Developments in the design and management of the feedbase

www.csiro.au

Dean Thomas

CSIRO Agriculture and Food

21st August 2019

Summary

- WA mixed farming feedbase
- Feedbase innovation
- Modern Stubbles project
- Data to information for decision making

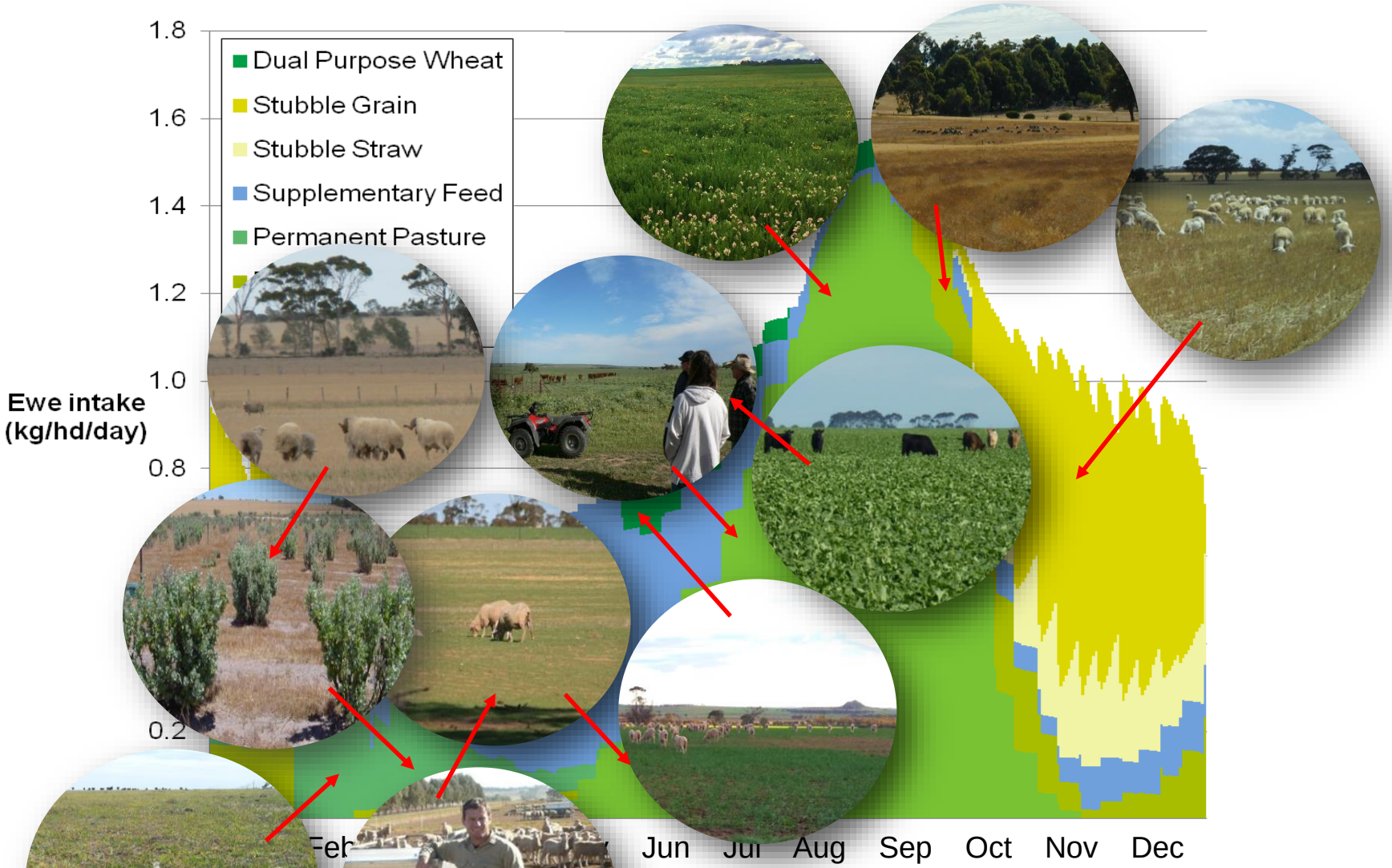
Improving the farm feedbase

- Composition of annual pastures?
- Increase/improve the area of perennials?
- Getting the most out of stubbles? Chaff piles?
- In-season tactics to improve feed access?

  e.g. pasture phases, forage crops, dual-purpose crops, sacrificial crops
- Adjust stocking rates and timing (e.g. lambing) in the livestock enterprise?
- Changes to feedbase informed by long-term climate data?
- Forage conservation; grain, hay, silage?
- Use of digital decision support technologies?

Improving the amount, diversity, and quality of the feedbase

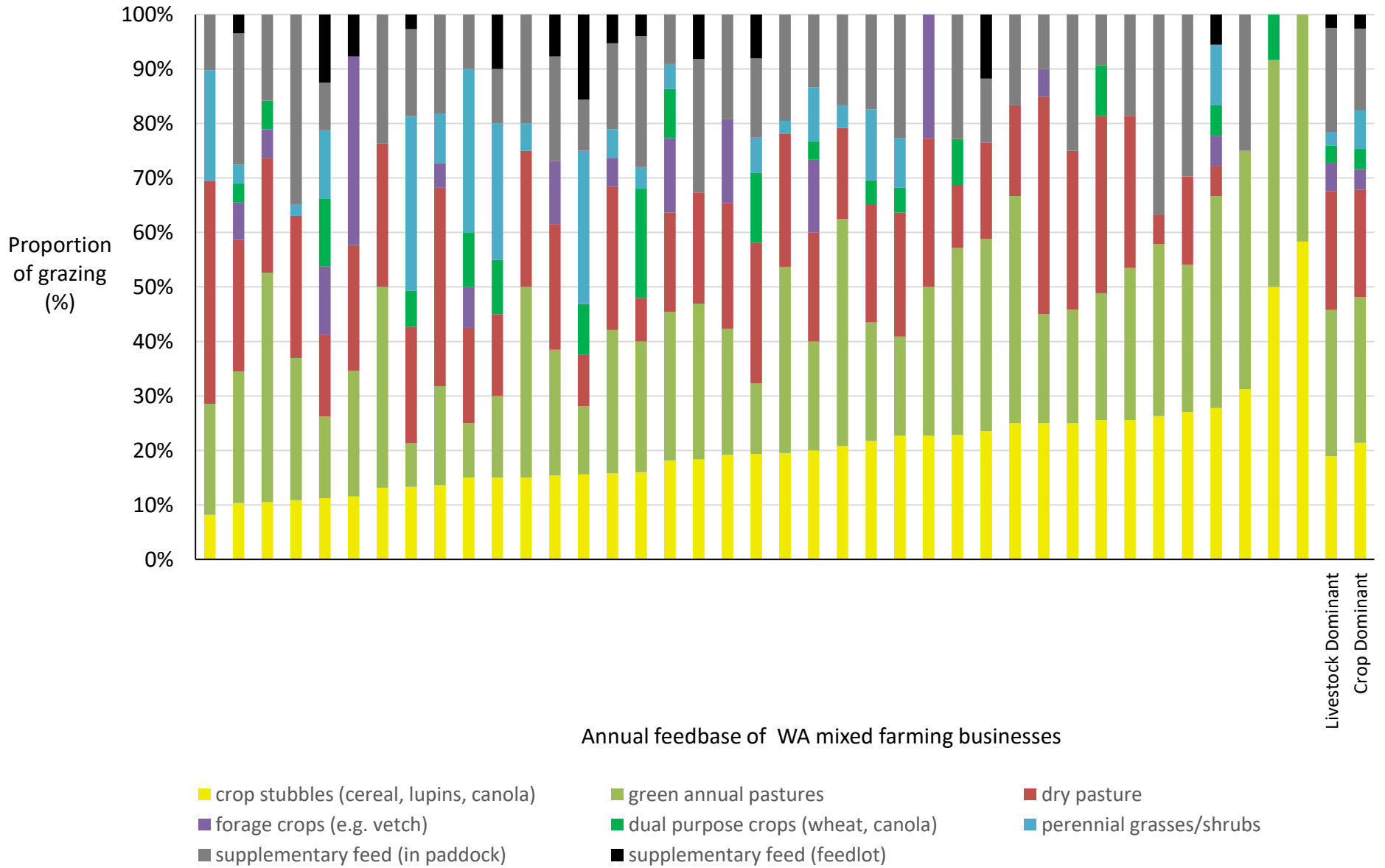
Feedbase in Mediterranean-type mixed farming



