

POPULATIONAL DYNAMICS OF *FUSARIUM SOLANI* F. SP. *PHASEOLI* IN SOIL AND DISEASE SEVERITY ON LEGUMES AND CEREALS

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INTRODUCTION

Fusarium solani f. sp. *phaseoli* (FSP) is among the most important soilborne pathogens in Brazil. Symptoms of Fusarium root rot are frequently observed on production areas of common bean in the State of Minas Gerais, Brazil. This fungus produces structures of resistance, named clamidospores, which are able to maintain the fungus in soil even in host absence. The objective of this study was to evaluate the populational dynamics of FSP in soil cultivated with legumes and cereals species, aiming to know their effects on fungus survival.

MATERIALS AND METHODS

From December 2006 to November 2007, two field trials were carried out in an area in Oratórios, State of Minas Gerais, previously cultivated with common bean, where plants with severe symptoms of Fusarium root rot had been observed. The following treatments were tested: 1. hand-weeding plot; 2. common bean (*Phaseolus vulgaris* cv. Pérola); 3. *Cajanus cajan*; 4. *Crotalaria juncea*; 5. *Canavalia ensiformis*; 6. *Zea mays*; 7. *Brachiaria decumbens*; and 8. *Pennisetum glaucum*. A randomized complete-block design with six replicates was used. Each plot had four 2 m-long rows, 0.5 m apart. Once a month, the populational dynamics of FSP was monitored in soil based in colonies forming units (CFU) grown in PCNB-peptone-agar (PPA) selective medium. Moreover, hypocotyls and roots of some legumes and cereals species commonly used as green manures and/or in no-tillage systems was also studied to determine the disease severity according to a 1 to 9 scale (Abawi and Pastor-Corrales, 1990). With these data, the index of McKinney (IM) was calculated according this equation:

$$IM(\%) = \frac{\sum (\text{score} \times \text{number of plants with this score})}{(\text{total number of plants} \times \text{greater score})} \times 100$$

RESULTS AND DISCUSSION

Owing to similar results of the trials, just results of one trial are showed. Successive cultivation of common bean in areas with FSP increased the fungus population in soil (Figure 1), because it was the most susceptible species to the fungus (Figure 2). Fusarium root rot was less severe on *C. cajan*, *C. juncea* and *C. ensiformis* than on common bean. Thus, CFU countings for green manure legumes were always lower during the trial. Keeping the soil weeding or cultivated with cereals (species not susceptible to the fungus) reduced the fungus population to almost zero. Our results also indicated that higher populational densities of FSP in soil and higher severity of disease coincided with periods of elevated temperatures from December to April (Figure 2).

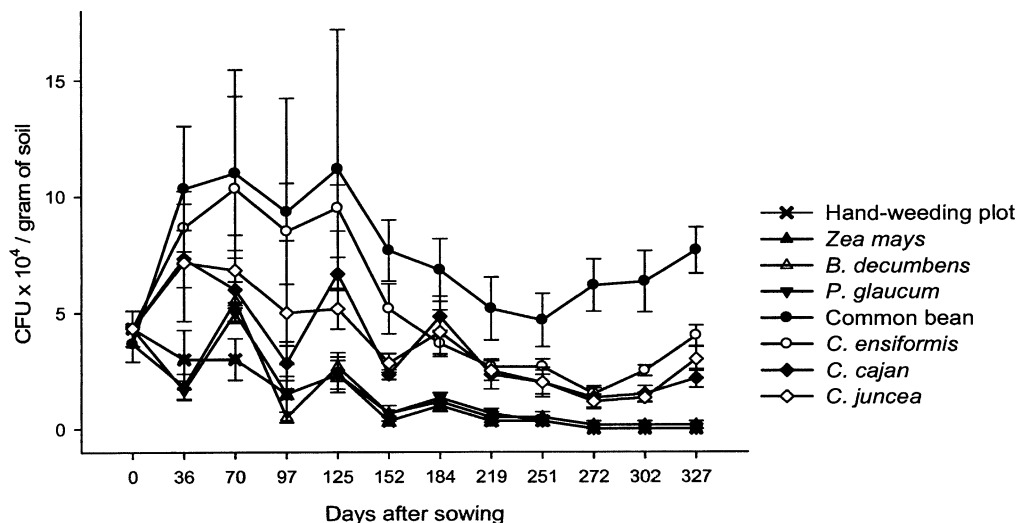


Figure 1. Populational dynamics of *Fusarium solani* f. sp. *phaseoli* (\pm SE) in soil cultivated with legumes and cereals species. Data expressed in CFU (colonies forming units).

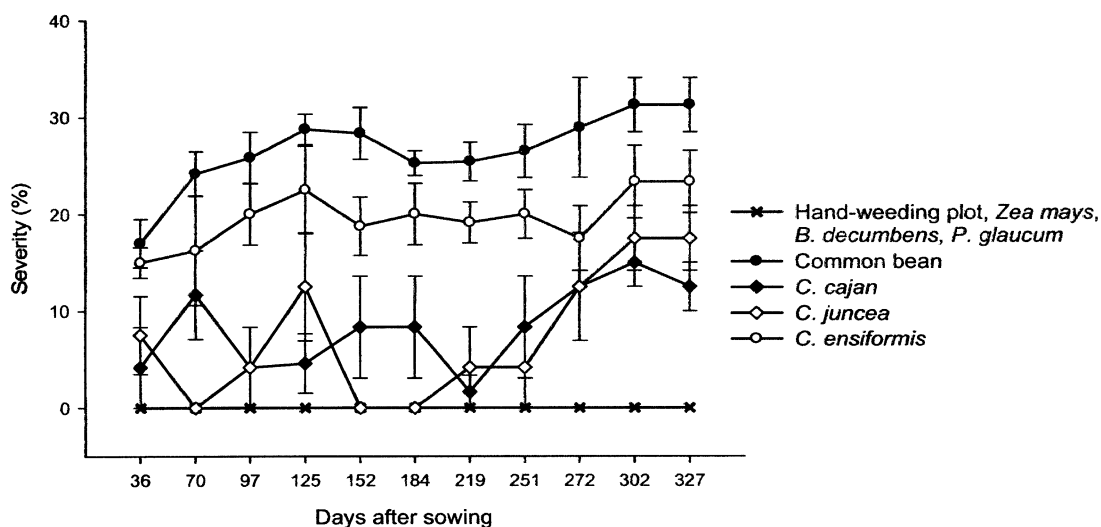


Figure 2. Evaluation of *Fusarium* root rot severity (\pm SE) based in a 1 to 9 scale in different legumes and cereals species.

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