RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION $1.50 JULY 2, 2003

INSIDE

Vegetable of the Week: Beets

Michelle Infante-Casella, Gloucester County Agricultural Agent

The beet (*Beta vulgaris*) is a member of the goosefoot family, Chenopodiaceae. Other plants in this family include chard, spinach, and common pigweed. Beets are believed to be native to the Mediterranean area of Europe and North Africa, and a secondary area of development was located in the Near East. Many members of the beet family are found in areas with elevated salt levels in the soil, since beets are one of the most salt tolerant vegetables. Beets will tolerate alkaline soils, but are very sensitive to soils with low pH levels. Optimum pH for beets is 6.0-6.8. The roots of wild beets were used in ancient times as a source of medicine. Wild types did not resemble the cultivated forms we have today. In history, the fleshy root type we have today was listed in the sixteenth century. Cultivation of this vegetable did not become popular until the 1800's.

In the U.S. we produce approximately 14,000 acres of fresh market beets. Beets are a minor crop and are listed as 21st among the top 22 vegetable crops in the U.S. Leading states in order of production include Texas, California, New Jersey, Illinois, New York, Florida, Michigan, Oregon, and Ohio. Wholesale buyers of beets look for a good-quality product that is relatively smooth and firm with dark color and unblemished skins. Black pitting on the surface of roots at harvest may be a sign of Boron deficiency. Beet tops should look young, clean, fresh, and tender. Roots should be firm and dirt-free. Tops should not contain any dry, damaged, or discolored leaves. Beets should be stored around 32°F with 98-100% humidity. Typical shelf life for beets is 30-90 days when tops are removed, and 10 days for bunched beets. Although this crop is stored at low temperatures it is still sensitive to freezing injury if temperatures fall below 32°F.

There are hundreds of varieties of beets. Some specialty varieties may catch the interest of consumers and may fit into some niche markets. One specialty variety with roots containing red and white rings is 'Chiogga'. The tops are lighter green than other varieties and the stems and veins are more of a pinkish color than the deep purple of red root varieties. Another specialty type is the golden beet. This variety typically has low germination rates and should be seeded at higher rates to ensure good plant stands. See the *2003 Commercial Vegetable Production Recommendations* for more information on beet culture, pest control, and varieties.

Resources used for this article include: Vegetables: Characteristics, Production, and Marketing. L.C. Pierce; The Packer; Produce Availability and Merchandising Guide. ❑

Pest Notes

Gerald M. Ghidiu, Ph.D., Vegetable Entomology

✔ **Notes on European corn borer:** Delaware reports that scouts are finding 30% ear damage in sweet corn, and up to 100% whorl infestation in whorl-stage sweet corn, even though moth counts in light traps have been low to moderate. This indicates that moths have been active during the night, and the light traps may not indicate this activity. Also, with the high humidity and current warm temperatures, egg hatch and larval survival is high. Monitor sweet corn whorls, and still keep an eye on the blacklight and pheromone trap levels for moth activity. If bell pepper fruit are larger than 1.5 inches in diameter, and moths are active, it is advised to start a spray program for **corn borer moths**. The Eastern Shore Research and Extension Center, Painter, VA reports that damaged stems in potatoes, caused by European corn borer larvae, were very low in number even though moth flights peaked earlier. It is expected that similar patterns will be found in New Jersey potatoes.

✔ **Notes on spider mites:** Hot, dry weather is favorable to development of **spider mite** populations on many crops, including cucurbits, eggplant, tomato, pepper, and others. If Agri-Mek is used, do *not* combine with Bravo Weather-Stik or other fungicide with similar sticker, since it prevents the miticide from penetrating the leaf surface to provide effective, long-residual control. Dr. Tom Kuhar, at the Painter Research Station, suggests that Agri-Mek can be combined with other fungicides such as Quadris and is typically used with any of several different adjuvants, such as Latron B-1956 or 0.25% horticultural oils that do enhance leaf penetration.

