

# VEGETABLE CROPS HOTLINE

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

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No. 507  
May 22, 2009

<<http://www.btny.purdue.edu/pubs/vegcrop>>

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**NEW FUNGICIDE** - (Dan Egel) - Several new uses have been added to the label of Switch® 62.5WG. Cucurbit vegetables have been added to the label along with the diseases Alternaria leaf blight, gummy stem blight and powdery mildew. Leaves of root and tuber vegetables can now be treated with Switch® 62.5WG for Alternaria leaf blight and powdery mildew. Root vegetables, except sugar beet, can be treated with Switch® for the same diseases. Tomatoes have been added to the Switch® label with the diseases early blight, grey mold, and powdery mildew. Switch® 62.5WG contains the active ingredient cyprodinil in mode of action (MOA) group 9 and fludioxinil in MOA group 12. Most vegetable uses require users to alternate to a different MOA group after 2 sequential applications. Before using Switch®, one should be certain that the label lists the crop use that is intended. Switch® is produced by Syngenta™.

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**POWDERY MILDEW OF MUSKMELON** - (Dan Egel) - The keys to managing powdery mildew of muskmelon have been host resistance and the application of systemic fungicides in a timely manner. Observations from last year suggest that a new race of the powdery mildew fungus has overcome host resistance. (We are doing research on this subject at the Southwest Purdue Ag Center (SWPAC) this year.) Therefore, application of systemic fungicides for powdery mildew is critical. Work conducted last year at SWPAC suggests that the following fungicides should be used to manage this important disease.

- Quintec® is labeled on muskmelon and watermelon and has been very effective in my tests. This product is not systemic, but can relocate on leaf surfaces via a vapor phase. However, since it is not systemic, it will not enter the leaf and have any effect on existing infections. Therefore, be sure to apply Quintec® before powdery mildew is observed and/or mix Quintec® with a systemic fungicide labeled below. Quintec® is a group 13 fungicide and should not be applied in sequential applications (see the label).

- Procure® and Rally® (formerly Nova®) are group 3 fungicides and have been effective in my tests. They are both systemic. Again, do not apply these fungicides in sequence. These fungicides are labeled for pumpkins.
- Folicur is now labeled for muskmelon, watermelon and pumpkin. It is a group 3 fungicide. I do not have experience with this fungicide on powdery mildew yet. I expect that it will perform similarly to Procure® and Rally®.
- The fungicide Pristine® has active ingredients in group 7 and group 11. The group 7 portion of the fungicide is moderately effective against powdery mildew and can be used in alternation or mixed with the fungicides above. Note that the fungus that causes gummy stem blight of muskmelon and watermelon has been observed to be resistant to Pristine in Knox County.
- Organic growers do not have systemic products certified for their production. However, copper products may have some effectiveness against powdery mildew. Oxidate® may also help to manage this disease. A biological product that may have effectiveness is Serenade®. It is critical with all these products to obtain excellent coverage. Do not mix Oxidate® or a copper product with a biological product.

Apply fungicides 10 to 14 days before first harvest of muskmelon. Watermelon has not been affected by powdery mildew. Notify me if you see symptoms on watermelon. I would continue to purchase muskmelon hybrids with resistance to powdery mildew. The *Midwest Vegetable Production Guide for Commercial Growers for 2009* has additional information <[www.btny.purdue.edu/Pubs/ID/ID-56/](http://www.btny.purdue.edu/Pubs/ID/ID-56/)>. Always read the fungicide label carefully before application.

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**FUSARIUM WILT OF WATERMELON** - (Dan Egel) - This disease of watermelon may cause plants to wilt and/or become stunted. Often one leaf or vine may be wilted leaving the rest of the plant apparently healthy (Figure 1). While the roots may be white and healthy, the interior of the stem may have a brown discoloration (Figure 2).

Relatively cool weather seems to favor the fungus over the watermelon seedling. Thus, cool weather in May and early June sometimes leads to a higher incidence of Fusarium wilt. In addition, this disease is often found in well-drained areas. Regardless of how many watermelon plants appear to be dying at the moment,



**Figure 1:** Fusarium wilt has caused a leaf and vine of this watermelon seedling to wilt. (Photo by Dan Egel)



**Figure 2:** A brown discoloration of the inside of the stem is typical of Fusarium wilt of watermelon. (Photo by Dan Egel)

remember that this disease will not spread from plant to plant in the field. Typically, no more than 10 percent of plants will be killed due to Fusarium wilt of watermelon. In addition, once the weather turns warmer, the watermelon plant will begin to outgrow the fungus.

