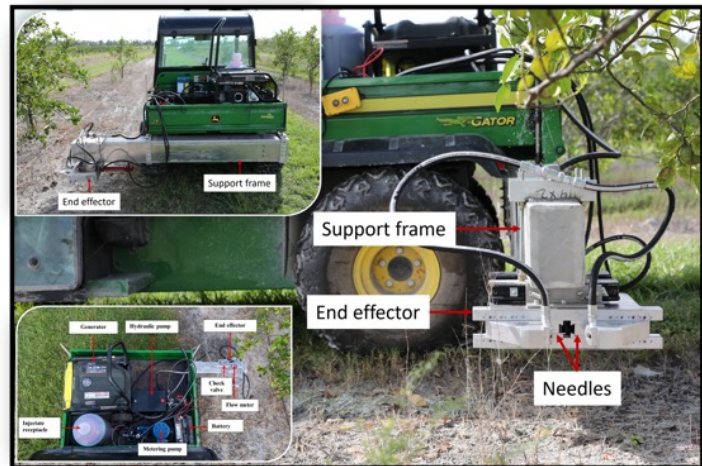


# Delivering Therapeutic Materials through Trunk to Treat Huanglongbing-affected Citrus Trees

**Researchers:** Ozgur Batuman, Yiannis Ampatzidis, Ute Albrecht, Fernando Alferez, Tara Wade, Nabil Killiny, Amit Levy, Veronica Ancona, Louise Ferguson

**Contact:** Ozgur Batuman, [obatuman@ufl.edu](mailto:obatuman@ufl.edu)

UF/IFAS SWFREC



## Take Home Message:

- An ADS is developed to inject therapeutics to citrus through the trunk.
- The improved ADS can grab and inject therapeutics from both sides of a mature citrus tree in a short time (approximately 8 ml /sec).
- The ADS must be tested extensively to assess its durability and reliability for use on a commercial scale.

**Effort Statement:** The major issues including leakage during injection are now eliminated and a new and more robust prototype of an automated delivery system (ADS) is developed.

**Summary:** Current devices for introducing liquid materials such

as oxytetracycline (OTC) to citrus through the trunk consist of relatively large-sized and single injectors combined with substantial pressure, which can cause considerable phytotoxicity and harm the tree. This project aims to develop an automated delivery system (ADS) consisting of multiple injectors to reduce injury and effectively deliver therapeutics to citrus vascular tissues through the trunk to improve plant health and performance. The prototype of an ADS developed at UF/IFAS SWFREC in Immokalee effectively grips and penetrates the trunk of mature citrus trees from two sides. The most current ADS does not cause noticeable damage, but longer-term effects must

be determined. We are now injecting different types of therapeutics, including various bactericides, nanoparticle metals, peptides, nucleic acids, agrochemicals, plant defense inducers, growth regulators, nutrients, and traceable dyes to understand their uptake, movement, and distribution in the plant. We will further modify the current ADS device to reduce or eliminate extensive shear and tear due to its repetitive use on mature trunks so that hundreds of trees can be treated without frequent needle replacement. Later, we can try the ADS in grower cooperators' groves throughout Florida's main citrus production regions.

## Funding:

 National Institute of Food and Agriculture  
U.S. DEPARTMENT OF AGRICULTURE