

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

AUGUST 20, 2003



Improving Postharvest Quality Begins at Harvest

William H. Tietjen, Warren County Agricultural Agent

Proper handling of produce after harvest will directly affect freshness and salability. Maintaining cool temperatures to slow deterioration and high humidity to prevent moisture loss are the most effective means of preserving quality. There are a number of additional factors to consider when striving to improve postharvest quality.

1. Harvest the product at the correct stage of maturity to have peak quality.
2. Reduce physical handling; each time a product is handled there may be additional damage due to cuts, abrasions, and bruising. Most of the postharvest diseases caused by fungi and bacteria are weak pathogens requiring an injury to gain entrance and cause rots.
3. Controlling temperature is the most important way to reduce deterioration. If possible, harvest early in the day. Use shade covers to keep produce out of direct sun.
4. Packing lines should be kept clean. Avoid or minimize the distance and speed that the product may encounter on the packing line. Impact bruising usually shows up during display at retail.
5. Use boxes or containers which prevent damage to the product during transit. Stabilize loads to prevent vibration, which causes bruising.
6. Cool the product after grading and packing. University of California research has shown that generally for every hour of delay from harvest to cooling, one day of shelf life is lost.
7. Know the handling requirements of your produce, i.e., temperature, relative humidity, sensitivity to chilling injury. See page A11 (Table A-6) for specific postharvest recommendations for vegetables in the *2003 Commercial Vegetable Production Recommendations*. In addition, the University of California Postharvest Technology and Information Center website has a wealth of information at <http://postharvest.ucdavis.edu>.
8. Employee training is essential to get workers to harvest and handle produce to minimize damage. Maintain strict worker hygiene at all points during postharvest handling and marketing.
9. At retail, display only good quality produce for sale. Poor quality will never improve. Shade the sales display from direct sun.

Following these guidelines will help to improve the salability of your produce by maintaining quality (appearance, texture, flavor, nutritive value and safety) and reduce losses between harvest and consumption. □

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Improving Drainage of Wet Soils with Gypsum

Joseph Heckman, Ph.D., Specialist in Soil Fertility

Higher-than-normal amounts of rainfall are stressful to crops grown on poorly drained soils. Use of gypsum to improve the structure and drainage of wet soils has a long history. The practice of applying gypsum (also called landplaster) to agricultural land began in Europe and the idea came to America around 1770. The New Jersey Agricultural Experiment Station published in 1953 an excellent bulletin entitled "Gypsum for Improving Drainage of Wet Soils". This article will summarize the major points of that bulletin, which is no longer in print, and offer a current perspective on how to use gypsum for soil improvement.

Application of finely ground gypsum improves soil drainage and aeration as a result of the binding of calcium to dispersed clay particles. This effect of calcium of bringing clay particles together into relatively unstable clusters is called flocculation. Calcium flocculation of clay particles is especially helpful on sodium or salt damaged soils. Although organic amendments such as manure or compost can also improve soil structure, the joint use of organic amendments and gypsum gives the best results (Figure 1).

The combination of calcium flocculation and organic matter decomposition can lead to the formation of relatively stable soil aggregates, improved soil structure and better water infiltration.

Wet spots are widespread on New Jersey farm fields. They typically occur in basins where there is no outlet for surface drainage. Because these low-lying positions often receive runoff from upland areas, the amount of water that needs to drain is far in excess of normal rainfall. Fine soil particles also tend to collect and settle in these wet spots, which further increases their tendency to puddle.

During dry years crops may grow fine but in wet years these ponded areas may result in reduced yield or in complete crop failure. Even a short period of ponding can cause stress to seeded or transplanted crops. Root development is curtailed due to lack of oxygen and due to the formation of toxic compounds in soil (reduced iron and manganese). Also, the crops may become starved for nitrogen because soil nitrate will be converted to gaseous forms of nitrogen that will be lost to the atmosphere.

Growers can still benefit from the research findings based on experiments conducted during the 1940's and 50's with the use of gypsum on New Jersey soils. The important findings and recommendations follow:

- ❖ Calcium sulfate applied in the form of the anhydrite (CaSO_4) or the hydrated form known as gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) were equally effective.

- ❖ Limestone (CaCO_3) also adds calcium to soil and improves flocculation, but gypsum is faster acting and more effective because gypsum has a much higher solubility.

