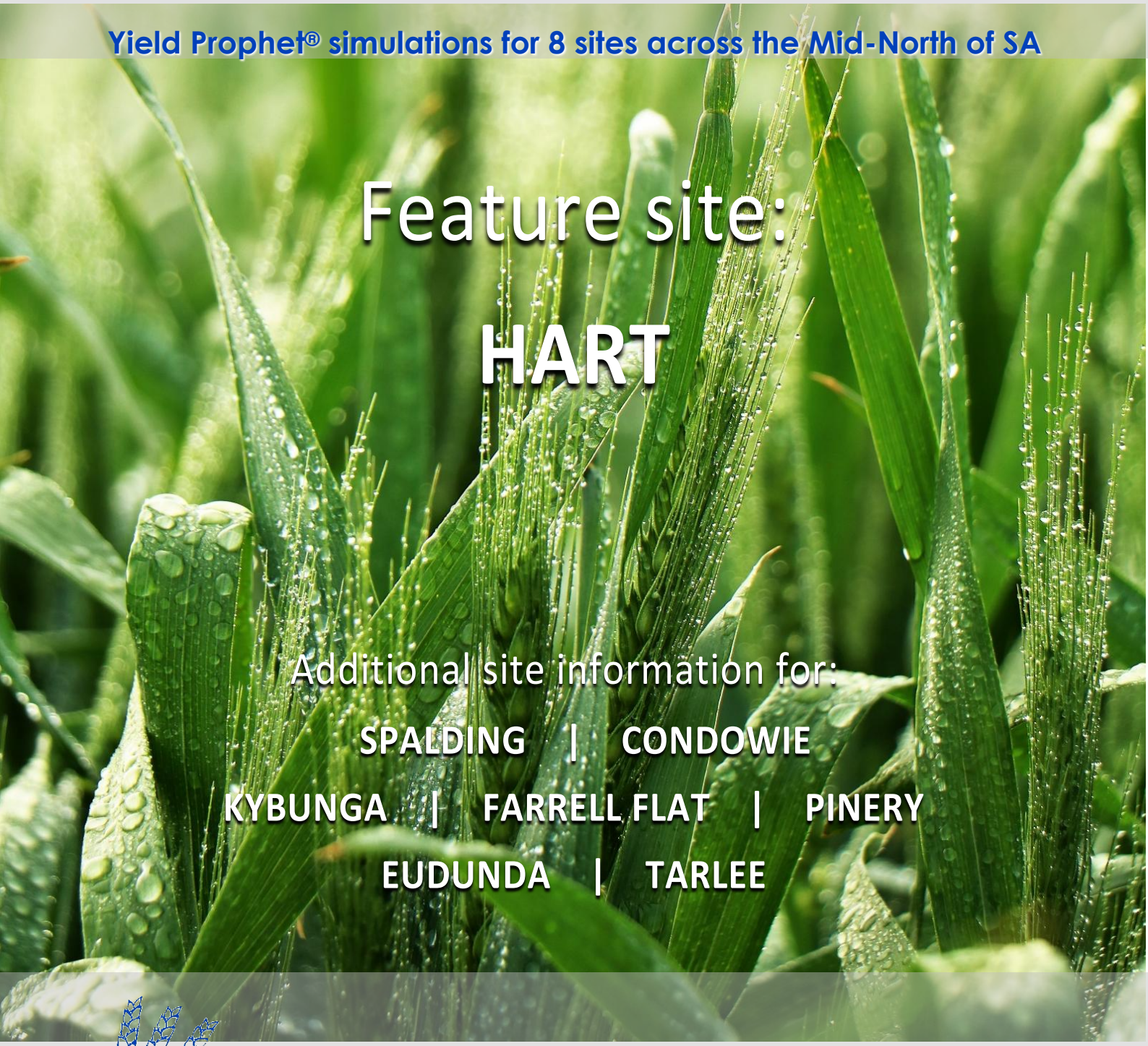
HART BEAT

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



Feature site:

HART

Additional site information for:

SPALDING | CONDOWIE

KYBUNGA | FARRELL FLAT | PINERY

EUDUNDA | TARLEE

HART SA's premier cropping field site

Rocky River AG

CNH Capital Case IH Flexicoil Setting the Standard

Incorporating RiskWi$e Balancing risk and reward for on-farm N decision making

MINIMISE RISK & MAXIMISE REWARD in 2025

ISSUE 68

August 11, 2025

HART BEAT 2025

HART BEAT

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 9. 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.

