



Maximising beef production and profits using high quality forages



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A joint initiative of:



Queensland
Government



Northern Territory
Government



Department of Agriculture and Food



mla
MEAT & LIVESTOCK AUSTRALIA

Are you?

- a beef producer using high quality sown forages
 - for example, leucaena, butterfly pea, oats, forage sorghum, lablab etc.
- a beef producer not yet using high quality sown forages
- an industry representative

If currently using high quality sown forages, do you?

- grow annual forage crops only
- grow perennial legume forages only
 - for example, leucaena, butterfly pea
- grow both types of forage

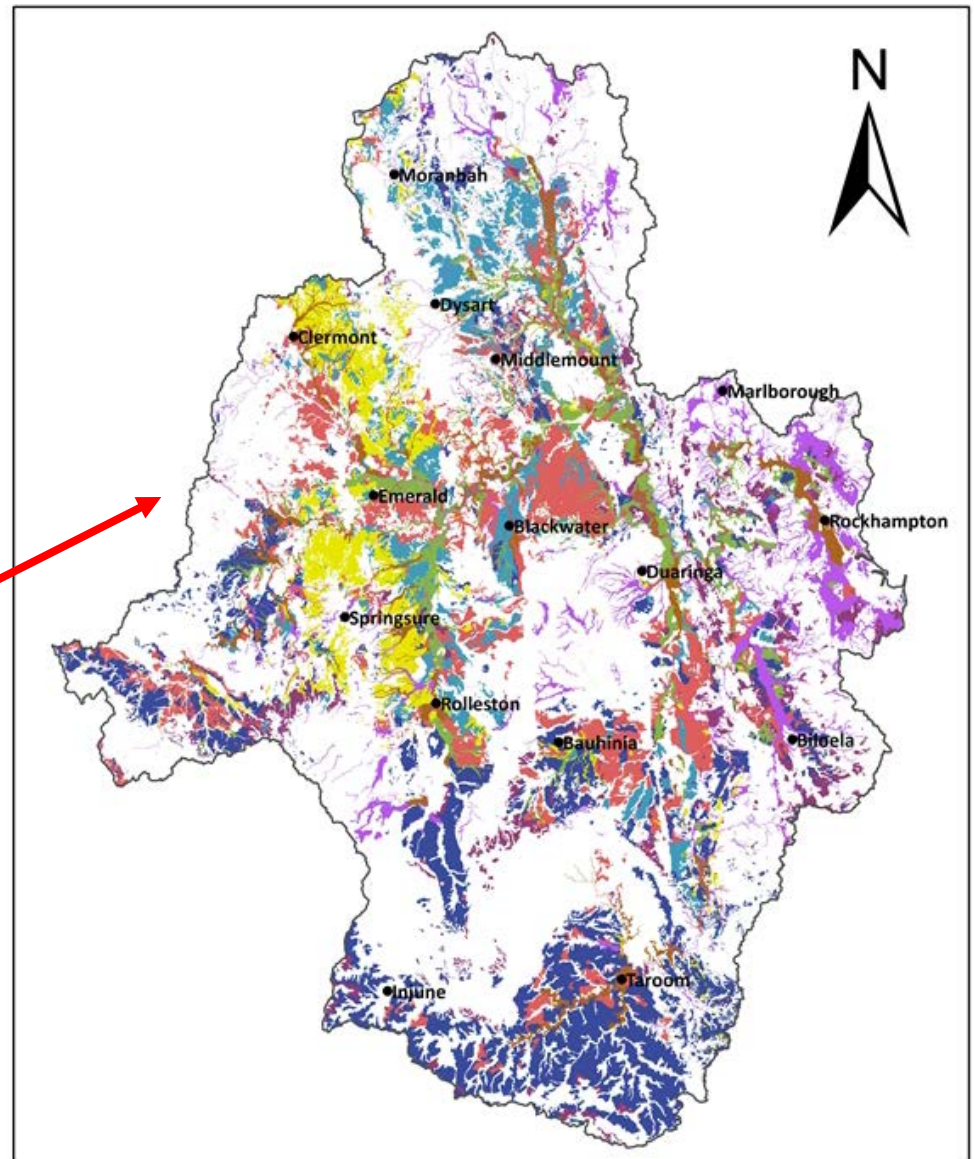
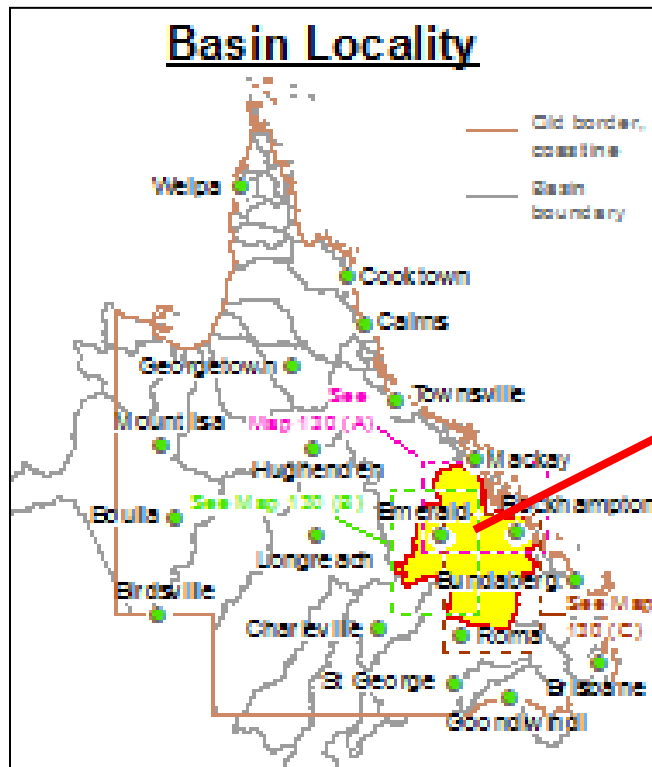
High-output forage systems for meeting beef markets - Phase 2



