

VEGETABLE CROPS HOTLINE

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

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GUMMY STEM BLIGHT FUNGICIDES FOR 2009 - (Dan Egel) - In issue no. 502 of the *Vegetable Crops Hotline* <www.btny.purdue.edu/pubs/vegcrop>, it was reported (*Status of Fungicide Resistance to Gummy stem Blight in Indiana*) that some strains of the fungus that cause gummy stem blight of muskmelon and watermelon are resistant to two important groups of fungicides that are used in Indiana. The resistant strains of the fungus have only been found in Knox County. The fungicides that may no longer control gummy stem blight belong to the mode of action group 11 (e.g., Amistar®, Cabrio®, Quadris®) and group 7 (Pristine® has active ingredients in group 7 and 11).

With the support of Ed White of the Indiana State Chemist Office, I have explored the possibility of an emergency exemption for fungicides that might give us an additional tool for gummy stem blight control in the 2009 season. However, the relevant laws will not permit the EPA to allow such an emergency exemption this year. Part of the reason is that Indiana cannot demonstrate that significant losses have occurred while using the currently labeled fungicides for gummy stem blight. Another reason is the new registration of the fungicide Folicur 3.6F®. This product is in the mode of action group 3 and so will not be affected by the resistance that has been detected in Indiana. After reviewing the literature, I believe that Folicur® will offer a good alternative to the group 7 and group 11 fungicides.

Contact fungicides with the active ingredients chlorothalonil (e.g., Bravo®, Echo®, Equus®) and mancozeb (e.g., Dithane®, Manzate®, Penncozeb®) are not affected by the resistance observed in Knox County. In addition,

these contact fungicides do not require alternation with fungicides of a different mode of action and offer excellent alternation partners with those fungicides that do require alternation. The systemic fungicides Amistar®, Cabrio®, Folicur®, Pristine®, and Quadris® should all be alternated with a fungicide with a different mode of action number after each application. More information can be found in issue no. 502 (*Why Isn't My Fungicide Working?*).

I plan to take samples of gummy stem blight from muskmelon and watermelon plants around the state to determine the distribution of fungicide resistant strains. Please contact me if you believe you may have resistant strains of the gummy stem blight fungus in your field. I am also conducting research this summer at the Southwest Purdue Agricultural Center to determine how to best manage our fungicide resistance problem.

An informal question and answer session on this topic will be held at the Southwest Purdue Agricultural Center on Tuesday April 14 from 6:30 to 7:30 pm. Interested parties may show up at any time during this period to ask questions. As always, please contact Dan Egel with any questions or comments at (812) 886-0198 or egel@purdue.edu.

GREENHOUSE AIR QUALITY - (Chris Gunter, currently at North Carolina State University) - As the season starts and we begin to use greenhouses that have been empty for the winter; be on the lookout for injury due to poor air quality. One problem causing gas of concern to most greenhouse growers is ethylene. This gas can be generated by faulty heat exchangers, dirty fuel openings, and incomplete combustion of fuel. We have also seen problems caused by using nonvented unit heaters in the greenhouse. These problems can be increased in especially tight greenhouse structures, those that have little exchange with the outside air.

Ethylene is a plant hormone produced by plants during their growth and development. However, ethylene produced through faulty heating equipment can be very detrimental to greenhouse crops, because it is produced in high concentrations. It can affect all the above ground parts of the plant including leaves, flowers and fruit. Low levels of ethylene can cause leaves to droop downward (epinasty) even though they are not wilted

(Figure 1). Stem thickening, increased branching, flower bud abortion, flower malformation and general stunting can also occur as a result of exposure to ethylene. Crops vary in their sensitivity to ethylene, however tomatoes are especially sensitive. A wide range of crop plants can be affected by ethylene in the greenhouse.



Figure 1: Tomato plants affected by ethylene often have leaves that turn downwards. Ethylene may be released by heaters that have incomplete combustion. Greenhouses that are vented properly are less likely to have plants damaged by ethylene. (Photo by Dan Egel)

Symptoms of ethylene damage can be very subtle, especially if there are no plants grown in clean air available for comparison. Further complicating diagnosis are factors like exposure time, concentration of ethylene, stage of plant development, temperature and sensitivity of plant species to damage by the gas.

Proper heating system installation and maintenance are the best ways to prevent problems. A maintenance plan should include cleaning the unit heater and fuel orifice twice a year. Propane flames should have a small yellow tip when properly adjusted and natural gas flames should be a soft blue with a well-defined inner cone. To ensure proper combustion heater units should have a clean air intake, which provides fresh air to the combustion chamber. Adjustment and maintenance of heating units are best done by professionals before the greenhouse is started for the growing season. When having the heater serviced, always ask the repairperson to check for leaks, cracks and any obstructions that may be in the stack. Also all heaters used in the greenhouse should be vented to the outside with a stack, which allows for exhaust gas not to be drawn back in to the greenhouse through the ventilation system.

Here are a few other things you should check before the season.

