Powdery Mildew Control and Prevention:

Since temperatures this past week were warm yet cooler than normal in the upper 70’s and low to mid 80’s with cool nights in the upper 50’s, combined with a few afternoon rain showers, I thought I might discuss powdery mildew for today’s column. This fungal disease is most prevalent in the spring when temperatures are warm between 68-86°F, but can be a pest anytime when the conditions are right.

When I was the head water at a local greenhouse in St. Louis County, it was always a battle to keep powdery mildew from attacking our zinnia and gerbera daisy plants. It was inevitable as the temperatures rose and the plants grew too large for their four pack containers, that the need for water in the late afternoon would mean creating the ideal conditions for powdery mildew to take over the zinnia benches. It was either let the plants dry out and become un-presentable, or water them and try to space them out as much as possible; waiting for the inevitable powdery mildew to arrive on the scene.

Powdery mildew is a common fungi disease that affects a great deal of plant species including common vegetables and landscape plants. Caused by different types of host specific, obligate parasite fungi, powdery mildew is prevalent; overwintering in plant debris in and around a garden site. Powdery mildew, like many fungi spread by water splashing and wind; developing during warm periods when the humidity next to plant leaves surfaces is above 90%. Humidity, warm days and cool nights are the environmental requirements for powdery mildew inoculum to develop and cause an
infection. Some plants are more susceptible than others. In my open woodland garden I manage, monarda and garden phlox are the most prone to infection of powdery mildew.

As powdery mildew develops, signs of the disease (actually evidence of the fungi present) become visible, as it forms a mat of multiple hypha (a strand of vegetative fungi growth) called mycelium. This whitish gray mold appears on the surface of the leaf, stems and fruit. Powdery mildew fungi penetrate and take nutrients from the plant, causing a slump in vigor of the plant and yellowing tissue. Although typically powdery mildew does not directly kill a plant, it leaves it susceptible to diseases caused by other organisms. For vegetable growers this could mean a decrease in vegetable production and quality if the infection is widespread. Plants in the Cucurbit family such as zucchini, and pumpkins are also notoriously susceptible to powdery mildew.

To control powdery mildew it is important to first follow a few steps to prevent the infection from occurring, and or to limit it’s severity. First space out vegetable and landscape plants to increase air circulation. Stagnant humid air is a sure way to spread the infection. Second, use drip irrigation and limit overhead irrigation. Although powdery mildew does not develop in “free moisture on leaves,” overhead irrigation can splash up spores of different fungi and creates a humid environment for powdery mildew to develop. If overhead irrigation is the only option, water as early in the day as possible, allowing the leaves to dry completely before evening. This goes along with the garden saying “Never let your plants go to bed wet.” Powdery mildew develops most rapidly on cool nights when the humidity is high. Powdery mildew infections tend to be most severe on shaded plant material.

There are many chemical fungicide control methods available to homeowners, many of which can be sprayed on susceptible garden plant to prevent powdery mildew development. Limiting the use of pesticide and rotating mode of action, can limit the development of resistance of the fungi to the fungicide treatment. Copper, chlorothalonil, or sulfur based contact fungicides can be used to prevent powdery mildew development. For more information on other fungicides labeled to control powdery mildew, see http://soilplantlab.missouri.edu/plant/diseases/mildewfungicide.aspx . The entire leaf and plant surfaces should be sprayed for best results.

Cultivars of common vegetable and landscape plants are available that have been bread for resistance to powdery mildew. For Monarda, ‘Purple Mildew Resistant’ and the deep reddish-purple flowering ‘Colrain Red’¹ and for Phlox paniculata white flowering ‘David’² and “David’s Lavendar”³, both have showed resistance to the diseases.

Powdery mildew covered pant parts and diseased debris should be removed from the site to limit reinfection. The good news is that as temperatures become hot this summer, instances of powdery mildew also tend to diminish, but keep an eye out for powdery mildew which may be lurking in a cool

¹ http://www.chicagobotanic.org/downloads/planteval_notes/no12_monarda.pdf
shaded garden, or deep underneath the leaf canopy in vegetable gardens, waiting for environmental conditions to change and become prefect to spread.45678

5 http://www.clemson.edu/extension/hgic/pests/plant_pests/flowers/hgic2049.html
6 http://www.ext.colostate.edu/pubs/garden/02902.html
7 http://www.uvm.edu/~pass/perry/cohmild.html
8 http://vegetablemdonline.ppath.cornell.edu/factsheets/Cucurbits_PM.htm