

# PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

MAY 25, 2005



## INSIDE

<b>Pest Notes .....</b>	<b>1</b>
<b>IPM Update .....</b>	<b>2</b>
<b>Vegetable Weed Control .....</b>	<b>3</b>
<b>Postemergence Herbicide Crop Tolerance .....</b>	<b>4</b>
<b>Vegetable Disease Update .....</b>	<b>4</b>
<b>Disease Briefs .....</b>	<b>6</b>
<b>Vegetable Diseases of the Week .....</b>	<b>7</b>
<b>Copper Applications and Oxidate .....</b>	<b>7</b>
<b>Strawberry Update .....</b>	<b>8</b>
<b>The Importance of Soil Potassium in Growing Vegetables .....</b>	<b>8</b>
<b>Weekly Weather Summary .....</b>	<b>9</b>

## Pest Notes

*Gerald M. Ghidui, Ph.D., Specialist in Vegetable Entomology*

### Degree Day Accumulation

Insect pest activity has been unusually low for the end of May throughout New Jersey, mostly due to low air and soil temperatures. Last year (2004), the degree day accumulation was well over 600 dd on May 22, but this year (2005) it is only 391. The degree day is a method of calculating accumulated heat units from the beginning of the year using a base threshold. Because insects are cold-blooded, they operate on heat units. For each insect that we issue predictions, there is a temperature known as the developmental threshold (base threshold). When the temperature is higher than that threshold, the insect develops or activity begins, and when the temperature is lower, the insect does not progress. That threshold is the base for which degree days are calculated (the base may be different for different insects).

The simplest calculations involve the average of the maximum and minimum temperatures. Just average the highest and lowest temperatures for that day, subtract the base, and the remainder is the accumulated heat units for that day (negative numbers are no heat units). For **European corn borer** (base 50), if the high temperature is 70, the lowest 50, then average the two ( $70 + 50 = 120$ , divided by 2, equals 60) and subtract from the base 50, which leaves 10 total accumulated heat units for that day. This can be added to the previous accumulated units, if any, from the start of the year.

Thus the activity of many insects can be accurately predicted based on total accumulated heat units above the threshold. For the European corn borer, we can predict the life stages based on degree days using a base (threshold) 50:

- 423 degree days - beginning of the first generation moth flight
- 603 degree days - beginning of the first generation egg laying
- 699 degree days - start of first generation egg hatch

The activity of the European corn borers, using a degree day predictive model, varies slightly from south to north in New Jersey, and from year to year. But it is still a fairly accurate method of predicting the borer's activity (as well as other insect pests) throughout the state. A few moths have been caught in pheromone traps as of last week, but these could be early-emerging moths from isolated areas, or moths that came in from more southern states (such as Delaware or Maryland) on wind currents. In any case, trap counts throughout New Jersey are extremely

**SEE PEST NOTES ON PAGE 8**

# IPM Update

Kristian Holmstrom, Program Associate in Vegetable IPM

## Sweet Corn

As the weather has grown even colder since last week, adult **European corn borer** (ECB) activity has declined to nearly nothing. With warmer evening temperatures, activity will increase, but for now catches are extremely light (see ECB map). The small spot of activity on the ECB map in northern Warren County is not an indication of increased activity there, but rather the result of a small number of sample dates. It is possible that the recent unfavorable weather may have a limiting effect on the first ECB generation, but that remains to be seen. Many early sweet corn plantings are still in the seedling stage, and are not affected by ECB activity. Some of the earliest plantings, including those under plastic, will be at the vulnerable whorl stage. As weather warms, it is important to begin scouting these plantings. Check 5 consecutive plants each in 10 random locations throughout the planting. Look for the characteristic groups of small holes ("shot-hole") in the leaves. Typically these holes will be found on the outer whorl leaves and also on consecutively younger leaves as the tiny ECB bore into the plant. Consider treating if 12% or more plants are infested with ECB. While plants are in the whorl stage, it is possible to allow the feeding to increase prior to treating, although it is advisable to use an insecticide prior to tassel emergence. After treating, continue scouting regularly to assess infestation levels at the pretassel and tassel stages. ECB larvae will be evident by the discoloration they cause in the tassels. Consider treating as long as the infestation remains over 12%. Be sure to make one insecticide application at the full tassel stage (when the tassel spreads just prior to silking) to clean up ECB larvae moving down the stalks. This is critical to minimize damage to ears. Current ECB activity is low, but should increase dramatically over the next 10-14 days. The highest average nightly ECB blacklight trap catches are:

