

WTFRC Quarterly Report Format

Project No.: TR-04-439
Project Title: Fruit surface temperature sensor
Project PI: Larry Schrader
Project Funding: \$26,600
Project Initiation Date: March 19, 2004
Quarterly report (4th)

OBJECTIVES:

1. Improve the FST sensor and reduce the total cost of the sensor to an effective least-cost marketable product and one that faithfully simulates real apples.
2. Determine efficacy of the FST sensors in commercial orchards to effectively control EC in reducing heat-induced stresses.
3. Study reliability and life of the sensors.

PROGRESS:

1. The FST sensor, as modified during 2nd and 3rd quarters, performed reliably in several settings.
2. A limited number of FST sensors were constructed for use with a transmitter and portable read-out device. These portable units can be moved easily from one orchard to another or within an orchard to study spatial differences in FST. The unit employs short-distance radiotelemetry (<100 feet), so a grower can keep the reader unit in his truck, and drive by to get a reading of FST.
3. Data were summarized and analyzed during this quarter. The most extensive data set was obtained from a commercial orchard near Brewster. Two new EC systems were installed with different control systems. Both were controlled by FST sensors on a "real time" basis. That is, the EC was activated when the FST sensor reached the upper temperature set point, and EC was terminated when the FST sensors were cooled to the lower temperature set point. The FST of real apples was monitored with thermocouples on data loggers, and compared favorably with the FST output of the FST sensors. Sunburn suppression in 'Gala' and 'Golden Delicious' was very effective under both EC systems. Fruit color development was enhanced markedly in 'Gala' apples protected by these EC systems. Fruit firmness after cold storage was higher in 'Golden Delicious' from the EC-protected plots. Pack-out data will be available soon.
4. FST sensors were installed at three Beta sites of the Ag Weather Network (near Zillah, Wenatchee, and Brewster) thanks to Fran Pierce and colleagues who developed the firmware for interfacing the FST sensor with the Network.

PLANS FOR NEXT QUARTER: See new proposal that has been submitted for 2005. We plan to construct, sell, install, and service 50 FST sensors for further Beta testing. We plan to construct and loan seven FST sensors for use with the Beta sites of the AWN (Pierce et al.). We plan to continue research & development of the FST sensors and EC control systems.