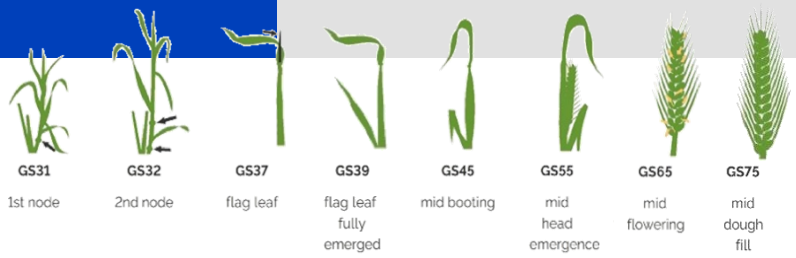
Using climate data for the current season, *Yield Prophet®* simulates the soil water, nitrogen processes and crop growth in the paddock. *Yield Prophet®* calculates the amount of water and nitrogen available to the crop as well as the water and nitrogen demand of the crop.

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®*.

Location:

HART

HART BEAT



Date of report: August 11, 2025

Site information

Soil type: Sandy clay loam

Average annual rainfall: 400 mm

Crop growth

Variety:	Scepter wheat
Sowing date:	May 23, 2025
Emergence:	June 18, 2025
Soil sampling date:	April 4, 2025
Starting soil N:	120.4 kg N/ha
Seeding fertiliser:	8 kg N/ha

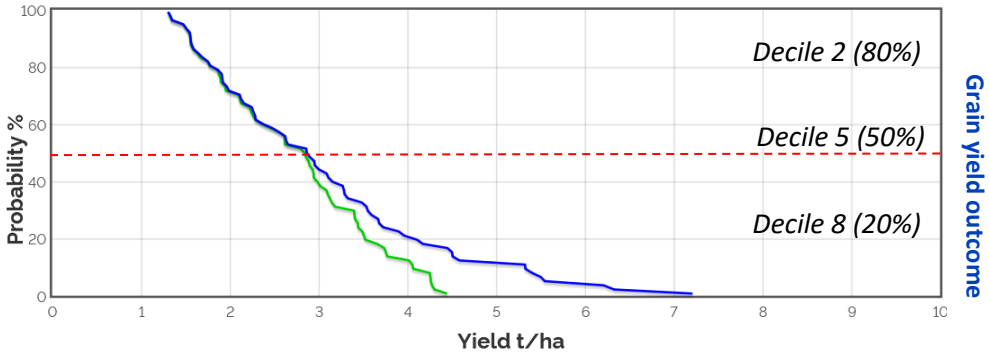
The season so far

Annual rainfall to date:	137.8 mm
GSR to date:	131 mm
Current GSR decile:	2
Initial PAW (April 4)	0 mm
Current predicted PAW:	45 mm (22% full)
PAWC:	206 mm

Total nitrogen:

Based on 128.4 kg N/ha starting soil & seeding N

+ 30 kg N/ha applied in crop



The **green** line in the graph above shows the predicted grain yield at Hart 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 Hart has been used, and starting soil available nitrogen and water was measured. The red dotted line represents Decile 5, or 50% probability of receiving 2.9 t/ha (-0.1 t/ha difference since July – refer to below table).

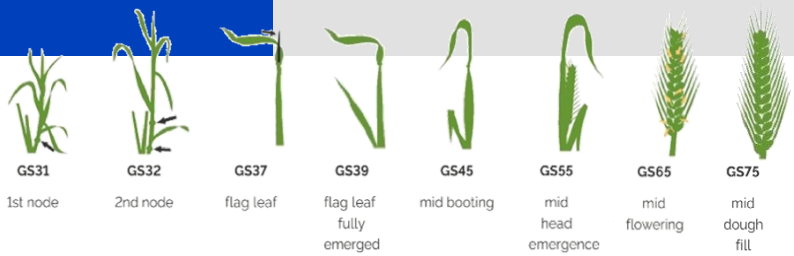
Based on the data from graph above, this table shows the amount of additional N required to meet the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
PY_N (t/ha)	1.3	1.6	1.8	2.1	2.4	2.8	3.0	3.4	3.5	4.1	4.4
PY_w (t/ha)	1.3	1.6	1.8	2.1	2.4	2.9	3.2	3.6	4.1	5.3	7.0
Yield difference (t/ha)	*0*	*0*	*0*	*0*	*0*	*0.1*	*0.2*	*0.2*	*0.6*	1.2	2.6
Difference in PY_w (t/ha) since last report	+ 0.3	- 0.1	- 0.2	- 0.3	- 0.4	- 0.1	- 0.3	- 0.3	- 0.7	- 0.1	+ 0.1
Additional N requirement (kg N/ha)	**0**	**0**	**0**	**0**	**0**	**4**	**8**	**8**	**24**	**48**	**104**

