

Fertigation strategies improve production of *Hippeastrum*

August 30 2016

Recent studies have demonstrated that a priority for the floriculture industry is identifying environmentally friendly production strategies that result in marketable ornamental plants. The authors of a report in the June 2016 issue of *HortScience* say that implementing recommended nutrient management strategies in soilless culture production offers multiple benefits for growers.

The researchers said that "closed-loop systems" can optimize fertigation and reduce drainage [water](#) runoff from greenhouses. "Closed-loop systems are considered environmentally friendly because they significantly improve water use efficiency when compared with free-drain soilless systems," they noted. Despite these benefits, commercial applications of closed loop systems are limited in some Mediterranean regions because of high investment costs and difficulties related to nutrient solution management.

The researchers worked to determine best production practices for greenhouse production of *Hippeastrum* plants. "Potted *Hippeastrum* plants are a significant component of the Italian ornamental industry as a result of the high demand of this product on national and international markets," they explained.

The study design involved two nutrient management strategies—electrical conductivity (EC) or nitrate-nitrogen concentration control (N-NO_3^-)—used in a semiclosed, soilless system. The scientists analyzed effects of both of the methods on *Hippeastrum* [plant growth](#),

ornamental quality, plant-water relations, mineral composition, and water use efficiency. In the EC and the nitrate based strategies, the recirculating nutrient solution was flushed 10 and 5 times, respectively. Water loss and total water use in the EC-based strategy were significantly higher (261.1% and 61.5%, respectively) compared with the N-NO₃⁻-based strategy.

"There were no significant differences in terms of plant growth parameters, stomatal resistance, leaf water relations, and macronutrient composition in plant tissues between the two nutrient management strategies," the authors said.

Analyses revealed that the N-NO₃⁻-based strategy significantly minimized nitrate, phosphate, and potassium emissions to the environment. The effective water use efficiency of the system recorded in the N-NO₃⁻-based strategy was 55.9% higher when compared with the one recorded with the EC-based strategy.

"Our findings demonstrate that, by means of N-NO₃⁻-based strategy, it was possible to prolong the nutrient solution recirculation in a semiclosed cultivation of *Hippeastrum*, with the goal of limiting water drainage and minimizing nitrate emission in the environment, with no detrimental effect on plant growth and ornamental value," the authors said.

They recommended that the nitrate-based nutrient management strategy be adopted by floricultural growers because of its ability to produce profitable crops. They added that N-NO₃⁻ concentrations in nutrient solution can be easily and routinely measured using low-cost, efficient tests.

More information: The complete study and abstract are available on the ASHS *HortScience* electronic journal web site:

[hortsci.ashspublications.org/c ... nt/51/6/684.abstract](https://hortsci.ashspublications.org/content/51/6/684.abstract)

Provided by American Society for Horticultural Science

Citation: Fertigation strategies improve production of Hippeastrum (2016, August 30) retrieved 17 April 2024 from

<https://phys.org/news/2016-08-fertigation-strategies-production-hippeastrum.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.