

Proceeding for presentation at 2016 New Jersey Ag Convention and Trade Show

## **Managing Basil Downy Mildew - New York Perspective**

Margaret Tuttle McGrath  
Plant Pathology & Plant-Microbe Biology Section, SIPS, Cornell University  
Long Island Horticultural Research & Extension Center  
3059 Sound Avenue  
Riverhead, NY 11901  
mtm3@cornell.edu

Downy mildew can be effectively managed in basil with conventional fungicides applied weekly starting before symptoms are detected. This disease has proven difficult to manage, especially in crops grown organically. A high level of control is needed for fresh-market herb crops to be salable. Inadequate control obtained with organic fungicides is at least partly due to the challenge of obtaining thorough spray deposition on the underside of basil leaves. Resistant varieties providing a high level of suppression are in development. They will be an important management tool, especially for organic producers. The first commercial resistant variety (Eleonora) has not provided sufficient suppression to be used as the sole management tool or in an integrated program with organic fungicides. Basil downy mildew has been occurring regularly in New York, albeit sporadically in some areas, since 2008. Both greenhouse and field-grown crops have been affected. Managing this disease has become a routine part of successful basil production. These statements are based on results from research and observations from commercial plantings.

Results from research conducted in 2015 confirmed previous results. Research on Long Island is being conducted with field-grown plants exposed to naturally-occurring downy mildew. In one experiment, downy mildew was very effectively controlled with programs with conventional fungicides applied weekly (98-100% control). The fungicides in the two programs were Quadris, Revus, Ranman, and Zorvec (only product included not yet registered for this use) or Ridomil and K-Phite. In contrast, the organic fungicide program evaluated was ineffective tested on a susceptible variety, Italian Large Leaf, and a moderately resistant variety, Eleonora. The program was MiiStop and Double Nickel applied in alternation with Regalia mixed with Double Nickel and Cueva followed by Trilogy. Applications for the organic program were made twice weekly on a preventive schedule. In another experiment, two new fungicides were evaluated used alone or in programs with Revus and Quadris. They were compared to Quadris alternated with Revus, the copper fungicide Cueva, and Ranman plus K-Phite alternated with Revus plus K-Phite. Only one of the programs was effective. Poor control in this experiment is at least partly due to the spray interval being extended to 13 days due to rain after downy mildew had started to develop. This documents the importance of maintaining a regular application schedule to manage this disease. In a fourth experiment, several biopesticides were evaluated in combination with Cueva applied every third application. The biopesticides were Double Nickel, Oso, Procidic, Sil-Matrix, Regalia, and an experimental. Applications were made weekly on a

preventive schedule until downy mildew was found, then twice weekly. None of the treatments were effective. Two experiments were conducted in 2015 to evaluate basil being developed with resistance to downy mildew. Experimental lines from Rutgers University exhibited excellent resistance and good horticultural characteristics (leaf size, shape and flavor). An experimental hybrid from Enza Zaden USA, Inc. also exhibited excellent resistance. Downy mildew was also suppressed, albeit numerically not as well, in two other experimentals from Enza, Eleonora, and two experimentals from PanAmerican Seed.

A seedling assay was conducted in 2015 to assess whether inadequate spray coverage was a potential explanation for poor control with biopesticides and organic fungicides. Most of these products lack the ability that many conventional fungicides have to move through leaf tissue to the underside where downy mildew develops. Seedlings in pots were dipped in fungicide solutions of the same concentration as was used to spray on plants in field experiments. The seedlings were allowed to dry in the greenhouse overnight, then put in the field next to the experiment plants for three days beginning on 23 Sep before returning to the greenhouse. When the assay seedlings were examined 8 days after they were put in the field, no symptoms were found on any plants treated with Sil-Matrix, Trilogy, Cueva, or the conventional standard fungicide, Revus. There were symptoms on only 1-3 out of 10 plants treated with MBI-110, Regalia, Procidic, and MilStop, 4 plants treated with Oso, while there were 6-8 affected plants for the nontreated control, Actinovate, and Double Nickel treatments. Among these treatments, severity on affected plants was lowest for MBI-110 and Regalia. No symptoms were found on plants treated with Sil-Matrix or Cueva at the second assessment 5 days later. In conclusion, inadequate spray coverage appears to be an explanation for poor control with some products.

Research results and reports are being posted at:  
<http://livegpath.cals.cornell.edu/research/basil-downy-mildew/>

For more information about downy mildew of basil plus photographs, go to:  
<http://vegetablemdonline.ppath.cornell.edu/NewsArticles/BasilDowny.html>

*Please Note: The specific directions on fungicide labels must be adhered to -- they supersede these recommendations, if there is a conflict. Before purchase, make sure product is registered in your state. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended.*