

Comparing the performance of early blight and Septoria leaf spot resistant materials in the presence and absence of fungicides

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The three principal foliar diseases of tomato in the eastern half of the US are late blight (LB) caused by *Phytophthora infestans*, early blight (EB), caused by *Alternaria tomatophila*, and Septoria leaf spot (SLS), caused by *Septoria lycopersici*. Resistance for late blight is conferred by the use of two genes, *Ph2* and *Ph3*, which when combined provide immunity to the current LB genotypes that include US22 and US23. The deployment of genetic resistance for EB and SLS which show strong tolerance or resistance, respectively, has been the focus of research during the past 3 seasons. Under our environmental conditions and with direct inoculation of plants (2008 and 2009) we demonstrated that in the case of EB, resistance should be homozygous to achieve best control and that this level of tolerance can be augmented with judicious use of a few fungicide sprays. In the case of SLS, it is less clear that resistance needs to be homozygous or in a heterozygous condition, but again the level of control can be enhanced with fungicide sprays. The epidemic of SLS once established has proven more difficult to contain with less sprays. In 2011 we repeated a similar field study, but with the inoculum for EB and SLS introduced by inoculating two spreader rows located on the outside of the four test rows containing varieties or lines either susceptible, homozygous resistant or heterozygous resistant.

Growers in recent years have become more cognizant of the need to select fungicides on basis of having a low environmental impact quotient (EIQ) profile. These values for individual fungicides are published annually in the Cornell Vegetable Guidelines to guide growers as to which fungicides are safer to the applicator, the environment, and to the consumer. Ways to drive down the EIQ values are through the selection of fungicides with inherently low EIQs (highly efficacious, low residues, and reduced application rates) and to apply fungicides following a forecast system called Tom-Cast. The fungicides selected for trial in 2011 included the conventional fungicide *chlorothalonil* (Bravo WS) and an organic treatment of *fixed copper* (Nu-Cop), both applied weekly, and sequential rotation of two reduce-risk fungicide combinations, *azoxystrobin* + *difenoconazole* (Quadris Top) and *fluopyram* + *pyrimethanil* (Luna Tranquility), applied following the Tom-Cast program using 18 or 25 DSV. Results of the 2011 season will be compared and contrasted with previous field studies.