Location:

SPALDING

HART BEAT



Date of report: August 11, 2025

Soil type: Red brown earth
Average annual rainfall: 430 mm

Simulation assumptions

Crop growth

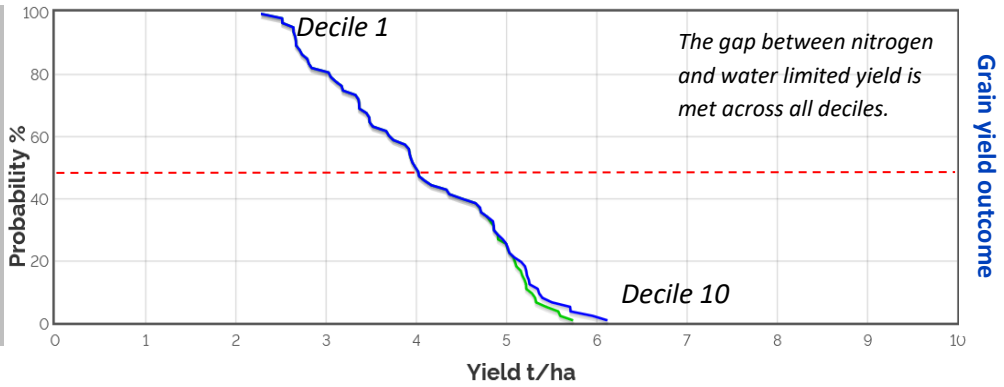
Variety:	Scepter wheat
Sowing date:	May 1, 2025
Starting soil N:	241 kg N/ha
Nitrogen fertiliser:	20 kg N @ seeding

The season so far

GSR to date:	182.4 mm
Estimated GSR decile to date:	5
Initial PAW (April 7):	0 mm
Current predicted PAW:	68 mm (47% full)
PAWC:	143 mm

Yield Prophet® prediction

Based on 261 kg N/ha starting soil & seeding N. No in crop N applied.



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 4.0 t/ha wheat grain yield – refer to below table).

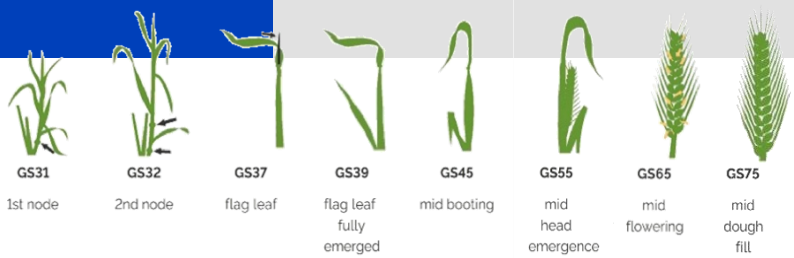
Based on the data from graph above, this table shows the amount of additional N required to meet the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
PY_N (t/ha)	2.3	2.7	3.0	3.4	3.7	4.0	4.5	4.9	5.1	5.3	5.7
PY_w (t/ha)	2.3	2.7	3.0	3.4	3.7	4.0	4.5	4.9	5.1	5.4	6.1
Yield difference (t/ha)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0.1	0.4
Difference in PY_w (t/ha) since last report	+ 1.6	+ 1.3	+ 0.9	+ 1.0	+ 1.0	+ 1.0	+ 1.1	+ 1.1	+ 0.8	+ 0.7	+ 0.8
Additional N requirement (kg N/ha)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**16**

Location:

