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**Phytophthora and irrigation water** by Mary Hausbeck, MSU Plant Pathology. From: MSU Vegetable Crop Advisory Team Alert newsletter. Vol. 22, No. 15, August 8, 2007 Many Michigan vegetable crops such as squash, cucumber, eggplant, pepper, beans, watermelon, melon and tomato are susceptible to *Phytophthora capsici*. This pathogen causes disease on plant crowns, roots and fruit. *Phytophthora* can move in surface water, which is often relied upon for irrigation in Michigan. Research conducted by Michigan State University from 2002 to 2005 identified *Phytophthora* in a river, ponds and ditches in several Michigan counties. In standing water, *Phytophthora* produces swimming spores which can be spread with moving water. Swimming spores can survive and cause infection for 8 to 10 hours. Therefore, when surface water is contaminated with *Phytophthora*, the pathogen can be spread to a field through irrigation. Pear and cucumber baits, along with temperature sensors, were placed in plastic milk crates kept afloat by attaching polyethylene

foam pool noodles to the lid. Floating the baits was important because swimming spores always move to the surface of the water. The crates were then suspended in the water for three to seven days before baits were removed for examination. Pieces of infected pear and cucumber baits were placed onto media plates which promote *Phytophthora* growth. After three days, the plates were examined for *Phytophthora*. Some of the *Phytophthora* collected from surface water was found to be resistant to the fungicide mefenoxam (Ridomil). *Phytophthora* was detected in several surface water sources in multiple years, even when non-host crops were planted nearby. Most of the infestations occurred when the water temperature was between 59F and 77F. It is important to take precautions when irrigating crops. If irrigation is necessary, do not use surface water sources. Drip irrigation from well water or ponds fed by well water is recommended to reduce the risk of *Phytophthora* spread on susceptible vegetable crops. Irrigate conservatively, and try to limit irrigation close to harvest.

**Produce Safety at the Farm Market–A Guide for Farmers and Sellers** by Sanja Ilic & Jeff LeJeune, Food Animal Health Research Program and Doug Doohan, Department of Horticulture & Crop Science.

Consumers don't come to farmers' markets to get a dose

of E. coli or salmonella. But if farm markets turn out to be a source of these or other causes of foodborne illness, consumers will quickly choose to get their fresh produce elsewhere.

The Centers for Disease Control and Prevention estimates that 76 million Americans a year suffer a case of foodborne illness, although many mild cases go undiagnosed. Thousands of cases are more serious, though: According to the CDC, "there are 325,000 hospitalizations and 5,000 deaths related to foodborne diseases each year. The most severe cases tend to occur in the very old, the very young, those who have an illness already that reduces their immune system function, and in healthy people exposed to a very high dose of an organism." In other words, every customer at your farm market is a potential victim of foodborne disease. The safety precautions you take could save a life, and your business.

Food safety experts with Ohio State University Extension and the Ohio Agricultural Research and Development Center suggest paying special attention to three areas: transportation, product handling, and sale and display. In each area, consider proper personal hygiene, temperature control, cross-contamination prevention, and cleaning and disinfection.

These are especially important guidelines when handling fresh produce, much of which will be eaten raw. Other types of fresh food, such as meat and poultry, are usually thoroughly cooked before eaten, so any microorganisms they harbor are killed. That's why foods that are not typically cooked before being consumed deserve special handling.

Remember: Bacteria that cause foodborne illness can show up anywhere. Even if you grow your goods organically or have a small operation with just family members involved, your product is as much at risk as in a large operation. It's just common sense -- and good business sense -- to take all precautions possible to prevent the foods you sell from becoming contaminated. Here are some guidelines:

Transportation: Be sure to transport food in containers that can be wrapped, covered and otherwise protected from contamination, and that can be cleaned and sanitized before each use. Plastic bins would be an ideal choice; don't use wooden crates or used cardboard boxes, which might harbor disease-causing bacteria and pass it along to the food items inside.

Keep produce cold by putting it on ice or refrigerating it during shipping. Spinach and other leafy greens should have ice between layers of leaves to keep it cold. Cold temperatures (below 40 degrees) slows down the growth

of microorganisms and prolongs shelf life.

Make sure the vehicles you are using to transport food items are clean. Vehicles that are used to carry fresh produce should not be used for other purposes that might lead to contamination -- moving animals, chemicals, or compostable materials, and they should be free of foreign substances such as bird droppings. Don't transport produce with raw meat, equipment or gas containers in the same vehicle -- the chance of contaminating your fresh produce is too great.

**Product Handling:** Believe it or not, the simple precaution of washing your hands often is one of the most effective ways to prevent food contamination.

**Wash your hands:**

**When**

Before handling produce.

After every visit to the washroom.

After a break or meal.

After hand-to-face contact (e.g., coughing, sneezing, blowing nose).

After handling any materials other than the produce (crates and especially money).

**How**

Use proper hand washing techniques.

Wet hands, lather soap for 20 seconds (sing "Happy Birthday" twice).

Scrub well (especially fingernails and knuckles) Use fingernail brushes if available.

Rinse

Dry hands and wrists with paper towel.

If there is no water?

Use hand wipes to remove soil.

Use hand sanitizer.

