

Basil, Downy Mildew, and Red Lights

by Maria Giovine, Master Gardener

What would the south Florida herb garden be without the aroma and spice of sweet basil (*Ocimum basilicum*)? Culinary basil comes in a variety of sizes, leaf shapes, and colors, making the herb a delight to the eye as well as to the nose and tongue. *Ocimum*, the genus name, comes from the Greek and means "to be fragrant," while the species name *basilicum* is derived from the Greek *basileus*, which means "king or prince." Basil is indeed king among herbs.

Interestingly though, its use as an herb in Europe and the Americas dates back only to the 19th century. For hundreds of years before that basil was prized exclusively for its medicinal value. Basil's essential oil contains camphor, and one of its many early uses was as an infusion to ease stomach pain. In other places and periods inhaling the aroma of basil was believed to alleviate depression. In parts of Asia basil has been used in religious ceremonies for millennia.

Unfortunately, this regal legacy is being threatened today by downy mildew. The disease was first observed on basil plants in Florida in 2007 and has spread throughout most of the United States. It has been reported in Europe and many other countries throughout the world, threatening to devastate the cultivation of this most sought after herb. Downy mildew is caused by the pathogen *Peronospora belbahrii*, which belongs to a fungus-like class of microorganisms called Oomycota. Oomycetes are frequently referred to as water molds.

The first symptom of downy mildew on basil is yellowing of the leaves which is often mistaken for a nutritional deficiency. Take a look at a basil leaf that is beginning to yellow. If the yellowing does not cross over the veins, this might indicate downy mildew. If you turn the leaf over and see a dark fuzzy growth, the disease is almost certainly present. The growth, or *sporingia*, consists of the spores through which the disease spreads.

Excessively humid conditions facilitate the spread of the pathogen and cause the yellow leaves to turn brown and then black. Unfortunately, downy mildew has also been observed on these basil relatives in the *Lamiaceae* or mint family: coleus (*Solenostemon* spp.) and sage (*Salvia* spp.).

The disease can be controlled with commercially available fungicides that are labeled for downy mildew. Application must start at the very onset of disease. Fungicide would be more effective if applied as a preventative, before the appearance of symptoms. It is helpful to know, therefore, that downy mildew is more likely to strike younger leaves.

Preventing moisture on the leaves also goes a long way in checking the spread of the disease.

But the news is not all bad. Researchers at the Tropical Research and Education Center in Homestead have found that shining red lights on basil plants for 12 hours every night inhibits the spread of downy mildew, and even more dramatically when used in conjunction with certain fungicides. Scientists can not yet explain why this is so, but are eager to investigate the processes at work because it means that the disease might one day be controlled without exclusive reliance upon chemicals. Long live the king.

A basil leaf infected with *Peronospora belbahrii* ,



<http://edis.ifas.ufl.edu/pdffiles/VH/VH02000.pdf>

<https://news.ifas.ufl.edu/2015/07/shining-a-red-light-to-slow-downy-mildew-on-basil/>