



A Memorable Freeze

The long freeze (or freezes) of early January 2010 was one of the most memorable in recent history. Temperatures over most of the state for the first two weeks in January averaged 15°F to 20°F below normal. There were 11 consecutive nights with temperatures below 34°F in the Plant City area. This number of consecutive cold nights was nearly twice as many as had occurred in the past 79 years. Temperatures in Central Florida dropped as low as 18°F in some locations. The National Agricultural Statistics Service initially estimated this freeze would decrease the orange crop by 6 million boxes. The price of Valencia oranges increased noticeably after the freeze. However, by the end of the season in 2010, the orange crop declined by less than 2 million boxes from what had been estimated in December 2009.

Although this January freeze had a record number of cold nights and trees in colder locations were damaged, overall total fruit loss was relatively small compared to the freezes in the 1980s. Part of the reason for the relatively minor impact on total yield was that two weeks before the freeze started, night time minimum temperatures were relatively cool and rainfall was low. The cool dry weather helped harden off the trees and increased their ability to withstand later cold events.

Getting Water Wise

Growers of a number of crops including citrus, strawberries, and blueberries used irrigation water to protect their crops. This massive amount of pumping over so many consecutive nights lowered the groundwater level in the Dover and Plant City areas by nearly 60 feet. This long period of pumping resulted in the development of roughly 760 dry wells and 132 sinkholes in this area. This necessitated more than \$1.2

million in well repairs or replacements. In the past, most freezes have lasted two to four nights, and groundwater levels recovered rapidly. Because of the large number of complaints, the Southwest Florida Water Management District (SWFWMD) held several public meetings and developed a Draft Action Plan. Some of the goals of this plan are to 1) reduce the risk of sinkhole development and well problems, 2) protect existing investments to the greatest extent practical, and 3) use an incentive-based approach to reduce groundwater pumping during freeze events over a 10-year implementation period.

To meet these goals, SWFWMD is encouraging other methods of freeze protection like tailwater recovery systems. SWFWMD will fund up to 75% of the cost of such systems. Other cold protection methods that can be eligible for Facilitating Agricultural Resource Management Systems funding for strawberries include row covers, tunnels, or foam. While these methods provide some protection for strawberries, each method has some drawbacks. For example, foam has to be reapplied every freeze night, and there is seldom enough time to cover large acreages before freezing temperatures arrive.



Another Alternative

Wind machines may regain popularity for citrus and blueberries. Wind machines are commonly used to protect crops in the western U.S. In calm conditions, an inversion of warmer air above the cold air at ground level can sometimes develop. Wind machines mix the upper warmer air with the colder lower air and raise the temperature in the crop zone by a few degrees. The volume of air moved and area covered are related to propeller design and horsepower. Newer types of wind machines have become available in recent years, and they range from 15 to more than 150 horsepower. While these wind machines are only effective in radiation frost conditions and raise temperatures only slightly, they can be useful in borderline frost situations.

The duration of the January 2010 freeze is one for the recordbooks. Hopefully, we will not see such a long period of cold weather anytime soon. **FG**

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