# HORTICULTURE
# FIELD DAY REPORT - 1998

**TEXAS A&M UNIVERSITY AGRICULTURAL**
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## A MICROPROCESSOR BASED DATA ACQUISITION SYSTEM FOR MODELING CANTALOUPE PHENOLOGY

J. T. Baker, D. I. Leskovar, and F. J. Dainello

**Background.** Texas cantaloupe producers have requested assistance in developing methodologies for predicting crop developmental stages and final harvest dates. In order to schedule labor for harvesting and arrange transportation of the fruit to market, cantaloupe producers must accurately predict harvest dates generally within a two to three day window, to be economically competitive. These predictions are generally based on prior experience with a particular cultivar in the number of days from seeding or transplanting to final harvest. These predictions based on chronological time often fail due to unseasonable weather. Our goal is to develop a simple simulation model that can be run with standard weather data to predict cantaloupe developmental stages and harvest dates.

**Research Findings.** A data acquisition system was developed and programmed to monitor the environment during a cantaloupe planting date experiment (Fig. 2). This system consists of a Campbell Scientific CR-10 data logger connected to two AM416 relay multiplexers (Fig. 3) in order to provide an additional 64 channels of analog inputs for measuring air, soil and plant temperatures as well as light levels (Fig. 1). Tagged mainstem cantaloupe vines (Fig. 4) are monitored for developmental stage three times weekly in six planting dates of three contrasting cantaloupe cultivars. These data will be used to derive crop developmental rate equations as a function of temperature and light. The model will be tested and validated against independent data sets currently being developed at the TAMU Agricultural Research and Extension Center at Uvalde by Dr. D. I. Leskovar.

**Application.** Use of this model will allow cantaloupe producers to accurately predict harvest date as well as provide a tool for managing crop growth stage dependent applications of fertilizer, pesticides and irrigation.

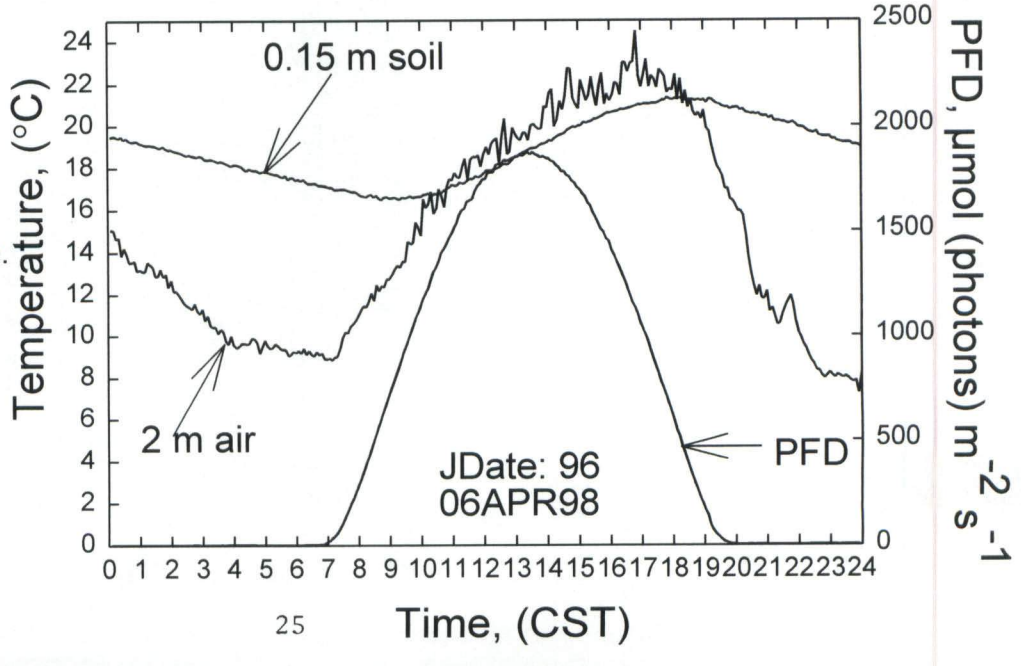


Fig.1. Temperatures and light (photon flux density, PFD) vs. time.

Fig. 2. Programable data acquisition system for monitoring soil, plant and air temperatures, light level and soil moisture content and tension.

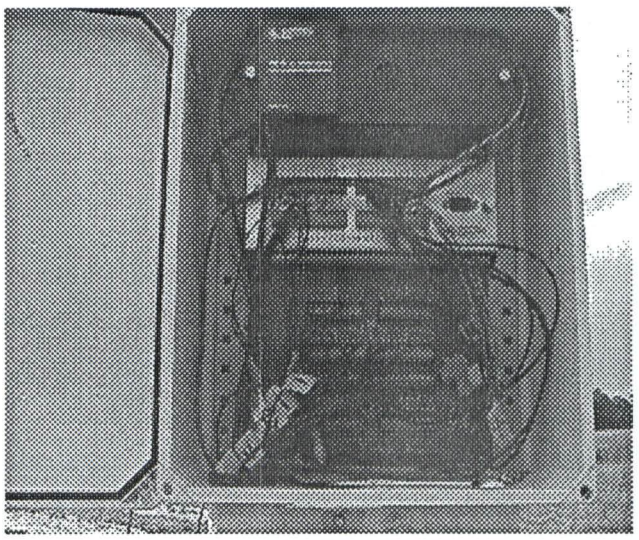

Fig. 3. CR-10 data logger and AM416 relay multiplexer.

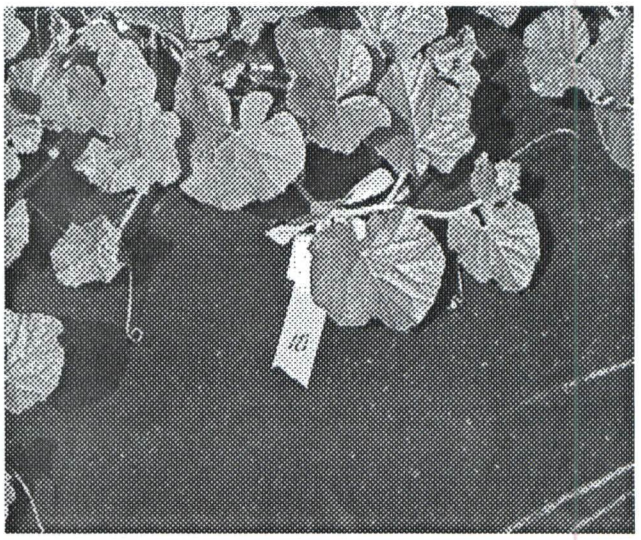

Fig. 4. Tagged cantaloupe vine used to monitor crop growth stage.