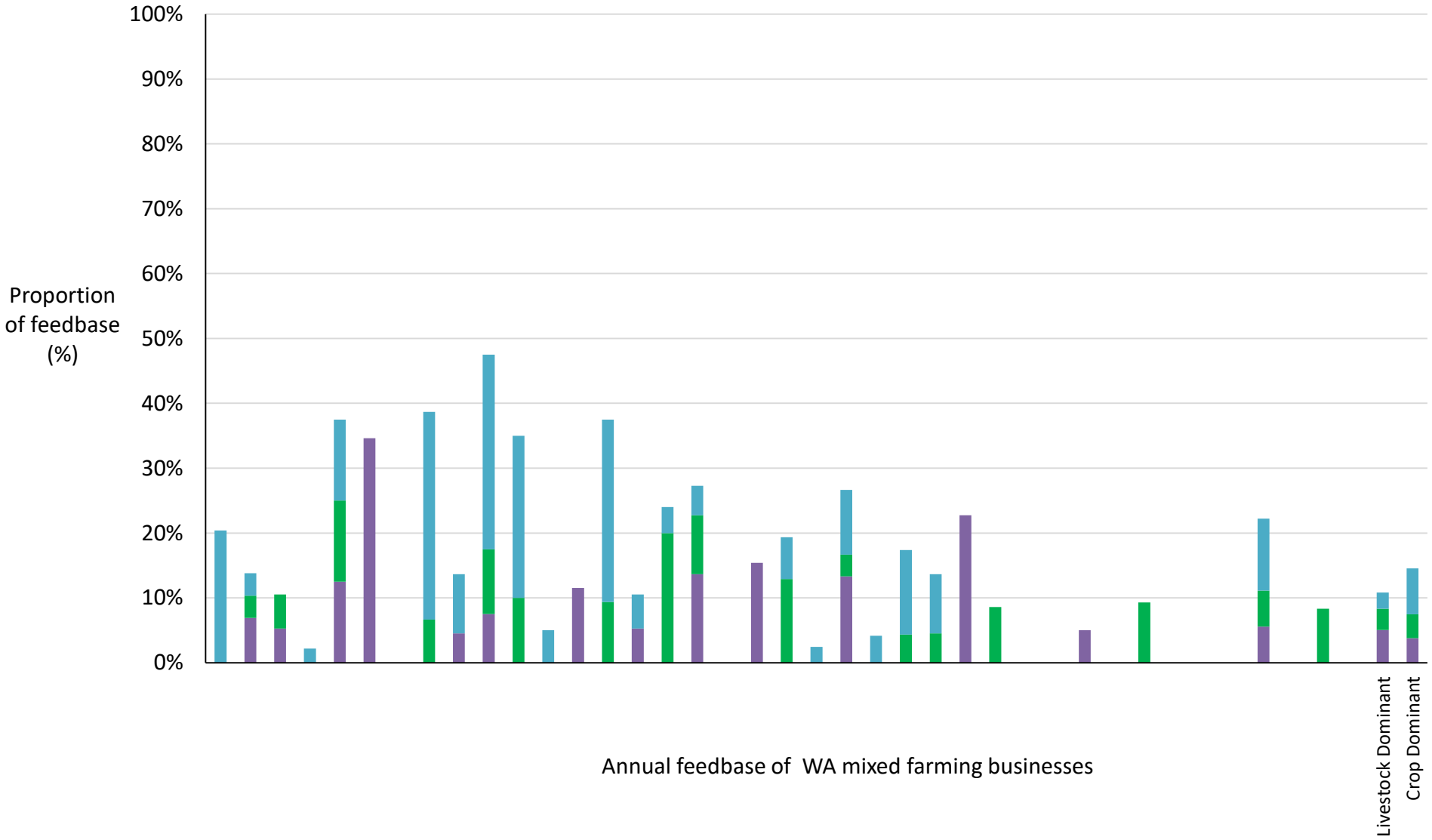
AusFarm

CSIRO

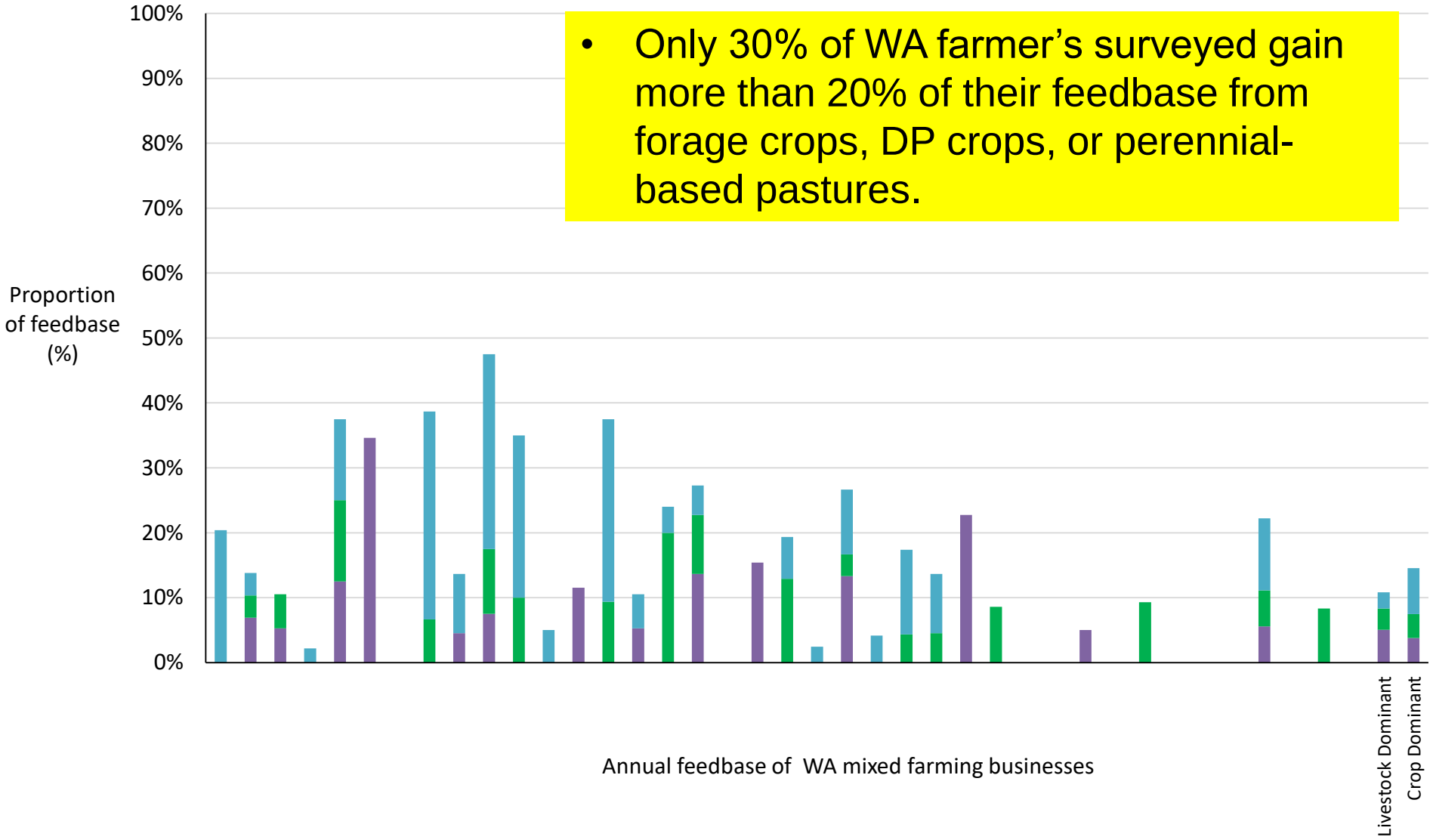
Feedbase survey



Forage for the autumn/winter feed gap



Forage for the autumn/winter feed gap



Feedbase diversity

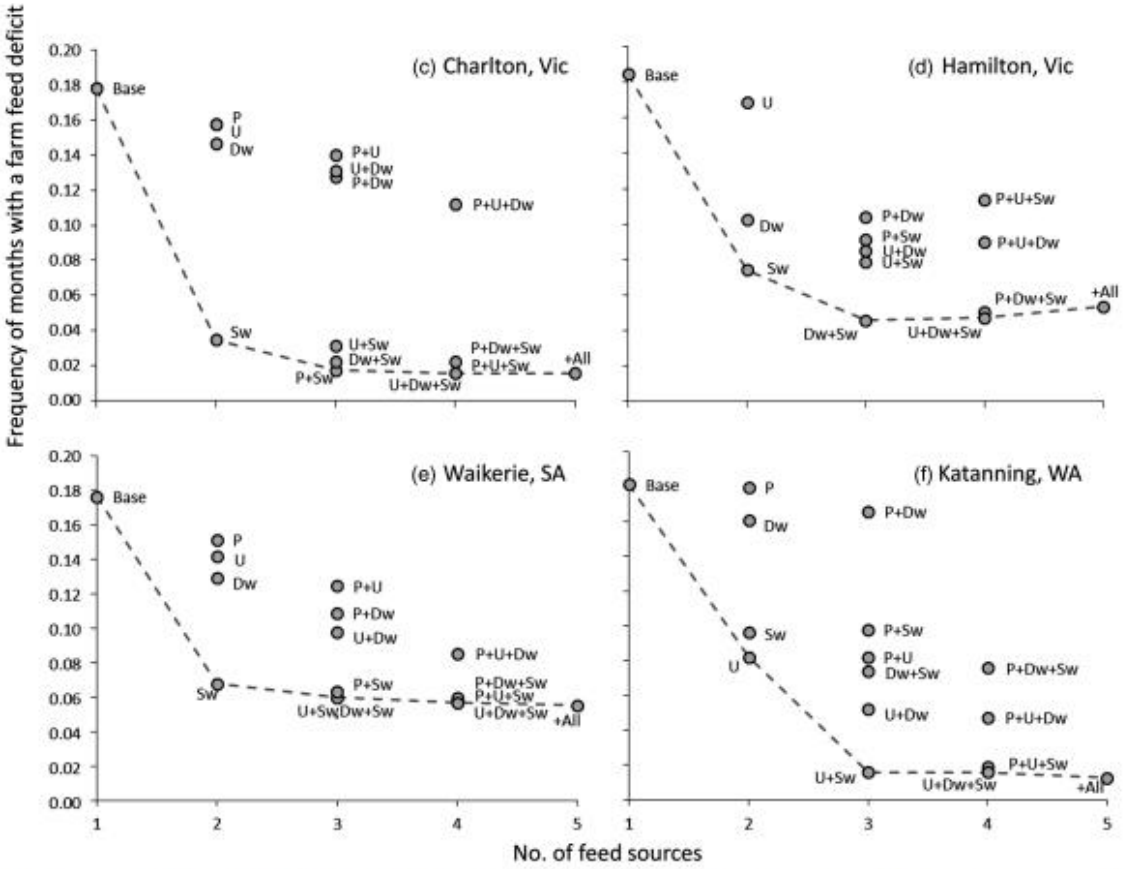


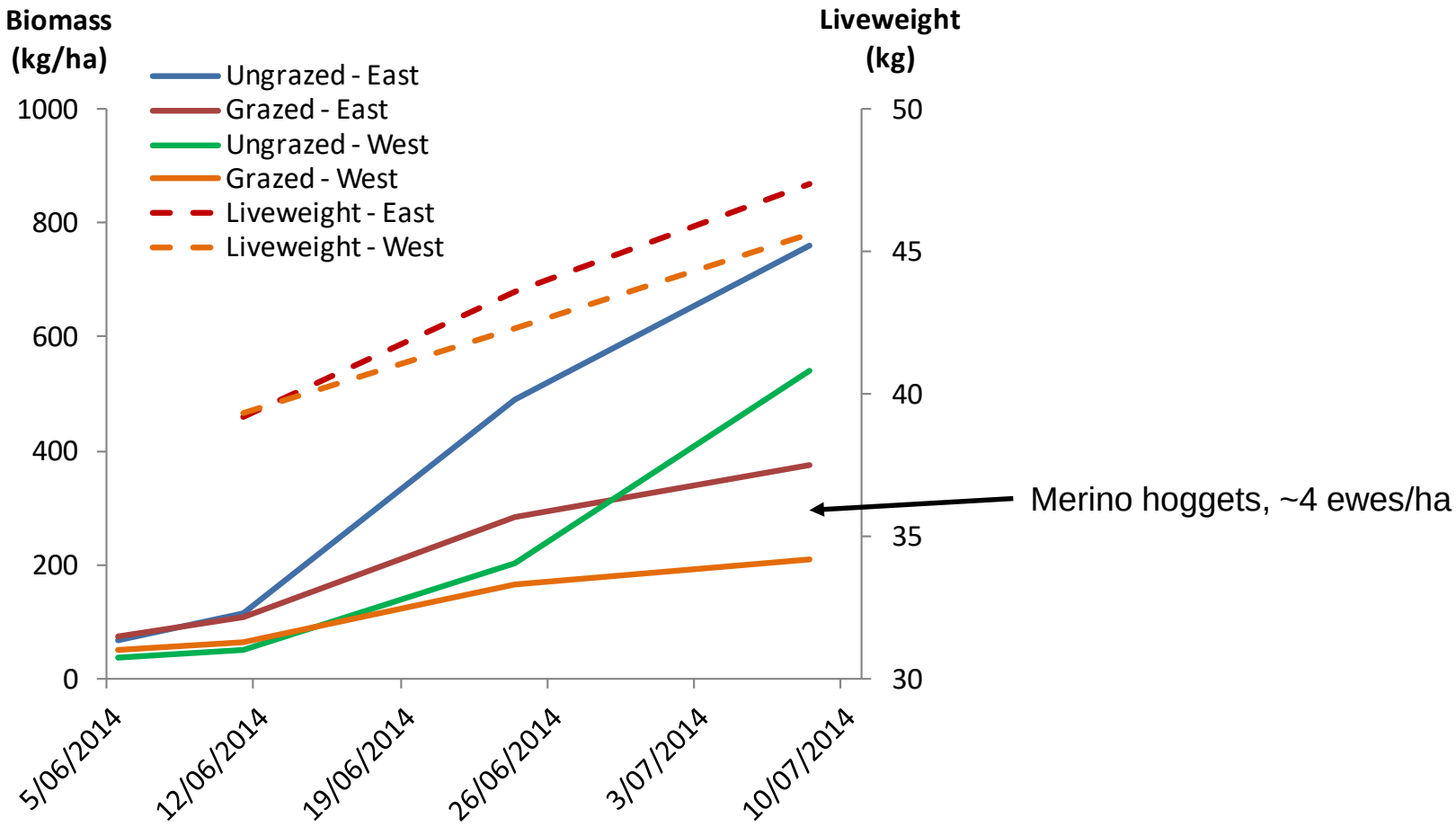
Figure 5 Frequency of months when farm feed supply (including carry-over) is insufficient to meet livestock demand under a diversity of feedbase combinations under high stocking rate scenarios across six locations (a–f; see Figure 3). Dotted line indicates the lowest risk scenarios as the level of feedbase complexity increases. Codes indicate the combination of feed sources (see Table 1).

