

## ***Carrie Lynn Whitcher***

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### **Nature of the Problem**

Pollution of surface water, particularly from phosphate accumulation in lakes, rivers, and coastal drainages, has generated national attention and valid concerns for a dwindling fresh water supply. Eutrophication has been linked to phosphate water contamination, a key factor leading to fertility restrictions in several states.

Phosphorus leaching in commercial horticulture is a problem with soilless media due to three factors. First, water-soluble fertilizers, continuous-liquid feed fertilizers, and controlled-release fertilizers are used in excess due to their success with intensively managed crops. Second, this overabundance of fertilizer adds excessive phosphorus (P) in leachate from top-watered irrigation systems. Third, soilless media have almost no ability to adsorb and retain P unlike mineral soils causing more P losses into the environment.

The use of zero-leach irrigation systems (subirrigation and hydroponics included) provide a method of retaining lower levels of water-soluble P in solution without compromising quality of the crop or releasing P in irrigation runoff. Peat moss is a primary component in today's potting media; therefore understanding the complexities of soluble-P in peat-based media and the conservation of P in zero-leach irrigation systems are the basis for this work.

### **Research Objectives**

To identify the optimum phosphorus rates for the growth of potted flowering crops in zero-leach irrigation systems.

To compare phosphorus rates and phosphorus balance for potted flowering crops in zero-leach systems and top watering irrigation systems.

To determine the fate of phosphorus, sorption/desorption rates, in soilless media.

### **Intended Career Path Statement**

Upon completion of the Ph.D. in horticulture from Texas A&M University, I will pursue a university faculty teaching/research position in horticulture where I can continue horticulture nutrition research and develop undergraduate horticulture courses for agriculture students. Our new ag teachers and future graduates need to be aware of the importance of nutrient conservation, composting practices, and best management practices of our groundwater sources. As a professional educator, it is important to link research to industry and to the home gardener to provide optimal plant nutrition information while minimizing nutrient pollutants into our groundwater sources.

Research is only as important as it is useful, and I am a strong believer of developing inservices and seminars to pass along new work and successes in research.