

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

JULY 16, 2003



Weather Phenomena that Affect Adult Corn Earworm Populations in New Jersey

Kristian E. Holmstrom, Program Associate in Vegetable IPM

The corn earworm, (CEW), is a perennial pest of vegetable crops in New Jersey, including sweet corn, peppers, legumes, tomatoes, and lettuce. CEW adults are strong fliers, capable of speeds of over 5 m/sec without the aid of wind. Wind-aided CEW have been reported to travel great distances in a single night, depending on wind speed at the altitude the moths attain. CEW overwintering in New Jersey is inconsistent, with success only occurring over very mild winters. When local overwintering takes place, New Jersey experiences a May-June population of CEW adults. Typically however, CEW does not begin to hit significant levels until some time in July. At this time, New Jersey generally goes through a gradual increase in adult CEW population that may remain relatively stable for the remainder of the season, or suddenly increase with weather patterns that aid migration of this pest into the region.

Recently emerged CEW moths exhibit behavior that enables them to take advantage of prevailing winds. Shortly after sunset, CEW adults fly upward, frequently gaining altitudes of several hundred meters above ground level where wind speeds are higher. This behavior allows greater long-range dispersal. It is expected that the arrival of mid-to-late summer storms of tropical origin will bring with them a large number of CEW adults. Such systems are turbulent, and if traveling from the south or southwest, will aid in CEW transport to northern areas.

A review of CEW trap catches for the past four seasons reveals that the large, sudden increases in New Jersey were not associated with tropical storms. Rather, they were likely the result of local emergence combined with migratory individuals transported to our area following emergence events in states to the south. The transport system in each case was not a tropical storm, but appears to be an extended period of southerly winds during moth emergence. Breezes from the south and southwest are not uncommon in New Jersey during the summer. When conditions causing this weather pattern occur during CEW emergence in the mid-Atlantic region, however, we see dramatic increases in our adult CEW population. One critical period in New Jersey is the first two weeks of August. This follows CEW emergence to our south, and with

SEE WEATHER ON PAGE 2

INSIDE

Weather Phenomena that Affect Adult Corn Earworm Populations in NJ	1
Physiological Disorders of Tomatoes	2
Pest Notes	3
IPM Update	4
Weekly Weather Summary	6

WEATHER FROM PAGE 1

favorable winds, moths may come to our area. A similar phenomenon may take place in early September. Much of what happens depends on weather patterns. Cold fronts approaching New Jersey from the north or northwest often result in abrupt decreases in CEW activity in our area. This may be a combination of lower temperatures and wind shifts to the north.

Pest maps created from the blacklight network operated by the Rutgers Cooperative Extension Vegetable IPM Program alerts growers in time to respond to CEW levels in New Jersey:

www.pestmanagement.rutgers.edu/IPM/Vegetable/Pest%20Maps/maparchive.htm.

It may be possible however, to anticipate these sudden increases in New Jersey by monitoring CEW trap catch activity from states to our south. Virginia Tech:

www.vaes.vt.edu/tidewater/insectadvise,

and North Carolina State University:

http://ipm.ncsu.edu/current_ipm/

pest_news.html are good sites, because they regularly post CEW blacklight catches, and because they are well to our south, giving us some advance warning of when emergence is occurring. It is also

important to know the direction of prevailing winds during these CEW emergence periods. There are many sites posting current weather, summaries, and forecasts, including wind direction. For our area, one useful site is the National Weather Service (NWS) Philadelphia/Mt. Holly forecast office:

www.erh.noaa.gov/er/phi/index.html.

Begin looking at Virginia and North Carolina catches in mid July for increases. When increases occur, look at the forecast wind direction. If sustained winds are from the south or southwest, there is the potential for significant CEW increases in New Jersey within 1-2 weeks. □

Physiological Disorders of Tomatoes

Wes Kline, Ph.D., Cumberland County Agricultural Agent and Stephen Garrison, Ph.D., Specialist in Vegetable Crops, Emeritus

The following conditions are really not diseases and applying a fungicide will not control them. We have been seeing several disorders this summer with the adverse weather conditions. The first tomato cluster has few if any tomatoes, which is the result of poor pollination. Following are some of the disorders found in early tomatoes this year.

