Balancing the crop-livestock mix for system resilience and productivity

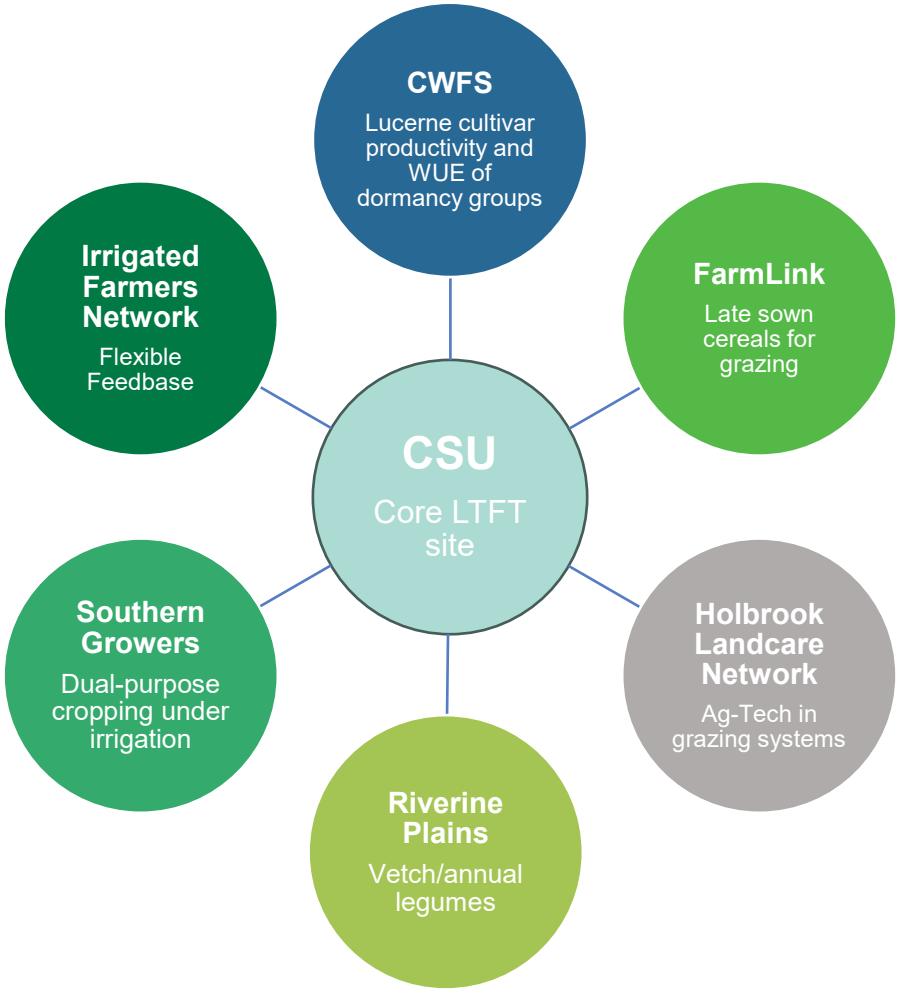
Australian Government
Department of Agriculture, Fisheries and Forestry
Future Drought Fund
SOUTHERN NSW Innovation Hub
SUSTAINABLE AGRICULTURE, LANDSCAPES AND COMMUNITIES
Charles Sturt University
Gulbali Institute
Agriculture Water Environment

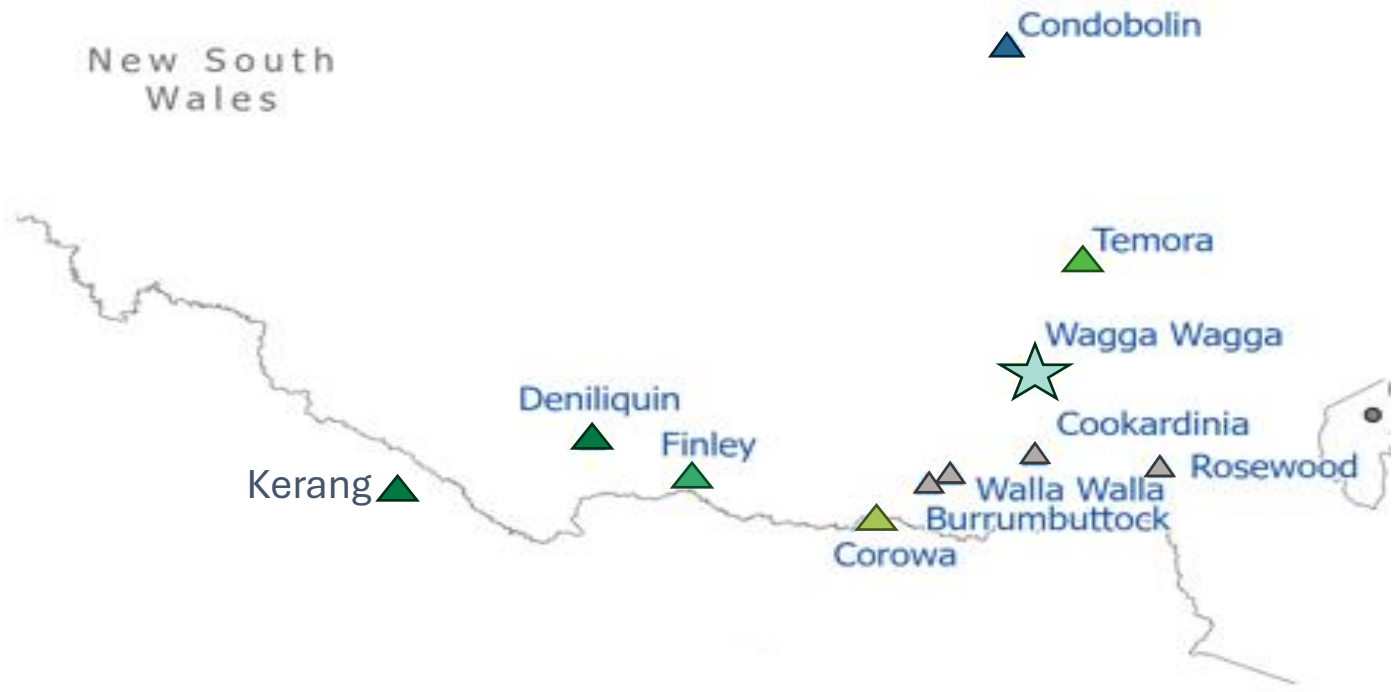
This project received funding from the Australian Government's Future Drought Fund

