

Economic analysis of benefits from grazing standing lupin crops in a mixed farm enterprise in south-west Western Australia

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Abstract

Context. In the south-west of Western Australia, weaned lambs typically graze dry annual pastures and crop stubbles during late spring, summer and autumn. The low energy and protein content of these feeds typically means that lambs are supplemented with concentrates to achieve target growth rates. Fully mature, standing lupin crops that could be harvested may provide higher quality feed than dry pasture and crop stubbles over this period. **Aims.** This study tested the hypothesis that the incorporation of standing lupin crops for grazing will increase whole-farm profitability. Furthermore, we aimed to quantify the relative contributions of stocking rate, sale value of lambs, weaner survival rate and ewe lamb reproduction to this increase in farm profit. **Methods.** Whole-farm bioeconomic modelling was used to assess the profitability of grazing standing crops in a mixed farming system. An analysis was conducted for a representative mixed farm in southwest Western Australia with a self-replacing Merino flock, and the profitability of grazing either oat or lupin crop was assessed based on whether it was harvested or grazed. A sensitivity analysis was then carried out to test the robustness of the results and understand the role of standing crops in a mixed farming system. **Key results.** Grazing lupins grown on 7% of the total farm area increased whole-farm profitability by almost AUD\$30,000 or AUD\$200/ha of standing crop. In this environment, across a range of assumed crop yields and prices, it was always more profitable to graze standing

lupins rather than harvest the lupins. The increase in profit was primarily due to an increase in stocking rate of 1.2 dry sheep equivalent per hectare when able to graze the optimum area of standing lupins compared to when there was no standing crop. In addition to the increase in stocking rate, revenue from sheep sales increased with the Merino wether and mixed sex crossbred weaners sold for an extra AUD\$13 per lamb when stocking rate was constrained to the optimum when there was no standing lupin crop. **Conclusions.** This analysis demonstrated that in the south-west of Western Australia grazing standing lupin crops was always more profitable than harvesting the grain. **Implications.** If lupins are included in crop rotations in this environment profit will be increased if they are grazed, it is also clear that stocking rate should be increased to fully capitalise on potential gains in farm profit.