

# PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

SEPTEMBER 24, 2003



Crop residue. Source: Purdue University

## Crop Residue Management

*Joe Ingerson-Mahar, Vegetable IPM Coordinator*

Now that the growing season is coming to an end, it seems that it is too early to begin thinking about next year's crops and management. The reality, of course, is that it is not. How this cropping year wraps up could have a significant impact on next year's crops and pest levels.

A good example of this was the fall of 1999 after Hurricane Floyd broke the drought that year. It remained cool and wet with crops, especially field corn left in the field. We may have similar conditions this year as well. There has been ample rain and Hurricane Isabel has flattened some corn fields which may be difficult to harvest. Whether the ground dries enough to allow harvesting, remains to be seen. As in the spring of 2000, if we have a substantial number of fields remaining unharvested then we may see a surge in spring populations of **European corn borer**.

The same thing can happen with other insects and plant diseases. Undisturbed plant residues may contain disease pathogens that overwinter and reinfest susceptible crops in the spring of the following year. That is why our production recommendation books include residue management practices such as mowing and plowing, and in some cases, burning of the residue. In situations where the crop residue can't be turned under or burned, crop rotation in the following year becomes more of a factor. If the previous crop residue can't be broken down, then move susceptible crops to other locations on the farm.

For those of you who are planning to sell your produce as IPM produce, you will find in the IPM crop guidelines (available at the RCE website, under the vegetable pest management program) that residue management is one of the high priority items to be done by growers to manage disease pests.

Of course, for those with sloping ground, you must be aware of erosion problems that could be compounded by fall plowing. If erosion is a severe problem, then you may require the assistance of either your county agent or local Natural Resources and Conservation Service representative to help plan the best way to manage both crop residue and soil conditions. □

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# Decontaminating and Storing Sprayers

Andrew Landers, Ph.D., Pesticide Application Technology Specialist, Cornell University

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## Sprayer Decontamination and Maintenance

Sprayers must be thoroughly decontaminated, inside and outside, after use. Regular maintenance of spraying equipment will prolong its life and ensure accurate trouble-free operation. This allows spraying to be done with the minimum loss of time and taking full advantage of favorable weather conditions.

NOTE: Read the manufacturer's instructions before beginning to wash out a sprayer. Wear protective clothing appropriate to the pesticide which has been used. This may include an apron, rubber gloves, boots and face shield.

It is important to clean everything thoroughly including associated equipment such as mixers, the site where mixing and filling is done, and, of course, yourself.

## Dispose of Pesticide Waste

REMEMBER: Cleaning up should be done in such a way that washings DO NOT enter public sewers or any water courses, not fields which have under-drainage and certainly not catchment areas for boreholes or wells.

The safe disposal of pesticide waste is a serious responsibility for sprayer operators. It is important, therefore, that everything should be done to keep waste generation to a minimum. Remember that pesticide waste is of four types:

1. Concentrated products
2. Diluted pesticides including washings
3. Empty containers
4. Contaminated clothing and other materials

Try to keep the volume of tank washings to a minimum. Special low volume, inexpensive washing systems are now available which consist of a spinning nozzle(s) mounted in the tank. The device can be connected to a hose or water tank. Water passes through the rotating nozzle(s) and cascades down the inside walls of the tank.

## Preparation for Storage

Any spray liquid or contamination left in the tank should be disposed of correctly. Remove tank drain plugs or open drain cock. Hose down the inside and outside of the tank, including the tank top. Scrub where necessary or use a low volume pressure washer. Replace drain plug or close drain cock. Remove the suction, main and in-line filter elements. Wash them thoroughly in clean water with a soft brush and replace. Remove nozzles, nozzle filters and nozzle bar end caps if they are so