- DAF and MLA co-funded project: 2011 – 2015
- Objective:
 - to examine the relative **production** and **profitability** of alternative **forage options** for backgrounding and finishing cattle in the **Fitzroy River catchment** of Queensland



Fitzroy River basin - Queensland



Data from co-operator properties



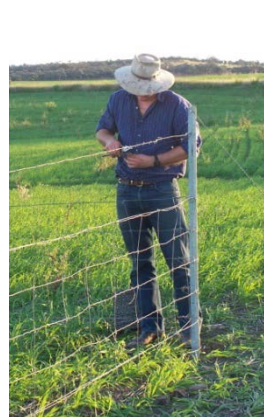
- 24 forage sites on 12 properties over 2011-2014
 - **annuals:** oats, forage sorghum, lablab
 - **perennials:** butterfly pea-grass, leucaena-grass, perennial grass-only as a comparison
- 3 regions within the Fitzroy River basin
 - CQ Open Downs, CQ Brigalow, SQ Brigalow



Data from co-operator properties



- monitored forage, animal and economic performance
- 31 individual data sets



Conclusions: forage production



	Annual forages			Perennial forages		
	Oats	Sorghum	Lablab	Leucaena-grass	Butterfly pea-grass	Perennial grass
Biomass in grazed pdk (kg DM/ha)	4,555	12,150	6,014	L: 417 G: 3,809	BP: 528 G: 4,591	3,702
Total forage growth (kg DM/ha)	8,184	19,307	9,637	n/a	n/a	n/a
Diet CP (% DM)	12.3	8.8	11.5	12.0	9.7	6.6
Diet DMD (%)	63	55	59	59	59	55

Biomass values are the peak for annuals and average over the duration of monitoring for the perennials. Leucaena biomass is only the edible material (<5 mm in diameter)

- Greatest biomass: sorghum
- Highest quality: oats (C3)
- Lablab and leucaena-grass also provided high quality diet



