

HART

BEAT

Yield Prophet® simulations for 8 sites across the Mid North of SA

Hart | Spalding | Condowie
Kybunga | Farrell Flat | Pinery
Eudunda | Tarlee



Incorporating
RiskWiSe Balancing risk and reward for on-farm decision making
MINIMISE RISK & MAXIMISE REWARD
in 2026

ISSUE 71
June 23, 2026

HART BEAT definitions

The Hart field site has been characterised for plant available water capacity (PAWC) and bulk density to determine how much of the measured water and nitrogen is available to the crop during the season.

Plant available water capacity (PAWC) – is the difference between the drained upper limit of the soil and the lower extraction limit of a crop over the depth of rooting. It is the maximum water available to a crop from a particular soil type.

Plant available water (PAW) – is the amount of water contained in the soil at a given time minus the crop lower limit.

Growing season rainfall (GSR) – is rainfall for the period between and including April to October.

Decile – is a measure of seasonal rainfall on a scale of 1 to 10. In a Decile 7 year, 70% of previous years were

drier, in a Decile 3 year 30% of previous years were drier.

Yield Prophet® is an internet-based service which uses the APSIM wheat prediction model.

The model relies on accurate soil, crop, historical climate data and up to date local weather

information to predict plant growth rates and final hay or grain yields. These are critical measurements specific to the site being analysed and may not fit closely to individual situations. Instead, the predictions will give a realistic guide to seasonal prospects based on a site with similar rainfall and / or soil type.

Using climate data for the current season, *Yield Prophet®* simulates the soil water, nitrogen processes and crop growth in the paddock. *Yield Prophet®* calculates the amount of water and nitrogen available to the crop as well as the water and nitrogen demand of the crop.

Disclaimer: *Yield Prophet®* information is used entirely at your own risk. You will accept all risks and responsibility for losses, damages, costs and other consequences of using *Yield Prophet®* information and reports. To the maximum extent permitted by law, APSRU and BCG excludes all responsibility and liability to any person arising directly or indirectly from using the information generated by *Yield Prophet®*.

Important Notice: *Yield Prophet®* does not generate recommendations or advice; it is only a guide and must be combined with local paddock and district knowledge. APSIM does not take into account weed competition, pest/disease pressure, pesticide / herbicide damage, farmer error, or extreme events (such as extreme weather, flood and fire). Click on these links for more information about [APSIM](#) or [Yield Prophet](#)

Yield Prophet® Lite

A **FREE** online tool to predict yield potential and manage in-crop nitrogen

Don't have Yield Prophet®?

Yield Prophet® Lite is a free online tool for estimating potential yield values for your crop, taking into account various rainfall scenarios and application rates of nitrogen.

More info or download the App: <https://www.yieldprophet.com.au/yplite>

A look at HART BEAT in 2026

This season we're again taking you through our RiskWiŞe nitrogen decision making process, based on a risk-reward analysis. Similar to previous seasons, Yield Prophet® outputs for the Hart site this year are not just simulations –we're using actual data and relevant climate information (with links included) to show how nitrogen decisions can be made. This document explains a practical example of the decision-making process used to determine an appropriate nitrogen rate. This rate will be applied to the Hart wheat variety trial, providing an opportunity to reflect on our decision at the end of the growing season. We've also included some information on seven other sites across the Mid North, so you can see predicted yield outcomes across a range of soil types and season deciles.

What is RiskWiŞe?

RiskWiŞe is a 5-year national investment from GRDC that will support the on-farm decision making strategies of Australian grain growers, by assisting them to better understand risk and provide risk management tools to maximise returns. Some key aspects include:

1. Understanding risk and reward
 - a. Identifying the known and unknown components of risk.
 - b. Tools to help assess and balance upside reward and downside risk.
2. Challenging grower decision-making to account for various probabilities or futures and seasonal outlooks when making decisions.

Through this project, growers and advisors will receive support to quantify the probability of various outcomes, then use that information to make risk vs reward assessments. This can be applied across a range of management decisions in the context of your own farming operations.

Background

In the past, our nitrogen decisions have been based on one future, for example: a target yield of 3 t/ha in a particular environment. This target is helpful because we can use the 40 kg N per tonne of wheat rule, to calculate that we need 120kg N. If we know how much N is currently available to the crop, we know how much extra to add. But we also know that if we are unlikely to hit this target, we are going to either under-fertilise and regret being too cautious or over-fertilise and regret being too optimistic. An alternative approach is to look at a range of possible outcomes so that we can better understand the downside risk and upside reward, using all the information available to us at that point in time. **By knowing the downside risk and upside reward of our decision, we can be more comfortable in weighing up the benefits of our decision and understand the risks.**

When it comes to harvest, we will know whether our decision was lucky or unlucky, but in June we can only know that we have made a wise or unwise decision.

Yield Prophet® uses our starting soil water and weather records for 2026 up to June 23 and shows the range of possible futures using all historic seasons. We have also used a forecast from the Bureau of Meteorology.

Review: 2025 nitrogen decisions

Season conditions & outlook

Like many areas across the Mid North and South Australian regions more broadly, Hart experienced dry conditions in 2025, achieving growing season rainfall (GSR) of 223 mm (300 mm average). Following Decile 2 GSR (176mm) in 2024, a wheaten hay crop and a late break to the season, high background N in 2025 was observed and starting conditions were dry. At the time nitrogen (N) decisions were being made in July, the 3-month BOM forecast showed that there was a 76% chance of above average rainfall from July to September. At this time the Bureau predicted a neutral ENSO phase (neither El Niño nor La Niña) until at least the end of August, with a high chance of neutral conditions lasting until the end of the year.

Decision tools:

Deep soil N and water test results, Yield Prophet[®], Bureau climate outlook (3-month forecast), and the fast graphs for slow thinking spreadsheet were used to generate some quick graphs & economics.

How did the tools used stack up?

In July, Yield Prophet[®] initially predicted wheat grain yields ranging from 1-6.9 t/ha across decile outcomes. Based on the conditions and outlook information above, enough N was added at Hart to achieve a Decile 5-6 yield (30 kg N/ha). Although the Bureau was predicting a 51% chance of Decile 7-10 rainfall for July- September, we decided to take a somewhat conservative approach considering the dry and late start to the season. Overall, Decile 3 GSR conditions resulted in 1.71 t/ha wheat grain yield (Scepter). Although GSR was better than 2024, conditions were not completely favourable, with greater than average rainfall in July favouring early crop development, however below average spring rainfall resulted in water stress during reproductive stages, impacting yield potential across the site.

N decisions: how have we performed?

It can be challenging to match crop N demand when it is unknown what the season will present in each given year. By looking at our starting soil conditions, yield spread, and the season forecast we can make informed decisions. Although these decisions can be good at the time, we can still have unlucky outcomes. See below for how our decisions have stacked up:

Table 1. Summary of N decisions across four seasons at Hart.

	2023	2024	2025	2026 (to date)
Predicted yield (PY _w)	1.5 – 7.9 t/ha	1.0 – 6.4 t/ha	1.0 – 6.9 t/ha	2.6 – 7.8 t/ha
*Chance of exceeding average rainfall (BOM)	22%	52%	76%	30%
Applied N (kg N/ha)	74 kg	60 kg	30 kg	90 kg
GSR decile required (to match applied N)	4 (3.5 t/ha)	4 (2.7 t/ha)	5-6 (3-3.5 t/ha)	5 (5.6 t/ha)
Actual GSR decile	4	2	3	8
Actual yield (t/ha)	4.06	0.56	1.71	

**Three-month forecast outlook (July-September or August-October)*

A model of predicted and actual yields at Hart over 13 years (2012-2025) shows that there is a moderate to strong correlation between Yield Prophet® predictions and observed yields.

