

# Sustainable Disease Management of Cucurbit Crops in the Home Garden

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## INTRODUCTION

Cucurbit vining crops include cucumbers, watermelons, cantaloupe, pumpkins, zucchini, and summer and winter squashes, and can be highly productive plants in small gardens. During wet summers, downy mildew and fungal leaf spot diseases tend to occur, while in drier summers, powdery mildew is the most common disease. Gardens with cucumber beetle pressure are much more likely to have plants affected by bacterial wilt, since striped and spotted cucumber beetles can carry the bacterial wilt pathogen.

## CULTURAL PRACTICES

Well drained, high organic matter soils are best for direct-seeding cucurbits, which require as much sun as possible. Plastic mulch or a thick layer of compost is recommended for weed suppression, moisture management, and to reduce fruit contact with soils. Vines should be trained lengthwise down the row to prevent injury from walking or accidental mowing. For best results, do not plant cucurbits in a location that was planted to vining crops in the previous 2 years. This can be accomplished by maintaining a garden journal that identifies where each type of plant was grown in each year.

## RESISTANCE

As with other crops, select resistant varieties based on diseases that have been problems in the garden in previous years. Downy mildew, the most devastating disease of cucurbits, can eliminate plants in a matter of days under wet conditions. Cucumber varieties with partial downy mildew resistance include 'Sassy,' 'Calypso,' and 'Eureka' (pickles) and 'Poinsett,' 'Turbo,' and 'Thunder' (slicers). 'Sunray' summer squash, and 'Ambrosia' and 'Honey Brew' muskmelons are partially resistant to downy mildew, but few varieties with downy mildew resistance exist for watermelons, pumpkin, winter squashes, and zucchini. Many powdery mildew-resistant varieties of picklers, slicers, pumpkins, and squash are available. Varieties that are less susceptible to bacterial wilt include the pickle cukes 'Cross Country' and 'County Fair,' 'Howden' pumpkins, and 'Waltham Butternut' squash. All watermelons have natural resistance to bacterial wilt. For additional recommendations, see Resources.

## USING THE TABLE

The following table focuses on cultural practices aimed at reducing risk of developing diseases of cucurbit crops. Cultural practices should be implemented in each plant growth stage, regardless of fungicide program, for optimal disease management. Many cultural practices target multiple diseases, as shown in the table. If disease pressure is high or higher quality produce is desired, growers may consider the fungicides listed in the right-hand column. Organic fungicides (OMRI-approved) are marked with an asterisk (\*). All fungicides require excellent coverage of plant tissue and recurrent applications for maximum effectiveness. For best results, most fungicides should be reapplied when residues are no longer visible or on a 10-day interval, whichever happens sooner.

## RESOURCES

- Plant Pathology Extension Publications  
<http://www2.ca.uky.edu/agcollege/plantpathology/extension/pubs.html>
- Home Vegetable Gardening (ID-128)  
<http://www.ca.uky.edu/agc/pubs/id/id128/id128.pdf>
- IPM Scouting Guide for Common Problems of Cucurbit Crops in Kentucky (ID-91)  
<http://www.ca.uky.edu/agc/pubs/id/id91/id91.pdf>
- Bacterial Wilt of Cucurbits (PPFS-VG-11)  
[http://www2.ca.uky.edu/agcollege/plantpathology/ext\\_files/PPFShtml/PPFS-VG-11.pdf](http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-VG-11.pdf)
- Cornell University Tables of Resistant Vegetable Varieties  
<http://vegetablemdonline.ppath.cornell.edu/Tables/TableList.htm>

| Time of Year <sup>1</sup>                 | Growth Stage      | Cultural Management  | Disease  | Chemical Management <sup>2</sup>                                       |
|---|-------------------|--|--|--|
| May<br>(cucumber, squash, melons)         | Seeding           | Plant resistant varieties; Sow pathogen free seeds; Plant into warm soils; Avoid planting in extremely wet areas; Increase spacing between plants. | Alternaria leaf blight<br>Anthracnose<br>Damping-off | Use pretreated seed  |
| June<br>(pumpkin)                         |                   |  |  |  |
| June - July<br>(cucumber, squash, melons) | Vegetative growth | Remove infected leaves/vines/fruit; Remove weeds; Avoid overhead watering.<br><br>Bacterial wilt - Manage cucumber beetles (disease vector).       | Alternaria leaf blight<br>Anthracnose                | Chlorothalonil or copper* or mancozeb or myclobutanil                  |
| July - August<br>(pumpkin)                |                   |  | Downy mildew   | Chlorothalonil or copper* or mancozeb or phosphorous acid <sup>3</sup> |
|   |                   |  | Powdery mildew                                       | Copper* or myclobutanil  |
| June - July<br>(cucumber, squash, melons) | Blossom           | Remove infected leaves/vines/fruit; Remove weeds; Avoid overhead watering.<br><br>Bacterial wilt - Manage cucumber beetles (disease vector).       | Alternaria leaf blight<br>Anthracnose                | Chlorothalonil or copper* or mancozeb or myclobutanil                  |
|   |                   |  | Downy mildew   | Chlorothalonil or copper* or mancozeb or phosphorous acid <sup>3</sup> |
|   |                   |  | Powdery mildew                                       | Copper* or myclobutanil  |
|   |                   |  | Bacterial wilt                                       | --   |
| June - July<br>(cucumber, squash, melons) | Fruit bearing     | Remove infected leaves/vines/fruit; Remove weeds; Avoid overhead watering.<br><br>Bacterial wilt - Manage cucumber beetles (disease vector).       | Alternaria leaf blight<br>Anthracnose                | Chlorothalonil or copper* or mancozeb or myclobutanil                  |
|   |                   |  | Downy mildew   | Chlorothalonil or copper* or mancozeb or phosphorous acid <sup>3</sup> |
|   |                   |  | Powdery mildew                                       | Copper* or myclobutanil  |
|   |                   |  | Bacterial wilt                                       | --   |
| August - September<br>(pumpkin)           | End of season     | Remove all leaves/fruit/plant tissue and destroy (do not compost); Deep-till soil.   |  |  |
| August<br>(cucumber, squash, melons)      |                   |  |  |  |
| October<br>(pumpkin)                      |                   |  |  |  |

<sup>1</sup> Growth stage typically occurs during this time of year. However, time of year may vary from year to year depending on environmental conditions.

<sup>2</sup> Products approved by the Organic Materials Review Institute (OMRI) for organic production are noted with an \*

<sup>3</sup> Phosphorous acid and/or sulfur dust may injure plants; test on a small area, wait at least 3 days, and inspect for damage prior to treating entire planting.

<sup>4</sup> Avoid spraying chlorothalonil on blossoms, as it may pose a risk to honeybees.

*December 2015*

**Reviewed by:** Dr. Shubin Saha, Department of Horticulture, University of Kentucky

**Photo credit:** Matt Barton, UK Agricultural Communications