

The Development of an Armillaria Resistance Screen for Clonal Walnut Rootstock

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Project Summary/Abstract

Briefly describe the long-term objectives for achieving the stated goals of the project.

In order to effectively identify Armillaria-resistant walnut germplasm for use in development of resistant rootstocks for California nurseries and growers, we propose to first establish a reliable and rapid screening procedure that can be used in a greenhouse with young plants and will be predictive of field performance. Such a Screening procedure may have applicability with other fruit and nut crops.

Scope of Work

Describe the goals and specific objectives of the proposed project and summarize the expected outcomes. If applicable, describe the overall strategy, methodology, and analyses to be used. Include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate. Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the goals and objectives.

The goal of this project, which is an ongoing from a prior year Agreement, is to develop a screening assay for *A. mellea* resistance that can be performed rapidly under controlled conditions in a greenhouse or growth chamber using small clonal walnut rootstock plants. To reach this goal, the following objectives will be pursued during the project period from July 1, 2020 through June 30, 2021:

1. Identify more virulent and/or competitive strains of *Armillaria mellea*. Isolates available in the collection of Dr. Kendra Baumgartner will be screened including the one we are currently using (Yolo 308) and two other strains (SJ1 and CC7) that were used in the in vitro screening for walnut Armillaria resistance experiments (Baumgartner, et al). New strains may be isolated from diseased walnut roots by plating on selective medium (Worrall, 1991).
2. Develop procedures for reducing or suppressing the populations of microorganisms that exist on the soil root ball or roots of plantlets to be screened for resistance:
 - 2a. Minimize contamination of in vitro multiplied microshoots: Transplant in vitro multiplied microshoots into sodium hypochlorite surface sterilized containers and steam soil mix for rooting and growth in greenhouse fog chambers in which the containers never touch the bench surface.
 - 2b. Reduce or suppress microorganisms that exist on the soil root ball and roots of greenhouse grown liner sized walnut plantlets using fungicides and bactericides.