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College of Agricultural, Consumer, and Environmental Sciences

Illinois Fruit and Vegetable News

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A newsletter for commercial growers of fruit and vegetable crops

"We are what we repeatedly do. Excellence, then, is not an act, but a habit." Aristotle

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editor, Rick Weinzierl, 217-244-2126, weinzierl@illinois.edu. The *Illinois Fruit and Vegetable News* is available on the web at: <http://www.ipm.illinois.edu/ifvn/index.html>. To receive email notification of new postings of this newsletter, call or write Rick Weinzierl at the number or email address above.

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University of Illinois Extension Specialists in Fruit & Vegetable Production & Pest Management

Upcoming Programs

- **Northern Illinois Grape Grower Field Day, August 15, 2009**, at the University of Illinois St. Charles Horticulture Research Center. Speakers include Brad Beam and Elizabeth Wahle covering topics on grape maturity, and growers will be able to tour plantings at the research center. Bill Shoemaker and Elizabeth Wahle also will cover topics including variety screening, breeding, and weed management. Registration begins at 8:30 a.m., and the program will conclude around 3:30 p.m. The St. Charles Horticulture Research Center is 1.5 miles west of St Charles on IL Rt 38. At the intersection of Rt 38 and Peck Road, turn north. The entrance is the first driveway on your left. Please call or email Bill Shoemaker for additional information at 630-584-7254 or wshoemak@illinois.edu.
- **2009 Illinois Pumpkin Field Day, September 10, 2009**, 10:00 a.m. – 2:00 p.m. at the University of Illinois Vegetable Crops Research Farm at Champaign, IL. Registration is free, and the program includes lunch. For more information see <http://www.cropsci.illinois.edu/events/PumpkinDay2009.pdf> or contact Mohammad Babadoost at 217-333-1523 or babadoos@illinois.edu.
- **2009 Sustainable Agriculture Tours that involve fruits and vegetables:**
 - **September 22, Fresh Fruits and Vegetables.** River Front Berry Farm, Martinton (<http://www.riverfrontberryfarm.com>)

A fee of \$20 per person will be charged for this tour, which includes lunch. Registration at least one week in advance is required. For more information on these and other tours, see

<https://webs.extension.uiuc.edu/registration/default.cfm?RegistrationID=2845>. To register by phone, contact Donna Cray at 217-241-4644. For more information, contact Deborah Cavanaugh-Grant (217-968-5512; cvnghgrn@illinois.edu).

Regional Updates

In southern and southwestern IL ... The southern region is running about two weeks ahead of schedule, with peach harvest already to Cresthaven and early-season fall apple harvest already started with cultivars such as Gala and Ozark Gold. Extreme changes in high temperatures over the past month have both delayed and speed up maturity dates causing harvest to be much less spread on many crops, not just peaches. Tomatoes continue to lag in terms of ripening, although set appears to be good following the slump after the late June heat wave. The last plantings of sweet corn, peppers, and cucumbers for the season are in the works or just finished. Bird predation continues to be a serious problem for many crops such as sweet corn, peach, and grape. This is a year where cannons (where possible), squawk boxes and bird netting on grapes pay for themselves. Deer, raccoon, and opossum predation is fairly heavy as well. Fall-bearing raspberry harvest continues, while blackberry harvest is starting to wane.

The St. Louis area and its Illinois collar counties are in need of additional rain, but the remainder of the region is hoping for the tap to shut off. Climate-wise, this has been a very difficult season, and many growers are commenting that their quality is not where it would normally be, particularly in terms of size development and overall pest control. Continual rain has made it difficult to maintain residual control for diseases, insects, and weeds.

There has been an outbreak of tomato late blight in the northeast and Mid-Atlantic States, and just recently a confirmed case in northern Illinois, so it is expected to continue moving into the area. Late blight (*phytophthora*) on tomato has not reared its ugly head in the southern region yet, but bacterial diseases, Septoria, and early blight (*Alternaria*) are fairly prevalent. (See the articles below for further details.) Pepper plant wilting as a result of *Phytophthora* infection is fairly widespread throughout the region, particularly following the recent heat wave. On the up side to all of this, markets for specialty crops have remained strong overall.



