

Economic evaluation of establishing pasture legumes in the Brigalow Belt

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Introduction

Pasture legumes are the best long-term management option for increasing productivity and profitability from grass dominated pastures in the Brigalow Belt bioregion through improving pasture yield and livestock performance. However, successful adoption rates of legumes remains low with poor establishment being a common reason for failure in commercial paddocks. This paper summarises findings of a recent economic evaluation (Thompson et.al 2025) of 29 leucaena, desmanthus/stylo (Des/Stylo) and medic establishment options currently available to producers on high, moderate, and low productivity (and non-arable) land types. The findings aim to inform future investment decisions for producers and industry research and extension.

Methods

This evaluation defines the processes and costs to establish legumes on a 500 ha production paddock and quantifies the additional ongoing expenses and impacts on pasture and cattle production and gross margins over 30 years. Establishment methods included cultivation and planting in one-pass (low cost; Low\$), whole paddock (high cost; Hi\$) and cultivated strips (Strip). Failure rates were factored into the modelling along with fallowing and phosphorus fertiliser application (+P). Investment performance was measured using discounted cashflow analysis by calculating the marginal differences in cash flow between the base scenarios for each productivity zone and the legume scenarios.

Results

The 2 best performing options for each investment performance measure are shown in Table 1. Establishing leucaena increased profitability most on high and moderate productivity land but did not rank as well in other measures. Establishing Des/Stylo in strips performed well across all metrics on all land types including increased profitability, high rate of return, fast payback and low cash flow deficit.

Table 1. Top two performing legume establishment options (modelled on 500 ha).

Land productivity	Largest increase in profitability (\$million)	Highest % return per \$ invested	Fastest payback (years)	Lowest cash flow deficit (\$million)
High	Leucaena 1.5	Des/Stylo Strip 62%	Des/Stylo Strip 8	Medic Low\$ -0.05
	Des/Stylo Strip 1.3	Medic Low\$ 39%	Medic Low\$ 8	Des/Stylo Low\$ -0.1
Moderate	Leucaena +P 1.7	Des/Stylo Strip 513%	Des/Stylo Strip 6	Des/Stylo Strip -0
	Des/Stylo Strip +P 1.5	Des/Stylo Strip +P 337%	Des/Stylo Strip +P 6	Des/Stylo Strip +P -0
Low: Arable	Des/Stylo Strip +P 0.9	Des/Stylo Strip +P 50%	Des/Stylo Strip +P 8	Des/Stylo Strip -0.06
	Des/Stylo Hi\$ +P 0.8	Des/Stylo Strip 38%	Des/Stylo Strip 8	Des/Stylo Strip +P -0.07
Non-arable	Stylo Strip 0.1	Stylo Strip 15%	Stylo Strip 19	Stylo Strip -0.06

Discussion and conclusion

Establishing leucaena and Des/Stylo in strips were the most profitable options but success depends on the constraints each grazer faces (borrowing capacity, workload, climate, soil). Key considerations include better soils increase available options and profitability, applying phosphorus fertiliser increases profitability when it is a constraint, and successful establishment through planning and implementing suitable agronomic techniques is key to reducing risk. While establishing legumes increases short-term risk and may not be every graziers' solution, the potential economic rewards can be substantial.

References

Thompson, et al., (2025). Economic evaluation of establishing pasture legumes in the Brigalow Belt. Queensland: Department of Primary Industries

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