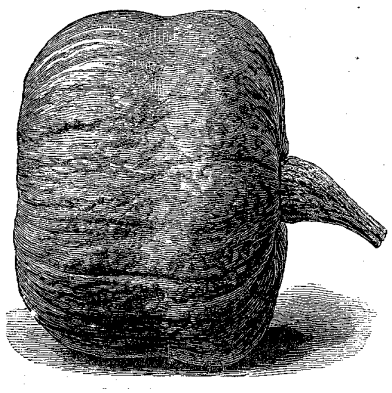
RUTGERS COOPERATIVE RESEARCH & EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION $1.50 SEPTEMBER 21, 2005



INSIDE

Vegetable Disease Update

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

✔ **Cole Crops – Downy mildew** can be a problem in fall cole crops (cabbage, collards, broccoli, cauliflower and kale). Infection begins as irregular yellow spots on leaves which later turn brown. A white fluffy growth develops on the underside of leaves during cool moist weather. When the disease first appears apply a fungicide every 7 to 10 days. Bravo, maneb, Ridomil Gold Bravo and Aliette are labeled. For more information on control please see the *2005 New Jersey Commercial Vegetable Production Recommendations*.

✔ **Cucurbits – 'White speck' of Pumpkin –** also known as Microdochium or Plectosporium blight causes small, distinct lesions on infected vines, petioles, leaves, handles and fruit. Symptoms include light tan to pure white 'spindle-shaped' lesions that have a dry, scabby appearance. These small 'white specks' often coalesce to form large, dry scabby whitish-tan areas on infected plant parts. Heavy vine infection can lead to complete defoliation and handle and fruit infection can ruin aesthetic fruit quality. Control of White speck begins with proper rotations with crops other than cucurbits. Maximum coverage with fungicide applications is necessary. For more information on control please see the *2005 New Jersey Commercial Vegetable Production Recommendations*.

✔ **Cucurbits – Powdery mildew –** Powdery mildew is developing on cucurbits in south Jersey. Powdery mildew typically occurs from mid-July until the end of the season. Unlike Downy mildew, the diagnostic characteristics of Powdery mildew are pure white 'fuzzy' growth on both the upper and lower leaf surface, petioles and stems. Symptoms typically begin on older, lower leaves and can develop and spread rapidly under dry, humid conditions. Control of Powdery mildew begins with regular scouting for symptoms and weekly fungicide applications. Fungicide resistance management of the fungus which causes Powdery mildew is critical. Fungicides with a high risk for resistance development such as the strobilurins (Cabrio, Pristine, Flint, Amistar, Tanos, Group 11) should be tank mixed with a protectant fungicide such as Bravo (M4) or Sulfur (M1) and rotated with fungicides of a different chemistry such as Bravo (chlorothalonil, M4 + Nova or Procure (Group 3). Group 3 fungicides are also high-risk and should never be applied alone. Growers need to read

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and follow restrictions on labels carefully. For more information on control of Powdery mildew and other important diseases of cucurbits please see the *2005 New Jersey Commercial Vegetable Production Recommendations Guide*.

✔ **Cucurbits – Downy Mildew –** Downy mildew continues in all cucurbit plantings. In some fields Downy mildew has caused 100% loss. Growers should take great precautions to keep Downy mildew under control. If Downy mildew has been a problem in fields, growers should scout and continue on a weekly fungicide maintenance program. There are a number of fungicides labeled for control of Downy mildew and many will help control other important diseases in cucurbits. For information on control of Downy mildew and other important diseases of cucurbits please see the *2005 New Jersey Commercial Vegetable Production Recommendations Guide*.

✔ **Leeks – Purple Blotch –** Symptoms of Purple blotch include tannish-brown, elongated, concentric, circular lesions with chlorotic margins. Lesions run parallel with the leaf veins. Development of Purple blotch is favored by warm night temperatures. Fungicide applications should begin in the fall as soon as transplants are set out on 10-day intervals as long as night temperatures remain warm. There are a number of fungicides labeled for the control on Purple blotch. . For more information on control please see the *2005 New Jersey Commercial Vegetable Production Recommendations*.