LONG-TERM TRIAL SITE, CSU 2025

Jess Wyse

RESILENT MIXED FARMING SYSTEMS





CELEBRATING 30 YEARS GRAINS RESEARCH UPDATE

COMPARING MIXED FARMING SYSTEMS

1. Traditional “Wolfe” system

Grain focus, opportunistic DPW, 5.3 ewes/ha lucerne

L-L-L-L-L-C-W-B-F-C-DPW-B

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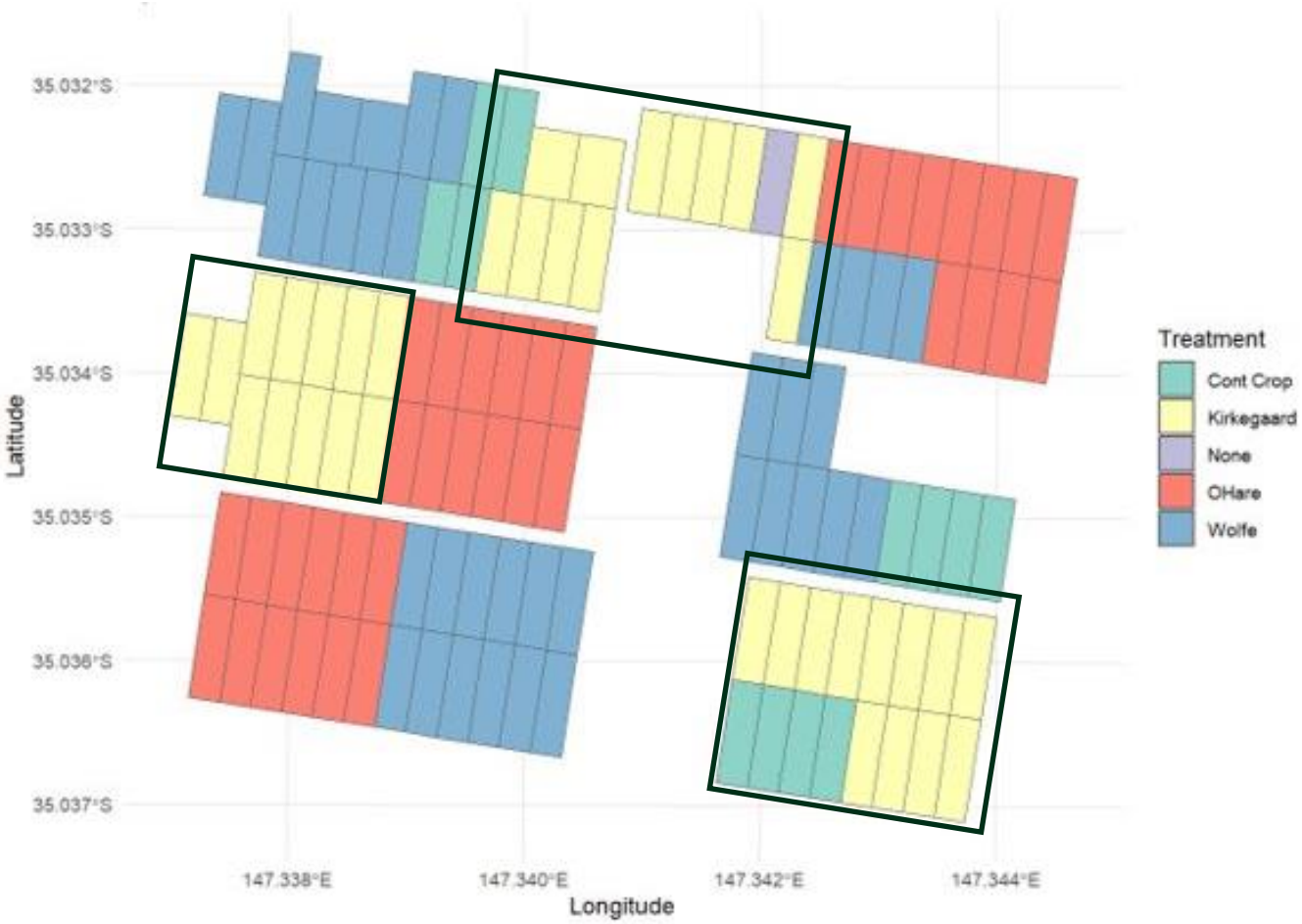
2. High intensity “Kirkegaard” system

Livestock focus, DPW/C + forage legume mix for higher whole farm stocking rate, 7.3 ewes/ha lucerne

L-L-L-L-L-C-DPW-B-V-*DPC-DPW*-B



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3. Ley farming “O’Hare” system

Low risk livestock focus, 50% crop/pasture mix, 6.1 ewes/ha pasture

CI-CI-C-DPW-CI-CI-C-DPW-CI-CI-C-DPW

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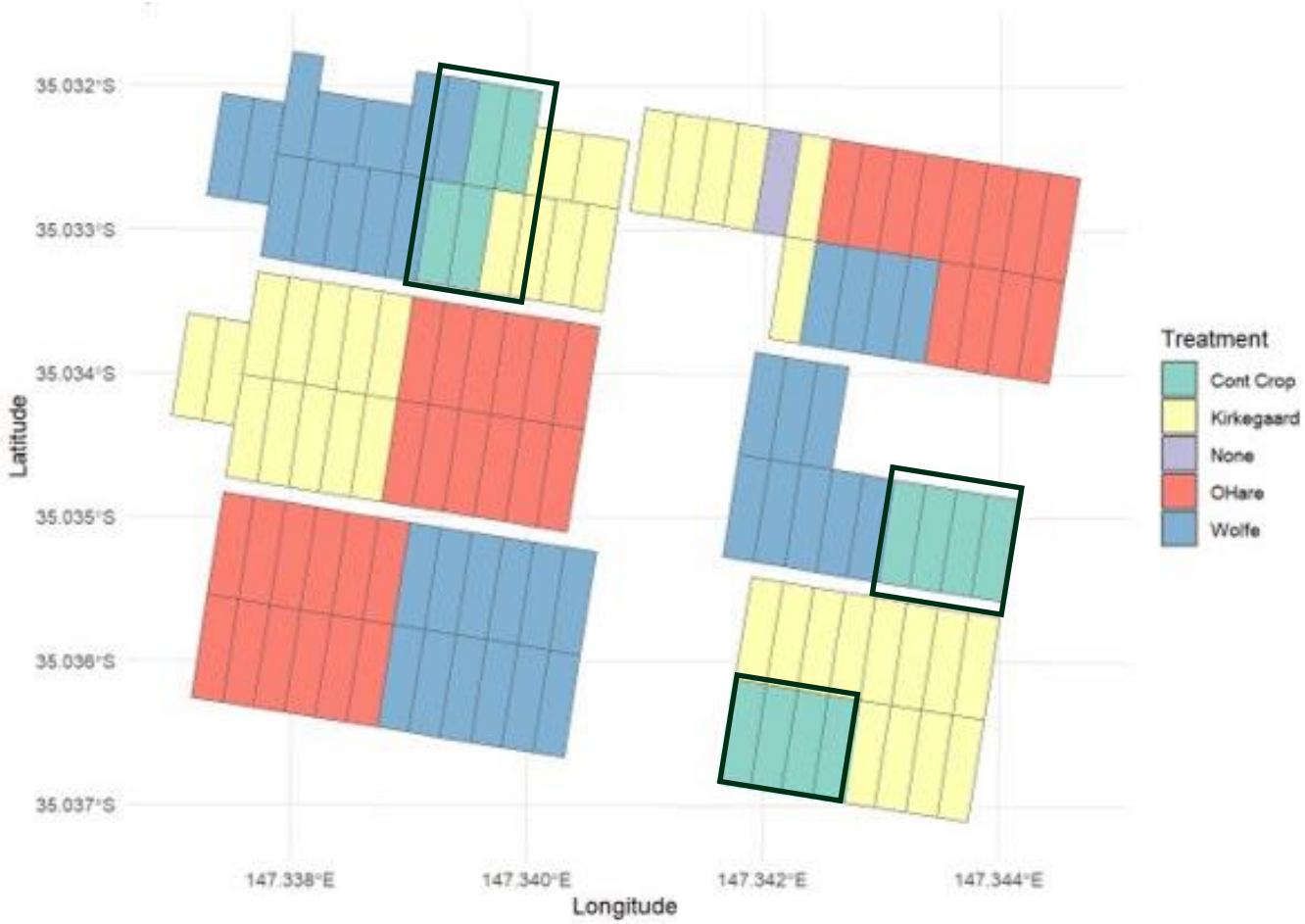
CI-CI-C-DPW-CI-CI-C-DPW-CI-CI-C-DPW

