

How root traits of soft fruit help resist pest and pathogen attack



The James
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Background

This project hopes to identify morphological structures and biochemical characteristics that interfere with pest/pathogen movement, host recognition, feeding or reproduction on or in the plant. We aim to investigate 4 key traits (1) root architecture and morphology, (2) leaf trichomes, (3) cane/stem architecture and (4) plant habit to determine how variation in these traits contributes to resistance against pest and diseases in the soft fruit crops raspberry, blackcurrant and blueberry.

The soft fruit crops



The pests and diseases

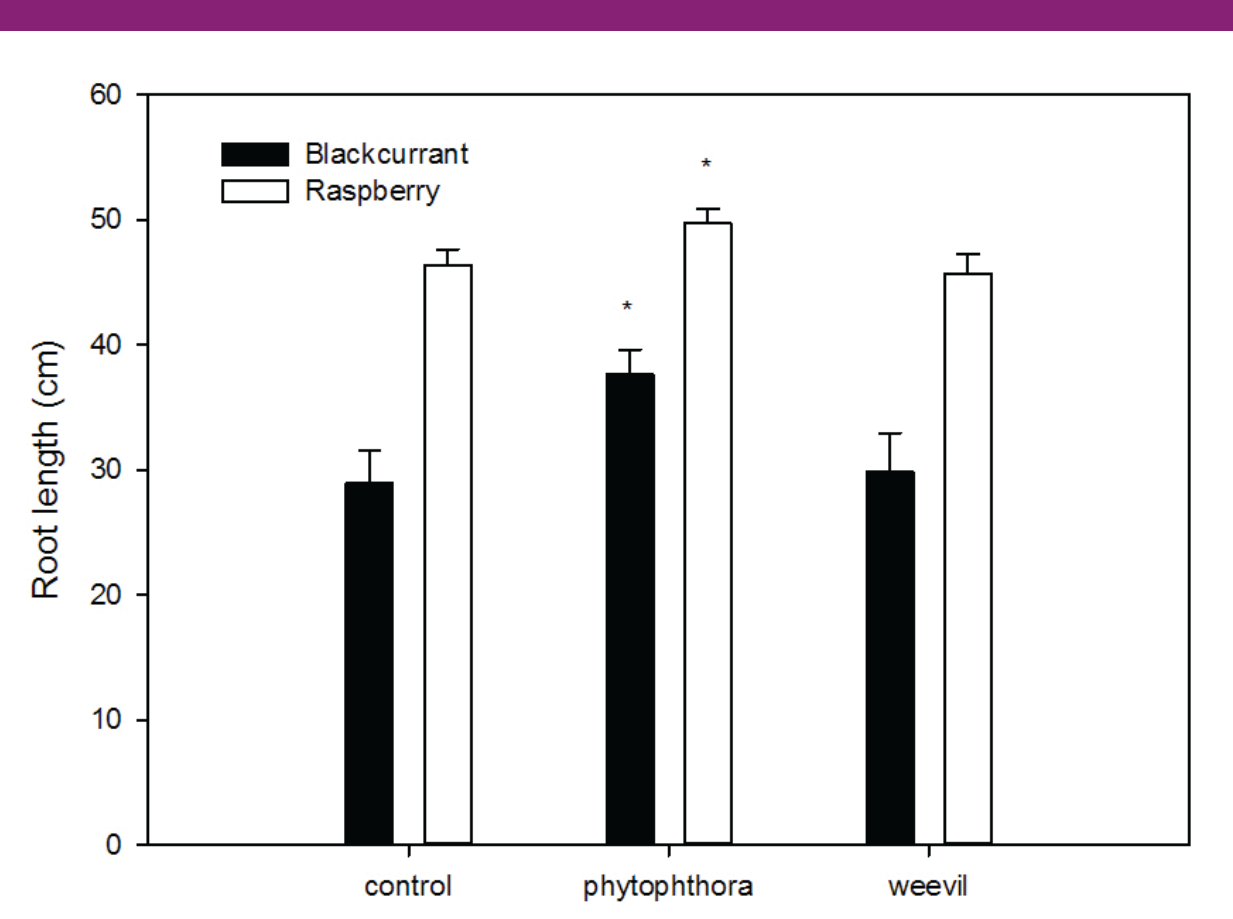
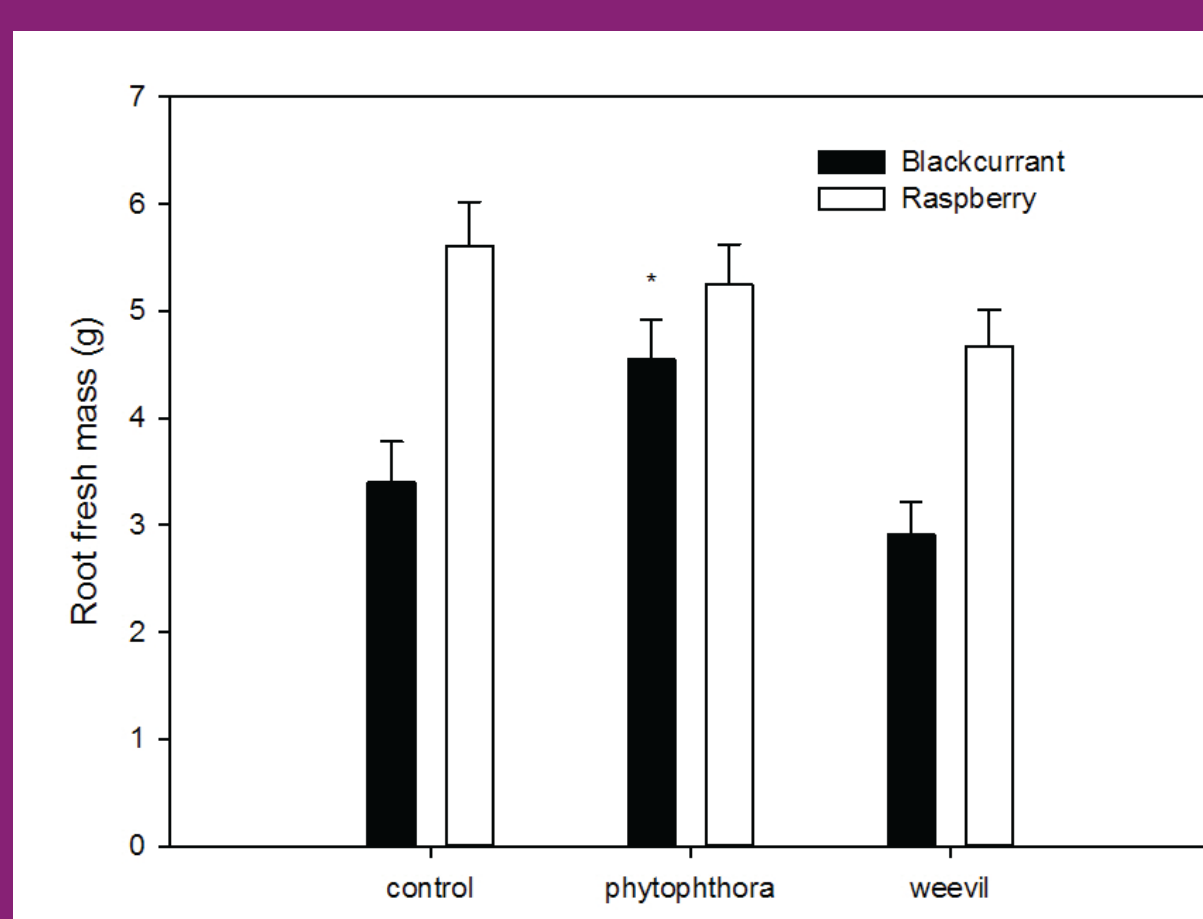


