CARIBBEAN FOOD CROPS SOCIETY

37

Thirty Seventh Annual Meeting 2001

Trinidad and Tobago

Vol. XXXVII

Proceedings of the Caribbean Food Crops Society. 37:202-206. 2001

PUMPKIN RESPONSE TO FOUR EVAPOTRANSPIRATION REPLENISHMENT TREATMENTS

Julio Rossy, Department of Agronomy and Soils, College of Agricultural Sciences, University of Puerto Rico
***Elvin Román-Paoli**, Sonia Martínez-Garrastazú, and Carlos Almodóvar, Agricultural Experiment Station, University of Puerto Rico, HC-01 Box 11656, Lajas, Puerto Rico 00667-9714*

ABSTRACT: The response of pumpkin, *Cucurbita moschata* (Duchesne) Poir, to four evapotranspiration replenishment treatments (25, 50, 75, and 100%) was studied at Lajas and Juana Díaz experiment station of the University of Puerto Rico. Pumpkin was planted on 1 March and 17 March, 2000 at Lajas and Juana Díaz, respectively. The experiment was arranged on a split plot, where the whole plot consisted of the evapotranspiration replenishment treatments (ERT) and subplots of drymatter and leaf area determination. Theoretical potential evapotranspiration (ET_0) was estimated using the Pan A evaporation method. The average Kp values used were 0.63 and 0.66 for Juana Díaz and Lajas respectively. Pumpkin (var. Soler) average Kc value was 0.78. ERT did not affect significantly crop leaf area, drymatter, and yield at both locations. The lack of response to treatments was due to the high amount of off-season rainfall that occurred during the trial.

INTRODUCTION

Pumpkin is one of the most important vegetable crops in Puerto Rico. Although Soler is the most widely planted pumpkin selection, little information is available or published on its water requirements, growth and yield. The Pan A evaporation method was used to estimate pumpkin ET and replenish it through irrigation. The Pan A evaporation method is a simple and inexpensive method that provides a measurement of the integrated effect of radiation, wind, temperature, and humidity on the evaporation from an open surface (FAO, 1990). This method has been widely investigated, representing valuables contributions to agricultural production in the tropics. The data presented herein is an ongoing research project and its goal is to determine the effect of irrigation on pumpkin growth and phenology to increase crop yields, improve quality and reduce production cost in Puerto Rico.

MATERIALS AND METHODS

The ongoing research was continued during the 2000 season at the Lajas and Juana Díaz Experiment Substations, of the University of Puerto Rico. The experiments were established on 1 March and 17 March at Lajas and Juana Díaz, respectively. During the 2000 season just one pumpkin cultivar (*Cucurbita moschata*) was included in the trial (Soler). Whole plot consisted of four evapotranspiration replenishment treatments (25, 50, 75, and 100%). Whole plots consisting of two beds per plot were arranged in a randomized complete block design with four replications. Each plot was divided into five subplots. Subplots corresponded to sampling dates: 3, 5, 7, 9, and 15 weeks (close to harvest) after planting. Data acquisition, overall crop and experiment managements were done as described by Rossy et al. (2000).

RESULTS AND DISCUSSION

Data gathered during this trial was transformed using the log function because it did not meet ANOVA assumptions. The ANOVA showed that evapotranspiration replenishment treatments (ERT) did not affect significantly pumpkin leaf area, dry matter and yield at both locations.

Observed dry matter accumulation (Figure 1) for both locations was greater than drymatter reported in 1999 experiment (Rossy et al., 2000). The statistical analysis showed no significant differences among ERT for drymatter. Drymatter accumulation at Lajas was much higher than at Juana Díaz despite the ERT. Drymatter accumulated at harvest was taken at 114 and 128 days after planting for Juana Díaz and Lajas, respectively. Pumpkin leaf area development was similar for both locations (Figure 2). These results contrast with leaf area data taken during 1999 season. Leaf area tended to be linear during 1999 while 2000 data tended to be quadratic at Lajas. Leaf area reduced drastically, at harvest, due to a severe attack of *Diaphania hyalinata*. At Lajas, pumpkin growth during 2000 was greater than 1999. No evident differences were observed between years for Juana Díaz.
ERT did not affect pumpkin yield.

Yield registered at Lajas varied between 29,000 and 36,000 kg ha^{-1} (Figure 3). Soler yield obtained at Juana Díaz was way below the average registered for the zone. An off-season rainfall that occurred during the trial caused lack of response to ERT, reduced the irrigation applied. Although the data set obtained during the current year was important, no inference could be done to the irrigation needed, because of the above-mentioned factors.