4. Continuous cropping system

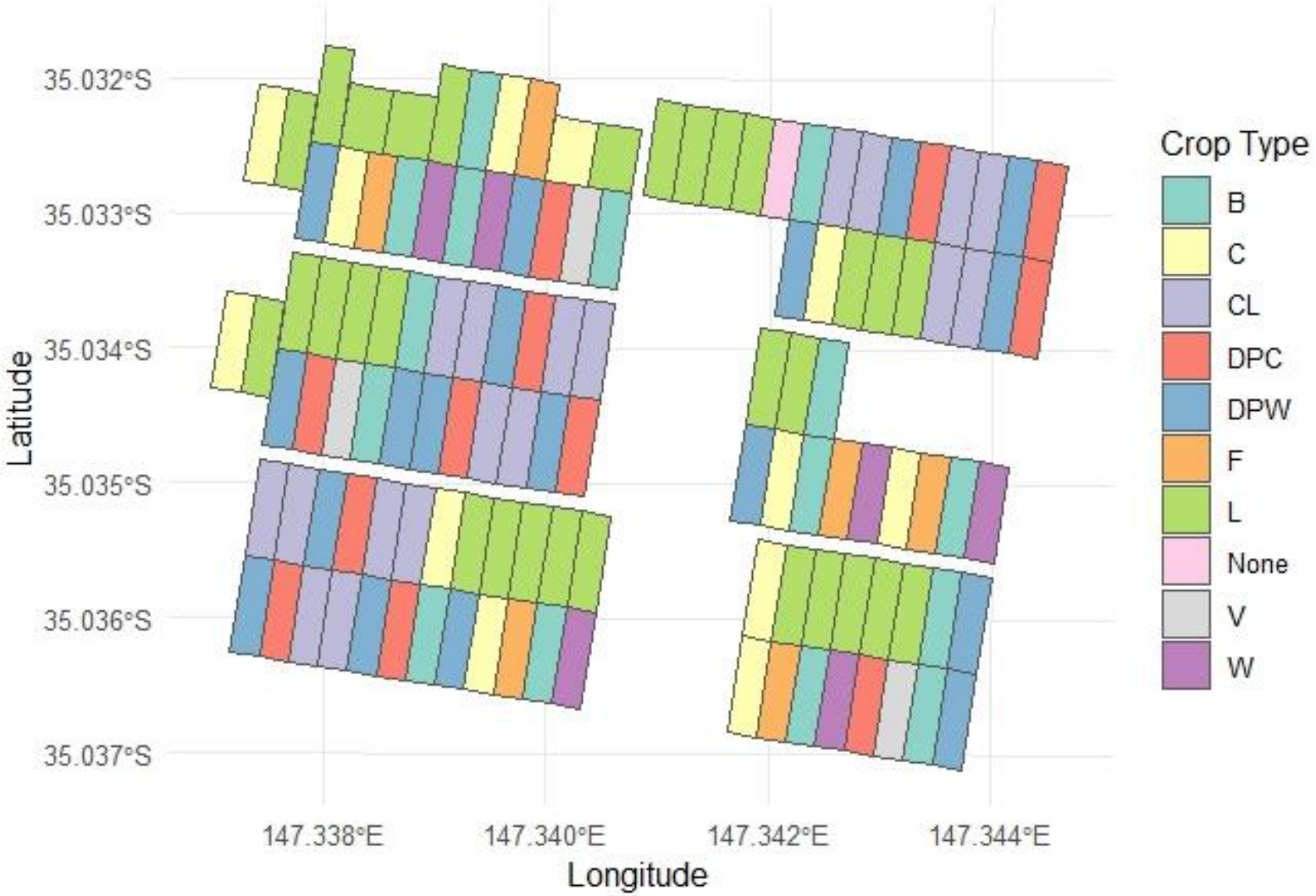
100% cropping, with no dedicated pasture phase or livestock production, high yielding cultivars

F/V-C-W-B

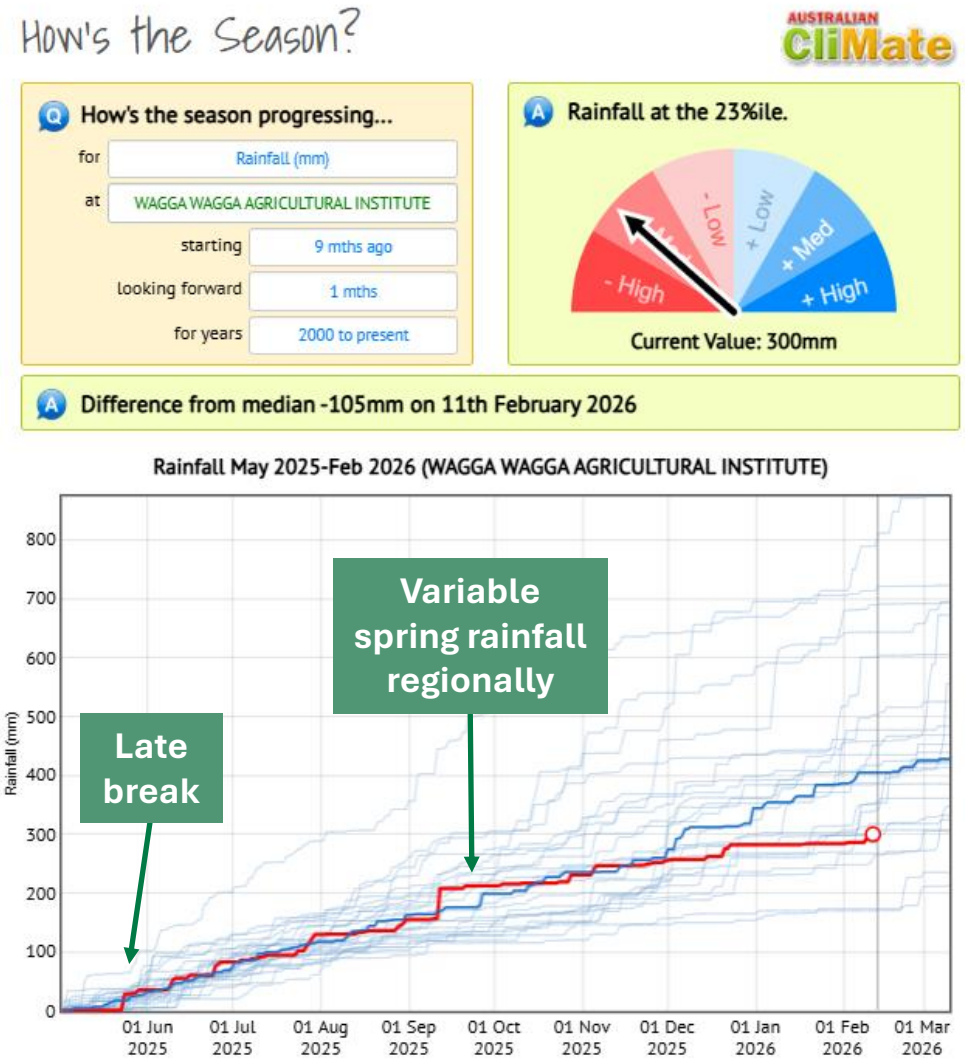


CELEBRATING 30 YEARS GRAINS RESEARCH UPDATE

MIXED FARMING SYSTEMS ARE COMPLEX!



