



A typical grower weather station for use in the Florida Automated Weather Network cost-share program.

# Grower tools for water conservation

By Kelly T. Morgan

**W**eather-related information is essential to Florida's agricultural producers for making important decisions. Citrus growers, in particular, routinely monitor current weather conditions to make informed decisions regarding the use of water for irrigation scheduling and cold protection. The use of evapotranspiration estimates and real-time monitoring of air and wet-bulb temperatures is critical for irrigation

and cold protection. Since the mid-1990s, the Florida Automated Weather Network (FAWN), a program of the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS), has developed a variety of weather-related tools that can aid growers in making irrigation and cold-protection decisions. FAWN has proven very useful in helping growers save both water and dollars. IFAS estimates show use of FAWN tools save billions of gallons of water, generating savings of millions

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of dollars. However, some farms can be many miles from a FAWN site. Therefore, FAWN may not provide the level of specificity needed to ensure growers are operating their irrigation systems during optimal times.

Differences in measurements between a farm and the closest FAWN site can cause growers to over- or under-irrigate and operate their systems longer than is actually needed for frost protection, thus misusing large amounts of water and potentially leaching fertilizer.

Site-specific data from a network of grower-owned and maintained weather stations will maximize irrigation efficiency and substantially reduce the amount of water and fuel or electricity used. Data for the grower weather stations can be viewed from the FAWN website and used in FAWN tools. The Florida Department of Agriculture and Consumer Services (FDACS) and FAWN established a cooperative program two years ago to provide growers with temperature data from their sites. The cost-share program by FDACS, called My Florida Farm Weather, provides 75 percent of the purchase costs of weather stations connected to FAWN. Currently, the weather data from about 170 weather stations in the My Florida Farm Weather program can be accessed through the FAWN website (<http://fawn.ifas.ufl.edu/>).

## **IRRIGATION SCHEDULING WITH SMART PHONES**

Tree water use, or evapotranspiration (ET), to schedule irrigation is not a new concept. However, the use of ET for the irrigation scheduling process has not received widespread implementation due to calculations needed to convert it into an irrigation schedule. The availability of real-time and forecast weather data and the growing use of smart phone and tablet devices provide an opportunity to better connect data with users in an applicable format. New smart phone and tablet irrigation apps have been developed by a UF/IFAS team. The

apps are commodity specific for citrus, cotton, strawberry, vegetables and urban turf. These apps use real-time data and user input to generate an irrigation schedule in units of time. Apps also send notifications to users for scheduled irrigation events in a large number of irrigation blocks. Apps were developed for iPad, iPhone and Android devices and are available for free at app stores by searching “smartirrigation.” Typically, use of ET-based technologies average 30 percent to 40 percent water savings compared to a time-based schedule; actual water savings with these commodity-specific apps are currently being measured. Use of these smart irrigation apps are expected to reduce total volumes of water applied, resulting in water conservation and protection of water supplies from nutrient leaching while maintaining plant production.

## USE OF WEATHER STATION DATA TO REDUCE WATER USE FOR FREEZE PROTECTION

Real-time monitoring of air and wet-bulb temperatures is critical in cold protection. FAWN provides growers with a variety of weather-related tools that can aid them in making these decisions. The FAWN Cold Protection Toolkit assists growers in estimating minimum overnight temperatures, tracking of forecasts, estimating evaporative cooling potential and determining the temperature at which to shut down frost-protecting irrigation — all based on real-time weather data.

The use of temperatures at FAWN sites can approximate cold weather conditions at grower fields, but may not provide the level of specificity needed to ensure growers are operating their irrigation systems during optimal times for freeze protection. Therefore, growers rely on FAWN weather data and tools to plan for freeze protection, but tend to operate their systems longer than is actually needed, thus wasting large amounts of water. The site-specific data from grower-owned and maintained weather stations in

the FDACS My Florida Farm Weather program can be used in the FAWN Cold Protection Toolkit to maximize irrigation efficiency on cold nights and substantially reduce the amount of water used on freeze nights.

Cost-share opportunities to obtain weather data can improve grower water conservation while not reducing production. Use of smart phones and websites with site-specific weather data

can save growers money and conserve water. These best management practices will be expanded and enhanced in the near future to further improve fertilizer use and reduce the environmental impact of agriculture in Florida. 🍊

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