

Susceptibility of Potentially Useful Cover Crop Species to Soil-borne Pathogens

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Introduction

Novel crops particularly leguminous species have the potential to play a major role in more diversified and sustainable food production systems, e.g. as cover crops. We assessed 62 accessions of various legume species for their susceptibility to difficult to manage root infecting pathogens.

Material and Methods

Susceptibility to *Fusarium avenaceum*, *F. oxysporum*, *F. solani*, *Peyronellaea pinodella* (syn. *Phoma medicaginis*) and *Didymella pinodes* was tested. Pea variety EFB 33 (resistant) and Santana (susceptible) were included as controls. Single plants were grown in 200 ml autoclaved sand, and inoculated at sowing with 2×10^4 spores g^{-1} substrate. Plants were harvested after 35 days and the level of damage on external and internal tissue was assessed on a 1-9 scale (Fig. 1).

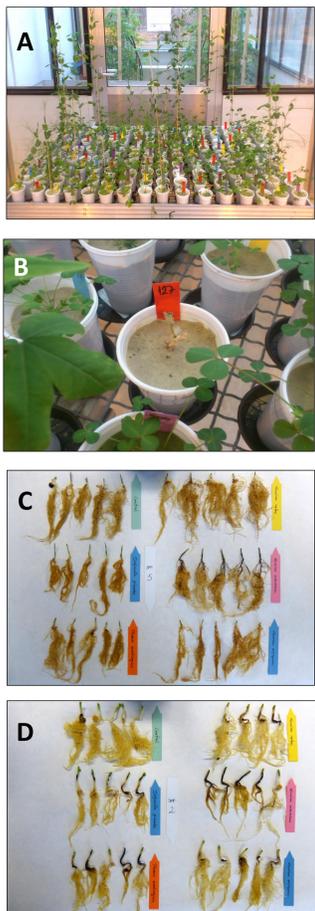


Figure 1. (A, B): *F. avenaceum* wilt (C, D): symptoms on roots after inoculation with tested pathogens

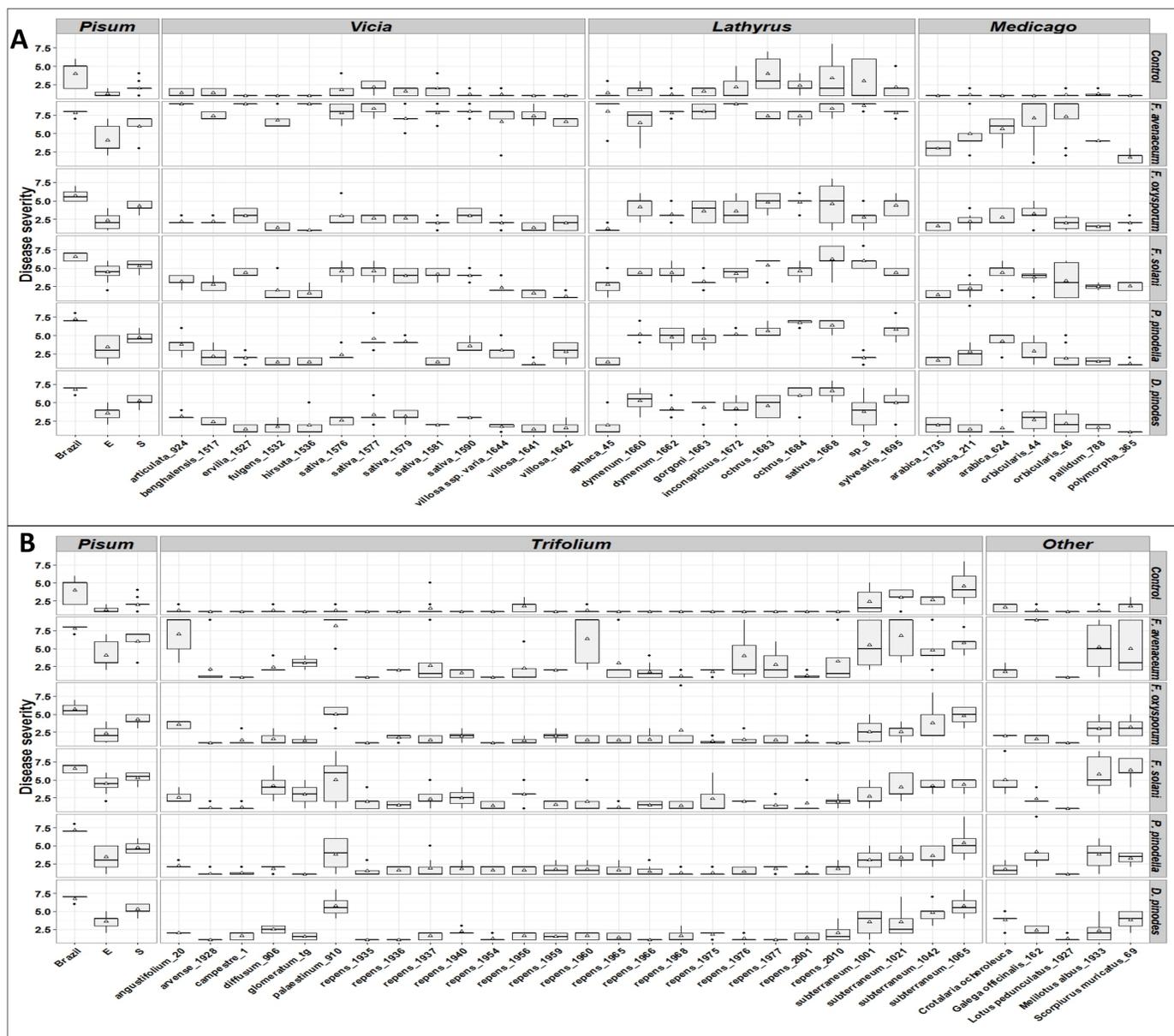


Figure 2. Disease severity (DS, 1 – healthy, 9 – dead plant) of 62 legume accessions inoculated with *Fusarium avenaceum*, *F. oxysporum*, *F. solani* and *Peyronellaea pinodella*, and *Didymella pinodes*. The resistant pea EFB 33 (E) and the susceptible pea Santana (S), were included as additional controls. Accession IDs are given as suffixes on x axis. The horizontal line in the boxplot shows the median value, the bottom and tops of the box the 25th and 75th percentiles and the vertical lines the minimum and maximum values, outliers as single points. Mean values of disease severity are marked with triangles.

Results and Discussion

- Almost all plant species and accessions tested were highly susceptible to *F. avenaceum*, with notable exceptions of *Crotalaria ochroleuca*, *Lotus pedunculatus* and a few *Trifolium* and *Medicago* accessions (Fig. 2).
- *P. pinodella* and *D. pinodes* most severely affected *Lathyrus* (Fig. 2A). *D. pinodes* has been reported as highly specialized pathogen of pea, however, these findings indicate that it has a much wider host range among legumes.
- *F. oxysporum* caused variable DS on some *Trifolium* species, otherwise, infections were low. *F. solani* caused overall higher DS, however, not exceeding DS of 5 with some variation among accessions (Fig. 2B).
- High level of host specificity within pathogenic strains of *F. oxysporum* and *F. solani* species complex stresses the importance of pathogenicity testing on various host plants.