

Water and Nutrient Management in Nursery and Greenhouse Crops

Background

Commercial production of ornamental plants in greenhouses and nurseries is a very intensive agricultural cropping system, receiving the highest water and nutrient inputs. For example, nitrogen (N), the most heavily used fertilizer, is sometimes recommended for annual applications in excess of 4,000 lbs. per acre compared to 150-200 lbs. per acre typically applied to agronomic crops. Excess use of water and fertilizers is not only inefficient but also has environmental consequences, i.e., soil and ground water pollution. This project focuses on development of efficient fertilization and irrigation programs and practices that can sustain ornamental crop productivity and quality while maximizing the use efficiency of water and fertilizer resources and minimizing their environmental impact by reducing nutrient leaching and runoff losses.

Objectives and Approach

Nursery and greenhouse experiments in economically important greenhouse crops like cut flower roses, and nursery/landscape crops like crape myrtles, azaleas, and herbaceous perennials, are assessing actual water and fertilization requirements. The studies are normally carried out in containers (using soilless growing media) and hydroponic systems (water culture) that effectively allow for the control of environmental conditions and the measurement of actual water and nutrient uptake (absorption) and utilization by the plants. High-efficiency irrigation and fertilization delivery methods and management practices are also being evaluated and compared against conventional practices and methodologies.

Program Benefits

- The identification of actual water and nutrient requirements in ornamental crops will reduce production costs to growers and minimize losses to runoff and leaching, therefore minimizing environmental impacts.
- Selection of best management irrigation and fertilization practices that effectively enhance their use efficiency.
- Information on water and nutrient usage of a crop at discrete or specific developmental stages (phenology) and as a function of specific environmental conditions could be used to project volumes and amounts required to effectively produce a crop over a given period of time.

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