Allamuchy	1	Oldwick	1
Dayton	1	Pennington	1
Downer	1	Seeley Lake	1
Jones Island	1	Woodstown	1

**Flea beetles** continue to cause injury on some seedling stage sweet corn plantings in the northern counties, although cold wet weather has suppressed their activity somewhat. Damage appears as scrape marks on the older leaves, and when heavy, causes those leaves to dry out. The appearance of heavy feeding often accompanies stretches of cooler weather. Under these conditions, the plants remain small, and beetles feed on the same leaves for prolonged periods. The action threshold for flea beetles is 6 per 100 seedlings if no soil insecticide has been used and the variety is susceptible to **Stewart's Wilt**. If these criteria are met, an insecticide application may be warranted. If the planting is to be irrigated (as is the case in some areas due to dry condi-

tions), insecticides may be omitted as overhead irrigation will suppress flea beetles temporarily.

## Peppers

When warmer weather arrives, peppers will be at some risk from ECB infestation. Although the first ECB flight is not commonly associated with fruit damage, they will lay eggs on young plants. The resulting larvae will tunnel into the main stem of the plant, causing death above the point of entry and delaying development. It is advisable to scout the fields weekly, looking at 2 leaves per plant on 5 consecutive plants in 10 random locations. Consider treating if 2 or more plants are found to have ECB egg masses on them. The ECB egg mass is a flat, pale colored group of 15-30 eggs, and resembles fish scales. They will commonly be found on the underside of leaves.

## Tomatoes

Field plantings of tomatoes in the Rutgers Cooperative Research & Extension scouting program in the northern counties remain largely pest free for now. It is likely that some **aphid** colonies will begin to appear in the field soon, however. This has begun to happen in several high tunnel tomato plantings. When deciding whether or not to treat for aphids, consider the age of the plant and the presence of predators and parasites. Aphids are often controlled naturally by syrphid fly (flower fly) maggots and *Aphidiid* wasps. The former is a colorful maggot that may be found feeding among the aphid colonies, and the latter causes the aphids to become bloated and golden in color as parasitism occurs. If these antagonists are found among aphids, control may be delayed as long as fruit are not affected directly by aphid droppings. Later in the season, as fruit begin to size, large aphid colonies will affect fruit quality as their droppings fall on the fruit surface. If this condition is occurring, treatment should not be delayed.

## Cole crops

When it is not raining, **crucifer flea beetles** have been found in some cole crop plantings (direct seeded and transplanted) throughout the state recently. This pest is capable of causing significant damage to young plants, and plantings should be monitored regularly. Consider treating if flea beetles are found on greater than 50% of plants in a 50 plant sample, and damage is occurring. While looking for beetles, also check for the presence of **diamondback moth larvae (DBM)** and **imported cabbage worms (ICW)**. Both pests may be present in cole crops at this time, although cold weather will suppress new egg laying. Consider treating when greater than 20% of plants are infested prior to heading or 5% are infested when heads are present. It is important to check the youngest leaves, as this is often where ICW are found. For collards, kale and mustard, consider treating if greater than 10% of the plants are infested at any time.

**SEE ECB DISTRIBUTION MAP ON PAGE 9**

# Vegetable Weed Control

Bradley A. Majek, Ph.D., Specialist in Weed Science

✓ **Peppers** - Cold weather earlier in the season may result in abnormal growth of peppers during the next few weeks. Low temperatures can injure tiny leaves in the growing points. When these leaves grow out in a few weeks, they may exhibit a variety of epinastic responses that resemble virus or 2,4-D drift injury. Leaves may be crinkled, stretched, the midvein may be shortened, and/or the leaves may appear otherwise abnormal. The response can be very variable. Night temperatures after transplanting need not drop to freezing to cause this injury. Night temperatures in the upper thirties and even forties can affect "soft" plants just out of the greenhouse. The plant will outgrow the problem in time.

✓ **Peppers** - Dual Magnum has a special state 24C label for use to control weeds in BELL AND NON-BELL PEPPERS. The label is valid only in New Jersey. The manufacturer, Syngenta, requires growers to sign an indemnification agreement that must be notarized and recorded by the Vegetable Growers Association of New Jersey for the label to be valid. Read the agreement thoroughly and fill out completely before mailing to the VGANJ for validation. Copies of the indemnification agreement are available from VGANJ or your county agent.