CONDOWIE

HART BEAT



Date of report: August 11, 2025

Soil type: Sandy loam
Average annual rainfall: 350 mm

Simulation assumptions

Crop growth

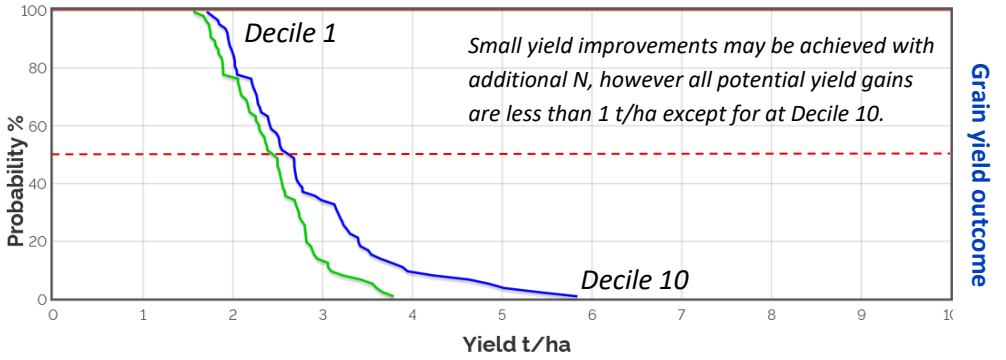
Variety:	Scepter wheat
Sowing date:	May 1, 2025
Measured starting N:	97 kg N/ha
Nitrogen fertiliser:	20 kg N/ha @ seeding + 30 kg N/ha

The season so far

GSR to date:	160.3 mm
Estimated GSR decile to date:	6
Initial PAW (April 4):	2 mm
Current predicted PAW:	61 mm (53% full)
PAWC:	115 mm

Yield Prophet® prediction

Based on 117 kg N/ha starting soil & seeding N
+ 30 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 2.4 t/ha nitrogen-limited yield or 2.6 t/ha water-limited yield– – refer to below table).

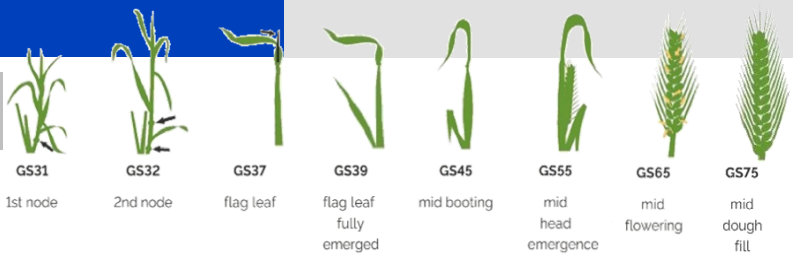
Based on the data from graph above, this table shows the amount of additional N required to meet the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
PY_N (t/ha)	1.6	1.8	1.9	2.1	2.3	2.4	2.6	2.7	2.8	3.1	3.8
PY_w (t/ha)	1.7	2.0	2.0	2.3	2.4	2.6	2.7	3.2	3.4	3.9	5.8
Yield difference (t/ha)	*0.1*	*0.2*	*0.1*	*0.2*	*0.1*	*0.2*	*0.1*	*0.5*	*0.6*	*0.8*	*2.0*
Difference in PY_w (t/ha) since last report	+ 1.5	+ 1.4	+ 1.1	+ 1.1	+ 1.0	+ 1.0	+ 0.9	+ 1.0	+ 0.7	+ 0.8	+ 1.5
Additional N requirement (kg N/ha)	**4**	**8**	**4**	**8**	**4**	**8**	**4**	**20**	**24**	**32**	**80**

Location:

KYBUNGA

HART BEAT



Date of report: August 11, 2025

Soil type: Clay loam

Average annual rainfall: 428 mm

Simulation assumptions

Crop growth

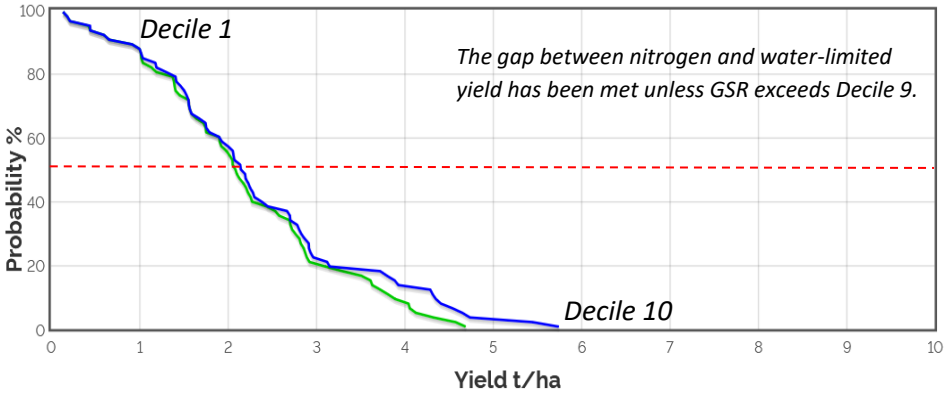
Variety:	Scepter wheat
Sowing date:	May 1, 2025
Measured starting N:	164 kg N/ha
Nitrogen fertiliser:	20 kg N/ha @ seeding + 30 kg N/ha

The season so far

GSR to date:	112.4 mm
Estimated GSR decile to date:	1
Initial PAW (April 4):	0 mm
Current predicted PAW:	30 mm (11% full)
PAWC:	262 mm

Yield Prophet® prediction

Based on 184 kg N/ha starting soil & seeding N + 30 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 2.3 t/ha wheat grain yield – refer to below table).

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

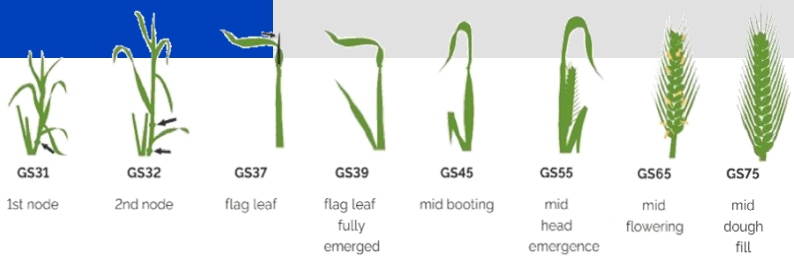
Equivalent decile finish	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
PY_N (t/ha)	1.0	1.2	1.4	1.7	2.1	2.3	2.6	2.8	3.0	3.7	4.6
PY_w (t/ha)	1.1	1.3	1.6	1.7	2.1	2.3	2.6	3.0	3.2	4.4	5.8
Yield difference (t/ha)	*0.1*	*0.1*	*0.2*	*0*	*0*	*0*	*0*	*0.2*	*0.2*	*0.7*	*1.2*
Difference in PY_w (t/ha) since last report	*+ 1.0*	*+ 0.5*	*+ 0.3*	*+ 0.1*	*+ 0.2*	*+ 0.2*	*+ 0.2*	*+ 0.2*	*+ 0.1*	*+ 0.1*	*+ 0.1*
Additional N requirement (kg N/ha)	**4**	**4**	**8**	**0**	**0**	**0**	**0**	**8**	**8**	**28**	**48**

Location:

FARRELL FLAT

HART BEAT

Date of report: August 11, 2025



Soil type: Light clay loam
Average annual rainfall: 474 mm

Simulation assumptions

Crop growth

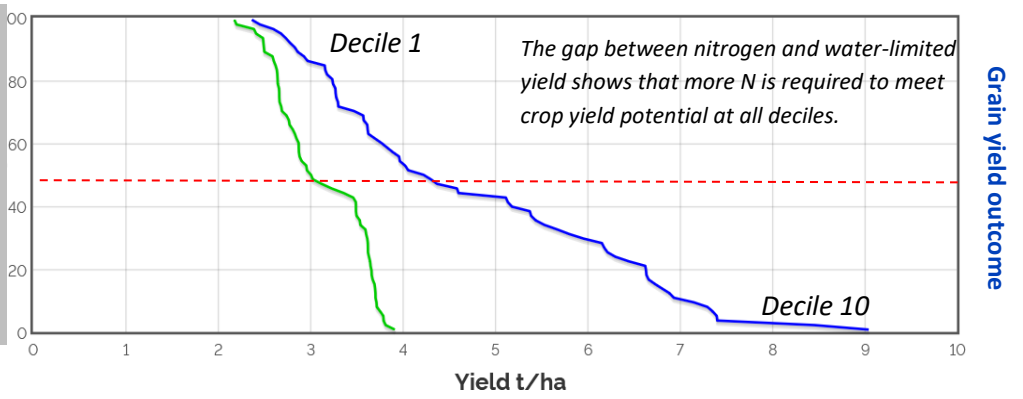
Variety:	Scepter wheat
Sowing date:	May 1, 2025
Measured starting N:	97 kg N/ha
Nitrogen fertiliser:	20 kg N/ha @ seeding + 30 kg N/ha

