

# Rapid Diagnostics For TCAA Commercial Clientele

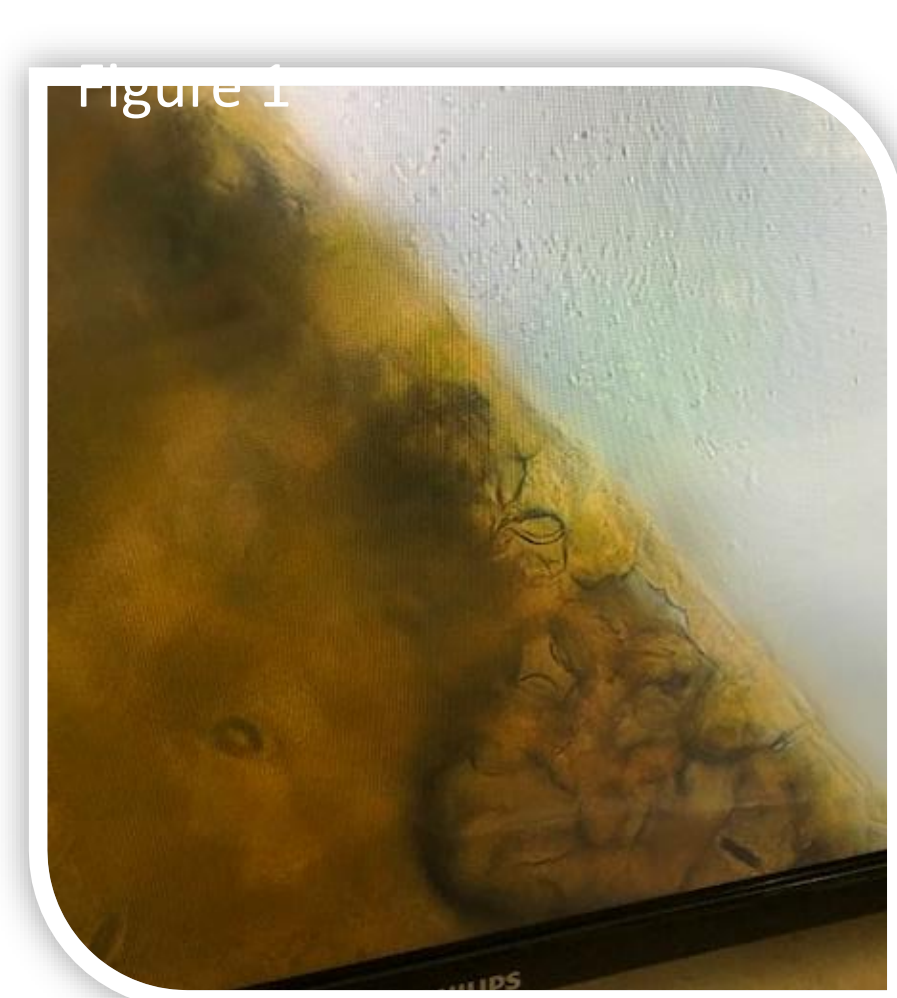
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## Background

In 2019, the Hastings Triage Laboratory was established at the Hastings Agricultural & Extension Center with support of the Tri-County Agricultural Area (St. Johns, Putnam and Flagler Counties, FL). St. Johns County and UF/IFAS provide financial support. The farmers were eager for rapid results in times of crop stress and were dissatisfied with the timeframe to receive a diagnosis from the main campus in Gainesville. The majority of farmland in Hastings is comprised of table-stock and chip potatoes, along with cabbage and sod. As of 1901, Hastings was identified as the “Potato Capital of Florida.” The agriculture agent was comfortable inheriting this lab due to her educational minor in plant pathology, and multiple years experience in a plant diagnostic lab.



## Objectives

- (1) Provide rapid diagnostics of abiotic versus biotic crop stressors;
- (2) Determine if diseases are caused by bacteria, fungi or viruses;
- (3) Provide management recommendations based on UF/IFAS research and peer-reviewed publications.

## Materials and Methods/ Educational Approach

This laboratory is centrally located within the core of the agricultural community of St. Johns County, and within 35 miles of the furthest farms in the TCAA. The services available include:

- Soil and water pH testing (Fig. 3), including electrical conductivity (EC) of irrigation water samples;
- Immunostrip kits (Fig. 4) for testing over 20 different viral strains, and 2 oomycete species;
- Culture of fungal pathogens on agar media plates; and
- Dissecting and compound microscopes (Fig. 5) that are paired with a camera and software for downloading images and recording videos.

These tools allow the agent to quickly determine crop injury from high salts, take high quality photos of fungal spores and hyphae (Fig. 2), confirm bacteria presence with streaming (Fig. 1), and verify specific viral strains such as Cucumber Mosaic Virus (CMV).

## Outcomes and Impacts

Since the establishment of this laboratory in February of 2019, 78 plant samples were submitted for diagnostics, and 30 soil/water samples were submitted for pH/EC results for a cost savings of \$3,420 in testing fees, when compared to other diagnostic lab fees. This laboratory has prevented the unnecessary application of pesticides, reduced water inputs, and identified fungal vs bacterial pathogens and provided recommendations using the Vegetable Production Handbook of Florida to over 1,250 acres of commercial fruit and vegetable production in the TCAA. Crops ranged in value of \$5,000 - \$15,000 per acre, including blueberries, brassicas (Fig. 6 & 7), green beans, potatoes and strawberries.