Do not handle or sell any type of food if you have a contagious illness -- especially an intestinal problem. If you have any cuts, sores or wounds, be certain they are bandaged properly. This protects both you and the food products you are handling.

Wear clean, protective clothing, such as clean or one-use aprons, gloves, smocks and shoes. Soiled clothing can harbor bacteria that can be transferred to produce you're handling.

Clean and sanitize all utensils and surfaces that will have contact with food.

Sale and Display

Be sure clean and sanitize all surfaces before setting up your display. Wipe down surfaces regularly thereafter with

a clean towel or wipe.

Never allow animals near your produce, including rodents, birds and domestic pets.

Pre-pack food items before putting them out for display. This will prevent too many consumers from handling the same produce, and protect the produce from dust, dirt, etc. Mark the date clearly on labels.

As much as we all like it, money can be pretty dirty! Consider having one person handle the produce, and another taking money and giving change . Or, change gloves after handling money and before handling produce.

Keep all food items and containers off of the floor or ground. Containers should be put on a pallet or another empty crate to prevent dirt, dust or splashing water from contaminating the produce inside, and to keep rodents or pets from getting into them.

Separate different types of food, especially high-risk items such as meat from produce.

Be sure to have an appropriate waste container nearby, so waste products can be safely thrown away. Waste containers should be leak- and pest-proof. Containers such as a crate or open basket could allow leaking and attract pests.

Educate your customers about food safety and provide hand sanitizer or wipes for them to use before handling any of your produce.

**Crop Reports by Ron Becker and Brad Bergefurd**

## Wayne County Report From August 10th

With heavy rains having occurred in some parts of the county in each of the last two weeks, some fields of vine crops are showing severe signs of both pythium and phytophthora blight. Downy mildew continues to spread to more farms, especially in cucumbers. Powdery mildew is being found everywhere, including on young plantings. Cucumber beetles and corn rootworm adults have started feeding on ripening melons as well as the fruit of other vine crops. Both European corn borer and corn earworm trap catches increased this week, putting area sweet corn growers on 4-5 day spray schedules for their silking corn. Fall armyworm damage is also being found in several sweet corn fields. So far they have been feeding only in the tassel area.

## Southern Ohio Vegetable and Berry Update- 8/5-

8/11/07 Hot and dry was the general pattern across the southern Ohio growing region this past week and it does not look any better for the upcoming week.

Thunderstorms traveled across the region on 8/ 8 and 8/9 bringing lightening and thunder however very little precipitation was associated with these fronts, with some areas receiving 1/2 inch of rainfall where most areas received only a few sprinkles to 2/10 inch. Therefore irrigation systems continue to run with temperatures soaring into the mid to upper 90's each day causing severe stress and pollination problems on many crops. Honeybees



remain clustered at hive entrances working harder with fanning and keeping the hives cooler than working the fields and pollinating crops. Many pumpkin fields transplanted or direct seeded the mid to end of May are 70 to 90% orange with nice fruit size, this has growers concerned especially with the continued heavy Powdery Mildew and Downy Mildew disease pressure that continues to plague all vine crops. Growers who have not begun their fungicide protectant programs on all vine crops are experiencing severe economic damage and losses from these diseases including sun burn on fruit. Growers who are keeping their vines free of disease and still have good leaf canopy, this is protecting the fruit from sunburn, those with poor leaf canopy are reporting severe sunburn on pumpkins, watermelon, cucumbers, summer squash and cantaloupe. Yellow vine decline has shown up in pumpkin fields with high populations of squash bug which vectors the disease. The disease takes at least 28 days until symptoms are seen. At several farm visits and Field Days last month we found high numbers of Squash bug and squash bug egg masses. To view a Powerpoint presentation on Yellow Vine Decline see the Veg Net web site at

<http://ohioline.osu.edu/~vegnet/problem/yellowv.ppt> Harvest of all summer produce continues with tomato, cantaloupe and sweet corn harvest peaking this week. Cantaloupe ripening has been enhanced by the high heat however the normal "glut" has not really occurred and

prices remain above normal for this time of the year with high volumes and numbers coming through the Bainbridge Produce Auction last week. Marketers are complaining of slow traffic and slow sales this past week in retail farm markets and Farmers Markets due to the high heat and traditional "Back to School" preparation with last minute vacations etc. that always occur from beginning to mid August. Field seedings of summer squash, pickles, green beans and snap peas, many as double crops following a previous crop were made this week. Transplanting of broccoli and cauliflower continues. Bacterial canker continues to appear in tomato fields. Many growers who have experienced this disease either bought their plants from greenhouse growers or else grew their own tomato plants near or in the same greenhouse with garden varieties of tomatoes that had been grown for bedding plant sales. This brings us back to the old message **DO NOT GROW COMMERCIAL VEGETABLE TRANSPLANTS NEAR OR IN THE SAME GREENHOUSE WHERE BEDDING PLANTS ARE BEING GROWN!!** It appears to be most severe where growers did not begin a copper fungicide program soon after planting. It is recommended to begin a fixed copper spray program soon after transplanting of tomatoes <http://ohioline.osu.edu/b672/pdf/Tomatoes.pdf> which may help with control of bacterial disease. For more on this devastating disease of tomato see the Ohioline fact sheet at <http://ohioline.osu.edu/hyg-fact/3000/3120.html>