

Evaluation of a forecast model for tomato powdery mildew in central California, 2006 - 2007

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A computer model for predicting when to apply fungicides was developed by Guzman-Plazola et al. and had previously been validated at ten locations in California in 1995 and 1996. In this project, the model was evaluated in commercial fields at ten locations in the San Joaquin Valley during 2006 and 2007. At each location, an automated weather station was placed within the field to record temperature, relative humidity and leaf wetness within the tomato canopy. These data were made available to the public via the UC IPM website. In replicated plots in each field, the fungicides myclobutanil (trade name Rally) and pyraclostrobin (trade name Cabrio) were rotated in applications timed according to a calendar schedule (14 to 21 day intervals), or according to the model recommendations. Control plots received no fungicide applications. At the end of the season, severity of powdery mildew was evaluated in each plot. In 2006, two locations had no powdery mildew, while at five other locations there was a range of disease pressure from low to high. In 2007, there was an epidemic of powdery mildew in the Central Valley and all three field locations had moderate to high disease pressure. Over the ten locations, the calendar treatment averaged four sprays per season, while the model treatment averaged 2.5 sprays. At six of the eight locations where powdery mildew appeared, the calendar and model treatments provided a similar level of control, whereas at the other two locations the calendar treatment provided better control. At selected locations, we deployed a second set of sensors or a second weather station from a different manufacturer. The data suggest that using the model can reduce the number of fungicide applications while maintaining a level of control similar to that of the standard calendar spray applications, but that the model output is very sensitive to differences in the weather data, such as microclimate differences between nearby fields, sensor placement (in-canopy versus above), and type of weather station.