

VEGETABLE CROPS HOTLINE

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

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WHERE ARE THE CUCUMBER BEETLES? - (Frankie Lam and Ken Scheeringa) - In mid-April we scouted and found some flea beetles on early-planted corn and bean leaf beetles on soybeans, in southern Indiana. Normally by late April or early May, after transplanting muskmelons into the field, we expect cucumber beetles to be feeding on our plants. However, the beetles have "disappeared" from the fields and not many insects are established in our crops. In early June I still have not seen a cucumber beetle on my melons planted at our Center. Some muskmelon growers are asking, "Where are the cucumber beetles?"

A review of weather conditions in April and early May is the key to answer this question. The first three weeks of April were usually warm and dry. From April 1 to 22 the nine agricultural Districts in Indiana reported average daily temperatures (°F) about 6 to 8 degrees above the climate normals (Table 1). Then unseason-

Table 1. Departure of average daily temperatures in April and early May 2005 from climate normals (1971-2000).

Agricultural District	Average daily temperature departure (°F)	
	April 1 - 22	April 23 - May 5
NW	7.9	-8.3
NC	7.3	-9.2
NE	7.0	-9.3
WC	7.0	-9.7
C	6.4	-10.0
EC	7.2	-9.5
SW	5.9	-9.9
SC	6.7	-9.7
SE	5.9	-10.8
Average	6.8	-9.6

ably cold weather, including some subfreezing nights, gripped our state from April 23 to May 5. In the nine districts daily temperatures averaged from about 8 to nearly 11 degrees below normal and about 15 to 20 degrees colder than the early season warm spell.

We concluded, in our previous article (please read *Winter Temperatures (2004-2005) and Insect Survival in Indiana* in Vegetable Crops Hotline No. 449 on May 27, 2005), Indiana had a mild winter relative to the climate normals and the early season insect populations should be similar to or slight higher than those of last spring. A warm early spring encourages insects to "awaken" from their overwintering condition earlier and begin to search for food. After the insects "woke up" from the overwintering conditions, the chemicals that serve as antifreeze in their bodies decrease or break down. Afterwards most insects cannot tolerate temperatures near or below freezing. Yet, the data indicate that the average daily temperature was 9.6°F below climate normals in all nine districts during the 13-day long cold snap. Most of the insects would be killed by these cold temperatures. Probably, insects observed on crops in early and mid-April did not survive and not many insects were found in fields after late April. If our speculation is true, this year we would have less cucumber beetle pressure on the muskmelons during the early season. Furthermore, the mid- and late season insect populations will depend on the coming June weather.



COOL AND DRY WEATHER FAVORS THE GROWTH AND DEVELOPMENT OF APHIDS - (Frankie Lam) - *A portion of this article was written as a Vegetable Crops Hotline - BULLETIN, June 2, 2005.* Early season weather has been cool and dry in Indiana. For instance, by comparing the data collected at Southwest Purdue Agricultural Center, near Vincennes from April 22 to May 31 (total of 40 days) between the years 2004 and 2005, the accumulated degree-days (°F) in 2004 was 2,686 and in 2005 was 2,424, whereas the accumulated precipitation (inches) in 2004 was 8.84 and in 2005 was 6.65. In other words, during 2005 in Vincennes for those 40 days we have 262 degree-days and 2.19 inches precipitation accumulated less than last year. This cool and dry season has been favorable for the growth and development of aphids. In

late May aphids (Fig. 1) have been observed in many cucurbit fields, including cucumber, muskmelons, and watermelons in southern Indiana. Some growers had already sprayed their fields for the control of aphids. If the weather continues to be cool and dry, scout your fields once every two to three days for aphids.