(Bell *et al*. 2018)

Dual-purpose canola, Esperance

(*Photo credit: John Kirkegaard*)

Early grazing Magenta wheat, Tammin



(Moir, 2014; Honours thesis)

Pasture-cropping, Moora

Crop and location	Δ Crop production (%)	Δ Pasture production (%) Winter	Δ Pasture production (%) Summer	Net increase (%)
Buloke barley				
Cunderdin	-14	-70	-29	58
Jerdacuttup	-14	-38	23	81
Karoonda	-25	-92	-36	24
Mingenew	-37	-28	90	53
Moora	-14	-19	56	89

(Lawes *et al*. 2014; Thomas *et al*. 2014)

Biserrula, Tammin

(Revell and Thomas, 2004)

Anameka™ old man saltbush was selected from 60 000 plants for higher energy and 'palatability'

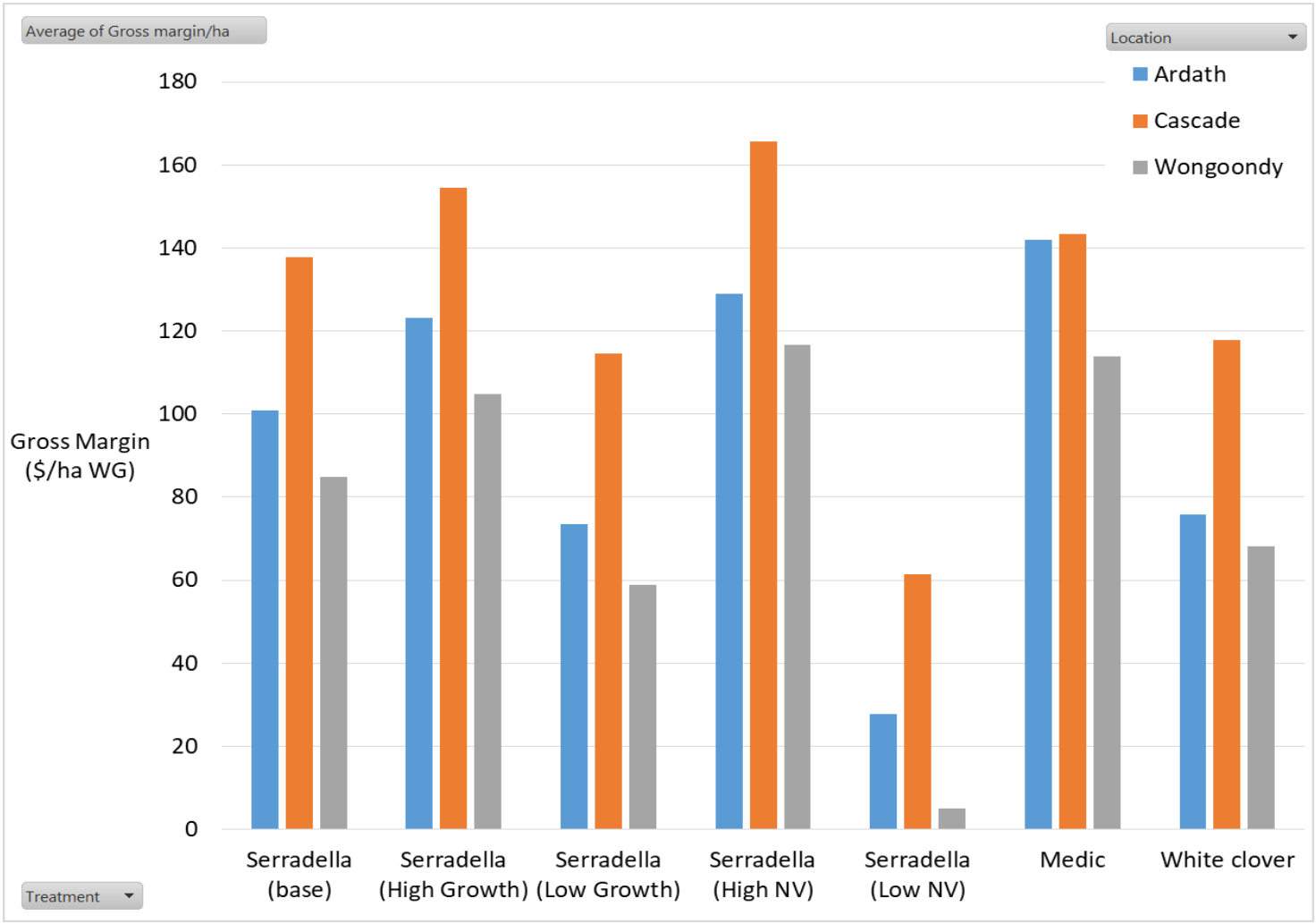
Compared to the mean of the collection...

- 15% units higher digestibility (OMD 64%)
- Preferred (higher voluntary intake)
- 8x more 'edible' biomass
- Easy to propagate
- No difference in field establishment & survival

(Norman *et al*. 2015)

