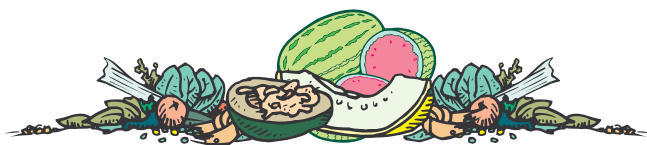


VEGETABLE CROPS HOTLINE

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

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VINE DECLINE UPDATE - (Dan Egel) - Since the mid-1980's, outbreaks of a disease known as **mature watermelon vine decline (originally known as sudden wilt)** have occurred in watermelon fields in southwestern Indiana. The disease was a limiting factor in many watermelon fields in 1989, 1995 and 1999. In 2000, it was especially severe, affecting more than 50% of watermelon acreage in Sullivan, Knox and Gibson counties, and resulted in total estimated yield losses of 20%.

The 2001 Season: In contrast with the severe economic loss of 2000, it is estimated that no more than 5% of watermelon acres in southwestern Indiana were affected with mature watermelon vine decline (MWVD) in 2001. Watermelon yields were normal to above normal. MWVD in 2001 was also observed later in the season than in 2000. The lower incidence of MWVD this year may be correlated with lower rainfall in late spring and early summer. The accumulated rainfall from April through July 2000 was 21.1 inches, while there was only 13.9 inches for the same period during 2001.

Greenhouse Work: Despite the temporary retreat by MWVD, work on its cause and management continues this fall. Actively working on MWVD are Purdue scientists Chris Gunter, Frankie Lam, Ray Martyn, Angus Murphy, Hari Ramasubramaniam, Andreas Westphal and myself.

One of our primary goals has been to determine whether MWVD is caused by a biological factor such as a fungus in the soil or an environ-

mental factor(s). Preliminary indications from the field suggest that MWVD occurs regardless of whether the soil has been fumigated or not. However, for two years, we have brought field soil into the greenhouse and fumigated it to see whether watermelon plants would wilt as in the field. Watermelon plants in non-fumigated field soil wilted from MWVD. In contrast, watermelon plants in fumigated field soil did not wilt. This may indicate that the problem is biological.

Soil Fumigation: The question then arises, why is MWVD so difficult to control with fumigation? Soil fungi may reinfest field soil after fumigation or the roots may grow out of the fumigated zone. In addition, less than optimal fumigation conditions may lead to less than optimal results. In contrast, fumigations conducted in greenhouse pots are less likely to become recontaminated.

Identifying the Culprit: Now that we have circumstantial evidence that MWVD is caused by a biological factor, we have intensified our search for the organism(s) involved. We have collected many soil organisms from the field and are now in the process of screening these organisms for their ability to cause MWVD.

A Related Problem: Another perennial disease of watermelon is Fusarium wilt. The fungus that causes Fusarium wilt of watermelon, *Fusarium oxysporum* fsp. *niveum* (FON), exists as three races 0, 1, 2. Each race differs by the cultivars it attacks. Most commercial cultivars have adequate resistance to races 0 and 1. However, at present, there are no cultivars with resistance to race 2. Fortunately, race 2 has a limited known distribution. Race 2 has not been identified in Indiana. For the last several summers, watermelon plants with Fusarium wilt have been collected from watermelon production areas in SW Indiana. The associated fungi have been isolated and we are now in the process of screening these to determine if any are Race 2 of FON.

We hope to have more information by spring 2002. It is unlikely that Fusarium wilt causes MWVD, but it may contribute to the problem.

Managing MWVD: Although we now believe MWVD is a disease caused by a soil microorganism(s), environmental factors probably still play an important role. Factors such as soil moisture, soil temperature, maturity of the watermelon vines, soil type and watermelon culture all may contribute to the overall disease syndrome. Managing MWVD may ultimately depend on manipulating cultural, environmental and biological factors.



TAX DEDUCTIBLE GIFTS TO PURDUE'S VEGETABLE RESEARCH AND EXTENSION FUND - (Liz Maynard) - The Department of Horticulture and Landscape Architecture at Purdue University has a gift account to support commercial vegetable crop applied research and extension. Contributions to the fund can be made payable to Purdue Research Foundation and sent to: Vegetable Research/Extension Fund, Dept. of Horticulture and Landscape Architecture, Purdue University, 1165 HORT, W. Lafayette, IN 47907-1165. On your check memo line, please indicate for fund 703-1165-0003.