fitted. Soak them all in a bucket of water with a material recommended for cleaning of spray machinery. Scrub clean with a soft brush. Partly fill the tank and pump out to flush all parts. Ensure that you open and close boom valves a few times during the flushing to clean out crevices. Refill the tank with clean water or a recommended cleaning agent. There are about a dozen commercial tank cleaners designed to remove or neutralize most of the modern low-rate chemicals. If no cleaning agent is available, one gallon of household ammonia per 50 gallons may be used. DO NOT use chlorine-based cleaners such as bleach. Re-circulate for 15 minutes, and then pump a quantity through the pipes and booms. Leave the remainder for as long as practicable; overnight if possible. Discharge at least on quarter of the contents of the tank through the booms and drain the rest. Check that no deposits remain in the tank or filters. If any remain, hose them down and scrub them off. To ensure thorough cleaning and decontamination, the last three steps can be repeated. Store nozzles and filters in a safe place. Leave valves open and the tank lid loosely closed. Ensure that the sprayer and all parts are completely empty of water, especially the pump. If you are unable to completely drain the system, you can use an antifreeze solution. An environmentally safe antifreeze diluted to 50% may be acceptable. Hose down the outside parts of the sprayer, scrubbing if necessary. Ensure that the sprayer is parked safely and securely. Wash down waterproof clothing, apron, boots and face shield. Wash outside and inside of gloves with soap and water and rinse and dry them. Finally, thoroughly wash your face, neck and hands with soap and water.

## Mechanical Maintenance

Lubricate all appropriate parts prior to storage. Check oil levels. Check soundness of all components, particularly booms and boom hinges. Electrical connections and components which control valves, spray monitors, etc. should be cleaned and protected as directed by the owner's manual. Check wheels, wheel bearings and tire inflation.

## Storage of Sprayers

Store sprayers under cover, taking care to prevent dirt and moisture from affecting the tank or working parts. Remember sunlight softens and weakens rubber materials and can degrade plastic materials. Storing in a building also allows you the opportunity to conduct any routing or pre-season maintenance. □

### GLEANINGS FROM PAGE 3

The book can also be viewed on the Internet at <http://www.cnr.berkeley.edu/ucce50/ag-labor/>.

Labor Management in Agriculture (in English or Spanish) costs \$12.50 plus tax and shipping (where applicable) and can be ordered through the UC Cooperative Extension office in Stanislaus County. For more information, contact Elizabeth Resendez at 209-525-6800 or [eresendez@ucdavis.edu](mailto:eresendez@ucdavis.edu). (*From 'VegNet', Ohio State University Extension Vegetable Crops*) □

# Gleanings...from Around the Region

Rick VanVranken, Atlantic County Agricultural Agent

❖ **Loosen Compact Soil with Fall Tillage:** Compact zones in soils may develop gradually over time with normal field activities or as the result of a single field operation when soils are wet. Deep tillage can help break and ameliorate compact zones. For deep tillage to be most effective the soil needs to be somewhat on the dry side so that the soil fractures well as the chisel shanks move through the soil. If the soil is too wet, the shanks cut through the soil like a knife through soft butter, leaving only a groove that flows back together.

The most effective depth to run chiseling shanks is 2 inches below the compact layer. Going deeper provides no additional advantage and just uses more fuel. The depth of the compact zone or layer can be determined with a tile rod or penetrometer. Be sure to probe the soil in several areas of the field. A compact layer will probably vary. Breaking up compact zones will allow water to better infiltrate and eliminate ponding on the soil surface which in itself contributes to soil compaction. (From D. Warncke, Michigan State University via 'Long Island Fruit and Vegetable Update', Cornell Coop Extension of Suffolk County)

❖ **Time to Lime:** Fall is the best time of the year to apply finely ground limestone. The desirable pH for [New Jersey] soils for vegetable production is 6.0 to [6.5]. Low pH restricts the availability of phosphorous, increases the solubility of elements such as aluminum which are toxic at high levels, decreases the availability of molybdenum and boron and is usually associated with low levels of calcium and magnesium. ON the other hand avoid pHs above [6.8] for most crops. High pHs can lead to zinc or manganese deficiencies in crops such as sweet corn, snap beans, spinach, beets, onions and tomatoes. The choice of dolomitic (high magnesium) or calcitic (high calcium) limestone depends mostly on whether magnesium is needed. Both dolomitic and calcitic limestones supply calcium. However, calcitic limestone provides very little or no magnesium. It is recommended dolomitic limestone be used unless magnesium levels in the soils are high. If you don't want to increase the pH of the soil, gypsum (calcium sulfate) is an option to increase calcium levels. Gypsum (calcium sulfate) supplies calcium, but will not neutralize acidity. (From 'Long Island Fruit and Vegetable Update', Cornell Coop Extension of Suffolk County)