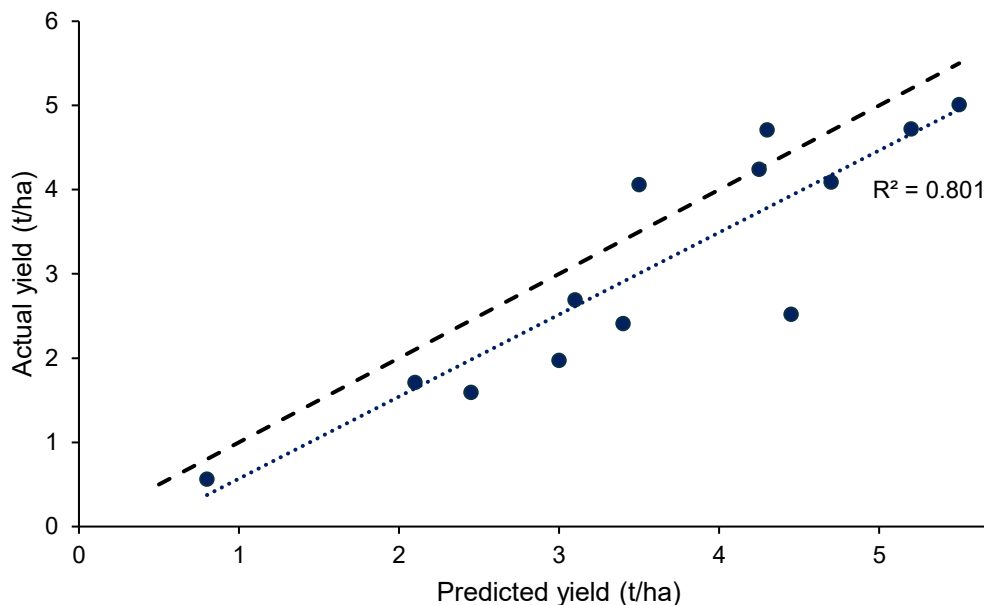


Figure 1. The relationship between Yield Prophet® grain yield predictions and actual yield at Hart across 13 seasons (2012-2025). Predicted yields shown have been generated from July or August simulations. Yields from 2021 are not included in this data set, due to significant grain losses prior to harvest. The dashed black trendline is the 1:1 line, crossing through point 0.

Hart's top tips for growers:

1. **Soil test:** it is important to understand your baseline N to budget your fertiliser well and ensure you're not mining available soil organic N from the system. There may be years we need to replace what we've taken from the system, if under-fertilising has occurred.
2. Consider looking at your estimated nitrogen and water limited **yield potential** across a range of season deciles to understand the range of outcomes in a given season. This is a really great and quick tool to see how much N you will require to close the yield gap.
 - Step 1:** get your soil N data and divide by 40. This becomes your nitrogen limited yield (for example: 80 kg N/ha / 40 = 2 t/ha wheat grain yield).
 - Step 2:** estimate your grain yield across different deciles, this becomes your water limited yield (example only: Decile 1 = 1.0 t/ha, Decile 5 = 3.5 t/ha, Decile 7 = 6 t/ha).
 - Step 3:** determine the difference between these two numbers in each decile range and multiply by 40 (this is how much N you require to meet yield your gap) Easy!
3. **Reflect** on your N decision and learn from this for the consecutive season.

Useful information links:

1. BOM three-month outlook: [Rainfall - Totals that have a 75% chance of occurring for July to September - Climate Outlooks](#)
2. Southern Hemisphere monitoring: <http://www.bom.gov.au/climate/enso/?ninoIndex=nino3.4&index=nino34&period=weekly>
3. Understanding the IOD: <http://www.bom.gov.au/climate/about/australian-climate-influences.shtml?bookmark=iod>
4. **NEW!** Fast Graphs for Slow Thinkers- N budgeting across deciles: [N FGFST V3 - Water, Soil N & Fert Limited Yield](#)

Location:

HART

HART BEAT

Date of report: June 23, 2026

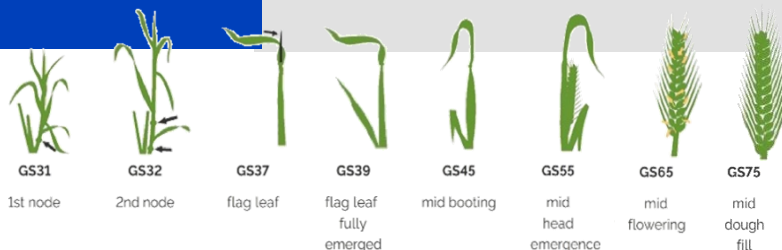
Site information

Soil type: Sandy clay loam

Average annual rainfall: 400 mm

Crop growth

Variety: Scepter wheat
Sowing date: May 06, 2026
Emergence: May 15, 2026
Soil sampling date: March 31, 2026
Starting soil N: 96 kg N/ha
Seeding fertiliser: 18 kg N/ha
Top dress: 30 kg N/ha



GS31

1st node

GS32

2nd node

GS37

flag leaf

GS39

flag leaf fully emerged

GS45

mid booting

GS55

mid head emergence

GS65

mid flowering

GS75

mid dough fill

The season so far

Annual rainfall to date: 249 mm
GSR to date: 143 mm
Current GSR decile: 8
Initial PAW (March 31): 44 mm
Current predicted PAW: 120 mm (58% full)
PAWC: 206 mm

Yield Prophet® report: Hart field site

Output 1: What is our yield spread?

The first report (below) was run on June 22, after a 'no brainer' application of 30 kg N/ha was top dressed due to an opportunistic rain event in early June (starting soil and seeding N also included). The yield probability curves display two different nitrogen scenarios. The **green** line displays grain yield at Hart with the current soil available nitrogen, or Nitrogen-limited yield (PY_N). The **blue** line represents the grain yield potential for water-limited yield potential (PY_w). A difference between these two lines, as observed below, indicates additional N fertiliser is required for the crop to reach its yield potential if growing season rainfall exceeds Decile 1. The red dotted line represents Decile 5 (or 50% probability of receiving 4.4 t/ha nitrogen-limited yield or 5.8 t/ha water-limited yield) (Table 2).

Total nitrogen:

Starting Soil N (0 – 135 cm):

96 kg N/ha

Fertiliser at seeding:

18 kg N/ha (100 kg/ha DAP)

Top dress (June 12):

30 kg N/ha (65 kg/ha Urea)

