Choice of sheep enterprise affects production and risk

SM Robertson[AB] and MA Friend[AB]

[A]EH Graham Centre for Agricultural Innovation (NSW Department of Primary Industries and Charles Sturt University), Wagga Wagga NSW 2678: surobertson@csu.edu.au; mfriend@csu.edu.au
[B]Co-operative Research Centre for Future Farm Industries, Nedlands, WA

Abstract: *This study examined the extent to which choice of sheep enterprise could increase production from the same pasture base. A replicated experiment was conducted between 2006 and 2010 in south-eastern NSW. A July lambing Merino x Merino flock (Winter Lambing Merino) was compared with Merino ewes lambing in September to both Merino and Terminal rams (Later Lambing), and a Merino flock with half the ewes lambing in July to Terminal rams and half the ewes lambing in September to Merino rams (Split Joined). The Split Joined enterprise performed as well as the Winter Lambing Merino in poor years, but had the capacity to be more productive in better years, while the Later lambing system was less resilient under drought conditions, and attracted high levels of supplementary feeding such that in drought years it produced the lowest gross margins. The results show that production can be doubled through choice of lambing time, stocking rate and ram breed, but that drought and inflexible management can have a larger adverse impact in some sheep enterprises than others.*

Key words: farming system

Introduction

Perennial pastures are advocated over annual based pastures to reduce groundwater recharge (Ridley *et al.* 1997), but to maintain or increase farm profitability, the additional cost of sowing these pastures needs to be offset by higher production income. The type of enterprise which performs well on an annual-based pasture system may be unable to utilize the additional pasture supplied by the longer growing season of perennials. Spring-lambing systems have been widely recommended as increasing farm profits by allowing higher stocking rates, and the use of terminal sires has also been shown to increase gross margins (Warn *et al.* 2006).

A winter-lambing self-replacing Merino enterprise is commonly used in the high rainfall zone. This study evaluated whether production and gross margins could be increased through use of enterprises with a later or split joining, and use of both Merino and Terminal rams.

Methods

Design and management

The experiment was conducted near Tarcutta, NSW (147°31'E 35°12'S) between 2006 and 2010. A randomised block design was used with three replicates of three treatments. Each replicate of each treatment comprised three paddocks – one each of lucerne (cv. Aurora), phalaris (*Phalaris aquatica*, cv. Australian) and tall fescue (*Festuca arundinacea*, cv. Resolute and Quantum) totalling 5.2 ha per farmlet. By area, each farmlet comprised 20% lucerne, 20% tall fescue and 60% phalaris.

The three treatments were: Winter Lambing Merino (WLM) – merino ewes joined to merino rams to lamb in July; Later Lambing (LL) – Merino ewes with 50% joined to Merino and 50% joined to terminal (Composite – based on Poll Dorset, 2006 to 2009; Poll Dorset in 2010) rams lambing from the first week in September; Split-Joined (SJ) – 50% of ewes lambing to terminal rams in July and the other 50% lambing to Merino rams in September. The same mid-winter stocking rate was used in all treatments in each year; 8, 10.2, 13, 11.2, 11.2 dry sheep equivalents in 2006–2010, respectively with the difference in lambing time meaning the LL enterprise carried twice as many ewes/ha as the WLM enterprise. Lambs were sold at weaning, or retained while pasture allowed. Ewes were managed to achieve a body condition score of 3 at joining and lambing.

Measurements were recorded for wool and lamb production. Gross margins were calculated using an annualised pasture establishment and maintenance cost of $72/ha (over seven years for lucerne and ten years for phalaris). An additional fertiliser cost of $4/dry stock equivalent/ha/year (range $146 to $186/ha) was included. Feed costs of $300/t for grain and $100/t for straw were used. Carcase values were 360 c/kg for Merino lamb, 450 c/kg for crossbred lamb and 250 c/kg for ewes. Wool values were calculated using Woolcheque (www.wool.com) averaged over November 2010 to November 2011, with an indicative value of 1411 c/kg clean for 20 micron wool. The initial purchase cost of ewes was not included in gross margins

Clean wool and lamb production per hectare were analysed using Genstat (Payne *et al.* 2009) by analysis of variance using year and treatment as fixed effects and replicate as the random effect.

Results and discussion

The failure of spring rainfall in 2006 to 2009 disadvantaged systems which lambed in September (annual rainfall 252, 477, 536, 604 and 1185mm, 2006 to 2010, respectively). The LL enterprise produced a similar ($P > 0.05$) quantity of lamb to the WLM enterprise in all years (Table 1) despite a higher number of lambs, due to the slow growth of September born lambs. The SJ enterprise produced up to 63 kg more lamb than the other enterprises in both 2007 and 2010 because the combination of use of terminal rams, moderate stocking rate, and two times of lambing allowing a proportion of lambs to grow well when pasture growth was variable between seasons.

Despite the LL enterprise producing 64 to 106% more ($P < 0.05$) clean wool/ha than WLM, due to more ewes carried/ha, high supplementary feeding levels and similar lamb production resulted in the LL enterprise producing a similar or lower gross margin to WLM in most years (Table 1). Fertility failure in SJ caused a low gross margin in 2009, but in years with wet summer, gross margins were more than $100/ha higher than the WLM enterprise due to a greater capacity to increase lamb production when pasture conditions allowed. However, differences in the purchase cost of ewes should also be considered when comparing systems.

Conclusions

This study shows that choice of lambing time, stocking rate and ram breed can considerably alter both production and the risk in adverse seasons. Sheep production systems need to contain strategies to minimise the risk of high feeding costs and poor production in drought years.

Table 1. Production and gross margins for three sheep enterprises.

Treatment	2006	2007	2008	2009	2010
			Live weight of lambs sold(kg/ha)		
LL	168	144	165	198	197
SJ	172	207	196	144	260
WLM	140	163	171	177	210
l.s.d. (P = 0.05)	38				
			Supplement fed (kg/ha)		
LL	1517	742	1317	1125	274
SJ	796	485	882	762	0
WLM	407	390	424	556	0
			Gross margin ($/ha)		
LL	29	88	24	108	303
SJ	113	235	117	46	417
WLM	77	121	120	104	261

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