Indiana citizens can receive a 50% tax credit for direct contribution to an in-state university up to a maximum gift of \$400 if filing a joint return, or \$200 if filing an individual return. The tax credit directly reduces the bottom line of your state income tax, either reducing the amount you owe in taxes or increasing the refund you will receive. Look for form CC 40, or check with your accountant. For more information on gift giving, contact the Purdue Research Foundation (PRF), Purdue University, W. Lafayette, IN 47907, for information on the Annual Giving and Matching Gift Program. PRF will send a brochure that explains all the options for contribution and tax credit.



CALL FOR DONATIONS TO SILENT AUCTION AT HORT CONGRESS - (Liz Maynard) - The fifth annual Silent Auction to benefit the Fruit and Vegetable Applied Research and Extension Funds will be held at the 2002 Indiana Horticultural Congress. See previous article for a description of the vegetable fund; the fruit fund is similar in purpose and operation but supports fruit research and extension. The success of the auction depends on donations from growers, tradespeople, and Purdue staff. The donated items are auctioned at the Congress and proceeds go to the Fund. Items auctioned in past years have included apple trees, artwork, handicrafts, pesticides, and more. Do you have an item or a service to donate this year? Contact Tom Roney at (317) 326-2278.



FUND FOR WTC GREENMARKET FARMERS - (from Diane Eggert, NYS Farmers Direct Marketing Association, edited by Liz Maynard) - On September 11 the New York City Greenmarket opened its regular Tuesday morning farmers market at the World Trade Center. In the terror that followed all farmers made it out of harm's way without injury, but their trucks, canopies, tables, supplies and produce were lost beneath the rubble. Insurance will not be picking up this loss because it was an "act of terrorism or war." Now they not only must bear the financial burden of the loss of these vital needs, but they also must bear the costs without having this important market to earn their income.

The Farmers' Market Federation of NY has established a "Fund for WTC Greenmarket Farmers." Contributions and donations can be made to this fund at any time and all proceeds will be distributed to those farmers affected by the tragedy at the WTC. For more information, call (315) 475-1101 or log onto <www.nyfarmersmarket.com>. Send your donations to: Fund for WTC Greenmarket Farmers, c/o Farmers' Market Federation of NY, 2100 Park Street, Syracuse, NY 13208.



FALL PRODUCE DISPLAY CONTEST: IVGA WANTS YOUR PHOTO! - (Liz Maynard) - Enter a photo of your farm's Fall Pumpkin Display in the first annual Indiana Vegetable Growers' Association Fall Marketing Display Contest. The photos will be exhibited in a slide show during the Hoosier Pumpkin School at the Indiana Horticultural Congress in January. A panel of judges will select the Most Creative Fall Display. The farm submitting the winning picture will be awarded a free one-year membership in the Indiana Vegetable Growers' Association. We know there are some awesome displays out there: show us what you have!

To enter a photo or slide, send it to Chris Gunter, SWPAP, 4369 N. Purdue Rd., Vincennes, IN 47591. To enter a digital image, e-mail it to <gunter@hort.purdue.edu>. Entries should be postmarked by January 14. Photos and slides will be converted into digital images. Originals will be returned after the contest.



STEWART'S WILT - (Dan Egel) - Long time Hotline readers will realize this article and table about sweet corn varieties with partial resistance to Stewart's wilt usually shows up in March. However, Gerald Pataky of the University of Illinois has made the information available now and that is when I think it will be most useful-now.

I will have to wait until March, however, to relate the information on likely flea beetle severity since winter temperatures determine the number of flea beetles that survive (flea beetles spread Stewart's wilt of sweet corn).

A list of selected sweet corn varieties with good resistance is included below. This list is compiled from studies carried out by Gerald Pataky at the University of Illinois in 2001. The list includes the type of sweet corn (se, sh2), the color, and the seed source for each variety along with the resistance ranking (1=resistant, 9=susceptible). Only varieties rated 3 or better were included in this list. The complete list can be seen in the Midwest Vegetable Variety Trial Report for 2001. Dr. Pataky has also compiled a list of variety reactions since 1984. Growers with additional questions should call me.