Used science & sheep to identify elite plants

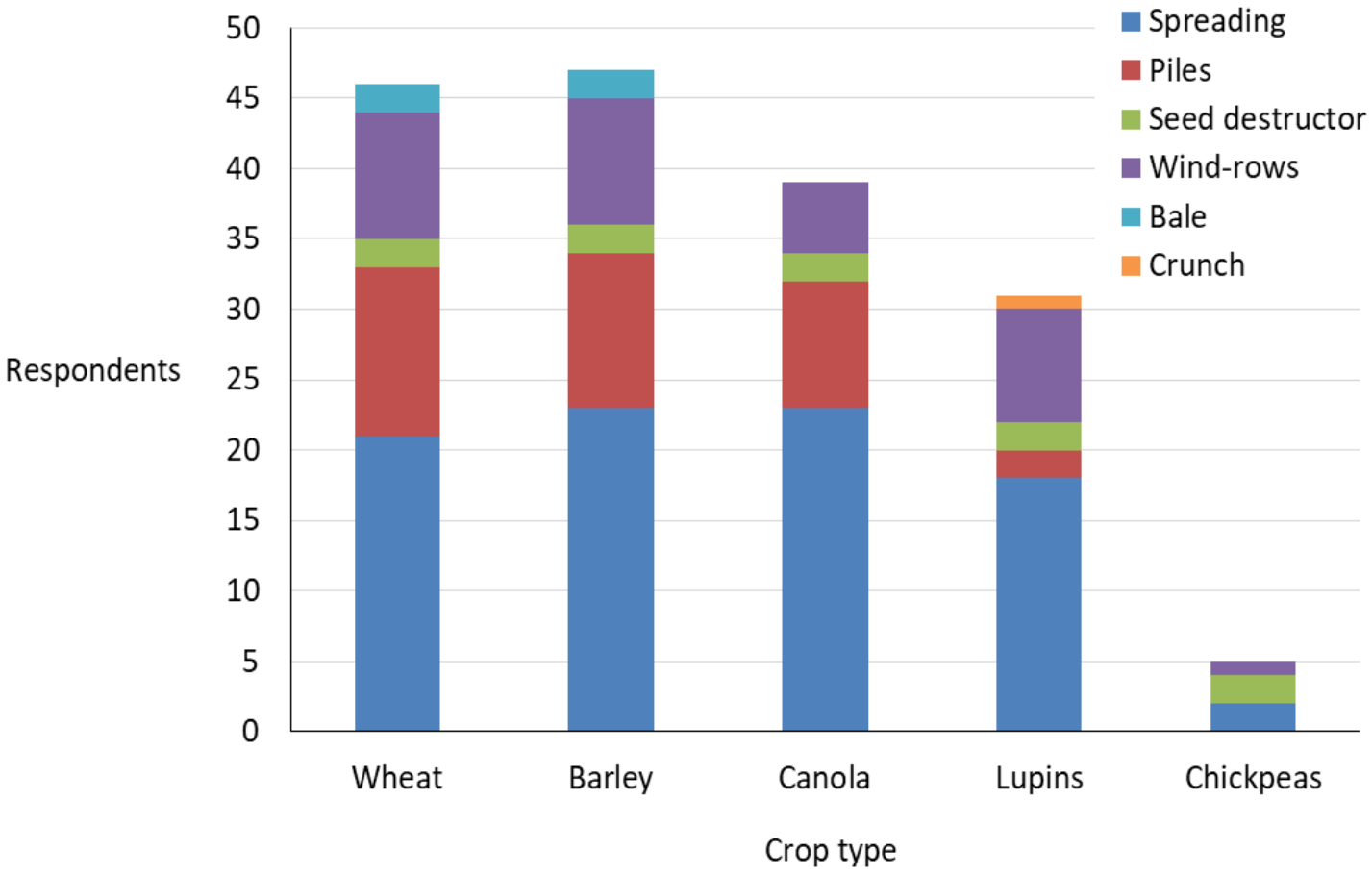
Pasture productivity and quality



Modern stubbles project

(Project team: Dean Thomas, Andrew Toovey, Elizabeth Hulm, Gonz Mata, Doraid Amanoel)

Header chaff management



Perceptions of grazing value of stubbles

Stubble type	Feed quality			Grazing intensity	
	High	Medium	Low	Heavy	Light
Wheat stubble	XX	XXXXX	XX	XX	
Barley stubble	XXXXXXXXX	XX		XXX	
Canola stubble	XX	XX	XXX		X
Oat stubble	X		XX		
Lupin/legume stubble	XXXXXXXXXXXXX			X	XXX

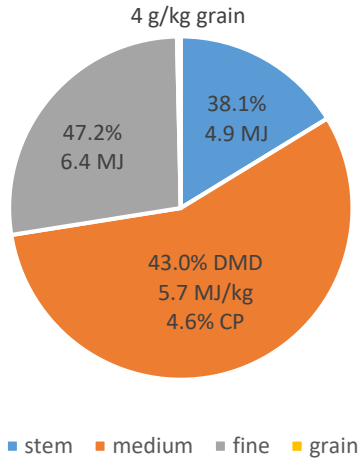
Stubble sample collection

Sorting the wheat from chaff…

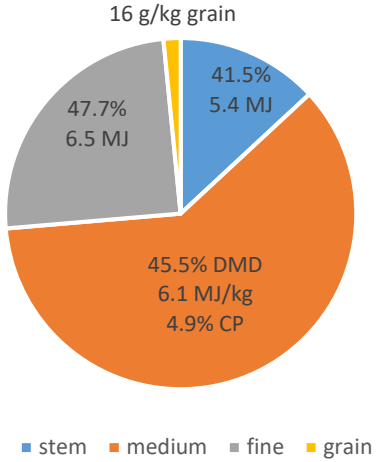
Coarse (stem) Medium Fine

Chaff quality

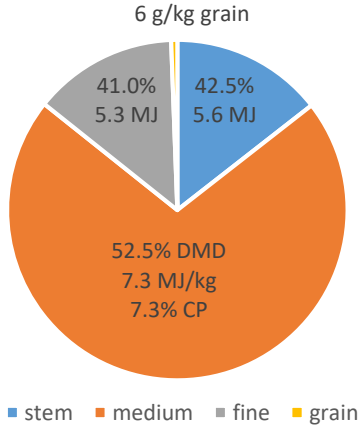
Wheat (n=14)



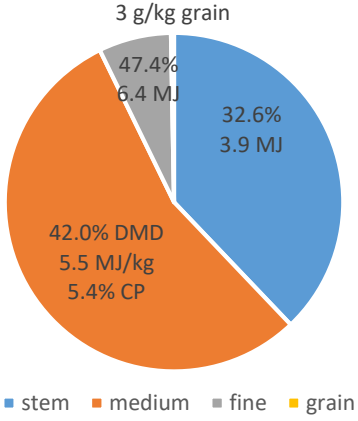
Barley (n=17)

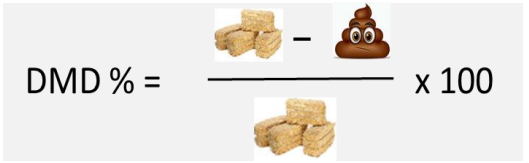


Lupins (n=3)

