

# VEGETABLE CROPS HOTLINE

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

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**FUNGICIDE RESISTANCE UPDATE** - (Dan Egel) - Gummy stem blight, caused by *Didymella bryoniae*, is one of the most important foliar diseases of muskmelon and watermelon in Indiana. The application of fungicides to manage gummy stem blight is usually necessary for the production of a commercial crop. In February of 2009 (issue number 502 of the *Vegetable Crops Hotline*), it was reported that strains of the gummy stem blight fungus are resistant to some common fungicides. Work on this subject has continued in our laboratory. Collections of the fungus have been made from four counties and the strains tested for resistance to fungicides from group 7 (includes such products as Amistar®, Cabrio®, Pristine®, Sovran® and Quadris®) and group 11 (includes products such as Pristine®). Note that Pristine® has 2 active ingredients, one a group 7 and one a group 11. All of these products are systemic and have one mode of action for each active ingredient.

Our testing from four counties has revealed resistant strains in all counties tested (see table at right). Strains resistant to group 7 have not been found thus far in Jackson County. However, strains sensitive to these fungicides have been found in all counties tested as well. Thus, there is widespread resistance to the fungicides mentioned above in all the counties tested to date. But whether the strains in your field are resistant or not is not known unless we have tested it (individual growers can call me to inquire about specific samplings). In fact, it is possible that both types of strains, resistant and sensitive, may exist in the same field.

So how should a grower know what to apply in any given field to help control gummy stem blight? One bright spot is that no resistance has been reported for fungicides with the active ingredient chlorothalonil

(includes products such as Bravo®, Echo®, Equus®) or mancozeb (includes such products such as Dithane®, Manzate®, Penncozeb®). Nor is resistance to such products likely. As reported in the *Hotline* issue previously mentioned, these are contact fungicides with multiple sites of action-resistance is unlikely. These products may be applied instead of or in tank mixes with the systemic products listed above. **I recommend that any time one of the group 7 or group 11 fungicides listed above are applied, the contact fungicides listed here are tank mixed with them.**

Meanwhile, group 3 fungicides with the active ingredient tebuconazole (products include Folicur® and Monsoon®, both 3.6F) are still working-no resistance has been reported. These are systemic products, have one mode of action and can be alternated with or tank mixed with other labeled products (consult the label for more information).

Fungicide resistance will likely continue to be an important issue for us in the future. Any additional information will be reported in these pages and in various extension meetings around Indiana. Please report any concerns to me. And always read and follow the fungicide label carefully.

**Presence (+) or absence (-) of strains of *Didymella bryoniae*, causal agent of gummy stem blight of muskmelon and watermelon, resistant to group 7 or group 11 fungicides in four counties in Indiana.**

County	No. of strains tested	Presence of strains resistant to:	
		Group 7*	Group 11**
Gibson	5	+	+
Jackson	3	-	+
Knox	32	+	+
Owen	2	+	+

\*\*such as Amistar®, Cabrio®, Pristine®, Sovran®, Quadris®  
\*such as Pristine®

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**PREVENT LATE BLIGHT IN 2010** - (Dan Egel, Gail Ruhl and Tom Cresswell. William Kirk of Michigan State University contributed to this article.) - Many tomato growers around the state had to deal with an unusual disease this past season. Late blight of tomato was confirmed in 31 Indiana Counties. The question in the mind of many growers will be: "How do I avoid late blight of tomato next year?"

A little background may be appropriate here. First, late blight of tomato is unusual in Indiana because the fungus responsible for the disease has not overwintered in our relatively cold Indiana winters. Therefore, for late blight to occur, it has had to blow up to Indiana or arrive on plant material such as transplants (See article in the *Vegetable Crops Hotline Issue #512*).

Second, the fungus that causes late blight affects potato and tomato. While there was no report of late blight on commercial potatoes, (we had one late blight confirmation on potato in a home garden) it is possible the disease was present in commercial fields in Indiana. Most experts believe that late blight is more likely to overwinter on potato tubers than on tomato crop debris.