❖ **Rural Road Safety:** Farmers know the limitations of their machinery. What they don't always realize is the general public is not familiar with what their machines can and cannot do. This is especially important when a

tractor is traveling by itself or when it is towing an agricultural machine, and for self-propelled machines, such as combines, and other harvesting equipment. These machines have limited speed and maneuverability. Machines with this speed limitation are identified to motorists on the road with a Slow-Moving Vehicle (SMV) Emblem [it is required by law in New York and other states, but not in NJ]. SMV emblems have changed over the years. The newer emblems are identified by a label that signifies that it meets the requirements for the ASAE standard S276-5MAY98. The SMV emblem has a central fluorescent orange triangle. The orange triangle was designed to be eye-catching during daylight hours. The orange triangle is bordered by red strips of retroreflective tape. The red retroreflective strips are visible as a hollow red triangle when illuminated by lawful low beam headlights up to 600 feet away. To increase the visibility of agricultural machinery, extremity marking is essential. Red retroreflective tape should be placed on the rear of the machine and amber retroreflective tape should be placed on the sides near the front and rear quarters with more amber tape in the middle. In addition, be sure your red and amber tail lights and signal lights are working and use four-way flashers. Drivers should check their mirrors frequently. (From the National Safety Council via 'Weekly Vegetable Update', Cornell Coop Extension of Ontario, Wayne, Yates Counties & Steuben Muck)

❖ **New Univ. of CA book offers tips for hiring, managing Farm Labor:** A new book published by the University of California Agricultural Issues Center suggests ways agricultural employers, managers and supervisors can cultivate greater productivity and reduce turnover among employees. In the book, *Labor Management in Agriculture: Cultivating Personnel Productivity*, second edition, author Gregory Encina Billikopf discusses motivation and other factors that affect job performance.

"When it comes to profitability, there are many factors that farmers have little control over, such as cost of feed, crop prices and the weather," said Billikopf, a University of California labor-management farm advisor. "Much of what growers can do to enhance their bottom line, however, is associated with their employees."

Labor Management in Agriculture covers such topics as the use of practical tests in hiring, the fine-tuning of incentive pay (including piece rates), the advantages and disadvantages of different pay structures, performance evaluations, interpersonal conflicts and employee discipline. The book focuses on management and supervision techniques rather than on legal requirements, and includes examples from the experiences of farm employers.

The publication is available in English (2nd Edition, 248 pp.) and Spanish (International Edition, 262 pp.). The hardbound book contains 18 chapters and more than 100 photos. This edition contains a new chapter on interpersonal negotiations and updates throughout that are based on the latest results in personnel management research.

SEE GLEANINGS ON PAGE 2

# IPM Update

Kristian Holmstrom, Program Associate in Vegetable IPM

## Sweet Corn

**European corn borer (ECB)** adult activity is very low except in parts of Salem and Cumberland Counties (see ECB map). This area of activity is likely part of a limited third flight. Currently active adults will lay eggs on all stages of corn. At this time, all remaining sweet corn plantings are probably silking. After the full tassel treatment, follow up with regular insecticide applications on silks as dictated by the local **corn earworm (CEW)** catches. The highest average nightly ECB blacklight trap catches are:

Bayside	5	Cedarville	3	Califon	1
Cohansey	5	Allentown	2	Centerton	1
Woodstown	5	Pedricktown	2	Mannington	1
Shirley	4	Pole Tavern	2	New Egypt	1

Corn earworm (CEW) adult activity rises and falls with changes in prevailing wind direction. When New Jersey experiences significant southerly breezes, trap catches increase somewhat. Cooler evening temperatures result in lower trap catches. Fluctuations in adult CEW activity have been occurring with the passing of recent storms and frontal systems. Overall CEW activity is moderate throughout the state, with higher activity along the Delaware Bay shore (see CEW map). For this reason, strict silking spray schedules should be observed until local catches indicate otherwise. We will continue to monitor populations and weather conditions throughout the region to try to provide advance warning of CEW populations. Black areas on the map (red on the web) represent populations requiring a 2-3 day silk spray schedule. Cross-hatched areas on the map (green on the web) represent a population requiring a 3-4 day silk spray schedule. The highest average nightly CEW blacklight trap catches are:

Bayside	18	Downer	6	Shirley	5
Jones Island	11	Eldora	6	Tansboro	4
Tabernacle	10	Indian Mills	6	Mannington	3
Cedarville	6	Pole Tavern	5	Woodstown	3

## General Sweet Corn Spray Schedule

Silking Corn:	North	2-3 days
	Central	3 days
	South	2-3 days

**Fall armyworm (FAW)** continues to threaten sweet corn plantings throughout New Jersey. Silk spray schedules for CEW control should prevent FAW from damaging ears, but it is important not to skip treatments.