Conclusions: forage production



- Generally **soil fertility was low** and fertiliser application was not common practice
 - **soil N and P** likely to be limiting for many **annual forage crops**
 - **P** limiting for many **perennial legume-grass pastures**
 - Low soil N levels were reflected in low plant CP for some cereal crops
 - most extreme example was SQB Oats 2011: soil nitrate N was 42 kg/ha; green leaf CP was 4.5% at start of grazing



Conclusions: animal production



	Annual forages			Perennial forages		
	Oats	Sorghum	Lablab	Leucaena-grass	Butterfly pea-grass	Perennial grass
Total LWG (kg/ha/yr)	93 (38-144)	108 (41-253)	99 (41-156)	198 (129-306)	125 (50-245)	76 (0-169)

Total LWG values are per total grazing area in each paddock; range of values across all sites shown in brackets

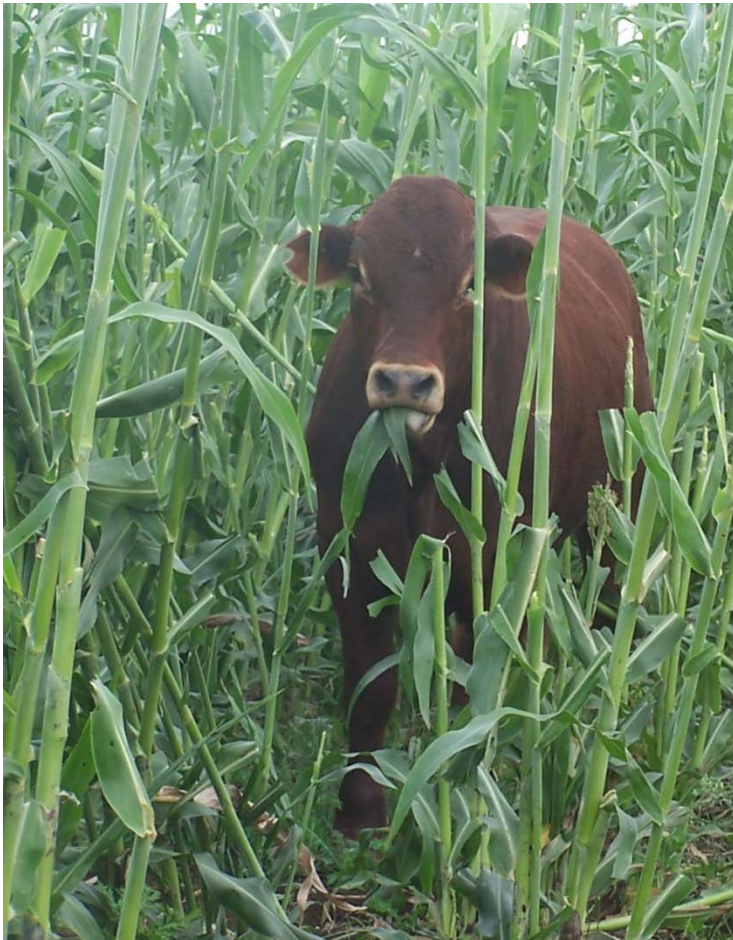
- Sown high quality forages increase beef output
- leucaena-grass beef production 2.6 times > than grass-only
- Forage sorghum: similar beef production to oats and lablab although twice as much forage biomass



Conclusions: animal production



- Grazing management may be limiting productivity and profitability of annuals, especially of forage sorghum
 - generally grazing started too late and stocking rates were too low



Conclusions: animal production



- Maximise profitability by **selling cattle straight off forage**
 - cattle returned to perennial grass pastures will lose their liveweight advantage due to **compensatory gain** effects
 - compensatory gain in such circumstances generally mean it is uneconomic to feed forages to **growing stock**
- Better **monitoring of cattle weight gain** may allow more optimal timing of sale and maximise cattle price margin



Questions, comments?



