

Plant Disease Growth and Transmission

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In general, a plant becomes diseased [1] when its normal structure, development, function, or other activities are disrupted by a causal agent that causes an abnormal physiological process. Interference with one or more of a plant's basic physiological or biochemical processes causes pathological symptoms or conditions. Plants may be afflicted by several disease-causing agents at the same time in nature. A plant that is dealing with nutrient deficiency or an imbalance of soil moisture and oxygen is more likely to become infected by a pathogen, and a plant that is dealing with nutrient deficiency or an imbalance of soil moisture and oxygen is more likely to become infected by a pathogen. The disease complex is made up of all disease-causing agents that damage a plant. For a disease to be recognized, knowledge of normal growth patterns, varietal characteristics, and normal variability of plants within a species—as these relate to the conditions under which the plants are growing—is required.

SAPROGENESIS AND PATHOGENESIS

These are two terms used to describe the process of a disease developing. The stage of disease pathogenesis [2] occurs when the pathogen is in close contact with living host tissue. There are three distinct phases involved

Inoculation: the pathogen is transferred to the infection court, or the region where the plant is invaded (the infection court may be the entire plant surface, a number of wounds, or natural openings such as stomata [microscopic pores in leaf surfaces], hydathodes [stomata-like openings that secrete water], or lenticels [small openings in tree bark]).

Incubation: the interval between the pathogen's presence in the infection chamber and the onset of symptoms.

The onset of disease symptoms, as well as the establishment and dissemination of the pathogen, is referred to as infection.

In terms of their ability to infect, virulence is one of the most essential features of pathogenic species. A pathogen's [3] ability to spread through and kill tissue is influenced by a variety of factors. Toxins that kill cells, enzymes that damage cell walls and extracellular polysaccharides that obstruct fluid flow through the plant system are all examples of virulence factors

Not all pathogenic organisms are created equal in terms of virulence—that is, they do not contain the same quantities of substances that contribute to plant tissue invasion and destruction. Furthermore, not all virulence factors are active in any disease.

When a pathogen is no longer in critical contact with living host tissue, it enters saprogenesis, where it either continues to develop in dead host tissue or goes dormant. Some fungi develop their sexual fruiting bodies during this stage; for example, the apple scab (*Venturia inaequalis*) produces perithecia, flask-shaped spore-producing structures, in fallen apple leaves.

A disease is said to have become epidemic [4] (meaning "on or among people") when the number of people it affects significantly increases. Epiphytotic ("on plants") is a more precise term for plants, while epizootic ("on animals") is the equivalent term for animals. Enphytotic (endemic) diseases, on the other hand, occur at relatively constant levels in the same region each year and usually cause disease.

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