

## SYMPOSIUM ON POPLAR BOX (*EUCALYPTUS POPULNEA*) LANDS IN RETROSPECT

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The problem addressed by the symposium at Cobar in March 1979 and by the subsequent papers published in various issues of *The Australian Rangeland Journal* was the reduction in grazing capacity resulting from the increase in woody plants in poplar box (*Eucalyptus populnea*) lands. The organisers wished to bring together not only the published and unpublished information about one of Australia's more wide-spread semi-arid woodland systems, but also the various user and research groups in the communities, the States and CSIRO. Finally, the organisers hoped that the participants would examine what had been presented and would propose research directions in relation to current land use problems.

This symposium differed little from other symposia on rural problems in that users wanted prompt, economic (cheap?) solutions to the 'woody weed' problem and research workers doubted if these existed. Indeed, there was a strong 'woody weed' emphasis throughout the proceedings. The biologists argued that a general solution would probably come through ecological management rather than through one-hit cultural techniques, such as herbicide application or cultivation, and would require an improved understanding by users of how the poplar box ecosystem functioned in relation to factors such as grazing, fire, climate and soils; research workers themselves did not have this knowledge. In addition, simple solutions were unlikely to hold in a variable climate such as that of the poplar box lands.

At the symposium there was broad agreement on the reduction in grazing capacity, the increase in unwanted woody plants, and the social and economic consequences of the decreasing productivity of the grazing lands. Fire and grazing, both before and since European occupation, and tree clearing were held to be important. Research directions were not discussed to the extent that had been expected, possibly because resources were already committed to existing projects and a reduction in the level of these resources was expected at some future date. However, the feasibility of introducing plant species such as a legume to accompany buffel grass in the northern poplar box lands, and a counterpart of buffel grass to the non-arable and non-arid poplar box lands in New South Wales was raised. Management was discussed at various times, but there were no overall management proposals.

Because authors were encouraged to revise their manuscripts in the light of other contributions and discussion at Cobar, the published papers may differ from those originally presented. From these published papers, the symposium discussion, and subsequent correspondence and discussion with contributors, I have prepared the following over-view of the 'woody weed' problem and its management in poplar box grazing lands.

The nexus between grazing with sheep, the subsequent deterioration of the poplar box grazing lands, and re-vegetation by a suite of adapted, indigenous, long-lived species appears real. The occasional ingress of these species into well managed grazing lands, just like the population explosions in deteriorated grazing lands, appears to be associated in part with the infrequent years of abundant rainfall, suggesting that no poplar box lands are inviolate; the presence of a few seed-bearing individuals is a constant threat to continuing livestock production. The rapid growth of suppressed plants that may have been recruited in small numbers of average years and the production of large amounts of grass fuel for fires have also occurred in these years of abundant rainfall. The ingress or increase in the number of shrub and tree species depends also on the occurrence and longevity of seed or 'nursery' trees and the favourable state of vegetation (bare ground, degree of shade).

One can argue that had the Aboriginal people continued their sole occupancy of the poplar box lands, the soils and vegetation would have remained much as they were in the immediate post-settlement period. With the European invasion of these lands came hard-hooved sheep and cattle, the axe, saw and mattock, and an altered fire regime. Through grazing (and confirmed by tree clearing) came exposure and compaction of the soil surface which led to a changed hydrology, and trampling and eating which led to organic matter breakdown. Already *in situ* in the poplar box lands were suites of shrub and tree species which have proved capable of colonising and stabilizing the poplar box system; 'woody weed' dominance has seen sheep and cattle populations reduced to low levels. Many poplar box lands are already in this shrub-dominated category. While 'woody weeds' are seen as an undesirable result of a particular land use, they also limit the damage and degradation resulting from that land use. Where grazing lands have deteriorated to the shrub dominant condition, or to bare ground, it appears unlikely that the depleted soil resource will permit a return to the initial form of grazing use.

Although the effects of interactions between rainfall, fuel production, plant species, vegetation state and grazing result in a complex system, it is not unmanageable. With the benefit of hindsight we can reason that the use of the original poplar box lands for grazing could have proceeded to the present day with better control of grazing and with controlled burning, after abundant rainfall seasons, of portions of holdings. Where grazing lands in good condition are invaded by large numbers of seedlings, or have deteriorated to the shrub-grass condition but with the soil resource still intact, a return to the grass dominant condition appears possible, either through the use of fire or the plough; the incorporation of improved high-yielding grass species would further assist in keeping out woody plants, as would a programme of selective removal of the mature individuals of those woody plants most difficult to control. Poplar box lands at present in good condition would be candidates for this type of management.

*Editor's Note.*

*It was intended to complete publication of the Proceedings of the Poplar Box Symposium in this issue. However, one paper has had to be held over to the next issue.*

*The paper is by B.R. Tunstall et al. and is entitled 'Vegetation changes in poplar box woodland: Effects of tree killing and domestic livestock'.*