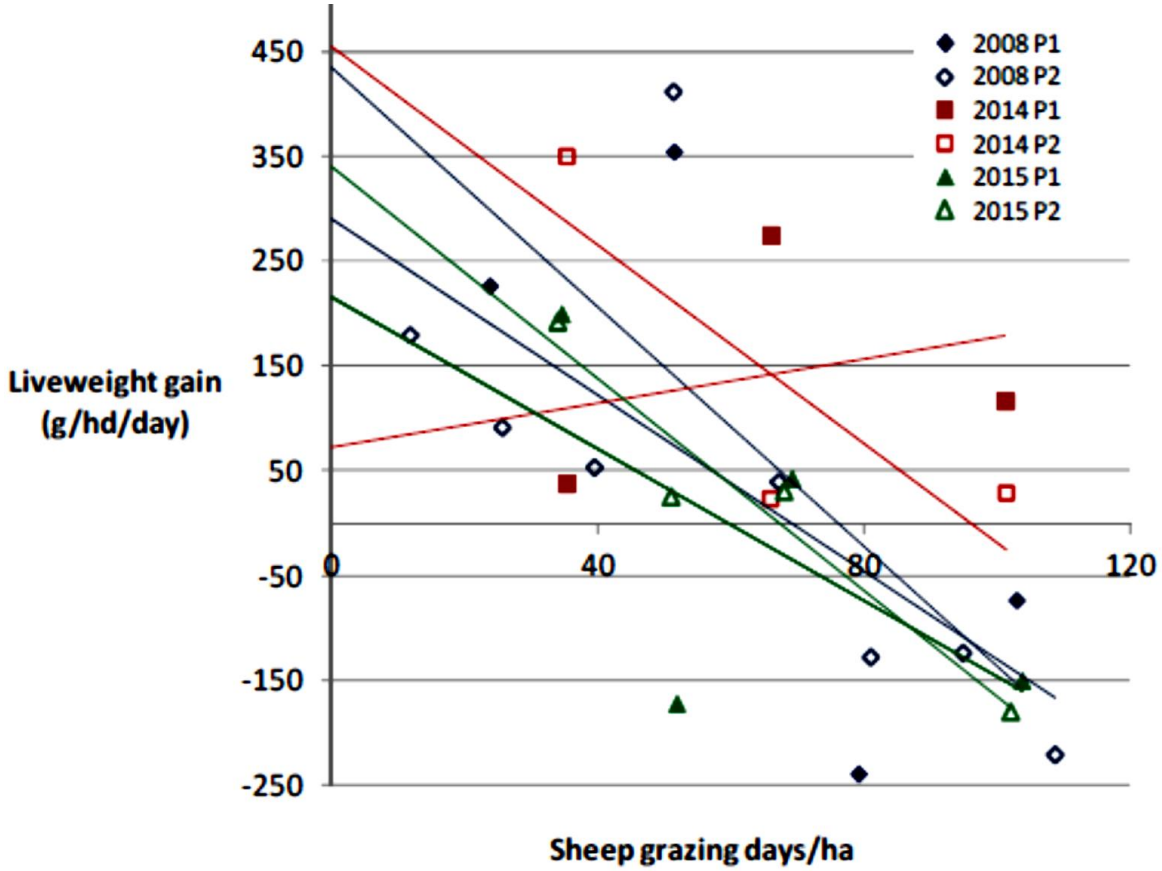


Canola (n=9)



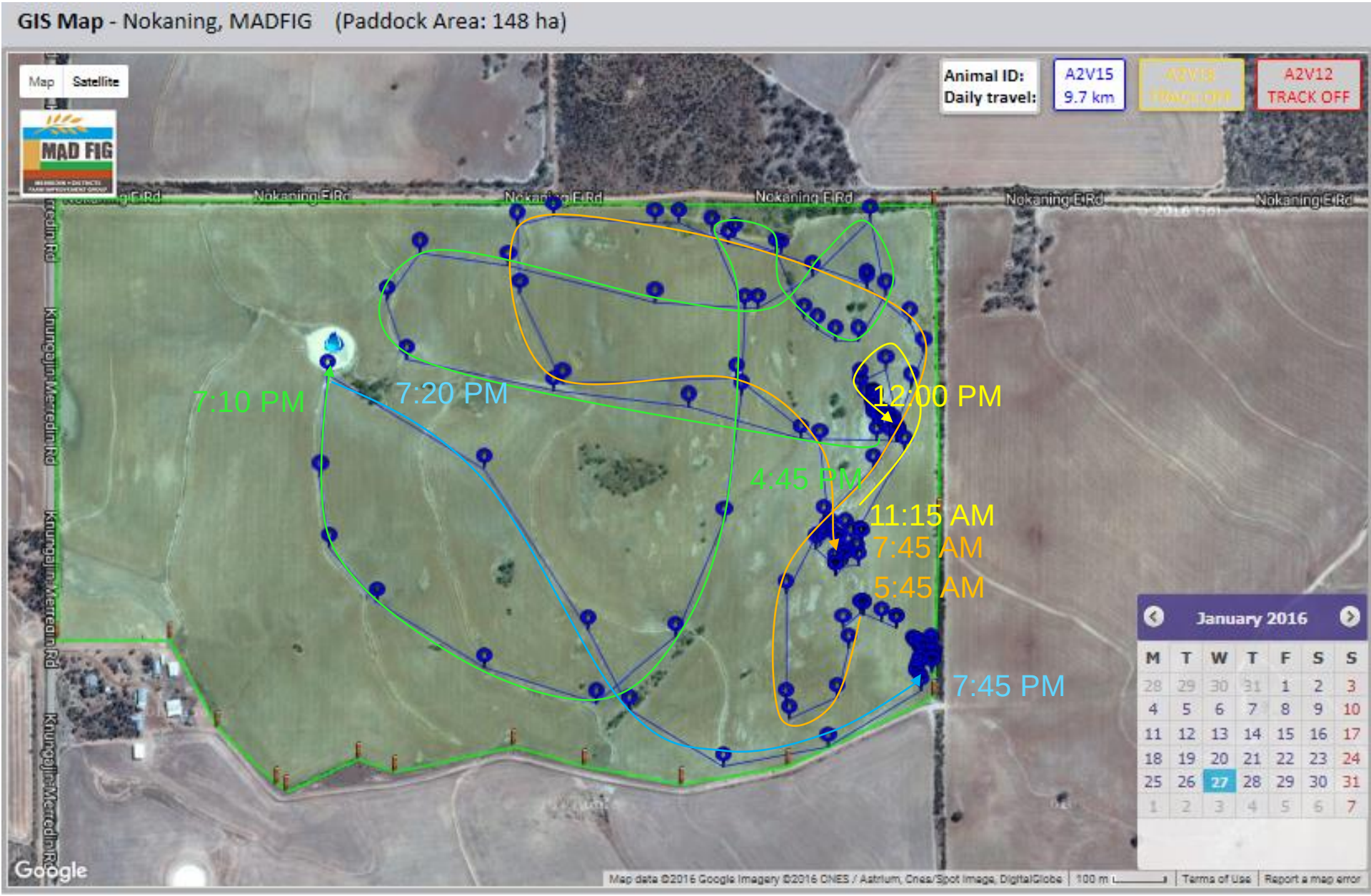


Ewe liveweight on wheat stubbles



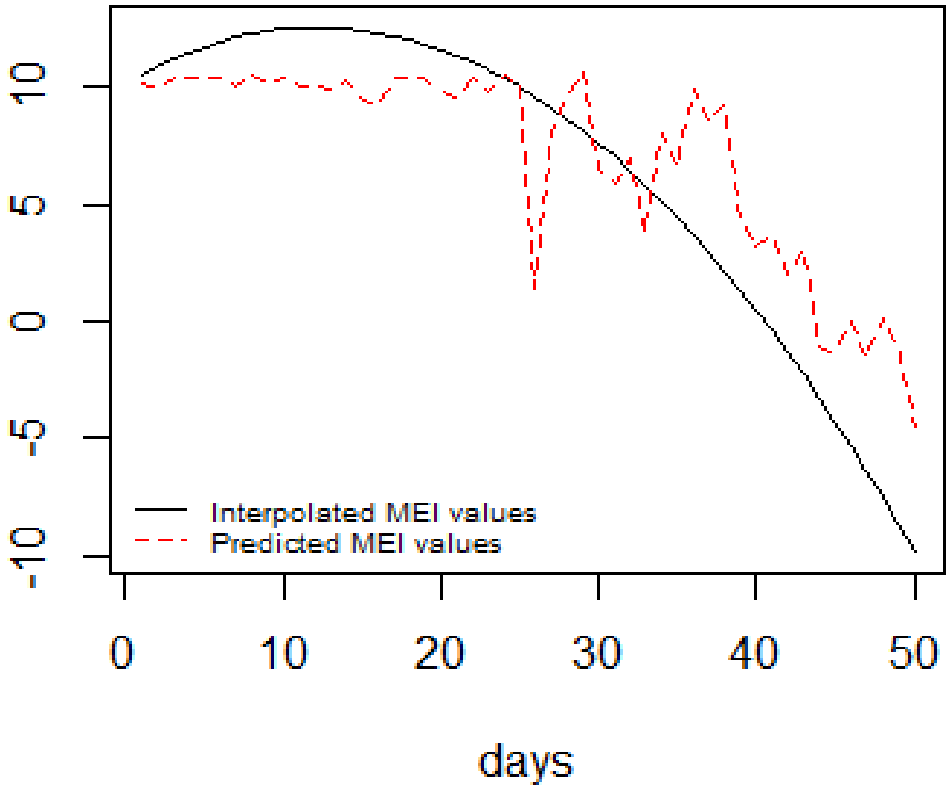
Grazing behaviour tracking

On-animal sensors



Machine Learning and grazing stubbles

ME Intake
(MJ/hd/day)