✔ **Parsley – Septoria Blight /Bacterial (blight) leaf spot –**Leaf spots caused by **Septoria blight** are easily distinguished by small, angular to round leaf spots with grayish-brown centers with a definitive dark, brown margin. Numerous black fruiting bodies develop and are visible in the center of lesions. Spread of Septoria blight is by wind-driven rain, heavy dews and overhead irrigation. Workers and equipment may also spread the disease during wet conditions. Best management practices include i) proper crop rotations of at least 2 years and by using clean or treated seed ii) *scout fields early* for symptom development iii) keeping workers and equipment out of fields with wet foliage iv) plowing under residue of harvested crop and avoid planting in fields adjacent or near previously infected fields. Applications of asoxystrobin (Amistar or Quadris) and fixed copper can be alternated every 7 days for control. 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 spread of **Bacterial leaf spot** as long as fixed copper is included with the azoxystrobin. If Oxidate is used, follow the label carefully.

✔ **Spinach – White Rust –** Symptoms of White rust include *irregular, chlorotic areas on the upper leaf surface with white, blister-like pustules developing on lower leaf surface.* Development of White rust is favored by cool nights and mild day temperatures with *prolonged periods of dew or fog which favor wet leaf surfaces*. Control of White rust begins with crop rotations of 2 or more years. Some varieties have partial resistance and should be used if possible. A preventative fungicide schedule should begin 2 to 3 weeks after planting, and/or *if weather conditions favor disease development***.** There are a number of fungicides labeled for the control of White rust on spinach. For more information on the control of White rust on spinach please see the *2005 New Jersey Commercial Vegetable Production Recommendations*.

✔ **Tomato – Anthracnose –** Symptoms of Anthracnose are easily diagnosed. Symptoms on ripe fruit appear as water-soaked circular lesions that often have a lighter colored tan center. Black fruiting bodies are often visible in the center of Anthracnose lesions. Control of Anthracnose begins with preventative fungicide applications. Fungicides labeled for other important foliar and fruit diseases of tomato will help control Anthracnose. If fruit-ripening agent has been used, additional fungicide applications may be necessary to help control Anthracnose. For more information on control please see the *2005 New Jersey Commercial Vegetable Production Recommendations*. ❑

Disease Briefs

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

Damping-off of Spinach

Damping-off can be a serious disease in newly seeded spinach causing reduced, irregular stands and yield. Damping-off can be caused by a number of soil-borne fungal pathogens, including *Fusarium*, *Rhizoctonia*, and *Pythium* spp. Damping-off may kill seedlings prior to emergence (pre-), or cause seedlings to suddenly collapse and die soon after they emerge from the soil (post-). Symptoms of post-emergence damping-off often include the sudden wilting seedlings with water-soaked areas developing on young stems and roots. Damping-off is favored by wet conditions in poor or slowly drained soils. Soil temperature may also influence the activity of soil-borne pathogens. Rhizoctonia typically prefers warmer soils and *Pythium* spp. typically prefer cooler soils. Control begins with proper field selection and seedbed formation on well-drained soils; planting high-quality, treated seed; and preventative fungicide control measures. Apply Ridomil Gold 4E at 1 to 2 pt/A or Ultra Flourish 2E at 2 to 4 pt/A as a pre-plant incorporated or a soil surface spray after planting. For more information on control please see the *2005 New Jersey Commercial Vegetable Production Recommendations*.