REFERENCES

FAO, 1990. Crop evapotranspiration guidelines for computing crop water requirements. Irrigation and drainage paper no. 56.

Rossy, J., E. Román-Paoli, S. Martínez Garrastazú, and E. Rivera. 2000. Effect of controlled water regimes on pumpkin growth. Proceedings Caribbean Food Crop Society, 37 (in press).

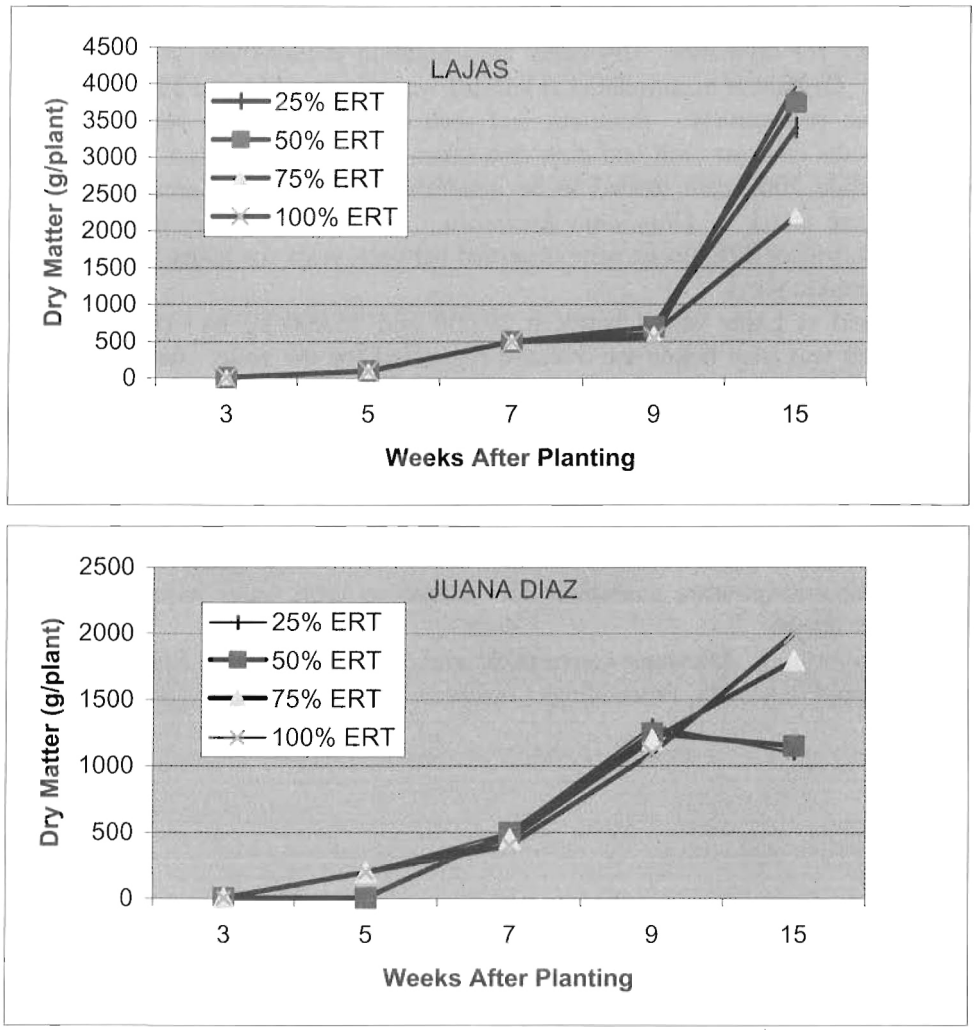
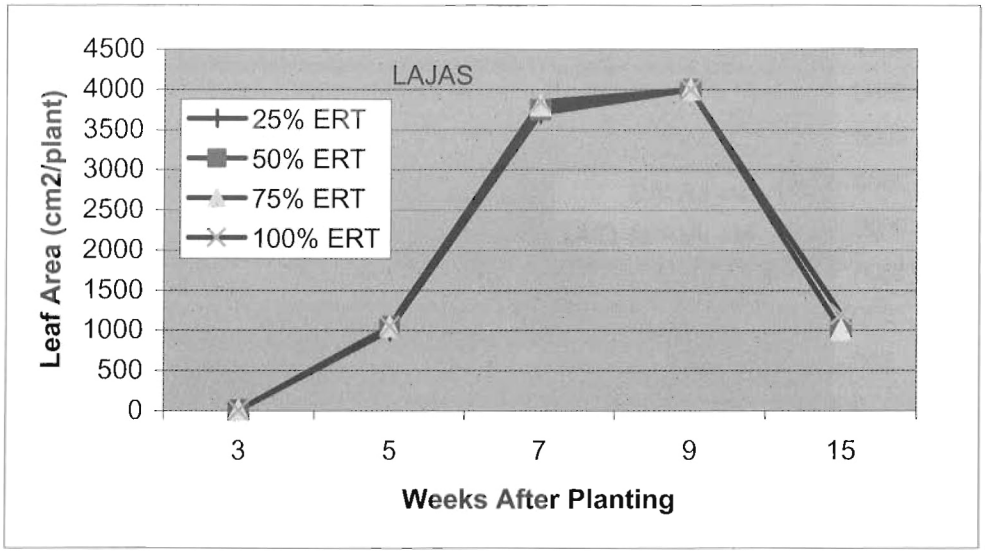