(Suparwito et al. 2017)

MURDOCH UNIVERSITY
PERTH, WESTERN AUSTRALIA

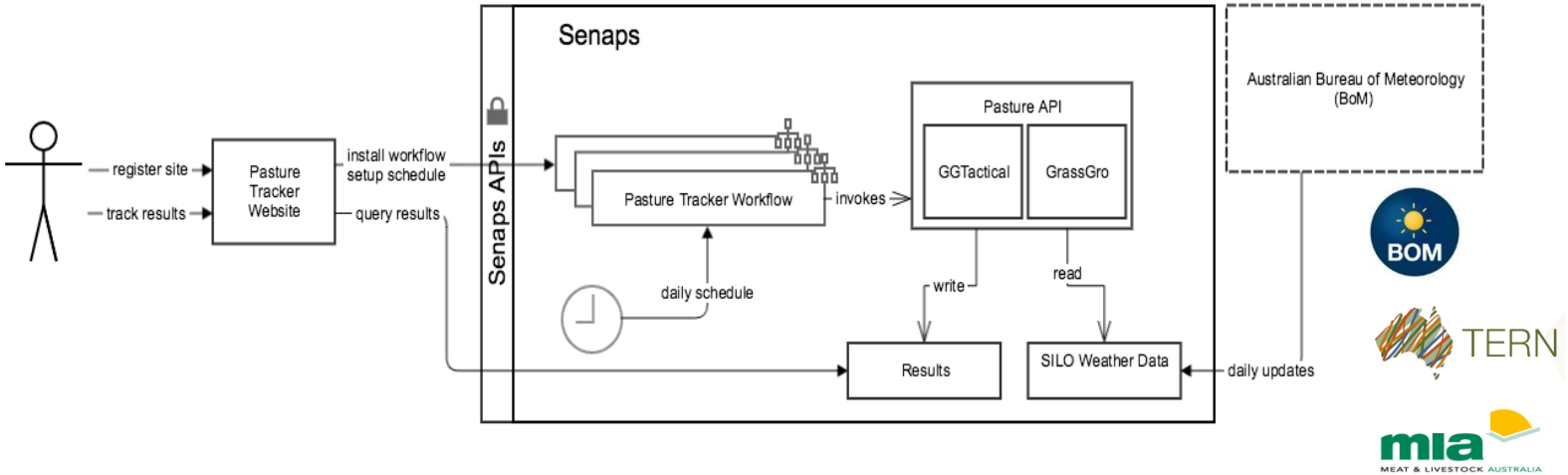
CSIRO

Research to practice change?

- What would you change on your farm given perfect knowledge of stubble feed value?

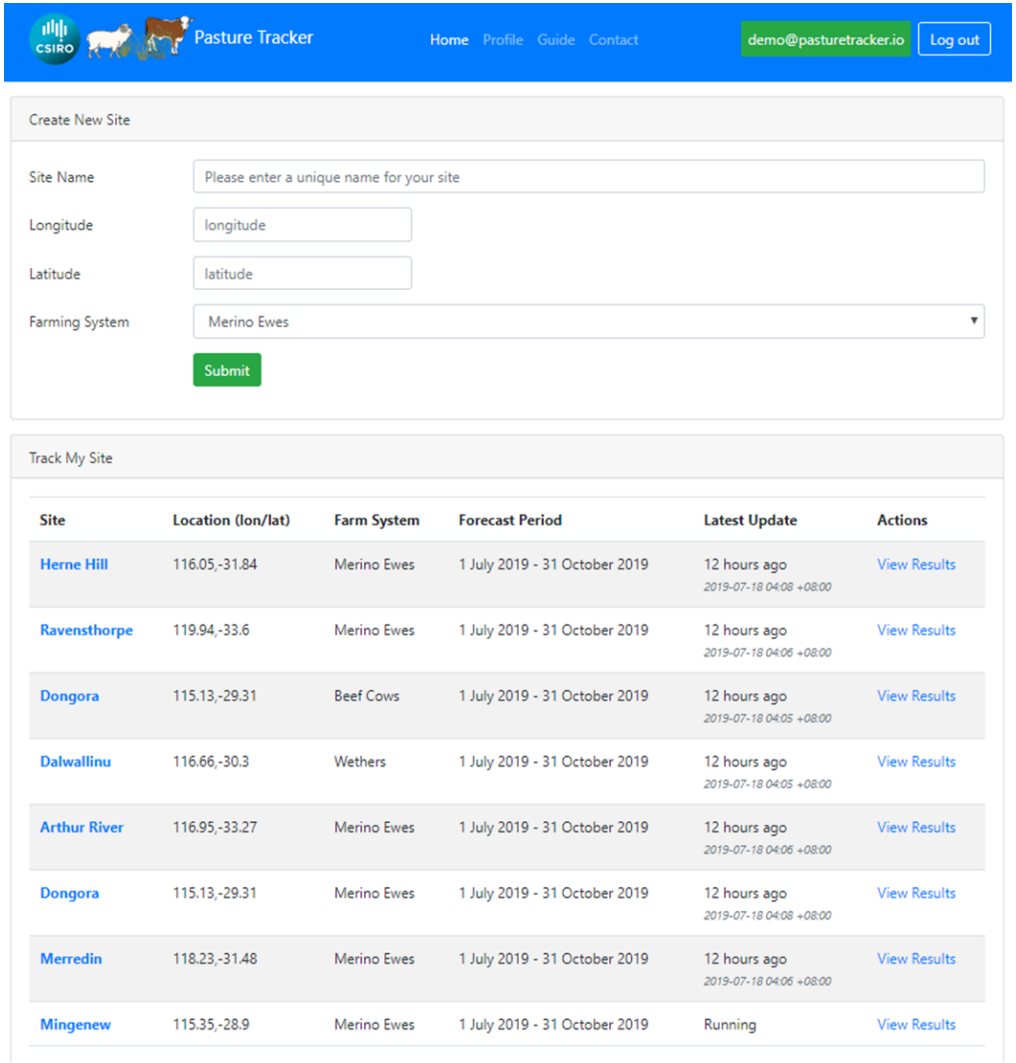
  - Timing of supplementary feeding
  - Maintaining ewes in better condition

Pasture API: data integration workflow



(Project Team: Dave Henry, Neville Herrmann, Gonzalo Mata, Dean Thomas, Eric Zurcher, Joe Pasenen)