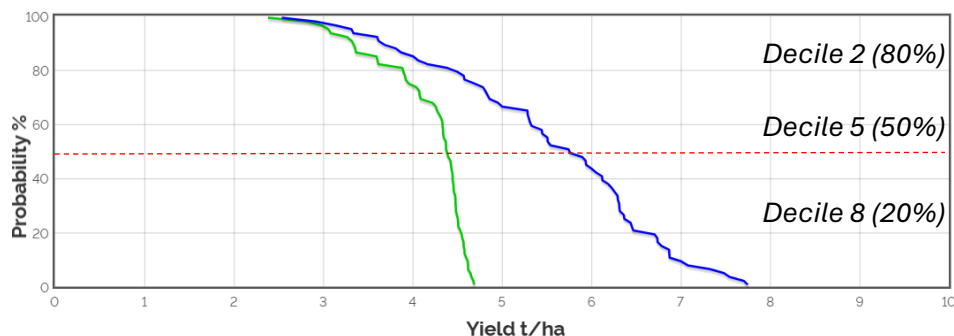


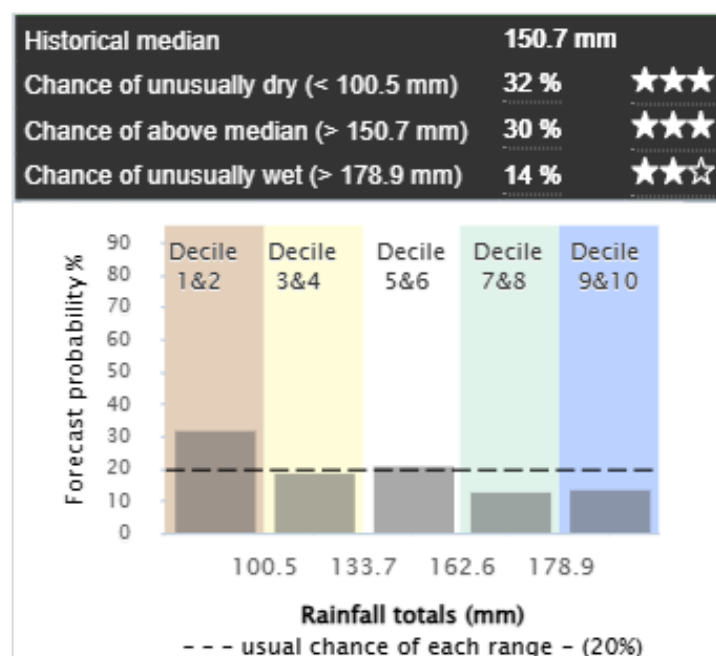
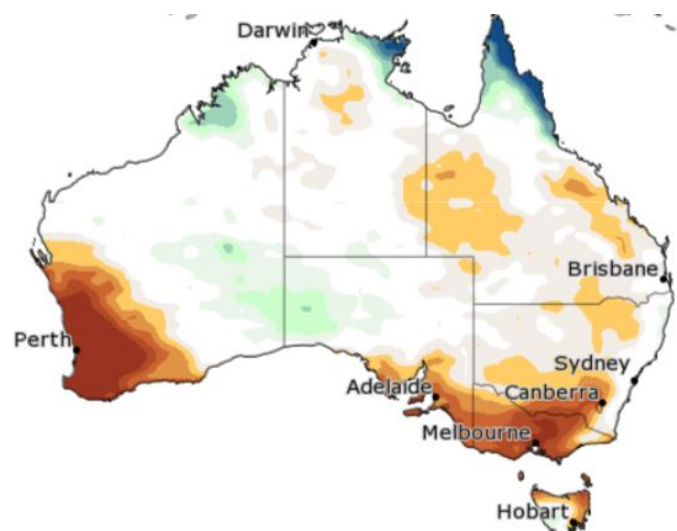
Table 2. N required across all season decile outcomes (adapted from Yield Prophet Output 1 shown above).

Equivalent decile finish	0	1	2	3	4	5	6	7	8	9	10
PY _N (t/ha)	2.5	3.3	3.9	4.1	4.3	4.4	4.4	4.5	4.5	4.6	4.7
PY _w (t/ha)	2.6	3.7	4.4	4.9	5.3	5.8	6.1	6.3	6.6	6.9	7.8
Yield difference (t/ha)	0.1	0.4	0.5	0.8	1.0	1.4	1.7	1.8	2.1	2.3	3.1
N requirement (kg N/ha)	4	16	20	32	40	56	68	72	84	92	124

WHAT'S NEXT: Seek more information & consider the climate outlook

ENSO Outlook

The Bureau have declared that the ENSO is now in an El Niño phase, with predictions for conditions to persist until the end of the year. **What does this mean?** An El Niño phase generally leads to a higher chance of below average rainfall and above average temperatures. Forecasts are suggesting a strong-very strong El Niño event, however this does not necessarily correlate with strong impacts on our climate. Every El Niño is different, with severity varying between each event.



July-September Outlook

We can also find short and longer-term climate information indicating the likelihood of above average rainfall, in this case a 3-month forecast (left) (National BOM map showing chance of exceeding average rainfall above). The shaded area in each bar indicates the likelihood of each of the five rainfall bands occurring. The forecast likelihood can be compared to the usual chance (20%) shown by the dashed line. In this case, we have a 51% chance that July - September rainfall will fall into a Decile 1 – 4 category, and 27% chance of falling into Decile 7 – 10. **Combined, this information tells us that the likelihood of receiving above median (average) rainfall from July-September is 30% which is slightly lower than long-term odds.**

Sourced from Bureau of Meteorology:

<http://www.bom.gov.au/climate/outlooks/#/rainfall/median/seasonal/0>

NEXT UP: We combine Yield Prophet® output, the bureau forecast & economics

How much N: What do the economics tells us?

Geopolitical disruptions in early 2026 brought fertiliser and diesel costs to the forefront of many farmers mind with significant increase in costs compared to 2025. The below graph is an example of the economic appraisal of applying an additional 60 kg N (130 kg/ha of urea) with a 30% chance of exceeding above average rainfall (to match the current BOM forecast detailed in previous section). This is based on the yield information for each decile provided in Output 1 (wheat price of \$330/tonne, urea at \$1200/tonne and application cost of \$15/ha). Any point above the “0” line is a profitable outcome. The light blue line shows an additional 60kg N/ha with no value on carry over N and the dark blue line represents an additional 60 kg N/ha accounting for 70% carry over on any un-used N (on average, carry over N has shown to be between 60-80%).

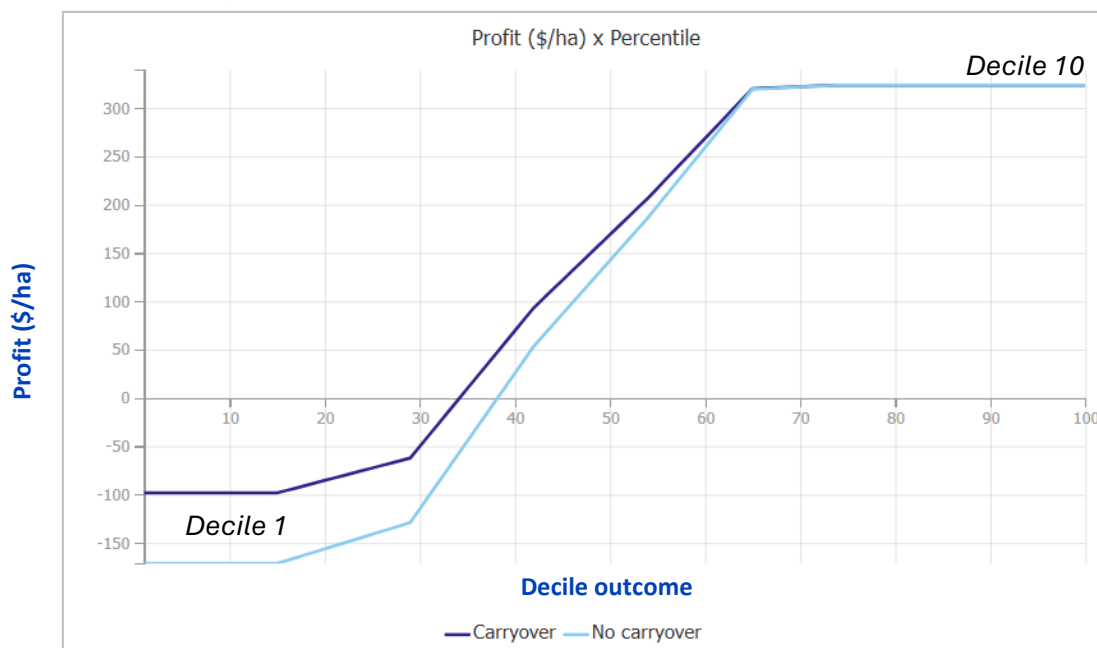


Figure 2. Profit (\$/ha) x percentile graph for adding an additional 60kg N/ha to Output 1. Graph source adapted from Yield Prophet® output 1 with Peter Hayman's 'Fast Graphs for Slow Thinking' calculator.

