

# VEGETABLE CROPS HOTLINE

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

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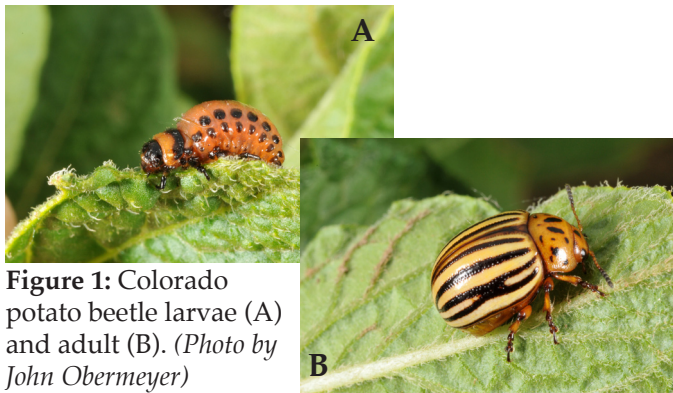
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**COLORADO POTATO BEETLES** - (Rick Foster) - One of the insect species that seems to have an amazing ability to develop resistance to various insecticide classes is the Colorado potato beetle (Figure 1A and B). Historically, this insect has quickly developed resistance to many new classes of insecticides in major potato producing areas. For example, in the early 1980's, potato beetles on Long Island, NY developed resistance to the pyrethroid insecticides in about 2 years. Here in Indiana, we don't grow that many potatoes and resistance has developed more slowly than in some areas. When I arrived at Purdue over 20 years ago, it quickly became obvious that our beetles were resistant to Sevin®, one of the few products available to homeowners. Resistance soon developed to Thiodan® as well. However, the pyrethroid insecticides have continued to be effective, until recently.



**Figure 1:** Colorado potato beetle larvae (A) and adult (B). (Photo by John Obermeyer)

My recommendation is that if you receive unsatisfactory control with one of these products that you discontinue its use immediately. We have several other products available that will provide good to excellent control. The neonicotinoid insecticides (Actara®,

Admire®, Assail®, Platinum®, Provado®) are still effective used either at planting or as foliar treatments. Agri-Mek®, Provado® and Rimon® are also effective foliar materials with different modes of action. To avoid developing resistance to these products, I recommend that growers use different modes of action on different generations. For example, if you use either Admire® or Platinum® as a planting time treatment, don't use Actara®, Assail® or Provado® as a foliar treatment. Likewise, if you use a foliar treatment for first generation control, use a different mode of action on the second generation. See the chart on page 137 of the *Midwest Vegetable Production Guide* (ID-56) <[www.btny.purdue.edu/Pubs/ID/ID-56/](http://www.btny.purdue.edu/Pubs/ID/ID-56/)> for a list of registered products and the IRAC group numbers (which signify the product's mode of action).



**SQUASH BUGS** - (Rick Foster) - I have received a number of reports of infestations of squash bugs recently (Figure 1). This insect is particularly important to control on young pumpkins since these plants can't tolerate as much feeding damage. The easiest stage to control is the young nymph stage. To achieve the best control results, scout for egg masses and flag several plants and leaves where you find them. Go back to those plants daily and when most of the egg masses have hatched, that will be the best time to spray. The best control is achieved with one of the pyrethroid insecticides (Ambush®/Pounce®, Asana®, Brigade®, Mustang Max®).



**Figure 1:** Adult squash bug laying eggs. (Photo by John Obermeyer)



**SUMMER SQUASH FRUIT ABORTING - (Liz Maynard)**

- There have been reports of summer squash fruit aborting at a young stage (Figure 1). If the flowers are aborting after they have opened there may have been a problem with pollination. It is possible that cool weather this season has led to more female flowers and fewer male flowers, which can lead to poor pollination. I have observed rather low numbers of male flowers in some squash plantings (Figure 2). Other possibilities include low pollinator activity due to hot or dry weather or absence of pollinators. If flowers abort before opening it could be caused by stress from environmental conditions, or a heavy load of developing fruit.



