**Forecasts Based on Weather Conditions Favoring**

**Development of Secondary Inoculum**

In late blight of potato and tomato (caused by the

oomycete *Phytophthora infestans*), the initial inoculum

is usually low and generally too small to detect and

measure directly. Even with low initial inoculum, the initiation

and development of a late blight epidemic can be

predicted with reasonable accuracy if the moisture and

temperature conditions in the field remain within certain

ranges favorable to the fungus. When constant cool temperatures

between 10 and 24°C prevail and the relative

humidity remains over 75% for at least 48 hours or is

at least 90% for 10 hours each day for 8 days, infection

will take place and a late blight outbreak can be

expected from 2 to 3 weeks later. If, within that period

and afterward, several hours of rainfall, dew, or relative

humidity close to the saturation point occur, they will

serve to increase the disease and will foretell the likelihood

of a major late blight epidemic (Fig. 8-23).

Computerized predictive systems have been developed

for epidemics of late blight and several other diseases;

in some such systems, e.g., BLITECAST for late

blight (Fig. 8-20); FAST (for forecasting *Al. solani* on

tomatoes); TOMCAST (for tomato forecaster) for

tomato early blight, *Septoria* leaf spot, and anthracnose;

and PLAM for peanut leaf spot, moisture and temperature

are monitored continuously. From this information

weather severity values are calculated, infection and

disease severity values are predicted, and recommendations

are issued to growers as to when to begin spraying.

More recent refinements in late blight forecasting

include, in addition to data on moisture and temperature,

information on the level of resistance of the potato

variety to late blight and the effectiveness of the fungicide

used. Information on all these parameters is, of

course, very useful in the formulation of recommendations

for fungicide applications.

Several leaf spots, such as those caused by the fungi

*Cercospora* on peanuts and celery and *Exserohilum*

(*Helminthosporium*) *turcicum* on corn, can be predicted

by taking into account the number of spores trapped

daily, the temperature, and the duration of periods with

relative humidity near 100%. An infection period is

predicted if high (95–100%) relative humidity lasts for

more than 10 hours, and growers are then urged to

apply chemical sprays immediately.