

# VEGETABLE CROPS HOTLINE

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

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**DOWNY MILDEW OF PUMPKIN** - (Elizabeth Maynard and Dan Egel) - The following article was written as a *Vegetable Crops Hotline - BULLETIN*, August 15, 2003. This disease is wide spread in Indiana this season. Downy mildew of pumpkin is not usually an important disease in Indiana. This is because downy mildew does not over-winter in Indiana and must "blow in" from southern states where the disease is active on plants all year long. Do not confuse downy mildew with powdery mildew. Both affect pumpkins. See the disease description below for downy mildew.

**What does downy mildew look like on pumpkins?** Downy mildew is primarily a leaf disease. Often, the first symptoms one observes are yellow, angular or square looking spots on leaves (Figure 1).



Figure 1. Close up of downy mildew on upper surface of pumpkin leaf. (Picture by D. Egel)

The underside of the leaves may be covered with a black fuzzy looking growth-this is the fungus that causes the disease (Figure 2). Leaves may eventually, turn brown and crinkle. The leaves may turn upwards



Figure 2. Lower surface of pumpkin leaf with downy mildew. Black fuzz is present on lesions. (Picture by D. Egel)

as they dry (Figure 3). Severe outbreaks may result in the rapid death of vines, which in turn may cause handles on pumpkins to become brown.



Figure 3. Leaf curl caused by downy mildew. (Picture by D. Egel)

### Weather conditions that favor downy mildew:

Downy mildew requires a period of leaf wetness and high humidity for successful infection. Heavy dews can provide adequate moisture to get this disease going. Recent rains have likely spread the disease

considerably. Although the fungal spores may land in your field, there has to be leaf wetness for the disease to cause problems. The optimum temperature for downy mildew is 59 to 68°F.

**What other crops are affected by downy mildew?**

A wide variety of organisms cause downy mildew on plants as varied as soybeans and pumpkins. However, the fungal organisms involved are usually specific for a particular plant family. Thus, the fungus that causes downy mildew of pumpkin can also affect cucumbers, muskmelons and watermelons.

**Managing downy mildew:** Since downy mildew does not over-winter in Indiana, rotation and tillage will not help to reduce the severity of downy mildew. (Growers will want to use these practices to manage black rot, bacterial spot and powdery mildew.) Any cultural practice, which allows good aeration between leaves, can lessen the impact of downy mildew. An example would be wider spacing between plants. Although some resistance is present in cucumbers and melons, there is no resistance among pumpkins and squashes.

**Will the fungicide treatments I have been applying for black rot and Plectosporium blight also control downy mildew?** For the most part, fungicide schedules designed to control common pumpkin diseases of Indiana will help to slow the spread of downy mildew. Protectant fungicides such as chlorothalonil (e.g., Agronil, Bravo, Echo, Equus), maneb (e.g., Maneb and Manex) and fixed coppers will provide good control of downy mildew if applied at weekly intervals.

Growers with high value crops may want to try systemic products. The strobilurin products (e.g., Cabrio, Flint, and Quadris) should also provide good control. Ridomil Bravo Gold, Acrobat and Aliette contain active ingredients specific for the control of downy mildew and related diseases.

The decision as to whether to apply fungicides to pumpkins that have been confirmed with downy mildew will be influenced by several factors.

- 1) How soon before pumpkin harvest? Pumpkins that will be harvested in a few weeks will probably not suffer from a mild case of downy mildew. Growers who plan to pick into October should be more concerned.
- 2) How many green pumpkins are present and will ripen in time to be sold? A grower who is trying to protect young fruit should be more concerned with downy mildew than a grower with primarily mature fruit. Downy mildew does not affect fruit directly.
- 3) Other factors include, the expense of the fungicide, recent and predicted weather patterns, and one's willingness to apply fungicides. For example, a grower who has a school children U-pick operation will probably be less willing to apply fungicides than a grower with a

commercial shipping operation. Finally, be realistic as to the yields and prices expected and the amount of protection any fungicide can offer. Remember, the application of any fungicide is to protect the healthy growth, the diseased foliage cannot be "cured" of the disease.

For recommendations on fungicides to control downy mildew, consult the *Midwest Vegetable Production Guide for 2003* (ID-56) <[www.entm.purdue.edu/entomology/ext/targets/ID/index/htm](http://www.entm.purdue.edu/entomology/ext/targets/ID/index/htm)>. Always read the label carefully.