Sweet banana peppers wilting as a result of *Phytophthora* infection. (Elizabeth Wahle)

Elizabeth Wahle (618-692-9434; wahle@illinois.edu)

In northern Illinois, late July and early August have been characterized by highs in the 70s to upper 80s and lows in the 50s to upper 60s. Soil moisture content is very low in general, with only about an inch of rain in most areas over the last 3 weeks (with notable exceptions). Irrigation equipment is in use in many vegetable farms and fruit orchards in the region.

Summer spray programs continue in orchards, with fruit is sizing well. Early varieties such as Lodi, Pristine, Red Free, William's Pride, and Prima are ready for picking in some orchards. Grapes are sizing well, with insect and disease control programs ongoing.

Harvesting of sweet corn, cabbage, green beans, broccoli, peppers, tomatoes, and summer squash continues, and muskmelon harvest will start very soon in the Kankakee area. Western corn rootworm beetles and cucumber beetles are numerous in some fields. Corn earworm and European corn borer counts have been very low during the last two weeks, but I have received reports and observed in some farms problems with tomato foliar diseases such as early blight, late blight, and septoria leaf spot. Other problems include powdery mildew on winter squash foliage and lots of blackbirds in sweet corn fields in the region.

Maurice Ogutu (708-352-0109; ogutu@illinois.edu)

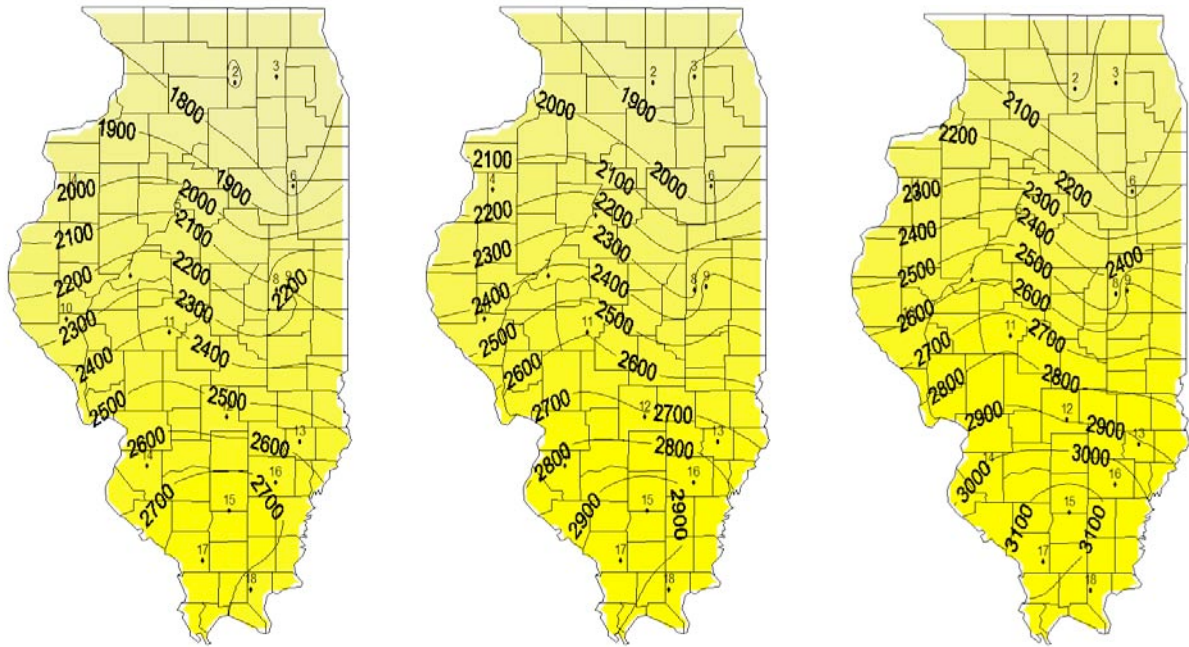
Degree-day Accumulations

Degree-day accumulations presented in the maps below based on weather stations in the Illinois State Water Survey WARM data base have been taken from the Degree-Day Calculator on the University of Illinois IPM site (<http://www.ipm.uiuc.edu/degreedays/index.html>). The maps present degree-day accumulations and projections based on a 50-degree F developmental threshold and a January 1 starting date, but other options that use different thresholds and specific biofix dates are available on the Degree-Day Calculator. The degree-day calculator is available as a result of a joint effort of current and former extension entomologists (primarily Kelly Estes) and Bob Scott of the Illinois State Water Survey. If you have questions about how to use the site, contact me or Bob Scott (rwscott1@uiuc.edu).

