



INTEGRATING IRRIGATED PASTURES INTO BEEF OPERATIONS IN THE KIMBERLEY REGION

BACKGROUND

Irrigated and fertilised pastures, either for stand and graze or hay, offer a means of improving the nutrition of cattle in the Kimberley, especially during the dry season when cattle struggle to maintain weight. Most efforts to date have focussed on technical aspects of establishing pivot irrigation systems and learning to manage the irrigated pasture for optimal animal performance.

There has been relatively little focus on how forages might be best integrated into a whole of enterprise beef operation. CSIRO has developed a beef systems model to explore how irrigated forages can be integrated into extensive breeding enterprises. The model grows animals based on energy and protein of native and irrigated pastures and cows conceive according to body condition score. Costs of production and revenue are included so as to examine enterprise profitability.

SIMULATING USE OF IRRIGATED FORAGES BASED ON MOWANJUM RESULTS

For the assessment of irrigated forages, a baseline property of 300,000ha was used, assuming a mix of Pindan and spinifex country. The property runs breeders and produces young animals (male and female) for live export (350 - 400kg target weight). Sale price was assumed to be \$3.00/kg and total herd size was 6774 AE.

For the irrigated forage scenarios, well managed Rhodes grass was used based on pivots supplied by groundwater. This assumed irrigation was available year-round and high levels of nitrogen were applied (400-500kg N/ha) to try to maintain high protein and energy levels in pasture.

Two scenarios were used for irrigated Rhodes grass. One involved grazing all young animals destined for export (all weaners, steers, surplus females) on 250ha of pivots (5 pivots) with the aim of reaching a target weight of 450kg by 30 months of age. The second scenario grew 100ha of Rhodes grass hay with hay being used as part of an early weaning strategy (animals weaned at 80kg) to improve branding rates with excess hay being sold on the local market at \$160/tonne.



Grazing of irrigated Rhodes grass under the first scenario greatly increased annual liveweight gains of grower animals from 119kg/year to 259kg/year (or 0.70kg/day weight gain). These liveweight gains are consistent with more recent results from Mowanjum. Annual forage production was around 35 tonnes of dry matter/ha which again is consistent with the results from Mowanjum. Grazing irrigated Rhodes grass had some flow-on benefits to the breeder herd with branding rates increasing somewhat as a consequence of weaners getting good early growth and more native pasture available for breeders.

The best financial result was from growing hay used to support early weaning. Weaning calves at 80kg and feeding them in the yards for two months on high quality hay with some additional pellets, allowed breeders to regain body condition more quickly each year and this lifted overall branding rates from 53% to 64%. It was this increase in calf numbers and reduction in breeder mortalities that drove much of the additional profit rather than the hay per se.

However, this analysis does not include the capital costs of development, which for pivot operations in this region, may range between \$12,000 and \$20,000 per hectare. When capital costs are considered in a full investment analysis, returns on investment may be modest or even negative. It is therefore imperative that the return on investment from pivot irrigation is considered in terms of how the irrigation is integrated into the overall business and how it optimises the business performance.

Forage	None - baseline	Rhodes grass: live export	Rhodes grass: hay
Irrigated pasture area (ha)	0	250	100
Herd size (AE)	6,774	7,136	7,357
Pasture utilisation (%)	15	14.9	16.1
Weaning rate (%)	53	56	64
Annual growth (kg/animal)	119	259	118
Beef produced per year (tonnes)	683	1,043	874
Gross margin (\$/AE)	175	194	230
Gross margin (\$/ha)	3.94	4.6	5.63
Profit (EBITDA) (\$ m)	0.6	0.73	1.05
Marginal cost of beef produced from sown forages (c/kg beef)		261	86

Table 1. Effect of Irrigated Rhodes grass on animal performance and profit in an extensive breeding operation at Derby.

In the two scenarios considered in this analysis, returns on investment are likely to be higher for the early weaning scenario, which requires much lower overall capital investment but which has good annual net returns.



Contact:

Andrew Ash
CSIRO
andrew.ash@csiro.au