Results from the first year work which investigated root characteristics



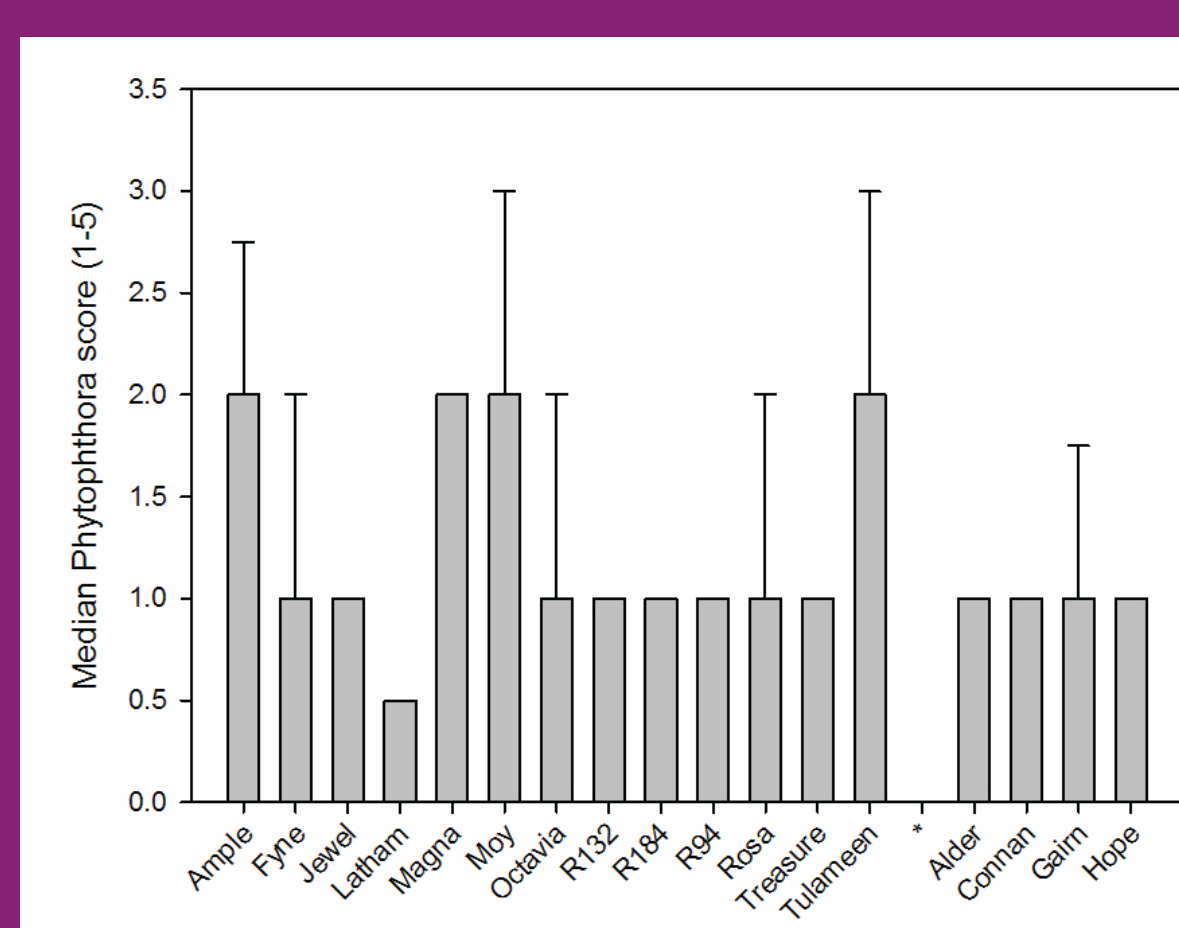
The experimental set-up

Thirteen raspberry varieties and 4 blackcurrant varieties were planted in rhizotubes and placed in a polytunnel for 5.5 weeks. There were three treatments (1) vine weevil larvae (2) phytophthora and (3) control.