2025 SEASON...LATE BREAK, VARIABLE FEED SUPPLY, TIMELY SEPTEMBER RAIN



CELEBRATING 30 YEARS GRAINS RESEARCH UPDATE

2025 SEASON…LATE BREAK, VARIABLE FEED SUPPLY, TIMELY SEPTEMBER RAIN

How's the Season?

AUSTRALIAN CliMate

How's the season progressing...

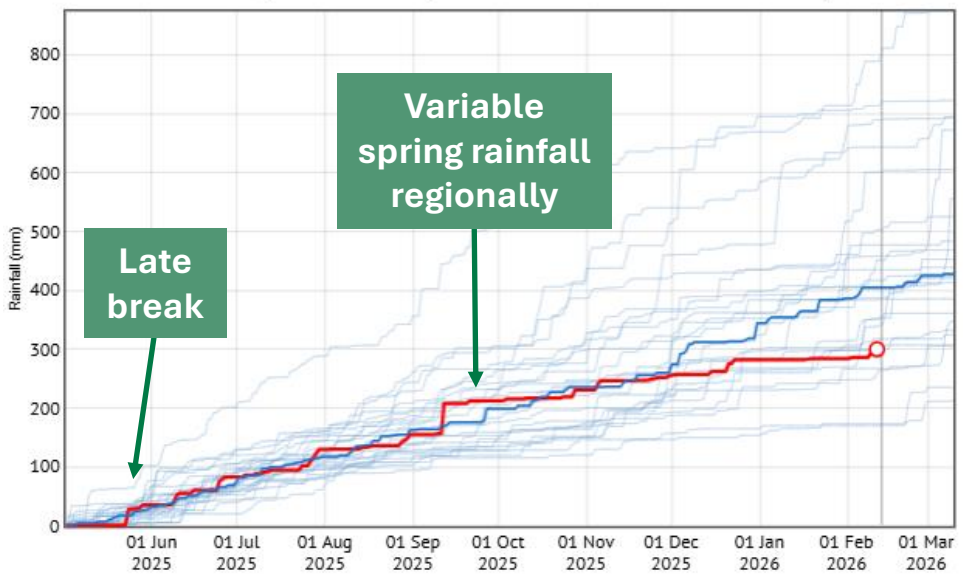
for	Rainfall (mm)
at	WAGGA WAGGA AGRICULTURAL INSTITUTE
starting	9 mths ago
looking forward	1 mths
for years	2000 to present

Rainfall at the 23%ile.

Current Value: 300mm

Difference from median -105mm on 11th February 2026

Rainfall May 2025-Feb 2026 (WAGGA WAGGA AGRICULTURAL INSTITUTE)



How's the Season?

AUSTRALIAN CliMate

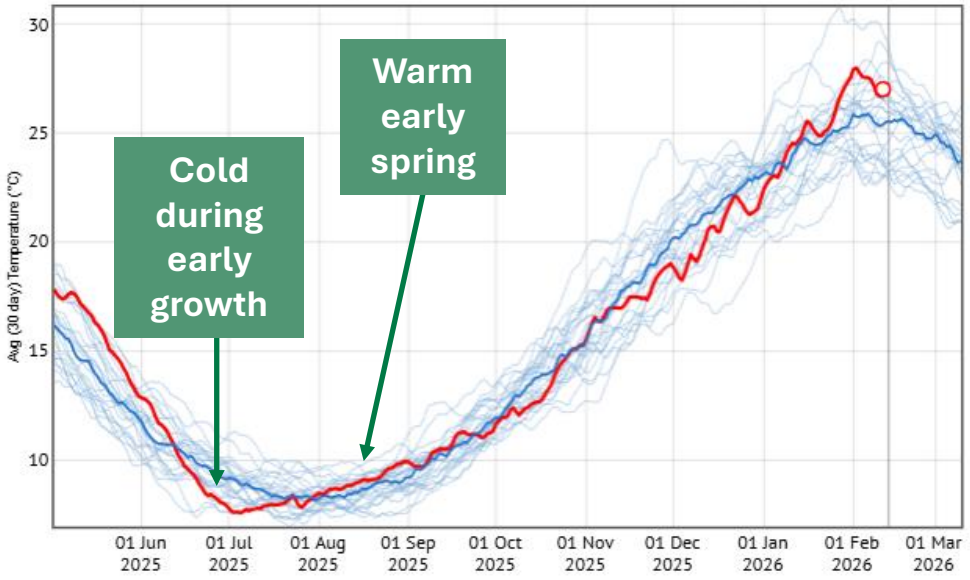
How's the season progressing...

for	Avg. (30 day) Temperature (°C)
at	WAGGA WAGGA AGRICULTURAL INSTITUTE
starting	9 mths ago
looking forward	1 mths
for years	2000 to present

Avg (30 day) Temperature at 27.0°C.

Difference from median +2°C on 11th February 2026

Avg (30 day) Temperature May 2025-Feb 2026 (WAGGA WAGGA AGRICULTURAL INSTITUTE)



MANAGING THE CROPPING SYSTEM…

Delayed autumn break = late sowing

Variable establishment – DPC + faba bean

No DPW in 2025

Navigating a high-pressure ryegrass site!

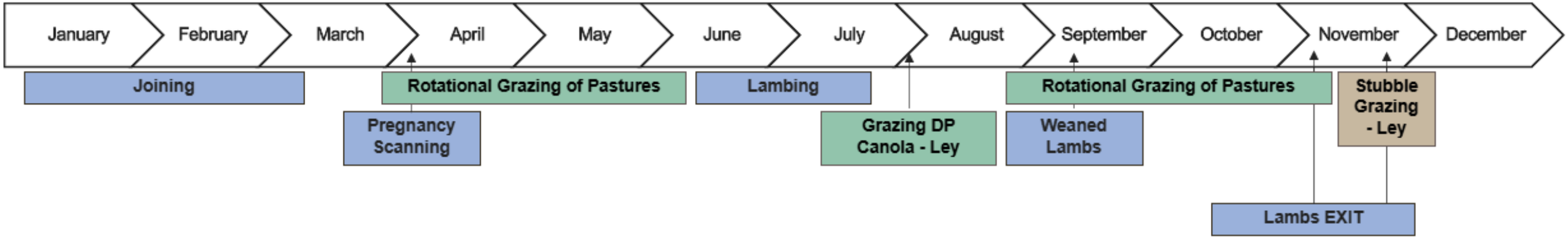
MANAGING THE LIVESTOCK SYSTEM…

- Joining in confinement (Jan/Feb), terminal sire system
- Composite (2025), First Cross (2026)
- Base level DSE/farmlet ~5ewes/ha pasture

- June/July lambing
- Reset stocking rate at lamb marking ~1.2 lambs/ewe (survival rate/seasonally dependent)

- Lambs exit @ ~50kg target (feed availability/ GR dependent)

MANAGING THE LIVESTOCK SYSTEM...