Puffiness

If fruits appear square or angular, cut some open to see if there are seeds inside. The fruit that is set may have few seeds, resulting in poorly shaped fruit. Cavities may be empty or with little jelly. The reason is inadequate pollination caused by low (less than 55°F) or high (100°F or over) temperature, or improper fertilization (high nitrogen or low potassium). Proper fertilization will help minimize the disorder.

Gray wall, Blotchy Ripening or Yellow Eye

Irregular, grayish-brown blotchy areas (GW) can occur on the upper half or side of fruit. On ripening, fruit with GW or blotchy ripening (BR) have blotchy areas of green and yellow tissue surrounded by areas of normal red tissue. Greenish-white and white tissue is usually present in the fruit walls, and brown necrotic areas may be located around the vascular system of the fruit. Yellow-eye, a ring of yellow tissue surrounding the stem scar, often occurs in fruit with BR and internal white tissue.

GW and BR symptoms often appear on shaded fruit growing in the interior of dense, vegetative plants. Cloudy, moist, cool weather, high soil moisture, high nitrogen, soil compaction; and low potassium increase the incidence and severity of the disorders. Varieties differ in their susceptibility. Maintaining proper nutrient levels and variety selection will help reduce these problems. This is a good year to check how the early varieties perform.

Catface

Catfacing has been observed on first harvested fruit. The symptoms are enlarged scars and holes in the blossom end. Cold weather occurring about three weeks before flowering begins has been shown as one cause. There are differences among varieties for this disorder. Check to see if there are differences among the varieties being grown. □

Pest Notes

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

New Additions for imidacloprid (Admire 2F, Provado 1.6F) labels for New Jersey:

- Legumes – for **aphids, leafhoppers, thrips, whiteflies**
- Okra – added Okra to the label for fruiting vegetables for **aphids, flea beetles, leafhoppers, thrips, and whiteflies**.
- Root vegetables (horseradish, radish, parsnips, beets, carrots, celeriac, turnip, etc) – for **aphids, leafhoppers, flea beetles, whiteflies**.
- tuberous and corm vegetables (yams, etc) – **aphids, leafhoppers, whiteflies**.
- leafy vegetables (cilantro, parsley, radicchio, dandelion, etc) for **aphids, leafhoppers, whiteflies**.
- greenhouse cucumber and tomatoes (Admire 2F for mature plants in production greenhouses) – **aphids, whiteflies**.

✓ **General: Cancellations** (from Long Island Fruit & Veg Update):

Syngenta Crop Protection has announced that all registrations for diazinon will be cancelled. For **Non-Agricultural** uses, such as lawn and garden, end-use products containing diazinon made by Syngenta can be sold until December, 2004. Product containing diazinon made by Syngenta already purchased can be used until stocks are depleted. Sales of all **Agricultural** uses may continue until all stocks/supplies are used up. All diazinon in the hands of growers can be used until stocks are depleted. Note: this cancellation ONLY applies to diazinon products made by Syngenta, and does NOT apply to diazinon products manufactured by other companies such as Gowan, Makhteshim-Agan, etc.

✓ **Leafy vegetables, endive, escarole, lettuce:** **Leafhopper** populations are exceptionally high at this time because of the favorable weather conditions during the past 2 weeks. If populations are still low, several pyrethroids are available that will help manage the population, including Fury, Mustang or Mustang Max, Warrior or permethrin (Pounce, Ambush). If populations are higher, consider dimethoate (Cygon) or Lannate.