Type	Color	Source	Variety	Resistance
se	Y	Mesa	Merlin	2
se	Y	Cr	Miracle	1
se	BC	Mesa	Accord	3
se	BC	Cr	Ambrosia	3
se	BC	Mesa	Buckeye	1
se	BC	Mesa	Encore	3
se	BC	Mesa	Lancelot	3
se	BC	Sem	Seneca Nation	1
se	W	Cr	Argent	3
se	W	HM	Brilliance	3
se	W	HM	Silverado	2
se	W	HM	Sweet Satin	2
sh2	Y	Sem	Brut	3
sh2	Y	Cr	Crisp n Sweet 710RR	2
sh2	Y	Cr	Crisp n Sweet 710ARR	2
sh2	Y	Sem	Diva	3
sh2	Y	Sdw	Flagship II	3
sh2	Y	GG	Green Giant Code 107	3
sh2	Y	Cnt	Mirai 003	3
sh2	Y	Cr	Missouri	3
sh2	Y	HM	Morning Star	3
sh2	Y	Rog	Prime Plus	1
sh2	Y	Rog	Primetime	2
sh2	Y	HM	Rustler	2
sh2	Y	Sem	Stetson	1
sh2	Y	AC	Summer Sweet 7630	2
sh2	Y	HM	Sure Gold	3
sh2	Y	HM	Ultimate	1
sh2	Y	IFS	Xtra Tender 171A	3
sh2	Y	IFS	Xtra Tender 177A	2
sh2	Y	IFS	Xtra Tender 179A	1
sh2	Y	HM	Zenith	1
sh2	BC	HM	Candy Store	3
sh2	BC	Cr	Tango	3
sh2	BC	HM	Twin Star	1
sh2	BC	IFS	Xtra Tender 271A	3
sh2	BC	IFS	Xtra Tender 277A	2
sh2	BC	IFS	Xtra Tender 278A	3
sh2	BC	IFS	Xtra Tender 282A	2
sh2	W	Sak	Millenium	1
sh2	W	HM	Silver Dollar	3
sh2	W	AC	Summer Sweet 7631	1
sh2	W	AC	Summer Sweet 781 Ultra	1
sh2	W	IFS	Xtra Tender 372A	3
sh2	W	IFS	Xtra Tender 378A	2
sh2	W	IFS	Xtra Tender 382A	2

Type - se=sugary enhancer; sh2=shrunken2.
 Color - Y=yellow; W=white; BC=bicolor.
 Source - AC=Abbott & Cobb; Cnt=Centest; Cr=Crookham Company; GG=Green Giant/Pillsbury; HM=Harris Moran; IFS=Illinois Foundation Seeds; Mesa=Mesa Maize; Rog=Rogers (Syngenta); Sak=Sakata; Sdw=Seedway; Sem=Seminis (Asgrow/Seneca).



WINTER MEETINGS: There are some excellent programs planned for this winter. Starting off the New Year in Northwest Indiana, the **Illiana Vegetable Growers' School on January 3** in Schererville will include presentations on new varieties, scheduling drip irrigation, specialty tomatoes, foliar fertilizers, and insect, weed and disease management. Private pesticide applicator recertification credits are available for people whose Indiana Private Applicators License expires in 2005 or later. For a complete program and registration form, go to <www.hort.purdue.edu/hort/ext/veg/ivgs2002.html> or call (219) 785-5674.

January 29 - 30 in Indianapolis the Indiana Horticultural Congress will include the **Hoosier Pumpkin School**. Guest speakers on no-till pumpkin production include Steve Groff from Cedar Meadow Farm in Pennsylvania and D. Riggs of D. Riggs Consulting, Stone Wall Hill Farm in New York. Marketing consultant Jane Eckert from Illinois will provide the keynote address at a joint session on the theme of marketing using school tours. Purdue staff will discuss the latest recommendations on pest management, cultural practices, and variety selection. In addition to the pumpkin school, sessions are planned on production and marketing of hispanic vegetables and culinary herbs and salad greens, season extension techniques, and organic production. A special program on the Safety and Quality of Medicinal Herbs and Herbal Supplements will be offered on January 28. Nationally known speakers including Gail Mahady from the University of Illinois at Chicago and Steven Foster of Fayetteville, Arkansas will share their expertise with the audience. The complete IHC program and registration form will be mailed to all Hotline subscribers in early January, and will be available on the web by mid-December at: <www.hort.purdue.edu/hort/ext/hortcongress/>. For more information call (765) 494-1293.

