

INVITED REVIEW
SUPPRESSION OF SOILBORNE FUNGAL DISEASES
WITH ORGANIC AMENDMENTS

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SUMMARY

The use of organic matter (OM) has been proposed, for both conventional and biological agriculture systems, to decrease the incidence of plant diseases caused by soil-borne pathogens. In this work we review reports on the application of OM amendments, focusing on the suppressive capacity of different OM materials and the response of different soilborne pathogens. A total of 250 articles were analysed, with 2423 experimental case studies. The effect of OM amendments was found to be suppressive in 45% and non-significant in 35% of the cases. In 20% of the cases, a significant increase of disease incidence was observed. Compost was the most suppressive material, with more than 50% of cases showing effective disease control. The effect of crop residues was more variable: it was suppressive in 45% of the cases, but enhanced disease in 28%. Finally, significant disease suppression with peat was recorded only in 4% of the experiments. The ability of OM to suppress disease varied largely with different pathogens: it was observed in more than 50% of the cases for *Verticillium*, *Thielaviopsis*, *Fusarium* and *Phytophthora*. In contrast, effective control of *Rhizoctonia solani* was achieved only in 26% of the cases. From this review it emerged that OM amendments have great potential but, at the same time, present some inconsistencies in their application. More investigation on the mechanisms by which OM acts on disease suppression is needed to make the use of these materials more predictable.

Key words: Composts, crop residues, *Fusarium* spp., organic wastes, pathogen suppression, peats, *Phytophthora* spp., phytotoxicity, *Pythium* spp., *Rhizoctonia solani*, *Thielaviopsis basicola*, *Verticillium dahliae*.