	Long term average		Worst case	
	No carryover N	138	\$/ha	-172
70% carryover N	106	\$/ha	-99	\$/ha

Based on the information above, with our current season forecast, applying additional N to this crop is only profitable for seasons greater than approximately a Decile 4. Accepting that there may be other factors that could affect final yield (other than rainfall) such as frost or heat spikes.

Yield Prophet® (based on Output 1)

There is benefit to applying additional N virtually across all seasons, highlighted by the significant gap in water limited yield (WLY) and nitrogen limited yield (NLY) (Figure 3). The difference between WLY (PY_W) and NLY (PY_N) at Decile 5 is 1.4 t/ha. Based on the rule of thumb of 40 kg/ha N required per tonne of wheat produced, this gap could be covered by adding 56 kg N/ha (Table 2).

We are confident that if we experience below average rainfall conditions, we'll see a portion of N carry over into 2027. The upside of adding an additional 60 kg N/ha is worthwhile, while remaining conservative due to a higher chance of below average rainfall over the next three months. The dark blue line shows fertiliser limited yield (FLY) after an additional

in-season application of 60 kg N/ha. Even after this additional application, there is potential for significant yield to be left in the paddock due to insufficient N if GSR exceeds Decile 6.

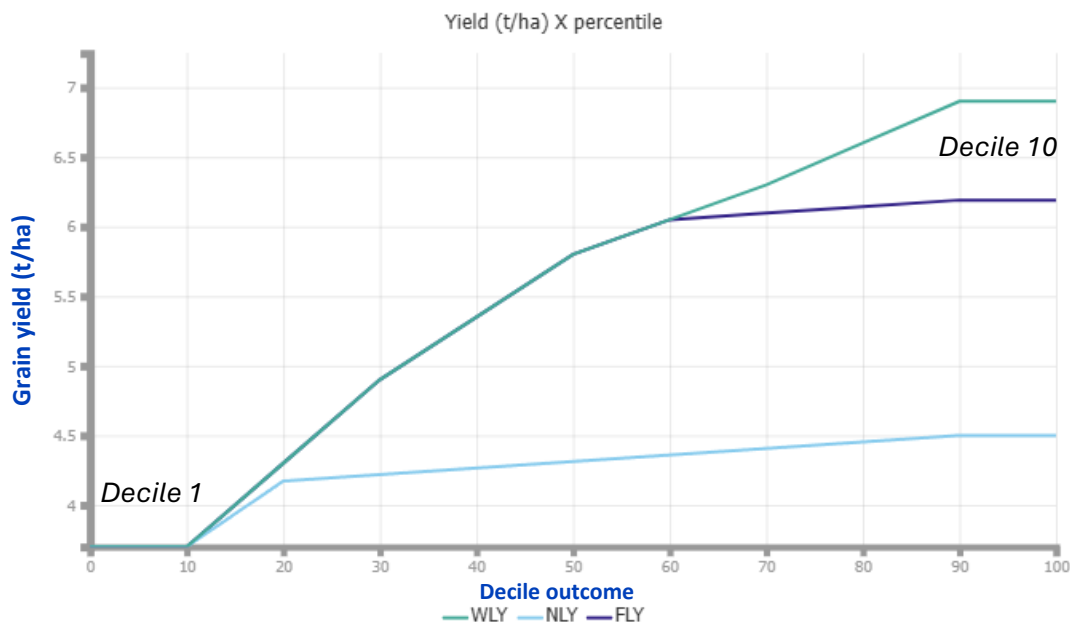


Figure 3. Yield x percentile graph for adding an additional 60kg N/ha to Output 1. Graph source adapted from Yield Prophet® output 1 with Peter Hayman’s ‘Fast Graphs For Slow Thinking’ calculator.

Output 2: Nitrogen application

From our decision-making process, we know that additional N is required to improve our final yield, so, **we plan to apply 60 kg N/ha (130 kg urea) as a second in-season top dress application to Scepter wheat.**

The below output was modelled on June 23. There is still a slight gap between nitrogen and water-limited yield from Decile 6 onwards. Note that Outputs 1 and 2 have a similar blue line showing a wide PY_w yield range of 2.6 t/ha to 7.7 t/ha depending on how the season finishes. Adding extra nitrogen has moved the green line (PY_N) closer to the water-limited yield and 60 kg N/ha was sufficient to close the yield gap to our target water limited yield (PY_w).

Total nitrogen:

Starting Soil N (0 – 135 cm):

96 kg N/ha

Fertiliser at seeding:

18 kg N/ha (100 kg/ha DAP)

Top dress:

30 kg N/ha (65 kg/ha Urea)

60 kg N/ha (130 kg/ha Urea)

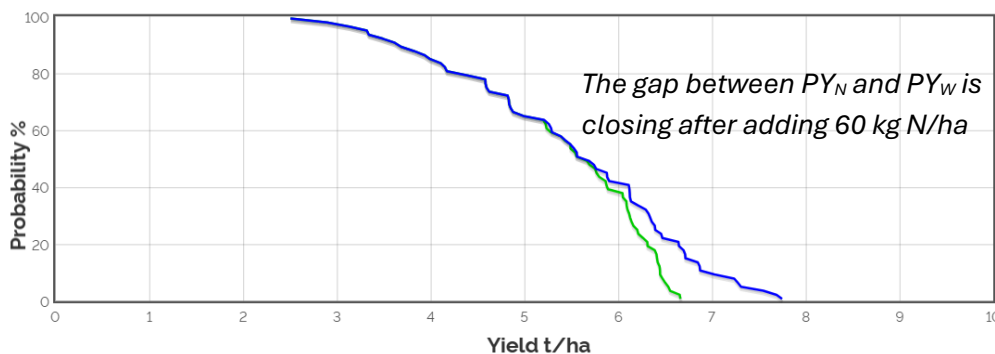


Table 3. N required across all season decile outcomes (adapted from Yield Prophet Output 2 shown above).

Equivalent decile finish	0	1	2	3	4	5	6	7	8	9	10
PY_N (t/ha)	2.6	3.7	4.3	4.8	5.3	5.6	5.9	6.1	6.3	6.4	6.7
PY_w (t/ha)	2.6	3.7	4.3	4.8	5.3	5.6	6.1	6.3	6.6	7.0	7.7
Yield difference (t/ha)	0	0	0	0	0	0	0.2	0.2	0.3	0.6	1.0
N requirement (kg N/ha)	0	0	0	0	0	0	8	8	12	24	40

Summary of N application at Hart

After taking into account Yield Prophet® Output 1 which included starting soil N, seeding fertiliser, and a 'no brainer' top dress application of 30 kg N/ha in early June, we considered the Bureau forecast which predicted 30% chance of exceeding median rainfall for the next three months. Currently sitting at a Decile 8 GSR for 2026, we wanted to ensure that our N decisions considered exceeding Decile 1 rainfall which is where our current N availability would begin limiting yield potential, while remaining conservative with our N decision strategy due to the BOM outlook.

We then conducted a quick economic analysis to decide if we should apply 60 kg N/ha to close the yield gap to Decile 5-6, this highlighted that it would be profitable for seasons greater than a Decile 4.