- ❖ Applying organic amendments such as manure or compost in combination with gypsum is more effective for improving soil structure and water infiltration than either amendment applied alone.

- ❖ Gypsum is especially valuable for overcoming surface crusting. The recommended application rate of gypsum is 2 tons/acre. The gypsum should be applied to the soil surface with a lime spreader and disked in, followed by deep plowing, to achieve a through mixing with

Chemistry of Gypsum

When calcium sulfate is hydrated ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), or combined with water, it is called gypsum, and when it is free of water, it is referred to as the anhydrite (CaSO_4). Gypsum contains 23% calcium and 19% sulfur while calcium sulfate contains 29% calcium and 24% sulfur. Calcium sulfate gradually converts to gypsum when in contact with water. Finely ground gypsum is many times more soluble in water than finely ground agricultural limestone or calcite (CaCO_3).

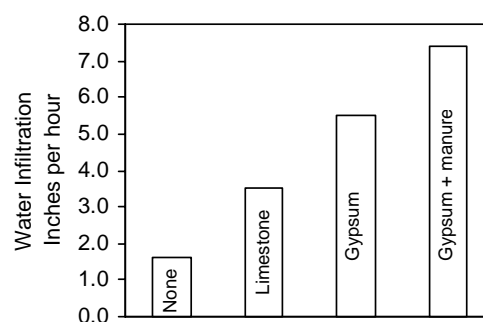


Figure 1. Effect of limestone, gypsum, and gypsum-plus-manure on water infiltration into a Sassafras soil. Limestone and gypsum were each applied at the rate of 4 tons/acre. Manure was applied at 10 dry tons/acre. Measurements were taken at 23 days after treatment.

the plow layer. Plowing should be deeper than usual for the greatest benefit. Deeper tillage and subsoiling may increase the effectiveness of the gypsum application.

- ❖ Some poorly drained soils cannot be helped with gypsum. On soils that are poorly drained because of a clay bed below the plow layer the use of gypsum may do little to improve water infiltration. Digging a hole to explore the soil profile for deeper impenetrable layers can help to identify sites where gypsum may not be effective.

- ❖ The application of gypsum at the rate of 2 ton/acre is slightly acidifying. On loam soils the pH may decrease by about 0.3 units.

- ❖ Gypsum is also an excellent source of plant available sulfur and calcium. The

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GYPSUM FROM PAGE 2

need for sulfur by New Jersey soils and crops is increasing as coal burning power plants reduce emissions of sulfur dioxide to curb acid rain.

Calcium can compete with magnesium and potassium for plant uptake. Thus, be careful to monitor and maintain a good balance of calcium to magnesium to potassium on soils that may have low soil test levels.

❖ Studies conducted on New Jersey soils with gypsum applied to poorly drained sites in the 1950's demonstrated that timothy, rye, and corn yields were increased by 27 to 75%. It is reasonable to assume that when gypsum improves drainage of wet spots, comparable benefits are likely to occur with today's crops.

❖ In addition to improving drainage, gypsum can provide other agronomic benefits. Improved seedling emergence on crusting soils has been documented. Gypsum can also improve water acceptance into the soil, decrease runoff, and conserve water for use by crops. Although wet spots will benefit most from the application of gypsum, a blanket application to fields prone to surface crusting may also be beneficial.

❖ Avoid the use of some by-product gypsums such as phosphogypsum which are known to contain radium.

❖ Mined gypsum may cost \$50 to \$100/ton or \$6.50/50 lb bag. Pelletized gypsum may cost \$260/ton. Recycled wallboard gypsum costs about \$65/ton.

❖ Considering that the beneficial effects of gypsum may last about three years, significant yield increases are required to make the outlay for gypsum economically viable.

References: Rinehart, J.C.; Blake, G.R.; Tedrow, J.C.F.; Bear, F.E. Gypsum for Improving Drainage of Wet Soils. New Jersey Agricultural Experiment Station Bulletin 772, June 1953. Rutgers University, New Jersey.