For spider mite management, control the mites before the population reaches a high level, especially now that the hot temperatures are here. The mite-active pyrethroids, such as Capture or Danitol, are most effective when applied while the mite pressure is still low, and are much less effective once the mite population is high, although nearly all miticides work poorly after the mite population is high. The pyrethroids in particular do not make effective rescue treatments. Other miticides that are more effective when the mite population is increasing are Agri-Mek, dimethoate (Cygon EC), Kelthane, Metasystox-R, Vendex WP or Vydate L. Consult label for all rates, restrictions and crop listings before use. ❑

IPM Update

Kristian Holmstrom, Program Associate in Vegetable IPM

Sweet Corn

European corn borer (ECB) adult catches appear to have hit a peak in many areas late last week, with the focus of activity shifting to northwestern counties. As of the weekend, catches have begun to decline although still significant in most counties (see ECB map). The decline of the first ECB adult generation usually is coincident with large increases in feeding as the larvae hatch from eggmasses laid by the adults. This is now occurring throughout the state. Recent feeding numbers from Mercer and Hunterdon Counties have exceeded 50% of plants infested. Infestation rates in the 20-30% range are common in all areas. Larvae are easily found in emerging tassels at this time. ECB exposure to pesticide applications is never greater than when the tassel is spreading as it begins to shed pollen. This stage (full tassel to first silk) is often the last and best opportunity to clean up an ECB infestation before the larvae bore back into the plant near the developing ears. Continue to scout whorl and pre-tassel stage plantings at least weekly. Look at 5 consecutive plants in each of 10 random locations. Consider treating if 12% or more plants are infested. Feeding may be allowed to get higher than this prior to treating if the plants are still in the whorl stage, but it may take 2-3 applications prior to silking to clean up the infestation. Remember to make the full tassel application to eliminate remaining ECB larvae. Many sweet corn plantings are silking now while the first ECB flight is still occurring. For this reason, silking sweet corn should be treated periodically to prevent direct infestation by larvae resulting from eggs laid on or near ear flags. See silking spray schedule below. The highest average nightly **ECB** blacklight trap catches are:

Medford	5	Lawrenceville	3	Croton	2
Phillipsburg	4	Little York	3	Oldwick	2
Sergeantsville	4	Belvedere	2	Pole Tavern	2
Califon	3	Chester	2	Shirley	2

Corn earworm adult numbers are extremely low at this time, with local activity in central New Jersey (see CEW map). This pest is currently not a great threat to silking sweet corn in most areas. Catches in states to our south are reasonably low as well, although there have been some signs of increased adult CEW activity in North Carolina within the past few days. This may be important given the trajectory of the remnants of tropical storm Bill. This weather system is projected to pass through southern New Jersey on Thursday, and may be a potential carrier of CEW from areas to our south. There is no large adult population in those areas however, so large increases are unlikely in our area. Check local light trap catches and updates in next week's newsletter for further information on the status of CEW in New Jersey. The highest average nightly **CEW** blacklight trap catches are:

Allentown	1	Georgetown	1	New Egypt	1
Cranbury	1	Hammonton	1	Sykesville	1
Crosswicks	1	Medford	1		
Downer	1	Millstone	1		

See IPM on page 3

IPM from page 2

General Sweet Corn Spray Schedule

Silking Corn:	North	6 - 7 days
	Central	5 - 6 days
	South	6 - 7 days

Pumpkins

Cucumber beetles continue to be a problem on pumpkin and winter squash. Soil insecticides provide good control, but foliar applications may be warranted if nothing was applied at planting. Check fields weekly for the presence of cucumber beetles. Look at 5 consecutive plants in 10 random locations and consider treating if beetles are present at 6 or more sites, and the plants are in the 0-4 true leaf stage. Plants at this small stage are more likely to acquire damaging **bacterial wilt** infections. Also note the presence of **squash bugs** and their egg masses. This pest is a threat to plants in the 0-4 true leaf stage if adults or eggs are present at all sites. As plants begin to run, squash bug does little significant damage.

It is time to begin scouting the older plantings for **powdery mildew (PM)**. While looking for insects, observe two older leaves per plant for the white, powdery looking lesions that are characteristic of this fungus. PM often does not show up until fruit begin to develop. Begin the fungicide program when 1 or more PM lesions are found per 50 leaf sample. See the *2003 New Jersey Commercial Vegetable Production Recommendations* for fungicide selections.

No reports of **downy mildew** have materialized yet in New Jersey, and the Cucurbit Downy Mildew Forecast Site (http://www.ces.ncsu.edu/depts/pp/cucurbit/) from NC State University does not currently list the mid-Atlantic states as "at risk".