From this process it was decided that an additional in-season application of 60 kg N/ha will be applied prior to the next rainfall event, and we are confident that this will meet N requirements appropriately. Based on a urea price of \$1200 per tonne (\$1.20/kg), our additional top dress input this season is equal to \$72/ha.

All other sites have a 'no brainer' top dress application of 45 kg N/ha in June, excluding Eudunda (sufficient soil N to Decile 9). Site specific applications will occur in the next edition.

We'll share our reflections on this decision and an update on how the season and yield potential across the 8 locations is tracking in our next edition of HART BEAT in July.

For more information, please contact our Research Lead, Kaidy.

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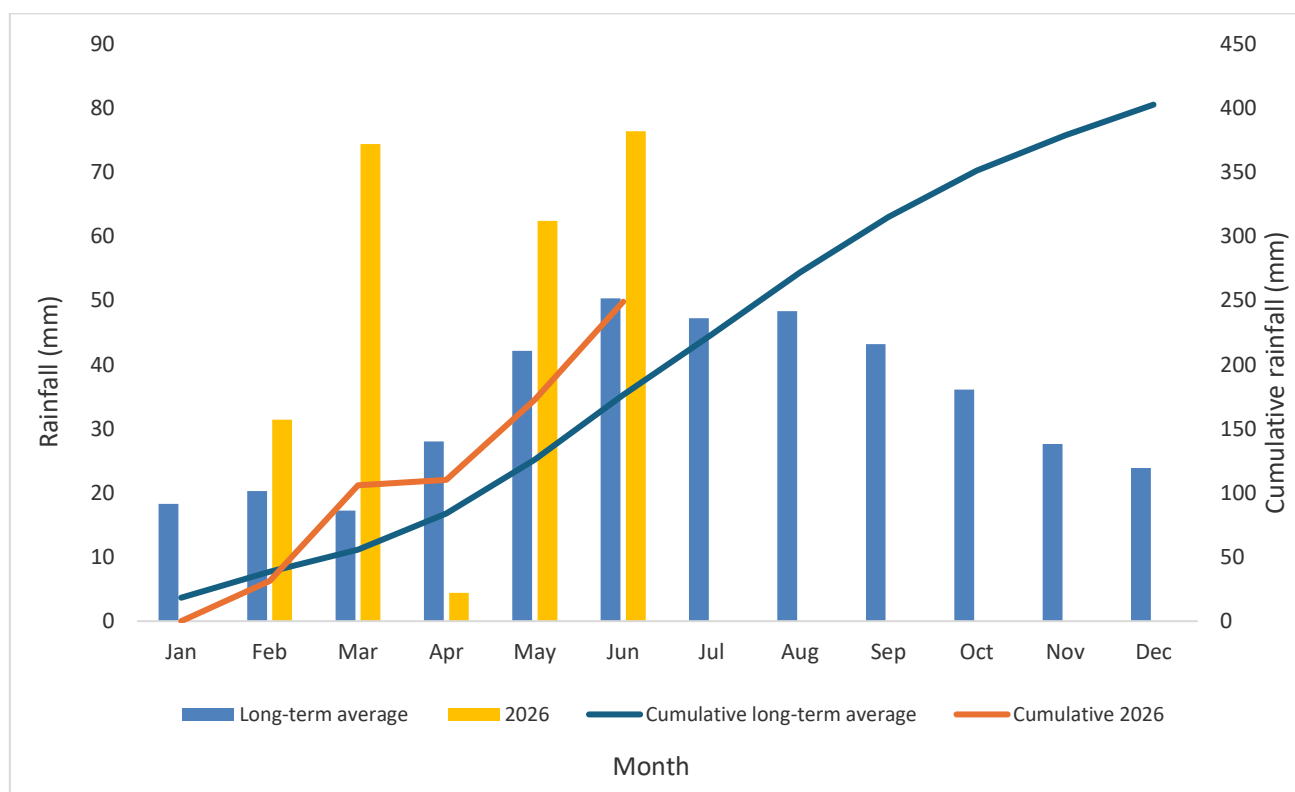


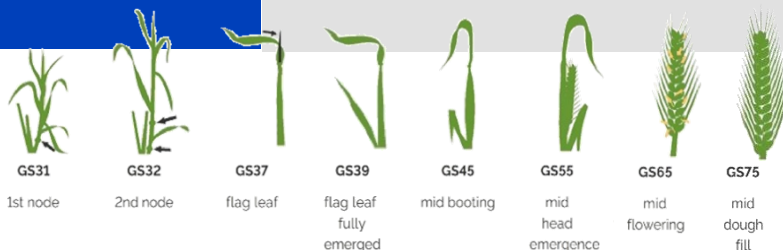
Figure 4. Hart rainfall graph for the 2026 season and long-term average. Lines are displayed to present cumulative rainfall for long term average (blue) and 2026 (orange). Current season rainfall data sourced from Mid North Mesonet <https://mesonet.com.au/>.

Location:

SPALDING

HART BEAT

Date of report: June 22, 2026



Soil type: Red brown earth

Average annual rainfall: 430 mm

Simulation assumptions

Crop growth

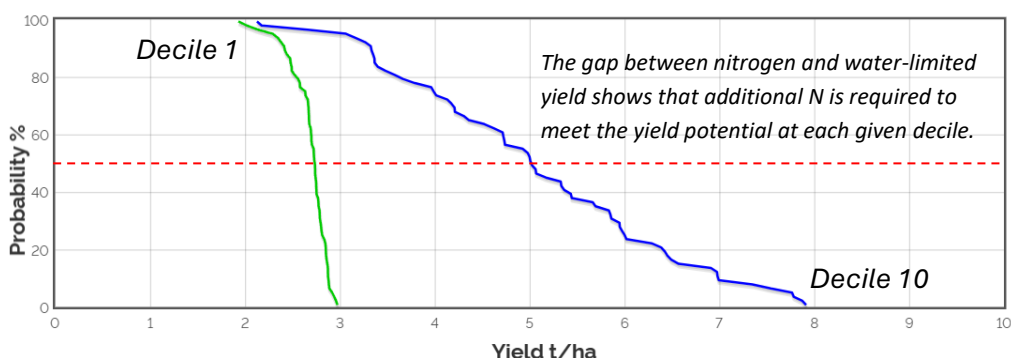
Variety: Scepter wheat
Sowing date: May 1, 2026
Measured starting N: 66 kg N/ha
Nitrogen fertiliser: 20 kg N @ seeding
+ 45 kg N/ha

The season so far

GSR to date: 158.5 mm
Estimated GSR decile to date: 8
Initial PAW (April 7): 0 mm
Current predicted PAW: 90 mm (63% full)
PAWC: 143 mm

Yield Prophet[®] prediction

Based on 66 kg N/ha starting soil & seeding N.
+ 45 kg N/ha applied in crop



The **green** line in the graph above shows the predicted grain yield at Spalding for nitrogen-limited yield (PY_N). The **blue** line represents the grain yield potential for water-limited yield (PY_W). No difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. A large difference between these two lines, indicates additional N fertiliser is required for the crop to reach its yield potential. Site characterisation data from APSoil for Spalding has been used, and starting soil available nitrogen and water was measured. The red dotted line represents Decile 5 (or 50% probability of receiving 2.7 t/ha nitrogen-limited yield or 5.0 t/ha water-limited yield – refer to below table).