The following steps are recommended to avoid loss from late blight next year.

- Do not use potato seed pieces saved from the 2009 crop.
- Potato growers should disc fields to leave as many tubers as possible on the surface of the soil. Tubers on the soil surface are more likely to become cold enough to kill any late blight fungus that might be present.
- Where possible, roll the tubers to crush them during the winter.
- Avoid forming potato cull piles larger than 1 ton as tubers toward the center of the pile may not freeze.
- Pull volunteer tomatoes and potatoes next year.
- Avoid growing tomatoes in a greenhouse situation where the plant tissue might stay green all winter. Maintain at least 1 month where all the tomatoes are removed from the greenhouse and the structure is allowed to freeze.
- Potato and tomato growers should become familiar with the fungicides that are recommended for this disease. A good place to look for these products is in the *Midwest Vegetable Production Guide for Commercial Growers 2010* (ID-56) <[www.btny.purdue.edu/Pubs/ID/ID-56/](http://www.btny.purdue.edu/Pubs/ID/ID-56/)> (due out January 2010). Do some thinking about what products one might use and talk to your dealer about availability.
- Contact your county educator, Dan Egel or the Plant and Pest Diagnostic Laboratory at Purdue University about suspicious tomato or potato plants next season.
- Read the *Vegetable Crops Hotline* to keep up-to-date on disease outbreaks and control recommendations.

Late blight is unlikely to be present in Indiana in 2010, but following these recommendations is a good precaution.

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**DOWNY MILDEW IN BASIL** - (Margaret Tuttle McGrath of Cornell University and Dan Egel) - Downy mildew of basil was reported in Indiana in a few counties in 2009.

The basil downy mildew pathogen (*Peronospora belbahrii*) can be spread in contaminated seed, in infected basil leaves, and as wind-dispersed spores. Spores of the basil downy mildew pathogen are capable of being dispersed long distances. The pathogen can spread widely once introduced to an area. This could explain the widespread occurrence of basil downy mildew in the eastern USA in 2008.

Using seed not infested with the basil downy mildew pathogen, selecting a less susceptible variety, and applying fungicides are the primary management practices for downy mildew.

Variety evaluations are being conducted to determine if there are inherent differences among varieties and species of basil. Sweet basil varieties 'Aroma 2', 'Genovese', 'Genoveser Martina', 'Italian Large Leaf', 'Magical Micheal', 'Mariden', 'Nufar', 'Opal Purple Variegated', 'Poppy Joe's', 'Queentette', and 'Superbo' had the most symptoms. Fewer were found on 'Amethyst Imp', 'Mrs. Burn's Lemon', 'Red Leaf', 'Red Rubin', and 'Sweet Aden'. Similar low severity of downy mildew was observed in several varieties of the other basil species examined: 'Lemon', 'Lemon Mrs. Burns', 'Lemon standard', 'Lemona', and 'Lime'. No symptoms were found on leaves of 'Spice', 'Blue Spice', and 'Blue Spice Fil'. In an evaluation conducted on Long Island in 2009, 'Cinnamon', 'Queenette', and 'Red Rubin' were less severely affected than 'Superbo'.

Applying fungicides frequently and starting before first symptoms are considered necessary to control downy mildew effectively. Few fungicides are currently labeled for this new disease. Actinovate AG® and OxiDate® are OMRI-listed fungicide labeled for use on herbs and for suppressing foliar diseases including downy mildew. OxiDate® is labeled for use outdoors and in greenhouses. There are two phosphorous acid fungicides, ProPhyt® and K-Phite®, that have downy mildew under herbs on the current label. These fungicides were effective in fungicide efficacy experiments with applications started before or after initial symptoms were found. Amistar® and Quadris® are labeled for use on basil but not specifically for downy mildew; they have the same active ingredient, which has been shown to be effective for this downy mildew.

