Water content thresholds recommended for Gardenia jasminoides

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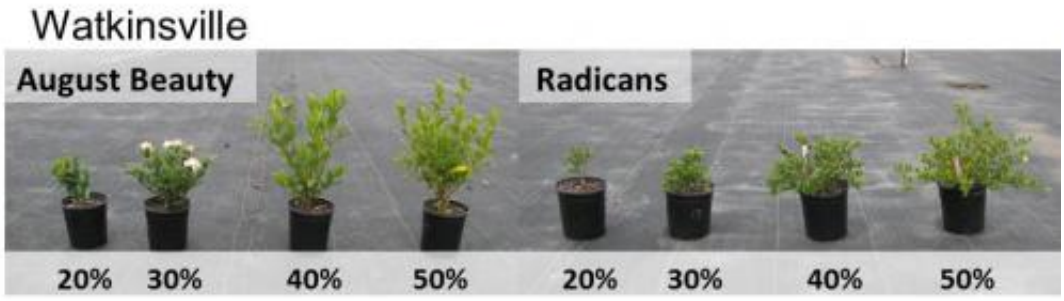

Cultivars 'Radicans' and 'August Beauty' were used in a study that showed that soil moisture sensor technology can be effective for controlling growth of the cultivars. Credit: Amanda Bayer

More efficient irrigation management has become a primary focus in sustainable container plant production as growers look for ways to improve resource use and mitigate negative environmental impacts of fertilizers and pesticides that are often found in nursery runoff. Among the new technologies for increasing irrigation efficiency is the use of soil moisture sensors for automated irrigation. The practice allows nursery personnel to schedule plant irrigation when substrate volumetric water content drops below a certain threshold, thus improving irrigation efficiency by applying water only when needed.

Amanda Bayer, John Ruter, and Marc W. van Iersel from the Department of Horticulture at the University of Georgia published a

research study in the *HortScience* in which they compared the growth of *Gardenia jasminoides* 'August Beauty' and 'Radicans' grown at various volumetric water control thresholds. Their experiments were designed to determine whether irrigation can be applied more efficiently without having a negative impact on plant quality. The study was done at both the University of Georgia Horticulture Farm in Watkinsville, Georgia and at the University of Georgia Tifton campus so the scientists could compare plant responses under different environmental conditions. Substrate water content, irrigation volume, and plant growth were analyzed at both locations.

"Our results showed that 'August Beauty' and 'Radicans' had similar growth responses to volumetric water control thresholds, indicating that the challenges in 'Radicans' production are not solely related to irrigation management," the authors said. "Height, width, shoot dry weight, root dry weight, and leaf size were reduced at the 0.20- and 0.30-$m^3 \cdot m^{-3}$ thresholds compared with the 0.40- and 0.50-$m^3 \cdot m^{-3}$ thresholds."

Results demonstrated that the 0.20-$m^3 \cdot m^{-3}$ threshold was insufficient for root establishment, leading to high mortality rates for both cultivars. "Poor growth at the lower thresholds shows the importance of root establishment using higher thresholds when using deficit irrigation," the authors explained. Little or no difference in growth was found between the 0.40- and 0.50-$m^3 \cdot m^{-3}$ water content thresholds for either cultivar. Irrigation was more efficient at the 0.40-$m^3 \cdot m^{-3}$ thresholds with little leaching observed.

"These results show that cultivars with different growth habits respond similarly to volumetric water content thresholds, and that alteration of volumetric water content can be used for growth control," the authors said.

More information: The complete study and abstract are available on