The season so far

GSR to date:	193 mm
Estimated GSR decile to date:	5
Initial PAW (April 7):	0 mm
Current predicted PAW:	99 mm (57% full)
PAWC:	172 mm

Yield Prophet® prediction

Based on 117 kg N/ha starting soil & seeding N
+ 30 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 3.0 t/ha nitrogen-limited yield or 4.2 t/ha water-limited yield– refer to below table).

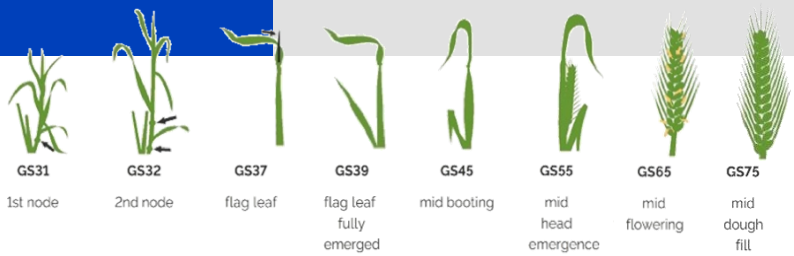
Based on the data from graph above, this table shows the amount of additional N required to meet the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
PY_N (t/ha)	2.2	2.5	2.6	2.7	2.9	3.0	3.5	3.6	3.7	3.7	3.9
PY_w (t/ha)	2.4	2.8	3.2	3.5	3.8	4.2	5.2	5.9	6.6	7.1	8.9
Yield difference (t/ha)	*0.2*	*0.3*	*0.6*	*0.8*	*0.9*	*1.2*	*1.7*	*2.3*	*2.9*	*3.4*	*5.0*
Difference in PY_w (t/ha) since last report	*+ 1.7*	*+ 1.2*	*+ 1.0*	*+ 0.9*	*+ 0.7*	*+ 0.7*	*+ 1.2*	*+ 1.3*	*+ 1.2*	*+ 1.0*	*+ 0.2*
Additional N requirement (kg N/ha)	**8**	**12**	**24**	**32**	**36**	**48**	**68**	**92**	**116**	**136**	**200**

Location:

PINERY

HART BEAT



Date of report: August 11, 2025

Soil type: Silty clay loam
Average annual rainfall: 374 mm

Simulation assumptions

Crop growth

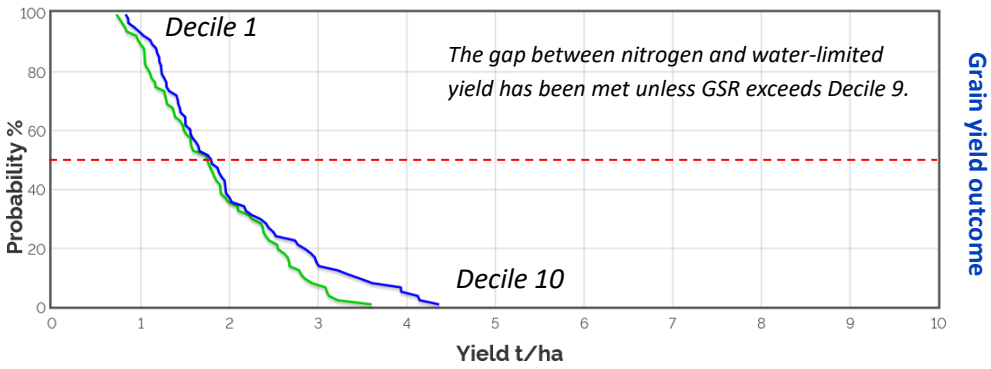
Variety:	Scepter wheat
Sowing date:	May 1, 2025
Measured starting N:	155 kg N/ha
Nitrogen fertiliser:	20 kg N/ha @ seeding + 30 kg N/ha

The season so far

GSR to date:	105.2 mm
Estimated GSR decile to date:	1
Initial PAW (April 7):	0 mm
Current predicted PAW:	13 mm (16% full)
PAWC:	79 mm

Yield Prophet® prediction

Based on 175 kg N/ha starting soil & seeding N + 30 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 1.7 t/ha nitrogen-limited yield or 1.8 t/ha water-limited yield– refer to below table).

