CONTROL OF *MIMOSA PIGRA* IN KAKADU NATIONAL PARK

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Summary. The wetlands of Kakadu National Park are threatened by mimosa, *Mimosa pigra.* Forty-nine infestations, ranging from four hectares to individual plants, have been found and all are under control to the extent that no mature plants are known. Continuing effective control requires reduction of seed transport and extensive searches to find plants before they seed. Developments in herbicides and application technology aimed at controlling mimosa would appear to be of little value in the Kakadu program.

INTRODUCTION

Mimosa threatens the ecological and aesthetic values of the wetlands of Kakadu National Park, Northern Territory. A thorny shrub native to South America (1), in tropical Australia it forms dense thickets of around 100 mature plants per ha (W.M. Lonsdale, pers. comm. 1987) which replace sedgeland and other wetland communities (2). Mature stands in Australia produce large numbers of seed (9000/m^2/yr have been recorded: W.M. Lonsdale, pers. comm. 1987). Mimosa is currently found within 10 river catchments in the Northern Territory with infestations ranging from scattered plants to dense thickets covering some 450 km^2 (W.M. Lonsdale, pers. comm. 1987). While considerable research is being carried out on biological control of the species (3), at present chemicals are the only option for controlling large infestations.

CONTROL IN KAKADU NATIONAL PARK

Forty-nine infestations of mimosa, covering approximately 10 ha, have been located in Kakadu National Park since discovery of the first stand in 1981. All of these are considered under control in that they consist only of seed banks and emerging seedlings. Four people are employed full-time on control operations with an annual cost of approximately $200,000.

Control operations consist of searching for new infestations, removing existing plants, destruction of seed banks, fencing of infestations and washdown of vehicles. Extensive and repeated searches of wetlands are carried out in order that new infestations are discovered before seeding occurs. Each year more than 1000 km^2 of floodplains and adjacent areas are searched.

Control of existing plants generally involves foliar spraying with dicamba (1.2 kg a.i./ha), or soil sterilization with hexazinone (10 kg a.i./ha = 4 ml Velpar^R L/m^2, spotgun application). Seed bank reduction through intensive burning using a diesel/petrol mix pumped on to the ground has been attempted at four infestations. Ground surface temperatures of 350°C have been achieved, however at 5 cm below the surface the temperature did not exceed 65°C. At one site all seeds appear to have been destroyed as no germination has occurred after removal of seeding parent plants and burning in October 1985, while at the other three sites seedlings continue to emerge, presumably because some seeds were buried before burning.

Fencing of infestations with a large seed bank is given a high priority to prevent further distribution of seeds by animals, particularly feral buffalo. The emergence of seedlings from wallows, pug marks and mud rubbings on trunks of trees strongly suggest that buffalo are capable of transporting considerable quantities of seed. Washdown of vehicles considered most likely

to import seeds, particularly buffalo catching and shooting vehicles, is also carried out. Contracts for the removal of buffalo include severe financial penalties for entry with an unwashed vehicle. Soil and seed samples taken at the time of washdowns have not revealed the presence of mimosa seeds, however circumstancial evidence suggests that such vehicles are a major source of new infestations. For example, 25% of infestations in Kakadu are found in the immediate vicinity of road creek crossings or buffalo catching camps. Consideration is being given to expanding washdown facilities and requiring their use by other classes of vehicle.

DISCUSSION

Control of mimosa in Kakadu must be considered successful in that no mature stands are known to exist, in stark contrast to many river catchments outside the Park where extensive areas of wetland communities have been overtaken by dense and apparently stable mimosa infestations. However, to maintain this level of control using current techniques may require increasing input of resources since transport of seed into, and within, the Park seems highly likely. Figure 1 illustrates the problem of continuing seed dispersal: there is no decrease in the rate at which new sites are being discovered despite the fact that most areas of floodplain have now been searched at least once.

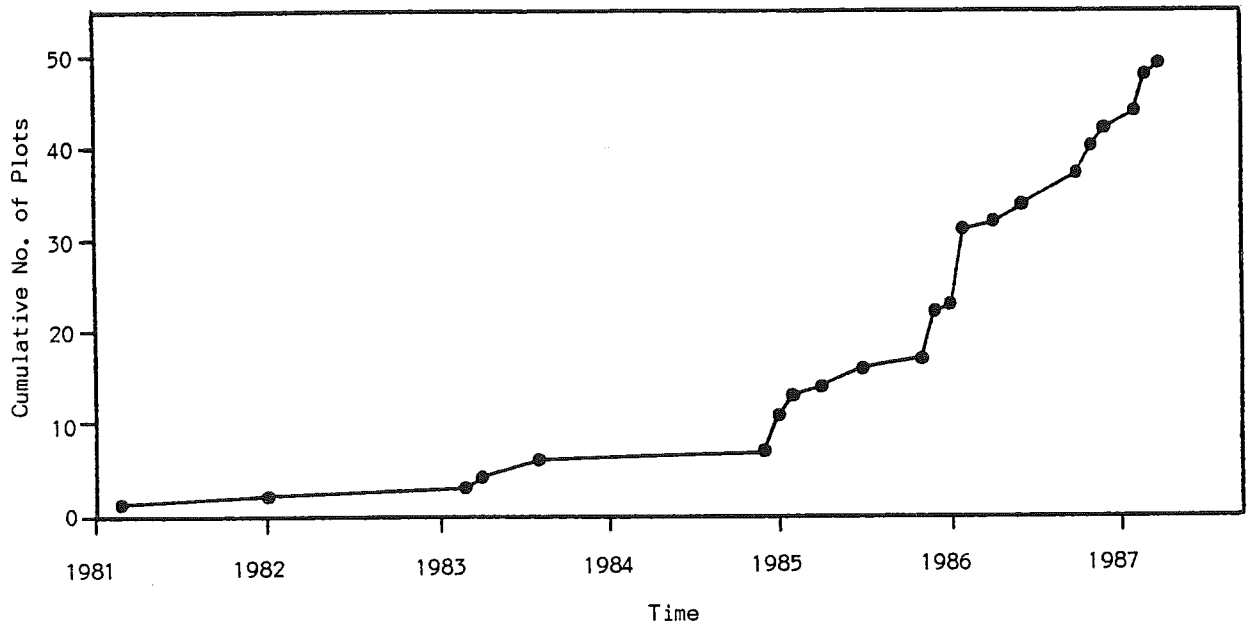

Figure 1. Cumulative number of mimosa infestations located in Kakadu National Park between 1981 and 1987.

In the absence of an effective biological control agent, the principal requirements for continuing suppression of mimosa in Kakadu are: the ability to control seed movement into and within the Park, which in turn requires information on the manner in which seeds are transported; sufficient resources to find mimosa at very low densities; and an understanding of mimosa seed ecology directed at reducing seed banks or suppressing germination. Further developments in herbicides or application techniques for mimosa are not likely to solve the problem in Kakadu.

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