

# PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

JUNE 8, 2005



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## Crop Rotations for Prevention of Phytophthora in Solanaceous and Cucurbit Crops

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

Crop rotation is a beneficial cultural practice for decreasing plant disease. Due to the lack of proper crop rotations, **Phytophthora** in solanaceous and cucurbit crops has increased on many farms over the years. The main species of Phytophthora infecting solanaceous and cucurbit crops is *Phytophthora capsici* which causes crown rot and fruit rot in pepper, tomato, eggplant, squash, pickles, cucumbers, and melons.

Growers have relied heavily on fungicide applications to control Phytophthora. However, the disease can spread with (and even become resistant to) chemical controls. Other common forms of control have been to divert standing water from fields. By removing saturated conditions in the field the disease will not spread as rapidly. Finally, and probably the most difficult for some growers, is to use crop rotation. Limited land resources and limited markets force some growers to produce the same crops in the same fields in short rotation.

Proper crop rotation can be done by diversifying the types of crops grown on a farm. Crops like corn, beans, cole crops, small grains, lettuces, greens, onions, carrots, turnips, and many cover crops are not susceptible to *Phytophthora capsici*. Planting these crops in a 3-5 year rotation with susceptible crops may greatly reduce the incidence and occurrence of *Phytophthora capsici* in the field. However, the practice of good crop rotation alone will not ensure the complete elimination of the disease. Proper sanitation with tillage equipment can also be done to prevent field to field spread of the disease. A small amount of contaminated soil on field equipment can spread spores from infected fields to clean fields. Be sure to properly clean equipment before moving into new fields, especially if working in a field with a known history of Phytophthora. A good practice is to till the field that is known to be contaminated with Phytophthora last.

Leaving a field fallow is also a type of rotation. This means not harvesting any profit from that field in the fallow year. Even better than leaving a field fallow is to plant a cover crop. The addition of organic

**SEE CROP ROTATIONS ON PAGE 2**

# Vegetable Disease Update

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

✓ **Collard/Turnip – Peppery leaf spot** - Symptoms of Peppery leaf spot include water-soaked spots that turn purplish-brown surrounded by yellow 'halos'. These lesions can be up to 1/8 inch and can join together turning leaves yellow causing them to drop off. The pathogen can survive in the soil and on debris from previous crops. During cool, wet periods, the disease can become severe and be spread by splashing rain. Best management practices for control include i) start with clean seed, ii) plant in clean beds and, iii) use proper crop rotation of one year or more. If Peppery leaf spot has been a problem in the past, beds should be sterilized prior to planting.

✓ **Cucumber/Pickles – Angular leaf spot**, symptoms are distinct and easily diagnosed. Small water-soaked lesions develop on leaves and expand until they are delimited by larger secondary veins in leaves resulting in angular lesions. After time these lesions turn brown and infected tissue drops-off resulting in 'shotholes'. Angular leaf spot can be spread by splashing rain, insects, on the hands of workers and on farm machinery. Working in the field when the foliage is wet favors the spread of the disease. The disease can also be spread by blowing wind and in irrigation water. Best management of Angular leaf spot begins with clean-seed and planting in fields that has been out of cucurbit production for at least 2 years. Cultivating when foliage and soil are wet and irrigating with pond water should be avoided. There are cucurbit varieties with resistance. Add label rate of fixed copper + mancozeb to fungicide maintenance program and repeat applications every 7 days.

✓ **Lettuce – Bottom Rot/Drop** – 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 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 and, 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 preventing the spread of Bacterial leaf spot as long as fixed copper is included with azoxystrobin. If Oxidate is used, follow the label carefully.

✓ **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

**SEE DISEASE UPDATE ON PAGE 3**

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## CROP ROTATIONS FROM PAGE 1

matter to soil stimulates beneficial microbial activity in the soil that can compete with pathogenic organisms, like *Phytophthora capsici*. By creating a microbial balance in the soil, pathogens will not flourish due to suppression by beneficial microorganisms. Good crop choices for maximum organic matter benefit include plants like sudangrass, crimson clover, or field corn. All but field corn can be mowed and regrowth will occur for more biomass production. Sudangrass should be planted after the threat of spring frost to mid-July and mowed when about 18 inches tall. Mowing will promote more vegetative growth and tillering. Sudangrass can be used as a summer cover crop and will winter kill with frost. Crimson clover can be planted in September in New Jersey and is winter hardy. If mowing, be sure to mow just as flower buds start to appear. Be careful not to let the clover bloom because it will attract pollinators away from your vegetable crops. Also realize that by planting cover crops, rather than crops to be harvested, no economic return will be gained from the field during that period. However, the future returns from cash crops growing in improved soils will be noticeable.