Use Dual Magnum to control **annual grasses** and certain **broadleaf weeds**. Weeds that Dual Magnum suppresses or controls that could not be controlled with other labeled herbicides include **yellow nutsedge**, **galinsoga**, and **nightshade**.

Apply Dual Magnum at 0.67 to 1.0 pints per acre (0.6 to 1.0 lb ai/a) pre transplant or post transplant as a basal-directed spray. Read and follow all label instructions and restrictions.

Do NOT incorporate pre transplant applications.

Do NOT spray posttransplant applications "over the top" of peppers.

Do NOT apply within 60 days of harvest.

The label, validated through the VGANJ, is effective for this growing season, and expires at the end of the year.

✓ **Cabbage** - Dual Magnum 8E has received special state labels for use to control weeds in CABBAGE. The manufacturer, Syngenta, requires growers to sign an indemnification agreement that must be notarized and recorded by the Vegetable Growers Association of New Jersey for the label to be valid. Read the agreement thoroughly and fill out completely before mailing to the VGANJ for validation. Copies of the indemnification agreement are available from VGANJ or your county agent.

Use Dual Magnum to control **annual grasses** and certain **broadleaf weeds**. Weeds that Dual suppresses or controls that could not be controlled with other labeled herbicides include **yellow nutsedge**, **galinsoga**, and **nightshade**.

In transplanted cabbage, apply Dual at 0.5 to 1.33 pints per acre (0.48 to 1.27 lb ai/a) pre transplant or post transplant within 48 hours of planting. Do NOT incorporate pre transplant applications. Use Dual Magnum with caution. Some temporary stunting may occur that could delay maturity.

In direct seeded cabbage, do NOT apply Dual at planting. Use other labeled herbicides to control weeds as the cabbage emerges. Apply Dual at 0.5 to 1.33 pints per acre (0.48 to 1.27 lb ai/a) after the cabbage has developed 3 to 4 leaves to control weeds for the remainder of the season. Control emerged weeds by cultivation and hoeing or with postemergence herbicides before applying Dual Magnum. Use Dual magnum with caution. Some temporary stunting may occur that could delay maturity.

The label, validated through the VGANJ, is effective for this growing season, and expires at the end of the year.

✓ **Sweet potatoes** – Apply Command 3ME 1.33 to 2.66 pints per acre (0.5 to 1.0 lb ai/a) after planting. Command will suppress or control many **annual grasses** and **broadleaf weeds**, but will not control **pigweed**, **carpetweed** or **yellow nutsedge**. Tank-mix with Devrinol 50DF at 2 to 3 pounds of product per acre (1.0 to 1.5 lb ai/a) to improve control of pigweed and carpetweed.

Command 3ME is Micro Encapsulated to reduce vapor drift after application, but encapsulation does not prevent spray drift when applications are made in windy conditions or completely prevent vapor drift. Attention to weather and wind conditions is still needed to prevent off-site movement.

Apply Command 3ME when the humidity is low, winds are light, and blowing in a safe direction (away from sensitive vegetation). Do **NOT** spray in windy weather to avoid spray drift injury, or during calm periods when the humidity is high. Incorporate before a period of calm wind and near 100% humidity occurs to reduce the risk of vapor drift. **READ AND FOLLOW ALL LABEL WARNINGS AND RESTRICTIONS.** □

## Postemergence Herbicide Crop Tolerance

Bradley A. Majek, Ph.D., Specialist  
in Weed Science

The recent extended period of cloudy weather and high soil moisture may have resulted in certain crops growing rapidly and developing a thinner than “normal” wax layer, called the cuticle, on the leaves. This thinner cuticle is more easily penetrated by postemergence herbicides. Warm temperatures during the cloudy moist period will increase the speed of growth and the thinness of the cuticle.

To reduce the risk of crop injury from postemergence herbicides this week:

1. Reduce the amount of spray additives used to the minimum labeled amount.
2. Use nonionic surfactants instead of oil concentrates when the herbicide label gives you a choice.
3. Do NOT add any surfactant, oil concentrate, or other additive if the label allows application alone.
4. Do NOT add liquid fertilizer to the spray solution, even if the herbicide label suggests it as an option.
5. Delay treatment of crops that are marginally large enough to treat according to the herbicide label.
6. Delay treatment until the crop has experienced 3 to 5 days of bright, clear, warm, and sunny weather before applying postemergence herbicides. The cuticle thickens when the weather turns warm, sunny, and dry. □

## Vegetable Disease Update

Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology  
and Wesley Kline, Ph.D., Cumberland County Agricultural  
Agent