Data to information



Feedbase forecasting

Pasture Tracker Home Profile Guide Contact demo@pasturetracker.io Log out

< Back

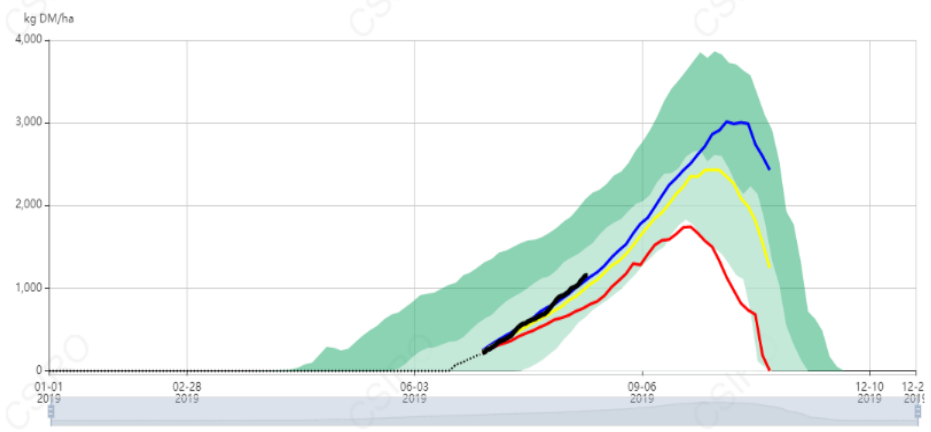
Site Information

Name	**Arthur River**
Location (lon/lat)	116.95,-33.27
	View in Google maps (opens in new tab)
Farm System	Merino Ewes
Forecast Period	1 July 2019 - 31 October 2019
Last Updated	23 minutes ago
	2019-08-16 11:44 +08:00

Results

Projected green available herbage (kgDM/ha) relative to historical variation.

Pasture Tracker Site: Arthur River - location (lon/lat): 116.95,-33.27 - Merino Ewes - 1 July 2019 - 31 October 2019



Pasture Tracker Home Profile Guide Contact demo@pasturetracker.io Log out

< Back

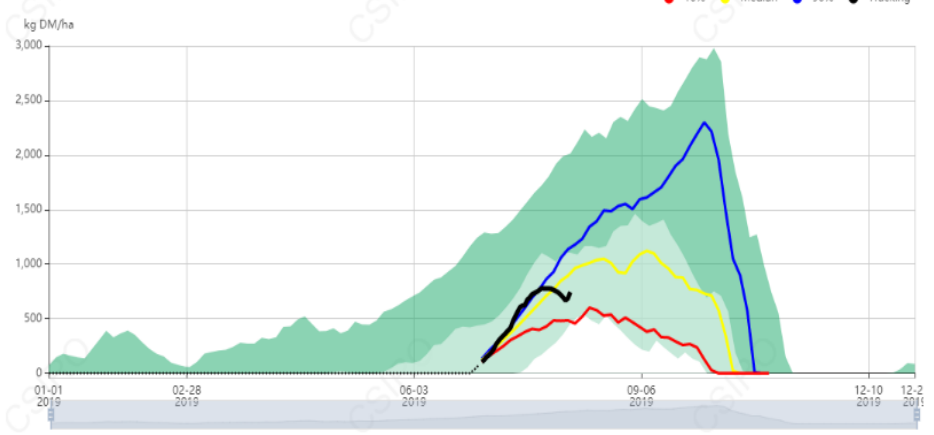
Site Information

Name	**Ravensthorpe**
Location (lon/lat)	119.94,-33.6
	View in Google maps (opens in new tab)
Farm System	Merino Ewes
Forecast Period	1 July 2019 - 31 October 2019
Last Updated	24 minutes ago
	2019-08-16 11:41 +08:00

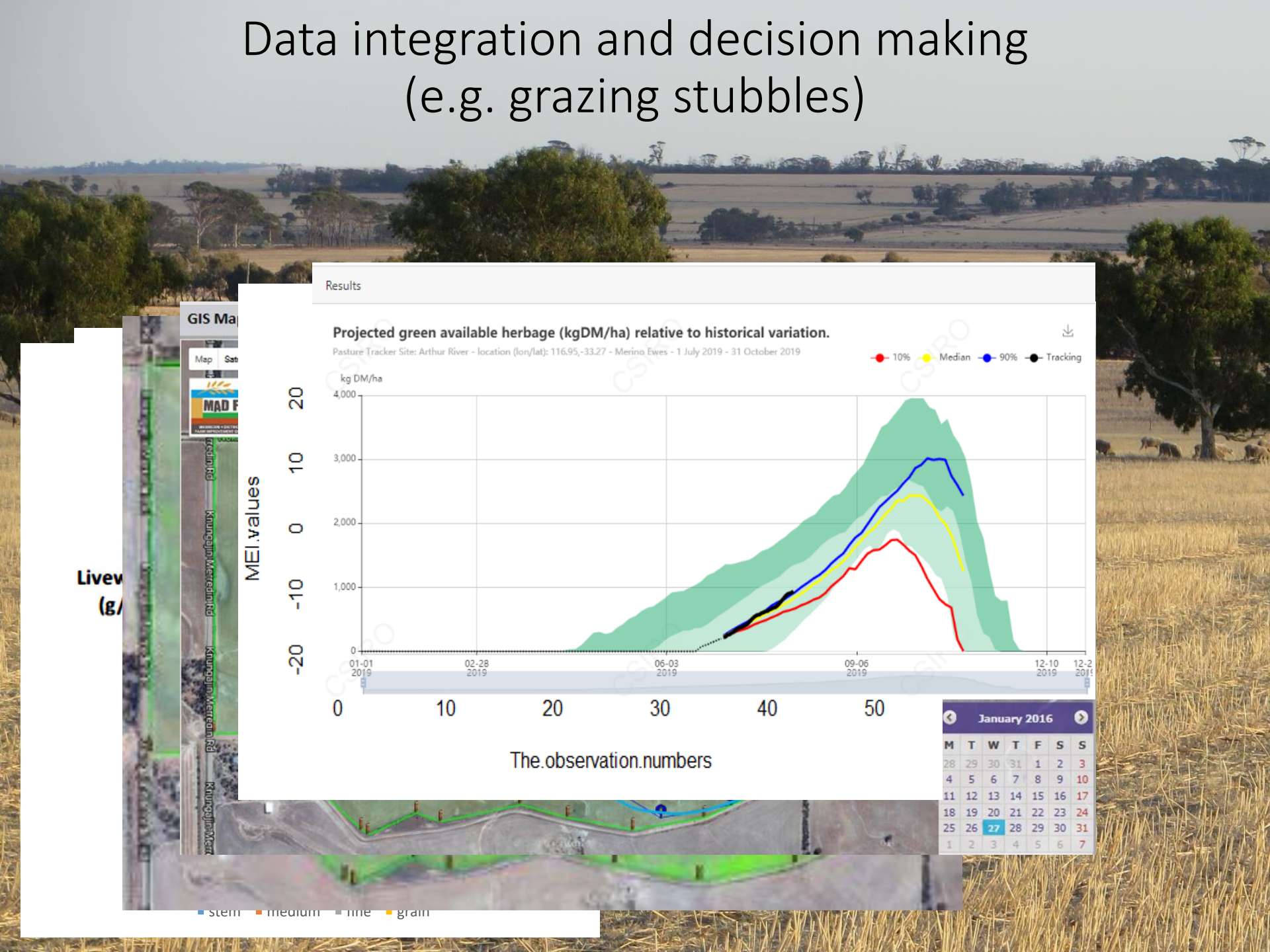
Results

Projected green available herbage (kgDM/ha) relative to historical variation.

Pasture Tracker Site: Ravensthorpe - location (lon/lat): 119.94,-33.6 - Merino Ewes - 1 July 2019 - 31 October 2019



Data integration and decision making (e.g. grazing stubbles)



Thank you!













MEAT & LIVESTOCK AUSTRALIA

Australian Wool Innovation Limited

GRDC GRAINS RESEARCH & DEVELOPMENT CORPORATION

CSIRO