

# Electrolyzed water that kills plant diseases Dead in the water

*Pathologist creates electrolyzed water-and-salt solution that kills plant diseases*

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*A UGA scientist has found an environmentally friendly product nurserymen can use to kill plant diseases.  
What is it?  
Water.*

*But this fungus-killing water doesn't flow from just any faucet. It's electrolysed water created by a machine that combines water, electricity and a salt solution that enhances the water's properties.*

The water-and-salt solution flows through a machine called an electrolysed oxidising water unit. The result is two types of water: one very acidic and one highly alkaline.

"I've tried the acidic electrolysed water on everything from begonias to geraniums," says James Buck, a plant pathologist in the College of Agricultural and Environmental Sciences. "It's very safe for the plants. And it kills fungi in a matter of seconds."

Hundreds of species of ornamental plants are grown in nurseries across the Southeast. And nurserymen constantly fight to control diseases that reduce their plant yields.

"Typically, in just one year, 10 percent of the crop will be lost to plant diseases," Buck says.

To test the effectiveness of the electrolysed water, Buck selected two diseases to work with: powdery mildew and gray mold.

"In a greenhouse operation, you're going to have these two diseases," Buck says. "They're foliar fungi that attack the leaves and flowers of plants."

Buck applied the electrolysed water as a spray and found it killed fungi much faster than traditional fungicides.

"We're not trying to replace fungicides," he says. "But we are looking for alternatives and additional tools for growers to use. On top of its effectiveness, the electrolysed water is also environmentally friendly."

The water kills bacteria and fungi almost immediately, but it loses its properties over time.

"That's another reason it would be a popular choice," Buck says.

After his first round of successes, Buck expanded his tests to include 25 fungi. And each time the electrolysed water killed the fungus in "usually 10 to 30 seconds."

Over the next two years, he plans to broaden his research into electrolysed water's use as a contact fungicide. He'll do so with the help of a \$123,000 Pest Management Alternatives grant from the U.S. Department of Agriculture.

He plans to find out how much and how often the water should be sprayed, which ornamentals it works best on and how its cost compares to that of traditional fungicides. The research may lead to e-water replacing or reducing the use of chemical fungicides in commercial greenhouses.

"The electrolysed oxidizing water unit won't be an affordable option for mom-and-pop nurseries," he says. "But large nursery operators should find the cost well worth the benefit."

For the past four years, food scientists with the College of Agricultural and Environmental Sciences also have been using the electrolysed water--to kill

bacteria on food and sanitize surfaces and equipment used in food preparation. "We're focusing on finding safe, effective, economical and practical means of controlling food-borne pathogens as food moves from the farm, through post-harvest operations and onto the table at home," says Yen-Con Hung, a food scientist with the college.

"EO water has many applications," he says, "from non-thermal food washing and sanitization to water treatment and general household cleaning applications." Hung has tested electrolysed water's effectiveness for controlling food-borne pathogens on plastic kitchen cutting boards, fresh poultry and lettuce.

"This water drastically cuts down the levels of *Campylobacter* and salmonella on chicken carcasses," he says. "It would be a very effective addition to chicken processing plants."

He has found the water effective, too, at removing pathogens on foods like lettuce that can't be heated to kill bacteria.