Fans and Components: Check bearings on electric motors, Check and adjust belt tension, Check physical condition of belts, Tighten or replace missing bolts and nuts, Check and adjust belt pulley alignment, Clean fan blades/housing, check and service fan-jet distribution system and convection tube.

Heat Exchangers, Burners, Gas Controls and Thermostat: Check for cracks and corrosion, Clean heat exchanger if necessary, Inspect and clean burners, Inspect and clean inside of burner tubes, Inspect all gas lines and tubing for tight fits, Check electrical connections to gas valve, Check thermocouple for cleanliness and tighten connections, Check thermostat for cleanliness, Check wiring to and from thermostat, Check thermostat setting.

Vent systems/Chimney: Check for obstructions, Check connections for tightness and security, Check vent support system for security, Check joints for signs of leakage, Check vent pipe drip leg and clean-out cap, Check weather cap.

Gas Supply: Check that gas mains are turned on, Check propane level, Check heater combustion air inlets for obstructions, Turn on gas, light pilots and observe burner flame, Activate or cycle heater unit to insure proper operation.

BRAVO WEATHER STIK® SUPPLEMENTAL LABEL AVAILABLE - (Announcement) - Pepper growers who are planning on applying Bravo WS® for anthracnose or Botrytis Gray mold have to have in their possession a label that specifically mentions pepper. If one does not have such a label, it will be possible to download a label from the Indiana State Labels and Documents web site. Click on either the blue company label ID number of either the supplemental label or the container label on the URL <<http://state.ceris.purdue.edu/htbin/prodinfos.com?ProdId=2001052027&State=IN&Type%20=P>>.

Other label information may be obtained from the National Pesticide Information Retrieval System. Click on the state of Indiana to start the search process using the URL <<http://state.ceris.purdue.edu/>>.

Contact Dan Egel with any questions or comments at (812) 886-0198 or egel@purdue.edu.

2009 MIDWEST VEGETABLE PRODUCTION GUIDE FOR COMMERCIAL GROWERS (ID-56) - (Dan Egel) – Dozens of copies of the new edition of this guide have been purchased around Indiana this year. Do you have your copy? Included in the Guide is information about disease, insect and weed management, cultural practices and variety recommendations for crops from asparagus to zucchini. States covered by the guide are Illinois, Indiana, Iowa, Kansas, Minnesota and Missouri. The price is still a reasonable \$10 for a hard copy and free if one views the Internet copy at: <www.btny.purdue.edu/Pubs/ID/ID-56/>. To purchase a hard copy, call 1-800-EXT-INFO. Below find a copy of what's new in the 2009 guide.

New and Revised Sections

- A number of chapters have been combined so that the information presented in this guide is presented in a format similar to pesticide labels.

- The new Fruiting Vegetables chapter contains information for eggplant, pepper, and tomato.
- The new Legumes chapter contains information for peas and cowpeas; and snap bean, dry bean, and lima bean.

Cultural Practices

- Spacing recommendations have been added for mini- or "personal" watermelon.

Disease Management

- The fungicide Nova 40W® (myclobutanil) has been renamed Rally 40WSP®. Like Nova 40W®, Rally 40WSP® is labeled for use on asparagus, cucurbits, mints, snap beans, and tomato for control of powdery mildew, rust, and Rhizoctonia diseases.
- The fungicide Presidio 4SC® (fluopicolide), manufactured by Valent, has been labeled for use on cucurbits, fruiting vegetables, leafy vegetables, and sweet potato for control of downy mildew, white rust, and phytophthora diseases.
- The fungicide Revus 2.009SC® (mandipropamid), manufactured by Syngenta, has been labeled for use on crucifers, cucurbits, leafy vegetables, onions, and peppers for control of downy mildew and phytophthora diseases.
- The fungicide Folicur 3.6F® (tebuconazole), manufactured by Bayer CropScience, has been labeled for use on asparagus, cucurbits, onions, leafy vegetables, and root crops for a variety of diseases.
- The fungicide Quintec 2.08SC® (quinoxifen), manufactured by Dow AgroSciences, has been labeled for use on lettuce, muskmelon, and watermelon for powdery mildew control.

Weed Management

- Callisto® (mesotrione), manufactured by Syngenta, and Chateau® (flumioxazin), manufactured by Valent, have been labeled for asparagus.
- Callisto® (mesotrione), manufactured by Syngenta, and Casoron® (dichlobenil), manufactured by Chemtura, have been labeled for rhubarb.
- Cadet® (fluthiacet-methyl), manufactured by FMC, Option® (foramsulfuron), manufactured by Bayer CropScience, and Laudis (tembotrione), manufactured by Bayer CropScience, have been labeled for sweet corn.
- Poast® (sethoxydim), manufactured by BASF, has been labeled for okra, dill, root vegetables, and turnip tops.
- Chateau® (flumioxazin), manufactured by Valent, has been labeled for garlic and, in Indiana and Illinois, dry bulb onions.
- Valor® (flumioxazin), manufactured by Valent, has been labeled for sweet potato.