Cucurbit virus survey

The Vegetable Pathology lab, in coordination with county agricultural agents and the Rutgers Plant Diagnostic Laboratory in New Brunswick will be conducting a survey of virus-infected cucurbit crops this fall. Four viruses can typically be found in cucurbit crops. These include **CMV (cucumber mosaic virus)**, WMV (watermelon mosaic virus), ZYMV (zucchini yellow mosaic virus) and PRSV (Papaya Ringspot Virus, formerly known as WMV-I). Although diagnosing the problem can be easy (these viruses all produce similar and recognizable symptoms on infected hosts) determining which virus(es) are infecting cucurbit crops (in any given year) requires a special test. Growers who have had virus problems in their cucurbit fields and/or who are beginning to see virus symptoms develop should contact their county agent for more information on how to participate. ❑

Pest Notes

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

✔ **IR-4** – At the recent IR-4 Food Use Workshop meeting held in San Diego, CA, there were 3 projects approved for study this year:

- Fipronil applied in furrow for **carrot weevil** control in parsley
- Actara applied to cucumbers for **cucumber beetle** control
- Carzol (miticide) to onions for **thrips** control

A fourth project *may* get funded this year, which is dinotefuran (a new neonicotinoid class of insecticide) for **whiteflies** in greenhouse tomatoes.

Plus, as a bonus, the importance of **stink bugs** was brought to the forefront, and several research projects will be funded for a close look at stink bug control. Because stink bug activity has been increasing, and damage to tomatoes, peppers, peaches, and other crops has also been increasing from year to year, the general concern was that we need to know which materials are working best on the various stink bug species, and we need new chemistry insecticides for future control of these pests in various crops. Plus, the marmorated stink bug is a serious threat to most of our crops, and is already in the state and moving south into Mullica Hill, Swedesboro, and other areas.

All in all, a very successful meeting was held, and the vegetable growers received a lot of attention and some of our concerns were addressed.

✔ **General:** Pest activity, in general, has been declining throughout the state as fall approaches. The current hot weather, however, has allowed **corn borer moths**, **fall armyworms**, **beet armyworms**, and **corn earworms** to remain active, and can still cause damage to late crops.

Beet armyworms have been reported to be causing damage in peppers, beans, and tomatoes during the past several weeks. Weather has been favorable to their development, and egg masses can still be found on the undersides of leaves of these crops. Dr. Tom Kuhar, Virginia Tech University, recently conducted lab tests on these pests, collected from the field, to determine which insecticides are most effective. He reports that Avaunt and Intrepid have worked the best, followed by SpinTor, Lannate, and Bt (*Bacillus thuringiensis*) products. The pyrethroids have been relatively ineffective. It is important to identify this pest while still in a small larval stage for proper management. Using a material that is ineffective will allow this worm to survive and become even larger, making it more difficult to control. Treat with the right material, obtain thorough coverage, and get the sprays on the plant while the pest is still in the early instar stages and your management tactics will be perfect.

European corn borers are still a pest, and if the weather stays warm, will continue to be a pest. During extended falls, a late 2nd generation, or even a partial 3rd generation of moths can occur, resulting in late borer infestations in the field. However, the weather predictions are for very cool weather to reach our area beginning this weekend. Cool or cold nights will reduce or stop the moth flight activity, which will finally bring an end to the threats from this pest in tomatoes, corn, peppers, beans, and other crops. During the next two weeks, much depends on the local weather patterns. ❑

IPM Update

Kristian Holmstrom, Research Project Coordinator II, Vegetable IPM Program

Sweet Corn

Adult **European corn borer (ECB)** activity declined further over the past week, as the flight slows. The highest trap catches are now coming from western Warren County at this time (see ECB map). Be sure to check all remaining non-silking sweet corn plantings for signs of ECB damage. Check 5 consecutive plants each in 10 random locations. Look for the "shot-hole" type injury on leaves and discolored sections in the emerging tassels. Consider treating when 12% or more of plants show fresh feeding signs. Additionally, be sure to treat these early sweet corn plantings as they go to full tassel and first silk. This application will help eliminate remaining ECB larvae before they can re-enter the plant near the developing ear. Current **corn earworm (CEW)** adult numbers require silk spray schedules that will be sufficient to prevent ECB damage to developing ears by larvae that have been deposited on or near the ears themselves. The highest average nightly ECB blacklight catches are:

