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BLACK SPEARGRASS (*Heteropogon contortus*) PERSISTENCE VARIES ACROSS ITS GEOGRAPHIC RANGE

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INTRODUCTION

Heteropogon contortus (black speargrass) dominant pastures occupy 25 M ha and occur on a wide variety of soil types which receive between 700 and 1200 mm annual rainfall. They are an important forage resource for the breeding and finishing of 3-4 million beef cattle in Queensland. Diet selection studies using oesophageal fistulated steers (R.E.Hendricksen, unpublished data) indicate that steers selectively graze *H. contortus* throughout the year and that it is selected in preference to almost all other grass species.

Because of the importance of this species to Queensland's beef cattle industry, a knowledge of its persistence is useful in developing sustainable grazing practices. This paper compares the demographic performance of *H. contortus* at four sites across regional Queensland.

METHODS

Extensive grazing studies have been conducted at Galloway Plains, Calliope, central Queensland (Orr *et al.* 2001), at "Glenwood", Mundubbera, southern Queensland (Orr *et al.* 2004) "Keilambete", central highlands of Queensland (Jones *et al.* 2001) and at "Wambiana", Charters Towers (O'Reagain and Bushell 1999). Permanently located quadrats, either 50 x 50 cm or 100 x 100 cm, were established at each grazing study to examine the persistence of *H. contortus* in relation to grazing management options – mainly stocking rates. In each of the quadrats, the position of each *H. contortus* plant was charted from the commencement of each study with subsequent recordings made annually. Further details of this methodology are reported in Orr *et al.* (2004). Data presented here include the survival of the original plants and one annual seedling cohort of *H. contortus* plants from each grazing study.

RESULTS

The survival of *H. contortus* plants, both original plants and annual seedling cohort, at all four grazing studies displayed a similar pattern of high initial mortality of plants (Figure 1). There was a clear trend for both initial plants and the annual seedling cohorts at "Glenwood", "Galloway Plains" and "Keilambete" to have extended life spans. However, both the original plants and the 2000 seedling cohort at "Wambiana" displayed continuing mortality as distinct from the extended survival as displayed by plants at the other three more southerly grazing studies.

DISCUSSION

These data indicate clear differences in the survival of *H. contortus* at the four sites with plants in northern Queensland being less persistent than those in central and southern Queensland.

One possible reason for these differences in survival is the severity of the dry season at "Wambiana". All four sites have a predominantly summer rainfall, however, the dry season at "Wambiana" is longer and more severe than at the southern sites where firstly, the dry season is less pronounced and secondly, annual rainfall is more evenly distributed throughout the year. These two considerations suggest that conditions for plant growth at "Wambiana" are less favourable than at the other three sites.

T. J. Hall (unpublished data) compared four ecotypes of *H. contortus* from across northern Australia (Katherine, Mareeba, Torrens Creek and Mundubbera) both at home and at the three other locations. Results indicate that the southern ecotypes are faster at producing tillers, faster at developing inflorescences and shed seed earlier than the more northern ecotypes. Furthermore, although southern ecotypes don't grow as tall, these southern ecotypes produce more total tillers and can respond to better growing conditions as indicated by higher plant yields in the second year of growth compared with northern ecotypes. It is probable that these characteristics confer better plant survival.

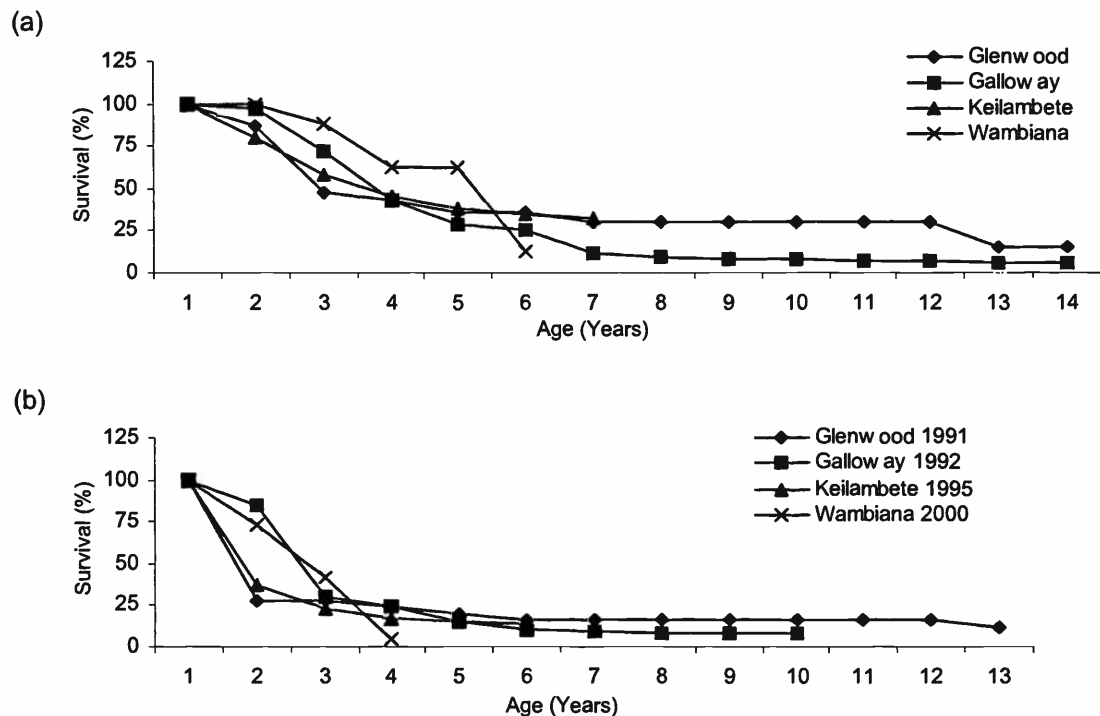


Figure 1. Survival (%) of (a) original plants and (b) one annual seedling cohort of *Heteropogon contortus* at four sites across Queensland.

Under grazing in northern Queensland, *H. contortus* plants were almost eliminated after five years grazing at stocking rates of 0.95 and 1.25 beasts/ha but continued to contribute 5-10% of total pasture yield (Jones 2003). In contrast, *H. contortus* persisted for 13 years at a stocking rate of 0.5 steers/ha in central Queensland where it contributed 30% of total pasture yield (Orr *et al.* 2001). These data indicate that the persistence of *H. contortus* varies across its geographic range and this fact needs to be considered when devising sustainable grazing management practices.

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