Shainberg, I.; Sumner, M.E.; Miller, W.P.; Farina, M.P.W.; Pavan, M.A.; Fey, M.V. Use of Gypsum on Soils: A Review. Advances in Soil Science, Volume 9, 1989. Springer-Verlag New York Inc. □

Late Blight Update

Wes Kline, Cumberland County Agricultural Agent

Late blight has been found in more processing tomato fields and some white potato fields. However, no reports have been received for fresh market tomatoes. Growers should be scouting fields on a weekly basis to check for the disease. A Special Local Need label (24c) has been received for the use of Curzate 60 DF to control late blight of tomato. Curzate is a systemic fungicide which has curative properties for infections that have occurred within 3 days prior to applying the product. Labeling of Curzate represents another tool for managing late blight. Where late blight is present, growers should be using this product at a rate of 5 oz/A. This product must be used in combination with either mancozeb or chlorothalonil. A copy of the label *must* be in the possession of the grower at the time of application. The label is available on the Rutgers Cooperative Extension label page at: <http://www.rce.rutgers.edu/labels> or from your county agricultural agent.

Three products are now available to manage late blight in tomatoes: Acrobat 50WP, Curzate 60DF and Gavel 75DF. Rotate these materials in combination with mancozeb and chlorothalonil on a five day schedule until the chance of late blight passes. Applying these fungicides more frequently is not recommended, nor is it necessary. The same schedule should be followed for white potatoes, but refer to the 2003 Commercial Vegetable Recommendations for spray materials. Drier weather and high temperatures will help reduce the spread of the disease. □

Vegetable Disease Update

Edited by Joseph Ingerson-Mahar, Vegetable IPM Coordinator

Report from Wes Kline, Cumberland County Agricultural Agent

The late blight infections noted last week on tomatoes have spread now to white potatoes in southern New Jersey. See previous article.

Report from Kris Holmstrom, Vegetable IPM Program Associate for Northern New Jersey

As of this morning (8/20) there has been positive identification of a **cucurbit downy mildew (DM)** infection in a pumpkin field near Quakertown, Hunterdon County. Given that this disease typically blows in from the south or southwest, it is probable that there are other infected fields around the state. Downy mildew of cucurbits is characterized by yellow lesions noticeable on the upper leaf surface with dark, fuzzy sporulation on the lower surface. Chlorotic lesions quickly become necrotic and cause collapse of infected leaves. It is critical to protect all cucurbit crops from DM infection. A regular 7-day protectant fungicide program for powdery mildew will help minimize DM injury as well. For fields at risk, consider using Acrobat 50WP at 6.4 oz/A, on a 7-day schedule or a Ridomil Gold product on alternate weeks with chlorothalonil (7-day schedule).

Phytophthora crown rot of cucurbits has increased dramatically following heavy rains in recent days. In the northern counties, some fields have lost the majority of winter squash as soils remain near their water holding capacity. Consult the *2003 Commercial Vegetable Production Recommendations* for materials that may aid in minimizing fruit and foliar infections.

Recent heavy rains and, in some cases hail, have resulted in increased severity of **bacterial canker** in some northern New Jersey tomato plantings. It is critical that field work should be conducted in the younger (less affected) plantings before entering infected plantings. This will help prevent spread to plantings that have not yet hit peak fruit production. □

Pest Notes

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

✓ **Cabbage:** Because the past recent weather conditions consisted of airstreams passing through New Jersey but originating in the deep south, it is likely we will see an increase in both **cabbage looper** and **diamondback moth**. The adults of these pests migrate into our area from the south, and can ride the wind currents for great distances. Monitor cabbage plants closely for small holes appearing in the leaves, and then determine which pest is causing the holes. It makes a difference because different pest control materials are effective against specific pest species, and may or may not control the pest that is present. See pages F14-F15 of the *2003 Commercial Vegetable Recommendations* for recommended materials for the different worm pests found on cabbage in New Jersey.

✓ **Corn (sweet):** Adults of all the worm pests are still active during the evening, including **corn earworm**, **European corn borer**, and **fall armyworm**. Because of the past weather conditions and patterns (hot air currents following the coast from Florida northwards to New Jersey), it is likely that the number of earworm and fall armyworm moths will increase in local blacklight traps and pheromone traps. Also, the hot days and warm nights are ideal for mating, oviposition and larval survival. The most effective spray materials for sweet corn ear protection include Asana, Baythroid, Fury, Mustang (Mustang Max), Lannate, Larvin, Pounce, Ambush, or Warrior. Direct sprays at the ear zone for maximum effectiveness.