✓ **Tomatoes:** Southern states report moderate to high levels of **thrips** in tomatoes, both larvae and adults, including **tobacco thrips**, which is one of the species that transmits **Tomato Spotted Wilt Virus**. Guthion, Monitor, Provado, and SpinTor are labeled for thrips control in tomato. It is important to use high volume, high gallonage for effective management of thrips.

✓ **Sweet Potato:** Reports from Virginia indicate that high numbers of **wireworm** adults (**click beetles**) are being caught in traps throughout the area. They recommend that sweet potato growers apply 3-4 foliar applications of carbaryl (Sevin) or other labeled materials for control of wireworms as the population increases in the traps. Foliar applications directed at the base of the plant help reduce the adult population as they attempt to deposit eggs in the soil.

✓ **Squash:** Monitor squash and pumpkin fields for **squash bug** adults, nymphs and egg masses for increasing infestations. These pests can cause severe damage if populations increase as they inject toxic saliva into the plant which causes the plant to wilt, turn black and die. After vines begin to run, watch for adult buildups at the base of the plant, and for the eggs and nymphs on the leaves. More weedy fields, or no-till fields, generally have more squash bug problems than conventional and/or clean fields. Several pyrethroids (Asana, Ambush, Capture, Pounce) and carbaryl (Sevin) are labeled for squash bug control in cucurbits.

✓ **Pepper:** This is about the time of the year that **beet armyworm** moths oviposit on pepper plants. Look for masses of small worms on the upper canopy of pepper plants, and the appearance of “window pane” damage to the leaves (young beet armyworm larvae and damage are similar in appearance to **leaf miner** and **leaf roller** damage). After increasing in size, larvae stop foliage feeding and enter fruit. Effective materials for beet armyworm on pepper include Avaunt, Confirm, Intrepid, Lannate and SpinTor. Control of these pests is much easier with small larvae than with large larvae.

✓ **Potatoes:** For long season potatoes, watch for build-up of **potato leafhoppers**. These pests can still cause significant damage to potatoes, and often build up to damaging levels before discovery. Effective materials when the population is low include the pyrethroids Ambush, Asana, Baythroid, or Pounce. If the population is high, consider Actara, Guthion, Imidan, Lannate, Provado, Thionex (Thiodan), or Vydate. □

IPM Update

Kristian Holmstrom, Program Associate in Vegetable IPM

Sweet Corn

European corn borer (ECB) adult trap catches are very low throughout much of the state. We are between adult flights in most of New Jersey, with light activity focused in the central counties (see ECB map). Larval infestation rates are quite high in many areas despite lower than usual adult catches. Many pre-tassel stage plantings have ECB infestation rates of 50-60% at this time. Be aware that it may take several applications to reduce this infestation to acceptable levels. When the emerging tassel is still bound together, some protection is provided to ECB larvae. The time when the planting goes to full tassel is optimal for successful control. After the full tassel treatment, follow up with weekly insecticide applications unless local **corn earworm (CEW)** catches require a tighter schedule. Plantings now in the short whorl and seedling stage should remain free of ECB infestations for some time. The highest average nightly ECB blacklight trap catches are:

Shirley	3	Cedarville	1	Milltown	1
Cranbury	2	Centerton	1	New Egypt	1
Millstone	2	Cohansey	1	Shirley	1
Allentown	1	Georgetown	1	Woodstown	1

CEW adult activity remains low in the state. At this time, most CEW catches are in the central counties, with a few sporadic catches in Atlantic and Cape May Counties (see CEW map). Activity in states to our south is relatively low. We will continue to monitor populations and weather conditions throughout the region to try to provide advance warning of CEW populations. In areas where CEW are being caught, spray schedules are necessary to protect developing ears. The shaded area on the map represents a population requiring a 5-6 day silk spray schedule. The highest average nightly CEW blacklight trap catches are:

Allentown	1	Egg Harbor	1	Green Creek	1
Centerton	1	Fishing Creek	1	Matawan	1
Cranbury	1	Folsom	1	Millstone	1
Crosswicks	1	Georgetown	1	New Egypt	1

General Sweet Corn Spray Schedule

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

Sap beetles have been observed in all areas recently. These pests will infest corn ears following insect or bird damage. In varieties where the ear grows to the end and through the husk, sap beetles may infest without previous damage. If sap beetle is observed in pre-tassel corn plantings, a silk spray schedule should be initiated even

in the absence of CEW. Weekly treatments should minimize sap beetle damage.