Figure 3

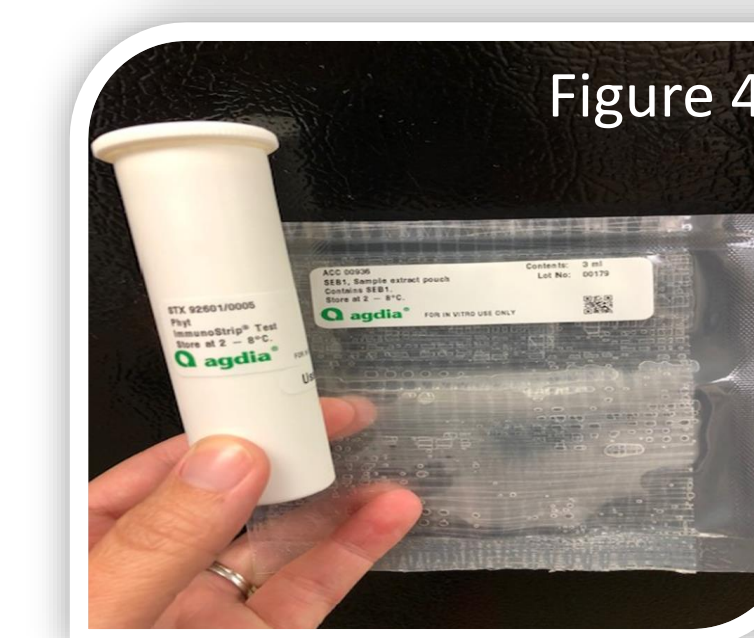


Figure 4



Figure 5

## Conclusions

Farmers have given positive feedback regarding the timeliness of the results, and the ability to share information remotely with specialists and other laboratories using technology. While the Hastings Triage Laboratory is capable of providing rapid diagnostics, there are still limitations as assistance from campus is occasionally needed for DNA level testing. However, this setup can easily be established in other extension offices and research sites with support from local growers, and an extension agent who is confident working with laboratory equipment and diagnostic experience.

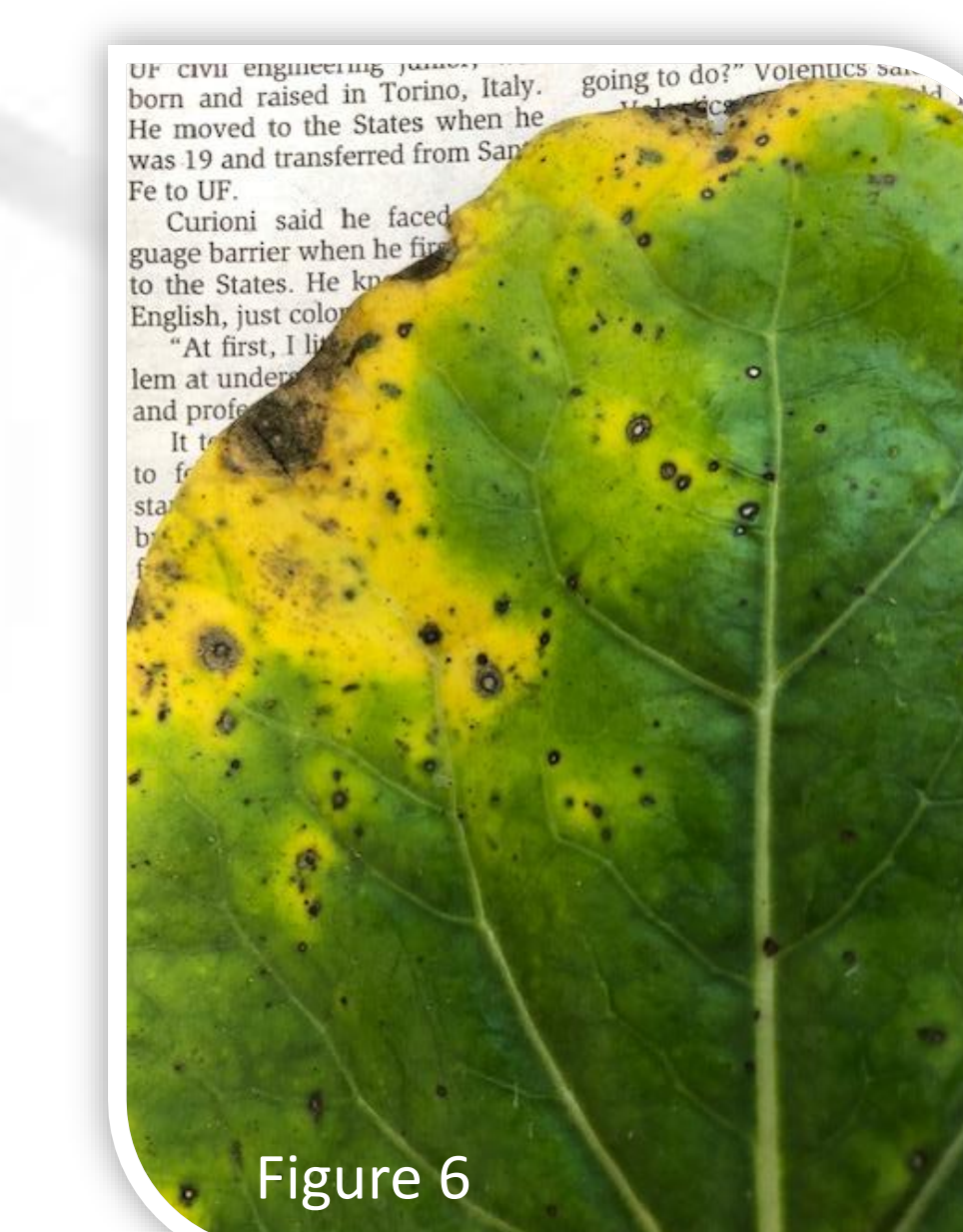


Figure 6



Figure 7