Tomatoes

Aphid populations are on the increase in some plantings now. This is generally not a significant problem unless fruit are sizing up, and are likely to be discolored by the **sooty mold** that develops on the sticky aphid droppings. If aphids increase prior to fruiting, they often can be left untreated, as natural predators and parasites generally control them. As insecticides are put on for other pests, enemies of aphids are killed off, and aphid numbers can increase dramatically. Fruit quality is an issue, and aphids must be controlled if they increase during later fruit development. Observe the undersides of leaves on 5 consecutive plants in 10 random locations. If aphids are increasing and fruit are sizing up, consider treating to prevent loss of fruit quality.

Maintain a regular fungicide program on fruiting plants to prevent foliar diseases like **early blight** and **septoria**, as well as **anthracnose fruit rot**. See the *2003 New Jersey Commercial Vegetable Production Recommendations* for fungicide selections.

Peppers

As **ECB** larval activity increases, damage to peppers becomes a significant threat. If 2 or more eggmasses are found on leaves in a 50 plant sample, consider treating. This is particularly important if fruit of greater than one half inch in diameter are present. If plants are small, ECB larvae may damage the central stems as well, and should be treated preventatively. **Aphids** are a threat to peppers also, as with tomatoes. Again, consider treating if fruit are present and quality is likely to be reduced by aphid droppings and **sooty mold**.

Advisory for Potential Pest – Orange Striped Underwing

Joseph Ingerson-Mahar, Vegetable IPM Coordinator

This large European moth with dusky brown to black forewings and bright orange hindwings with a prominent black stripe was first found in Nova Scotia in 1979. Since then it has spread south and west and probably currently inhabits much of the eastern US. The caterpillar called an army cutworm is a general feeder attacking many different vegetable crops including carrots, cabbage, potatoes, strawberries as well as shrubs and grass. So far it hasn't been a significant pest in the northeast.

However, this past week approximately 1500 moths of this species were collected in the blacklight trap at Eldora in southern New Jersey. Typical blacklight catches would be more like 20 to 30 moths per week. Growers and homeowners in the southern Cumberland County/northern Cape May area should be on the watch for feeding damage on their crops and ornamentals for the next month. Look for large egg masses (50 to 200 eggs) on the underside of leaves or on stems – initially the eggs are pale green but turn brown as they age. Newly hatched caterpillars would not eat much but the larger caterpillars which might reach 1 ¼ to 1 ½ inches would consume a considerable amount of plant material.

Caterpillar

Moth

Snap Beans

Consider treating plantings in bloom and pin stages in areas where **ECB** adult catches are 5 or more per night (crosshatched and darkest areas on the ECB map). **Potato leaf hopper (PLH)** activity is very high at this time. Legumes are a favorite host for PLH, and are susceptible to damage by PLH feeding. If a sweep net is available, consider treating when 100 or more adults and/or nymphs are found in 20 sweeps prior to bloom, or 250 + are found during bloom, or 500+ during pod development. If no sweep net is available, check 10 sites in the field. If adults and nymphs are present in all sites, consider treating. Re-sample prior to treating again. See the *2003 New Jersey Commercial Vegetable Production Recommendations* for insecticide selections.

See ECB and CEW Distribution Maps on page 7

Bacterial Canker on Tomato

Tom Zitter, Department of Plant Pathology, Cornell University

Reprinted from Southern Tier Produce News, Cornell Cooperative Extension, July 2003.

Bacterial Canker is a serious disease of tomato and is one of two bacterial diseases that truly are systemic in nature. Symptoms of bacterial canker occur both internally and externally. The marginal necrosis of leaves is one key external symptom and illustrates that spread can occur by heavy rains when abrasions on margins and stems allow bacteria to enter and spread to adjoining plants. Down the row occurrence can be expected, so this bacterial disease is highly infectious, contaminating hand, stakes and string used for trellising. The use of copper mixed with maneb can be used to lessen this external movement.

Plants are also infected internally, and browning of the vascular tissue is often most prominent at the nodes. Spray will not affect this stage of disease. A second bacterial disease that we occasionally see in New York is **tomato pith necrosis**. This bacterial infection is favored by low night temperatures, high humidity and excessive nitrogen, with the latter being a key component for disease occurrence. Affected leaves will show brown to black necrosis along the mid-veins and internally the vascular system will show extensive necrosis and blackening. Greatly enlarged leaves and internally blackened nodes is a common appearance. Occurrence of infected plants will be at random. Because this disease is truly systemic in nature, no chemical controls are effective. ❑

Vegetable Disease Observations in the Field

Michelle Infante-Casella, Gloucester County Agricultural Agent. With input from: Wes Kline, Cumberland County Agricultural Agent, Peter Nitzsche, Morris County Agricultural Agent, and Kristian Holmstrom, Program Associate, RCE Vegetable IPM

Cucurbits

- **Powdery mildew** has been found in Southern New Jersey on squash and melons.
- **Phytophthora crown rot** is especially a problem where water has laid and where the crop has been planted after other cucurbit or solanaceous crops.