✓ **Pepper:** Moth flights of **European corn borer** remain relatively high, and weather conditions are ideal for oviposition and larval survival. These pests deposit eggs on the plants that will hatch into small larvae that may bore directly into the fruit. Protective sprays must be on the plant as eggs hatch. Effective management materials include Orthene S or Orthene 97 (with either, a maximum of only 2 lb active ingredient is registered for use on pepper per season), SpinTor, Intrepid, and Avaunt. If **beet armyworms** (or **yellow-striped armyworms**) are present, SpinTor and Avaunt are the best options. As borer flights decrease, and **aphid** populations will likely not flare, then any of the pyrethroids will also be effective against the European corn borer. If pyrethroids have been used several times on peppers, look closely on the underside of the leaves for aphid outbreaks. If leaves or fruit appear "glistening", or extra shiny, it is an excellent indicator of aphid populations present on the leaf undersides. Consult page F58 of the *2003 Commercial Vegetable Recommendations* for New Jersey for thorough information on selecting the proper aphicide for the right aphid pest.

IPM Update

Kristian Holmstrom, Program Associate in Vegetable IPM

Sweet Corn

European corn borer (ECB) adult activity is moderate to high in many areas of New Jersey at this time. Trap catches in parts of Cumberland, Salem, Burlington and western Hunterdon Counties are the highest now (see ECB map). These adults will lay eggs on whorl through silking stage corn. Feeding signs will increase in sweet corn plantings through late August. Check fields weekly, and consider treating if greater than 12% of plants are infested with ECB alone or in combination with **fall armyworm (FAW)**. After the full tassel treatment, follow up with regular insecticide applications on silks as dictated by the local **corn earworm (CEW)** catches.

Note: There is no data from Monmouth, Ocean, or Middlesex Counties this week, so data has been extrapolated to cover those areas. The highest average nightly ECB blacklight trap catches are:

Little York	28	Allamuchy	6	Chester	4
Cohansey	26	Seeley Lake	6	Flanders	4
Phillipsburg	9	Belvidere	5	Snyder Farm	4
Elmer	8	Burlington	5	Shirley	3

SEE IPM ON PAGE 5

Pumpkin (cucurbits): Cumberland County Agricultural Agent Wes Kline has reported infestations of **squash bug** nymphs and adults. The nymphs are similar in appearance, but without the wings and more bluish-to grayish in color (they turn brown as they molt into the adult stage). Heavy populations can cause much damage. Effective materials include Ambush, Asana, Capture, Pounce, and Sevin. Obtain thorough coverage to ensure effective management of adults and nymphs.

Tomato: Watch for **stinkbug** population buildup, or for an increase in damage caused by stinkbugs. Southern states report an increase in the stinkbug population during the past 1-2 weeks, and it will likely be the same for the mid-Atlantic region. Timing of the application has been shown to be the most important factor in stinkbug management. Stinkbugs are best controlled when feeding damage on the fruit is first detected, usually early to mid-August for this area. Stinkbug damage is characterized by asterisk-like stars appearing on either green or red fruit, and is usually a yellowish or gold-like color when the fruit becomes red. It has a corky tissue in the fruit flesh underneath the peel. Individual spots may occur, or when damage is heavier, entire large blotches may appear on the fruit. Recent trials have shown that the most effective materials include Actara, Warrior, Baythroid, Thiodan, or Monitor. Thorough coverage of plant foliage is recommended for best results. □

IPM FROM PAGE 4

Corn earworm (CEW) adult activity has decreased throughout New Jersey over the past week. At this time, the highest CEW activity is in eastern sections of the state with scattered high catches elsewhere (see CEW map). The decline is largely due to a change in the dominant weather pattern, decreasing the migratory influx to our area from the south. We will continue to monitor populations and weather conditions throughout the region to try to provide advance warning of CEW populations. Silk spray schedules are critical to prevent significant losses to CEW. Cross-hatched areas on the map (green on the web) represent a population requiring a 3-4 day silk spray schedule, and dotted areas on the map (blue on the web version) represent a 5-6 day spray schedule.

