

# VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the  
Purdue University Cooperative Extension Service

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**WILTING AND DEAD MELON TRANSPLANTS** - (Dan Egel, Chris Gunter, Frankie Lam) - *The following article was written as a Vegetable Crops Hotline - BULLETIN, May 18, 2006.* Our latest field visits and phone calls have centered on wilting and dying cantaloupe and watermelon transplants. Unusually warm temperatures in April have been followed by below normal temperatures in May. Couple that with higher than normal rains and it makes for cool, wet growing conditions during the early transplant season. These poor growing conditions have contributed to a number of problems.

**Seedcorn Maggot and Wireworm** - These insects favor cool soil temperatures (50-60°F). To check for damage, dig up a wilting plant and split the crown and the main root with a pocketknife and look carefully for any maggot or worm feeding in the stem. The seedcorn maggot is yellowish-white, legless, with a pointed head and is about ¼ inch long when fully grown. The wireworm is slender, jointed, usually hard-shelled, with three pairs of legs, and tan brown in color. Once a field is infested with seedcorn maggot or wireworm, not much can be done to cure the problem. Replanting decisions should be made based on estimates of the size of the maggots infesting the field. If the maggots are smaller than ¼ inch long we recommend waiting 10 days to replant, if they are larger or equal to ¼ inch long, plants can be replanted after 5 days. If wireworms are found, wait to replant until soil temperatures are above 70°F. Soil insecticide application for control of seedcorn maggot and wireworm needs to be made prior to laying plastic, unless a drench application is made to each individual plant at planting.

**Soilborne Fungi** - Although it has been possible to isolate various fungi such as *Pythium* or *Rhizoctonia* from some of the dying plants, such infections would not have occurred in the field but for the cold, wet weather. Any disease problems present are secondary and in most cases there is no reason to avoid resetting in the original holes. There is no need to apply special foliar fungicide treatments to those plants that have survived. The MELCAST EFI values have been relatively low due to the cool weather, indicating that weather conducive to foliar disease has not arrived. Growers should apply a foliar fungicide at or before vine-touch and follow a regular schedules such as prescribed by MELCAST.

**Herbicide Misapplication** - We've been in at least one field in which herbicide was applied over the top of plastic mulch prior to transplanting. The damage we saw appeared to be related to the herbicide being washed into the planting holes following a rainfall and concentrating around the transplant. This is an illegal application and this practice should not be made. Read and follow the label instruction carefully for any herbicide application to avoid crop injury. Consult the Midwest Vegetable Production Guide for Commercial Growers (ID-56) <[www.entm.purdue.edu/entomology/ext/targets/ID/index.htm](http://www.entm.purdue.edu/entomology/ext/targets/ID/index.htm)> for herbicide recommendations.



**PURDUE, PARTNERING SCHOOLS EXPANDING AG EDUCATION** - (Announcement) - Agricultural education to help grow Indiana's agribusiness industry will soon be offered at college campuses across the state, thanks to an agreement among Ivy Tech State Community College, Vincennes University, the Purdue University Cooperative Extension Service and Purdue College of Agriculture.

Ivy Tech will offer associate's degrees in business administration with an agribusiness concentration, starting at some locations this fall.

Graduates of this program could pursue jobs in agriculture-related fields in the areas of sales and manufacturing. Ivy Tech will soon determine which campuses will offer the courses in the 2006-07 academic year.

"This partnership will help provide access to agricultural education in areas of the state that may need additional learning opportunities," said Dale Whittaker, associate dean and director of academic programs for Purdue Agriculture.

“By partnering with Ivy Tech and Vincennes, we’ve found a way to supply the agricultural industry with additional resources and help keep some of our youth in Indiana who might otherwise pursue similar programs out of state.”

The content for the agricultural courses at Ivy Tech will be designed in consultation with Purdue faculty and will be taught by approved instructors accredited in those fields. College credit for approved agriculture courses also will transfer to Purdue for students who decide to pursue additional studies.