Tomatoes

- **Bacterial speck** continues to be seen. However, spread of this disease has slowed due to more dry conditions. Always work in fields when foliage is dry and continue treatments for bacterial speck and spot listed in the *2003 Commercial Vegetable Production Recommendations*.
- **Timber rot (Sclerotinia)** has been found on stake tomatoes. To avoid this disease in the future rotate away from fields where snap or lima beans, peas, lettuce, or cucurbits have been grown. Timber rot generally occurs on the lower stem around the cotyledon scars. White cottony hyphae are first seen and the stem melts and rots. Next, small black stone structures appear. These are the fruiting bodies of the fungus. Allowing for good drainage and air movement in the field will help reduce this disease.
- A few instances of **pith necrosis** were found in tomatoes. Causal agent is *Pseudomonas corrugata*. This disease is favored by high nitrogen, high humidity, and moist conditions. It usually doesn't spread, but the typical recommendation is to do tool cleaning between rows to add oxygen to the soil. The disease causes plants to wilt above a lesion on one of the larger stems. Often lots of adventitious roots form above the lesion.

Peppers

- **Phytophthora crown rot** has been found in low-lying areas and where water has not properly drained from the field.

Peas

- **Root rot** is prevalent in processing fields. This is a complex of diseases which are the result of excess moisture. There is nothing that can be done this year. Root rots are favored by short rotations. Peas should be planted only once every four years and fields which have poor drainage or compacted soil should be avoided. Rotation with small grain crops will improve soil structure and reduce disease severity. Do not rotate with snap or dry beans.

Potatoes

- Although not a disease, ozone damage is often confused with disease symptoms. Ozone damage has been seen in susceptible varieties. This is not surprising since prior to these hot sunny days, the rainy, cool, overcast conditions caused plant tissue, especially leaves, to be soft and thin skinned. Ozone injury also shows up on occasion in some watermelon varieties. ❑

Strobilurin Resistance and Managing Powdery Mildew of Cucurbits

Margaret Tuttle McGrath, Ph.D., Associate Professor, Department of Plant Pathology, Long Island Horticultural Research and Extension Center, Cornell University

Reprinted from Southern Tier Produce News, Cornell Cooperative Extension, July 2003.

Resistance to strobilurin fungicides in the cucurbit **powdery mildew** fungus was detected in the USA in 2002. This was not surprising because strobilurin resistance had already developed elsewhere in the world. The cucurbit powdery mildew fungus has demonstrated a high potential for developing resistance. Resistance has developed to each chemical class active for powdery mildew that is at risk for resistance somewhere in the world following repeated use. Strobilurins are in fungicide group 11, quinone outside inhibitors (QoI). Strobilurins have been available for commercial use in the USA beginning in 1998 when azoxystrobin received Section 18 registration in some states for cucurbit powdery mildew. Federal registration was granted in March 1999.

Strobilurin resistance was documented in four fungicide efficacy experiments conducted in research fields in GA, NC, VA, and NY. In these fields, strobilurins, when used alone on a 7-day schedule (use pattern not labeled), did not effectively control cucurbit powdery mildew compared to previous years. Strobilurin efficacy was seen to decline dramatically after the second application in NY. Efficacy also was reduced in commercial fields in KY and research fields in AZ, CA, KY, IL, and MI in 2002 where strobilurins were used predominantly or exclusively. One resistant isolate was obtained from both the AZ and CA fields; however, this is not considered conclusive because the sample size was small. Isolates were not tested from KY, IL, or MI.

Resistance can be detected in research fields more easily than commercial fields, especially when control is not greatly affected. Reduced control is often the first indication that resistance has developed. Detecting reduced control is easier in research fields because there are also plants treated with other fungicides not affected by resistance and non-treated plants. Comparing all the treatments and considering how these treatments have performed in previous experiments reveals whether efficacy is indeed reduced. Poor application timing is another possible reason for reduced control; however, this would affect efficacy of other treatments as well. Resistance also can be more difficult to detect in commercial fields because other fungicides used with strobilurins in a program designed for managing resistance might provide enough control of powdery mildew to mask the presence of strobilurin resistant strains, especially if they are at a low frequency.