March 15, 2002 - The Southwest Indiana Melon and Vegetable Growers Association will hold their annual meeting at the Quality Inn (formerly the Holiday Inn), located at 600 Old Wheatland Road, Vincennes, IN. Registration is at 8:30 AM. Topics include: Migrant Labor Issues; Disease & Insect Management; Variety Trial Update; Pesticide Record Keeping. Private applicator points will also be available. For more information call Jerry Nelson at (812) 882-3509.

ACTIGARD AND MESSENGER - (*Dan Egel*) - Plant pathologists have known for several years that under specific circumstances, plants exposed to various chemicals, microorganisms or physical stress are better able to withstand plant diseases. This phenomenon is known as Systemic Acquired Resistance. Today, there are two pesticides that induce Systemic Acquired Resistance in vegetable plants: Actigard and Messenger. Neither of these pesticides affects the fungi, bacteria or viruses that cause plant disease directly. Instead, these pesticides seem to cause an increase in the plant's ability to fight plant diseases.

There is still much to be learned about Actigard and Messenger in particular and about Systemic Acquired Resistance in general. At this point, we can make several generalizations:

- Both pesticides should be used as part of a general overall program to manage plant diseases. Such a program should be developed from the cultural and pesticide management options listed in the **Midwest Vegetable Production Guide for Commercial Growers, 2002 (ID-56)** <<http://www.entm.purdue.edu/entomology/ext/targets/ID/index.htm>>. Do not use either Actigard or Messenger as an act alone pesticide.

- It takes some time for both Actigard and Messenger to affect any changes in plants. Therefore, application of both pesticides should begin early, before the plants become diseased.
- These pesticides act by a novel mode of action and therefore have a relatively novel set of instructions. As always read and follow the label carefully.

Actigard - Labeled for Tomatoes for bacterial spot and bacterial speck, and for spinach for downy mildew and white rust. Some positive results have been obtained with Actigard, particularly with bacterial spot of tomato. Actigard has been associated with yield loss in some situations. Therefore, follow precautions on the label carefully. For example, avoid applying Actigard to plants that are stressed by drought, heat, etc.

Messenger - Labeled for several different vegetable crops including greenhouse use. Instructions for some crops include mention of specific diseases, while for other crops Messenger is said to "boost overall vigor and to aid in the management of disease". Since Messenger is a relatively new pesticide with a new chemistry, little work has been done by University personnel to test its effectiveness. Therefore, Messenger is not listed under individual crops in the **Midwest Vegetable Production Guide for 2002 (ID-56)** <<http://www.entm.purdue.edu/entomology/ext/targets/ID/index.htm>>.



PROTECT YOUR PESTICIDES AGAINST COLD WEATHER - (*Fred Whitford*) - The outdoor application season is ending and pesticide applicators welcome a short breather before attending educational programs this winter. It's a good time to spend a few minutes inventorying the pesticide products you have on hand and assessing your pesticide storage area. Make sure cold weather won't mean frozen products, wasted inventory, and money down the rathole for you! Exposure to extreme hot or cold temperatures can affect pesticide products adversely, often hindering their performance when used later on. Containers of products that have been in storage for a long time are especially vulnerable to bursting or tearing when exposed to extreme temperatures, thereby increasing the likelihood of spills.

The temperature at which a pesticide freezes depends on the formulation, the solvents, and the inert ingredients. Some products freeze at 32°F, while others freeze at higher and lower temperatures. Read the label of each pesticide in your storage area to identify the temperature range that you should maintain. Keep in mind the following points, which will simplify your pesticide storage dilemma.

- Estimate as closely as possible and purchase only the amount of pesticide(s) needed for one application season.
- Return unopened containers to the dealer for a refund.
- Check with your dealer about the possibility of his storing your inventory over the winter.
- Rotate your stock on a regular basis, always using the oldest containers first.
- Store pesticides away from extreme temperatures: >100°F and <30°F.
- Keep pesticides out of direct sunlight, in addition to overheating, ultraviolet radiation in sunlight can break down some chemicals.

Sources: The Georgia Pest Management; OSU Extension Facts 7551; MontGuide 8706.