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**CORN EARWORMS - (Rick Foster) -** Corn earworm flights have been very low this season. Usually by this time we have been catching economic numbers of moths (more than 10 per night) for almost a month. This year, we had our first catch of more than 10 moths per night on August 22. On August 26, we caught 66 moths, for our first really heavy flight. There is another reason that damage from corn earworms should be less than normal in most areas of the state. Late season sweet corn usually is heavily damaged both because of the number of moths flying and because the late sweet corn is much greener than most of the field corn grown around it. With all the late planting this year, much of the field corn is still fairly green. That means it will be attractive to earworm moths for egg laying. That should help to reduce the numbers of eggs being laid in sweet corn fields. Nonetheless, if you have sweet corn that is in a vulnerable stage to corn earworms (fresh green silks present), you need to be treating regularly for earworm. If you are catching fewer than 10 moths per night in your trap, treat every five days if the high temperature is less than 80°F and every four days if the high is above 80°F. This spray schedule will also take care of European corn borers and fall armyworms. As the number of moths caught in the trap increases, decrease the interval between sprays. If you are catching more than 50 moths per night, you should be putting on a spray every 2 days if temperatures are high and 3 days if temperatures are low. Remember that you can stop spraying 7 to 10 days before harvest without getting any earworms into the ears. Capture and Warrior have consistently provided the best control of earworms and corn borers. If temperatures are above 85°F, Capture may provide somewhat better control than Warrior.

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**MITES ON TOMATOES - (Rick Foster and Liz Maynard) -** When we get an extended period of hot, dry weather, we occasionally see outbreaks of two-spotted spider mites on tomatoes. Since this is relatively uncommon, we don't have a lot of information about how much impact the feeding damage from the mites has on tomato yield or quality. We certainly don't have a threshold to tell us how many are too many. Our best

guess would be that if you start seeing damage comparable to that shown in Figure 1 and the fruit are not yet starting to ripen or for fresh market



Figure 1. Mite damage on tomato.

growers who intend to pick for a while longer, you should probably take some action to reduce the mite



Figure 2. Adult mite and egg.

numbers. An adult mite and egg are shown in Figure 2. Two products that are labeled for mite control on tomatoes that we have experience with on other crops

are Agri-Mek and Dimethoate. Either of these products should reduce mite numbers quite well.

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**MANAGING LIABILITY FOR FRUIT AND VEGETABLE GROWERS** - (John Wargowski, Executive Director, Mid American Ag and Hort Services) - The Ohio Specialty Crop Food Safety Initiative is sponsoring its second Food Safety Workshop on Thursday, November 20 in Columbus, Ohio at the Marriott North Hotel. The workshop will focus on managing liability for fruit and vegetable growers, packers and shippers to increase the marketability and safety of their produce. While the Initiative stresses the prevention of microbiological contamination of fresh fruits and vegetables, it is best to prepare should such contamination occur.

Mary Donnell, Extension Agent, Ohio State University Extension Agricultural Business Enhancement Center and workshop coordinator says that topics will include developing crisis management plans, understanding how to work with media during difficult times, building a food recall system and exploring options in product liability insurance.

The featured presenter is Gil Meyer, Director, Issues and Program Management, Dupont Agriculture & Nutrition where one of his roles is serving as crisis coordinator. Meyer also serves on the executive

committee of the International Food Information Council, a leading organization of the food industry and conducts workshops on crisis management.

Additional presenters include Paul Panico, Chief, Division of Food Safety, Ohio Department of Agriculture; Mary Donnell; John Wargowsky, Executive Director, Mid American Ag and Hort Services; Martha Filipic, Technical Editor, Communications and Technology, Ohio State University Extension; Dr. Shari Plimpton, Program Manager, Industry Outreach, Center For Innovative Food Technology; and Scott Bell, Loss Control Manager and Christal Leggett, Custom Accounts Underwriter with Farmland Insurance-Nationwide Agribusiness Companies.

