Northern Gulf - Factsheet 3: Over-sowing native pasture with stylo and applying adequate phosphorus to deficient soil can improve profitability

Managing a grazing business in the Northern Gulf presents significant challenges including tough climatic conditions and low levels of productivity. The economics of over-sowing native pastures with stylo was analysed by Queensland's Department of Primary Industries to determine if it could improve the profitability of Northern Gulf grazing businesses.

Key finding

Over-sowing native pasture with stylo was found to increase profitability, which varied depending on strategy and pasture utilisation.

Applying adequate P fertiliser to stylo pastures with P-deficient soils further increased profitability.

The evaluation involved developing a modelled property on typical infertile soils to assess several different strategies. Strategies one and two included over-sowing native pasture with stylos for steers on one 500 ha paddock but grazed at two different pasture utilisation rates (20% and 40%). A utilisation rate of 40% was found to be sustainable in well-managed sown pastures. Occasional wet season spelling is also recommended. A third strategy assumed stylo pasture was already established but the soil was phosphorus (P) deficient, so examined applying P fertiliser to the stylo pasture to increase growth. A fourth strategy examined over-sowing native pasture with stylo across enough area to graze all steers on the 30,000 ha property from weaning to sale.

Stylo establishment

A four-year pasture development process was modelled, removing steers, burning and aerially sowing seed ($9/ha) plus building additional fencing and watering points in the first year (development costs of $40/ha). Cattle were grazed from May to December in the second and third years and then year-round grazing commenced from the fourth year. An uncoated seed mix (2 kg/ha at $14/kg) of 3/4 Seca and 1/4 Verano was used for the stylo mix.

Applying adequate P fertiliser to P-deficient soils (4 ppm) improves stylo growth. Most stylo species suitable for the Northern Gulf require at least 8 mg/kg of P in the soil to maximise yield potential. The analysis assumed that 100 kg/ha of triple superphosphate (20 kg/ha of P) was applied in the first year and then 25 kg/ha (5 kg/ha of P) every two years thereafter to maintain P levels. Triple superphosphate was costed at $890/t ex GST and spread at $12/ha.

Production traits

Strategy	Native pasture	New stylo	New stylo	Established stylo + P
Pasture utilisation	***20%***	***20%***	***40%***	***20%***
Dry matter produced (kg/ha)	1,500	2,500	2,500	3,500
Digestibility	49.5%	54%	54%	54%
Carrying capacity (ha/AE)	13.4	7	3.5	2
Steer liveweight gains	113 kg	158 kg	159 kg	190 kg

The table to the right compares the production traits for native pasture only (including safe stocking, wet season spelling and adequate wet season P supplementation) with stylo at a 20% or 40% utilisation rate. Over-sowing native pasture with stylos was expected to produce more dry matter and increase digestibility, carrying capacity and steer liveweight gains – with the advantage occurring when stylo is selectively grazed in the late wet and dry seasons. Applying P fertiliser to stylo pasture was anticipated to increase the amount of dry matter even more and provide further improvements to carrying capacity and steer liveweight gains.

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Development strategy – stylo for all steers

On native pasture, steers were allocated 5,579 ha and the breeding herd 24,421 ha (30,000 ha total). Introducing stylo increased steer carrying capacity per ha and reduced the area needed to graze steers, thus freeing up area to sustainably run additional breeders and produce more weaner steers. Over-sowing 3,530 ha of native pasture with stylos provided an appropriate balance between an expanded breeder herd and suitably sized stylo-grass paddock to grow all the steers on the property from weaning to sale. The expanded breeder herd increased the number of weaner steers produced from 230 to 260 each year. The analysis assumed 700 ha of stylo was over-sown each year for 6 years and that 83% of the area was successfully established.

Were the changes profitable?

The table below presents results from an investment analysis evaluating changes in cash flow that occurred over 30 years (5% discount rate applied) for each stylo strategy and utilisation rate. The results identified that over-sowing native pasture with stylos on a 500 ha paddock increased profitability each year by $5,100 (annualised net present value) relative to native pasture if pasture utilisation remained at 20%, or $17,300 if utilisation increased to 40%. Based on average cattle prices (2006-18) and 2018 costs, up to $98,100 (20% utilisation) or $286,000 (40% utilisation) could be spent to establish the stylo paddock before the investment became unprofitable (the breakeven point).

Applying P fertiliser to the established stylo pasture (20% utilisation) increased profitability each year by a further $12,700.

Strategy	Utilis-ation	Area (ha)	NPV ($/yr)	Rate of return	Payback period	Peak deficit
New stylo paddock	20%	500	$5,100	11%	12 years	-$66,400
New stylo paddock	40%	500	$17,300	20%	9 years	-$92,700
Established stylo + P	20%	500	$12,700	22%	6 years	-$70,600
New stylo for all steers	20%	3,530	$31,000	10%	15 years	-$270,600

Over-sowing native pasture with stylos across enough area to graze all the steers (3,530 ha) increased profitability each year by $31,000 relative to native pasture. Up to approx. $650,000 could be spent to establish the stylo before the investment became unprofitable (breakeven).

Please note, these results are specific to the assumptions used for the analysis.

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