Belvidere	12	Califon	2	Tabernacle	2
Allamuchy	5	Centerton	2	Little York	1
Mullica Hill	3	Seeley Lake	2	Port Colden	1
Hackettstown	3	Shirley	2	Sewell	1

Over the past week, CEW activity has increased somewhat as southerly breezes have preceded recent weather fronts. Highest activity is currently in coastal Cumberland County (see CEW map). In general, the current population is one that requires a 3-day silk spray schedule to manage effectively. On the map, cross-hatched areas (green on the web version) http://www.pestmanagement.rutgers.edu/IPM/Vegetable/Pest%20Maps/maparchive.htm) warrant a 3 day silk spray schedule. Black areas on the map (red on the web version) indicate a 2-3 day spray schedule. The highest average nightly CEW blacklight catches are:

Jones Island	13	Denville	6	Indian Mills	4
Hackettstown	7	Chapel Heights	5	Mannington	4
Hammonton	7	East Vineland	5	Seeley Lake	4
Chester	6	Farmingdale	4	Tabernacle	3

Fall armyworm (FAW) is active throughout the state, with infestations common. Damage is quite high in some cases. This pest will lay eggs on all stages of sweet corn, including large seedlings. As a result, it now becomes critical to include seedling stage corn in scouting activities. Initial injury to sweet corn appears as "window-pane" type feeding on leaves, with damaged areas progressing down toward the whorl. As the larvae increase in size, they begin to chew large, ragged holes in the leaves, and their brown droppings are quite obvious. Consider treating when 12% or more plants are infested with FAW alone, or in combination with ECB.

General Silking Spray Schedules*:

North – 3 days
Central - 3 days
South - 3 days

*Note: These are general recommendations. Local trap catches may indicate some variation in the frequency of insecticide applications to silking sweet corn.

Pumpkins

As fields mature, it is important to determine when to discontinue fungicide applications. Fields still having adequate foliage should be treated to limit **powdery mildew (PM)** and **downy mildew (DM)** damage as long as fruit must remain in the field for several more weeks. If foliage is largely gone, or fruit are to be removed promptly, it is not necessary ton continue the foliar program.

Check fields for large **melon aphid** populations. This pest is not likely to limit size or numbers of fruit at this late stage, but is present in such high numbers that their droppings are accumulating on the surface of fruit below the leaves, resulting in a sticky coating on the fruit. A good rain can remove these droppings, but if that does not occur, the sooty mold may begin to grow on the coating, making them unappealing to consumers. If foliar cover is still present in the field, and aphids are increasing on the undersides of leaves, consider an insecticide application to limit the deposition of droppings on fruit. Coverage on the underside of leaves is critical to control. Avoid synthetic pyrethroid insecticides, as these may make the problem worse.

Now is the time to monitor fields frequently for the return of **cucumber beetles**. These insects often feed on maturing fruit late in the season, causing scarring on the rinds. This injury is more severe on large varieties like 'Atlantic Giant' and 'Prizewinner', where the beetles frequently bore into the flesh, causing rot to set in. Check 100 fruit at random at least weekly. If cucumber beetles or fruit injury are seen in more than one area of the field, consider treating to limit further damage.

Peppers

Aphids and **TSSM** are all appearing in peppers at this time. Monitor fields weekly for the presence of these organisms. Check 2 leaves and 2 fruit per plant on 5 consecutive plants in 10 random locations in the field. Observe the under sides of leaves for aphids and mites. Consider treating if aphid numbers exceed 100 per 100 leaf sample or there are fruit on the plants that are being disfigured by the sticky droppings of the aphids. Consider treating for TSSM if more than 10% of sampled leaves are infested. (Spot treatments may be useful if the infestation is localized). Observe fruit and leaves for the light or silver-colored streaks caused by thrips feeding. Consider