Crop rotation alone will not ensure the complete elimination of *Phytophthora* in vegetable fields. Chemical and cultural practices must be utilized in combination for good control of this disease. □

## DISEASE UPDATE FROM PAGE 2

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 o 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

✓ **Strawberry – Leather rot** - 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 main 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.

✓ **Tomato - Early Blight, Septoria leaf spot** Apply the following fungicides on a 7-day schedule or according to Tom-Cast advised sprays using the alternation pattern described below to delay the potential development of resistant to FRAC Group 11 fungicides.

Bravo, Echo, Equus, chlorothalonil, M4) at 2 to 3 pt 6F/A or OLF (also for gray leaf spot, black mold and soil rot), or  
mancozeb (Dithane, Manex II, Manzate, Penncozeb, M2) at 3 lb 80WP/A or OLF (also for gray leaf spot and leaf mold)

Alternate one of the above fungicides with one of the following:

Amistar, Quadris (azoxystrobin, 11) at 1.6 to 2.0 oz 80WDG/A or OLF (Also for buckeye rot and black mold. Do not apply near apples, see label for details.), or

Cabrio (pyraclostrobin, 11) at 8 to 12 oz 20EG/A, or Endura (boscalid, 7) at 2.5 to 3.5 oz 70W/A, or Flint (triflozystrobin, 11) at 4 oz 50 WDG/A, (Do not apply near Concord Grapes.) or  
Tanos (fomoxodone + cymoxanil, 11 + 27) at 8 oz 50W/A + protectant fungicide (also for buckeye rot suppression and gray leaf spot).

✓ **Tomato – Late blight** - *There have been no confirmed cases of Late blight in our region to date.* However, new strains of the fungus that cause Late blight are present in the mid-Atlantic region. These strains are aggressive on tomatoes and resistant to Ridomil Gold. Apply one of the following protectant fungicides and repeat every 7 days or follow a disease forecasting system to schedule fungicide applications:

Bravo, Echo, Equus, chlorothalonil, M4) at 1 to 3 pt 6F/A or OLF, or  
Gavel (zoxamide + mancozeb, M2 + 22) at 1.5 to 2 lb 75DF/A, or  
mancozeb (Dithane, Manex II, Manzate, Penncozeb, M2) at 3 lb 80WP/A or OLF.

Once late blight is detected in the area, switch to one of the following translaminar fungicides which can move into and through leaves:

Acrobat (dimethomorph, 15) at 6.4 oz 50WP/A plus a protectant fungicide, or  
Previcur Flex (propamocarb HCL, 28) at 1.5 pt 6F/A plus a protectant fungicide, or  
Tanos (fomoxodone + cymoxanil, 11 + 27) at 8 oz 50W/A plus a protectant fungicide.

Return to the use of protectant fungicides when conditions no longer favor the development of late blight.

✓ **Tomato - Stem Rot/Pith Necrosis** – Both bacterial diseases have shown up in isolated areas over the past

SEE TOMATO DISEASE ON PAGE 4

# Vegetable Diseases of the Week

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



Angular leaf spot of cucumber.



Symptoms of Stem/Pith Necrosis of tomato.

### **TOMATO DISEASE FROM PAGE 3**

week. Symptoms begin to develop as green fruit begins to mature. Both bacteria are most likely ubiquitous to tomato fields and develop when weather conditions and cultural practices lead to favorable conditions for disease development. Symptoms include the development of irregular brown lesions on main stems and branches. Late pruning (suckering) can provide entry points for both bacterial diseases, especially during wet conditions. Internally, stems will become brown and mushy. High humidity is necessary for disease development in both cases. High nitrogen and low night temperatures are associated with Pith Necrosis development. Control of both begins with cultural practices such as avoiding working in fields with wet foliage, avoiding late pruning and watching the amount of N applied to plantings. □

