

Chemical-Free Technology May Help Control Crop Diseases

University of Arizona



Research on fungal plant diseases by scientists at the University of Arizona has led to a chemical-free technology that may soon help farmers control destructive crop diseases.

Mike Stanghellini, Ph.D., formerly a plant pathologist at the university's department of plant pathology, accidentally discovered the key to this process in 1995.

Stanghellini's work focused on trying to find the most efficient way to control zoosporic fungal pathogens — which attack everything from grapes to cucumbers to potatoes — using the only means then available: chemical fungicides.

“ During an experiment, he was perplexed when a routine check of pathogen-injected plant specimens showed that some had not died. Even odder, he saw that the nutrient solution was foaming extensively in the unit where the plants continued to thrive.

Working with Raina Miller, Ph.D., a microbiologist in the university's department of soil, water and environmental science, the pair isolated the bacterium *Pseudomonas aeruginosa*. They discovered that it was making a biosurfactant

— a kind of naturally occurring soap — that was protecting the plants.

Their research showed that rhamnolipids, a type of biosurfactant, destroyed the zoospores by slicing through their membranes and exploding them. The technology was patented by the university in 1998, and has been licensed to a company in the Midwest which hopes to have its product on the market soon. The rhamnolipid biosurfactants can be used in contact lens cleaning solutions, consumer cleaning products and to help remove heavy metals from soil and clean up sludge.

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