Figure 1. Pumpkin dry matter accumulation response to evapotrnspiration replenishment treatments (ERT) at Lajas and Juana Diaz, Puerto Rico.



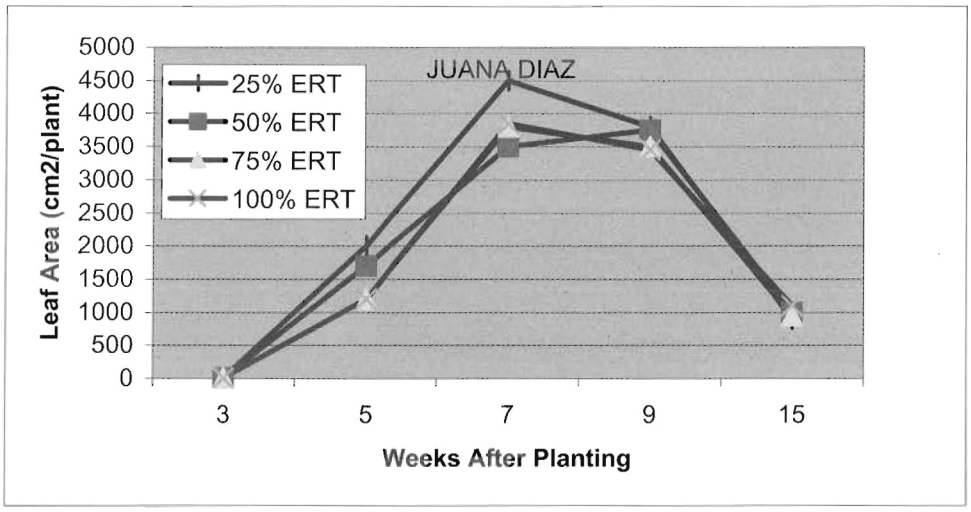


Figure 2. Pumpkin leaf area response to evapotranspiration replenishment treatments (ERT) at Lajas and Juana Diaz, Puerto Rico.

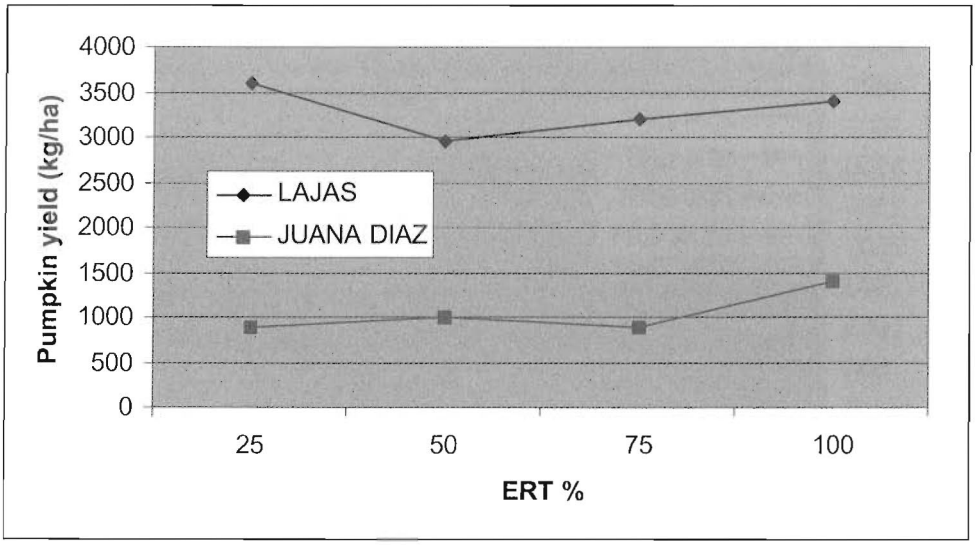


Figure 3. Pumpkin yield response to evapotranspiration replenishment treatments (ERT) at Lajas and Juana Diaz, Puerto Rico.