

## Water Deficit Management In Pecan Orchard

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### Abstract:

Pecan (*Carya illinoensis*) growers in Oklahoma experienced a severe drought condition coupled with high water demand during the summer season in which nut is in the water stage and kernel filling stage. The water stage in which the nut has liquid endosperm is the crucial stage determining the kernel's quality as liquid endosperm provides nutrients to the developing kernel. To manage the orchard in a limited supply of water is essential for growers. In Oklahoma, pecan irrigation is mainly determined by the grower's experience rather than scientific knowledge. This research evaluated a pecan orchard's irrigation schedule, which used traditional irrigation management in Perkins, OK. Two varieties (Pawnee and Kanza) were selected, and for a single variety, there are three treatments: full-irrigation (regular rate), half-irrigation (half of the regular rate), and no-irrigation. The stem water potential, nut quality, oil contents, and bud drop were evaluated among different irrigation treatments. Previous research indicated measuring water potential is a practical method to determine pecan's irrigation schedules. Our result showed in the Pawnee nut, the nuts of full-irrigation have a higher number of white skin (high quality) than other types of irrigation. Trees with no-irrigation treatment showed a poor yield than the trees of full- and half- irrigations. However, there were no significant differences in average kernel weight per nut among all the treatments. Our current research revealed that irrigation in summer facilitates nut quality and production, but since the yield of trees in half-irrigation did not decline, proper water reduction could be doable for some orchards.

Keywords: Pecan, Water Stage, Pressure Chamber