

# The mortality of three dominant perennial grasses after fire in Australia's tropical savannas

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## Introduction

Fires burn savanna landscapes in the Top End approximately once every two years, so the vegetation is highly resilient to frequent burning. However, the reintroduction of fire following long-term fire exclusion might have a major impact on plant populations. This study investigates such an impact for three perennial grass species. Changes in the abundance of grass species after fire could result in major changes to fuel loads, fire regimes and savanna biodiversity.

## Methods

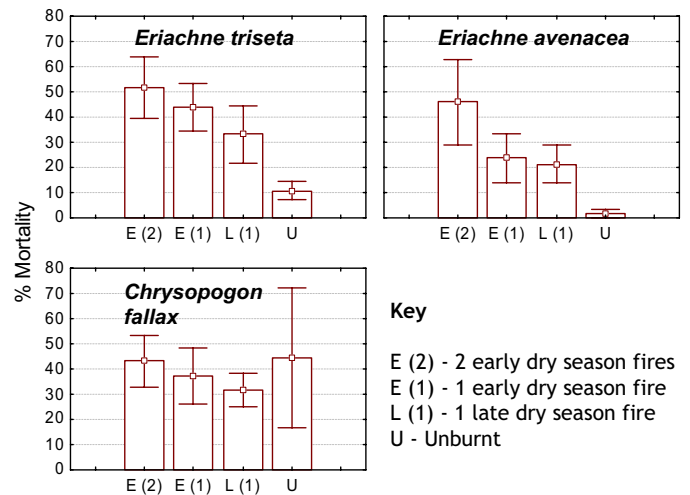
Hectare-sized plots in a landscape unburnt for up to 12 years were established near Darwin, NT. The 18 plots consist of a randomised complete block design with three replicates each of six fire regimes: early or late dry season burning at different yearly intervals, as well as control (unburnt) plots. In May 2004 before the burning experiment began, individuals of the three dominant perennial grasses (*Eriachne trisetata*, *E. avenacea* and *Chrysopogon fallax*) were tagged within plots that would experience the following treatments in a 20-month period:

- 1 early dry season (June) fire
- 2 early dry season fires
- 1 late dry season (October) fire
- No fires

The survival of tagged plants was recorded in December 2005.

## Results

Burning increased mortality approximately four-fold in *Eriachne* spp., caused almost entirely by the first fire (Fig. 1). *Eriachne trisetata* populations were particularly affected, decreasing by 30-40% in plots subjected to fire. In contrast, fire had little effect on the survival of *Chrysopogon fallax*, where mortality was high (40%) even in unburnt plots.



**Figure 1.** Percent mortality of *Eriachne trisetata*, *E. avenacea* and *Chrysopogon fallax* within the various burning treatments (mean +/- 1 SE)



## Discussion

Fire caused substantial mortality in *Eriachne* spp. Information is currently being collected on post-fire seed production and recruitment to assess the effects of fire on population size. The high mortality of unburnt *Chrysopogon fallax* plants may be a result of wallabies, which act independently of fire. The mortality of these grasses in burnt plots contributed to the significant reduction in herbage biomass after fire (L. Hunt, *pers. comm.*). An additional count of surviving tagged plants will occur in 2007 after 3 years of experimental burning treatments.