

EXTENDED ABSTRACT

RURAL TREE DECLINE IN AUSTRALIA

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Over the past two decades in Australia, there has been a dramatic increase in the rate of decline or death of native trees in many rural areas. The problem occurs mainly among remnant trees on lands that have been selectively cleared for cultivation or grazing, rarely within undisturbed stands. This "rural dieback" has been reported from all States, and extensive loss has occurred in some areas. The best-known example is in the New England tablelands of northern New South Wales where millions of trees have died since the late 1960s. A wide range of eucalypt and other tree species is affected (e.g., in Queensland, dieback of varying severity has been recorded in 67 tree species, including some commercially important timber species). Dieback has affected trees of all ages but the problem has been most severe among the older age-classes.

The causes of rural dieback are not completely known, but are thought to involve complex interactions of "natural" and management-related factors which stress or injure trees. Some of the measures taken to increase the production of livestock or crops, such as tree clearing, application of fertilisers, planting of exotic pastures, and cultivation, may produce a range of side effects detrimental to the health of remaining trees. Some of these side effects may be relatively direct in action. For example, trees may suffer physical damage from livestock or farm machinery, or from wind and hail as a result of increased exposure of their canopies. Some side effects may be associated with a gradual degradation of the tree's environment. For example, excessive tree clearance in susceptible areas has caused ground and stream waters to become increasingly saline, and this in turn has caused trees to decline in the salinised zone of the landscape. Other side effects of the intensification of land management may be less direct, though no less damaging. For example, pasture and crop development may favour growth and survival of certain root-feeding insect larvae whose adults feed on trees, and fertiliser treatment may also make the foliage of trees more attractive to insects. Stress, from whatever cause, may predispose trees to attack by insects and pathogens, and it makes them less able to cope with such attack. Other biotic and abiotic factors which have been implicated in dieback include drought, flooding,

waterlogging, frost, lightning, senescence, mistletoe, arboreal wildlife, changed fire regimes, pollutants, herbicides, loss of insectivorous wildlife, soil compaction, and redistribution of nutrients by livestock. The relative importance of many of the possible causal factors probably varies with place and time.

Economic consequences of widespread tree loss include loss of productive farmland due to erosion or salting, loss of valuable timber resources, loss of shade, shelter, and windbreaks, loss of habitat for insectivorous birds and animals that prey upon crop pests, loss of honey production, and costs of remedying damage to roads, property, waterways, and reservoirs caused by landslip, erosion, or siltation. Such additional costs to the rural producer flow on to the urban consumer.

One factor which appears to be a key element in the development of rural tree decline (and in other forms of environmental degradation), and which seems capable of practical address is the extensive tree clearing that has taken place since first settlement. There are now various programmes under way around Australia aimed at restoring the cover of trees and undergrowth on denuded or degraded lands and maintaining or enhancing existing vegetation cover in other areas. Such programmes, which involve both Government and private funding and the co-operation of a wide range of community groups, offer hope of reversing present trends.