Rick Weinzierl (217-244-2126; weinzier@uiuc.edu)

Degree-day accumulations, base 50 degrees F, starting January 1, 2009.

Station	County	Base 50F DD Jan 1 – Aug 11, Historic Average	Base 50F DD Jan 1–Aug 11, 2009	Base 50F DD Jan 1–Aug 18, 2009 (Projected)	Base 50F DD Jan 1–Aug 25, 2009 (Projected)
1. Freeport	Stephenson	2021	Missing	Missing	Missing
2. Dekalb	Dekalb	2064	1689	1831	1972
3. St. Charles	Kane	1960	1773	1913	2056
4. Monmouth	Warren	2197	1979	2130	2284
5. Peoria	Peoria	2303	2109	2271	2436
6. Stelle	Ford	2166	1753	1908	2064
7. Kilbourne	Mason	2409	2264	2427	2594
8. Bondville	Champaign	2307	2100	2255	2410
9. Champaign	Champaign	2377	2312	2480	2647
10. Perry	Pike	2347	2258	2426	2597
11. Springfield	Sangamon	2512	2418	2596	2775
12. Brownstown	Fayette	2617	2529	2710	2889
13. Olney	Richland	2592	2564	2738	2909
14. Belleville	St. Claire	2683	2654	2834	3011
15. Rend Lake	Jefferson	2790	2799	2986	3172
16. Fairfield	Wayne	2737	2705	2889	3072
17. Carbondale	Jackson	2696	2775	2954	3132
18. Dixon Springs	Pope	2757	2663	2845	3027



Degree-day accumulations, base 50 F, January 1- Aug 11, 2009 (left), and projected through Aug 18 (center) and Aug 25 (right).

Notes from Chris Doll

It finally feels more like peach picking season, with temps into the 90's and lots of sunshine. As a result, the harvest is moving through rather rapidly, and the quality and flavor is good. Locally, the rains have dried up, but there should be adequate soil moisture to take the peach crop on through the end of harvest. Some annual vegetable crops and heavy water users like red raspberry and blackberry are beginning to need supplemental water, as do matted-row strawberries. With near normal summer temperatures, the apple coloration has slowed, but ripening is showing on Gala and Gingergold. Redfree and Zestar were impressive during the cooler weather harvest.

Degree-days (base 50F) from codling moth biofix is now 2537, but a limited number of observations indicates that not many worms escaped from the use of Altacor, Delegate, Assail and Rimon. Trap counts are down, and everyone hopes they stay that way. However, it is a good time to watch for wooly apple aphids, mites, and San Jose scale and make control treatments if needed. Apple disease control appears to be quite successful, but it's time to watch for bitter rot, white rot, and the sooty blotch/flyspeck problems, and preferably to be using preventive sprays. The neighbor's organic trees are well covered with black now. Some necrotic leaf blotch on Golden Delicious and its seedlings has been seen, but in light amounts. Cedar apple rust has defoliated many home apple trees in Missouri in the cedar tree area. Another problem seen in Missouri was some yellowing and dropping of apple leaves from spring frost injury.

So, I have been traveling a little again to get a feel for orchards. And feel I did, with my surgically repaired back bouncing over some rough terrain. I was thinking about ripe peaches and apples being transported over the same terrain by careless tractor drivers. I realize that there is not much one can do in an established orchard with sod cover crops, but in establishing new orchard ground this fall, it is a good time to do some leveling before seeding the cover crop.

Thornless blackberry and black raspberry plants are growing well enough to have shoot tips reaching the ground. This is perfectly normal, and is their way of plant increase of the mother clone. But if they all root, the new plants become like unwanted weeds. It does not take much to clip them back before rooting or to pull them out before the roots become established and save time for their removal next spring.