Based on data from the graph above, this table shows the amount of additional N required to close the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	0	1	2	3	4	5	6	7	8	9	10
PY_N (t/ha)	1.9	2.4	2.5	2.7	2.7	2.7	2.8	2.8	2.9	2.9	3.0
PY_W (t/ha)	2.1	3.3	3.6	4.2	4.7	5.0	5.4	5.9	6.4	7.0	7.9
Yield difference (t/ha)	0.3	0.9	1.1	1.5	2.0	2.3	2.6	3.1	3.5	4.1	4.9
Additional N requirement (kg N/ha)	12	36	44	60	80	92	104	124	140	164	196

Location:

CONDOWIE

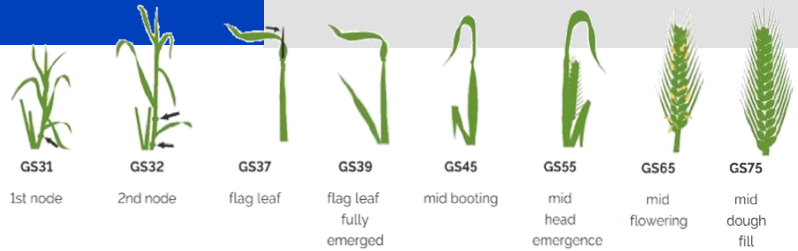
HART

BEAT

Date of report: June 22, 2026

Soil type: Sandy loam

Average annual rainfall: 350 mm



Simulation assumptions

Crop growth

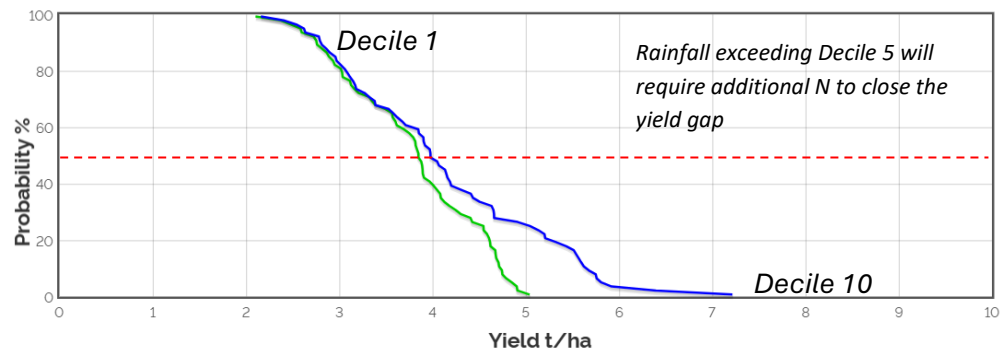
Variety: Scepter wheat
 Sowing date: May 1, 2026
 Measured starting N: 124 kg N/ha
 Nitrogen fertiliser: 20 kg N/ha @ seeding
 + 45 kg N/ha

The season so far

GSR to date: 175 mm
 Estimated GSR decile to date: 10
 Initial PAW (March 31): 77 mm
 Current predicted PAW: 132 mm (100% full)
 PAWC: 115 mm

Yield Prophet[®] prediction

Based on 124 kg N/ha
 starting soil & seeding N
 + 45 kg N/ha applied in crop



The **green** line in the graph above shows the predicted grain yield at Condowie for nitrogen-limited yield (PY_N). The **blue** line represents the grain yield potential for water-limited yield (PY_w). No difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. A large difference between these two lines, indicates additional N fertiliser is required for the crop to reach its yield potential. Site characterisation data from APSoil for Condowie has been used, and starting soil available nitrogen and water was measured. The red dotted line represents Decile 5 (or 50% probability of receiving 3.8 t/ha nitrogen-limited yield or 4.0 t/ha water-limited yield – refer to below table).

Based on data from the graph above, this table shows the amount of additional N required to close the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	0	1	2	3	4	5	6	7	8	9	10
PY _N (t/ha)	2.2	2.8	3.0	3.3	3.7	3.8	4.0	4.3	4.6	4.7	5
PY _w (t/ha)	2.2	2.8	3.1	3.4	3.8	4.0	4.2	4.7	5.3	5.7	7.2
Yield difference (t/ha)	0	0	0.1	0.1	0.1	0.2	0.2	0.4	0.7	1.0	2.2
Additional N requirement (kg N/ha)	0	0	4	4	4	8	8	16	28	40	88

Location:

KYBUNGA

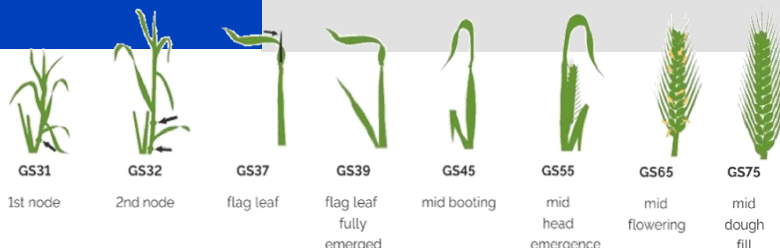
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BEAT

Date of report: June 22, 2026

Soil type: Clay loam

Average annual rainfall: 428 mm



Simulation assumptions

Crop growth

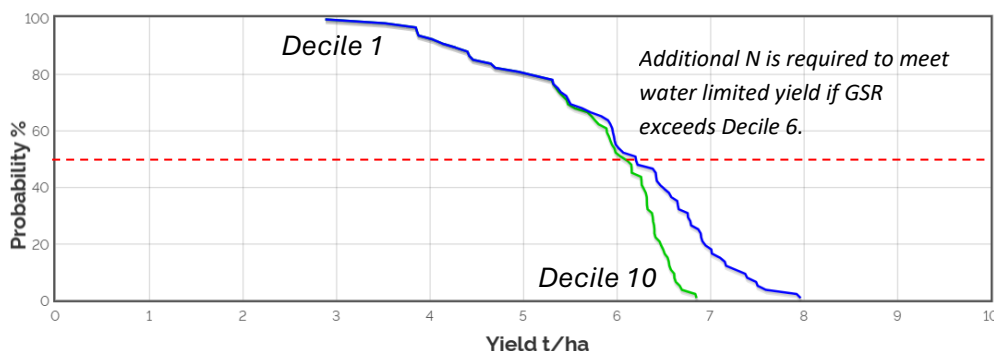
Variety: Scepter wheat
 Sowing date: May 1, 2026
 Measured starting N: 153 kg N/ha
 Nitrogen fertiliser: 20 kg N/ha @ seeding
 + 45 kg N/ha

The season so far

GSR to date: 122.4 mm
 Estimated GSR decile to date: 5
 Initial PAW (March 31): 85 mm
 Current predicted PAW: 143 mm (55% full)
 PAWC: 262 mm

Yield Prophet[®] prediction

Based on 153 kg N/ha
 starting soil & seeding N
 + 45 kg N/ha applied in crop



The **green** line in the graph above shows the predicted grain yield at Kybunga for nitrogen-limited yield (PY_N). The **blue** line represents the grain yield potential for water-limited yield (PY_W). No difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. A large difference between these two lines, indicates additional N fertiliser is required for the crop to reach its yield potential. Site characterisation data from APSoil for Kybunga has been used, and starting soil available nitrogen and water was measured. The red dotted line represents Decile 5 (or 50% probability of receiving 6.1 t/ha nitrogen-limited yield or 6.2 t/ha water-limited yield – refer to below table).