Note: There is no data from Monmouth, Ocean, or Middlesex counties this week, so data has been extrapolated to cover those areas. The highest average nightly CEW blacklight trap catches are:

Fishing Creek	6	Indian Mills	4	Elm	2
Hammonton	6	Flanders	3	Elmer	2
Springdale	6	Medford	3	Hopewell	2
Denville	4	Bayside	2	Morristown	2

General Sweet Corn Spray Schedule

Silking Corn:	North	4-5 days
	Central	3-4 days
	South	3-4 days

Fall armyworm (FAW) infestations continue in whorl and seedling stage sweet corn plantings throughout New Jersey, and infestations as high as 30% have been reported in the northern counties. FAW will often feed on seedling and short whorl stage sweet corn. For this reason, it is critical to scout even the youngest plantings for the rest of the season. Look for feeding that initially looks like ECB damage, but rapidly progresses to ragged holes in the leaves with large amounts of droppings in the whorl. FAW can be tough to control because penetration by the insecticide through the layer of droppings is sometimes difficult. Scout fields weekly and consider treating when 12% or more plants are infested with FAW alone or in combination with ECB. Increased spray volume and pressure often assist in control of FAW.

Corn leaf aphids are now very common in pretassel stage sweet corn. These blue-gray aphids can become a nuisance to consumers as they move down the plant and get between husk layers on the ears. Their populations may be enhanced by repeated use of pyrethroid insecticides in the silk spray program. It is wise to make at least one application of methomyl or other non-pyrethroid insecticide in the silk spray program to minimize ear infestations of corn leaf aphid.

Corn leaf rust continues to be seen at low levels in northern counties. Cooler evening temperatures and heavier dew events favor the development of this disease. While scouting, look for pustules on the oldest leaves of plants. Pustules rupture, emitting reddish, powdery

spores. There is a wide range of host resistance to this disease, but some varieties can be adversely affected. Check the seed source for resistance in your varieties. If the variety is susceptible to leaf rust, pustules will increase on the plant until moisture stress causes a reduction in ear size. The potential for loss is greatest if the infection begins when susceptible plants are in the whorl or seedling stages. Later infections may not reduce yield, but can cause pustules on the husks, which may make ears less marketable. Consider using chlorothalonil or mancozeb (7 day schedule), or Tilt (7-14 day schedule) if rust is found in the seedling or whorl stages.

Pumpkins

As vines run, check plantings for the presence of **powdery mildew (PM)**. Look for powdery lesions on either surface of older leaves. A fungicide schedule may be initiated after 1 or more lesion is found per 50 older leaves. The recommended fungicide program is for chlorothalonil +Nova to be alternated with a strobilurin type fungicide at 7-10 day intervals. It is important to remember that Quadris (a strobilurin type) is effective on PM, but is highly phytotoxic to some apple types. For this reason, Flint is a good substitute if apples are to be sprayed with the same apparatus used for spraying pumpkins and winter squash.

IPM field technician Kirsten Haberkern noted **cucurbit downy mildew (DM)** Tuesday evening in a pumpkin field near Quakertown, Hunterdon County. Observation of spores in the lab this morning (8/20), confirmed that it is DM. Check fields weekly for the presence of diffuse yellow blotches on the upper surface of leaves with dark, felt-like sporulation on the lower surface. The sporulation frequently occurs along the leaf veins. If this disease is found in any field, immediately treat all cucurbit crops with fungicides on a 7-day protectant schedule, and report the occurrence to your county agricultural agent. Consult the *2003 Commercial Vegetable Production Recommendations* for spray materials.

Bacterial leaf spot has been noted in a few pumpkin fields. Foliar lesions are often water-soaked, and develop a yellow margin over time. Yellow or tan areas on and immediately surrounding veins may be seen on the underside of leaves. If these symptoms are noted in the field, consider adding copper to the regular fungicide program. Consult the *2003 Commercial Vegetable Production Recommendations* for proper formulations and rates.

Tomatoes

Maintain regular fungicide applications for **foliar diseases** on tomatoes. Wet weather has prevented some fungicide applications, and plantings are now showing greater levels of **alternaria**. Good disease management to preserve foliar cover for fruit is critical for good fruit quality.

Continue to monitor for **aphids**. Often, the first sign of significant aphid populations is cast skins on leaves below the colonies. If this condition exists in the field,

SEE TOMATOES ON PAGE 6

and fruit are sizing up, consider treating. Aphid populations that are present prior to fruit enlargement are often controlled adequately by natural predators and parasites.

Be sure to check field edges for the presence of **two-spotted spider mites (TSSM)**. TSSM will enter tomato plantings from field edges as surrounding vegetation dries up or is disrupted. Look for the whitish pin-spots (stipple) on the upper surface of leaves. Mites are often found on the lower surface. Spot treat for TSSM if possible, to prevent a greater infestation in the field.