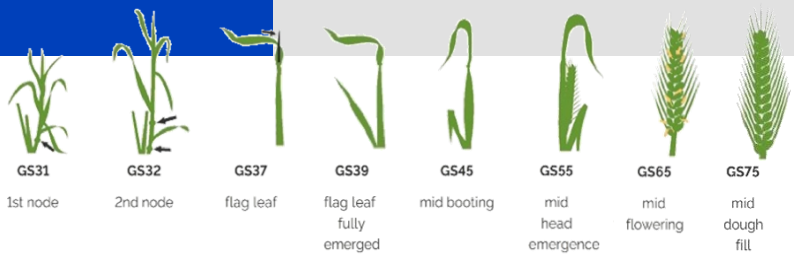
Based on the data from graph above, this table shows the amount of additional N required to meet the yield gap between the nitrogen and water-limited yield across a range of decile seasons.

Equivalent decile finish	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
PY_N (t/ha)	0.7	1.0	1.1	1.3	1.5	1.7	1.9	2.3	2.6	2.8	3.5
PY_w (t/ha)	0.8	1.1	1.2	1.4	1.6	1.8	2.0	2.3	2.8	3.4	4.3
Yield difference (t/ha)	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.0*	*0.2*	*0.6*	*0.8*
Difference in PY_w (t/ha) since last report	*+ 0.6*	*+ 0.6*	*+ 0.3*	*+ 0.2*	*0.0*	*- 0.1*	*-0.1*	*0.0*	*+ 0.1*	*+ 0.1*	*-0.2*
Additional N requirement (kg N/ha)	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**0**	**8**	**24**	**32**

Location:

EUDUNDA

HART BEAT



Date of report: August 11, 2025

Soil type: Gravelly loam
Average annual rainfall: 445 mm

Simulation assumptions

Crop growth

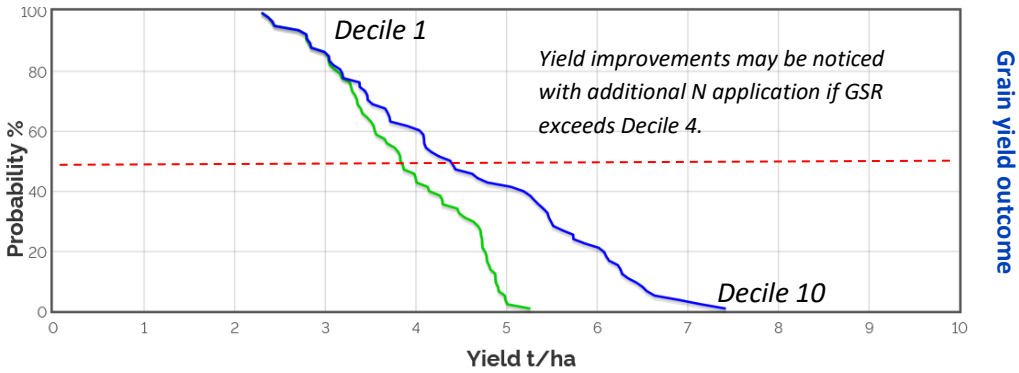
Variety:	Scepter wheat
Sowing date:	May 1, 2025
Measured starting N:	125 kg N/ha
Nitrogen fertiliser:	20 kg N/ha @ seeding + 30 kg N/ha

The season so far

GSR to date:	151.5 mm
Estimated GSR decile to date:	2
Initial PAW (April 7):	0 mm
Current predicted PAW:	57 mm (59% full)
PAWC:	96 mm

Yield Prophet® prediction

Based on 145 kg N/ha starting soil & seeding N
+ 30 kg N/ha applied in crop



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 3.8 t/ha nitrogen-limited yield or 4.4 t/ha water-limited yield– refer to below table).

