PROJECT 4

MID-YEAR REPORT - MARCH TO SEPTEMBER 1994

THE CONTROL AND MANAGEMENT OF *PHYTOPHTHORA MEGASPERMA* IN THE NATIONAL PARKS OF SOUTH-WESTERN AUSTRALIA

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1. CONTROL OF *P. MEGASPERMA*

1.1 *In vitro* sensitivity of *P. megasperma*

To date, the most significant control measure proven to retard the activity of the "dieback" fungus *P. cinnamomi* is phosphonate (Shearer and Fairman 1991). We have carried out *in vitro* studies to assess the sensitivity of *P. megasperma* to phosphonate. We have formalised our results and the manuscript is currently being reviewed, to be submitted to the journal *Plant Disease* by the end of the year.

1.2 Phosphonate spray trial - Fitzgerald River National Park (FRNP)

A phosphonate spray trial was commenced in the FRNP in October 1993. We re-assessed the trial in February, and we will be re-assessing the trial in November of this year. Additionally, tissue analysis of leaves from both treated and control plants will be carried out by B. Komorek to correlate observed changes in disease expression with residual tissue phosphonate levels.

2. MANAGEMENT OF *P. MEGASPERMA*

2.1 Significance of oospores

We have documented; 1) the influence of temperature on radial growth, sporangium and oogonium formation, and 2) the proportion of viable oospores produced *in vitro* for a selection of WA *P. megasperma* isolates. The manuscript describing this work has been submitted to K. Gillen (Regional Operations Manager - South Coast Region, CALM) for his expert input. We aim to publish the manuscript in *Australasian Plant Pathology* later this year.

Shearer, B.L. and Fairman, R.G. (1991). Control of *Phytophthora* species in native communities with phosphorus acid. Abstract 108/C18. *Proceedings of the Conservation Biology in Australia and Oceania Conference*, p. 72. University of Queensland.

2.2 Variability of *P. megasperma*

2.2.1 Morphological and isozymic variability

Twelve morphologically distinct groups have been identified among the *P. megasperma* isolates retrieved from WA, on the basis of oogonium diameter. Twelve to 15 distinct electromorphs have been identified among WA *P. megasperma* isolates using allozyme analysis. For management purposes, functional differences may be of significance. Morphological and isozyme analysis has described and defined the variation in *P. megasperma* from WA, and establishes a basis upon which functional variability can be interpreted. The results of this work will be discussed with Dr E. Hansen (Dept. of Botany & Plant Pathology, Oregon State Univ.), before publication of the findings.

2.2.2 Comparative pathogenicity

Representatives of each of the two electromorphs recovered from the FRNP will be selected and screened for variability in forming lesions in 5 year old stems of *Banksia baxteri*. This *in situ* trial will be commenced in October in a dis-used gravel pit in the Point Ann Region of the FRNP. Only local isolates will be screened and we have the support and endorsement of both the Albany District staff (CALM), and the South Coast Regional staff (CALM).

3. THE OCCURRENCE OF *P. MEGASPERMA* IN THE NATIVE PLANT COMMUNITIES OF WESTERN AUSTRALIA

We are continuing to document the; host range, degree of impact, and geographic distribution of infection by *P. megasperma* in the national parks of WA. We aim to input our data into the GIS-based project to produce an up-to-date map of susceptible hosts and their distribution.

4. Liaison

- Copies of last year's annual report have been provided to; D. Griffiths/K. Gillen (Albany District/South Coastal Region), Nathan McQuoid (FRNP Ranger-in-charge) and David Rose (Moora District).

- In April this year, we presented a poster at the "Symposium on Plant Diseases In Ecosystems" entitled, 'Morphological variability exhibited by *Phytophthora megasperma* retrieved from diseased areas of WA bushland'. The abstract was published in the conference proceedings.

- In August, we presented a departmental seminar (CALM) up-dating our progress on the *P. megasperma* project.