Practices that minimize leaf wetness and greenhouse humidity can contribute to control. These include planting where there is good air movement with rows parallel to the prevailing wind direction, maximizing plant spacing, and using drip irrigation. Humidity can be lowered in greenhouses by using circulating fans and lights and by increasing temperature.

Basil crops should be disked under or otherwise destroyed as soon as possible after last harvest or when abandoned because of disease to eliminate this source of inoculum.

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# UPCOMING MEETINGS AND ANNOUNCEMENTS, PLEASE MARK YOUR CALENDAR

**COMMENT PERIOD FOR FOOD SAFETY RECOMMENDATIONS** - (*Announcement*) - The Food and Drug Administration (FDA) has released recommendations for food safety recommendations. Links to the recommendations can be found below. These guides contain recommendations from the FDA on what growers can do to avoid contamination of their produce with unwanted microorganisms. Such microorganisms such as *Salmonella* and *E. coli* may cause sickness if consumed. Legislation now pending in Congress may give the FDA authority to regulate food safety compliance. That is, the FDA could enforce the recommendations given below as law if appropriate legislation is passed. Growers may comment on the recommendations by January 4, 2010. Comment at this website: <[www.regulations.gov/search/Regs/home.html#home](http://www.regulations.gov/search/Regs/home.html#home)>. For more information contact Dan Egel at (812) 886-0198 or [egel@purdue.edu](mailto:egel@purdue.edu).

Guide to Minimize Microbial Food Safety Hazards for Melons - <[www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm174171.htm](http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm174171.htm)>.

Guide to Minimize Microbial Food Safety Hazards for leafy Greens - <[www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm174200.htm](http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm174200.htm)>.

Guide to Minimize Microbial Food Safety Hazards for Tomatoes - <[www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm173902.htm](http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm173902.htm)>.

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**Fulton County Vegetable Crops Meeting**, November 25, 2009, 1:00PM (EST) at the Fulton County 4-H Fairgrounds, Rochester, IN. Contact Mark Kepler at [mkepler@purdue.edu](mailto:mkepler@purdue.edu), or (574) 223-3397.

Times, featured speakers and topics are:

- 1:00 pm - Liz Maynard, Purdue Regional Vegetable Specialist - Utilizing Nutrient Meters in your Enterprise
- 1:30 pm - Dan Egel, Purdue Pest Management Specialist - A Review of 2009 Diseases with Emphasis on Late Blight of Tomato
- 2:30 pm - Rick Foster, Purdue Entomologist - Western Bean Cutworm, Insects of High Tunnels

Break

- 3:10 pm - Fred Whitford, Purdue Pesticide Programs - Chains and Webs: Hot to Tie Your Loads Down for the Road
- 4:00 pm - Mark Kepler, Extension Education, Fulton County - Private Pesticide Applicator Direct Supervision.

Cost is \$20 per person (includes materials and hand-outs). **Make checks payable to:** Purdue CES Education Fund and **mail to:** Purdue Extension Service - Fulton County, 1009 W. Third Street, Rochester, IN 46875.

Credit towards recertification of a private pesticide license is an additional \$10 per person.

Registration Deadline is Wednesday, November 18, 2009.

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**CUCURBIT DOWNY MILDEW ipmPIPE SURVEY** - (*Wendy Britton, North Carolina State University*) - This is a reminder to everyone about the site survey for the Cucurbit Downy Mildew ipmPIPE. The survey can be found at the following website, <[www.ces.ncsu.edu/depts/pp/cucurbit/](http://www.ces.ncsu.edu/depts/pp/cucurbit/)>, by clicking on the "Please help us improve our Website" link on the top of the main page as well as on the top of the interactive map page.

We currently have 20 results from the survey and it would be extremely beneficial to have more. There will also be an "end of season" survey posted soon.