The workshop fee of \$40 includes a continental breakfast, lunch, workshop notebook and certificate of attendance. Attendance is limited to 100. Growers, packers and shippers from Ohio and other states as well as professionals working with fruit and vegetable growers, packers and shippers are welcome to register. November 10 is the workshop registration deadline while November 1 is the hotel registration deadline. Complete workshop information is available by contacting Jennifer Hungerford at (614) 246-8289 or [maahs@ofbf.org](mailto:maahs@ofbf.org) or visiting [www.midamservices.org](http://www.midamservices.org) and clicking on "projects."

This Initiative is cooperatively managed by the Ohio State University Extension Agricultural Business Enhancement Center, Mid American Ag and Hort Services and the Center for Innovative Food Technology and is financed in part through a grant from the Ohio Department of Agriculture, the State of Ohio and the United States Department of Agriculture under the provisions of the Specialty Crop Grant.

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**PLANT DISEASE MANAGEMENT** - (Dan Egel) - Although most vegetable production is winding down for the season, now is the time to plan for next year.

**Fall tillage** - After harvest is over, the crop should be tilled to reduce the amount of plant material remaining above ground. Any plant pathogens that exist on the foliage will be less likely to spread to any remaining adjacent crops if the field has been properly tilled. When plant material is plowed under, the leaves, stems and fruit begin the decay process sooner resulting in a lower survival of associated plant pathogens. Spring tillage does not allow for much time for old stems, leaves and fruit to rot and disintegrate. This applies to such pathogens such as *Didymella bryoniae*, which causes gummy stem blight of watermelon or *Alternaria solani*, which causes early blight of tomato. Plant pathogens may exist in piles of culled fruit over the winter, and affect production next year. Bury or plow under such culled fruit before it becomes a problem.

**Rotation** - This time of year, growers may begin to think about where crops will be grown next year. Many disease problems can be avoided if proper crop rotation

is practiced. Since some plant pathogens survive in the soil, planting the same crop year after year may build up populations of plant pathogens and lead to disease problems. For most plant pathogens, the longer the time in the soil without a suitable host plant, the fewer fungal spores or bacteria, which will survive. In general, a 3 to 4 year rotation is recommended. Since plant pathogens often infect related plants, be sure to rotate to plants in different plant families. If watermelon is planted one year, avoid planting cantaloupe, pumpkins, cucumbers, gourds or zucchinis for 3 to 4 years. If tomatoes are planted, avoid peppers, eggplant, or potato. If possible, plant a cereal plant (e.g., corn, wheat) after planting a broadleaf vegetable. The herbicides associated with cereal production are usually specific for broadleaves. This practice keeps volunteer plants, which may harbor disease from previous years, to a minimum.

**Resistant varieties** - When you buy seed for next year, consider whether or not the variety is resistant to important diseases. For example, some cantaloupe varieties are resistant to powdery mildew. Growers might want to sow late plantings to resistant varieties since that is when powdery mildew is usually worse. There are no completely resistant varieties to diseases such as *Alternaria* leaf blight of cantaloupe.

Keep these ideas in mind while finishing up this year's production and planning next year's. A few preventive practices may save a lot of trouble (and pesticides) in future seasons.

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#### UPCOMING EVENTS

September 16, 5 to 7:30 pm - **Pumpkin Twilight Meeting** at Kurtz Farm, 14212 SR 27, New Haven. We will start with a tour of pumpkin variety plots: 22 jack-o-lanterns, 4 pies and 4 mini-pumpkins. Purdue Vegetable Specialists will be present to provide updates in their areas of expertise. At 6:30 pm a picnic dinner will be served, sponsored by Rupp Seeds. Directions to Kurtz Farm: From I-69 near Fort Wayne, exit onto I-469 east. Take exit #25 from I-469 onto St. Rd. 37 and go north about 3 miles. A map is available on-line at [www.hort.purdue.edu/fruitveg/](http://www.hort.purdue.edu/fruitveg/); click on 'Events'. For more information call (219) 785-5673, or e-mail [emaynard@purdue.edu](mailto:emaynard@purdue.edu).

#### Mark your calendar for winter meeting dates:

January 8, 2004 - **Illiana Vegetable Growers' School**, Schererville, IN

January 26-28, 2004 - **Indiana Horticultural Congress**, Indianapolis, IN

**Call for Program Suggestions** - Winter meetings seem far away now, but we are already beginning to plan them. What topics would you like to hear about this winter? Let us know! Call (219) 785-5673 and leave a message, or e-mail [emaynard@purdue.edu](mailto:emaynard@purdue.edu).

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