PHENOLOGY FIRST…

Crop	Sowing	Emergence	Flowering	Maturity
Wheat	2nd Jun	20th Jun	13th Oct	24th Nov
Barley	5th Jun	23rd Jun	7th Oct	14th Nov
Canola (dry)	21st May	13th Jun	16th Sep	17th Nov
Faba Beans	1st Jun	26th Jun	10th Sep	21st Nov
DPC	22nd Mar	15th Apr/13th June	30th Sep	10th Dec

- Delayed emergence, split establishment in DPC

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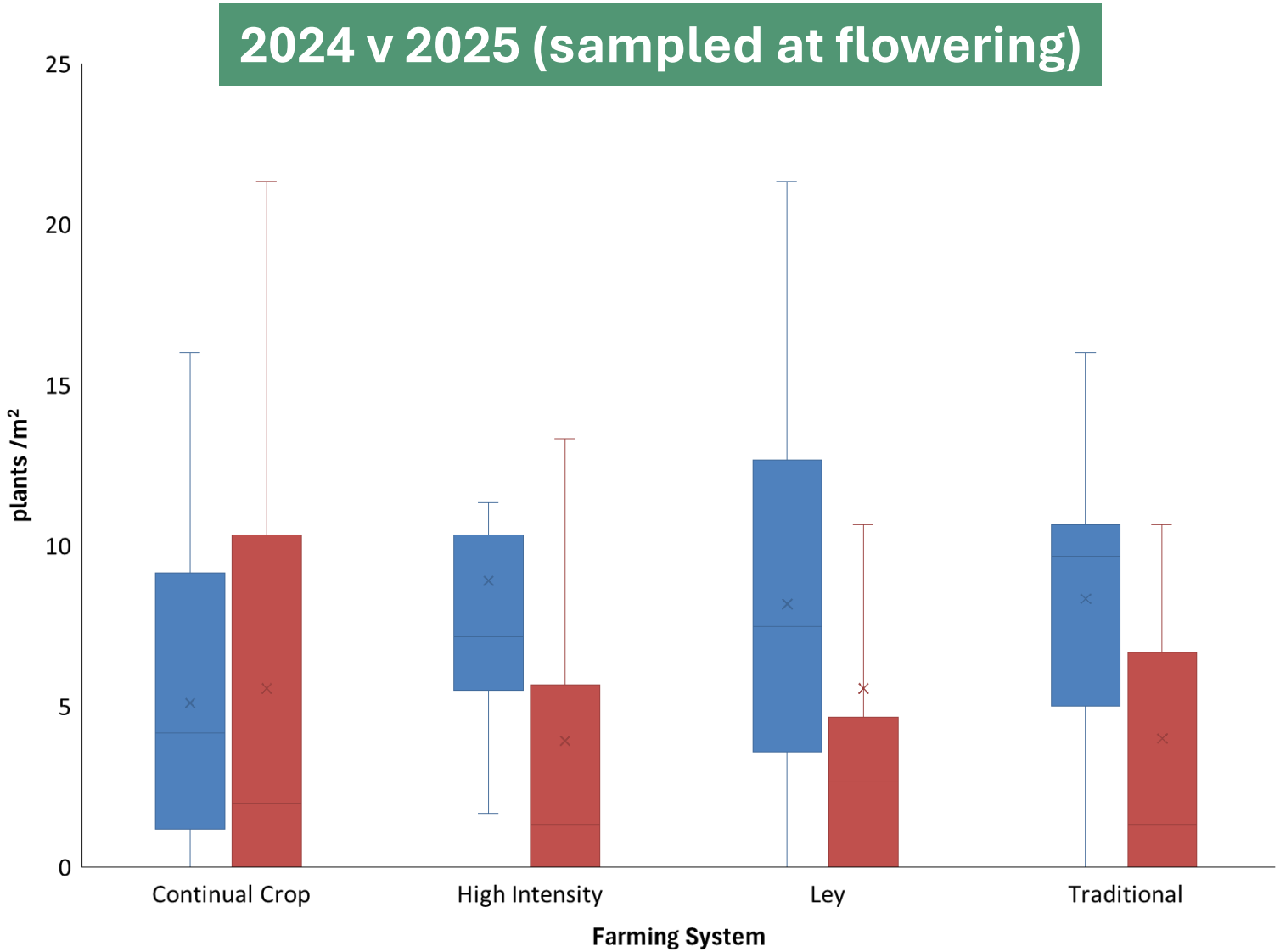
- Delayed emergence, split establishment in DPC
- Later than optimal flowering time in cereals and canola
- DPC flowered 2 weeks later than canola, slow to reach maturity
- September rainfall + mild temperatures during critical period key

MANAGING HIGH PRESSURE RYEGRASS…

- Reduced ARG numbers in mixed systems
- Control in DPC a challenge in high intensity & ley systems
- Glyphosate resistance a challenge
- Significant cost to crop production



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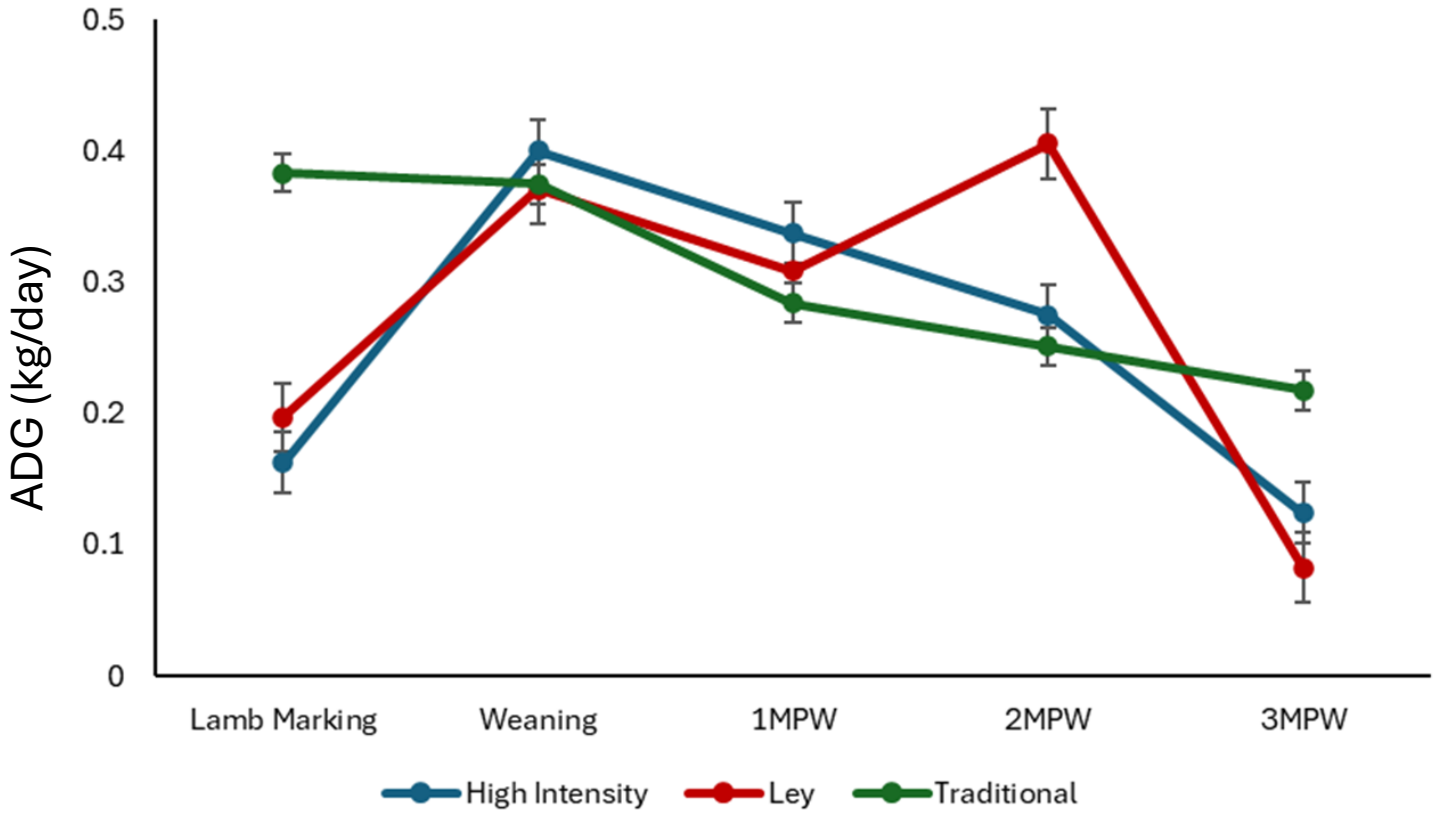
- Reduced ARG numbers in mixed systems
- Control in DPC a challenge in high intensity & ley systems
- Glyphosate resistance a challenge
- Significant cost to crop production
- **Significant contribution to feed base in 2025 (ley*)**

HIGH LAMB LIVEWEIGHT GAINS ON PASTURE...



