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Enhancing ecosystem services in vineyards: using cover crops to decrease botrytis bunch rot severity

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Abstract

Botrytis bunch rot is a disease that causes loss of yield and quality in many fruit and vegetable crops in temperate climates worldwide. The rot is caused by the fungus *Botrytis cinerea*, a saprophytic necrotroph. In grapes, the presence of the fungus can reduce yield, taint wine and increase its sensitivity to oxidation. In the current work, inter-row phacelia and ryegrass were mulched in situ in winter 2005 and compared with a bare ground control. The mulches were applied under 10-year-old Chardonnay vines in a 10-replicate randomized block design in New Zealand. Functional soil biological activity increased by 1.5–4.5 times in the two cover crop treatments compared with the control, an effect related to elevated soil moisture in these treatments. This increase in soil moisture and a higher rate of soil biological activity increased vine debris degradation, reduced *B. cinerea* primary inoculum on the debris

and decreased *B. cinerea* severity at flowering (December 2005) and harvest (April 2006). These results show the potential of mulched cover crops to enhance soil ecosystem services, reduce variable costs and improve the sustainability of viticulture and potentially other agricultural systems, in temperate climates worldwide.

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Keywords

- Botrytis cinerea,
- cover crop,
- mulch,
- conservation biological control,
- soil biological activity,
- vine debris degradation,
- primary inoculum,
- grape vines

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