It is possible to spread the fungus that causes Fusarium wilt of watermelon through soil that remains attached to cultivation equipment between fields. In order to minimize the spread of the fungus between fields, clean off soil between fields with high-pressure water. It may not be practical to disinfest the equipment between fields; however, one might spray a solution of a quaternary ammonia solution (Greenshield or Physan 20) or 10 percent bleach on the tools.

Growers will want to make every effort to keep infected seedlings out of commercial fields. Closely inspect transplants before planting them. Fusarium wilt can be transmitted on seed. Previously used trays may harbor the fungus that causes Fusarium wilt. Although transplant trays can be disinfested, it can be very difficult to clean and disinfest trays sufficiently to eliminate the possibility of Fusarium wilt.

Use long crop rotations of at least 5 to 6 years between watermelon crops since the fungus that causes Fusarium wilt survives for several years without a host planted in the field.

The fungus that causes Fusarium wilt of watermelon is very specific to watermelon and will affect no other crop plants. Likewise, Fusarium of other crop plants like tomato and cabbage will not affect watermelon.

While no variety is completely resistant to Fusarium wilt of watermelon, there are differences in susceptibility. See this link or call me about a list of varieties and their susceptibility to Fusarium wilt. <[www.btny.purdue.edu/Pubs/ID/ID-56/cucurbit.pdf](http://www.btny.purdue.edu/Pubs/ID/ID-56/cucurbit.pdf)>. There are no fungicide treatments for Fusarium wilt.

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### **PRUNING FRESH MARKET TOMATOES - (Liz Maynard) -**

Should tomatoes be pruned? What if the plants get too big? Questions like these come into the office on occasion and so this article will review pruning. As with many cultural practices, there's no one answer because it depends on the variety, production system, method of tomato support, labor availability, market demand, and other factors.

There are at least three types of pruning used in tomatoes: topping, fruit thinning and sucker removal. Topping is cutting off the top of the plant to promote development of fruit and is sometimes used in greenhouse production towards the end of the cropping cycle. Fruit thinning is the removal of one or more fruit from a cluster soon after fruit set. This is sometimes used on cluster tomatoes to promote larger and more uniform fruit size. Sucker removal involves breaking off branches when they are small. The remainder of this article will focus on sucker removal.

Branches, also known as suckers, typically form at each node along the stem of a tomato plant. Every place a leaf attaches to the stem, a sucker can form in the 'V' formed by the stem and the leaf (Figure 1). A pair of suckers also forms at the cotyledonary node. When a few inches long, suckers break off easily and cleanly with pressure from a thumb (Figures 2a and 2b). In determinate tomato varieties like Florida 91 and Mountain Fresh, suckers are sometimes removed beginning at the bottom of the plant and working up to the sucker just below the first flower cluster on the main stem (Figure 1). Often one, two, or three suckers below the flower cluster are allowed to grow and just the lowest suckers are removed. The sucker just below the first flower cluster will grow into a thick branch, practically a second main stem. The 'V' formed by this branch and the main stem is sometimes called the 'fork.' In indeterminate tomato varieties like 'Trust,' all suckers are removed if the plant is grown as a single stem. If an indeterminate variety is grown with two stems, the thick branch at the 'fork' is left and all others removed. If not trained to just one or two stems, indeterminate tomatoes are sometimes pruned just below the first flower cluster.



**Figure 1.** Tomato plant showing first flower cluster on main stem and two suckers (branches) below the first flower cluster. (Photo by Liz Maynard)



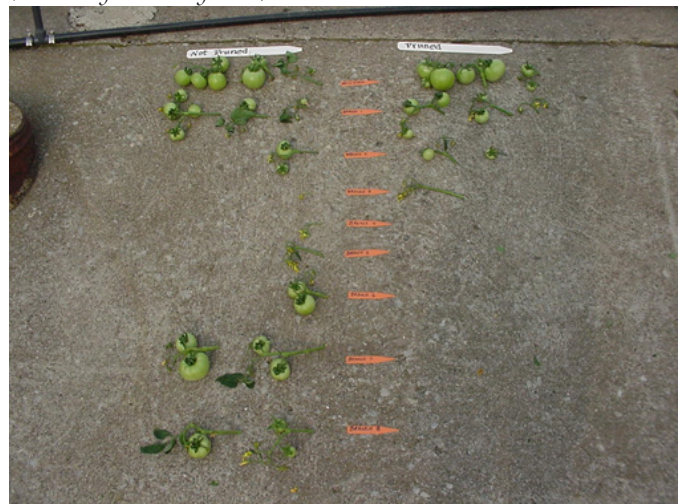
**Figure 2a (above) and 2b (below).** Small suckers are easily broken off with a thumb. (Photos by Liz Maynard)