Corn leaf aphids have recently appeared in some plantings. These blue-gray aphids are often present in the tassels beginning in mid-Summer, and 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.

Pumpkins

Squash bug is a common insect found in pumpkin fields at this time. This insect looks like a gray-brown, elongated stinkbug. Its eggmasses are copper colored, and laid in regular rows on the underside of leaves. Squash bug is an economic problem if it reaches high numbers (approaching 1 adult/plant) when pumpkins and winter squash are in the 0-4 true leaf stage. After this, feeding from squash bug is rarely damaging.

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.

Tomatoes

Maintain regular fungicide applications for **foliar diseases** on tomatoes, and monitor fields for **aphid** buildup. Often, the first sign of significant aphid populations is cast skins on leaves below the colonies. If this condition exists in the field, 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.

With warm weather, **two-spotted spider mite (TSSM)** has begun to appear in some tomato fields. While scouting tomatoes, look for the characteristic "stipple" or whitish pin spots on the upper leaf surface. TSSM will be feeding on the lower surface. Scout at least once a week, and try to identify initial local infestations. This permits spot treatments, and makes TSSM easier to control. If left to infest the entire planting, TSSM can be very difficult to manage.

Bacterial canker has appeared in several northern New Jersey tomato plantings. This disease is characterized by marginal necrosis on infected leaves, followed by stem lesions and the "birds-eye spot" or white rimmed

SEE IPM ON PAGE 5

IPM FROM PAGE 4

blister on the surface of affected 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.

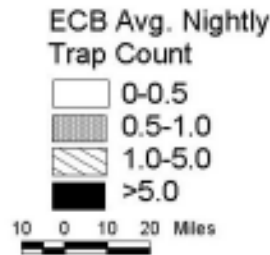
Snap beans

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 controls PLH as well, but ECB treatments are not necessary at this time. 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

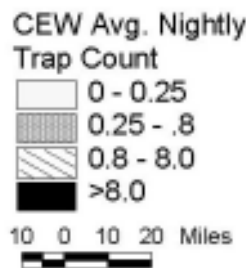
Imported cabbageworm (ICW), **diamondback moth larvae (DBM)**, and **cabbage looper (CL)** are all active now on cole crops. In addition, **flea beetle** continues to be a problem on some plantings. Check plantings at least once a week for the presence of the above pests. Consider treating if greater 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.

Distribution of Adult European Corn Borer for the Week Ending July 16, 2003



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

Distribution of Adult Corn Earworm for the Week Ending July 16, 2003



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 slightly above normal. Extremes were 93 degrees Canoe Brook on the 8th, and 52 degrees at Charlotteburg on the 14th. Weekly rainfall averaged 0.41 inches north, 0.53 inches central, and 1.07 inches south. The heaviest 24 hour total reported was 1.14 inches at Seabrook on the 9th to 10th. Estimated soil moisture, in percent of field capacity, this past week averaged 58 percent north, 57 percent central and 73 percent south. Four inch soil temperatures averaged 73 degrees north, 77 degrees central and 78 degrees south.