## Pumpkins

**Powdery mildew** control requires a regular fungicide program at this time. Failure to control this disease can result in smaller fruit size, pale fruit color, and weak

handles. 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.

**Downy mildew (DM)** is favored by moist conditions, and infects all cucurbit crops. Heavy sporulation when leaves are wet leads to rapidly spreading infections. Protectant fungicides are necessary to stop spore penetration on uninfected foliage. Fungicides with eradicant properties like Ridomil or Acrobat can help combat existing infections. Check fields weekly for the presence of yellow blotches becoming necrotic 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. Consult the *2003 Commercial Vegetable Production Recommendations* for spray materials.

As pumpkin fruit begin to mature, it is important to check fields periodically for the presence of **cucumber beetles**. Early in the season, these insects are a threat to transmit **bacterial wilt**. At this time of the season, they sometimes begin to feed on the rinds of mature fruit, causing direct damage and allowing rot organisms to establish. Cucumber beetles are often not distributed evenly throughout the field, so it is important to visit several areas to evaluate the situation. If cucumber beetles are found feeding on fruit, consider treating to prevent further injury. Generally, cucumber beetle has not been a problem thus far in the northern counties. During last season's dry conditions, they were much heavier.

As fruit mature, consider removing them from the field as soon as possible. As long as fruit are in the field, they are susceptible to **insect and animal damage**, **phytophthora**, and **bacterial soft rot**.

## Tomatoes

Maintain regular fungicide applications for **alternaria**, **anthracnose**, and **septoria** control on tomatoes. Good disease management to preserve foliar cover for fruit is critical for good fruit quality.

**Tomato fruitworm** (corn earworm) adult activity is generally below the level considered damaging to tomatoes. Exceptions to this are along the Delaware Bay shore (see CEW map), where catches are higher. In these areas, consider weekly treatments to prevent fruit injury until the population subsides. Fruitworm larvae often bore into the shoulders of tomatoes near the outer canopy of the plants. Consult the *2003 Commercial Vegetable Production Recommendations* for spray materials.

## Snap and lima beans

CEW continues to threaten snap and lima bean

**SEE IPM ON PAGE 5**

plantings in the southwestern counties. Areas shaded black on the map (red on the web version), indicate CEW adult populations that are potentially damaging to these crops. Consider treating snap beans at 5-7 day intervals if local CEW activity is heavy in your area. Check lima beans for the presence of larvae, and consider treating if averages of more than 2 larvae are found per 6 feet of row up to 4 weeks before harvest. After this, the threshold is 3 larvae per 6 row feet. It is important to choose an appropriate control material, as acephate is not effective against CEW. See *2003 Commercial Vegetable Production Recommendations* for spray materials.

### 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. When fields are harvested, disk and cover the residue as soon as possible to prevent old fields from becoming a source of DBM. Flea beetle infestations should be treated when the pest is present on more than half the plants in the sample and damage is occurring.

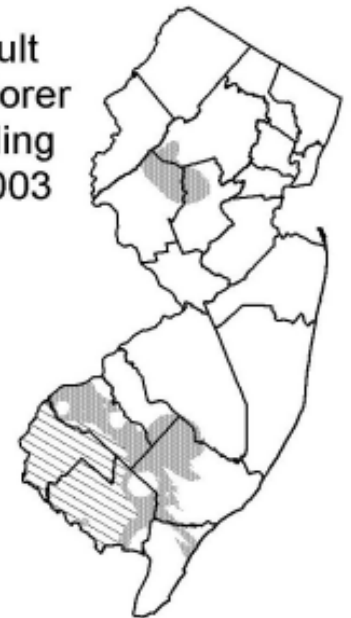
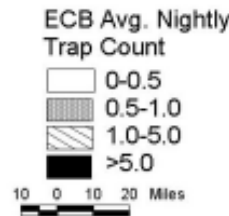
**Alternaria** is a threat to maturing cole crops now, and will remain so for the rest of the season. Look for necrotic lesions on older tissue. The lesions often have concentric rings within the borders. At the first sign of disease, begin a 7-10 day fungicide program. Consult the *2003 Commercial Vegetable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

### Peppers

In areas where **CEW** activity is heavy, consider a weekly protectant insecticide schedule to prevent fruit injury. On the CEW map, dark portions (shaded red on the web version) represent areas where CEW activity is a threat to pepper fruit. As eggs hatch, larvae will tunnel into the fruit around the cap like **ECB** does. As the larvae feed in the fruit, bacteria enter and can result in a high incidence of **soft rot**. When scouting, look at two fruit on five consecutive plants in ten random locations throughout the planting. Consider treating for CEW if fruit injury is increasing in the field. Consult the *2003 Commercial Vegetable Production Recommendations* for spray materials.