# IPM Update

Kristian Holmstrom, Program Associate in Vegetable IPM

## Sweet Corn

The adult **European corn borer (ECB)** flight has increased significantly since this time last week. Moths are easily seen flying in sweet corn plantings and in surrounding vegetation. Particularly high activity is present in parts of Mercer and Hunterdon counties at this time. This flight has been delayed due to extended cold weather, and may be shortened as a result. For now, activity is increasing and egg laying is occurring on host crops. In the northern counties, feeding has only just been discovered in the taller whorl plantings. As yet, it is below the 12% threshold, but this situation will change within a week. Expect to see feeding percentages over threshold and proceed accordingly. In southern counties, larval ECB infestations are well underway. Check 5 consecutive plants each in 10 random locations in the planting. Look for the presence of the characteristic “shot-hole” type feeding on the leaves of whorl stage plants. As the plants proceed to the pre-tassel stage, check the tassels for discoloration indicating the presence of small larvae. Consider treating if more than 12% of the plants are infested. Be sure to make an insecticide application at the full tassel stage to eliminate ECB larvae that may be emerging from opening tassels and moving down the plant to the area near the developing ear. As plantings enter the silk stage, make weekly applications as long as the adult ECB flight continues, even in the absence of **corn earworm (CEW)**. There is no ECB map in this week’s publication. An ECB map for this week will be produced on the web retroactively next week for those with an academic interest in this information. Web based ECB and CEW maps may be found at <http://www.pestmanagement.rutgers.edu/IPM/Vegetable/Pest%20Maps/maparchive.htm>.

## Peppers

This week, IPM staff have begun to find **ECB** egg masses in recently transplanted peppers. ECB eggs are flat, whitish, and waxy in appearance. Should the larvae from these eggs bore into the main stems of the small plants, the peppers would die above the point of entry. This causes the pepper to grow from below the wound, and eliminates the first blossoms from the plant. Check 5 plants each in 10 random locations in the field. Look at the underside of 2 leaves per plant for ECB egg masses, **aphids**, and **two spotted spider mites (TSSM)**. If two or more ECB egg masses are found on 100 leaves, consider treating to minimize stem injury. If aphids exceed 100 per 100 leaves, consider treating. This is less urgent if predators such as ladybird beetles or their larvae, syrphid maggots, lacewing larvae or parasitic wasps are active in

**SEE IPM ON PAGE 5**

## South Jersey IPM Update

Joe Ingerson-Mahar, Vegetable IPM Coordinator

✓ **European corn borer** trap catches remain erratic across the region with several traps not catching any moths. Only the traps in western Salem County seem consistent with high numbers. The highest European corn borer trap catches in the south are: Woodstown = 3.5 moths per night; Cohansey = 2.75 moths per night; Medford = 1 moth per night.

✓ **Corn earworm** moths have not been caught in any of the southern traps this past week.

### Other Pests

✓ **Wireworms** have been troublesome in two fields of sweet corn. The species is *Melanotus communis* which is the primary pest wireworm for the state. Once damage has been found there is no rescue treatment for the current crop. Any control measures will have to be implemented before the next crop is planted.

✓ One adult **Euschistus stinkbug** has been caught in Salem County. These stinkbugs are pests on a number of vegetable and fruit crops and are the principal stinkbugs causing the gold discoloration on ripe tomato fruit. Catching only 1 stinkbug does not give any real indication of how much a problem stinkbugs will be.

✓ An East Vineland grower reports finding **diamond back moth** infesting their plants but the levels are low. □

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### IPM FROM PAGE 4

the plantings and fruit are not yet present on the plants. If TSSM are found, consider spot treating the area to minimize the threat.

Recently, a few plants in northern areas have shown signs of extreme foliar distortion that is characteristic of a **cyclamen mite** infestation. These mites are favored by cooler weather, and are impossible to see without the aid of a microscope. If peppers plants begin to show significant foliar distortion near the growing points, including, but not limited to twisted and thickened leaves, extremely large leaves or bud proliferation, consider a miticide application as would be used against TSSM.

### Tomatoes

Tomato plantings in the IPM program have been largely pest free thus far. A recent hail event in Warren County however serves as a reminder that copper or other antibacterial product applications are important for several weeks after transplanting. **Bacterial infections** can become extremely limiting when hail causes numerous injuries to the plants, giving bacteria easy entry into the plants vascular tissue. Often organisms like the one responsible for bacterial canker in tomatoes does not cause symptoms for some weeks even though it is present on plant leaves. Antibacterial applications as recommended in the *2005 Commercial Vegetable Production Recommendations Guide* are always a good idea, but become critical after a hail or similarly damaging event. □

## Monitoring for Pepper Weevil

Joe Ingerson-Mahar, Vegetable IPM Coordinator

After the devastating **pepper weevil** infestation on a South Jersey farm last year, monitoring for pepper weevil is a prudent management decision this and every year. Besides the major infestations that have occurred in the past, minor infestations of pepper weevil have occurred in recent years in unsprayed pepper research plots in Salem and Cumberland Counties. This suggests that the occurrence of pepper weevil may be higher than we first anticipated.

Further, this suggests that those growers who do not have high **corn borer** pressure in peppers and tend to cut back on insecticide use are more susceptible to weevil infestations. Growers shouldn't stay with an intense spray schedule just on the chance of preventing a weevil infestation but instead purchase pheromone traps and check them frequently for the presence of weevils. The pheromones available now are two component pheromones attracting both males and female beetles.

