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## Sustainable Stocking Strategies Are Profitable in Managing for Climate Variability in a North Australian Savanna

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## Sustainable stocking strategies are profitable in managing for climate variability in a north Australian savanna

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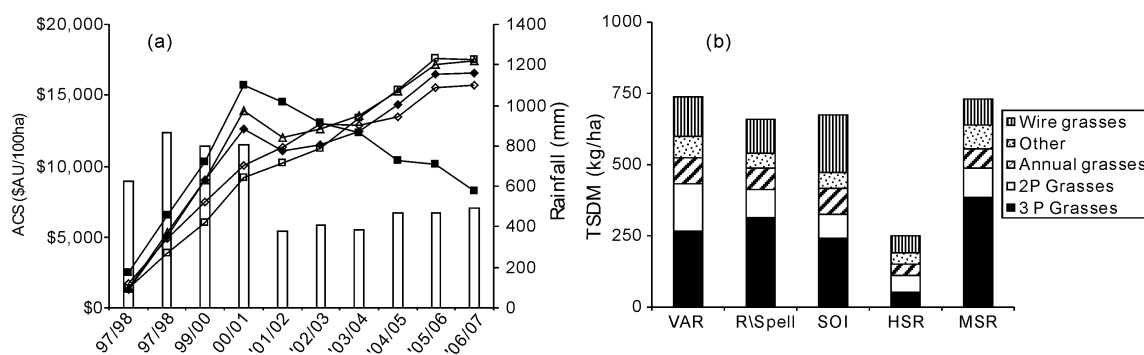
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**Key words :** Stocking rate ,southern oscillation index ,economics

**Introduction** Inter-annual rainfall variability is a major challenge to sustainable beef production in northern Australia and other savanna rangelands . Sustainable management strategies like moderate or variable stocking are widely promoted ,but adoption has been hindered by a perception that these strategies are uneconomic (O Reagain *et al.* 2003) .

**Materials and methods** The trial was established in 1997 in Eucalypt savanna on Wambiana (20°34'S ,146°07'E ; mean annual rainfall : 650 mm) near Charters Towers ,Australia ,to test the sustainability and profitability of different stocking strategies . These were (i) moderate stocking (MSR)-8 ha/animal equivalent (AE=450 kg steer) ,(ii) heavy stocking (HSR)-4 ha/AE , (iii) variable stocking (VAR)-numbers adjusted annually in May according to available pasture (range : 3-10 ha/AE) ,(iv) a Southern Oscillation Index (SOI)-variable strategy-numbers adjusted in November according to available pasture and SOI seasonal predictions (range : 3-10 ha/AE) and (v) rotational wet season spelling (R/Spell)-6 ha/AE .All treatments were replicated twice in 100 ha paddocks .Pasture total standing dry matter (TSDM) and composition were assessed annually and animal production measured using Brahman-cross steers .Accumulated cash surplus (ACS) was derived from the value of beef produced less supplementation and interest costs .

**Results and discussion** After 10 years ACS was highest in the MSR and VAR but lowest in the HSR .In the latter strategy ACS declined in later ,drier years post 2001 due to high feeding costs and reduced product value .In the VAR and SOI ,ACS also declined with the onset of dry years but following a reduction in stocking rates subsequently recovered .In May 2006 ,pasture TSDM was lowest in the HSR but similar in the other strategies .Pasture composition was also different with 3-P (palatable , productive and/or perennial grass) yield being 7-fold greater in the MSR than in the HSR .



**Figure 1** (a) Annual rainfall and accumulated cash surplus (ACS) over 10 years for the VAR ( $\Delta$ ), (R/Spell ( $\diamond$ ), SOI ( $\blacklozenge$ ), HSR ( $\blacksquare$ ) and MSR ( $\square$ ) strategies .(b) Contribution of different species groups to TSDM in May 2006 .

**Conclusion** The trial has provided the first long-term empirical evidence showing that sustainable stocking strategies can be profitable in the savannas of northern Australia

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### References

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