Treatment effects on root

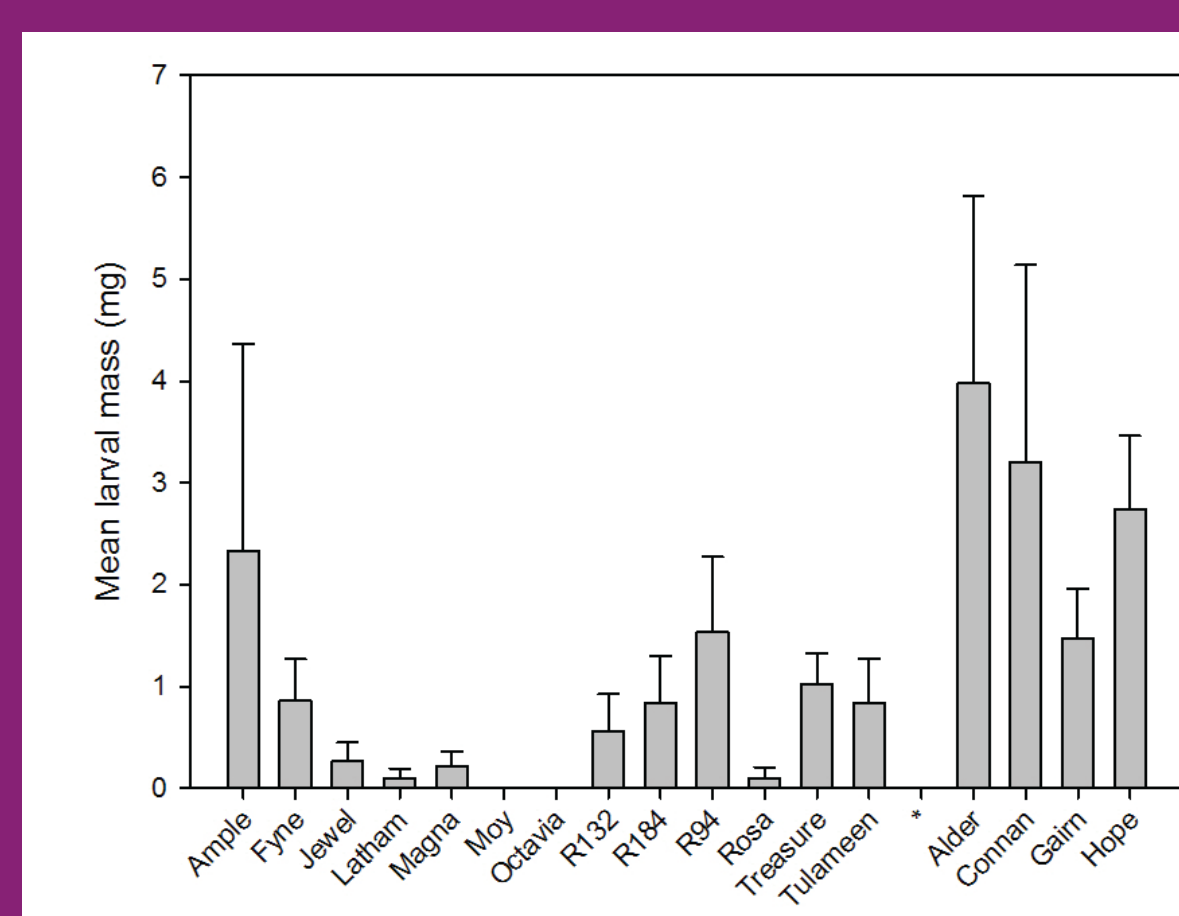
Root mass was increased by Phytophthora treatment in blackcurrant, but there was no effect in raspberry. Root length was increased by Phytophthora treatment in all plants. This indicates that blackcurrants maintain root mass:length, while raspberry roots exhibit smaller root mass:length.