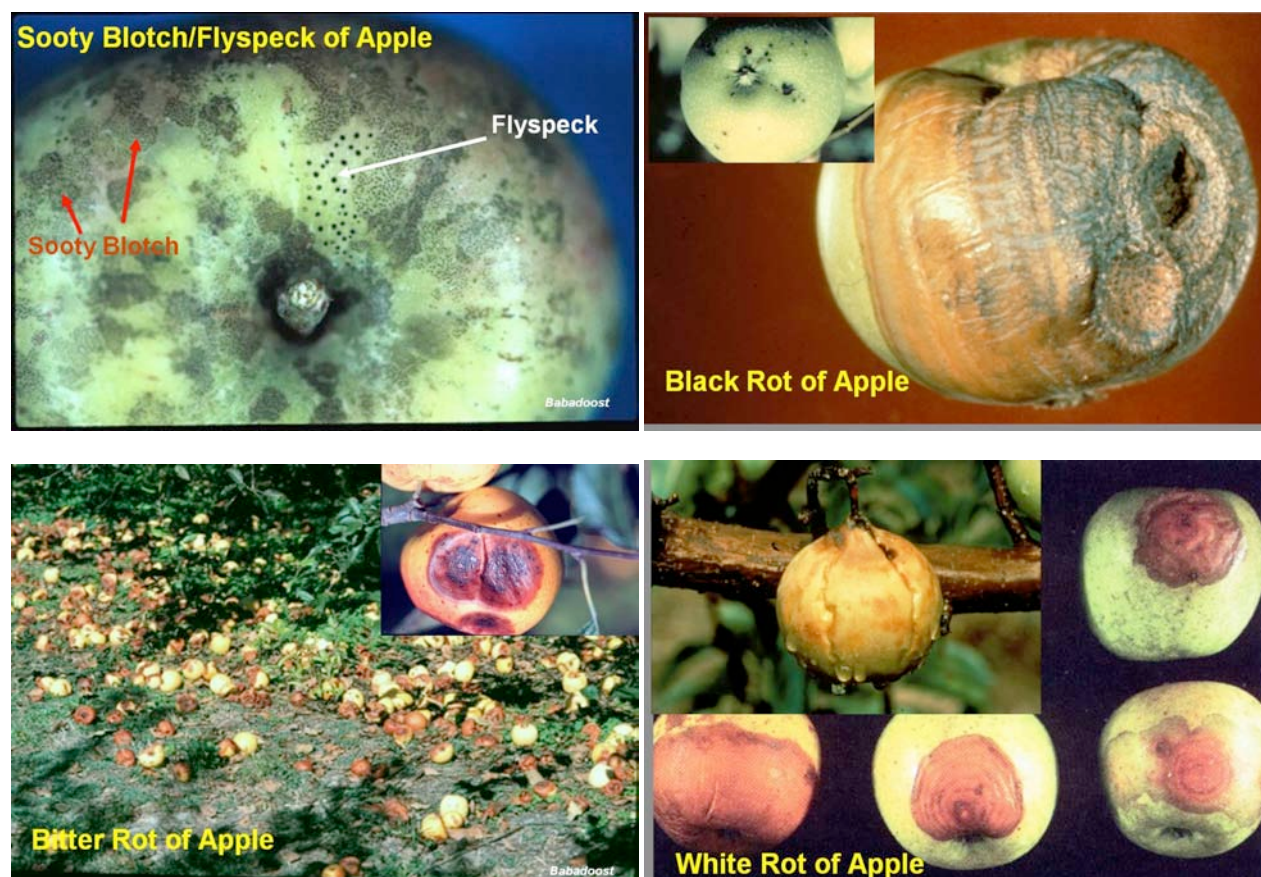
The calendar says that mid-August is quite near, and that is the usual time for ending leaf sampling for analysis on the tree fruits. The 2009 season is about normal, so within the next week should be satisfactory.

Chris Doll

Fruit Production and Pest Management

Summer diseases of apples

The major summer diseases of apple in Illinois are the sooty blotch/flyspeck complex and fruit rots (bitter, black, and white rots). Sooty blotch and flyspeck affect the surface of the fruit (see the related photo) making the crop unmarketable. Fruit rots can cause up to 100% crop losses. Sooty blotch, flyspeck, and bitter rot have already been observed in several apple orchards in southern and central Illinois. Because of the wet conditions through July, it is expected that summer diseases will occur widely in apple orchards in the state. Spray applications of effective fungicides at 10-day intervals are necessary to protect fruit against the summer diseases. Based on our past experience, applications of Topsin-M (thiophanate-methyl) plus captan alternated with Pristine (pyraclostrobin + boscalid) are effective against summer diseases of apple in Illinois. For more information on chemical control of summer diseases of apple, refer to <http://www.extension.iastate.edu/Publications/PM1282.pdf>.



