Phytophthora model Weihenstephan control of late blight in Germany

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The late blight pathogen is still the cause of considerable harvest losses in many regions of the world. Results from field studies show that epidemis typically cause yield losses of between 40% and 70%, depending on varietal susceptibilty and enviromental conditions. If infection occur early in th season, the entire harvest can be lost.

Since the year 2000 the Phytophthora model Weihenstephan, a DSS for the integrated control of late blight is established in Germany. The model is based on two components: monitoring and prognosis.

The weather-based prognosis calculates the epidemic pressure on the basis of the weather data from more than 90 local weather stations. The monitoring system is based on actual disease observations in more than 250 monitoring fields.
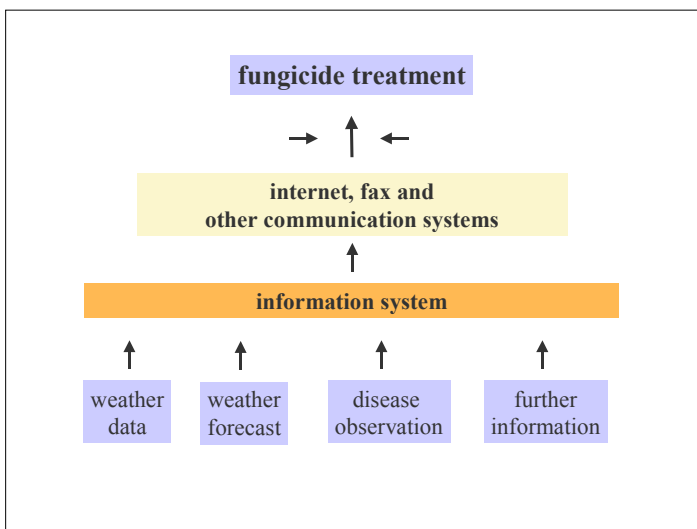

Figure 1: Scheme of the Phytophthora model Weihenstephan. The first step is to summarise the important data. By the use of modern communication systems (e.g. internet, fax, SMS) these data were send to the farmers and advisors.
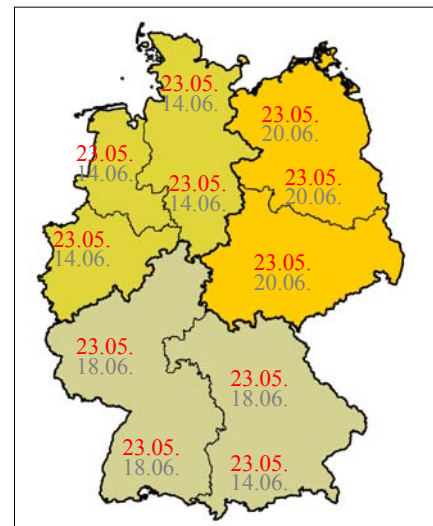

Figure 3: Recommended date of the first fungicide treatment (data 2000 to 2009; red: earliest date, black: latest date). The timing for the first treatment is mainly based on the regional soil moisture. In none of the years the model failed the first timing.
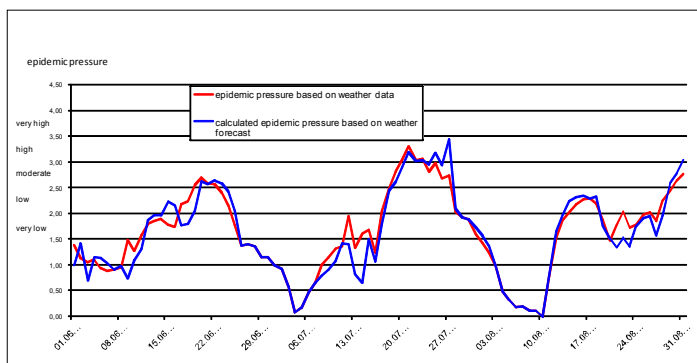

Figure 2: Comparison of the epidemic pressure based on weather data and forecast data. In most of the cases both lines are overlapping. The results show that it is useful to include forecast data in a late blight Decision Support System.
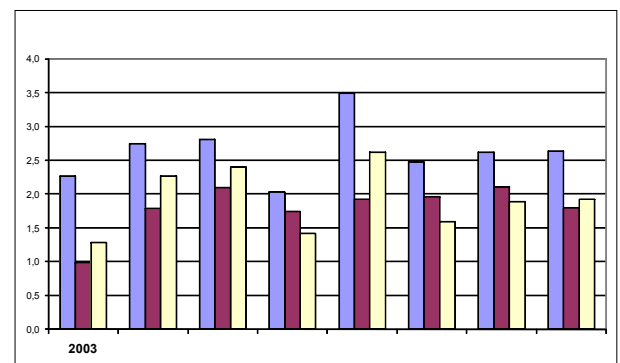

Figure 4: Comparison of the regional epidemic pressure of three different weather stations in Germany. The calculated epidemic pressure is highest at the weather station Lingen, Nord-West of Germany. There is a correlation between number of fungicide applications and epidemic pressure.