Phytophthora score

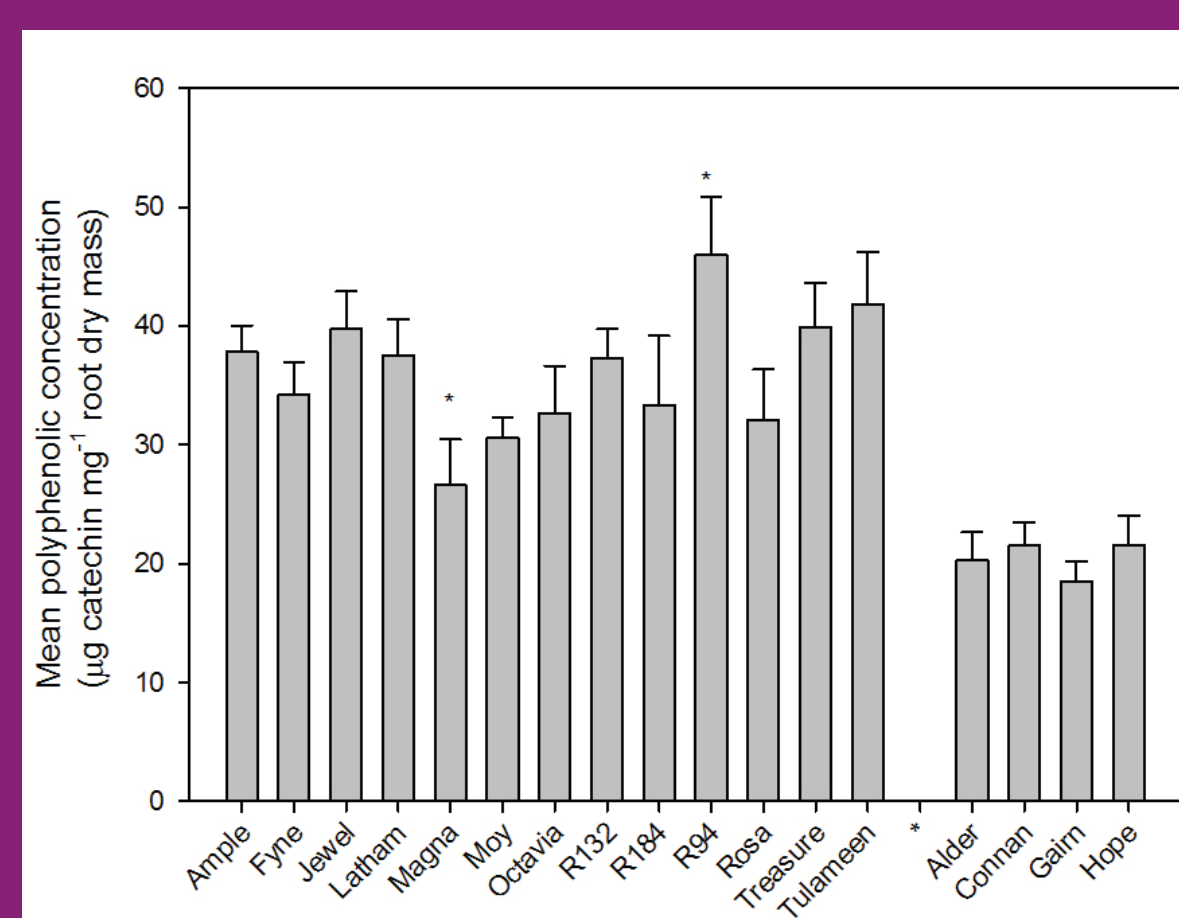
(0 = no damage; 4 = extensive damage)

There were no differences detected amongst blackcurrant varieties. There were differences observed between raspberry varieties: Ample, Magna, Moy and Tulameen were particularly susceptible.



Vine weevil larval mass

The mean larval mass differed between raspberry varieties so it is possible that variety may influence weevil performance.



Polyphenolic concentration

There were varietal differences in phenolic concentration detected in raspberry but not in blackcurrant.

In summary, the results from this year's experiments will be used to decide what varieties show interesting traits and should be used in the following years work.