This is the time of the season when **stinkbug** injury generally begins to increase significantly in tomato plantings. Stinkbug pressure in tomatoes tends to be heavier during dry seasons, and with this wet season, stinkbug injury has been minimal in scouted fields. Still, some adults in the *Euschistus* genus (larger, brown stinkbugs) have been captured recently in pheromone traps and found in corn tassels throughout the state. The adults will move into tomato plantings when surrounding host vegetation is too dry or is mowed. Adults and emerging nymphs will feed on green and ripening fruit, causing the large, yellow "cloudy-spot" injury. If this feeding is found to be increasing in samples, consider protectant sprays for stinkbug. Consult the *2003 Commercial Vegetable Production Recommendations* for spray materials.

Bacterial infections have worsened in several northern New Jersey tomato plantings following numerous heavy rains or hail. These diseases are characterized by marginal necrosis, or small very dark spots on infected leaves. If the disease is **bacterial canker**, there may be stem lesions and the "birds-eye spot" or white rimmed blister on the surface of affected fruit. Bacterial spot and speck cause dark lesions on the surface of infected fruit. As with all bacterial infections, avoid working in fields when the plants are wet. Surface sterilize pruning and tying tools between rows, and always work in infected plantings last. Copper with mancozeb may help minimize impact, although copper sprays can cause spotting on fruit. Actigard at the lowest recommended rate may also help. Actigard should be used weekly for a total of 6 applications.

Snap beans

ECB is a significant threat to snap beans in parts of New Jersey. Areas shaded in black on the ECB map (red on the web) represent adult populations capable of considerable damage to developing pods. In those areas, beans should be treated in the bloom and pin stages. Weekly protectant sprays should continue on developing pods as long as local ECB adult catches remain above 5 per night. Continue to monitor for **potato leaf hopper (PLH)** in beans. This pest is capable of severely stunting beans, and reducing yield. As populations build up in fields, and PLH reproduces in the crop, chlorosis and deformation of leaves may become apparent. When these symptoms of infestation appear, damage to the crop has already occurred. Insecticide applications directed at ECB often control PLH as well. For this reason, it is important to check regularly for PLH. Consider treating if adults and nymphs exceed 100 per 20 sweeps prior to bloom, or 250 per 20 sweeps at bloom, or 250+ during pod development. If a sweep net is not available, consider treating if nymphs are found in random samples covering all areas of the field.

Cole crops

Imported cabbageworm (ICW), **diamondback moth larvae (DBM)**, and **cabbage looper (CL)** are all active now on cole crops. In addition, **flea beetle** continues to be a problem on young plantings. Check plantings at least once a week for the presence of the above pests. Consider treating if greater than 20% of plants are infested prior to head formation or if greater than 5% are infested when heads are present. For collards, kale, mustard and other leafy cole crops, consider treating when 10% or more plants are infested with any larvae. Flea beetle infestations should be treated when the pest is present on more than half the plants in the sample and damage is occurring.

Alternaria is a threat to maturing cole crops now, and will remain so for the rest of the season. Look for necrotic lesions on older tissue. The lesions often have concentric rings within the borders. At the first sign of disease, begin a 7-10 day fungicide program. Consult the *2003 Commercial Vegetable Production Recommendations* for effective spray materials.

Peppers

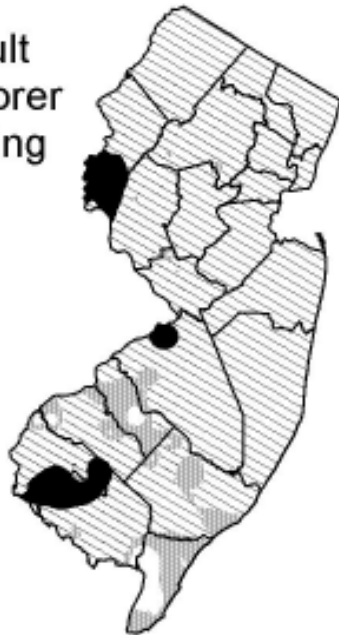
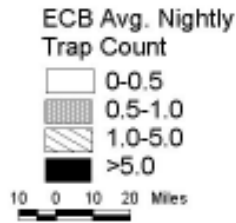
In areas where **ECB** activity is increasing, consider a weekly protectant insecticide schedule to prevent fruit injury. On the ECB map, cross-hatched and dark portions (shaded green and red on the web version) represent areas where ECB activity is a threat to pepper fruit. As eggs hatch, larvae will tunnel into the fruit around the cap. As the larvae feed in the fruit, bacteria enter and can result in a high incidence of **soft rot**. When scouting, look at two leaves and fruit on five consecutive plants in ten random locations throughout the planting. Consider treating for ECB if more than one eggmass is found in the field. Consider preventive treatments if fruit are present and local trap catches are greater than one moth per night on average. Consult the *2003 Commercial Vegetable Production Recommendations* for spray materials.

