RISK ASSESSMENT OF PLANT

DISEASE EPIDEMICS

The risk of development of a plant disease into an epidemic

is the probability that a certain intensity of incidence

or severity of the disease will be reached. For

example, a possible risk of tomato early blight can be

estimated as 10% incidence with 85% probability.

However, the risk of plant disease can also be determined

as the probability, e.g., 90%, that the maximum

possible incidence of a disease being about 60%, will

not be reached. Numerous host, pathogen, and environmental

factors must be taken into account in assessing

the risk of development of a particular plant disease:

history of the disease in the field from previous years,

resistance of planted varieties, presence and amount of

primary inoculum, period of susceptibility of the host,

prevailing weather conditions (temperature, rainfall, relative

humidity) during periods of susceptibility, availability

and cost of effective control measures, and so on.

Since in most cases information on all of these parameters

remains fairly constant from year to year, one needs

to concentrate primarily on estimating as well as possible

the starting inoculum of the pathogen and, subsequently,

in following closely changes in temperature

and moisture, appearance of first signs of the disease

in the field, and predictions of weather changes in the

near future. When all the parameters, constant and

variable (temperature, rainfall, relative humidity), are

known, or estimated from the best data available, a

knowledgeable person can project with some certainty

the likely risk of the disease developing up to a certain

level of severity. Risk assessment is sometimes expressed

as percentages of obtaining certain values of disease

severity; more often, however, it is expressed as low,

moderate, or high risk of reaching those disease severity

values. Nevertheless, risk assessment provides a

timely warning to the grower who subsequently

responds with appropriate urgency in applying effective

and sufficient management measures.