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

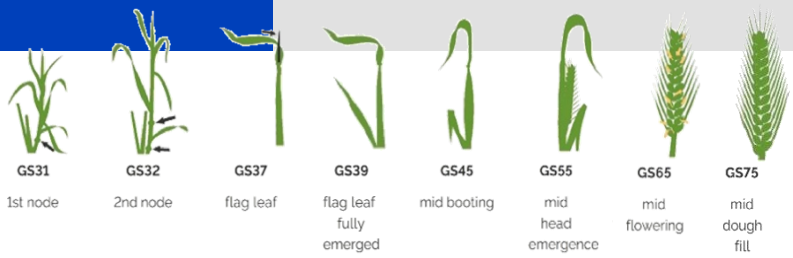
Equivalent decile finish	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
PY_N (t/ha)	2.3	2.8	3.1	3.4	3.6	3.8	4.2	4.6	4.8	4.9	5.2
PY_w (t/ha)	2.3	2.8	3.2	3.5	4.0	4.4	5.2	5.5	6.1	6.4	7.4
Yield difference (t/ha)	*0*	*0*	*0.1*	*0.1*	*0.4*	*0.6*	*1.0*	*0.9*	*1.3*	*1.5*	*2.2*
Difference in PY_w (t/ha) since last report	*+ 1.3*	*+ 1.2*	*+ 1.2*	*+ 0.8*	*+ 0.8*	*+ 0.4*	*+ 0.9*	*+ 0.8*	*+ 0.7*	*+ 0.6*	*+ 1.0*
Additional N requirement (kg N/ha)	**0**	**0**	**4**	**4**	**16**	**24**	**40**	**36**	**52**	**60**	**88**

Location:

TARLEE

HART BEAT

Date of report: August 11, 2025



Soil type: Sandy loam
Average annual rainfall: 428 mm

Simulation assumptions

Crop growth

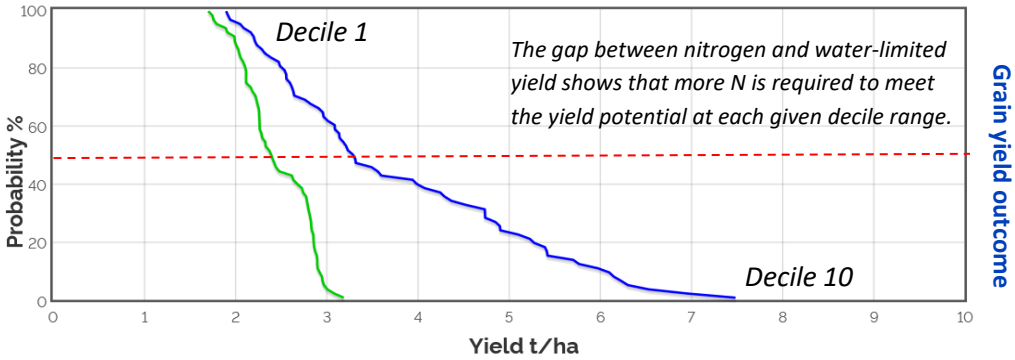
Variety:	Scepter wheat
Sowing date:	May 1, 2025
Measured starting N:	58 kg N/ha
Nitrogen fertiliser:	20 kg N/ha @ seeding + 40 kg N/ha

The season so far

GSR to date:	153.8 mm
Estimated GSR decile to date:	1
Initial PAW (April 7):	7 mm
Current predicted PAW:	51 mm (45% full)
PAWC:	113 mm

Yield Prophet® prediction

Based on 78 kg N/ha starting soil & seeding N
+ 40 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 2.4 t/ha nitrogen-limited yield or 3.3 t/ha water-limited yield).

Based on the data from graph above, this table shows the amount of additional N required to meet 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	2.0	2.1	2.2	2.3	2.4	2.7	2.8	2.9	2.9	3.2
PY_w (t/ha)	1.9	2.2	2.5	2.7	3.1	3.3	4.0	4.7	5.3	6.1	7.4
Yield difference (t/ha)	*0.2*	*0.2*	*0.4*	*0.5*	*0.8*	*0.9*	*1.3*	*1.9*	*2.4*	*3.2*	*4.2*
Difference in PY_w (t/ha) since last report	*+ 1.2*	*+ 0.5*	*+ 0.4*	*+ 0.3*	*+ 0.1*	*-0.1*	*+ 0.1*	*+ 0.1*	*+ 0.2*	*+ 0.3*	*+ 0.6*
Additional N requirement (kg N/ha)	**8**	**8**	**16**	**20**	**32**	**36**	**52**	**76**	**96**	**128**	**168**