Lamb liveweight gain on kura clover-ryegrass and white clover-ryegrass swards at two levels of soil fertility

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Temporal and spatial variation in the performance of white clover (*Trifolium repens* L.) is viewed as potential limitation to reliance on this legume in temperate grasslands. One alternative is kura clover (*Trifolium ambiguum* M. Bieb) – a high nutritive value and persistent rhizomatous forage legume suitable for permanent pastures. A feature of kura clover's persistence in some rangeland environments is its ability to survive with only occasional applications P and S fertiliser. These characteristics make kura clover an attractive forage legume for low-input, pasture-based sheep production systems in temperate regions.

This study compared lamb production on 'Endura' kura clover-perennial ryegrass (*Lolium perenne* L.) (KC-PR) and 'Grasslands Demand' white clover-perennial ryegrass (WC-PR) pastures under high and low soil P-S conditions in New Zealand. Clovers were established as monocultures in December 1996. 'Grasslands Ruanui' perennial ryegrass was direct drilled into the clover monocultures in March 1997. High P-S pastures received superphosphate fertiliser and had a mean soil Olsen P of 20 mg L^{-1} and SO_4-S of 11 mg kg^{-1}. Low P-S pastures received no fertiliser and had a mean soil Olsen P of 12 mg L^{-1} and SO_4-S of 7 mg kg^{-1}. Pastures were irrigated and rotationally stocked with 'Coopworth' ewe lambs using a variable stocking rate. Lamb production and pasture variables were measured over three grazing seasons (September to May) from 1998 to 2001.

Mean annual lamb production was greater for KC-PR than WC-RG at 1178 and 1069 kg ha^{-1} under high P-S and 1094 and 1015 kg ha^{-1} under low P-S conditions, respectively. Average daily gain was higher for KC-PR (141 g $head^{-1}$) than WC-PR (129 g $head^{-1}$) under both P-S conditions. Grazing days and herbage mass were greater under high than low P-S conditions, but similar for both clovers. Mean annual legume content for KC-PR and WC-PR was 25% and 16% in 1998/1999, 18% and 11% in 1999/2000, and 13% and 6% in 2000/2001, respectively. Crude protein and metabolisable energy concentrations in clover herbage were similar for both clover species averaging 290 g kg DM^{-1} and 12.5 MJ kg DM^{-1}, respectively. There was no effect of P-S on legume content or nutritive value. The greater lamb production on KC-PR was attributed to the ability of kura clover to produce more legume of similar nutritive value to white clover under both P-S conditions.