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Vegetable Production and Pest Management

Late blight of tomato. Late blight, caused by *Phytophthora infestans*, is a destructive disease of tomatoes. Late blight is also a serious disease of potato. *P. infestans* can infect and destroy the leaves, stems, and fruit of infected plants. In the past few weeks, late blight has been reported on tomatoes in several states, including Alabama, Connecticut, Delaware, Georgia, Indiana, Kentucky, Maine, Maryland, Massachusetts, New Jersey, Minnesota, New Hampshire, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin. Today (August 10), I received some photos from infected tomato plants from Lake County of Illinois that appear to show late blight symptoms. A sample will be examined soon for confirmation of the disease incidence in the field.



Symptoms of late blight start as irregular, greenish, water-soaked spots on leaves, petioles, and/or stems. Under cool, moist conditions, spots rapidly enlarge to form purplish black lesions. can girdle affected stems, killing foliage farther out. During periods of high humidity and leaf wetness, a cottony white mold usually is visible on lower leaf surfaces at the edges of lesions. In dry weather, infected leaf tissues quickly dry up, and the white mold disappears. On green fruit, gray-green water-soaked spots form, enlarge, coalesce, and darken, resulting in large, firm, brown, leathery-appearing lesions. If conditions remain moist, abundant white mold will develop on the lesions, and secondary soft-rot bacteria may follow, resulting in a slimy wet rot of the entire fruit. On ripe fruit, lesions have cream-colored concentric zones which eventually coalesce and affect the entire fruit.

Late blight of tomato could be managed using the following practices. (1) **Cultivar resistance.** In Oregon, the cultivar 'Legend' has been reported resistant to late blight. In Washington, some cherry tomato cultivars ('Red Cherry' and 'Sweetie') have been reported to be more tolerant to late blight. (2) **Cultural control.** Cultural controls alone will not prevent disease during seasons with wet, cool weather. However, the following measures will improve the chances of raising a successful crop: (a) Plant only healthy-appearing tomato transplants. Check to make sure plants are free of dark lesions on leaves or stems. (b) Destroy volunteer tomatoes and potatoes routinely by cultivation or herbicides. (c) Avoid wetting foliage when irrigating, especially in late afternoon and evening. (d) Space, stake, and prune tomato

plants to provide good air circulation. (3) **Biological control.** The following biological agents may be used for control of late blight of tomatoes: (a) Serenade WP at 4 to 8 lb/A on 5- to 7-day intervals; (b) Sonata at 2 to 4 quarts/A on 7- to 14-day intervals. (4) **Chemical control.** Begin chemical control programs before symptoms appear. The following fungicides have been registered for control of late blight of tomatoes. Agri-Fos (1.5-2 qts/A), Amistar (2 oz/A), Cabrio (8-16 oz/A), chlorothalonil (e.g., Bravo, Echo, Equus), Copper (various formulations), Forum (6 fl oz/A), Curzate (3.2-5 oz/A), Gavel (1.5-2 lb/A), Mancozeb (e.g., Dithane, Pencozeb), Maneb (1.5-2 lbs/A), Previcur Flex (0.7-1.5 pts/A), ProPhyt (4 pts/A), Quadris (6 fl oz/A), Quadris Opti (1.6 pts/A), Ranman (2.1-2.75 fl oz/A), Reason (5.5-8.2 fl oz/A), Revus Top (5.5 to 7 fl oz/A), Ridomil Gold (several formulations), and Tanos (8 oz/A). Read the fungicide label before application.

