INTRODUCTION

Parts of the southwest of Western Australia are subject to periodic flooding in areas that are also devastated by Phytophthora dieback caused by P. cinnamomi. Phosphite has been shown to be effective in controlling this pathogen (Hardy et al. 2001). Waterlogging induces many physiological dysfunctions in plants, but it is unknown what impact waterlogging has on uptake, distribution and efficacy of phosphite in controlling P. cinnamomi. We tested effects of waterlogging before and after a phosphite spray of Banksia species on:

- Uptake and distribution of phosphite in the plant,
- Effectiveness of phosphite to protect plants from P. cinnamomi.

METHODS

2 Banksia species (ca. 1 m high) susceptible to P. cinnamomi.
- One phosphite spray 7 days after (Exp. 1) and one 21 days before (Exp. 2) waterlogging for 0, 3 and 6/8 days in the greenhouse.
- Leaf water potentials and leaf gas exchange were measured.
- P. cinnamomi colonisation in stems and phosphite concentrations in leaves, stems, and roots were assessed: 1 week, 1 month and 4 months after phosphite treatment (Exp. 1) or after completion of waterlogging (Exp. 2).

RESULTS

Phyiology

- B. attenuata was more sensitive to waterlogging than B. baxteri based on transpiration rates, stomatal conductance and net photosynthesis.
- B. baxteri maintained stomatal aperture and gas exchange under waterlogging conditions.

Tissue phosphite concentration

- Waterlogging did not affect phosphite uptake and distribution when applied before or after waterlogging (Fig. 1).

CONCLUSIONS

- Except for severely water-stressed plants (e.g. 8 days waterlogging in B. attenuata), waterlogging generally did not markedly affect the ability of phosphite to contain P. cinnamomi lesions in stems.
- The impact of waterlogging on root infection and lesion extension have yet to be determined.

REFERENCES