The type of resistance detected to strobilurins was qualitative, which means individuals of the cucurbit powdery mildew pathogen were either highly sensitive to strobilurins or highly resistant. With qualitative resistance, control cannot be regained by applying the fungicide more frequently and/or at a higher rate or by switching to a more active fungicide in the same chemical class, in contrast with quantitative resistance. All strobilurins will be affected by resistance.

When strobilurins were first introduced, several people involved with their development felt they had a moderate to low resistance risk. These are site-specific compounds, which have often indicated a high resistance risk; however, they have a new mode of action (inhibition of mitochondrial respiration) that was thought to be difficult for fungi to overcome. Resistance developed much more quickly than expected, but resistance did develop first in a pathogen with a past history of developing resistance to site-specific compounds. Resistant strains of the cucurbit powdery mildew fungus were found in 1999 after just two years of commercial use in four countries. Unexplainably, resistance was not detected in North America, despite the size of the pathogen population, until the fifth year of commercial use. Just as unexpectedly, resistance to strobilurins developed first in the USA in the fungus causing **gummy stem blight** and **black rot** in cucurbits. This was not expected based on past history with benomyl resistance in these pathogens. In the USA, control failure associated with resistance to benomyl was observed in the cucurbit powdery mildew fungus just 1 year after its registration for use on cucurbits, but it was not observed in the gummy stem blight fungus until 23 years after its registration.

Current general recommendations for managing fungicide resistance include using a diversity of fungicides having different modes of action, within an integrated disease management program that includes non-chemical practices, such as use of resistant cultivars. Fungicides at risk for resistance should be applied as infrequently as possible. Using a resistance management program will also minimize yield loss when resistance occurs. It is extremely important to evaluate disease control when using any fungicide that is at risk for resistance development. Extension staff or the fungicide manufacturer should be contacted promptly, while the crop is still there, if control is inadequate and there are no other feasible explanations, such as poor application timing.

The fungicide program that has been recommended by extension specialists in the USA for managing powdery mildew and resistance is a strobilurin fungicide (azoxystrobin formulated as Quadris® or trifloxystrobin

See Strobilurin Resistance on page 6

STROBILURIN RESISTANCE FROM PAGE 5

formulated as Flint®) applied in alternation with the DMI fungicide myclobutanil (formulated as Nova® or Rally®) tank-mixed with a protectant fungicide. This program uses two strategies for managing resistance: 1. alternation among systemic fungicides in at least two chemical groups and 2. inclusion of protectant fungicides which are not at risk for resistance development because they have multi-site mode of action. Myclobutanil is a triazole fungicide in the DMI activity group, which is fungicide group 3. Growers need to know what chemical group fungicides are in to avoid alternating among products in the same group.

Although isolates were not tested from commercial production fields, it is prudent for growers to consider improving their resistance management program. Strobilurin resistance likely occurred in commercial fields as well as research fields in 2002. Strobilurin resistance appears to be widespread in the USA. It was confirmed in GA, VA, NC, and NY. It is likely in AZ and CA. And efficacy of strobilurins was reduced in some mid-western states. The cucurbit powdery mildew fungus produces spores wind-dispersed over large areas. Inoculum for powdery mildew developing on cucurbit crops is thought to be wind-dispersed northwards through the eastern and mid-western USA each year. Occurrence of resistance in commercial fields will reduce the utility of strobilurins, including those not yet registered, and eliminate an important tool for managing DMI resistance. Strobilurins and DMIs are the only systemic fungicides registered for cucurbit powdery mildew in the USA.

One suggested change to improve resistance management is to apply a contact fungicide with strobilurins as well as with DMIs. Based on research with Microthiol Disperss® and JMS Stylet-oil®, sulfur and mineral oil are recommended for resistance management because they are more effective than chlorothalonil and other contact fungicides for powdery mildew on the lower leaf surface. Quadris applied in alternation with Nova and Microthiol Disperss was more effective than Quadris alternated with Nova and Bravo in an experiment conducted in Riverhead, NY, in 2002. However, chlorothalonil is recommended when other diseases are a concern. Sulfur is very inexpensive, but can be phytotoxic to melon. Oil is not compatible with chlorothalonil, captan, sulfur, Kelthane, and possibly foliar nutrients; these materials should not be applied within 2 weeks of an oil application.

