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Nursery Production Technologies for Enhancing Water Quality Protection and Water Conservation

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ABSTRACT

The broad objectives of the project are to develop economically feasible production systems and management practices that promote water conservation and protect water quality while sustaining or improving crop quality, production, and profitability. Specific objectives include: improving water and nutrient use efficiency, capturing and recycling runoff, and remediating runoff containing excess nutrients and residual pesticides prior to offsite discharge. To achieve these objectives, the research team has engaged in research that addresses problems associated with (1) production inputs, (2) production systems, and (3) production outputs. Together, the project takes a whole-systems approach to environmental resource management. Growers can use multiple decision support tools to manage inputs, specifically a web-based simulation tool and crop models ensuring efficient use of nutrients and water while estimating runoff quantity and quality. As an example, runoff volume and quality can be calculated at the container level when growers take a systems approach to predict plant growth and water and nutrient requirements with the Container Crop Resource Optimization Program (CCROP). Growers can also change current management strategies to maximize nutrient and water use efficiency and minimize runoff for containerized nursery crops by using an automated, weight-based irrigation method along with substrate composition. Lastly, nursery runoff undergoes remediation for excess nutrients prior to offsite discharge or onsite containment for irrigation recycling using mixed constructed wetland systems, bacterial-based bioreactor systems for nitrate-nitrogen removal, and algae turf scrubber systems. To learn more, visit Clemson University (<http://tinyurl.com/sustainable-nursery>) or the Horticulture Research Institute (<http://tinyurl.com/ERMpdf>) websites to view papers that summarize this project.

Category: Agricultural BMPs

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