Pheromone kits comprising of 4 traps and 4 lures can be purchased from Great Lakes IPM, Vestaburg, MI, for \$27. Contact information for Great Lakes IPM: phone - 1-800-235-0285; website - [www.greatlakesipm.com](http://www.greatlakesipm.com). These traps can also be purchased from Gemplers. See <http://www.gemplers.com/a/shop/product.asp?T1=TPEW&UID=200506061016043283559204> for details. The lures are good for 1 month before they need to be changed. The traps should be placed near green bells as these seem to be the preferred varieties, however, all varieties of peppers are attacked. Traps should be placed at about plant height either in or beside the pepper field. If you or one of your neighbors brings in produce from southern states then a trap should be placed near where the produce would be unloaded. The most common way for pepper weevil to arrive in New Jersey is probably by hitchhiking on produce trucks or live plant shipments.

The female weevil will lay eggs in both flower buds and developing fruit and occasionally in more mature fruit. The initial fruit set is vulnerable and growers should watch the plants closely to see if there is a higher than normal blossom or fruit drop. Cut open some of these aborted blossoms and fruit to see whether a small (3/16") grayish white grub is inside. If a grub is found have it identified to make sure whether it is a weevil or not. You don't want to panic over a non-pest grub or maggot infesting a rotting fruit.

The adults are 3/16" long with a long slender snout or beak that makes up nearly half their length. The overall coloration is grayish brown but individuals may be dark or light colored. The weevil is active and unlike other

SEE PEPPER WEEVIL ON PAGE 6

**PEPPER WEEVIL FROM PAGE 5**

weevil pests the pepper weevil will fly. Because of their short generation time, 2 ½ to 3 ½ weeks, infestations can rapidly build up.

The odds of a pepper weevil infestation occurring are low, but as was mentioned earlier, considering the potential crop loss can reach 80%, it is prudent that pepper growers monitor for this pest.

Anyone wanting a copy of the power point presentation I have on pepper weevil biology and damage contact me either at 732-932-9802 or email – mahar@aesop.rutgers.edu.



Adult



Pupae (left) Larvae (right)

## Pest Notes

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

✓ **General:** We have accumulated over 600 degree days very quickly in the past week, which is above the threshold for our spring pests. This is evident by the high levels of insect activity in and around the fields: **European corn borer, corn earworm moths, Colorado potato beetles**, etc. Back to normal!

The registrants of endosulfan (Thiodan, Thionex) have requested a voluntary cancellation of endosulfan on succulent beans and peas, and spinach. Most likely, the EPA will agree and all future labels of Thionex/Thiodan will *not* have succulent beans and peas, and spinach. If the old label has these crops and the cancellation goes into effect, the product can still be used on them until existing stocks are gone.

Also, a new insecticide label has been approved for Oberon 2SC for use in corn, strawberries, potatoes, and vegetable crops for the control of **mites, whiteflies and psyllids**. In research trials, this product has been very effective against **two-spotted spider mites**, a pest to watch out for in the hot months of July and August in New Jersey. More information on this label as mid-summer approaches.

✓ **Beans:** Virginia reports early arrival of **potato leafhopper** adults on beans. In general, New Jersey can expect to see leafhoppers 1-2 weeks after Virginia. This pest can be very damaging, and causes “hopper burn” to the leaves. Monitor for the small, yellow nymphs on the undersides of the leaves, and if 1 nymph per leaf is observed, use either one of the recommended pyrethroids or dimethoate for effective control.

✓ **Cucurbits:** Platinum 2SC is now labeled on cucurbit vegetables for control of **cucumber beetles**. Apply Platinum at a rate of 5-8 fluid oz/acre using any one of the approved soil application methods listed on the federal label. Make only 1 application per season. A copy of this label should be in the possession of the user at time of application.

✓ **Eggplant:** **Flea beetle** populations are rapidly building in eggplant, and can still cause damage if population levels are high. All of the materials recommended are effective, including Actara, cryolite, Mustang MAX, Guthion, Provado, Thionex, Vydate L, and Warrior. Remember that growers should *not* use Actara or Provado after mid-June (next week) for insecticide resistance management (the object is to avoid the use of these materials *before* the second-generation **Colorado potato beetles** are present, thereby reducing the pressure on the beetle to develop insecticide resistance). It is strongly suspected that if the beetle becomes resistant to one of these new products (the neonicotinoids), it will become resistant to them all (Admire, Actara, Platinum, Provado, Assail are all neonicotinoid insecticides).

