



WEATHER OR NOT



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WELCOME

Things have really turned around in the last 6 weeks. The FarmLink region received some of the best rainfall in Australia over the past 4 weeks with the majority of areas now having full profiles of moisture which has improved yield potential, filled dams and, in some places, caused water logging in some lower lying areas. Regardless, farmers are still cautious given the strengthening El Nino year. Growers have taken the early opportunity to top dress some crops, particularly in canola.

Weed and disease pressure seems low. Pre-emergent and knockdown herbicides worked well and only some fungicide has gone out on some early sown barley as a protective measure.

We have experienced the occasional frost which has helped plants 'toughen up'. Keep an eye on frost damage from now on to assess any potential for reduced yield.

CLIMATE OUTLOOK

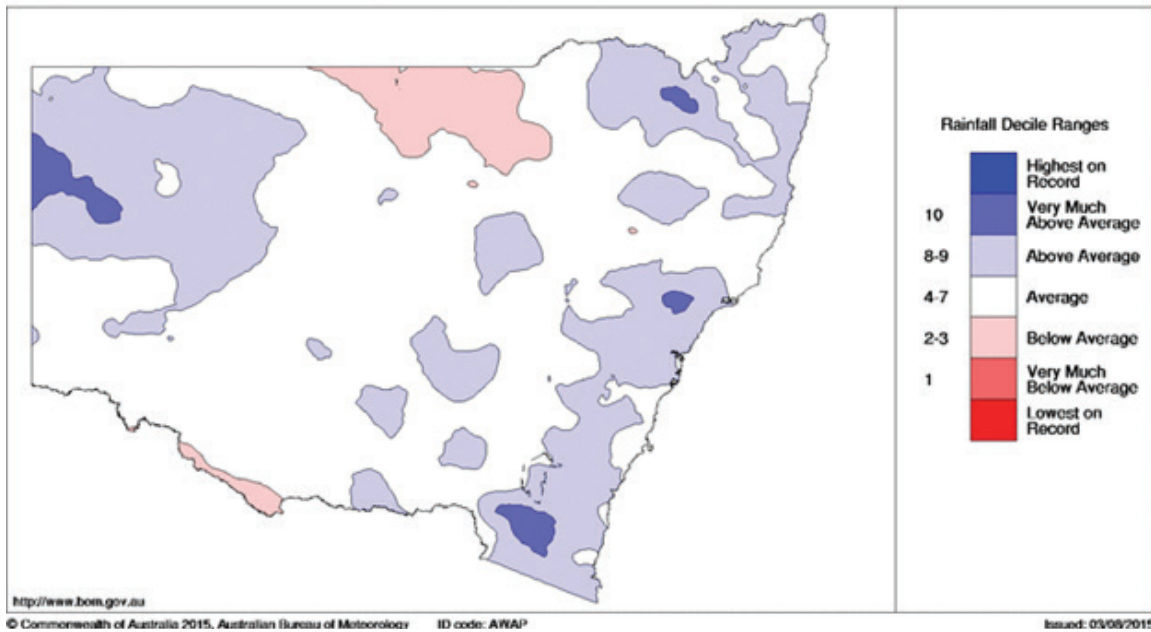
The latest outlook from the Bureau of Meteorology indicates El Nino continues to strengthen and is likely to persist in to early 2016. The ocean temperatures and atmospheric indicators of the Pacific Ocean are behaving similarly to 1982 and 1997 however Indian Ocean temperatures are not. In these past two drought years, the Indian Ocean was cool to neutral. This year temperatures remain warm. This could reduce the impact of El Nino.

Regardless, the rainfall outlook is for average to below average in eastern Australia.

YIELD PROPHET

Yield Prophet presents the capacity of a crop – what could you achieve? And how would you do it? The cropping season (Nov to July) decile map for NSW is showing that all Weather or Not sites have had average or better than average rainfall to date. The growing season decile for each site and simulated plant available water (PAW) is shown in the table below. All sites are showing PAW levels of greater than two thirds of capacity. Given the good seasonal conditions to date, potential in 2015 is significant. Don't miss out on this opportunity.

Distribution Based on Gridded Data
Australian Bureau of Meteorology



Site	GSR Decile	PAW [^] (mm)	PAWC* (mm)	% Full
AriahPark NW (Probe 1)	2	110	161	68%
AriahPark SW (Block 1 East Probe)	6	122	122	100%
BeckomNorth (Probe A)	7	139	161	86%
GreenethorpeWest (Probe A)	7	80	107	75%
DimaseerNE (Probe 0)	7	176	204	86%
Lockhart North (Probe 0)	8	163	148	110%
TAIC Paddock 16 (Probe A)	7	175	191	92%
Lockhart North (Probe 1)	8	152	213	71%

~ GSR = Growing Season Rainfall

* PAW = Plant Available Water

[^] Plant Available Water Capacity

NITROGEN PROFIT AND NITROGEN COMPARISON REPORTS

In this edition you will see outputs from the Yield Prophet nitrogen comparison and nitrogen profit reports. The comparison report allows scenario analysis to be conducted on the yield effects of the rate and timing of addition nitrogen. The nitrogen profit report enables the profitability of these scenarios to be assessed. As discussed in previous editions, a positive yield response from the application of nitrogen is possible at many of the sites.

