

Integrated Parasite Management Reduces the Cost of Gastro-Intestinal Nematodes of Sheep on the Northern Tablelands of N.S.W.

G. Kelly, L. Kahn and S. Walkden-Brown

CRC for Sheep Industry Innovation, University of New England, Armidale, N.S.W., 2351.

Gastrointestinal nematodes (worms) cost Australian sheep producers more than any other disease (Sackett *et al* 2006). Combined with the threat posed from increasing prevalence of anthelmintic resistance, the need for approaches that aim to delay development of resistance and reduce the cost of worms are required. Integrated approaches to controlling worm populations have been developed for the summer rainfall region of NSW (Scrivener *et al* 2006) but the comparative advantage of Integrated Parasite Management to reduce the cost of worms requires further investigation. The aim of this experiment was to contemporaneously determine the cost of worm infection on farms with either integrated (IPM) or regionally 'typical' (TYP) programs for worm control.

At six properties (IPM n=3, TYP n=3), two mobs (1 and 3-4 years of age) of Merino ewes (>300 animals per mob) were chosen at shearing in 2007. Within each mob, animals were randomly allocated to receive either IPM or TYP management (n=60) or 'worm-free' treatment (n=60). Worm-free treatment consisted of the oral administration of an albendazole capsule, an injection of long-acting moxidectin and an oral dose of an albendazole and levamisole combination drench. The treatments were repeated every 70-80 days. Allocations to treatment were swapped at shearing in 2008. TYP management properties did not monitor faecal worm egg counts or receive direct information or advice from project staff while IPM properties relied on the effective integration of chemical and non-chemical control methods. Recorded measurements for IPM and TYP groups are presented in Table 1 and are expressed as the difference from worm-free animals. Data were analysed using appropriate general linear models or parametric tests.

Table 1. Annual change in mortality rate, greasy fleece weight (LSM ± SE) and liveweight (LSM ± SE) for 1 year old and mixed age ewes from Integrated Parasite Management (IPM) and typical (TYP) treatments in relation to respective worm free animals.

	Year 1		Year 2	
	IPM	TYP	IPM	TYP
Mortality rate (% points)	-0.6	+9.9 [†]	+2.5	+0.3
Greasy fleece weight (kg)	-0.23* ± 0.04	-0.14* ± 0.05	-0.22* ± 0.05	-0.29* ± 0.05
Liveweight (kg/year)	-2.95* ± 0.42	-1.81* ± 0.35	-3.60* ± 0.44	-3.18* ± 0.38

† Difference is significant based on Wilcoxon rank test (P<0.05).

* Difference is significant from least squares mean (LSM) of worm-free treatment within management program (P<0.05).

Worm-free groups produced more wool and had greater liveweight gain than IPM and TYP. Higher mortality rates were observed with TYP management in year 1. Yearly average worm egg counts were lower on IPM compared to TYP properties for both years but were significantly reduced on TYP properties in year 2 (Year 1: 651 vs 1857 eggs per gram, Year 2: 694 vs 1345 eggs per gram). IPM properties had fewer anthelmintic treatments than TYP (3.4 vs 4.5 treatments per year) with a lesser use of persistent anthelmintics (27% vs 40% of treatments). The cost of worms on IPM and TYP properties was \$4.88 (or 7% of gross margin) and \$6.65 (or 12% of gross margin) respectively.

Results confirm the significant cost of worms for a northern, summer rainfall region. Integrated parasite management consistently controlled worm populations as demonstrated by lower yearly average worm egg counts. These benefits will translate into significant financial and welfare advantages for IPM when compared to TYP and provides proof of concept for industry adoption of IPM. Further investigations will determine the potential of IPM to delay development of anthelmintic resistance.

Sackett D, Holmes P, Abbott K, Jephcott S, and Barber M (2006). *MLA Report AHW.087*
Scrivener C.J., Kahn L.P. and Walkden-Brown S.W. (2006). *Proc. Aust. Sheep Vet.* **16**, 27.

Email: gkelly4@une.edu.au