

# Fogging, misting systems can protect ornamental foliage plants from cold, experts say

November 30 2010, by Tom Nordlie

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Florida winters are mild by human standards, but don't tell that to an aglaonema, sometimes called Chinese evergreen.

The Sunshine State produces two-thirds of the nation's ornamental foliage plants, many of them — such as aglaonema — tropical and subtropical species that suffer damage when the temperature drops below about 50 degrees Fahrenheit.

The annual wholesale value of ornamental foliage crops grown or sold in the U.S. is about \$400 million.

Florida growers often produce these plants in shade houses, walk-in structures covered by loosely woven fabric that lets in some sunlight. When cold snaps hit, growers usually rely on conventional heaters to warm the plants, but fuel is expensive.

Now, a three-year study by University of Florida researchers suggests it would be more cost-effective to heat shade houses with water, using devices called foggers and misters that emit clouds of tiny airborne droplets.

The results were published in the current issue of the journal *HortScience*.

“This seems to be a very efficient way to heat in subtropical climates (in shade houses and greenhouses),” said Bob Stamps, an environmental horticulture professor with UF’s Institute of Food and Agricultural Sciences. “The systems are so much less expensive than heaters and reduce fossil fuel consumption.”

Misters and foggers are widely available and commonly used to irrigate plants and reduce air temperature in hot weather, Stamps said. Mistlers emit water droplets averaging about 150 microns in diameter; droplets from foggers average 90 microns. A micron is one one-millionth of a meter.

Depending on the season, well water can accomplish either heating or cooling because it has the same temperature year-round, ranging from about 70 to 80 degrees Fahrenheit.

In chilly weather, the tiny droplets quickly radiate heat into the air, because they have a large amount of surface area relative to their overall volume.

The study involved two types of mistlers and two foggers in commercial nurseries during three winters. They kept shade houses warm enough to protect all but one genus of plant, from at least nine tested.

With water conservation a major issue in Florida, UF researchers are eager to find ways of minimizing the amount needed to protect crops.

One fogging system evaluated in the study used only about 750 gallons per acre per hour, compared with 5,000 gallons for one of the mistlers. Stamps said the research team would like to investigate whether the devices can protect plants when used intermittently, which could save more water.

So far, misters have gained modest popularity with Florida growers, mostly to warm potted foliage plants. Foggers are still little-used.

Stamps believes both technologies could protect food crops and cut-foliage crops, too. Researchers at UF's Mid-Florida Research and Education Center will test foggers and misters this winter with tomatoes and leatherleaf fern, a cut foliage popular in flower arrangements. Florida produces about 75 percent of the nation's cut-foliage crops.

One producer who's already convinced that misters and foggers are cost-effective is Wayne Lambert, an owner of Sunshine Foliage World, a nursery in Zolfo Springs.

The nursery began using misters when it opened in 1978 and now uses foggers in almost 60 acres of its shade houses, Lambert said.

One technical issue that hinders growers, he said, is that the nozzles used to produce droplets can become clogged with tiny particles of solid matter, reducing water flow.

Little research has been done on cold protection with foggers and misters, Stamps said. He hopes to determine ideal application rates to maintain temperatures, and explore the possibility of using surface water rather than ground water with the systems.

Provided by University of Florida

Citation: Fogging, misting systems can protect ornamental foliage plants from cold, experts say (2010, November 30) retrieved 26 April 2024 from <https://phys.org/news/2010-11-fogging-misting-ornamental-foliage-cold.html>

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