**Figure 1:** Zucchini plant with one young fruit beginning to abort (dried flower, yellowing blossom end) and a second fruit with flower just closed. (Photo by Liz Maynard)



**Figure 2:** Male flower of zucchini plant, necessary to supply pollen. (Photo by Liz Maynard)



**MEASURING MELON FRUIT QUALITY WITH A REFRACTOMETER - (Liz Maynard)**

- Many producers strive to produce vegetables with great internal quality and want to communicate that to consumers and buyers. This article will discuss the use of refractometers to measure °Brix, or % soluble solids, a common procedure for determining quality in cantaloupe and watermelons.

A refractometer is commonly used to evaluate sugar content of cantaloupe and watermelon fruit. It measures the angle of refraction as light passes through juice squeezed from the fruit. This angle is dependent on the type and concentration of dissolved solids, i.e. sugars and minerals. In sweet solutions like the melon juices it is highly correlated with the amount of sugar in the solution. The measurement is reported as °Brix (degrees Brix) or % soluble solids (SS).

Measurements on the ripe fruit are useful for describing quality of the product. Higher SS levels mean sweeter fruit. USDA grade standards use soluble solids levels to define internal quality for both cantaloupe and watermelon (as well as many other fruits), see table below. In research trials the measurements are used to compare varieties – reports of variety trials conducted at SW Purdue Ag Program include %SS for fruit – and influence of management practices on fruit quality. Soluble solids are also used to characterize a wide variety of other vegetables in research trials, including onions, sweet corn, and tomatoes.

USDA Grade Standard Definitions of Internal Quality for Cantaloupe and Watermelon.

	Very Good Internal Quality	Good Internal Quality
	% Soluble Solids	
Cantaloupe	11	9
Watermelon	10	8

Handheld refractometers are easy to calibrate, simple to use, and durable. Instructions that come with the instrument are the best guide for use. Common models look like a small telescope or kaleidoscope with an angled prism at the end opposite the eyepiece. The solution to be measured is placed on the surface of the prism, and a flap of plastic closed over it. The measurement is determined by looking through the eyepiece and reading off of a scale. Juice from individual melons can be squeezed directly onto the instrument.

The use of refractometers to measure soluble solids in fruit is well researched and documented, and recognized as standard practice in the industry. These instruments are reliable tools for objective measurements of internal quality in melons.



### PUMPKIN POWDERY MILDEW MANAGEMENT - (Dan Egel)

- Perhaps the 4<sup>th</sup> of July fireworks should be a signal to pumpkin growers to start thinking about managing powdery mildew. Fortunately, pumpkin growers have a new fungicide to choose from: Quintec<sup>®</sup> 2.08 SC has just received a label for pumpkins, winter squash and gourds. This article discusses Quintec<sup>®</sup> and other aspects of pumpkin powdery mildew.

Quintec<sup>®</sup> 2.08 SC has been labeled for powdery mildew on muskmelon and watermelon. Recently, this product obtained a label for powdery mildew of pumpkins, winter squash and gourds. Quintec<sup>®</sup> was discussed in issue no. 507 of the *Vegetable Crops Hotline*. Briefly, I have been impressed with the effectiveness of Quintec<sup>®</sup> on powdery mildew. However, Quintec<sup>®</sup> is not a systemic product. Therefore, growers might consider applying Quintec<sup>®</sup> in alternation with the systemic products Procure<sup>®</sup> or Rally<sup>®</sup>, which have also been effective. Quintec<sup>®</sup> may be more effective early in the season than late in the season due to the fact that it is not systemic. In order to apply Quintec<sup>®</sup>, it is necessary to have both the full and supplemental labels. One can use the following link to obtain these labels or contact Dan Egel <<http://state.ceris.purdue.edu/htbin/prodinfos.com?ProdId=2004057080&State=IN&Type%20=P>>.

Powdery mildew of pumpkins can be managed through a combination of partially resistant varieties, fungicides and crop rotation. Several pumpkin hybrids have partial resistance to powdery mildew. Recommended pumpkin varieties are listed in the *Midwest Vegetable Production Guide* <[www.btny.purdue.edu/Pubs/ID/ID-56/](http://www.btny.purdue.edu/Pubs/ID/ID-56/)>. Fungicides that can be used for powdery mildew of pumpkin are listed in the *Midwest Vegetable Production Guide* and in the extension bulletin BP-135-W <[www.btny.purdue.edu/Pubs/#vegetables](http://www.btny.purdue.edu/Pubs/#vegetables)>. A discussion of the various fungicides that are labeled is in issue no. 507 of the *Vegetable Crops Hotline*.

