

Early protection, fungicide effectively reduce downy mildew in basil

January 14 2015

Sweet basil, a consumer favorite culinary herb, has a tough adversary. Downy mildew caused by the fungus *Peronospora belbahrii* has become the most devastating disease of basil plants grown in the United States. Discovered in Uganda in 1933, the first outbreak of downy mildew in the U.S. occurred in Florida in 2007. The disease has since spread to more than 30 states in the U.S., making many commercially produced basil crops unsuitable for the fresh market; some long-time basil growers in Florida even stopped basil production in 2013 on the heels of disastrous crop losses attributed to downy mildew. Jaimin Pate, Shouan Zhang, and Maria Costa de Novaes of the University of Florida discovered several solutions to this challenging problem in their research on the effect of basil plant age and fungicide applications to control downy mildew. The study in *HortScience* contains vital information that may help basil growers revitalize production of the popular herb.

The researchers said that the severity of downy mildew is typically associated with three variables: the age of the basil plant, environmental conditions, and specific cultivar susceptibility. The most commonly grown sweet basil (*Ocimum basilicum*) is substantially more susceptible to downy mildew than other basil varieties. Cool, wet, and humid weather conditions create conditions conducive to infection by *Peronospora belbahrii*, and blowing wind and splashing water can spread the disease from infected to healthy plants. Making disease mitigation even more of a challenge, there are currently a limited number of fungicides and biologicals available for controlling downy mildew in basil.

The University of Florida team designed experiments in which they evaluated 2- to 7-week-old basil plants for their susceptibility to downy mildew, and studied the effect of a pre-inoculation application of the fungicide acibenzolar-S-methyl (ASM) for controlling the fungus on maturing basil plants. "In both experiments, the greatest disease severity of downy mildew was observed in 2-week-old basil regardless of the plants treated with ASM or not," the authors said. "The effect of plant age and ASM on number of leaves was significant, whereas the effect of interaction between plant age and ASM on number of leaves was non-significant." Results also showed that 4- to 7-week-old basil plants after seeding developed significantly lower downy mildew disease compared with 2- and 3-week-old basil plants. "One application of ASM before *Peronospora belbahrii* inoculation significantly reduced disease severity, except for 2-week-old basil when plants are very susceptible to this disease," the researchers said.

The authors acknowledged previously published research on downy mildew in basil, but noted that this study demonstrated for the first time that younger basil plants appear to be more susceptible than older plants to [downy mildew](#) under greenhouse conditions. The study recommended that 2- to 3-week-old basil plants be protected, and that application of ASM should be made before pathogen infection on plants older than 5 weeks to maximize the efficacy of the fungicide.

More information: The complete study and abstract are available on the ASHS *HortScience* electronic journal web site:

[hortsci.ashspublications.org/c ... /49/11/1392.abstract](http://hortsci.ashspublications.org/c.../49/11/1392.abstract)

Provided by American Society for Horticultural Science

Citation: Early protection, fungicide effectively reduce downy mildew in basil (2015, January

14) retrieved 31 October 2024 from <https://phys.org/news/2015-01-early-fungicide-effectively-downy-mildew.html>

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