“Purdue is the leader in agriculture in our state, and this partnership can only benefit all of us,” said Mary Ostrye, dean of academic affairs at Ivy Tech in Lafayette, Ind. Ivy Tech worked with an advisory board and advice from Purdue Agriculture to help develop its program.

We plan to bring some students into the system to study agriculture who may not be ready for a university setting. We want to get them excited about education and hope that many of our students will eventually go on to Purdue to earn bachelor’s degrees.”

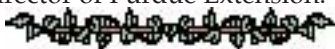
In addition to the agribusiness degree, Ivy Tech also plans to develop a more technically focused agriculture degree program that would include curriculum in animal, crop and horticultural production.

“In investigating the need for these programs, we talked to many people in the industry who mentioned the desire to see instruction offered that would prepare individuals to work in agricultural production jobs, with some basic knowledge of animal care and pesticide application, for example,” Ostrye said.

Vincennes has a long-standing partnership in agriculture education with Purdue Agriculture through the VU/Purdue Cooperative Agriculture Transfer Program, celebrating its 50th anniversary. The VU agriculture major will transfer into more than 40 Purdue majors. Purdue maintains a faculty member on site at VU for program coordination, student advising and teaching. In addition, VU offers associates of science programs in agribusiness, horticulture technology and John Deere equipment service.

Under the new agreement, VU plans to expand agricultural opportunities for students in the areas of biochemistry, biotechnology and agricultural engineering, as well as develop new dual-credit programs with high schools.

Purdue Extension, which has offices in all 92 Indiana counties, will provide support for the new academic programs. “We will help identify instructors in some areas and may contribute program ideas that enhance the educational offerings,” said David Petritz, associate dean and director of Purdue Extension.



**INSECT PESTS ON CUCURBITS DURING COOL EARLY-SEASON - (Frankie Lam)** - During this cold early-season, seedcorn maggot (Fig. 1) and wireworm (Fig. 2) have caused more damage on crops than a normal year.

During mid-May, I have seen corn maggot and wireworm injury in the cucurbit studies that are conducted at the Southwest Purdue Agricultural Center. One of my muskmelon studies has an average of 51% of the plants infested by seedcorn maggot and 1.4% of the plants infested by wireworm.



**Fig. 1.** Seedcorn maggot and pupa in soil and in the dissected transplant of muskmelon. (Photo by Frankie Lam)



**Fig. 2.** Wireworm injury on muskmelon transplant. (Photo by Frankie Lam)

**Cool Early-Season.** This is another year with a cool early-season in Indiana. For example at Vincennes in southwestern Indiana, before May 10 the temperatures were relatively warm through winter to early May; however, starting May 11 the average temperatures was below normal for more than 10 days (Table 1). From April 1 to May 10, the early season temperature has 170°F accumulated above normal. However, between May 10 and 21, the average daily temperature of each day was below normal and has - 81°F accumulated. Furthermore,

**Table 1.** Accumulated departure of average daily temperatures at Vincennes between April and mid-May 2006 from climate normals (1971-2000).

Date	Accumulated average daily temperature departure from climate normals (°F).
April 1 to May 10	170 (4.25 per day)
May 11 to May 21	-81 (-7.4 per day)

there were 5 days in these 11 days (from May 10 to 21) having the lowest night temperature dropping below 50°F. For winter temperature, climate normals, and insect survival, please read the article on Vegetable Crops Hotline No. 462, *Winter Temperatures (2005-2006) and Insect Survival in Indiana*.

**Seedcorn Maggot and Wireworm.** Seedcorn maggot and wireworm are occasional pests on cucurbits and their outbreaks mainly occur during cold early-season.

