

A Glimpse into Decision-Making Among Queensland Grain Growers

Introduction. The Queensland grain industry is a cornerstone of Australia's agricultural economy, contributing \$5 billion annually, thus significantly contributing to food security, regional employment, and export earnings (Business Queensland, 2024). With diverse cropping systems, including barley, sorghum, maize, chickpeas, faba beans, soybeans, and canola, the industry thrives on Queensland's varied climate zones and soil types. Understanding farmer decision-making is critical for enhancing the sector's sustainability and resilience, particularly in the face of challenges like climate variability, market fluctuations, and technological advancements.

Method. A total of 13 farmer group meetings were conducted among grain farmers across Brigalow, Capella, Gindie, Goondiwindi, Meandarra, Roma, and St George from 13 July 2023 to 11 June 2024, facilitated by the Queensland Department of Agriculture and Fisheries. Meeting notes were analysed using thematic analysis.

Decision-making process. Farmers employ a variety of approaches when making decisions. Many farmers utilise analytical decision support systems to examine the yield potential of crops and to determine the associated budget requirements. Additionally, their risk attitudes significantly influence their nitrogen management strategies and fertilization methods. Farmers' decisions are also influenced by recent events and practices that they are familiar with or are used to.

RESOURCE-DEPENDENT

"[Is anyone using variable rate?] When talking about bang for buck we should be using it, but you have to set everything up to do it and you need the people capable to handle it."

- Goondiwindi

"Still drilling but planning on buying machine to spread as could not get across country fast enough last year."

- Meandarra

EXPERIENCE-BASED

"I feel like the 'intel' is changing; it used to be 'use it or lose it'. now if it stays in there, maybe what I used to do (is best)...that is if I need 100 kg, used to put on 120kg."

- Meandarra

"Paddock 2 was the best performer of the comparisons, so thinking current strategy is working well."

- Meandarra

"I'm also playing with manure (esp given the research from in town (NFS) where manure has lifted soil organic matter and so mineralising more (N) for several years."

- Gindie

YIELD & PROFIT MAXIMISATION

"Apply for maximum yield and then add 10% each crop, if over fertilise left for the next crop, but guaranteed to have enough to maximise yield every year."

- Brigalow

"Now I put on 100kg/ha (urea); spend \$1 to get \$2. If I put on 200 kg/ha, I'll spend \$1 to get \$1."

- Gindie

VALUES & GOALS

"Last year, anyone have low protein? ... Yep, (but) I wasn't game to put it (N) on."

- Goondiwindi

"It is possible to put a Carbon filter over all activities. That is, is this change in practice going to increase (cost) or decrease (offset) my carbon footprint?"

- Roma

CALCULATION

"Budget per crop per year using soil test, PAW, yield potential, seasonal forecasting, paddock history then consider cost of urea (how much you can spend)"

- Brigalow, Goondiwindi, & Meandarra
"[Setting yield potential] Use how much moisture is in the ground and forecast."

- Goondiwindi

RISK ATTITUDE

"There's one, I think, worse than a high price [urea] and that's no product."

- Goondiwindi

"[Regarding spreading] at one stage spreading was a risk with 1-2mm of rain. Using disk, it goes down strait away."

- Goondiwindi

"[Nitrogen decision] Leave nothing in the tank"

- Meandarra

BEHAVIOURAL BIASES

"So, as long as N not limited, I'll stick with process I am using (regardless of when I put it on) [Status Quo Bias]."

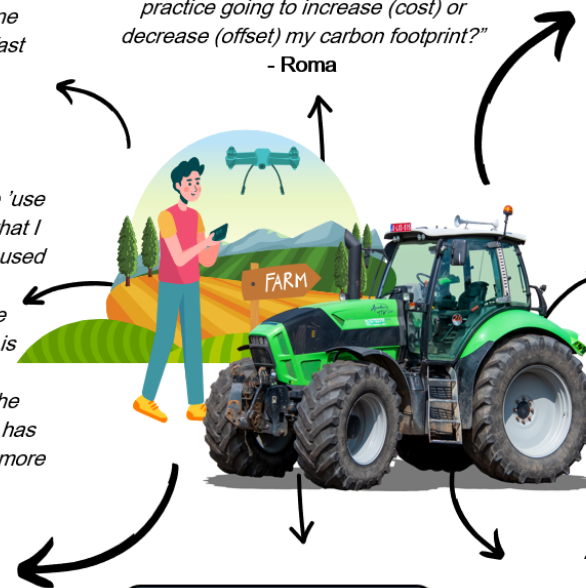
- Gindie

"We spread last year in front of a 2 mm storm and lost 8%. Spreading on 36 m swath was also very uneven, so we have strips of N deficiency throughout the current crop. We won't be spreading again [Recency Bias]."