The first application of a powdery mildew fungicide should occur when the pumpkin plant has grown into a full bush-like structure, but before it has started to vine. When the plant has grown into a 'bush', the higher humidity inside the plant canopy may contribute to powdery mildew development. Powdery mildew requires high humidity, but not leaf wetness to develop.

Powdery mildew has been observed on cucurbits in southern Indiana. Don't wait for more fireworks before starting your powdery mildew management program!



**DOWNY MILDEW UPDATE - (Dan Egel)** - Downy mildew of cucurbits has been spreading to some additional locations in North America. Below find the locations where downy mildew exists. See *Vegetable Hotline* issue no. 509 for more information on this disease. Since downy mildew has been observed in northeast Ohio, cucurbit growers in northern Indiana may want to consider an appropriate fungicide application. Downy mildew of pumpkin is described in bulletin BP-135-W and BP-140-W

<[www.btny.purdue.edu/Pubs/#vegetables](http://www.btny.purdue.edu/Pubs/#vegetables)>. Additional management options are described in the *Midwest Vegetable Production Guide* (ID-56) <[www.btny.purdue.edu/Pubs/ID/ID-56/](http://www.btny.purdue.edu/Pubs/ID/ID-56/)>.

As of July 7, downy mildew has been found this season in Florida, Georgia, Alabama, Louisiana, South and North Carolina, Virginia, Maryland, Ohio and Ontario Canada. It is always a good idea to scout ones fields for this disease; the accompanying photographs should help in identification. In addition, Purdue University has three sentinel plots that are scouted weekly in an attempt to find this disease.



**Figure 1:** Typical angular lesions of downy mildew on pumpkin. (Photo by Dan Egel)



**Figure 2:** Moist conditions will lead to the growth of the downy mildew fungus as seen on the underside of this pumpkin leaf. (Photo by Dan Egel)



**Figure 3:** Downy mildew on a cucumber leaf. (Photo by Dan Egel)



**Figure 4:** Downy mildew on a watermelon leaf. (Photo by Dan Egel)



**Figure 5:** Downy mildew on a muskmelon leaf. (Photo by Dan Egel)



**The Southwest Purdue Agricultural Center is proud to welcome Shubin K. Saha as our new horticulturist. Shubin is a native to Kentucky and received his bache-**

lors degree in horticulture at the University of Kentucky. After leaving Kentucky he attended the University of Florida for graduate school where he obtained a Doctor of Plant Medicine and a Ph.D. His work as a plant medicine student included use of soil solarization as an alternative soil management practice to methyl bromide for control of nematodes and weeds. Vegetable growers in the state of Florida have been heavily dependent on this broad-spectrum fumigant for a number of years and are in need of a viable alternative. Shubin worked on greenhouse vegetable production issues in Florida including management of greenhouse effluent for root-borne diseases caused by *Pythium* spp. and *Phytophthora* spp. Shubin's diverse background in Horticulture, Entomology, and Plant Pathology should be a good addition to our team here at SWPAC.

Shubin and his wife Amanda live in Vincennes. Amanda works at Vincennes University in the career resource center. In his free time Shubin enjoys fishing, golfing, and watching Kentucky basketball. He can be contacted at SWPAC via phone (812) 886-0198 and via email [ssaha@purdue.edu](mailto:ssaha@purdue.edu).



**WORKER PROTECTION STANDARD TRAINING OFFERED - (Announcement)** - Scott Monroe, Daviess County Extension Educator and Lynne Kiesel, facilitator at the Latino Community Learning Center in Daviess County will be offering Worker Protection Standard (WPS) training through the Daviess County office. The training will be offered in both English and Spanish.

Growers who are interested in scheduling a WPS training session, either at the office or on-farm, should call (812) 254-8668.

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