

# “With a little help from my friends”: Towards improved understanding of the structure and function of plant disease diagnostic information networks

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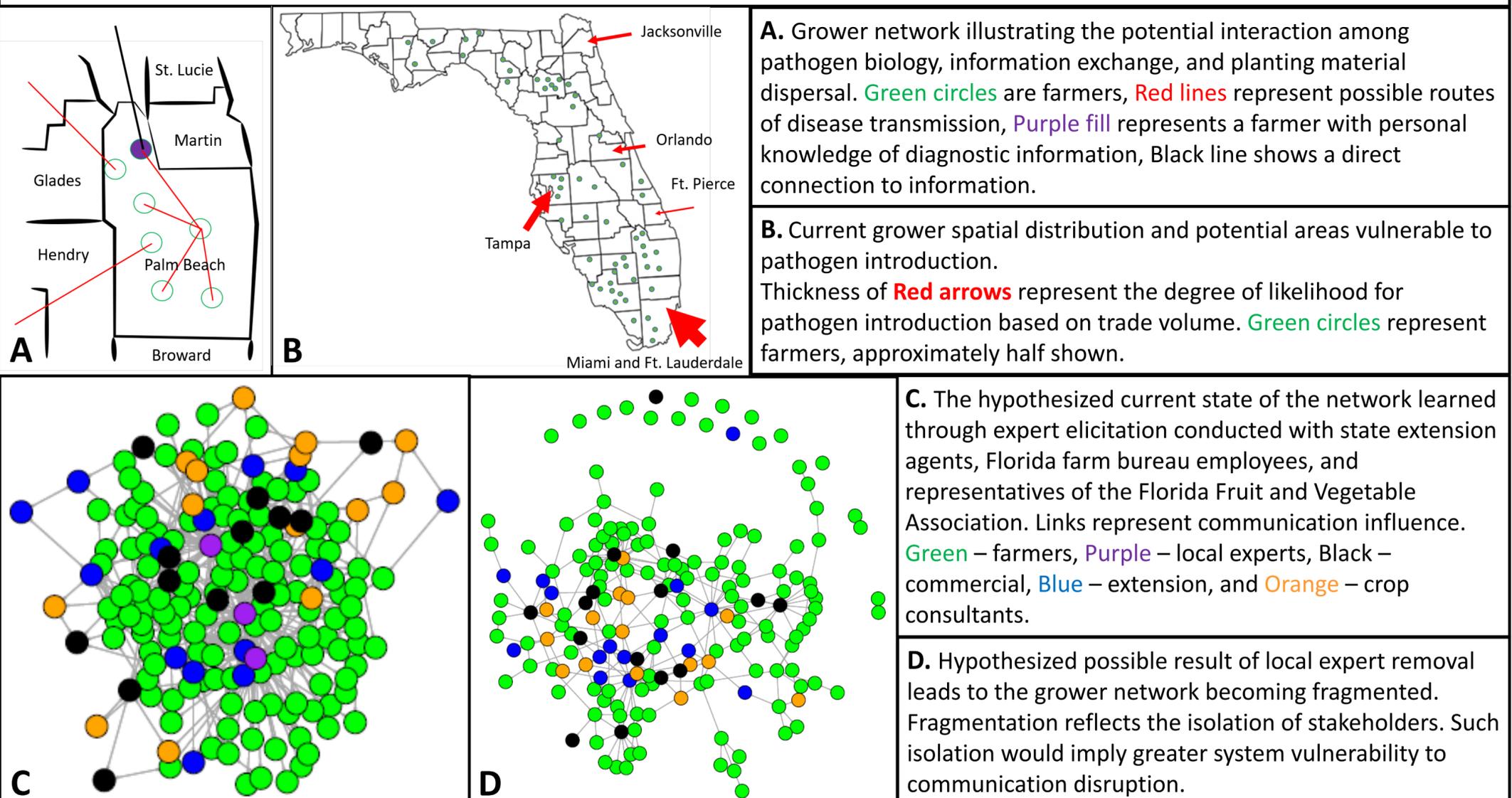
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## Background:

The need for early and accurate detection of introduced and endemic plant pathogens has led to the creation of international and domestic diagnostic networks. Globally, the Centre for Agricultural and Bioscience International's Plantwise Knowledge Bank has trained local extension officers and founded community plant diagnostic clinics where local farmers can learn from these officers. These efforts have become an important community resource. Domestically, the National Plant Diagnostic Network (NPDN), was established to support the coordination of diverse classes of stakeholders, such as growers, representatives of commercial interests, industry support personnel, and local, state, and federal regulatory officials. The resulting complexity and interdependent structure of diagnostic networks raises several questions. Specifically, what constitutes a “good” diagnostic network? What network qualities do efficient and resilient networks possess? And what qualities are important for participants to possess? Does the relative importance of these attributes vary between differing levels of economic development?

## Study Objectives:

To begin to address these questions, we are analyzing the Florida Plant Diagnostic Network (FPDN). Primary objectives of this research include characterizing grower information dissemination patterns pertaining to plant disease, and identifying spatial and/or temporal disease patterns in the state. These efforts will support scenario analyses of the system's response to introduced pathogens. Ultimately, our objective is to understand how regional and national plant diagnostic networks may be designed and deployed that ensure food security while preserving stakeholders' anonymity. Greater understanding of the performance of these networks can support decision-making by state and federal policy-makers.



## Preliminary results and hypothesized models:

Initial analysis of the network reveals a degree of susceptibility to fragmentation. Through the elimination of just a few key nodes, individuals become isolated, increasing the likelihood of pathogen establishment and dispersal prior to network recognition and response to this threat.

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