Strobilurins should be used as little as possible for managing powdery mildew to delay build-up of resistant isolates. This will be challenging because these fungicides are effective against several different plant pathogenic fungi that are often present at the same time as powdery mildew. This group is unique in that these fungicides are the first synthetic, site-specific compounds to provide significant control of plant diseases caused by pathogens from all three major groups of fungi. Consequently they have quickly become a very valuable tool for managing diseases. Early in disease development is the best time to apply strobilurins for powdery mildew because they have outstanding ability to inhibit spore germination, however, other diseases controlled by strobilurins begin to develop later in the growing season than powdery mildew. No more than half of the applications in a season should include strobilurins. A limit of one-third is recommended in other areas of the world.

Strobilurins could be used more wisely if the proportion of the powdery mildew pathogen population that is resistant to strobilurins was known before the first application of these fungicides and the impact was known of resistance management programs on the pathogen population.

Managing resistance to DMIs is also extremely important. Resistance to this group of fungicides is quantitative, in contrast with the qualitative resistance detected to strobilurins in the USA. With quantitative resistance the pathogen exhibits a continuous range in sensitivity including highly sensitive individuals, moderately insensitive individuals controlled with high but not low rates of the fungicide, and resistant individuals that are not controllable with the fungicide. Presently in the USA the degree of resistance to DMIs is such that Bayleton, the first DMI fungicide registered, is no longer effective while new DMIs, Nova and Procure, are still highly effective, especially when used at high rates. These fungicides reportedly are no longer adequately effective in other areas of the world, which indicates the cucurbit powdery mildew pathogen has the genetic potential to develop a higher degree of resistance to the DMIs in the USA. To manage DMI resistance, apply these fungicides at the manufacturer's higher label rates and shorter application intervals.

Managing DMI resistance may be challenging. The strobilurin-resistant isolates examined in 2002 also exhibited reduced sensitivity to DMIs. Most individuals in the powdery mildew fungal population in 2002 that were insensitive to one of these chemical groups must have been insensitive to the other, consequently, applying either a strobilurin or a DMI fungicide shifted the population towards insensitivity to both.

It is important to recognize that the systemic fungicides registered recently for cucurbit powdery mildew are not new chemistry. Cabrio is a strobilurin while Procure is a DMI fungicide. Some feel Procure may be sufficiently different from Nova that cross resistance between these may not always occur.

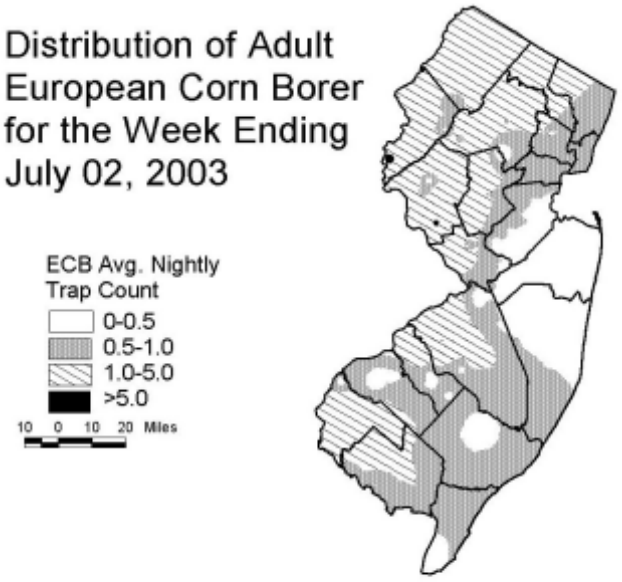
There are no new systemic fungicides in development that could be requested for use in 2003 through Section 18 or 24c registration in the USA.