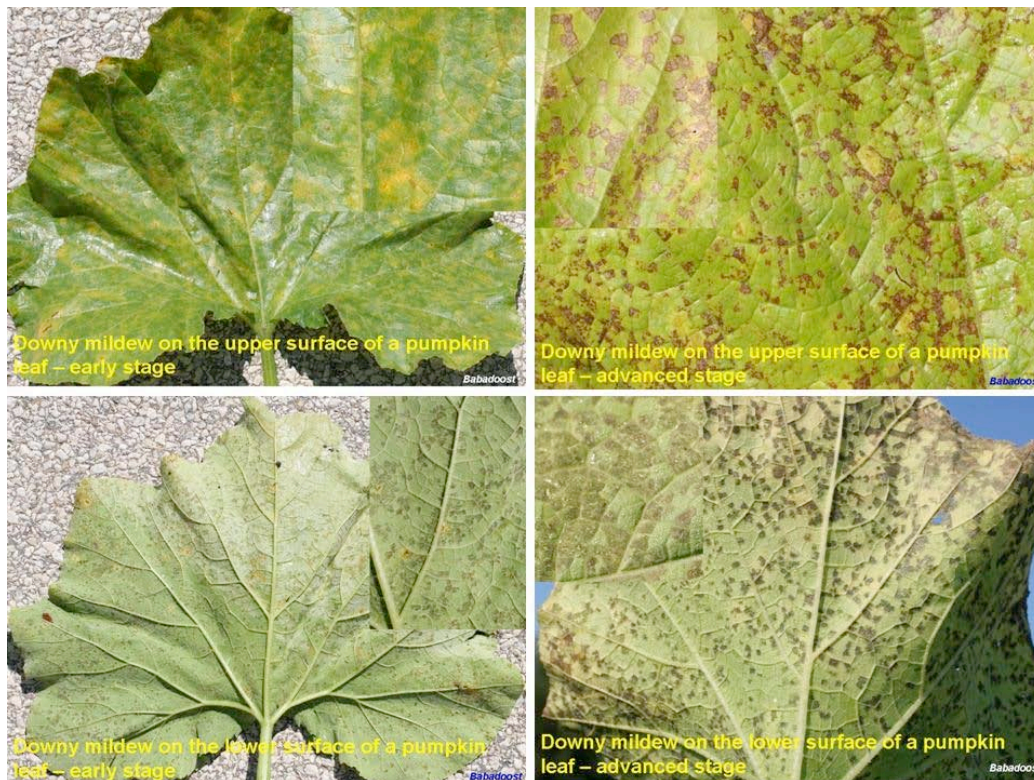
For more information on tomato late blight, refer to the following websites:

http://www.hort.cornell.edu/department/Facilities/lihrec/vegpath/photos/lateblight_tomato.htm

<http://www.vermontbiz.com/news/july/late-blight-strikes-tomato-and-potato-crops-across-vermont>

<http://www.ctahr.hawaii.edu/oc/freepubs/pdf/PD-45.pdf>, and http://www.btny.purdue.edu/pubs/ID/ID-56/ID-56_Production_Guide.pdf.

Downy mildew of cucurbits. The occurrence of downy mildew of cucurbits (*Pseudoperonospora cubensis*) in Illinois was reported on July 22, 2009, on cucumber plants grown in a home garden at Hamilton (Hancock county). The disease was diagnosed on muskmelon plants at the same location on July 28. I identified the disease on cucumber plants in Tazewell county on August 7, and I believe downy mildew is either already in cucumber and muskmelon fields throughout the state or will spread to all fields soon. However, the disease has not been observed in pumpkin, squash, or watermelon fields in Illinois yet.



Downy mildew affects leaves only. Symptoms of downy mildew vary with the host and environmental conditions. The first symptom is usually the appearance of indistinct, pale green areas on the upper leaf surface. The pale green areas soon become yellow in color and angular to irregular in shape, bounded by the leaf veins. As the disease progresses the lesions may remain yellow or become brown and necrotic. During moist weather the corresponding lower leaf surface is covered with a downy, pale gray to purple mildew. Often an upward leaf curling will occur.

Fields with infected plants should be sprayed with effective fungicides at 7-day intervals. Previcur Flex 6SC, Tanus 50WG, Ranman 3.6SC, Revus 2.09SC, and Presidio 4SC are effective against downy mildew of cucurbits in Illinois. These fungicides should be mixed with chlorothalonil (e.g., Bravo Weather Stik) and alternated. Gavel can be used to control downy mildew of cucurbits, except on pumpkins. Our studies in the past have showed that including chlorothalonil in the regular sprays is effective on delaying development of downy mildew in pumpkin fields.

Phytophthora blight of cucurbits. Phytophthora blight (*Phytophthora capsici*) has now been observed in several cucumber, pumpkin, and squash fields in central Illinois. This is the most important disease of cucurbits in Illinois. Because of the frequent rainfall and moist conditions, Phytophthora blight could develop in cucurbit fields at all locations with a history of Phytophthora blight on cucurbit or pepper plants. The disease causes vine infection and fruit rot, and crop losses up to 100% can occur. To prevent crop losses, scout cucurbit fields regularly for Phytophthora blight symptoms, especially after major rainfall, and particularly in low areas of fields. Weekly application of effective fungicides, beginning at the first sign of the disease, is necessary. Applications of mandipropamid (Revus at 8 fl oz/acre) plus a copper compound (i.e., Kocide-3000 or Cuprofix Disperss) alternated with cymoxanil + famoxadone (Tanos at the rate 10 oz/acre) plus a copper compound, or cyazofamid (Ranman 400SC, 2.75 fl oz/acre), or with dimethomorph (Forum at the rate of 6 fl oz/acre) plus a copper compound, or Fluopicolide (Presidio, 3-4 fl oz/acre) can reduce development and spread of Phytophthora blight in cucurbit fields. During periods of heavy rainfall, no fungicide provides satisfactory protection of plants against Phytophthora blight.