Type your questions
here anytime

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Conclusions: gross margins



	Annual forages			Perennial forages		
	Oats	Sorghum	Lablab	Leucaena-grass	Butterfly pea-grass	Perennial grass
Forage costs (\$/ha/yr)	136 (93-193)	96 (16-169)	99 (85-113)	34 (17-47)	21 (21-21)	2 (0-5)
Gross margin (\$/ha/yr)	131 (54-197)	54 (-48-243)	44 (38-50)	184 (90-304)	143 (34-379)	98 (-5-285)

Owner rates; forage costs per sown forage area only; gross margin per total grazing area



Conclusions: gross margins

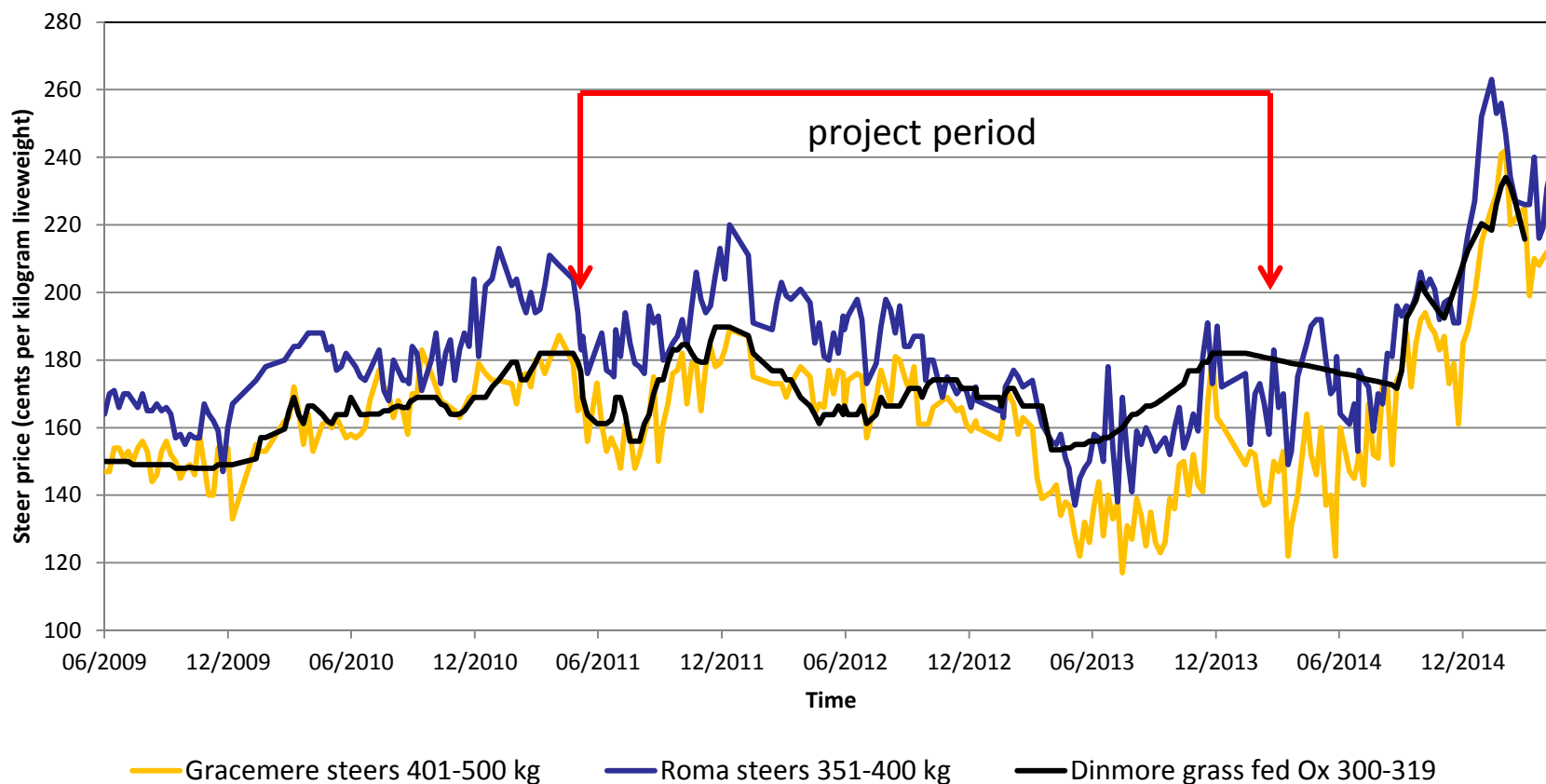
- Profitability was the combined result of
 - forage and beef production (kg/ha)
 - forage costs (\$/ha)
 - cattle price margin (sale less purchase price; \$/kg LW)
- influenced by management, seasonal and market factors