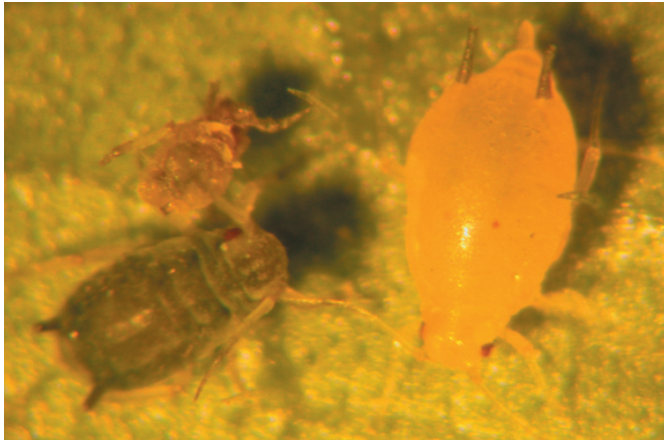


Fig. 1. Wingless melon aphids. (Photo by Frankie Lam)

Aphids suck the plant sap from the underside of leaves (Fig. 2), weakening the plants and reducing the quantity and quality of the fruit. Cucurbit leaves damaged by aphids have a distorted, cupped appearance (Fig. 3). Aphids can transmit viral pathogens by feeding on the plant a single time. Controlling aphids before the outbreak of a population might result in a lower incidence of viral diseases in crops. Moreover, the



Fig. 2. A colony of melon aphids on the underside of a cucumber leaf. (Photo by Frankie Lam)

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Fig. 3. Distorted, cupped appearance of (A) a watermelon and (B) a muskmelon leaf. (Photo by Frankie Lam)

“honeydew” secreted from the anus of the aphids may cause the growth of a sooty, black mold. The honeydew and the growth of the mold may cause cosmetic injury to the fruit. If plants are infested with a relatively high population before fruit set, a severe reduction in yield may occur.

For the scouting of aphids, first check the plants located on field borders, because most infestations will start at the border of a field. If aphids are found, then also check inside the field. On each colony of aphids also check for natural enemies, including predators and parasitized aphids. The predators of aphids are the larvae and adults of lady beetles and lacewing larvae. The parasitized aphids by wasps or known as mummy aphids appear tan and are 2-3 times larger than the normal aphids. For more information on the biology and natural enemies of aphids, please read the article, *Aphids on Tomatoes*, in the Vegetable Crops Hotline No. 448 on May 13, 2005.

If natural enemies are found, mark the infested areas with flags and return to inspect it in 2-3 days. If the aphid population is not increasing, no treatment is necessary. If the infested area is expanding, then spot spray the infested areas and 100 feet beyond the edges of infestation. Asana, Capture, Diazinon, Dimethoate, Endosulfan, Fulfill, Lannate, Malathion, Pounce, and Phaser are recommended for aphid control on cucurbits. Please read and follow the label carefully before applying insecticides.



FUSARIUM WILT OF WATERMELON - (Dan Egel) - This disease has begun to show up in some southern Indiana watermelon fields. The first symptoms observed are clusters of wilted plants scattered across a field (Fig. 1).



Fig. 1. Watermelon plants affected by Fusarium wilt often exhibit a wilt of a portion of the plant. (Photo by Dan Egel)

Often affected plants wilt in one stem or leaf while the rest of the plant appears healthy. The roots and exterior of the stem of wilted plants appear to be unaffected; however, the internal stem tissue of affected plants often appears brown (Fig. 2).



Fig. 2. Brown discoloration in the stem of watermelon plants in a symptom of Fusarium wilt. (Photo by Dan Egel)

The fungus that causes Fusarium wilt of watermelon will not spread within the field during the course of a season. That is, the disease will not spread from a plant that is wilting to a healthy plant. This disease is not likely to affect every plant in a field. Contrast Fusarium wilt of watermelon with a disease such as gummy stem blight of watermelon that may spread with splashing water to nearly every plant in the field.

It is difficult if not impossible to avoid Fusarium wilt once the fungus has been introduced into a field. However, read on for some suggestions.

