

Discover

COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES

PLANT PATHOLOGY

The department strives to be the premier source of discovery and application of knowledge related to plant-pathogen and plant-microbe interactions and the development of innovative approaches to plant disease control. Faculty are international leaders in fundamental and applied disease research for several crops, including grapevines and rice. The department is part of the national network for detection and diagnosis of threats to agricultural biosecurity.



IMPACT

- Improve crop quality, which reduces the need for harmful chemicals and helps ensure economic viability for the grapevine, tree fruit and nut, and nursery industries
- Introduce disease forecasting/risk assessment models for grapevine diseases, which allows growers to more accurately schedule sprays and reduce fungicide use

RESEARCH

Identification and understanding of plant pathogens and management of plant diseases they cause to develop sustainable strategies reducing disease impact.

Understanding variations in the genetic structure of plant and microbial populations, including biochemical, classical, and molecular approaches and the study of pathogen evolution.

Soil and rhizosphere microbiology includes the study of root diseases, the beneficial interactions between microbes and plant roots, and the impacts of farming on soil biology.

Research on the molecular mechanisms of plant-microbe interactions and applications to sustainable agriculture includes study of plant and microbial resistance and genetic modification to improve biological control agents and crop cultivars.

- Prevent spread of sudden oak death in natural ecosystems and pitch canker in pines through implementation of effective regulatory responses and management practices
- Develop disease-resistant cultivars of cereals and other crops
- Eliminate seed-borne pathogens in many vegetable crops
- Develop alternative disease management strategies that prevent crop failures
- Improve disease detection and management in rice and other crops by training and certifying industry scouts and regulatory staff
- Raise awareness and understanding of biotechnology in the plant sciences with educators across the U.S. and internationally

FUTURE PRIORITIES

The department envisions more emphasis on genetic analysis and biotechnology research to develop improved systems for detecting and managing plant diseases, and whole-system study of the biology and ecology of soil microbes, plant-microbe interactions, and plant pathogens in natural and urban systems. Increased public awareness concerning the beneficial role of biotechnology in agriculture is another high priority.



PHOTO PAGE 2: UC Davis plant pathologists are on the forefront of research to understand and manage threatening plant diseases caused by invasive pathogens and pests. These include *Phytophthora*

ramorum, a causal agent of sudden oak death (pictured above), and the Pierce's disease agent of grapevine, transmitted by the glassy-winged sharpshooter.



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