**SEE PEST NOTES ON PAGE 7**

**PEST NOTES FROM PAGE 6**

Emergence of Colorado potato beetles has been rapidly advancing, and beetle eggs and larvae can be found at this time as well. In addition to the neonicotinoids (see note above for flea beetles), effective control measures include Bt's (for larvae only, including Raven and Novodor), cryolite, SpinTor, Thionex, and Vydate L.

✓ **Potatoes:** Virginia reports the arrival of **potato leafhopper** adults on potato throughout the eastern shore, which is a little earlier than usual. This pest can cause "hopper burn" to a number of different crops, including potatoes, beans, and alfalfa. Crops treated with a systemic (Admire, Platinum) should be well-protected early in the season, but if not pre-plant or at-plant material was used, monitor for these pests closely for population buildup.

Assail 70WP has received a federal label for use on white and sweet potatoes for control of **aphids, leafhoppers, flea beetles, Colorado potato beetles, and European corn borer**. Use 0.6 – 1.7 oz Assail per acre, depending on pest (consult label for all rates, restrictions and

precautions). This product belongs in the neonicotinoid class of insecticides, and should be used accordingly (see eggplant above for recommendations on using this class of insecticides).

✓ **Pepper:** Assail 70WP insecticide has received a federal label for use on fruiting vegetables (all peppers, but not cucurbits) for control of **pepper weevil**. Use 1.7 oz Assail per acre per application, beginning when adults first appear and flower buds/fruit are present. Apply on a 7 to 14 day interval for effective control (for light populations, use the longer interval, and for heavy populations, use the shorter interval). Thorough coverage is important for effective management of pepper weevil.

✓ **Tomato:** The EPA has granted extension of an experimental use permit to Gargiulo, Inc. of Florida, for use of genetically engineered tomato plants to express the Bt gene for control of various worm pests. The states of CA, FL, VA, GA, MO, and IL have received this permit. These plants will effectively control pests such as **corn earworm** and **tomato hornworm**, and greatly reduce the need for foliar sprays of pesticides. □

## Weekly Weather Summary

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

Temperatures averaged near normal north and below normal central and south, averaging 66 degrees north, 65 degrees central and 64 degrees south. Extremes were 91 degrees at Canoe Brook on the 6th, and 43 degrees at Freehold on the 31st. Weekly rainfall averaged 0.48 inches north, 1.07 inches central, and 0.89 inches south. The heaviest 24 hour total reported was 1.23 inches at Toms River on the 3rd to 4th. Estimated soil moisture, in percent of field capacity, this past week averaged 78 percent north, 86 percent central and 62 percent south. Four inch soil temperatures averaged 59 degrees north, 63 degrees central and 63 degrees south.

Weather Summary for the Week Ending 8 am Monday 6/ 6/ 5										
WEATHER STATIONS	R A I N F A L L			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	.51	10.05	-2.10	88	47	67.	2	357	-75	75
CANOE BROOK	.41	10.52	-2.82	91	48	67.	2	500	105	76
CHARLOTTEBURG	.36	13.32	.09	88	47	64.	1	378	95	70
FLEMINGTON	.75	13.11	.46	87	46	65.	-1	437	22	79
NEWTON	.38	11.34	-.47	88	46	65.	1	402	70	74
FREEHOLD	.87	14.38	1.81	87	43	64.	-3	470	-15	92
LONG BRANCH	MISSING									
NEW BRUNSWICK	.98	12.06	-.30	88	50	66.	-2	475	-45	94
TOMS RIVER	1.34	13.56	1.04	88	49	63.	-1	383	-61	90
TRENTON	1.10	10.64	-.75	87	52	66.	-2	479	-88	87
CAPE MAY COURT HOUSE	1.13	12.15	1.11	81	47	60.	-7	305	-201	71
DOWNSTOWN	.65	11.33	.03	86	47	64.	-4	422	-159	62
GLASSBORO	1.05	12.58	.49	87	52	66.	-2	545	-16	78
HAMMONTON	.81	11.59	-.18	88	48	65.	-3	459	-94	64
POMONA	1.00	12.16	1.30	88	49	64.	-3	372	-109	83
SEABROOK	.73	12.09	1.58	86	53	67.	-1	584	-2	64
SOUTH HARRISON	.93	12.59	.65	87	53	65	NA	515	NA	NA
WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week* 127 (Ending 5/30/05) This Week 168 (Ending 6/6/05)										
* February total base 40 equals 32 units										

MILLTOWN, NJ 08850  
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**Pesticide User Responsibility:** Use pesticides safely and follow instructions on labels. The pesticide user is responsible for proper use, storage and disposal, residues on crops, and damage caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact RCRE in your County.

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