Based on data from the graph above, this table shows the amount of additional N required to close the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	0	1	2	3	4	5	6	7	8	9	10
PY_N (t/ha)	3.0	4.2	5.0	5.5	5.9	6.1	6.3	6.4	6.5	6.6	6.9
PY_W (t/ha)	3.0	4.2	5.0	5.5	6.0	6.2	6.5	6.8	6.9	7.3	8.0
Yield difference (t/ha)	0	0	0	0	0.1	0.1	0.2	0.4	0.4	0.7	1.1
Additional N requirement (kg N/ha)	0	0	0	0	4	4	8	16	16	28	44

Location:

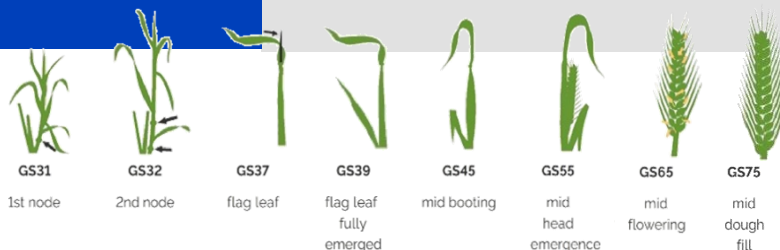
FARRELL FLAT

HART BEAT

Date of report: June 22, 2026

Soil type: Light clay loam

Average annual rainfall: 474 mm



Simulation assumptions

Crop growth

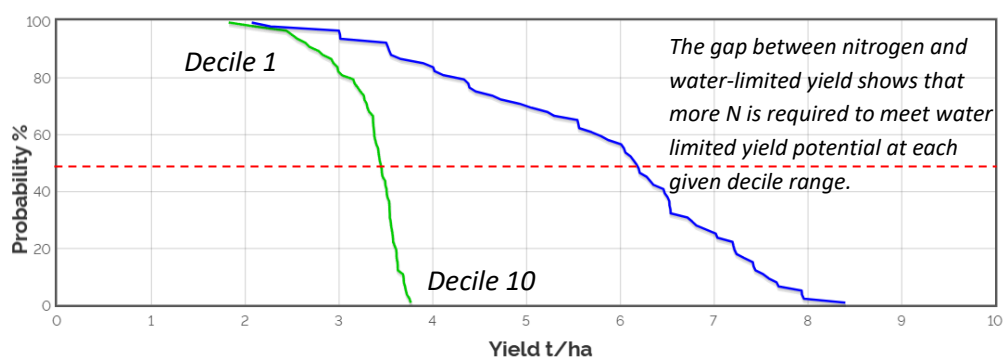
Variety: Scepter wheat
 Sowing date: May 1, 2026
 Measured starting N: 101 kg N/ha
 Nitrogen fertiliser: 20 kg N/ha @ seeding
 + 45 kg N/ha

The season so far

GSR to date: 127.8 mm
 Estimated GSR decile to date: 5
 Initial PAW (April 7): 13 mm
 Current predicted PAW: 80 mm (47% full)
 PAWC: 172 mm

Yield Prophet[®] prediction

Based on 101 kg N/ha
 starting soil & seeding N
 + 45 kg N/ha applied in crop



The **green** line in the graph above shows the predicted grain yield at Farrell Flat for nitrogen-limited yield (PY_N). The **blue** line represents the grain yield potential for water-limited yield (PY_w). No difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. A large difference between these two lines, indicates additional N fertiliser is required for the crop to reach its yield potential. Site characterisation data from APSoil for Farrell Flat has been used, and starting soil available nitrogen and water was measured. The red dotted line represents Decile 5 (or 50% probability of receiving 3.4 t/ha nitrogen-limited yield or 6.2 t/ha water-limited yield – refer to below table).

Based on data from the graph above, this table shows the amount of additional N required to close the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	0	1	2	3	4	5	6	7	8	9	10
PY_N (t/ha)	1.9	2.7	3.1	3.3	3.4	3.4	3.5	3.6	3.6	3.7	3.8
PY_w (t/ha)	2.1	3.5	4.2	5.0	5.7	6.2	6.5	6.7	7.2	7.6	8.4
Yield difference (t/ha)	0.2	0.8	1.1	1.7	2.3	2.8	3.0	3.1	3.6	3.9	4.6
Additional N requirement (kg N/ha)	8	32	44	68	92	112	120	124	144	156	184

Location:

PINERY

HART BEAT

Date of report: June 22, 2026

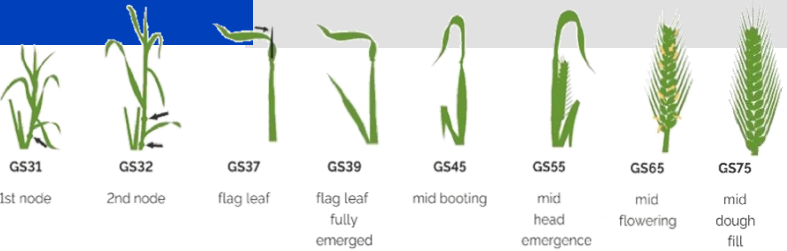
Soil type: Silty clay loam

Average annual rainfall: 374 mm

Simulation assumptions

Crop growth

Variety: Scepter wheat
 Sowing date: May 1, 2026
 Measured starting N: 196 kg N/ha
 Nitrogen fertiliser: 20 kg N/ha @ seeding
 + 45 kg N/ha

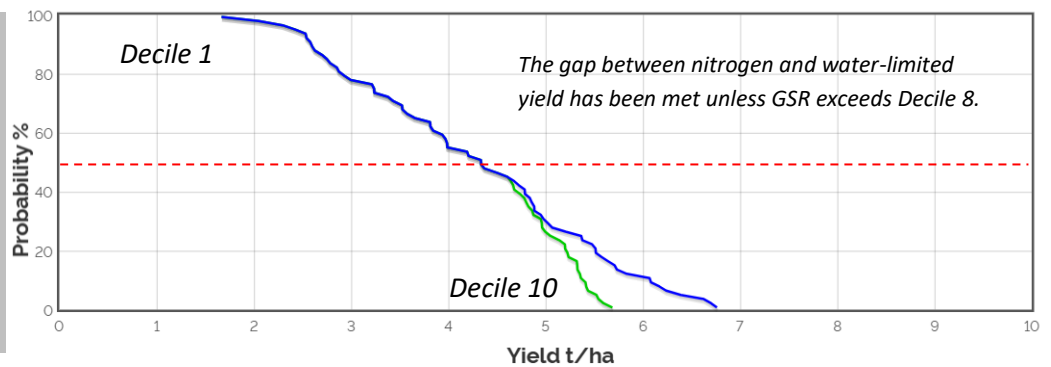


The season so far

GSR to date: 135.8 mm
 Estimated GSR decile to date: 7
 Initial PAW (April 7): 22 mm
 Current predicted PAW: 75 mm (95% full)
 PAWC: 79 mm

Yield Prophet[®] prediction

Based on 196 kg N/ha
 starting soil & seeding N
 + 45 kg N/ha applied in crop



The **green** line in the graph above shows the predicted grain yield at Pinery for nitrogen-limited yield (PY_N). The **blue** line represents the grain yield potential for water-limited yield (PY_w). No difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. A large difference between these two lines, indicates additional N fertiliser is required for the crop to reach its yield potential. Site characterisation data from APSoil for Pinery has been used, and starting soil available nitrogen and water was measured. The red dotted line represents Decile 5 (or 50% probability of receiving 4.3 t/ha wheat grain yield – refer to below table).