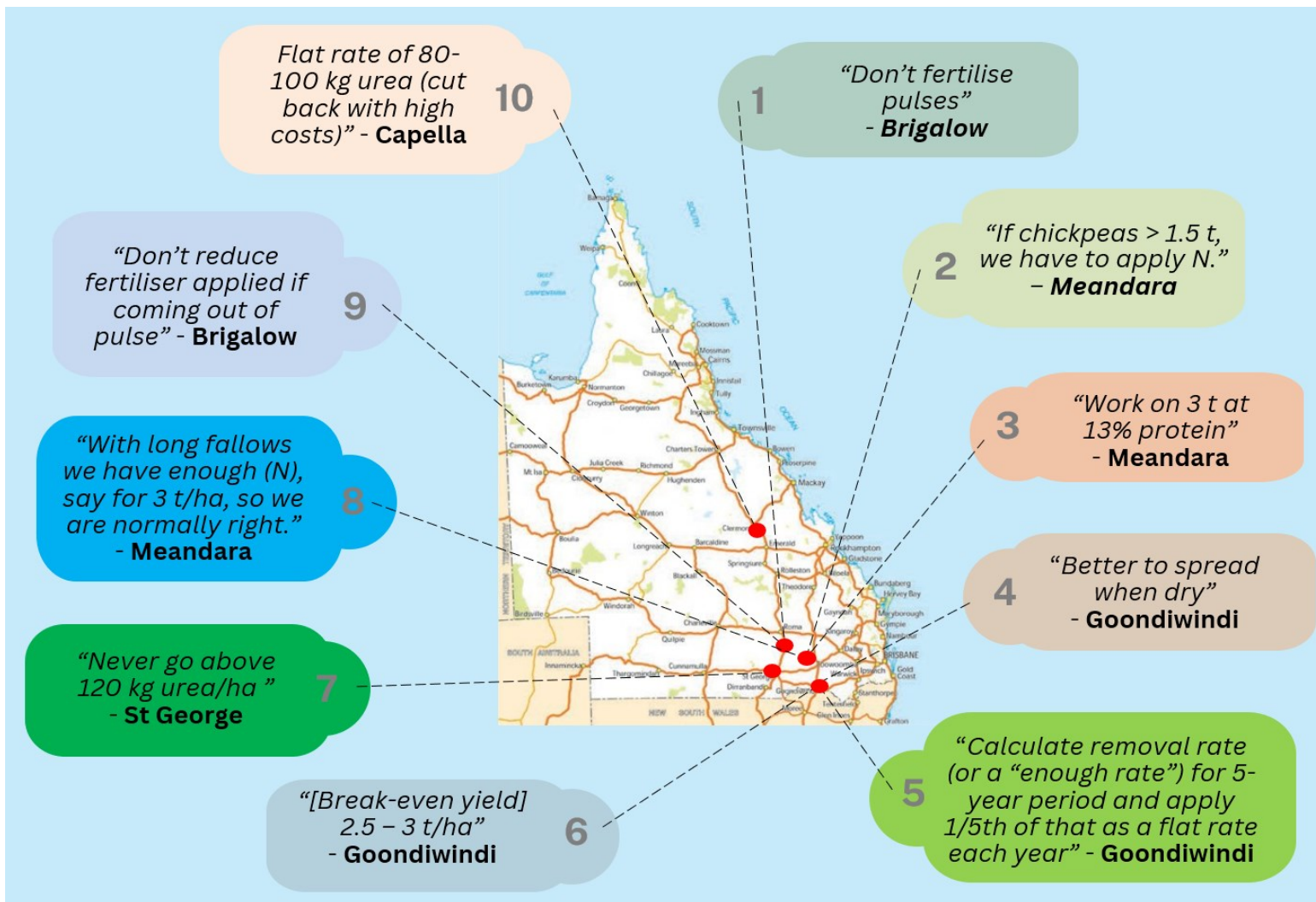
- Roma

RULES OF THUMB

Various rules of thumb used by farmers in setting yield targets and fertiliser management - Capella, Brigalow, Meandarra, St George, and Goondiwindi



Rules of Thumb Farmers Use in Fertiliser Management



Source of map: Department of Agriculture and Fisheries, 2024

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Decision-making process. The use of rules of thumb was observed across research sites, primarily in setting yield targets and nitrogen decisions. Farmers make decisions with the goal of maximising yields and profits. Many of their decisions are based on their own experience. Some farmers are constrained in their decisions based on their available resources. Notably, some farmers' decision making processes are strongly influenced by their values and goals.

Research gaps. Research gaps in relation to decision making identified by growers include nitrogen efficiency under different timing of application, temperature, moisture, and fertiliser product; phosphorous application for starter and deep application; and accurate weather forecasting.

References

Business Queensland. (2024). Broadacre crops. Queensland Government.
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