✓ **Cabbage – White mold, Bottom rot and Soft rot-** The rain and wind have created wet ground with blowing soils which can create an entry point for all three diseases on injured plant tissue. Unfortunately, little can be done to correct the problem in maturing plantings. White mold and bottom rot will cause mature outer leaves to wilt, brown out and die. White mold with produce thick, fuzzy white growth on the stem. Black fruiting bodies are produced and easily distinguishable in the fuzzy, white growth. Bottom rot will cause grayish, black lesions on the base of the mature leaves and extend upward. Greyish, brown mycelium will often be seen on these lesions when leaves are pulled apart. Soft rot will cause cabbage leaves to disintegrate quite rapidly. Leaves often look greasy and wet at first and eventually infected tissue dissolves away creating holes. Crop rotation is the best method to control these diseases. However, cultural practices such as avoiding late season cultivation which may cause wounding of leaves and throwing soil onto the cabbage plant may help.

✓ **Lettuce – Bottom Rot/Drop –** Reports of lettuce drop have increased this past week, growers should take precautions to help control Bottom rot (*Rhizoctonia*) and Lettuce drop (*Sclerotinia*) which may cause potential problems. For Bottom Rot, Endura 70W (boscalid, Group 7) at 8 to 11 oz/A, or Rovral 50WP (iprodione, 2) at 1.5 to 2 lb/A or OLF should be applied one week after transplanting or thinning and 10 and 20 days later. For Lettuce drop, the biological Contans 5.3WG at 2 to 4 lbs/A pre-plant can be incorporated at a depth of 1 to 2 inches; or Ronilan 50DF (vinclozolin, 2) at 1 to 2 lbs/A or OLF, or Rovral 50WP at 1.5 to 2 lb/A beginning one week after transplanting or thinning and again at 10 and 20 days later. For more information on control of Bottom rot and Lettuce drop and other important diseases of lettuce please see the *2005 New Jersey Commercial Vegetable Production Recommendations Guide*.

✓ **Parsley – Septoria Blight /Bacterial (blight) leaf spot –** Leaf spots caused by Septoria blight are easily distinguished by small, angular to round leaf spots with grayish-brown centers with a definitive dark, brown margin. Numerous black fruiting bodies develop and are visible in the center of lesions. Spread of Septoria blight is by wind-driven rain, heavy dews and overhead irrigation. Workers and equipment may also spread the disease during wet conditions. Best management practices include i) proper crop rotations of at least 2 years and by using clean or treated seed ii) scout fields early for symptom development iii) keeping workers and equipment out of fields with wet foliage iv) plowing under residue of harvested crop and avoid planting in fields adjacent or near previously infected fields. Applications of azoxystrobin (Amistar or Quadris) and fixed copper can be alternated every 7 days for control. Bacterial leaf spot (*Pseudomonas syringae*) of parsley shows up at the same time as Septoria blight. Leaf spots caused by Bacterial blight appear as small brown to black spots on the leaves. It does not have the grayish brown centers or brown margins like Septoria. The pathogen can be soil or seed borne and develops during cool, moist weather. The disease spreads during cool rainy periods or under sprinkler irrigation; and a high plant density. The same control measures listed for Septoria will assist in

SEE DISEASE UPDATE ON PAGE 5

#### DISEASE UPDATE FROM PAGE 4

preventing the spread of Bacterial leaf spot as long as fixed copper is included with azoxystrobin. If Oxidate is used, follow the label carefully.

✓ **Spinach (Downy mildew and White rust)** - The use of Ridomil Gold (mefenoxam, 4) at 1 to 2 pt 4E/A or Ultra Flourish (mefenoxam, 4) at 2 to 4 pt 2E/A at planting for damping-off control will provide early season disease control. Beginning 2 to 3 weeks after emergence (and prior to symptom development), apply the following on a 7 to 10 day schedule (do not use if temperature is high). Actigard (acibenzolar-S-methyl, P) at 0.75 oz 50WG/A, or Amistar (azoxystrobin, Group 11) at 2 to 5 oz 80WDG/A, or OLF. For downy mildew control use a minimum of 4 oz of Amistar 80WDG/A and do not make more than one consecutive application. Rotate to one of the following fungicides: Aliette (fosetyl Al, 33) at 3 lb 80WDG/A, or Kocide (fixed copper, M1) at 2 lb 61DF/A (Copper containing fungicides may cause some phytotoxicity), or Ridomil Gold Copper (mefenoxam + copper, 4 + M1) at 2.5 lb 70WP/A (on 14-day schedule). For more information please see the *2005 New Jersey Commercial Vegetable Production Recommendations Guide*.