Based on data from the graph above, this table shows the amount of additional N required to close the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

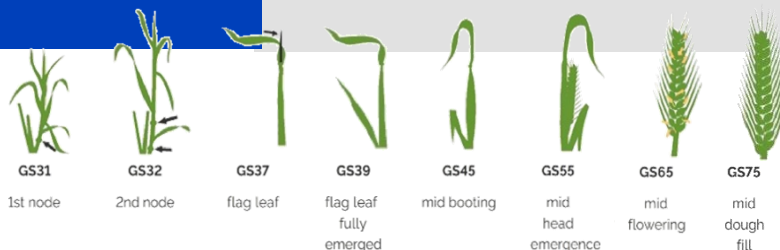
Equivalent decile finish	0	1	2	3	4	5	6	7	8	9	10
PY _N (t/ha)	1.7	2.6	2.9	3.5	3.9	4.3	4.7	5.0	5.2	5.4	5.7
PY _w (t/ha)	1.7	2.6	2.9	3.5	3.9	4.3	4.7	5.0	5.5	6.1	6.8
Yield difference (t/ha)	0	0	0	0	0	0	0	0	0.3	0.7	1.1
Additional N requirement (kg N/ha)	0	0	0	0	0	0	0	0	12	28	44

Location:

EUDUNDA

HART BEAT

Date of report: June 22, 2026



Soil type: Gravelly loam

Average annual rainfall: 445 mm

Simulation assumptions

Crop growth

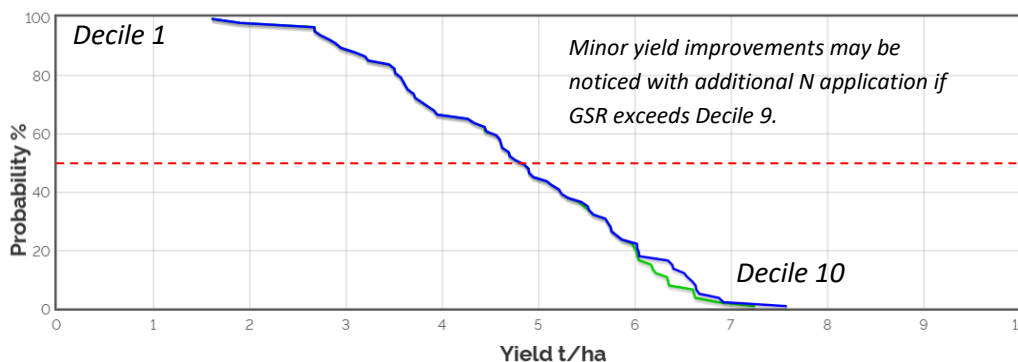
Variety: Scepter wheat
Sowing date: May 1, 2026
Measured starting N: 229 kg N/ha
Nitrogen fertiliser: 20 kg N/ha @ seeding

The season so far

GSR to date: 95.8 mm
Estimated GSR decile to date: 5
Initial PAW (April 7): 30 mm
Current predicted PAW: 67mm (70% full)
PAWC: 96 mm

Yield Prophet® prediction

Based on 229 kg N/ha
starting soil & seeding N



The **green** line in the graph above shows the predicted grain yield at Eudunda for nitrogen-limited yield (PY_N). The **blue** line represents the grain yield potential for water-limited yield (PY_W). No difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. A large difference between these two lines, indicates additional N fertiliser is required for the crop to reach its yield potential. Site characterisation data from APSoil for Eudunda has been used, and starting soil available nitrogen and water was measured. The red dotted line represents Decile 5 (or 50% probability of receiving 4.8 t/ha wheat grain yield– refer to below table).

Based on data from the graph above, this table shows the amount of additional N required to close the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	0	1	2	3	4	5	6	7	8	9	10
PY _N (t/ha)	1.9	2.9	3.5	3.8	4.5	4.8	5.3	5.7	6.0	6.4	7.3
PY _W (t/ha)	1.9	2.9	3.5	3.8	4.5	4.8	5.3	5.7	6.0	6.6	7.6
Yield difference (t/ha)	0	0	0	0	0	0	0	0	0	0.2	0.3
Additional N requirement (kg N/ha)	0	0	0	0	0	0	0	0	0	8	12

Location:

TARLEE

HART BEAT

Date of report: June 22, 2026

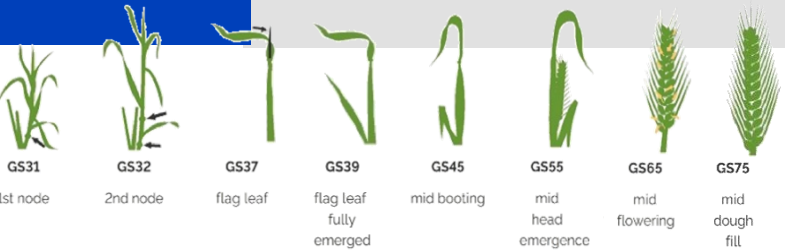
Soil type: Sandy loam

Average annual rainfall: 428 mm

Simulation assumptions

Crop growth

Variety: Scepter wheat
 Sowing date: May 1, 2026
 Measured starting N: 70 kg N/ha
 Nitrogen fertiliser: 20 kg N/ha @ seeding
 + 45 kg N/ha

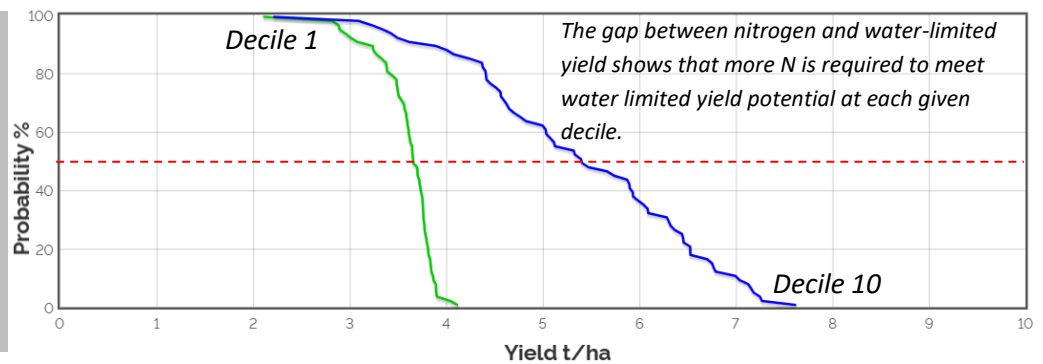


The season so far

GSR to date: 137.7 mm
 Estimated GSR decile to date: 6
 Initial PAW (April 7): 81 mm
 Current predicted PAW: 121 mm (100% full)
 PAWC: 113 mm

Yield Prophet[®] prediction

Based on 70 kg N/ha starting soil & seeding N
 + 45 kg N/ha applied in crop



The **green** line in the graph above shows the predicted grain yield at Tarlee for nitrogen-limited yield (PY_N). The **blue** line represents the grain yield potential for water-limited yield (PY_W). No difference between these two lines indicates the current soil N level is adequate for the crop to reach its yield potential. A large difference between these two lines, indicates additional N fertiliser is required for the crop to reach its yield potential. Site characterisation data from APSoil for Tarlee has been used, and starting soil available nitrogen and water was measured. The red dotted line represents Decile 5 (or 50% probability of receiving 3.7 t/ha nitrogen-limited yield or 5.4 t/ha water-limited yield).

Based on data from the graph above, this table shows the amount of additional N required to close the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	0	1	2	3	4	5	6	7	8	9	10
PY _N (t/ha)	2.2	3.2	3.4	3.6	3.6	3.7	3.7	3.8	3.8	3.9	4.1
PY _W (t/ha)	2.4	3.8	4.4	4.6	5.0	5.4	5.9	6.3	6.5	7.0	7.6
Yield difference (t/ha)	0.2	0.6	1.0	1.0	1.4	1.7	2.2	2.5	2.7	3.1	3.5
Additional N requirement (kg N/ha)	8	24	40	40	56	68	88	100	108	124	140