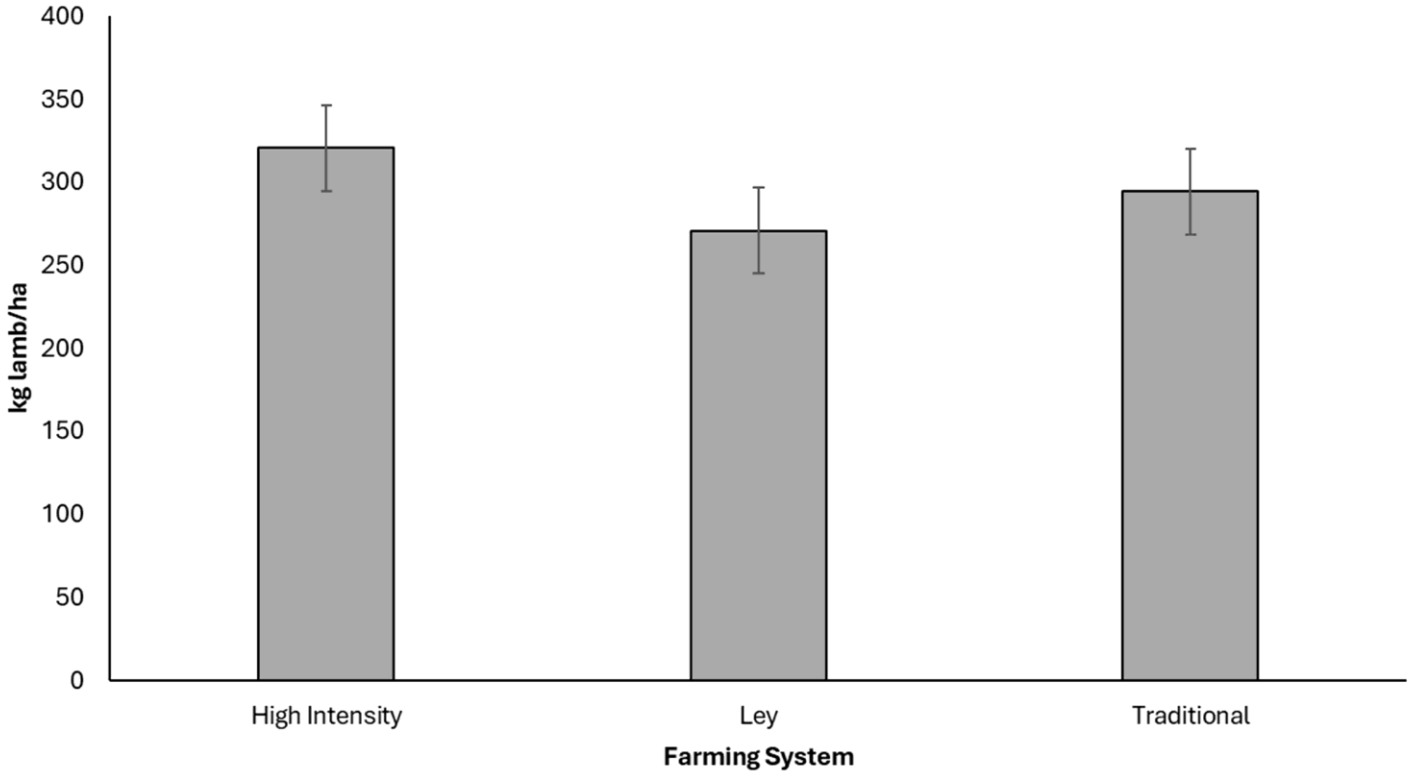
- Average weight gains ~300g/day in spring, declining later in season

HIGH LAMB LIVEWEIGHT GAINS ON PASTURE...

- Average weight gains ~300g/day in spring, declining later in season
- All production off pasture
- Lambs sold in November ~50kg

	Hd sold / farmlet	Mean Exit Weight	Valuation $/hd *November*
Traditional	6.0	52.4 kg	$282.00
High Intensity	8.3	49.8 kg	$265.70
Ley	8.3	54.1 kg	$298.60

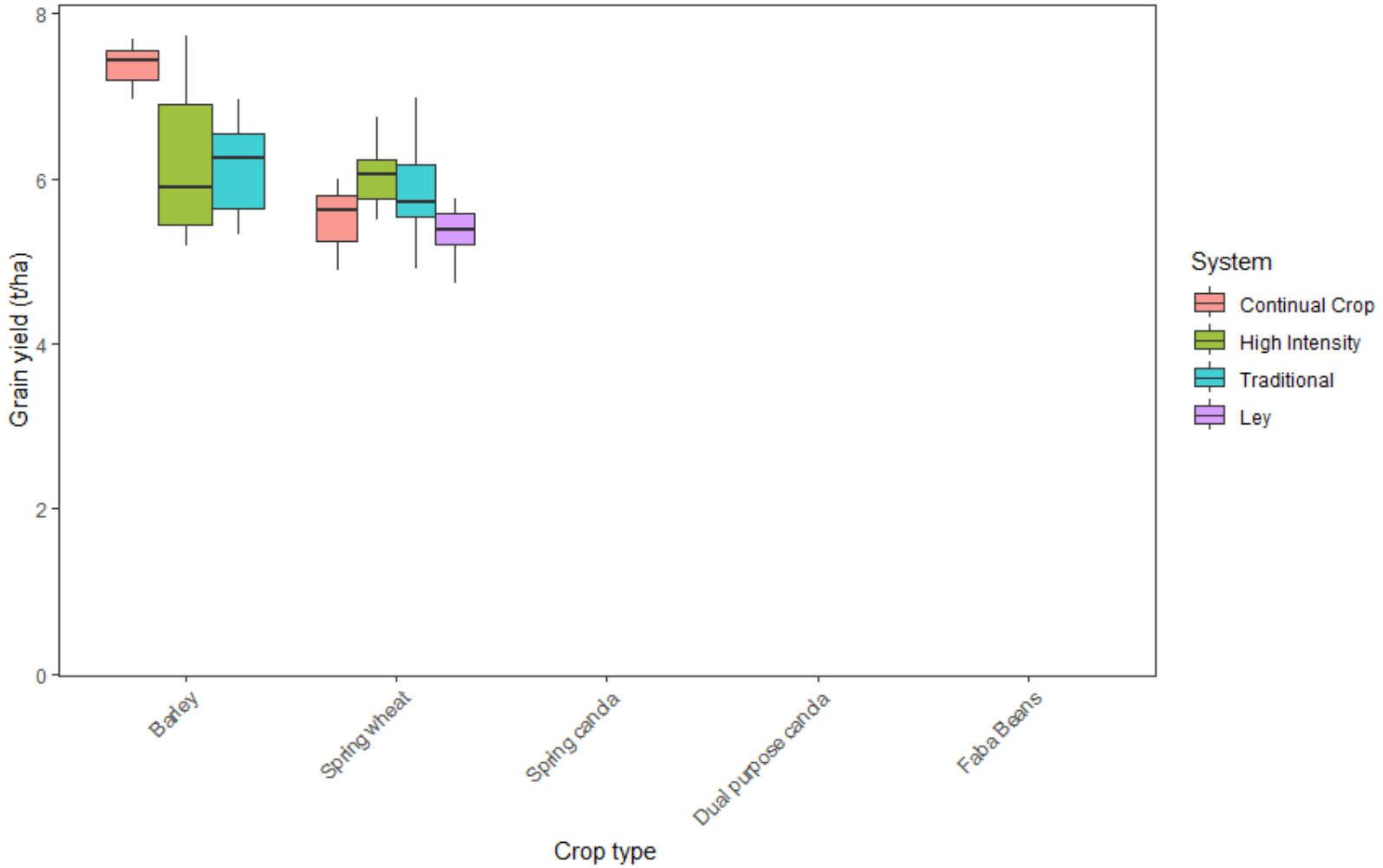
PRODUCTION LINKED TO PASTURE SUPPLY...