Late-season recommendations for control of corn earworm and other sweet corn insects

Through the first 10-12 days of August, 2009, corn earworm moth numbers in pheromone traps have not yet picked up dramatically in most of Illinois, but flights in August and September typically are heavy, and lots of egg-laying on sweet corn silks usually results in severe damage to ears in untreated fields or plots. Successful control can be complicated by resistance to pyrethroids in some populations of earworms that migrate into the region from the south, but resistance levels cannot be predicted in advance, and in the absence of resistance, the pyrethroids are the most effective and economical insecticides for earworm control. My best recommendations on how to proceed over the next several weeks go like so ...

1. Remember that whatever insecticides are used for earworm control, applications need to begin before the first larvae have hatched from eggs on silks. In the late summer, that usually means the first application should be made within 2 days after first silk if moths are active in the area.
2. In “normal” hot weather in August, the best insecticides need to be applied on 2- to 3-day intervals if moth flight is moderate (more than 20 moths per trap per night) or heavy, at least until all silk growth has stopped. The last application can be up to 4 to 6 days before harvest.
3. The most effective insecticides for earworm control (and concurrent control of fall armyworm and European corn borer) have been the pyrethroids Brigade/Capture (bifenthrin), Warrior (lambda-cyhalothrin), Mustang Max (zeta-cypermethrin), and Baythroid (cyfluthrin). These pyrethroid insecticides are considerably more effective than the older pyrethroids Pounce/Ambush (permethrin) and Asana (esfenvalerate).
4. There are two approaches to assessing and responding to possible problems with resistance to the pyrethroids. One is to try to detect failures as soon as they occur and switch to other types of insecticides immediately to prevent additional infestations. The other is to switch to alternative chemicals as soon as moth counts in pheromone traps increase dramatically (possibly suggesting immigration from the south where resistant populations are known to occur). Using the first of these approaches, growers are urged to check for infestations early and repeatedly during the period between first application and harvest in every planting. If small larvae are found in a significant number of ear tips despite a rigorous spray schedule, switching to new chemistries is recommended. Using either approach, the alternative insecticides that are most effective against corn earworm are Belt and Radiant. Older insecticides such as Lannate, Larvin, and Sevin generally are not effective enough as alternative insecticides.
5. **Combinations** of insecticides are expensive and will be effective only if the right products are combined. Combining one of the best pyrethroids with Belt or Radiant is likely to provide effective control, but the necessary rates of individual products in such combinations have not been established. Combining older products such as Lannate, Larvin, or Sevin with a pyrethroid has not consistently improved control over the pyrethroid alone.
6. Insecticide **rotations** that include pyrethroids are NOT the answer to addressing pyrethroid resistance in immigrant populations of corn earworms. If rotations are used during the silking-to-harvest time frame, whenever a pyrethroid is used alone against a pyrethroid-resistant population, it leaves a 2- to 3-day “hole” in the control program, and after earworm larvae hatch and enter ears during this period, rotating back to an alternative chemistry will not control the larvae already in the silk channel or ear tip.
7. Organic growers may use Entrust (OMRI-approved) for earworm control. It is not as effective as the pyrethroids, but it is far more effective than other alternatives available for certified organic production.
8. Bt sweet corn hybrids typically suffer only minimal damage from corn earworm, but some kernel injury can occur, and small larvae may be found in ear tips. Some insecticide applications are needed on Bt sweet corn when corn earworm moth flights are heavy from silking to harvest. Additionally Bt sweet corn hybrids are not highly resistant to fall armyworm, and treating to control this insect also is necessary where infestations develop.
9. Corn rootworm beetles feed heavily on silks of sweet corn, and they can prevent pollination and ear fill when silk clipping is severe. Pyrethroids used against earworms or fall armyworms are effective against rootworm beetles, but Belt and Radiant do not kill these beetles. Bt sweet corn hybrids are not resistant to silk clipping by rootworm beetles.

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