

VEGETABLE CROPS HOTLINE

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

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SQUASH BEETLE ON CUCURBITS - (Frankie Lam) - Squash beetle (Fig. 1), which belongs to the lady beetle family, is a pest of cucurbits. The adult is yellow in color, about 3/8-inch long, and has seven black spots on each wing cover (elytron). The larvae are distinguished from the predaceous lady beetle larvae by having large forked spines across their yellowish orange bodies. Both adults and larvae of the squash beetle feed on leaves of cucurbits, mainly squash, pumpkin, and muskmelon. However, the insect has also been reported to feed on blossoms and pods of lima beans and cowpeas, and on corn silk.



Fig. 1. Squash beetle on summer squash. (Photo by Frankie Lam)

During early June a few adult squash beetles were observed feeding on summer squash in southwestern Indiana. Not much research had been done on the economic threshold of squash beetles on cucurbits in the Midwest. This is because small populations of the beetle can be found occasionally on cucurbits and have

no great impact on cucurbit production. Handpicking is usually recommended for the management of the pest. If you observe a large population of squash beetles in your field, please call me at (812) 886-0198.



SUSTAINABLE AGRICULTURE GRANTS AWARDED - (Chris Gunter) - As some of you may know the North Central Region Sustainable Agriculture Research and Education (NCR-SARE) Program has grants available for farmers and ranchers as well as researchers. NCR-SARE recently announced that 47 Farmer Rancher Grant Proposals have been selected for funding. A total of \$414,489 will be disbursed in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. Every farmer and rancher will use the funding to implement a sustainable farm project.

In the Farmer/Rancher grant program, Indiana had 16 proposals submitted, which was just about average for the 12 states in the region and considerably more than have traditionally been submitted. Of those, two individual and one group proposal were funded for a total of \$29,270. Lafayette producer Kevin Colley received \$5,901 to implement his project, "Innovative Field to Market Processes for Small Produce Farms." Dale Rhoads and a team of producers in Nashville were awarded \$17,869 for their project, "Development of Organic Weed Control Strategies." Brent Ladd of West Lafayette received \$5,500 for "Value-added Sustainable Animal Production with Natural and Organic Leathers." For producers interested in writing these types of grants Purdue offers grant writing workshops to help make the process easier, contact your county extension agent for more information.

In the Research and Education Grant program, Indiana had one proposal submitted and it was funded. Congratulations to Dan Egel for his project, "The management of watermelon vine decline through sustainable management practices."

The USDA-funded NCR-SARE program provides competitive grants to farmers, educators, graduate students, and researchers furthering economically, environmentally, and socially sustainable agriculture. Once a year, NCR-SARE calls for grant proposals from farm-

ers and ranchers, then forwards those proposals to a Review Committee, made up of ag producers and other experts. After all the proposals have been scrutinized, the NCR-SARE Administrative Council selects projects to be funded.

For more information on the USDA-funded NCR-SARE program, its competitive grant programs, or to be notified of NCR-SARE's call for grant proposals, contact <www.sare.org/ncrsare/>, (402) 472-7081, or 1-800-529-1342. The state coordinator for SARE in Indiana is Rick Foster, feel free to contact him for more information (765) 494-9572.



GREENHOUSE TOMATO GRADE CHANGES PROPOSED

- (Announcement) - The Agricultural Marketing Service (AMS) of the Department of Agriculture (USDA) is soliciting comments on its proposal to revise the United States Standards for Grades of Greenhouse Tomatoes. AMS is proposing to revise the standards to allow that percentages of defects and size classifications be determined by count rather than weight. Additionally, AMS is proposing to delete the "Unclassified" section, add moldy stems as a damage defect, and add a scoring guide for damage and serious damage for skin checks. The proposed revisions would bring the standards for greenhouse tomatoes in line with current marketing practices, thereby improving their usefulness in serving the industry.

Comments must be received by July 31, 2006. Interested persons are invited to submit written comments to the Standardization Section, Fresh Products Branch, Fruit and Vegetable Programs, Agricultural Marketing Service, U.S. Department of Agriculture, 1400 Independence Ave., SW., Room 1661 South Building, Stop 0240, Washington, DC 20250-0240; Fax (202) 720-8871, E-mail FPB.DocketClerk@usda.gov. Comments should make reference to Federal Register: May 31, 2006 (Volume 71, Number 104, Page 30860).

The proposed United States Standards for Grades of Greenhouse Tomatoes are available either through the address cited above or by accessing the AMS, Fresh Products Branch Web site at: <www.ams.usda.gov/fv/fpbdoctlist.htm>.



PUMPKIN PLANTING TIME - (Dan Egel) - The time to plant pumpkins is fast approaching. Depending on market demands and double crop sequence, pumpkins are planted in Indiana from May through July. However, pumpkins seeded after about 20 June in southern Indiana are more likely to have virus problems. The virus diseases that are likely to affect pumpkin include, Papaya ringspot, Watermelon mosaic virus, Zucchini yellow mosaic, squash mosaic and cucumber mosaic virus.