✓ **Strawberry – Anthracnose fruit rot** - Strawberry anthracnose can be extremely destructive during warm, wet weather causing significant fruit rot. Symptoms of Anthracnose include blackish-brown circular spots on maturing green fruit and soft, sunken (flat) circular lesions on ripe fruit. On ripe fruit, lesions can expand rapidly and are often covered with a pinkish-orange spore mass. Spores are spread from infected to healthy fruit with splashing water. Control of Anthracnose always begins with a 7 to 10 day preventative spray program no later than 10% bloom and/or prior to disease development. For control apply the following combinations:

#1) captan (M3) at 4 lb 50WP/A plus Pristine (pyraclostrobin + boscalid, 11 +7) at 18.5 to 23.0 oz 38WG/A

#2) captan 5(M3) at 4 lb 50WP/A plus Abound (azoxystrobin, 11) at 6.2 to 15.4 oz 2.08F/A, or Cabrio (pyraclostrobin, 11) at 12 to 14 oz 20EG/A

#3) Captevate (captan + fenhexamid, M3 + 17) at 3.5 to 5.25 lb 68WDG/A

For subsequent applications, alternate:

captan (M3) at 4 lb 50WP/A plus Abound (azoxystrobin, 11) at 6.2 to 15.4 oz 2.08F/A, or Cabrio (pyraclostrobin, 11) at 12 to 14 oz 20EG/A with

captan (M3) at 4 lb 50WP/A, or Captevate (captan + fenhexamid, M3 + 17) at 3.5 to 5.25 lb 68WDG/A

To help manage fungicide resistance development, do not make more than 2 consecutive applications of either Pristine (pyraclostrobin + boscalid, 11 + 7), Cabrio (pyraclostrobin, 11) or Abound/Quadris (azoxystrobin, 11) before switching to another fungicide chemistry.

✓ **Strawberry – Botrytis (Gray Mold) and Blossom blight** – can cause serious losses in strawberry plantings if not controlled properly. Development is favored by moderate temperatures (59 to 77°F) with prolonged periods of high relative humidity and surface wetness. Control of Gray mold begins with preventative fungicide applications. Apply at 5 to 10 percent bloom and every 10 days until harvest. During periods of excessive moisture, spray intervals of 5 to 7 days may be necessary. Alternate fungicide chemistries to aid fungicide resistance management.

Application #1: captan (M3) at 4 lb 50WP/A *plus* Topsin M (thiophanate-methyl, 1) at 1 lb 70WP/A or Switch (cyprodinil, 9) at 11-14 oz. 62.5WG/A

Application #2; Elevate (fenhexamid, 17 - See restrictions) at 1.1 to 1.5 lb 50WDG/A, or Pristine (pyraclostrobin + boscalid, 11 + 7) at 18.5 to 23 oz 38 WG/A

Application #3: captan (M3) at 4 lb 50WP/A *plus* Topsin M (thiophanate-methyl, 1) at 1 lb 70WP or Switch (cyprodinil, 9) at 11 to 14 oz. 62.5WG/A

For subsequent applications, alternate:

Captan (M3) at 4 lb 50WP/A, or Captevate (captan + fenhexamid, M3 + 17) at 3.5 to 5.25 lb 68WDG/A, or Switch (cyprodinil, 9) at 11 to 14 oz. 62.5WG/A or Pristine (pyraclostrobin + boscalid, 11 +7) at 18.5 to 23 oz 38 WG/A, or Thiram (M3) at 4 to 5 lb 65WSB/A. □

## Disease Briefs

Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology

### Controlling Leather Rot of Strawberry

The cool, wet weather this past week has made conditions favorable for the development of leather rot in strawberry plantings. Leather rot is caused by *Phytophthora cactorum* and can be extremely damaging if left uncontrolled, especially if wet soil conditions and rainy weather persist for extended periods. Weather conditions which favor Gray mold development may also favor Leather rot. *Fungicides effective against Gray mold are not highly effective against Leather rot* (i.e. Captan, Topsin-M). Symptoms of Leather rot begin to develop as green fruit begins to develop and mature. On green fruit, infected areas often turn a dark-brown. As infection spreads, entire fruit may turn dark-brown and become 'leathery'. However, some fruit may remain mostly green with only dark-brown margins developing around point of infection. Importantly, infection may cause fully mature to turn reddish-brown to dark purple or *cause no distinct symptoms*. These 'healthy-looking' fruit have a very unpleasant taste and may be unintentionally harvested for sale. For control of Leather rot in:

#### New Plantings:

Aliette (fosetyl-AI, 33) at 2.5 to 5.0 lb 80WDG/A. Begin 14 to 21 days after planting and continue on a 30 to 60 day interval as long as favorable disease conditions occur, or

Ridomil Gold (mefenoxam, 4) at 1 pt 4E/A. Make one application at transplanting plus an additional application at fruit set or 30 days before harvest.