- Have this disease properly diagnosed and record what fields have this problem.
- Information on hybrid selection for Fusarium wilt management can be found in the Midwest Vegetable Production Guide for commercial growers. In addition, ask your seed representative. However, no hybrids are completely resistant to the Fusarium wilt fungus. High populations of the soil fungus will cause many varieties to show symptoms. Race 2 of the fungus exists in some areas fields; no resistance is known for this race.
- Crop rotations of 5 to 6 years will help lessen the incidence of Fusarium wilt; however, the fungus will survive upwards of 10 years in the soil without watermelon. It is unlikely that conventional rotations of 3 to 6 years will eliminate Fusarium wilt. However, shorter rotations will cause the disease to increase.
- Soil fumigation with formulations having a high content of chloropicrin may help lessen the problem. However, fumigation does not always get rid of Fusarium wilt problems.
- Manage other diseases that might exist in a field as much as possible. Otherwise healthy plants will be able to better withstand Fusarium wilt.
- I have observed Fusarium wilt in greenhouses over the last few years. Although this disease can be seed-borne, I have also noticed that the cleaner the greenhouse operation, the less the problem seems to be. For example, I believe that the fungus can survive on transplant trays.

- Covercrops may help to lessen the severity of Fusarium wilt. Researchers across the country have been looking into this topic.

Transplants replanted in affected fields may later show symptoms of Fusarium wilt. Growers desiring to replant can help lessen the impact of the disease by using varieties with partial resistance to Fusarium wilt. The fungus that causes Fusarium wilt of watermelon does not affect muskmelon, cucumbers and pumpkins. Therefore, these plants may be replanted into affected fields.

Please contact me if you believe you are having unusually serious Fusarium wilt of watermelon problems.



CANADA THISTLE CONTROL IN VEGETABLE CROPS - (Liz Maynard) - Canada thistle is one of Indiana's official 'noxious weeds', sharing this distinction with johnson grass, bur cucumber and shattercane. Property owners are required to 'control and contain' noxious weeds, and if they do not, Township Trustees or County Weed Control Boards may arrange for control at the property owners expense. This article draws on information in "Control Practices For Canada Thistle" by M. Ross <www.btny.purdue.edu/Pubs/WS/CanadaThistle>, and "Managing Canada thistle in organic cropping systems" by J. Masiunas <www.ipm.msu.edu/new-ag.htm#1>.

Canada thistle is a perennial that spreads rapidly from a vigorous creeping root system. An infestation may begin when a section of root is brought into a field, or when seeds are introduced in manure, mud, flood or irrigation water, by wind, or other means. Seedlings develop first into a rosette (Fig. 1) and then the stem elongates to form the taller, more familiar thistle plant (Fig. 2).



Fig. 1. Initial rosette of growth of Canada thistle. (Photo by Merrill Ross)

Control of an established patch is based on eliminating the ability of the root system to send up new shoots. Over time, the roots can be depleted of energy needed



Fig. 2. Mature growth of Canada thistle. (Photo by Merrill Ross)

to survive if they are repeatedly disturbed beginning in the spring, and any new shoots that emerge are immediately killed. If roots are not disturbed until the summer, it is likely they will have enough energy to survive disturbance and send up multiple new shoots.

Roots can be killed by application of glyphosate products in late May or June after flower buds have formed but before they open, and / or in September-October when shoots grow again. The herbicide will be

most effective if the thistle has not been recently disturbed by tillage and is not cultivated or mowed for 10 days after treatment. Glyphosate products are labeled for use between rows of most vegetable crops if the crop is protected from the spray.

Clopyralid (Stinger) will suppress roots. It should be applied from the rosette up to the bud stage, and may be used in sweet corn, asparagus, beet, turnip roots, cole crops and brassica leafy greens. Make sure to allow enough time between application and harvest as indicated by the preharvest interval listed for each crop on the label.

Growth of thistle shoots and replenishment of root energy reserves will be suppressed by a vegetable crop or cover crop that provides heavy shade. This alone won't eradicate the thistle, but can be used together with other practices that suppress roots. Repeated mowing of the thistle beginning in early spring will also deplete root reserves; this could be used at field edges.



SUMMER FIELD DAY - (Announcement) - Mark your calendars for the Southwest Purdue Agriculture Center's Summer Field Day. It will be held on August 10, 2005 at 1:30 pm at the Center, just north of Vincennes. There will be a tour and discussion of the various field experiments and specialists will be on hand to answer questions. More information will be published in a future issue of the Hotline.



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