These pests feed on the roots and bore into stems that near the ground surface (Figs. 1 and 2). They feed on the internal tissues and kill the plants. In the field if you find wilting plants and no clues of insect feeding or diseases on the aerial parts, then dig up the plant and check for seedcorn maggots and wireworms. In this early-season, the percentage of seedcorn maggot infestation in my muskmelon trial with soil insecticides were 18.8%, 31.3%, 56.3%, and 50.1% on Furadan, Platinum, Admire, and no soil-insecticide treatments, respectively. Based on the data of this trial, it seems that Furadan is relatively the most effective soil insecticide for seedcorn maggot. However, due to the low infestation of wireworm, it is difficult to draw a conclusion on the effectiveness of these chemicals on wireworm. For the curative management of seedcorn maggot and wireworms, please read the article, *Wilting and Dead Melon Transplants*, in this issue of Hotline.



**Fig. 3.** Seedcorn maggot adult and striped cucumber beetles on muskmelon. (Photo by Frankie Lam)

**Cucumber Beetles.** On May 5, more than 10 cucumber beetles (Fig. 3) per plant were observed on muskmelons and more than 140 cucumber beetles were counted on the yellow sticky traps within 48-hours at our Center. However, after May 10 the number of cucumber beetles on muskmelon has dropped dramatically in southwestern Indiana. Only a few beetles were observed on muskmelon and an average of 6.6 beetles were found on the sticky traps at our center. On the sticky traps placed in muskmelon fields of a grower in southwestern Indiana, no beetles were found on 13 sticky traps from May 15 through May 19. It seems that this cold early season may have detrimental effect on the activities of cucumber beetles on cucurbits.



**CATERPILLARS ON VEGETABLES - (Frankie Lam)** - Caterpillar pests of vegetables were observed on cabbage, eggplant, kale, pepper, and tomato in southern Indiana. The most common caterpillars on vegetables are cabbage looper, diamondback moth, and imported cabbageworm. About 5% infestation of cabbage loopers and diamondback moth larvae were observed during this cool early-season.

**Cabbage Looper.** The cabbage looper is a greenish caterpillar with a thin, conspicuous white line along each side of the body. The larva has three pairs of thoracic legs (true legs) and three pairs of prolegs (false legs) near the end of abdomen (Fig. 1A). There are no legs on the median half of the body and this region is generally humped up when the caterpillar rests or moves. When fully grown the caterpillar is about 1-inch. The adult is a mottled brownish moth (Fig. 1B) with a small silvery spot near the middle of each front wing. The hind wings are almost uniformly light brown.



**Fig. 1.** A - Cabbage looper feeding on kale. B - Cabbage looper moth. (Photo by Frankie Lam)

**Diamondback Moth Larva.** The caterpillar of diamondback moth is about one-third of an inch when fully grown. The small, pale green caterpillar (Fig. 2) chews small cavities and holes from the undersides of leaves. When fully grown the caterpillar spins a loose-mesh silken cocoon and pupate on the leaves of vegetables (Fig. 3). The adult is a small grayish moth about 1/3-inch long and with light color at the end margins of front wings forming a row of three diamond-shaped yellow spots when at rest.



**Fig. 2.** A diamondback moth larva starts to pupate on the underside of cabbage leaf. (Photo by Frankie Lam)

**Fig. 3.** An early pupal stage of a diamondback moth larva inside a loose-mesh silken cocoon. (Photo by Frankie Lam)



**Imported Cabbageworm.** The imported cabbageworm is another common pest on vegetables. Adult butterflies (Fig. 4) that are white in color were observed commonly in vegetable fields; however, no caterpillars were found on the plants that we scouted in southern Indiana. The imported cabbageworm has a velvety appearance with an orange stripe down the middle of the back and a paler broken stripe on each side of the body. The cabbageworm is about 1 1/4-inch long when fully grown.



**Fig. 4.** Imported cabbageworm butterfly. (Photo by Frankie Lam)

These caterpillars are destructive pests of vegetables and they can destroy a vegetable field within a few days under favorable conditions. However, their adults do not cause injury on crops. Growers should pay attention to the caterpillar populations once warm temperatures return to Indiana. For the management of these pests on vegetables, please read the *Midwest Vegetable Production Guide for Commercial Growers 2006* (ID-56) or call me at (812) 886-0198.



