

Preparing for the Winter

No crystal ball for the weather

Within the last few years, one of the major challenges citrus and foliage growers in Volusia County have been experiencing is the protection of their crop from the bitter harsh winter freezes. In general, it seems as though frigid temperatures have been dipping lower and lower with more intensity into the Florida peninsula in the last several years. With the exceptions of the freezes in the teens of January 1981 and 1983ⁱ, overall our winters of central Florida are typically mild, with daytime high temperatures generally in the fifties and sixties and nighttime low temperatures in the forties and thirties. What we don't know is, "how bad the freezes will be this year, or if there will be a freeze at all?" In any event, a grower has to be prepared in case it happens. Winter freezes may be light (temperatures in the upper twenties), moderate (temperatures in the mid twenties), severe (temperatures in the low twenties), or disastrous (temperatures in the teens). As a grower, preparation is vital to protect their assets.

Recently, the main culprit behind the cold temperatures in December 2010 was the same one which caused the cold winter of 2009-2010 which was a strongly negative North Atlantic Oscillation (NAO) and Arctic Oscillation (AO).ⁱⁱ

For citrus, there have been numerous trials using water as a protectant. Over-tree sprinklers, fog, and microsprinklers are three methods.

Over-tree sprinklers: Should not be used, for the accumulation of added weight from ice on limbs can cause the tree limbs of large trees to break.

Fog: Light winds can blow the fog away from the grove and will be ineffective.

Microsprinklers: Are the most efficient and beneficial for winter freeze protection of the bud union and lower portion of young trees. On calm nights, microsprinklers have given partial protection to healthy and well-hardened trees down to 17°F.

Low volume under tree microsprinkler irrigation: Is an alternative method for partial frost protection and can be more affordable than other methods. Microsprinklers, or spray jets, are small, low volume irrigation sprinklers that discharge 5 to 50 gallons/hour. In citrus groves, the

most commonly used spray jets discharge from 5 to 25 gallons/hour and cover a diameter of 5 to 21 feet. Irrigation rates of 2,000 gallons/acre/hour or 33.3 gallons/acre/minute are recommended. This can be accomplished with one, 20 gallon/hour jet or two, 10 gallon/hour jets per tree in a grove with 100 trees/acre. If there are 200 trees per acre, then one, 10 gallon/hour jet is adequate. Rates below this level will provide some protection, but not as much as higher rates. Application rates of 3,000 gallons/acre/hour or more are more effective at lower temperatures.ⁱⁱⁱ

For fern, by watering plants to field capacity before cold events can help protect the plants by increasing heat absorption and storage.^{iv} Watering plants before a freeze can help protect plants. A well watered soil will absorb more solar radiation than dry soil and will reradiate heat during the night. This practice elevated minimum night temperatures in the canopy of citrus trees by as much as 2°F (1°C).^v

Prior to a freeze, a grower needs to maintain and test all engines, pumps, supply lines, solenoids, valves, and emitters for needed upgrades and repairs. Check and replace all worn and clogged emitters and adjust emitters to provide 100 percent coverage; also, have fuel ready to go when the time comes. A fast flushing of all lines with an acid based solution to kill any algae and remove contaminants may be needed on lines that are old. High fuel cost have made grove heating during freeze nights prohibitively expensive except for high value crops.

ADDITIONAL INFORMATION:

The NOAA website: <http://www.srh.noaa.gov/mlb/?n=mlbnino> illustrates the current prediction of the EL Nino-Southern Oscillation (ENSO) and its impact on Florida's winter prediction. Another website is the Florida Automated Weather Network (FAWN) at <http://fawn.ifas.ufl.edu/>. To review the past trend of temperatures the website <http://forecast.weather.gov/product.php?site=NWS&issuedby=SFB&product=CF6&format=CI&version=1&glossary=1> is an excellent tool.

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ⁱ The Florida State University, Florida Climate Center, Florida Winters, http://coaps.fsu.edu/climate_center/winter.shtml

ⁱⁱ Watts, Anthony, NOAA, December 30, 2010 , <http://wattsupwiththat.com/2010/12/30/noaa-on-miami-florida-coldest-december-on-record/>

ⁱⁱⁱ Parson, L.R. et.al. and Boman, B.N., University of Florida, Pub. HS931, Microsprinkler Irrigation for Cold Protection of Florida Citrus, <http://edis.ifas.ufl.edu/pdffiles/CH/CH18200.pdf>

^{iv} Stamps, Robert H. et.al. and Natarajan, Seenivasan et.al. and Parsons, Lawrence R. et.al. and Chen, Jianjun, University of Florida, pub. ENH1168, Cold Protection of Foliage Plants in Shadehouses and Greenhouses, <http://edis.ifas.ufl.edu/pdffiles/EP/EP42900.pdf>

^v Ingram, Dewayne L. et.al. and Yeager, Thomas H, University of Florida, pub. ENH1, Cold Protection of Ornamental Plants, <http://edis.ifas.ufl.edu/pdffiles/MG/MG02500.pdf>