#### Established Plantings:

Aliette (fosetyl-AI, 33) at 2.5 to 5 lb 80WDG/A, or

Ridomil Gold (mefenoxam, 4) at 1 pt 4E/A. Apply in spring before first bloom and repeat once in the fall.

### Are you and your fields prepared for Phytophthora blight?

Last summer the first reports of Phytophthora blight in Pepper came during the first week in June. Fortunately, up through this week, the month of May has been relatively dry making conditions mostly 'unfavorable' for the development and spread of many vegetable diseases. That changed slightly late last week when 1 to 2" of rain fell. The rain caused water to pool at the ends of black plastic mulch rows here at the research station. Peppers for our research trial haven't been transplanted, yet field

conditions that favor the development of Phytophthora blight have made a presence. Do you have areas in fields which favor Phytophthora blight development, such as low, poorly or slowly drained areas? Has water pooled in rows after the first extensive rainfall of the summer season? Were tomatoes, eggplant, or cucurbit crops grown in the same field last year? Now is the time to answer some of these questions. Poorly drained soil or soils that pool water for extended periods after rainfall are extremely conducive for Phytophthora blight development. These areas should be avoided at all costs, especially if Phytophthora has been a problem in the same field in the past or a susceptible crop was planted in the field last year. Take adequate measures to make sure any excess rainfall does not pool, especially at the ends of rows either on bare ground or between black plastic mulch. Dig diversion ditches to allow excess water to run-off and away from the field. Along with appropriate fungicide applications at planting (i.e. mefenoxam, etc.) fields should be scouted regularly and poorly drained areas should be noted. Any infected plants should be removed from the field. Removing infected plants early, although time consuming, may help to remove an early-season source of inoculum, thus helping reduce the chances for further crown, stem and/or fruit rot development later in the growing season. Besides avoiding poorly drained areas and removing sources of inoculum, cultural practices such as removing plastic mulch in low and poorly drained soils before symptoms of Phytophthora appear may help to keep the soil dry and keep water from pooling. Taking preventative precautions is extremely important when it comes to controlling a disease such as Phytophthora blight, any measures which can be done to reduce the chances of it developing should be taken.

### Summer Diseases in Asparagus

With this year's asparagus cutting season winding down over the next few weeks it's not too early to think about important summer diseases. **Purple spot** lesions can appear on the spears during the harvest season and reduce quality as well as on fern growth later in the summer. Characteristic symptoms of Purple spot include small (1 to 2 mm) slightly, sunken elliptical reddish-purple lesions on spears and ferns. Damage to ferns can cause premature defoliation which will reduce carbohydrate flow and reduce yield for the next growing season. Chopping the fern and incorporating the debris in the fall after the fern senesces can help destroy overwintering sources of the fungus, however these practices may also lead Fusarium infection. Once fernstalks are full-size, fungicide applications (chlorothalonil) should be repeated every two to four weeks until frost.

**Rust** is another important pathogen of asparagus. Rust can easily be diagnosed in the field early in the season by the cream-colored oval lesions (6 to 19 mm) it produces. A few weeks later these lesions will appear reddish-

**SEE DISEASE BRIEFS ON PAGE 9**

## Vegetable Diseases of the Week

Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology



*Zucchini grown in an area of a field with poorly drained soil which is an ideal place for the start of a *Phytophthora* blight epidemic.*



*Distinct blackish-brown stem lesions in Eggplant caused by *Phytophthora* blight.*



*Phytophthora blight causing fruit rot of yellow summer squash producing masses of 'greasy' white sporangia.*

## Copper Applications and Oxidate

Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology and Michelle Infante-Casella, Gloucester County Agricultural Agent