**INDIANA VEGETABLE TOUR - (Announcement)** - The Ohio Vegetable and Potato Growers Association (OVPGA) has planned their annual vegetable and fruit tour centered around LaPorte, Indiana on June 21 - 22, 2006. According to OVPGA's President Don Ramseyer, "Last year's Ontario vegetable tour was a great learning experience and demonstrated the importance of our Great Lakes vegetable and fruit industry. Indiana will be another eye-opening learning experience for our producers, marketers and allied industry friends." Growers and others from Indiana are invited to register for the tour.

The tour will organize on Tuesday, 6:00 PM (CST), June 20 at the Holiday Inn Express, exit 49 of the Indiana Toll Road (Interstate 80/90). A meet and greet reception is scheduled for 6:30 PM at Enzo's Restaurant, five minutes from the Holiday Inn. The tour will then kick off at 7:30 AM, June 21 as the tour bus departs the LaPorte Holiday Inn. Wednesday's scheduled stops include observing production of processing tomatoes, peppers and other vegetables with drip irrigation, mint production, processing tomato production utilizing center pivot irrigation, onion production, direct and wholesale vegetable marketing, an apple orchard stop and more. The

tour will also stop at the Pinney Purdue Research Farm to observe sweet corn, tomato and pumpkin research trials. Wednesday's activities will conclude with a cookout at a local grower's farm. Thursday's scheduled stops include fresh market production of sweet corn, melons and tomatoes, a produce auction and machine harvest cucumber production.

For the convenience of tour participants, a block of rooms has been set aside at the LaPorte Holiday Inn Express, 100 East Shore Court, LaPorte, Indiana 46350 at an overnight rate of \$81.00 plus tax. Reservations can be made by calling (219) 326-7900. The meet and greet reception with complimentary hors d'oeuvres and cash bar is scheduled for 6:30 PM, June 20 at Enzo's Restaurant, 601 Michigan Avenue, LaPorte (five minutes from the Holiday Inn). Tour registration cost is \$95.00 first person and \$75.00 per person/same business thereafter. A \$20.00 per person discount is available for current OVPGA Buckeye or Ohio Fruit Growers Society Cardinal members.

For more information, contact Tom Sachs at (614) 246-8290 or email at [tsachs@ofbf.org](mailto:tsachs@ofbf.org). The registration form is available at [www.ohiovegetables.org](http://www.ohiovegetables.org).



**WEED CONTROL OPTIONS FOR PUMPKINS - (Liz Maynard)**

- Weeds in pumpkins are usually managed with a combination of preemergent herbicides, cultivation, hand-weeding, and postemergent herbicides. Some common systems used in Indiana are described below.

Probably the most common practice involves clean tillage in the spring, direct-seeding pumpkins, application of a preemergent herbicide, and cultivation and hand-hoeing or weeding as needed. Sometimes no preemergent herbicide is used because the grower's experience has shown that cultivation provides adequate control. Sometimes additional herbicide applications are made - a broadcast application of a post-emergence herbicide for grasses and/or selected broadleaves, a shielded row-middle application of a non-selective post-emergence herbicide, or a row-middle application of a preemergent herbicide at layby. The cultivation and handwork is important. It is rare that adequate weed control is obtained using herbicides alone.

This system can include a stale seedbed, where the ground is prepared for planting 2 to 4 weeks in advance and weeds that emerge before planting are killed with a non-selective herbicide, or sometimes, shallow cultivation. Planting then proceeds without further working of the soil. It is possible also use a rotary hoe after planting. Use of a stale seedbed will reduce the number of weeds that emerge after planting.

Sometimes pumpkins are no-tilled into crop stubble, soybeans from the previous season are the most common. In areas where wheat matures early enough, pumpkins can be no-tilled into wheat stubble. In these systems a burn-down herbicide like glyphosate is used before planting. After seeding, preemergent and if needed, post herbicide(s) are used as described above.

Hand hoeing or weeding is also likely to be needed, depending on weed pressure and herbicide efficacy.