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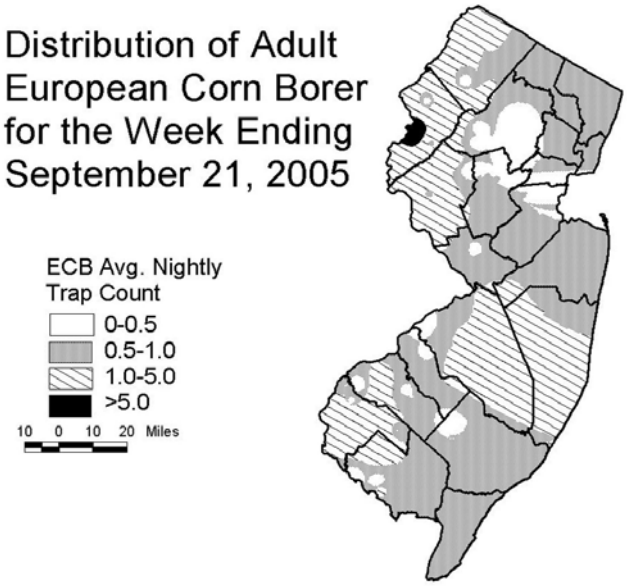
treating if thrips are found on 10% or more fruit, or 10% or more plants or fruit are showing signs of fresh feeding.

With current **ECB** and **CEW** activity throughout the state, it is important for all pepper plantings to be protected against fruit infestation by these pests. Both larvae will penetrate fruit just under or near the cap, resulting in increased incidence of soft rot. Plantings should be treated weekly to minimize injury. Consult the *2005 Commercial Vegetable Production Recommendations* for labeled materials. On the ECB map, peppers in any black, shaded or cross-hatched area are at risk for infestation. On the CEW map, areas in black (red on the web version) are at risk from CEW infestation also.

Beet armyworm (**BAW**) activity has increased both in area and numbers caught over the past week. On the BAW map, the shaded area indicates a light population that is not likely to be injurious at present levels. The crosshatched area represents a moderate population, and scouting of peppers for injury should be undertaken in that area. The black region on the map indicates a potentially damaging population. Fields in this area should be scouted frequently for the first signs of BAW feeding. BAW catches remained high in Cumberland, Salem and Atlantic Counties over the past week. High catches over the past week include 222 adult BAW per night near East Vineland and 138 per night near Seeley Lake in Cumberland County. BAW larval feeding has been reported on tomatoes near the Camden-Atlantic County border. Initial BAW feeding occurs on leaves near the growing terminals. Foliage has numerous ragged holes, and the small green larvae may be found curled up near the buds. As the larvae enlarge, they begin to damage fruit, and become much harder to control. Scouting is critical to optimizing control of BAW.

Cole Crops

Cabbage looper (CL), **imported cabbageworm (ICW)**, **and diamondback moth larvae (DBM)** infestations are high in many cabbage, broccoli and other cole crop plantings at this time. These caterpillars do considerable damage to the larger leaves before moving onto developing heads as the plants mature. They are capable of causing significant loss on all crops, but especially on collards and kale, where the mature leaf is the saleable portion. Check 5 consecutive plants each in 10 random locations in the field. Consider treating if greater than 20% of heading type cole crops are infested prior to head formation and if greater than 5% are infested when heads are present. For leafy greens, consider treating if 10% or more plants are infested at any time.



Data collected and processed by: Kris Holmstrom, Marilyn Hughes
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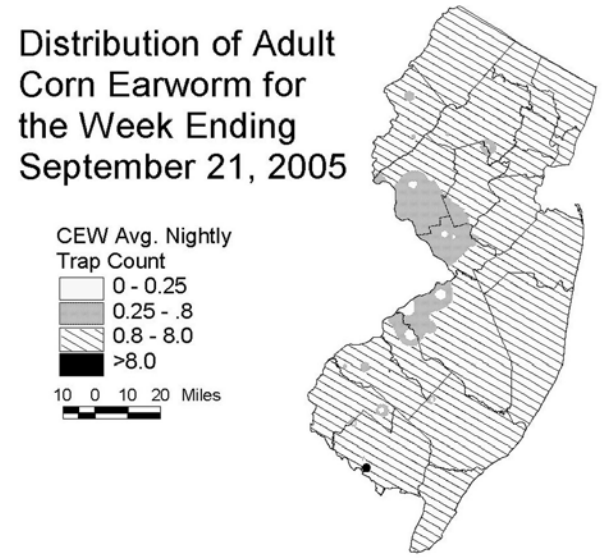