The specific directions on fungicide labels must be adhered to — they supersede these recommendations, if there is a conflict. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended. ❑

Strawberry Update

Peter Probasco, Agricultural Agent

The variety trial at Pedricktown showed Chandler to be the best variety still at 15,000 lbs/A. We did find a new variety "Ovation" that is about a week later than Chandler with some even larger primary fruits. It yielded 11,850 lbs/A, but would be a good fit with Chandler if you wanted some later strawberries. Flavor of Ovation was very good and plants are available from Nourse Farms in Deerfield, Mass. Overall yields were down this year from the past year since we lost a lot of fruit buds from the cold winter. Spraying of fungicides on a tight schedule allowed us to pick quality fruit despite all the rain. Retain sales were up since people realize New Jersey berries taste better. ❑



Data collected and processed by: Kris Holmstrom, Marilyn Hughes
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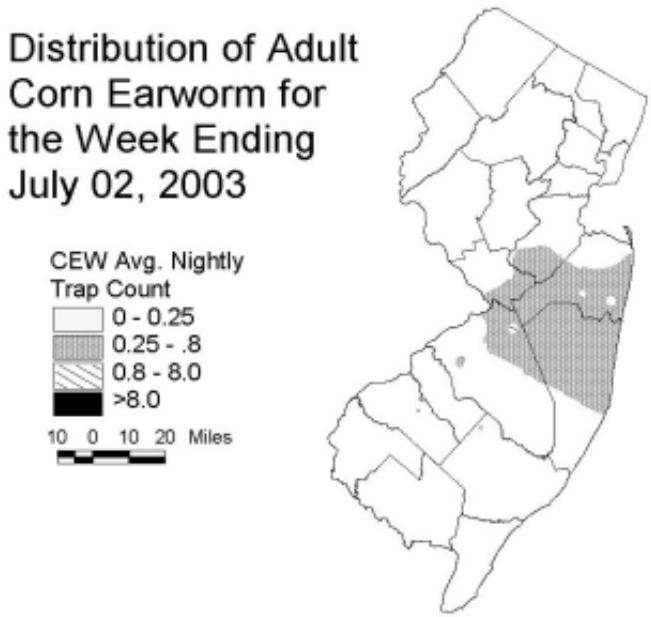

Data collected and processed by: Kris Holmstrom, Marilyn Hughes
Rutgers Cooperative Extension & Center for Remote Sensing

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged much above normal. Extremes were 98 degrees at Belvidere on the 27th, and 50 degrees at Belvidere on the 29th. Weekly rainfall averaged 0.00 inches north, 0.01 inches central, and 0.06 inches south. The heaviest 24 hour total reported was 0.13 inches at Downstown on the 27th to 28th. Estimated soil moisture, in percent of field capacity, this past week averaged 82 percent north, 73 percent central and 63 percent south. Four inch soil temperatures averaged 72 degrees north, 73 degrees central and 74 degrees south.

Weather Summary for the Week Ending 8 am Monday 6/30/ 3

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	.00	22.12	6.87	98	50	75.	5	847	-23	68
CANOE BROOK	.00	22.74	6.37	97	60	78.	7	887	48	71
CHARLOTTEBURG	.00	23.69	7.11	94	52	75.	7	610	-47	69
FLEMINGTON	.00	20.70	5.05	93	60	76.	5	834	-36	76
LONG VALLEY	.00	18.58	1.84	88	59	72.	4	572	-147	69
NEWTON	.00	19.69	4.74	94	55	76.	7	748	11	72
FREEHOLD	.00	18.89	3.54	95	56	77.	5	919	-44	69
LONG BRANCH	.03	20.37	4.99	94	61	77.	6	786	-106	50
NEW BRUNSWICK	.00	20.83	5.86	95	61	78.	4	879	-145	75
TOMS RIVER	.01	18.73	3.48	96	57	77.	5	886	-3	46
TRENTON	.00	18.42	4.46	92	57	77.	3	863	-210	49
CAPE MAY COURT HOUSE	.00	15.33	1.78	92	60	77.	5	848	-122	43
DOWNSTOWN	.14	18.25	4.44	94	57	78.	5	946	-145	55
GLASSBORO	.10	19.23	4.26	93	65	78.	5	1032	-38	54
HAMMONTON	.08	15.73	1.16	97	59	79.	6	996	-67	47
POMONA	.07	16.57	3.37	94	59	78.	6	875	-100	49
SEABROOK	.00	17.71	4.42	94	66	80.	7	1075	-23	48
ATLANTIC CITY MARINA	MISSING									
SOUTH HARRISON	.01	18.93	5.01	94	62	78	NA	1025	NA	NA

WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week 166 (Ending 6/23/03) This Week 264 (Ending 6/30/03)

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Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The pesticide user is reponsible 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 RCE in your County.

Use of Trade Names: No discrimination or endorsement is intended in the use of trade names in this publication. In some instances a compound may be sold under different trade names and may vary as to label clearances.