Less common, and likely to take some experimentation to adapt it to a particular farm, is no-till planting into a killed cover crop of winter rye. Rye is planted in the fall. The following spring, rye is killed, typically when is about two to three feet tall. It is most commonly killed with a herbicide. It can also be killed by mowing, or by using a roller/crimper. Pumpkins are no-till planted into the residue. A heavy residue provides significant suppression of weeds early in the season. Pre and post herbicides are often used as described above. Hand hoeing and weeding may also be necessary. With this system extra nitrogen (above the usual amount for pumpkins) should be applied before planting to avoid tie up of nitrogen by the rye residue. Twenty to forty lb./A extra N should be sufficient. An advantage of this system is that pumpkin fruit rest on the mulch and so are cleaner at harvest.

A variation on this system is to plant a grain, like oats or wheat, in the early spring and kill it with herbicide 2 or 3 weeks before no-till seeding the pumpkins. This practice is also one that will probably need some experimentation to develop a system that works on your farm.

Some growers who are set up for growing other crops in a plasticulture system grow pumpkins on beds covered with black plastic mulch, with or without drip irrigation. Pumpkins can be transplanted (use 2-3 wk-old plants) or direct seeded into the mulch. The plastic mulch provides weed control in the row. Between the rows of plastic weeds are managed using directed sprays of preemergent and/or postemergent herbicides, cultivation, hoeing and hand weeding. Plastic mulch can speed development of the pumpkin crop, so planting date may be a week or two later than without plastic.

No matter which method is used, advance preparation will increase the chance of success. Ideally, a pumpkin field will have a history of good weed management, and few perennial weeds. A list of the major weed species in the field will help in planning. Herbicides labeled for pumpkins are listed in the ID-56 Midwest Vegetable Production Guide (pp. 71 - 73) and which weeds they control are listed in the Herbicide Effectiveness Guide on p. 33 of the 2006 edition. Row and in-row spacing compatible with available mechanical cultivation equipment will make it easier to control the weeds.



**WHITE MOLD OF TOMATOES - (Dan Egel)** - The cool, wet weather this spring has resulted in more reports of white mold, also known as timber rot, than in past seasons. White mold may affect a broad range of broad leaf crops including tomatoes, many types of beans and occasionally cucurbits. Since this disease can cause problems in the same field for many years, it makes sense to understand and avoid white mold.

Growers who observe this disease will probably first notice a light tan area on the stems of affected plants. The disease often begins in the crotch of branches (Fig. 1) or

on injured areas of the stem. The white, cottony growth of the fungus may be observed under moist conditions. Small dark bodies about as large as a pea may be observed on the outside or inside of the stem (Fig. 1 inset).



**Fig. 1.** White mold on tomato, inset - sclerotia from white mold fungus. (Photo by Dan Egel)

The small dark bodies described above, sclerotia, can survive years in the soil. When conditions are proper, sclerotia can grow into a small mushroom. The spores from the mushroom may cause infection on a susceptible plant during moist, cool conditions (60 to 70 F).

This year, we have had reports of white mold occurring on greenhouse tomatoes. This may occur when tomatoes are grown in the field soil under a greenhouse or even in transplant trays. When tomatoes are grown year after year in one place, whether it be in a field or under a greenhouse white mold and other diseases will become much more likely. The spores that cause white mold may also drift into a greenhouse from outside and infect transplants in trays. In the latter case, white mold has probably occurred in some crop near to where the transplants are produced.

