



## ORGANIC FOLIAR TREATMENTS FOR CONTROL OF LATE BLIGHT OF POTATOES

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### SUMMARY

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Foliar application of plant-based extracts and compost teas may be a viable alternative to conventional fungicides for control of the potato late blight pathogen *Phytophthora infestans*. A study was established to compare the relative efficacy of a commercially available compost tea (JF Compost Tea), a powdered kelp product (ASL Powdered Kelp), and Manzate® 75 DF as foliar protectants against the potato late blight pathogen *Phytophthora infestans* (Mont.) de Bary. The pre- and post-treatment application leaf-surface bacterial population density, community structure, and antibiosis ability (i.e. ability to inhibit pathogen) on potato cv. Russet Burbank foliage were compared. Bacteria recovered using lab culture techniques were characterized by fatty acid methyl ester (FAME) analysis and sequencing of their partial 16S ribosomal RNA genes. Naturally occurring bacterial population densities on the leaf surfaces varied with year, and tended to be lowest following Manzate® 75 DF treatments. Bacteria recovered from the leaf surface after treatment application often bore little resemblance to their tank mixture counterparts and these bacterial communities were significantly ( $P=0.05$ ) less effective at inhibiting *P. infestans* growth in in vitro tests compared to the resident, pre-foliar treatment leaf bacterial communities. While the tank mixes contained bacterial isolates with significantly higher antibiosis activity than the well water used alone, this bacterial community either failed to become established on the leaf surface or were washed off during application. Manzate® 75 DF was the most effective foliar treatment ( $P=0.05$ ) for controlling *P. infestans* infection and disease development on potato leaves. Both JF Compost Tea and ASL Powdered Kelp were similar in their inability to protect

potato leaves from *P. infestans* attack. Leaf bacterial populations established following Manzate® 75 DF treatment had fewer antibiotic producing strains (in vitro) than naturally occurring leaf populations before foliar treatment, and Manzate® 75 DF thus likely derives little if any additional plant protectant properties from the naturally resident leaf bacterial community. In the present study, the use of compost teas as plant protectant treatments against late blight appears too unreliable to be agronomically effective.

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### REFERENCE

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Sturz, A.V., Lynch, D.H., Martin, R.C., and Driscoll, A.M. 2006. *Influence of compost tea, powdered kelp and Manzate 75 on the community composition and antibiosis against Phytophthora infestans of bacteria in the potato phylloplane*. Canadian Journal of Plant Pathology [In Press].

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### CREDITS

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