DISEASE-WARNING SYSTEMS

In many states and countries, different types of warning

systems are in place for one or more important plant

diseases. The purpose of these systems is to warn

farmers of the impending onset of an infection period

or to inform them that an infection period has already

occurred so that they can take immediate appropriate

control measures to stop recent infections from developing

or prevent further infections from occurring.

In most cases, the warning system begins with a

grower, an extension agent, or a private consultant surveying

certain fields on a regular basis or when the

weather conditions are likely to favor maturation of the

primary inoculum or appearance of the particular

disease. When mature inoculum (such as ascospores in

apple scab) or traces of disease (e.g., in potato late

blight) are found, the county extension office is notified.

The county extension office in turn notifies the state

extension plant pathologist, who collates all reports

about the disease from around the state and by electronic

mail (e-mail), telephone, fax, or in writing

notifies all concerned county agents (pest alert). They,

in turn, by e-mail, radio, telephone, or letter, notify

all farmers in their county. For diseases of potential

regional or national epidemic consequences, the state

extension plant pathologist notifies the federal plant

disease survey office of the U.S. Department of Agriculture,

which in turn notifies all extension plant pathologists

in adjacent and other states that may be affected

by that plant disease.

Since the mid-1970s, computerized warning systems

have been in use for certain diseases in some states.

Some of them (such as BLITECAST) use centrally

located computers that process weather data either collected

on the farm by individual growers and transmitted

electronically or phoned in when certain weather

conditions prevail, or at certain intervals. The computer

then processes the data, determines whether an infection

period is imminent, likely to occur, or cannot occur, and

makes a recommendation to the grower as to whether

to spray and what materials to apply.

After 1980, small special-purpose computers have

been used that have field sensors and can be mounted

on a post in a farmer’s field. Such units (such as the apple

scab predictor) monitor and collect data in the field on

temperature, relative humidity, duration of leaf wetness,

and rainfall amounts, analyze the data automatically,

make predictions of disease occurrence and intensity,

and, on the spot, make recommendations for disease

control measures. The same unit can be used for any

disease for which a prediction program is available, in

which case either the unit can be reprogrammed or the

program circuit boards can be interchanged. Predictions

from such units are obtained by using a simplified keyboard

and display right in the field or the unit can be

linked to a personal computer if additional processing

of data is desired.