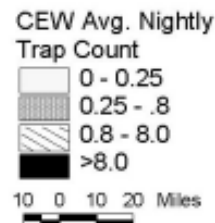
**Bacterial leaf spot (BLS)** is present in some areas. This disease is characterized by necrotic spots and margins on leaves. When infected, plants often drop large numbers of leaves. Fixed copper combined with maneb at 7-10 day intervals may be useful in minimizing spread in the field. Consult the *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 September 24, 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 September 24, 2003



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

# Grower Input Requested

This year we are not conducting a formal reader survey, but since we'll be updating our promotional materials, we'd like to get quotes from readers on how the Plant & Pest Advisory is useful to your operation. Also, this is a good time to give us ideas on ways to improve the newsletter.

How is the Plant & Pest Advisory useful to you? \_\_\_\_\_

What are some ways to make the newsletter of more value to your business? \_\_\_\_\_

Plant & Pest Advisory edition: \_\_\_\_\_ Occupation: \_\_\_\_\_ County: \_\_\_\_\_

Please send your responses either by e-mail to [ppadvisory@aesop.rutgers.edu](mailto:ppadvisory@aesop.rutgers.edu) or fax to 732-932-9838 or by mail to Cindy Rovins, 18 College Farm Road, Cook College, New Brunswick, NJ 08901-8551. Thanks.

## Weekly Weather Summary

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

Temperatures averaged much above normal. Extremes were 86 degrees at Hammonton on the 21st and 44 degrees at Charlotteburg on the 17th. Weekly rainfall averaged 1.55 inches north, 1.09 inches central, and 1.63 inches south. The heaviest 24 hour total reported was 1.82 inches at New Brunswick on the 15th to 16th. Estimated soil moisture, in percent of field capacity, this past week averaged 96 percent north, 83 percent central and 85 percent south. Four inch soil temperatures averaged 68 degrees north, 70 degrees central and 71 degrees south.

**Weather Summary for the Week Ending 8 am Monday 9/22/ 3**

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	.76	39.49	12.11	82	52	67.	6	2759	231	91
CANOE BROOK	missing									
CHARLOTTEBURG	2.55	40.10	11.06	81	44	63.	4	2213	198	94
FLEMINGTON	1.44	36.74	9.25	82	50	67.	5	2702	99	94
LONG VALLEY	1.07	37.04	7.31	80	50	66.	6	2161	-71	93
NEWTON	1.93	36.90	10.16	81	50	66.	7	2495	225	95
FREEHOLD	.70	29.12	2.41	84	52	69.	5	2916	152	76
LONG BRANCH	1.36	31.37	4.32	81	55	69.	5	2743	35	81
NEW BRUNSWICK	1.83	34.23	7.09	83	53	69.	6	2886	-12	88
TOMS RIVER	.29	33.33	5.68	83	53	70.	6	2925	211	56
TRENTON	1.28	28.91	3.22	83	54	69.	4	2856	-156	89
CAPE MAY COURT HOUSE	1.02	26.43	2.45	81	56	70.	3	2834	92	66
DOWNSTOWN	2.50	30.26	5.09	83	52	69.	4	2982	-43	90
GLASSBORO	2.16	31.33	4.88	82	57	71.	6	3157	164	85
HAMMONTON	1.61	26.15	-.27	86	53	70.	5	3117	116	87
POMONA	.93	24.20	.19	82	53	70.	6	2966	167	70
SEABROOK	1.57	31.80	7.57	82	58	71.	5	3226	181	83
ATLANTIC CITY MARINA	missing									
SOUTH HARRISON	2.15	28.63	2.83	82	57	70	NA	3122	NA	NA
WES KLINE — GDD BASE 40 PINEY HOLLOW										
Last Week	196 (Ending 9/15/03)									
This Week	206 (Ending 9/22/03)									

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