Title: Regional fungicide resistance testing service for *Botrytis spp* and *Colletotrichum spp* on small fruits

Progress Report

Grant Code: SRSFC Project: # 2021-E-05 (Category Service)

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Objectives: Provide fungicide resistance testing services to regional growers, extension specialists, and crop advisers

Justification and Description:
The University of Georgia Plant Pathology Department has established the Plant Molecular Diagnostic Laboratory (MDL) at the Tifton campus. This is a fee-based service lab, currently providing fungicide resistance testing support and routine advanced disease diagnosis to extension & research personnel, commercial growers & homeowners, for a wide range of plant pathogens. Fungicide resistance can lead to lost disease control, reduced yields, and unnecessary expense by applying products that no longer work. A limited number of fungicide classes are available to manage fungal pathogens, and this narrow fungicide pool increases the risk of disease control failure due to potential fungicide resistance development. For the proper management of fungal pathogens, we need to have early, rapid, and accurate testing methods to identify fungicide resistance in various fungi. Unfortunately, there is no other single location in the Southeast that can provide resistance testing for multiple fungal organisms and multiple fungicides. The overall goal of this proposed project was to provide fungicide resistant testing support to growers and crop advisers in the Southern States.

Procedures:

We have adapted the multi-well plate assay protocol from Dr. Guido Schnabel at Clemson University and transitioned their fungicide testing program to the molecular diagnostic laboratory at the University of Georgia.

Current Progress on fungicide testing service to growers and crop advisers

In 2021, a total of 510 suspected strawberry samples were received from growers or county agents or extension specialist from five southern states and tested against different fungicide classes including DMIs, QoIs, and SDHIs at the MDL as shown in figure 1.

Sl. no.	State	#Samples (set)
1	Alabama	330 (33 sets)
2	Georgia	80 (8 sets)
3	North Carolina	30 (3 sets)
4	South Carolina	50 (5 sets)
5	Virginia	20 (2 sets)
	Total	510 (51 sets)

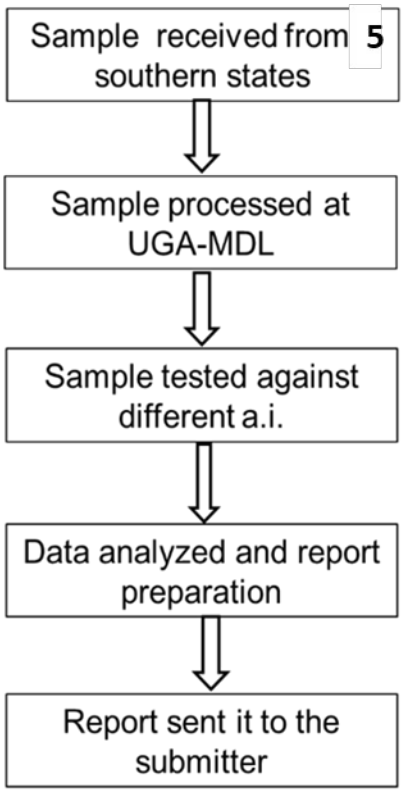

Figure 1: Sample collection map and layout for the fungicide resistant testing

The overall fungicide resistance frequencies results showed that the efficacy of QoI (pyraclostrobin) fungicide is decreasing for controlling both *Botrytis* and *Colletotrichum* spp. isolates (Figure 3). Topsin M (thiophanate methyl) is also showing weakness due to the increasing resistance phenotype against *Botrytis* spp.

Potential Impact

This service will be crucial to guide growers in the use of effective fungicides to reduce losses caused by fungicide resistance. Continuation of this testing service will provide management recommendations that will be valuable for small fruit growers in the southeastern U.S.