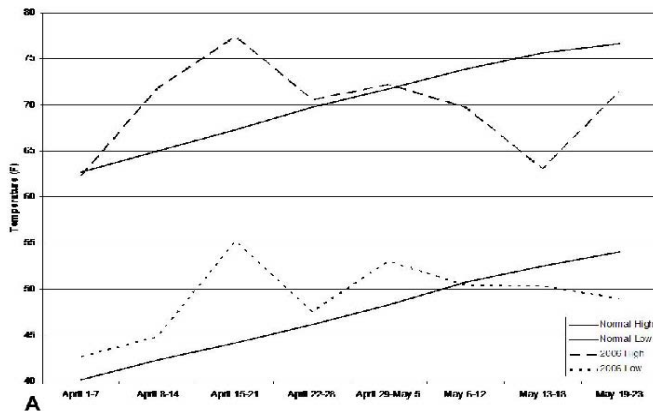
Also known as Sclerotinia or white mold, this disease affects a wide range of crops including tomato, potato, cucumber, watermelon, beans, etc. Due to the wide host range and the length of time the fungus may survive in the soil, managing this disease can be difficult. Greenhouse growers can steam heat soil or in some cases fumigate. Growers who have observed this problem in a particular field may want to avoid the field in the future. Sweet corn would be an acceptable rotational crop. I am not aware of any fungicides registered for use against the disease.



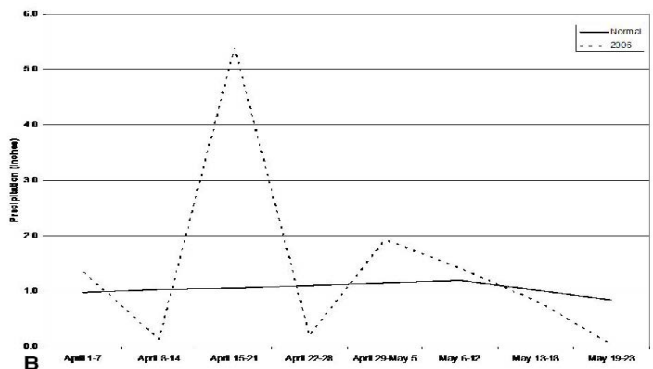
**UNSEASONABLE WEATHER IMPACTS CANTALOUPE MARKET - (Jennifer Dennis and Chris Gunter)** - As reported in the last VCH Bulletin (reprinted in this issue), we have been experiencing unseasonably cool wet weather. In fact during the early part of May local weather conditions in Vincennes, IN more closely resembled normal April weather (Fig. 1A). We have also been experiencing unseasonably wet weather through the end of April and early May (Fig. 1B).

Cantaloupe producers are now facing the dilemma of whether to plant or re-seed plants that were lost. There are some factors that each grower should consider

including average arrival time for cantaloupe within the marketplace and the f.o.b. shipping point price and how these two issues might affect the demand for this year's crop.



**Fig. 1A.** Average high and low weekly temperature (F) and **B** rainfall from April 1 to May 23, 2006 along with normal temperatures for Vincennes, IN.



California, Florida, Georgia, and Texas are huge producers of cantaloupe. South Texas, Florida, and California are usually the first to supply the market in April and May followed by South Carolina and Georgia from June to October. For Indiana, the cantaloupe season runs approximately from July through September. Due to the unfavorable conditions, most plantings will not be ready until August. Pushing the season back is ok when other states are also behind. However, if everything else remains the same (i.e. other states have not had adverse weather conditions), Indiana growers may receive lower prices for their crop due to an influx in supply during August and September from other places such as California, Florida and Georgia, as well as nearby states such as Michigan, Ohio, and Kentucky.

The United States Department of Agriculture (USDA) Economic Research Service (ERS) reports monthly f.o.b. shipping-point prices for various commodities. If other states cantaloupe crop is not affected, the supply will be larger than the demand and premiums will not be an option. The average shipping-point prices for cantaloupes are listed below:

	July	August	September
	(dollars per cwt)		
2005	10.80	8.10	11.00
2004	11.00	14.30	15.50
2003	16.40	15.70	14.20

Growers should keep in mind that Indiana is fifth in the nation for cantaloupe production just behind Georgia. If most of the crop has been lost due to unfavorable weather conditions, buyers may look to other states such as California, Colorado (6<sup>th</sup>), South Carolina (7<sup>th</sup>) Pennsylvania (8<sup>th</sup>), and Maryland (9<sup>th</sup>).

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