IRRIGATION EFFICIENCY AND WATER CONSERVATION: STANDARD SPRINKLER NOZZLES VS. HIGH EFFICIENCY NOZZLES

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Efficient irrigation systems not only conserve water but also contribute to water quality by reducing runoff and nutrient loading to water bodies. The advancement of irrigation technologies (e.g., sensors, controllers, sprinkler heads, nozzles, etc.) offers great opportunities to develop more efficient irrigation systems. The objective of this study was to compare standard nozzles to high efficiency (HE) sprinkler nozzles. The study was conducted at a UF/IFAS research facility, in Gainesville, Florida. The site consisted of 48 plots (12' x 12'), on a field covered with well-established Bermudagrass *cult. Bimini*.

Four traditional nozzle manufacturers were chosen for this study: Hunter, K-Rain, Rain Bird, and Toro. From each of these manufacturers, their standard nozzle was compared to their HE counterpart. The traditional nozzles (or non-HE) were tested at a "city pressure" of 60 psi. The HE nozzles were tested at both the city pressure and at their recommended pressure (or "optimized pressure"), which ranged between 20 and 40 psi depending on the HE nozzle model. Each of the 12 treatments was replicated four times, in a completely randomized design. All treatments were programmed to run for the same amount of time, which varied monthly according to UF/IFAS recommendations for the area. The experiment started on 15 July 2021 and ended on 17 October 2022.

The HE nozzles from brands A and B achieved water savings between 63 and 76%, while brands C and D saved between 12 and 59%, compared to their respective standard nozzles. Moreover, the water savings of HE nozzles from brands A and B were achieved without the need for additional pressure regulation. To achieve their maximum water potential savings, HE nozzles from brands C and D will require them to work at their recommended pressure.

PRESENTER BIO**:** Mr. Cárdenas is a research associate at UF with 20 years of experience in irrigation efficiency and water conservation. His research has contributed to creating standards for the Irrigation Association and the EPA WaterSense program. He has participated in different multidisciplinary and multi-state projects and published consistently in peer-reviewed journals.