Prices and gross margins



- Gross margins were calculated on the basis of the market prices available when cattle were placed on the forage and removed from the forage
- The variability in purchase and selling prices over the various grazing periods was reflected in the variability of the gross margins produced



Paddock result vs. whole farm



- Gross margins are the **first step** in determining the effect of sown forages on farm profit
 - they show whether the forage activity makes a profit or loss, at the paddock level
- To determine the value of the sown forage system to the **whole farm** or business, **a more complete economic analysis** is required



Whole farm economic case studies



- value of the sown forage system to the 'whole farm' or business, relative to other alternatives, e.g. perennial grass or grain crop
- compare the net profit generated by alternative operating systems
- include changes in un-paid labour, herd structure and capital



Conclusions: whole farm case studies



- Perennial legume-grass pastures, particularly leucaena
 - currently have a significant economic advantage over
 - annual forages, and
 - perennial grass pastures
 - not as profitable as grain cropping where it is a feasible alternative
- Annual forage crops
 - generally only add value to the beef enterprise if the opportunity cost of plant and unpaid labour are excluded



Constructed scenarios



- modelled scenarios
- use long-term average seasonal conditions and market prices
- standard management practices



Constructed scenarios



- results generally corroborate those from co-operator sites
 - same average ranking of forages for gross margin
 - except for perennial grass (6th for constructed scenarios but 4th for co-operator sites)



In summary, top tips....

To maximise **productivity** and **profitability** of sown forages:

- Ask the right questions
 - What is the purpose of the forage?
 - What forage types are best suited to my land type and production system?
 - What is the expected forage and cattle production?
 - What is the likelihood of the forage improving my business profitability?
- Plan ahead
- Use **best practice** agronomy and animal management
- Collect **data** and do the sums



Do the project results?

- confirm what you already thought/knew
- contrast with your own experience/figures
- unsure/need more information

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Modelling and DST development



- Data from field sites used to evaluate forage and animal models
- Forage models
 - GRASP
 - predicted un-grazed and grazed grass biomass satisfactorily
 - APSIM
 - Satisfactory prediction of un-grazed oats biomass
 - Under-predicted un-grazed forage sorghum and lablab biomass
 - Effects of grazing on annual forage biomass was poorly predicted



- Animal models
 - GrazFeed model under-predicted LWG of cattle grazing forage crops
 - Simple forage utilisation equation deemed most appropriate for use in simple DST
- Prototype DST, 'ForageARM' has been developed
 - Example of what might be possible if models can be improved



Extension products and activities



- Producer guide to forage use has been produced: 'Feeding forages in the Fitzroy'
- Forage gross margin calculators/spreadsheets
- Fitzroy Basin Field days

You are invited to a...



High Output Forages Field Day

Forage sorghum, lablab, oats, leucaena & perennial pastures



Locations and dates:

Clermont	2nd June 2015	8:30am – 3pm	Jim Fletcher	(07) 4967 0731	jim.fletcher@daf.qld.gov.au
Moura	3rd June 2015	8:30am – 3pm	Byrony Daniels	(07) 4983 7467	byrony.daniels@daf.qld.gov.au
Taroom	4th June 2015	8:30am – 3pm	Tim Emery	(07) 4622 9903	timothy.emery@daf.qld.gov.au

Contact:

Acknowledgements



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- We gratefully acknowledge the valuable contributions and input provided by **beef producers** across the Fitzroy River catchment who allowed collection of data from their forage paddocks and who provided information about their business to allow development of farm economic case studies.
- **The DAF project team:**
 - Dr Maree Bowen, Stuart Buck, Fred Chudleigh, Kylie Hopkins, Debra Corbet, Tim Emery, Byrony Daniels, Jyoteshna Owens, Jason Brider.



For more information...



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