A few years ago we evaluated the effect of sucker pruning in field production in N. Indiana using several varieties. Plants were pruned once early in the season, and in pruned plants, one or more suckers were removed below the first flower cluster on the main stem (Figures 3 and 4). We saw two main effects: 1. Total marketable yield was reduced by pruning, and 2. Average fruit size was larger with pruning. The more suckers removed, the greater the effect. The magnitude of the effects depended on variety. (The complete reports for these trials are available on line at Fresh Market Tomato Pruning Trial for Northern Indiana, 2001 <[www.hort.purdue.edu/fruitveg/rep\\_pres/2002prior/01tomprun.pdf](http://www.hort.purdue.edu/fruitveg/rep_pres/2002prior/01tomprun.pdf)>, Fresh Market Tomato Cultivar and Pruning Evaluation for Northern Indiana, 2000 <[www.hort.purdue.edu/fruitveg/rep\\_pres/2002prior/tomvar00f/tomvar00.html](http://www.hort.purdue.edu/fruitveg/rep_pres/2002prior/tomvar00f/tomvar00.html)> and Fresh Market Tomato Cultivar Evaluation for Northern Indiana, 1999 <[www.hort.purdue.edu/fruitveg/rep\\_pres/2002prior/tom99.html](http://www.hort.purdue.edu/fruitveg/rep_pres/2002prior/tom99.html)>).



**Figure 3.** Unpruned (left) and pruned (right) tomato plants. Red label marks first fruit cluster on main stem. (Photo by Liz Maynard)



**Figure 4.** Developing fruit from unpruned (left) and pruned (right) tomato plants. On pruned plant, 3 suckers below first flower cluster were allowed to grow and remaining suckers below that flower cluster were removed. (Photo by Liz Maynard)

The implications of these results for a particular operation depend on how market price varies with fruit size. In markets that pay a premium for large tomatoes and where small tomatoes are unmarketable, pruning may pay for itself even though yield is reduced. In markets where the premium for large tomatoes is minimal, or where small tomatoes can be sold, pruning may not pay for itself.

Sucker pruning has additional benefits and disadvantages. Pruned plants are easier to tie up in the trellis weave system, and can be easier to harvest. On the negative side, workers can spread disease organisms from plant to plant when pruning, and wounds opened by pruning can provide entry points for plant disease. There may be other pros and cons – we did not evaluate flavor or nutritional quality, but those could be influenced by pruning.

Indiana fresh market tomato producers have diverse production systems and markets, so there is no one-size-fits-all recommendation about pruning. If tomatoes get beyond the normal stage for pruning, it may be OK to leave them unpruned. As a grower, you are in the best position to make that decision on the basis of your markets, variety, production system, and competing needs for labor.

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**EXTENSION SPECIALISTS - (Information)** - Below find a list of Purdue University Extension specialists with expertise in vegetable production or marketing. Please keep this list for future reference.

Name	Expertise	Phone	Email	Location
Jennifer Dennis	Marketing	765-494-1352	<a href="mailto:jhdennis@purdue.edu">jhdennis@purdue.edu</a>	Purdue, W. Lafayette
Dan Egel	Vegetable Diseases	812-886-0198	<a href="mailto:egel@purdue.edu">egel@purdue.edu</a>	SWPAC, Vincennes
Rick Foster	Vegetable Insects	765-494-9572	<a href="mailto:rfoster@purdue.edu">rfoster@purdue.edu</a>	Purdue, W. Lafayette
Lyndon Kelley	Irrigation	269-467-5511	<a href="mailto:kelleyl@msu.edu">kelleyl@msu.edu</a>	Centerville, MI
Liz Maynard	Vegetables, Weed Management	219-785-5673	<a href="mailto:emaynard@purdue.edu">emaynard@purdue.edu</a>	Purdue NC, Westville
Steve Weller	Weed Management	765-494-3333	<a href="mailto:weller@purdue.edu">weller@purdue.edu</a>	Purdue, W. Lafayette
Fred Whitford	Pesticide Education and Regulations	765-494-1284	<a href="mailto:fwhitford@purdue.edu">fwhitford@purdue.edu</a>	Purdue, W. Lafayette

Main Purdue Extension Switchboard: (888)-398-4636 (888-EXT-INFO)

Other Useful Phone Numbers

Office of the Indiana State Chemist (765) 494-1587, <[www.isco.purdue.edu](http://www.isco.purdue.edu)>.

Plant and Pest Diagnostic Laboratory (765) 494-4641 <[www.ppdل.purdue.edu/PPDL/](http://www.ppdل.purdue.edu/PPDL/)>.

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