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**2009 SARE FARMER/RANCHER GRANTS** - (*Announcement*) - The 2009 call for farmer/rancher grant proposals is now available at <[http://sare.org/ncrsare/documents/FRG\\_CFP\\_2009.doc](http://sare.org/ncrsare/documents/FRG_CFP_2009.doc)>. The deadline is 4:30pm CDT, Thursday, December 3, 2009.

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**ILLIANA VEGETABLE GROWERS' SCHOOL** will be held Tuesday, January 5, 2010, at Teibel's Restaurant in Schererville. Pest management topics will include the western bean cutworm, aphids in cucurbits, selecting fungicides, late blight of tomato, and the Driftwatch online registry for pesticide sensitive crops and other areas. Afternoon sessions will include vegetable irrigation, the new Indiana law about selling home made food products at farmers markets and roadside stands, direct marketing opportunities, and northern Indiana variety trials on sweet corn, pumpkins, and tomatoes. Credits (PARP and CCH) towards recertification for Indiana Private and Commercial Pesticide Applicator licenses are expected, as well as Certified Crop Advisor continuing education credits. The registration brochure for the meeting will be available early in December at <[www.hort.purdue.edu/fruitveg](http://www.hort.purdue.edu/fruitveg)>, from your local Purdue Extension office, or may be requested by phone from (219) 785-5674, or email [emaynard@purdue.edu](mailto:emaynard@purdue.edu).

# Indiana Horticultural Congress

## January 19-21, 2010

## Indianapolis, IN

The Indiana Horticultural Congress will be held January 19-21, Tuesday through Thursday, at the Wyndham Hotel (formerly Adams Mark) in Indianapolis. This event is co-sponsored by Purdue and producer associations around the state, including the Indiana Vegetable Growers' Association and the Illiana Watermelon Association. The program includes concurrent sessions about vegetables, tree fruits, grapes, farm marketing, processing tomatoes, and agritourism. The fresh market vegetable and melon programs are summarized in this article.

Food safety and good agricultural practices will be covered in an all-day workshop on Tuesday. If you're wondering how what's going on with federal food safety regulation will affect you, are interested in meeting supplier requirements for a GAPs audit, or have committed to providing your market customers with high quality produce, this session will supply information you need to meet your goals.

Wednesday sessions will feature melons and pumpkins, and high tunnel production. Several speakers will discuss bees and pollination in cucurbits. Mr. Martin Eubanks from the South Carolina Dept. of Agriculture will share how their department promotes the state's agricultural products, including watermelons. Mr. Bob Morrissey of the National Watermelon Association has been invited to talk about food safety issues particular to watermelons. Pest management updates and variety trial reports will round out the melon and pumpkin program.

High tunnel sessions on Wednesday will feature Mr. Adam Montri from Michigan State University speaking about high tunnel structures and growing winter crops, Ms. Kathy Demchak from Penn State speaking about small fruit production in tunnels, as well as information about nutrient management, and a panel discussion with Indiana producers.

Thursday morning will focus on pest management. Speakers will provide information about how to protect your crop from all manner of pests, from birds, deer, and coyotes, to western bean cutworm, to late blight. Thursday afternoon presentations will address selling to wholesale markets, emphasizing issues for growers who are new to these markets.

Credits (PARP and CCH) towards recertification for Indiana Private and Commercial Pesticide Applicator licenses are expected for Wednesday and Thursday sessions.

The Trade Show will be open Wednesday and Thursday, January 20-21.

The Indiana Vegetable Growers' Association annual business meeting will be held Wednesday afternoon.

Registration materials will be available in late November. Watch your mailbox! The deadline for preregistration is early, in mid-December. For additional registration brochures or more information, see <[www.inhortcongress.org](http://www.inhortcongress.org)>, or call (765) 494-1296, or email [tgoodale@purdue.edu](mailto:tgoodale@purdue.edu).