Container-grown conifers benefit from irrigation based on daily water use

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Competition for limited water resources is challenging producers of container-grown nursery plants to investigate alternative irrigation strategies. One water-conserving method available to nurseries is scheduling irrigation in response to plants' daily water use (DWU), a technique that has been shown to reduce water applications between 6% and 75% without negatively impacting the growth of ornamental shrubs.

In a study in the October 2015 issue of *HortScience*, scientists from Michigan State University said the runoff from nursery operations can also contain nitrate-nitrogen and phosphate-phosphorous, among other contaminants. They noted that previous research has shown decreased nutrient loading with DWU-based irrigation management systems. The scientists designed a study of four conifer varieties to determine the effects of four DWU-based irrigation treatments on plant performance and runoff water volume and quality.

Rooted cuttings of four conifers were given four irrigation treatments: a control irrigation of 0.75 acre-inch per day, irrigation applied to replace 100% daily water use, applications alternating 100% with 75% DWU in a 2-day cycle, and a 3-day application cycle replacing 100% DWU on the first day and 75% DWU on the second and third days. Irrigation volume, plant growth, runoff volume, and nitrate and phosphate concentrations for all treatments were analyzed.

Results showed that, compared with the control, irrigation applications (averaged over both years of the study) were reduced by 22%, 24%, and

28%, in the 100, 100-75, and 100-75-75 DWU treatments, respectively. Plant growth for the DWU based treatments was the same or greater than the control.

The 100% and 75% DWU irrigation applications reduced runoff NO_3^--N loading by 36% and 67%, and PO_4^{3-}-P loading by 38% and 57% when averaged over all measurement days.

"Not only do these outcomes translate to less eutrophication potential, but it could also save growers money in the form of fewer nutrient inputs and potentially lower energy costs for the pumping and distribution of water," the authors said.

More information: The complete study and abstract are available on the ASHS *HortScience* electronic journal web site: hortsci.ashspublications.org/c … /50/10/1553.abstract

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