This past week finally brought rain (and some wind) with more expected this week making it ideal for bacterial infections to occur. Always remember that bacteria need a wound or natural opening in a plant in order to cause infection. Heavy rain, winds and hail can all cause injury to vegetable plantings. Some injury is quite noticeable such as hail damage, however, other injury may go unnoticed. Cultural practices such as tying, staking, cultivation and pruning can also create entry ways for bacterial infections. Many growers may plan on applying copper fungicides or tank mixes. *Although temperatures have been cool over the past few weeks. Be careful, when temperatures are high.* High temperatures increase the possibility of *phytotoxicity* when using Copper-based fungicides. In order to avoid this problem, growers should watch the daytime temperatures closely and avoid spraying if temperatures remain high. Management strategies to help avoid bacterial problems include not working in fields when the foliage is wet. Additionally, if overhead irrigation is used try to irrigate in the morning so foliage will dry quickly. Bacterial diseases thrive and spread when foliage remains wet for long periods of time.

Additionally, the product Oxidate is a promising tool in for control of bacterial diseases, especially in tomatoes. However, remember that *Oxidate has no residual activity* and should be used accordingly. Take caution when using this product on any crop and make sure to read the label. According to the product MSDS, Oxidate contains hydrogen dioxide (synonym for hydrogen peroxide) and peroxyacetic acid. The MSDS also states that the pH is 1.33 and that combinations of Oxidate with bases and metals (to name a couple) should be avoided due to reactivity issues and product instability. Mixtures of Oxidate and copper hydroxide may possibly produce soluble copper which is known to be phytotoxic. □

## Strawberry Update

*Peter Probasco, Agricultural Agent*

Chandler fields are being harvested now and we should have strawberries for the next 3 weeks. The crop is very good this year as we protected all the blooms through the frost periods. Keep the drip irrigation running daily during the dry periods to keep the plants turgid and the fruit size up. No problems with **Phytophthora** or **Anthraco**se this year. New Jersey supermarkets are starting to ask for Jersey Fresh strawberries this year. We are in a position for expansion of the market as supermarkets gear up for a local season like we have for fresh market tomatoes. □

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### PEST NOTES FROM PAGE 1

low, indicating moth activity is still low, most likely because of low emergence. Looking at predicted weather patterns and temperatures, it is estimated that degree day accumulations will total 423 around May 26-27. It is predicted that corn borer activity in black light and pheromone traps will trap first generation moths, starting normal emergence patterns, by this weekend. However, if temperatures remain cool, or conditions too wet, the moth emergence, activity, oviposition, and egg hatch (if any) will remain low.

For other insect pests that emerge from the soil, such as **Colorado potato beetles**, **flea beetles**, **asparagus beetles**, **rootworm beetles**, and others, soil temperatures have also remained lower than normal. Emergence of these pests is based on soil temperatures, and thus have been delayed. There have been almost no Colorado potato beetles or flea beetles, and a low population of asparagus beetles has been reported (but asparagus beetle feeding damage is also very low). As soils dry out and soil temperature increases, more of these pests will emerge. □

## The Importance of Soil Potassium in Growing Vegetables

*Raymond J. Samulis, Burlington County Agricultural Agent*

For many years, vegetable growers in New Jersey have used various fertilizer ratios such as 10-10-10, 15-15-15 dry or 9-9-9 liquid. In fact, these fertilizers are still widely used today.

Potassium, one of the macro elements, is surpassed only by Nitrogen and Phosphorous in its importance in amount needed by plants. Potassium is very important for many plant mechanisms and processes. Potassium is essential for Nitrogen metabolism in plants as well as being central to many enzyme reactions in plants. Plants need adequate Potassium in order to help ward off various diseases. Another important role of Potassium is for control of the stomata (leaf pores), which in turn controls plant turgor (rigidity).

Potassium is held within our soils at three different levels. The fixed or tightly held portion is contained in minerals such as feldspar, biotite and muscovite. There are slowly released forms, as well as readily available forms. Because our sandy soils have relatively low cation exchange (ability to hold nutrients), Potassium is one nutrient that can be deficient in the soil even though we are constantly adding it as fertilizer amendments. Maintaining the proper pH for the particular vegetable crop will help release easily available Potassium for plant uptake, again reiterating the importance of adequate liming. Crop removal results in losses of Potassium from the soil, and leaching of this nutrient also causes soil levels to drop. Potassium is one essential nutrient that can be used in a "luxury consumption" environment where plants will take up more than they actually need. This extra uptake does not improve yields and can become an economic liability for crops.

