



## Recent Advances in Plant Diseases

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### ABOUT THE STUDY

Disease fungi take their energy from the plants on which they live. They are responsible for a great deal of damage and are characterized by wilting, scabs, moldy coatings, rusts, blotches and rotted tissue. Protect your plants from debilitating diseases by learning to recognize the symptoms and practice prevention. A wholistic approach includes first identifying the pathogen.

Then decide on a treatment method that is safe, effective and responsible. Plant disease is an impairment of the normal state of a plant that interrupts or modifies its vital functions. All species of plants, wild and cultivated alike are subject to disease. Although each species is susceptible to characteristic diseases, these are, in each case, relatively few in numbers. The occurrence and prevalence of plant diseases vary from season to season, depending on the presence of the pathogen, environmental conditions, and the crop varieties grown. Some plant varieties are particularly susceptible to disease outbreaks, while others are more resilient. Losses from crop diseases can have a significant impact on the economy, losing income for crop growers and distributors and raising consumer prices.

Signs of plant disease are physical evidence of the pathogen. For example, mushroom fruiting bodies are a sign of illness. If you look at powdery mildew on lilac leaves, you can actually see the parasitic fungus itself. Bacterial ulcers in the drupe cause Gummosis, a bacterial exudate that exudes from the ulcer. Cancer itself is a plant tissue and a symptom, but the thick liquid exudate is mainly composed of bacteria and is a sign of illness. The symptom of a plant disease is the visible effect of the disease on the plant. Symptoms

may include detectable changes in the color, shape, or function of plants that respond to pathogens. Leaf wilting is a typical symptom of verticillium wilt caused by fungal plant pathogens.

Most plant diseases, about 85%, are caused by fungi or fungal-like organisms. However, other serious illnesses in food and forage crops are caused by viral and bacterial organisms. Certain nematodes also cause plant diseases. Some plant diseases are “non-biological” or non-infectious and are classified as diseases that grow under suboptimal conditions with air pollution, malnutrition, or toxic damage. Plant diseases are caused by three major pathogenic microorganisms: fungi, bacteria and viruses. If a plant disease is suspected, careful observation of the plant’s appearance can adequately indicate the type of pathogen involved.

Plant diseases are a normal part of nature and are one of many ecological factors that help balance hundreds of thousands of living plants and animals. Plant cells contain special signaling pathways that enhance defense against insects, animals, and pathogens. One such example concerns a plant hormone called jasmonic acid. In the absence of harmful stimuli, jasmonic acid binds to a special protein called the JAZ protein, which regulates plant growth, pollen production, and other processes. However, in the presence of harmful stimuli, jasmonic acid alters its signaling pathways and instead shifts to controlling processes involved in enhancing plant defense. The genes that produce jasmonic acid and JAZ proteins represent potential targets for genetic engineering to produce plant varieties with improved disease resistance.

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