Weather Summary for the Week Ending 8 am Monday 7/14/ 3

WEATHER STATIONS	R A I N F A L L			TEMPERATURE				GDD BASE50		MON
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	.34	22.50	5.30	90	59	75.	3	1215	68	48
CANOE BROOK	.75	23.49	5.19	93	62	75.	2	1256	109	64
CHARLOTTEBURG	.11	23.85	5.36	90	52	69.	-1	909	-12	45
FLEMINGTON	.88	21.58	3.96	90	59	73.	-1	1176	-8	67
LONG VALLEY	.13	18.71	-.14	84	58	70.	-1	864	-129	51
NEWTON	.25	20.10	3.28	89	57	71.	0	1079	63	54
FREEHOLD	1.18	20.18	3.01	91	62	76.	2	1294	9	69
LONG BRANCH	.34	21.04	3.91	91	65	78.	4	1175	-35	37
NEW BRUNSWICK	.31	21.17	4.22	89	62	75.	0	1248	-114	61
TOMS RIVER	.65	20.82	3.47	92	63	77.	3	1268	48	59
TRENTON	.19	18.89	2.86	89	62	75.	-1	1225	-194	36
CAPE MAY COURT HOUSE	.88	17.53	2.36	90	65	76.	1	1226	-76	59
DOWNSTOWN	1.37	20.49	4.74	89	63	76.	1	1317	-115	77
GLASSBORO	.54	20.97	4.14	90	65	76.	1	1417	6	61
HAMMONTON	1.29	18.08	1.44	92	65	77.	1	1386	-20	70
POMONA	.74	18.97	3.95	91	65	77.	3	1261	-39	63
SEABROOK	1.59	21.63	6.43	92	66	77.	1	1465	24	89
ATLANTIC CITY MARINA	missing									
SOUTH HARRISON	.94	20.35	3.45	90	65	76	NA	1408	NA	NA
WES KLINE — GDD BASE 40 PINEY HOLLOW										
Last Week	260	(Ending 7/07/03)								
This Week	251	(Ending 7/14/03)								

FIRST CLASS
POSTAGE PAID
PERMIT #576
MILLTOWN, NJ 08850

Rutgers Cooperative Extension - NJAES
U.S. DEPARTMENT OF AGRICULTURE
Rutgers - The State University of New Jersey
Plant & Pest Advisory
18 College Farm Road
Cook College
New Brunswick, N.J. 08901-8551

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION CONTRIBUTORS

Rutgers Cooperative Extension Specialists

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

George Hamilton, Ph.D., Pest Management

Joseph R. Heckman, Ph.D., Soil Fertility

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

Rutgers Cooperative Extension County Agricultural Agents

Atlantic, Richard W. VanVranken (609-625-0056)

Burlington, Raymond J. Samulis (609-265-5050)

Cape May, Russell Blair (609-465-5115)

Cumberland, Wesley Kline, Ph.D. (856-451-2800)

Gloucester, Michelle Infante-Casella (856-307-6450)

Hunterdon, Winfred P. Cowgill, Jr. (908-788-1338)

Mercer, Daniel Kluchinski (609-989-6830)

Middlesex, William T. Hlubik (732-745-3443)

Monmouth, Bill Sciarappa, Ph.D. (732-431-7260)

Morris, Peter J. Nitzsche (973-285-8300)

Salem, Peter R. Probasco (856-769-0090)

Warren, William H. Tietjen (908-475-6505)

Vegetable IPM Program (732-932-9802)

Joseph Ingerson-Mahar, Vegetable IPM Coordinator

Kristian E. Holmstrom, IPM Program Associate

NJAES Sustainable Agriculture Coordinator

Olga Wickerhauser

Newsletter Production

Jack Rabin, Associate Director for Farm Services, NJAES

Cindy Rovins, Crop Management Communications Editor

Rutgers Cooperative Extension (RCE) provides information and educational services to all people without regard to sex, race, color, national origin, disability, or age. RCE is an Equal Opportunity Employer.

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 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.

Reproduction of Articles: RCE invites reproduction of individual articles, source cited with complete article name, author name, followed by Rutgers Cooperative Extension, Plant & Pest Advisory Newsletter.

For back issues, visit our web site at: www.rce.rutgers.edu/pubs/plantandpestadvisory.