DOES ABIOTIC STRESS ON A PLANT INFLUENCE PHOSPHITE PROTECTION TO *PHYTOPHTHORA CINNAMOMI*?

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In Australia large areas of indigenous forests, Banksia woodlands and heathlands, are devastated by Phytophthora dieback disease caused by *Phytophthora cinnamomi*. Phosphite has been shown to be effective in controlling this pathogen's impact on a wide range of plant species across different families. But the influence of a plant's physiological status at the time of phosphite application on the subsequent efficacy of phosphite treatment to control Phytophthora dieback disease is a major factor limiting our understanding of the control of this pathogen. The key seasonal stresses in an Australian ecosystem of flooding, drought and fire are explored.

Adenanthos cuneatus (resprouter), *Banksia attenuata* (resprouter) and *B. baueri* (reseeder) are all susceptible to *P. cinnamomi* and are responsive to phosphite treatment. These species were selected within four plots in an area of the Stirling Range National Park that was scheduled for a fuel-reduction burn. Treatments of the plots were: 1) phosphite spray without fire, 2) phosphite spay with fire, 3) no phosphite spray without fire, and 4) no phosphite spray with fire. Phosphite treatment was applied either 6 weeks prior to the fire or after the fire when all resprouter species had foliage. On-going measurements during the experiment include leaf water potential, leaf gas exchange, lesion lengths on inoculated stems, and phosphite concentration in leaves, stems, lignotubers and roots.

Waterlogging trials were conducted in the greenhouse using *B. attenuata* and *B. baxteri* (reseeder). The response of these plants and subsequent recovery from waterlogging was examined. In the main trial, a phosphite spray treatment was applied before and after one waterlogging event of either 3 or 14 days duration. Plant physiology traits, lesion development and phosphite concentrations in plant tissue were monitored periodically similar to the fire experiment.

The effect of water deficit will be examined on *B. attenuata* and *B. baxteri* in the greenhouse and in *Banksia* woodlands. Measurements as for the fire experiment will be completed.