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DYNAMICS OF *HETEROPOGON CONTORTUS* IN RELATION TO STOCKING RATE AND LAND CLASS

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INTRODUCTION

The persistence of desirable species in a pasture is essential for sustainability and animal production. Therefore, it is necessary to document how grazing and land type (land class) influence the processes of seedling recruitment and plant survival (Orr and Paton 1993).

This paper presents interim results from a study which measured the effects of grazing pressure and land class on recruitment and survival of *Heteropogon contortus* (black speargrass) between 1990 and 1995.

METHODS

A grazing study was established in 1990 at Glenwood (25°41'S, 150°52'E) on a *H. contortus* dominant pasture growing on a granite derived soil. The effects of three stocking rate treatments (0.3, 0.6 and 0.9 beasts/ha) within two land classes (narrow leaf and silver leaf ironbark) are reported in this paper. There were two replicates.

Twenty permanent quadrats, each 0.5 × 0.5 m, were established to monitor the recruitment and survival of *H. contortus* plants. In autumn 1990 individual plants in these permanent quadrats were charted using a pantograph (Williams 1970), and subsequent recordings have been made annually. In autumn each year seed production was determined from inflorescence density measured in the permanent quadrats.

RESULTS

Rainfall has been below the long-term summer (October to March) mean (of 500 mm) throughout this study. Despite this, large differences in seed production between years have been recorded (Figure 1). Generally, seed production has been consistently higher in the silver leaf than in the narrow leaf land class and has been reduced by the highest stocking rate.

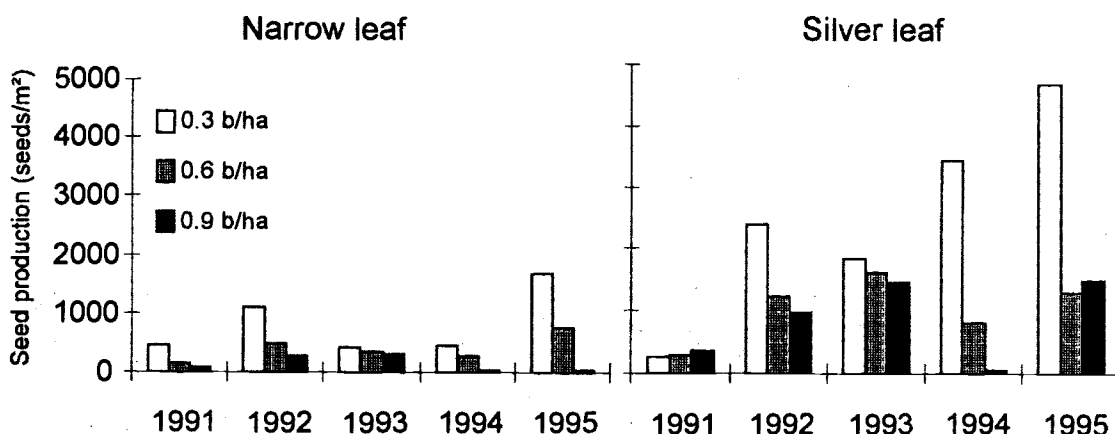


Figure 1. Seed production (seeds/m²) of *H. contortus* between 1991 and 1995 at three stocking rates in two land classes in southern *H. contortus* pasture.

The distribution of *H. contortus* plants in 1995 between the different age classes revealed substantial differences between land classes and stocking rates (Figure 2). Overall plant density was higher in the silver leaf than in the narrow leaf land class and plant density was reduced at high stocking rates. Few plants occurred in the 4, 3 and 2 year age classes in any treatment because few seedlings were recruited in 1990-1, 1991-2 and 1992-3 due to severe drought. Plants in the 1 and <1 year age classes were recruited over the 1993-4 and 1994-5 summers respectively and this recruitment was less at high stocking rates.

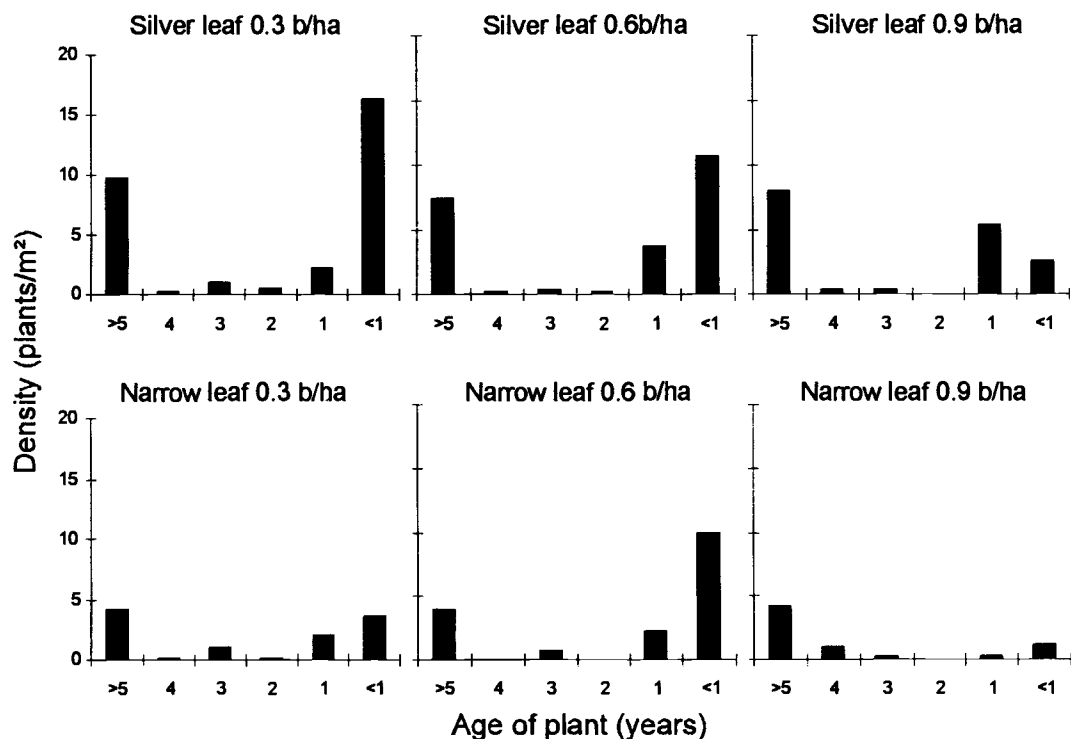


Figure 2. Age structure (plants/m²) of *H. contortus* in autumn 1995 at three stocking rates in two land classes in southern *H. contortus* pasture.

DISCUSSION

Heavy grazing has restricted seed production and seedling recruitment. Consequently, at 0.9 b/ha, *H. contortus* remains present in the pasture because of the survival of the initial population. With continued heavy grazing, these initial tussocks will die and plant density will probably fall because of limited seedling recruitment. Therefore, continuous heavy grazing can be expected to eliminate *H. contortus* from these pastures.

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