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EFFECT OF COMPOST AGAINST SOIL-BORNE PLANT PATHOGENS AND ITS IMPACT ON RHIZOSPHERE MICROBIOTA

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Abstract

Compost microbiota and microbial activity play a key role in suppressing soil-borne plant pathogens, starting from rhizosphere, The objective of the present work was to summarize results achieved evaluating compost efficacy against soil-borne pathogens such as *Phytophthora capsici* on courgette and *Fusarium oxysporum* on lettuce and tomato, and explain possible relationships among the targeted host/pathogen and the rhizosphere microbiota due to compost applications. Experimental trials were carried out on potted plants (by mixing compost into the potting substrate) and in two infested fields (by transplanting plants previously grown using potting substrate containing compost). Quantitative Polymerase Chain Reaction - qPCR and the next generation amplicon sequencing technologies were applied on rhizosphere samples. Compost suppressed the diseases by 50-70%, compared to the untreated controls. Moreover, a reduction of the abundance of the soil-borne pathogens up to 100 folds was observed in the soils where compost was applied. The abundance of beneficial microorganisms, such as *Bacillus* and *Trichoderma*, was also influenced and a 10-100 folds increase of it was observed in the rhizosphere of plants treated with compost. However, compost application did not affect the microbial diversity observed applying next generation amplicon sequencing. These findings suggest that compost can be used to reduce plant diseases caused by soil-borne pathogens, most probably improving the abundance of beneficial microorganisms and reducing that of pathogens, but not increasing rhizosphere microbial diversity.

Key words: crop protection, compost suppressiveness, microbiome, plant disease

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