

# Pathogens identified in Australian almond orchards

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## Introduction

- Understanding the range of economically important diseases is important in maintaining quality and high yields of Australian almonds
- In 2018 and 2019 extensive sampling was carried out in >25 orchards across the almond growing regions.
- Many samples were collected and isolates of potentially pathogenic organisms obtained
- Trunk diseases, leaf spots and fruit rot symptoms were observed.
- Many diseases have overlapping symptoms which may be caused by different pathogens
- We are compiling a comprehensive reference collection of potential pathogens which will provide a resource for further research into pathogenicity and inform more accurate diagnosis and management of diseases in Australian almond orchards

## Method

- Fungal and bacterial cultures isolated from symptomatic tissue.
- Grown on PDA (fungi) or Kings B (bacteria)
- Colony morphology observed, and single spore/colony cultures created
- DNA extracted from clean cultures using either a Promega Wizard Genomic DNA purification kit or a Bioline Isolate II Plant DNA extraction kit
- DNA from all samples amplified by PCR using ITS4 and ITS1F primers (fungi) or 16S (bacteria) to place into a genus
- Species identification will be undertaken using multiple primers eg. translation elongation factor,  $\beta$  tubulin, or others as determined by the genus identification



\* The species listed are only those where an isolate was obtained, other fungi and bacteria may have produced observable symptoms or been present in the field, but have not yet been isolated and identified.