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## Liveweight performance of cattle grazing Redlands and Wondergraze leucaena north Queensland

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Leucaena is a rapid-growing, perennial legume which has potential to intensify beef production in the northern rangelands of Australia. Adoption of leucaena in north Queensland has been limited, in-part by the prevalence of the leucaena psyllid (*Heteropsylla cubana*). Psyllid infestations cause yield losses (Bray and Woodroffe 1991) and all cultivars previously used by industry are susceptible. *Leucaena leucocephala* 'Redlands' (R) released in 2018 has genetic resistance to psyllids with potential to increase leucaena productivity in psyllid prone regions and increase adoption. However, the performance of R under commercial grazing was untested and cattle grazing a leucaena palatability trial at Whitewater Station in north Queensland, initially grazed other leucaena varieties in preference to R (Keating 2019).

To address concerns about the commercial suitability of R, a 61 ha replicated grazing trial was established at Pinnarendi near Mt Garnet (18.043°S, 144.876°E; 760 m asl) to compare liveweight gain between R and the widely used *Leucaena leucocephala* 'Wondergraze' (W). There are four paddocks each of R and W. Trial design, establishment and management are previously described (Lemin *et al.* 2018). Pinnarendi has 690 mm aar (highly seasonal) and red-earth soils (pH ~6.4) with low fertility. Inter-row pasture comprises grasses *Bothriochloa pertusa*, *Urochloa mosambicensis*, *Heteropogon contortus*, *Chloris gayana* and legumes *Chamaecrista rotundifolia*, *Stylosanthes spp.* Grazing by Brahman (*B. indicus*) and Droughtmaster (*B. indicus* x *B. taurus*) weaner steers was conducted for a minimum of 365 days for three cohorts. Animals were allocated to R or W treatments in even groups by weight and type and remained within treatments for grazing. Cohort 1 animals were rotated between paddocks; stocking was conservative. Cohort 2 animals were rotated between paddocks (overlapping Cohorts 1 and 3); stocking was low due to dry conditions. Cohort 3 animals remained within the same paddocks; stocking was maximised. Animals were weighed at about six weekly intervals (no curfew) and fed molasses (weekly) equivalent to 1 MJME/head/day for habituation to handling. Animals were offered commercial dry and wet season lick blocks comprising 30% urea and 8% phosphorus respectively; with intake monitored. Cohort 3 animals were administered either R or W adapted rumen inoculant (sourced from the DAF Tick Fever Centre).

Cattle readily consumed R (and W) across all cohorts and years. Cooler temperatures and low soil moisture constrained leucaena productivity from about May to October in each year. Psyllids occurred at the site in all years but did not persist in sufficient numbers to cause yield loss. Liveweight, Average Daily Gain (ADG) and stocking rate are shown in Table 1 for each cohort. Average annualised liveweight gain ranged from 202–238 kg and 199–247 kg for R and W respectively. Data for Cohorts 1 and 3 was analysed by an analysis of variance for ADG and end weight. There was no significant difference between R and W for ADG ( $P = 0.343$  and  $P = 0.371$ ; Cohort 1 and 3 respectively) or end weight ( $P = 0.332$  and  $P = 0.416$ ; Cohort 1 and 3 respectively). No statistical analysis was conducted for Cohort 2 due to a lack of replication.

**Table 1. Liveweight, ADG and stocking for three cohorts of steers grazing Redlands and Wondergraze leucaena at Pinnarendi, 2018–2021 (mean ± standard error of mean)**

Cohort	No. of days	No. of head	Wondergraze				Redlands			
			Average start weight (kg)	Average end weight (kg)	ADG (kg)	Stocking rate (AE/ha)	Average start weight (kg)	Average end weight (kg)	ADG (kg)	Stocking rate (AE/ha)
1	368	28	232 ± 10	482 ± 11	0.68 ± 0.02	0.40	226 ± 7	465 ± 9	0.65 ± 0.02	0.39
2	372	14	267 ± 20	470 ± 20	0.55 ± 0.02	0.34	257 ± 21	463 ± 26	0.55 ± 0.02	0.33
3	367	42	265 ± 10	501 ± 10	0.64 ± 0.02	0.58	264 ± 10	478 ± 15	0.59 ± 0.03	0.57

AE, adult equivalent (450 kg steer at maintenance).

The trial has demonstrated equivalent liveweight performance for cattle grazing R and W. A productivity advantage from adopting R in psyllid prone environments was not demonstrated due to the absence of significant psyllid populations during grazing. Weight gains were measured at most weighing events over all years for both R and W. This is in contrast to animals grazing native pastures on red-earth soils in similar environments when weight loss is usual during the mid-late dry season due to low quality pasture. Under such conditions annual weight gains of 80–100 kg/head (ADG = 0.22–0.27 kg) at stocking rates of 0.10–0.13 AE/ha are typical (unpubl. data). Establishment and management costs and animal performance data from the trial will better inform producers considering leucaena adoption in north Queensland.

### References

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