High Intensity had highest production per hectare of pasture supply

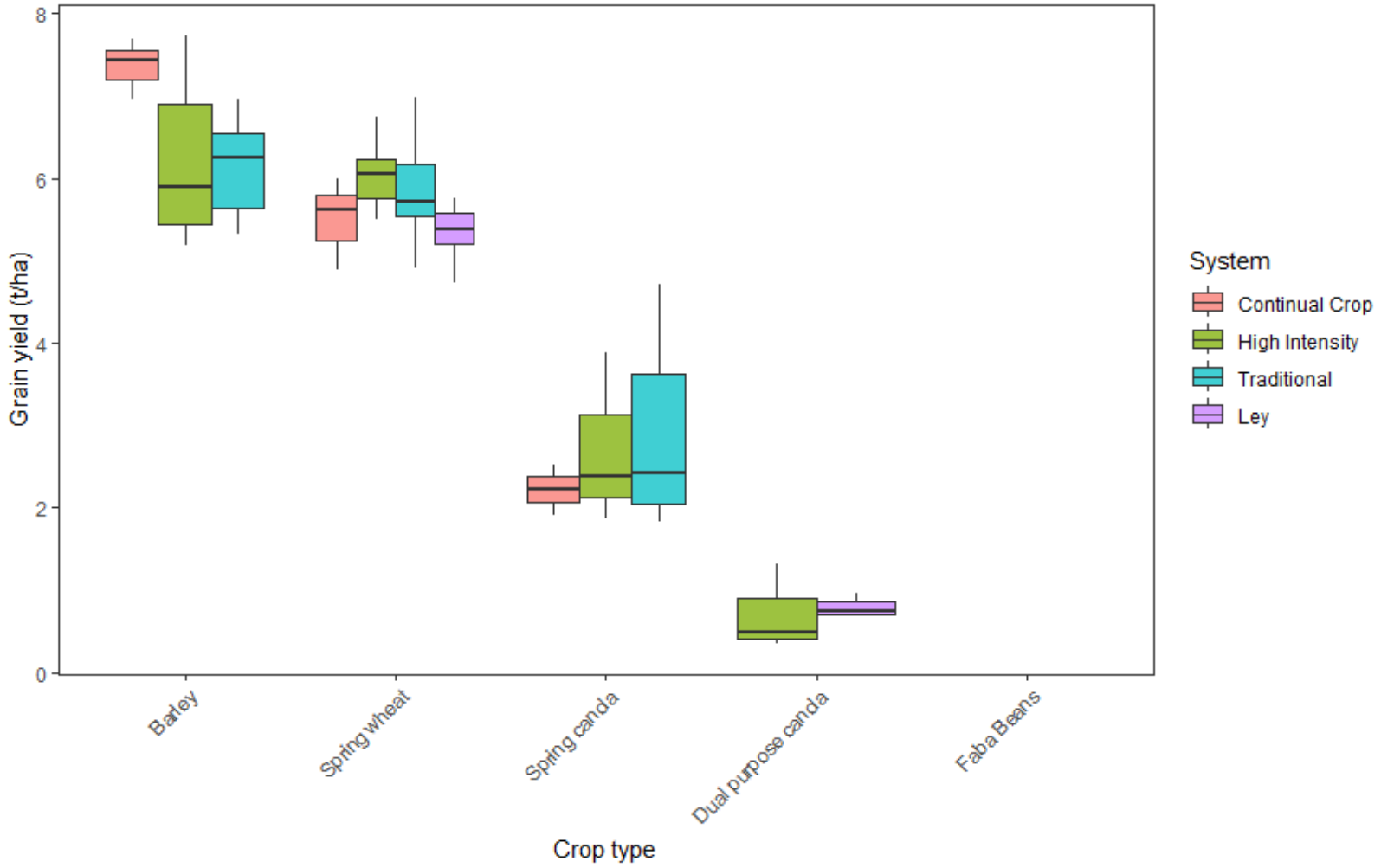
YIELDS CONSISTENT ACROSS SYSTEMS

Cereals a standout in 2025…



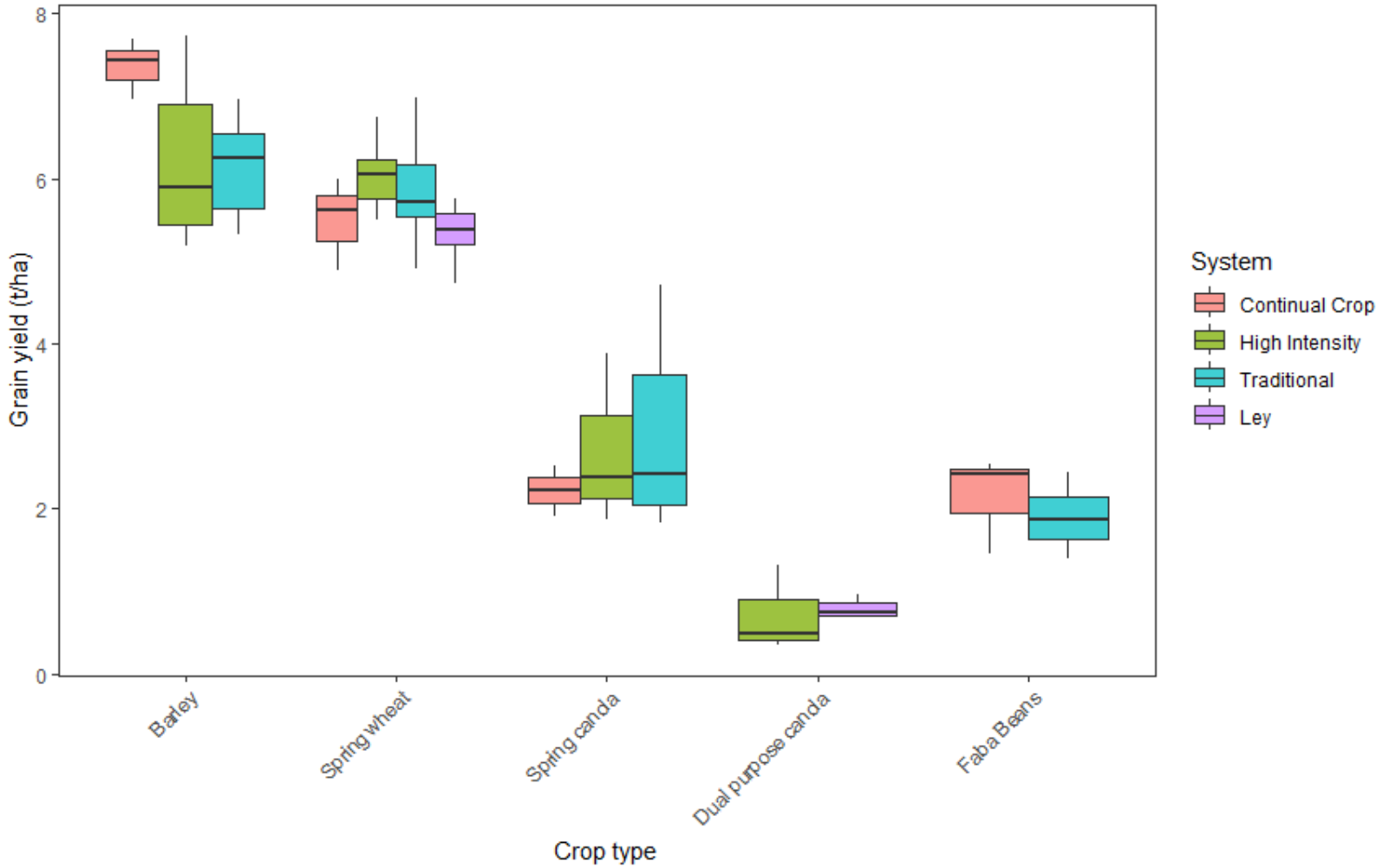
YIELDS CONSISTENT ACROSS SYSTEMS

Winter canola yields reflected poor early establishment and late development…

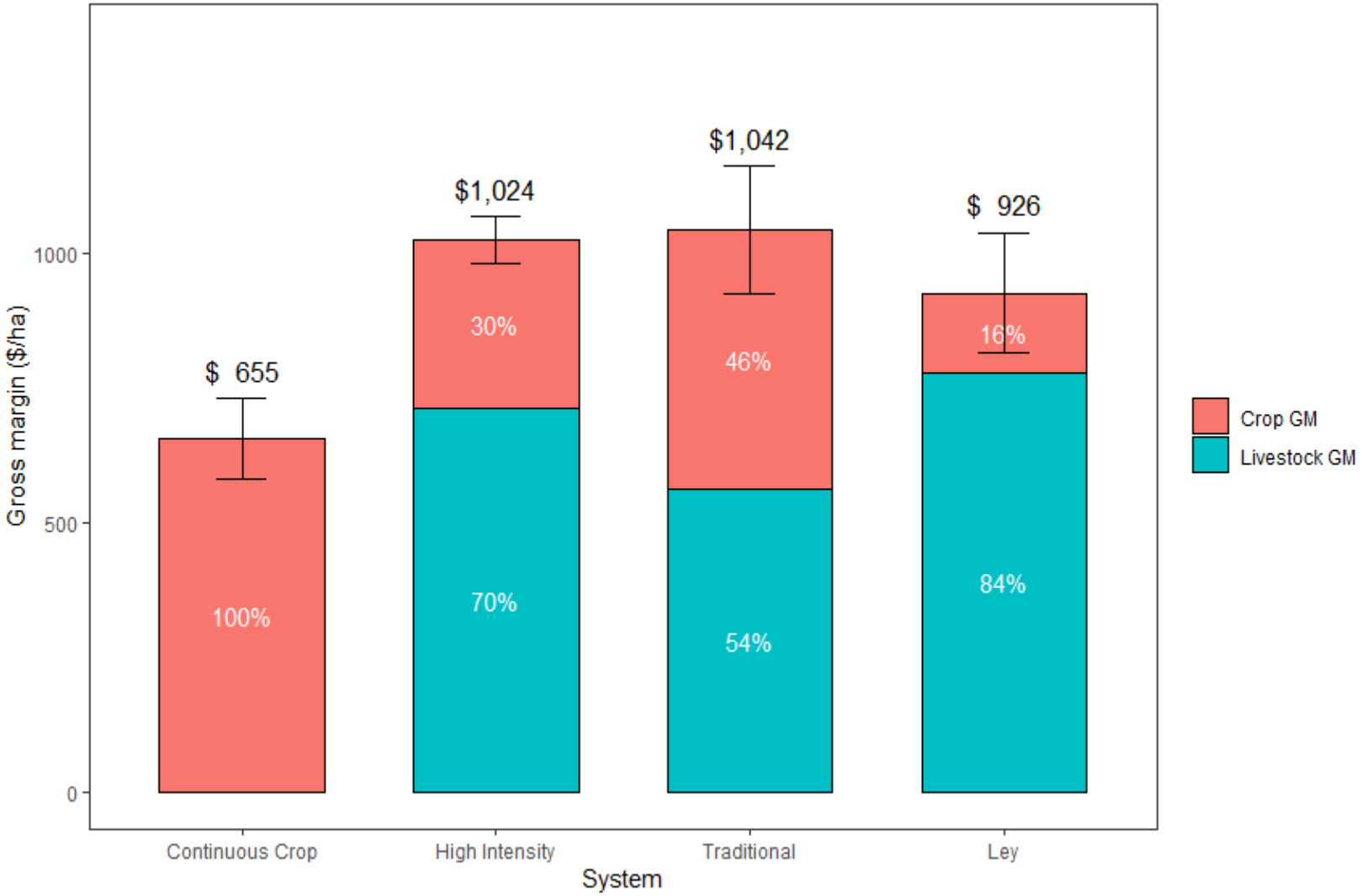


YIELDS CONSISTENT ACROSS SYSTEMS

Faba bean establishment variable…



PRELIMINARY GROSS MARGINS…



KEY LEARNINGS FROM 2025...

Year 1 captures seasonal learning, with system risk profiles and long-term performance expected to emerge over time – watch this space!

- **Crop yields were broadly comparable across systems**, indicating that GM differences were driven more by income diversification than by inherent differences in crop productivity

- **Enterprise mix was the primary driver of GM differences**, with mixed systems deriving 54–84% of total gross margin from livestock, buffering whole-farm profitability in a dry (decile 2–3) season, *noting livestock prices were relatively strong in 2025*

- **Mixed systems increased tactical flexibility**, allowing poorly established winter crops to be grazed or cut for hay while assisting with weed management

- Watch out for upcoming field walks at the LTFT site!

IT TAKES A VILLAGE!

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- Shawn McGrath
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- Shamsul Haque
- Daniel Curline
- Ana Horta
- Jen Bond
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- Greg Condon
- Neil Durning
- Jim Virgona
- Mathew Dunn
- Rohan Brill

Cross Hub steering committee:

- Warwick Badgery
- John Kirkegaard

This project received funding from the Australian Government's Future Drought Fund

#GRDCUpdate

CELEBRATING 30 YEARS

GRAINS RESEARCH UPDATE

Supplementary Feeding Costs

- High supplementary feeding costs in 2025, especially during lambing

Table. Supplementary feeding cost ($) per head over the defined period per farming system for ewes and lambs in 2025.

	Traditional	Ley	High Intensity
Feeding Cost			
Confinement Joining [1]	$9.25 ± 0.0	$12.94 ± 0.0	$12.94 ± 0.0
Lambing [2]	$25.83 ± 2.0	$26.93 ± 0.0	$27.34 ± 0.0

[1] 66 day confinement feeding. Includes adaptation period to grain prior to the 6-week joining period.
[2] 86 day hand feeding for traditional and high intensity farming systems, and 41 days for the ley farming system.