak occurs, revert to a calendar spray.

Melcast Watermelon EFI
Melcast Muskmelon EFI

TOMCAST Processing
Tomato DSV

Detailed Information on Weather Station Locations

Questions about weather-based models

Sample Record Sheet
Blank Record Sheet

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