Proc. Fla. State Hort. Soc. 133:28. 2020.

—Scientific Note—

Artificial Chilling for Blackberry Production in Florida

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Additional index words. artificial cooling unit; blackberry yield, vernalization

The devastation of Florida's citrus injury caused by citrus greening disease (HLB) has created a need for alternative crops to replace citrus. Blackberry is a crop with some potential to fill this gap, given the experience commercial growers in Florida have with other berry crops. However, blackberry cultivars have variable chilling requirements for productive fruiting (Yazzetti and Clark, 2001). Florida currently has only a small amount of commercial blackberry production, mostly using Arkansas blackberry cultivars, which require more chilling than is available in most of Florida (Andersen and Crocker, 2013). The objectives of this study are to quantify the yield increases possible from additional chilling and to explore the viability of artificial cooling systems to provide needed chilling requirements for Florida blackberry production.

This experiment was a field trial continuation of a trial took place in 2019 at the University of Florida IFAS greenhouses in Gainesville, FL. Two blackberry cultivars commonly grown in Northern Florida, 'Natchez' and 'Ouachita', were used in the trial. Plants from each variety were split into four groups: one untreated control that remained outdoors over the winter, and three treated groups that were artificially chilled in an insulated refrigeration unit at 4 °C for either 250, 500, or 750 h. The treated plants received artificial lighting while in the cooling unit and were placed with the control plants after receiving the prescribed number of chilling hours. After all chilling treatments were applied, the potted plants were grown at a commercial organic blackberry farm near Hawthorne, FL. Fruit were counted and harvested regularly during ripening and yield was recorded.

The yield data from 2020 showed an increase in yield in 'Ouachita' from the control to the 500-hour treatment and a decrease in yield beyond 500 hours. 'Natchez' increased in yield with every increase in chilling hours, although yields of both varieties, and especially 'Ouachita' were lower than they had been in 2019. This is likely the result of significant plant mortality and stunting from cane blight, which affected plants from both varieties, but particularly 'Ouachita'. Despite these setbacks, the data show a similar trend to data from the 2019 trial. In both years 'Ouachita' had the highest yield at 500 chilling hours. In 2019 this was significantly higher than the control but not the 250- or 750-h treatments. 'Natchez' seemed to trend towards higher yields with each additional increment of chilling hours. While this research shows some promising trends, further studies are needed to get a consistent, statistically significant result. Furthermore, the viability of artificial cooling for commercial production is still very much in doubt, and further research should explore its viability and alternatives. Additional research on this topic should be expanded to search for other viable cultivars for Florida production, as well as breeding Florida-adapted cultivars.

Literature Cited

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