TSSM is a threat to pepper plantings at this time. Consider spot treating if TSSM appears in the planting. Early detection and spot treatments can help prevent a difficult infestation later.

High levels of **FAW** feeding in sweet corn are an indication the population is high enough to cause problems for peppers as well. When scouting, determine the type of caterpillars present in fruit (if any). FAW is generally brown in color, with an inverted "Y" on its head capsule. ECB is a pale caterpillar with a dark brown, flattened head. It is important to distinguish between the two, because Orthene is not as effective on FAW as it is on ECB. Consult the *2003 Commercial Vegetable Production Recommendations* for spray materials effective against both pests.

Bacterial leaf spot (BLS) has been found on bell peppers recently in the northern counties. This disease is characterized by necrotic spots and margins on leaves. When infected, plants often drop large numbers of leaves. Fixed copper combined with maneb at 7-10 day intervals may be useful in minimizing spread in the field. Consult the *2003 Commercial Vegetable Production Recommendations* for formulations and rates. High fertility levels (to increase foliar fruit cover) may help prevent scalding of fruit. Avoid working in wet fields.

Distribution of Adult European Corn Borer for the Week Ending August 20, 2003



Distribution of Adult Corn Earworm for the Week Ending August 20, 2003



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

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 above normal. Extremes were 97 degrees at Seabrook on the 15th, and 54 degrees at Belvidere on the 18th. Weekly rainfall averaged 1.17 inches north, 0.47 inches central, and 0.56 inches south. The heaviest 24 hour total reported was 2.03 inches at Belvidere on the 11th to 12th. Estimated soil moisture, in percent of field capacity, this past week averaged 88 percent north, 73 percent central and 66 percent south. Four inch soil temperatures averaged 73 degrees north, 77 degrees central and 77 degrees south.

Weather Summary for the Week Ending 8 am Monday 8/18/03

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	2.96	35.03	12.66	94	54	76.	6	2089	141	95
CANOE BROOK	.36	27.62	4.12	93	60	78.	7	1979	24	71
CHARLOTTEBURG	1.34	33.87	10.15	90	58	75.	7	1698	157	76
FLEMINGTON	.10	31.20	8.52	93	59	77.	6	2046	41	81
LONG VALLEY	.60	29.36	4.91	84	62	73.	5	1597	-137	79
NEWTON	1.64	30.94	9.07	91	59	76.	7	1895	116	80
FREEHOLD	.87	25.84	3.76	91	60	77.	5	2205	67	86
LONG BRANCH	.10	28.14	5.91	93	63	76.	4	2021	-38	57
NEW BRUNSWICK	.40	29.52	7.31	93	60	78.	5	2165	-58	86
TOMS RIVER	.91	27.11	4.32	93	65	78.	7	2185	140	87
TRENTON	.09	23.98	2.84	88	65	78.	4	2137	-189	49
CAPE MAY COURT HOUSE	.17	22.36	2.69	89	64	76.	2	2085	-117	52
DOWNSTOWN	1.25	24.53	3.73	91	65	78.	5	2233	-99	84
GLASSBORO	.24	25.63	3.87	92	63	79.	5	2361	52	61
HAMMONTON	.91	21.89	.10	93	65	79.	5	2333	21	84
POMONA	.44	21.89	1.91	93	65	78.	6	2186	30	51
SEABROOK	.38	27.09	7.13	97	65	79.	5	2418	74	64
ATLANTIC CITY MARINA	missing									
SOUTH HARRISON	.27	22.74	1.07	91	69	80.	NA	2341	NA	NA
WES KLINE — GDD BASE 40 PINEY HOLLOW	Last Week	257	(Ending 8/11/03)	This Week	264	(Ending 8/18/03)				

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