Insect Management

- Belt SC®, manufactured by Bayer CropScience, has been labeled for control of caterpillars on sweet corn.

- Coragen®, manufactured by DuPont, has been labeled for control of caterpillars and other insect pests of cole crops, cucurbits, fruiting vegetables, and leafy vegetables.
- Radiant SC®, manufactured by Dow Agroscience, has been labeled for control of caterpillars, thrips, and other insects on asparagus, onions, cole crops, sweet corn, fruiting vegetables, leafy vegetables, root and tuber vegetables, legume vegetables, and potatoes.
- Movento®, manufactured by Bayer CropScience, has been labeled for control of aphids and whiteflies on fruiting vegetables, leafy vegetables, cole crops, and tuber and corm vegetables.

WEB SITE TO HELP SPECIALTY CROP GROWERS PROTECT THEIR INVESTMENT - *(Julie Douglas) - (Editor's note - Red Gold considers the following program sufficiently important that all of their processing tomato growers will be required to register with the website described below.)* Specialty crop growers are encouraged to register their crop on the Pesticide Sensitive Crops and Habitats Registry, a Web site designed to help Indiana growers protect against pesticide spray drift.

Specialty crops include--but are not limited to--beehives, organic crops, fruits, grapes, nursery crops, pumpkins, melons, tomatoes and vegetables.

"Our hope is that both commercial and private pesticide applicators will come to the Web site and check for nearby sensitive crop sites, and take more preventative and precautionary measures to mitigate spray drift," said Leighanne Hahn, water quality and endangered species specialist with the Office of the Indiana State Chemist.

Hahn explained that the number of acres in organic production is on the rise and according the 2007 Census of Agriculture, small farm production (fewer than 50 acres) went up 79 percent from 2002.

"It's a challenge to know where all these small acres and specialty crops, which are very susceptible to drift of pesticide products, are at," said Hahn, who also is the Web site coordinator. "The whole goal of this Web site is to help specialty crop growers and pesticide applicators better communicate with each other and prevent drift incidents from happening."

The Web site will be a great tool that we plan to use, said Phil Marshall, director of the Division of Entomology and Plant Pathology for the Indiana Department of Natural Resources.

"We always like to know where specialty crops and sensitive habitats are located," Marshall said. "We use a variety of control measures to curtail invasive species such as kudzu and gypsy moth. Having the ability to identify sensitive areas will allow us to better protect specialty crops and habitats from potential drift damage."

Specialty crop producers are encouraged to go to the Web site, <<http://beaware.agriculture.purdue.edu/>>, and register their fields or sensitive habitats. To register, click the "Producer" button on the left-hand side of the screen. Then follow these steps: join the producers list, log in, enter the type of crop, street address, zip code and then plot the field or sensitive habitat. For help with the registration process, a guide and video tutorial are available at <<http://beaware.agriculture.purdue.edu/index.htm>>.

For those specialty crop producers who do not have Internet access but wish to register their sites, contact a local Purdue Extension office for assistance.

Hahn explained that by the time a person from the OISC comes out to walk a field after a complaint, it's already too late and the damage has been done.

"Let's stop walking and start talking," she said. "We need to better communicate the value of our crops and where they are located, and the Web site is just one way of doing this."

For questions and more information about how to register specialty crops or a sensitive habitat on the Web site, contact Hahn at (765) 427-3472 or cropregistry@purdue.edu.

The Office of the Indiana State Chemist, Purdue University's Department of Agricultural and Biological Engineering, Indiana Vegetable Growers Association, Red Gold, Syngenta Crop Protection and the Indiana Wine and Grape Council sponsor the Web site. The Pesticide Sensitive Crops and Habitats Registry also is supported by the Indiana Department of Transportation.



NEW SWPAC SUPERINTENDANT - (Announcement)
- About this time last year we reported that Meb Lang had retired as Superintendent of the Southwest Purdue Agricultural Center. We are pleased to announce that Purdue University has hired Dennis Nowaskie as only the second SWPAC superintendant in over 40 years.

Dennis served as Assistant Superintendant at SWPAC since June 1994. He is a life long resident of Vincennes and was born on a melon farm south of Vincennes. Dennis understands melon farming since he raised melons himself until 2000 and he understands research having worked with Purdue researchers for 15 years.

Dennis is married and has two children. When not attending to SWPAC business or his family, Dennis likes to follow NASCAR racing and watch the occasional ball game. Let's welcome Dennis Nowaskie as Superintendent of SWPAC!

GROWER OPEN HOUSE - (Announcement) - An informal question and answer session on **Gummy Stem Blight Fungicides for 2009** will be held at the Southwest Purdue Agricultural Center on **Tuesday, April 14 from 6:30 to 7:30 pm**. Interested parties may show up at any time during this period to ask questions. Contact Dan Egel with any questions or comments at (812) 886-0198 or egel@purdue.edu.

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