

ISOLATED BANKSIA GRANDIS DEATHS ON ROADSIDE
DWELLINGUP I.M.U.

by

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A recent survey conducted to locate the cause of an alarmingly high number of isolated *Banksia grandis* roadside deaths within the Dwellingup Intensive Management Unit (I.M.U.), revealed that *Phytophthora cinnamomi* was associated with almost 50% of dead *Banksias* sampled.

All major roads within the I.M.U. were included in the survey. Samples were taken from 35 recently dead *Banksias* occurring singly along the roadside. Soil to a depth of 15 cm. surrounding each dead tree was sampled, lupin baited, and the radicles subsequently plated on antibiotic agar. In addition, tap and lateral root sections were taken, macerated, and the particles directly plated on antibiotic agar. Following an incubation period, all plates were inspected for *P. cinnamomi* colonies.

P. cinnamomi was detected in 29% and 42% of plates for lupin baiting and direct plating respectively. By grouping the two methods, 46% of all *Banksias* sampled yielded a positive *P. cinnamomi* recovery. *P. cinnamomi* becomes increasingly difficult to detect as inoculum density is reduced, therefore, it is reasonable to assume that this percentage may be considerably larger.

Deaths occurred on all topographical situations, predominantly within good to high quality jarrah forest. In the majority of cases, the ground cover consisted chiefly of *P. cinnamomi* host species. The height of the dead *Banksias* ranged from one to 10m.

As it has been established that *P. cinnamomi* is the organism primarily responsible for jarrah dieback, it follows that the end result of these new infections will be irreversible destruction of the total forest in the area surrounding the infection. This will occur in all cases as *P. cinnamomi* will survive as chlamydospores (resting spores) within the *Banksia* root tissue while soil conditions are unfavourable for germination and spread. In fact, in a number of the above infections, the fungus was isolated from tap roots up to 10 cm. in diameter during the dry, hot, late summer months. As soon as optimum levels of soil temperature and moisture are reached (during spring and autumn) fungal populations will increase and spread to nearby hosts where new infections will occur.

In addition to single *Banksia* deaths, a far greater number of established dieback patches of varying size have been recorded along these same roads. The situation is depressing, and, as there is some evidence that it is repeated in other Divisions, it is extremely important to establish why these outbreaks have occurred. It is logical to conclude that the answer lies in forest hygiene. Hygiene rules must be enforced, not only by Departmental personnel but by all parties relevantly concerned. It may be necessary to devise new rules and apply more strict supervision if future dieback outbreaks are to be reduced to an absolute minimum.

The survey also revealed the variability of dieback incidence in relation to roads. For instance, there were eight new and twenty seven established infections along Duncan's Road, while there were no new and only three established infections along George Road. It was observed that continuous dense *Banksia grandis* understorey was a characteristic feature of the forest along Duncan's Road, while infrequent, small *Banksia* patches only, occurred along George Road.

Although, on George Road infections may exist but have failed to be detected as disease symptoms have yet to be expressed, there appears, from the above observations, to be a strong correlation between the number of dieback infections and the incidence and density of *Banksia grandis*. As *Banksia grandis* is the most readily infected in addition to being the most susceptible host species within the jarrah forest, it follows that any practices designed to reduce the *Banksia grandis* component within the northern jarrah forest I.M.U.s, particularly along roads, would be highly desirable.