Go back to the basic question, how do we know how much Potassium our particular soil needs? Soil testing is the only way to really know. Under our sandy soil types, phosphorous is usually very high due to its stability and build up in the soil. On the other hand, Potassium can be low due to all the reasons we discussed.

The solution to the problem is to make sure that your fertility program takes into account the soil Potassium levels rather than trying to match the plants needs with a generic 1-1-1 ratio fertilizer. This can be accomplished by getting custom blends of fertilizer to match the need. Another approach is to apply Potassium in the form of potassium chloride (KCL) or potassium sulfate ( $K_2SO_4$ ), as a separate fertilizer application to supplement your standard fertilizer. Only a few years ago, Potassium was one of the cheapest of the major plant elements. Now however, due to overseas demand, particularly from China, transportation issues, and other reasons, increased prices and spot shortages are a reality.

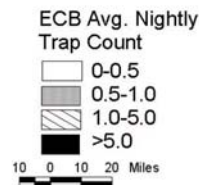
Remember, soil test regularly, match fertilizer ratios with what your soil and crop needs are, and save money by not applying materials you don't need. All crops and soils are not equal, and all have unique needs when it comes to Potassium fertilizer requirements. □

**DISEASE BRIEFS FROM PAGE 6**

brown. These reddish-brown lesions can produce spores which can cause more infections leading to further disease development. Control of Rust is extremely important and necessary in one and two year old beds, even with rust-resistant varieties. Growers need to begin scouting for symptom development in late-June in non-cutting beds and apply fungicides if necessary. In cutting beds, fungicide applications typically begin in mid-August. Fungicide applications of Chlorothalonil, mancozeb or myclobutanil rotated on a 7 to 10 day schedule will help control rust.

Although Purple spot and Rust are easily diagnosable in the field, growers who don't scout on a regular basis may find themselves trying to catch up with both diseases later in the summer. □

**Distribution of Adult European Corn Borer for the Week Ending May 25, 2005**



Data collected and processed by: Kris Holmstrom, Marilyn Hughes  
Rutgers Cooperative Extension & Center for Remote Sensing

## Weekly Weather Summary

*Keith Arnesen, Ph.D., Agricultural Meteorologist*

Temperatures averaged much below normal averaging 56 degrees north, 56 degrees central and 57 degrees south. Extremes were 77 degrees at Canoe Brook on the 17th, and 33 degrees at Charlotteburg on the 21st. Weekly rainfall averaged 0.44 inches north, 0.78 inches central, and 1.85 inches south. The heaviest 24 hour total reported was 3.06 inches at Cape May on the 20th to 21st. Estimated soil moisture, in percent of field capacity, this past week averaged 74 percent north, 68 percent central and 65 percent south. Four inch soil temperatures averaged 58 degrees north, 58 degrees central and 59 degrees south.

**Weather Summary for the Week Ending 8 am Monday 5/23/ 5**

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	MISSING									
CANOE BROOK	.53	9.62	-1.93	77	40	58.	-3	321	115	75
CHARLOTTEBURG	.14	12.15	.78	72	37	56.	-3	225	94	72
FLEMINGTON	.86	11.81	.86	73	38	56.	-6	273	53	80
NEWTON	.24	10.19	.07	70	39	55.	-5	241	77	73
FREEHOLD	1.29	12.54	1.63	75	41	57.	-6	308	35	91
LONG BRANCH	MISSING									
NEW BRUNSWICK	.96	10.22	-.48	74	40	56.	-8	293	-8	85
TOMS RIVER	1.21	11.18	.27	68	41	55.	-7	227	-29	92
TRENTON	.88	9.17	-.71	73	42	57.	-7	302	-33	77
CAPE MAY COURT HOUSE	3.06	10.69	1.12	70	43	55.	-8	178	-119	93
DOWNSTOWN	1.45	10.43	.60	74	41	57.	-8	266	-82	91
GLASSBORO	1.31	11.20	.76	74	44	59.	-5	354	21	90
HAMMONTON	1.54	10.37	.21	74	42	58.	-6	290	-35	91
POMONA	2.00	10.59	1.08	72	41	56.	-7	213	-61	93
SEABROOK	1.72	11.15	2.17	74	47	59.	-6	392	39	92
SOUTH HARRISON	1.56	11.20	.97	73	45	58	NA	340	NA	NA
WES KLINE — GDD BASE 40 PINEY HOLLOW										
Last Week*	143 (Ending 5/16/05)									
This Week	118 (Ending 5/23/05)									
* February total base 40 equals 32 units										

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