The reason a late planting date is likely to have more virus problems than an early planting date has to do with how the virus diseases are spread. Aphids are responsible for transmitting virus diseases of pumpkins. During the winter months, virus diseases overwinter in pumpkin and related plants in the southern US. As the season warms up, aphids move the disease slowly north as pumpkins and related crops are planted. By the time these virus diseases become severe in Indiana, it is usually mid-July. Therefore, if pumpkin fruit is set before virus disease become severe, less yield loss will be realized.

Before leaving the subject of pumpkin virus diseases, I would like to remind growers that even though aphids spread virus diseases, applying insecticides for aphids has been ineffective for virus management. This is because aphids are able to transmit viruses in just a few seconds. No insecticide is likely to work that fast. And even if the aphid is killed, the virus is still transmitted. Our research has shown that insecticides are not effective for pumpkin disease management, and we have also shown that repeated applications of insecticides can reduce beneficial insects and lead to the build up of secondary insect pests such as mites.



FIRST-GENERATION COLORADO POTATO BEETLES

- (Frankie Lam) - In late May relatively high number of first-generation Colorado potato beetle larvae were observed in some potato fields in southern Indiana. All stages of larvae were observed in fields and this is the time to scout and manage the pest on potato.

Colorado potato beetle overwinters as an adult 4-10 inches below soil surface. In spring the adults emerge and feed on early season potatoes and/or other hosts, such as eggplant (Fig. 1), pepper, tobacco, tomato, buffalo bur, and nightshade. The female adults lay eggs in



Fig. 1. Adult Colorado potato beetle feeding on eggplant. (Photo by Frankie Lam)

a mass (Figs. 2 and 3) on the underside of leaves. Eggs hatch in 4-10 days, depending on the temperature. The larvae molt four times before pupation. All larvae are reddish-brown with black head and legs and black spots on the lateral sides of the body. The first two larval stag-

es (Fig. 4) are usually small (about 1/8 to 3/16 inches) and feeding damage is not severe enough to cause economic damage. The third and fourth larval stages (Fig. 5) are larger in size (about 3/8 inches) and consume more foliage resulting in severe yield loss.



Fig. 2. Female Colorado potato beetle laying eggs on the underside of potato leaf. (Photo by Frankie Lam)



Fig. 3. Colorado potato beetle egg mass. (Photo by Frankie Lam)



Fig. 4. Early larvae of Colorado potato beetle. (Photo by Frankie Lam)

The level of tolerance for Colorado potato beetle on potatoes depends on the growth stage of the plants. The allowable defoliation for preflowering, flowering, and tuber formation of potatoes are 20-30%, 5-10%, and

30%, respectively. The optimal time for the control of the beetles on potato is during the second and third larval stages before severe feeding damage occurs. Please check the *Midwest Vegetable Production Guide for Commercial Growers* (ID-56) <www.entm.purdue.edu/entomology/ext/targets/ID/index.htm> for the recommendation of insecticidal control of the beetle. Read the label carefully before applying insecticides.



Fig. 5. Late larva of Colorado potato beetle. (Photo by Frankie Lam)



IMPORTED CABBAGEWORM ON CABBAGE - (Frankie Lam)

- The three economically important caterpillar pests on cabbage in Indiana are the imported cabbageworm, cabbage looper, and diamondback moth. In early June, 200 cabbage plants were scouted for caterpillar pests and on average 11 eggs of imported cabbageworm per plant were counted in southern Indiana. However, not many eggs and larvae of cabbage looper and diamondback moth were observed. This data indicated that many cabbageworms will be hatching and feeding on cabbage in the coming few days, scouting and management practices for caterpillars should begin on cabbage or other vegetables.

The adult of imported cabbageworm is a common white butterfly (Fig. 1) that does not cause any injury on plants. The female lays yellow, bullet-shaped eggs singly



Fig. 1. A common white butterfly is the adult of cabbageworm. (Photo by Frankie Lam)

on the underside of leaf (Fig. 2). A female can lay more than 200 eggs in her life span. The larvae hatch in a few days and require 3-4 weeks for five molts to complete the life cycle. The early caterpillars (Fig. 3) are greenish yellow, while the late caterpillars (Fig. 4) are velvet green in appearance. When fully grown the caterpillar is about 1 ¼ inches long, bear a narrow yellow line running along the center of the back and a broken yellow line on each side of the body.



Fig. 2. Yellow, bullet-shaped cabbageworm eggs laid singly on the underside of cabbage leaf. (Photo by Frankie Lam)

The cabbageworms feed on cabbage, broccoli, cauliflower, collard, horseradish, and kale. The early caterpillars may feed on leaf and bore into the ribs and the late caterpillars may bore into the head of cabbage. Their waste on cabbage may lower the marketable value of the crop. The economic threshold for cabbageworm on cabbage are 30%, 20%, and 10% infestation during transplant to cupping, cupping to early head, and early head to harvest, respectively. There are many insecticides that



Fig. 3. Early cabbageworm. (Photo by Frankie Lam)



Fig. 4. Fully grown cabbageworm. (Photo by Frankie Lam)

can control cabbageworms on vegetables effectively, please check the *Midwest Vegetable Production Guide for Commercial Growers* (ID-56) for recommendation. Read the label carefully before applying insecticides.

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