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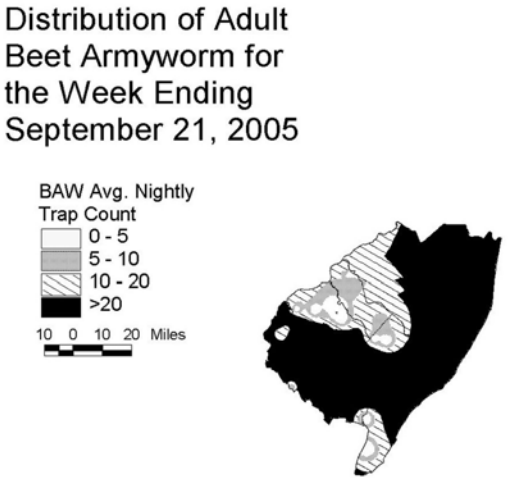

Data collected by Joe Mahar and processed by Kris Holmstrom
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Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged much much above normal, averaging 73 degrees north, 75 degrees central and 77 degrees south. Extremes were 95 degrees at Canoe Brook on the 14th, and 53 degrees at Charlotteburg, Newton and Freehold on the 13th. Weekly rainfall averaged 1.55 inches north, 0.90 inches central, and 0.53 inches south. The heaviest 24 hour total reported was 2.71 inches at Canoe Brook on the 14th to 15th. Estimated soil moisture, in percent of field capacity, this past week averaged 76 percent north, 61 percent central and 39 percent south. Four inch soil temperatures averaged 72 degrees north, 73 degrees central and 73 degrees south.

Weather Summary for the Week Ending 8 am Monday 9/19/ 5

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	missing									
CANOE BROOK	2.82	22.39	-5.93	95	56	76.	13	3255	752	90
CHARLOTTEBURG	1.55	23.64	-4.96	90	53	72.	12	2696	709	80
FLEMINGTON	.55	25.18	-1.92	93	55	74.	11	3050	484	68
NEWTON	1.26	20.07	-6.28	90	53	72.	12	2820	578	79
FREEHOLD	.39	24.12	-2.22	93	53	74.	9	3081	360	64
LONG BRANCH	.06	22.52	-4.16	91	60	75.	10	3066	401	33
NEW BRUNSWICK	1.43	25.12	-1.63	94	58	75.	11	3228	371	84
TOMS RIVER	.03	23.94	-3.33	89	55	75.	10	3021	351	31
TRENTON	2.60	26.80	1.48	92	58	76.	10	3266	300	79
CAPE MAY COURT HOUSE	.47	25.11	1.47	88	57	76.	8	2865	175	34
DOWNSTOWN	.39	20.20	-4.64	93	56	75.	9	3111	133	42
HAMMONTON	.02	21.82	-4.23	93	59	77.	11	3206	251	22
POMONA	.28	20.80	-2.92	93	56	77.	12	3123	366	35
SEABROOK	1.47	23.59	-.30	92	63	78.	11	3454	457	70
SOUTH HARRISON	.45	24.98	-.48	91	60	77	NA	3192	NA	NA

*SOME CUMULATIVE VALUES ESTIMATED DUE TO MISSING PAST DATA
WES KLINE — GDD BASE 40 PINEY HOLLOW
Last Week 201 (Ending 9/12/05)
This Week 251 (Ending 9/19/05)

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