PUMPKIN FRUIT ROT - (*Dan Egel*) - Judging by my phone calls and e-mails, pumpkin growers had a lot of problems in 2001 with fruit rots. I will describe the two most common fruit rots I observed this past season. These diseases were: Fusarium fruit rot and Phytophthora fruit rot.

The first symptom of **Fusarium fruit rot** is a white mold that is visible primarily on the bottom of the pumpkins. The mold may have a pinkish cast. The lesions may be large and water-soaked or small and dry. Pumpkin fruit with even small lesions may rot after harvest. Losses as high as 60% have been reported. It is not caused by the same fungus that causes fusarium wilt. While the fungus that causes fusarium wilt is limited in what plants it can attack, the fusarium that causes fruit rot can infect a wide number of plants. This means that fusarium fruit rot can not easily be controlled by crop rotation. (Of course, crop rotation is still a good idea for many other diseases.)

Unfortunately, fungicides have not proven effective against the disease. In a test by a researcher in Connecticut, combinations of 8 different fungicides failed to control the fungus.

It appears that some varieties are more susceptible than others to Fusarium fruit rot. It has been reported that the variety "Atlantic Giant" is resistant to Fusarium fruit rot. I have observed that the variety "Prizewinner" appears to have some tolerance. Some of the smaller pumpkins such as "Oz" also appear to have some degree of resistance.

To avoid the disease next year, perhaps the best idea is to plant several different varieties of pumpkins. Avoid fields that have had a history of the problem.

The other major problem was **Phytophthora fruit rot**. This disease was influenced by heavy rains at various times throughout the Midwest.

Often, the appearance of clusters of rotting fruit in the field first attract attention. The outbreaks are almost always in low-lying areas in the field where plant surfaces tend to remain wet for extended periods of time whether the moisture is in the form of rain or dew.

Pumpkin fruit are especially prone to infection at the top of the pumpkin, close to where the fruit is attached to the stem. The depression in the fruit surrounding the stem attachment serves as a reservoir for moisture and provides a very favorable setting for infection by spores of the Phytophthora fungus. The spores can be produced on other parts of the plant or on fruit of other plants (the fluffy white mold associated with the fruit rot contains millions of spores!). Spores also can be deposited into pumpkin fields after traveling on air currents from another source of infection... like a field of affected peppers!

Fungicides can be used to protect against Phytophthora infection, but it is an uphill battle. The most effective fungicides are protectants such as chlorothalonil (Bravo) and mancozeb. Copper is probably marginally effective. Dr. Mohammed Babadoost in Illinois reports he has not found any fungicides that can successfully control the disease.

Phytophthora blight is difficult to deal with, and must be managed with all available resources over a period of time. Avoid fields with a history of the problem. Do everything you can to avoid an early season outbreak that may jeopardize your other crops, and don't rely only on fungicides for control.



UPCOMING PUBLICATIONS FOR 2002 - (*Chris Gunter*) - Be on the look out for the new Midwestern Vegetable Variety Trial Report for 2002. This bulletin comes out early in 2002 from the Department of Horticulture and the Office of Agricultural Research Programs of Purdue University. Inside you'll find a collection of the vegetable variety trials from all across the Midwest. Crops tested include asparagus, beans, carrots, eggplants, muskmelon, peppers, pumpkin, squash, sweet corn, tomato, and watermelon among others. This bulletin gives you chance to see those vegetables perform under different growing conditions and production methods. The best part of this publication is the chance to see how new cultivars stack up against the old standards and what is new in the breeding pipeline for the future. A lot of seed companies submit plants to be tested in these trials and all of that information is available to you to make management decisions.

Another publication that should sit on every growers desk (or at least under the seat of the pick-up) is the Midwest Vegetable Production Guide for Commercial Growers, 2002 (ID-56) <<http://www.entm.purdue.edu/entomology/ext/targets/ID/index.htm>>. This publication has everything from labor law and bee information to weed, insect and disease information. Vegetable crops covered range from asparagus to tomatoes. Information in the ID-56 is updated every year. Pest information is revised based on new research. If you call us to answer a pest question, I may ask you to go to a specific section of the ID-56.

The cost for the ID-56 this year is \$10 and the cost of the Midwest Variety trials is \$12. Both may be purchased at one of several winter meetings, from county educators or from the Media Distribution Center (888) 398-4636 <<http://www.agcom.purdue.edu/AgCom/Pubs/index.htm>>. So don't start the 2002 season without all the information you need at your fingertips.

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