This is reflected in separation of the nitrogen limited and nitrogen unlimited curves in yield charts from the Yield Prophet crop report and nitrogen comparison report. However, will these applications produce a paying response? The nitrogen profit

report outputs of Yield Prophet help answer this question. You can change inputs to reflect a likely partial gross margin scenario for your paddock. Example nitrogen profit reports are shown in Figures 3 and 4 based on the gross margin assumptions in Table 2.

Classification	Australian Hard
Min Protein for Classification	11.5%
On Farm Wheat Price	\$320/tonne
Cost of N Fertiliser	\$2/kgN
Cost of N Application	\$750/ha

Table 2: Assumptions for a nitrogen profit report produced on the 22/08/08.

Figure 3 shows probability curve for crop return. In the event of the worst season finish on record (Pr 100%) all scenarios would achieve a return of approximately \$400/ha (a) if nitrogen fertiliser was applied. Given the best season finish on record (Pr 0%) Scenarios 1, 2 and 3 would each achieve a return of \$1,050/ha (b), \$1,350/ha (c) and \$1,500/ha (d) respectively. When reviewing these charts it is good practice to focus your attention on where the scenario curves separate away from each other.

Figure 3 illustrates that Scenario 2 and 3 would achieve a paying response given at least a decile 3 (e) (Pr70%) finish. Scenario 3 will have a paying response over Scenario 2 upon achieving a decile 5 (Pr 50%) (f) season finish.

Another output of a nitrogen profit report is shown in Figure 4. This output shows the likelihood of getting a 2 for 1 return on the investment of nitrogen in your crop. The marginal rate of return is calculated as the \$ difference between scenario 2 and 1 and scenario 3 and 1. The solid vertical bars represent the 2 for 1 return on investment (ROI) for scenarios 2 and 3. A 2 for 1 ROI is a desirable situation and accounts for the risk associated with farming and is often utilised as a basis for investment decisions. In this chart focus your attention where the vertical bar intersects with the sloping curve of the same colour

Yield Prophet estimates that this crop has a 70% (a) (decile 3 or above) chance of achieving a profit from the N applications proposed in scenarios 2 and 3. Scenarios 2 and 3 respectively have a 50% (b) (decile 5 or above) and 40% (c) (decile 6 or above) chance of achieving a 2 for 1 ROI.



Reports in this edition were generated on the 6th of August unless stated otherwise.

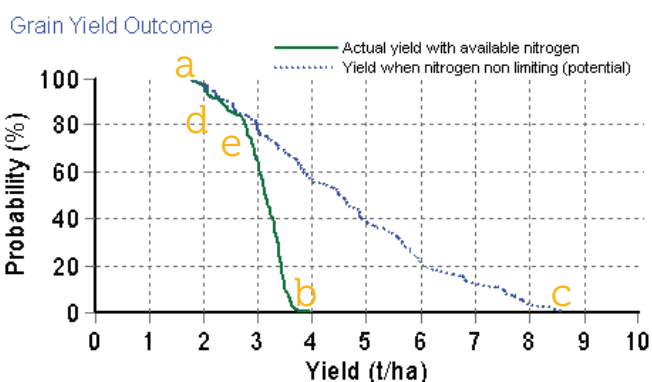


Figure 3: Probability of exceedence curves for a Derrimut wheat crop at Murtoa under three nitrogen application scenarios produced on 22/08/08.

Scenario 1: No additional N
 Scenario 2: 30kg/ha applied 8-August
 Scenario 3: 60kgN/ha applied 8-August

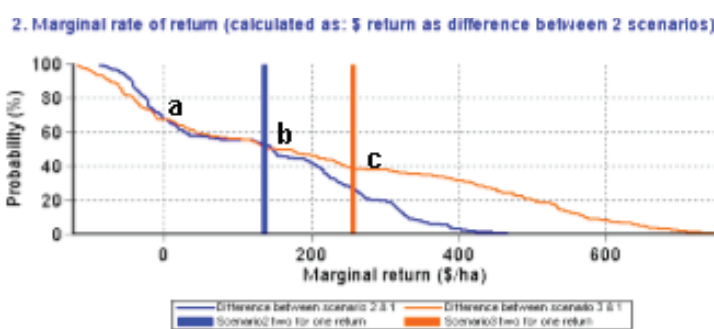


Figure 4: Marginal rate of return curve comparisons between Scenarios 2 and 1 and 3 and 1 of a Derrimut wheat crop at Murtoa produced on 22/08/08.



ARIAH PARK NW (PROBE 1)

Crop type: canola
Cultivar: Stingray
Sowing date: 20 April 2015
Soil type: sandy clay
Directional guide: -34.2482 | 147.1984
Historic average yield: 1.2 t/ha

There is a 50% probability of a response to nitrogen in this canola crop, that is, in a decile five year or better, a yield benefit is likely with the addition of nitrogen. The addition of more nitrogen is questionable given this paddock is at a decile 2. The benefits however are narrow, as shown in the yield outcome for nitrogen scenarios where an increase in yield is marginal with addition of extra N fertiliser.

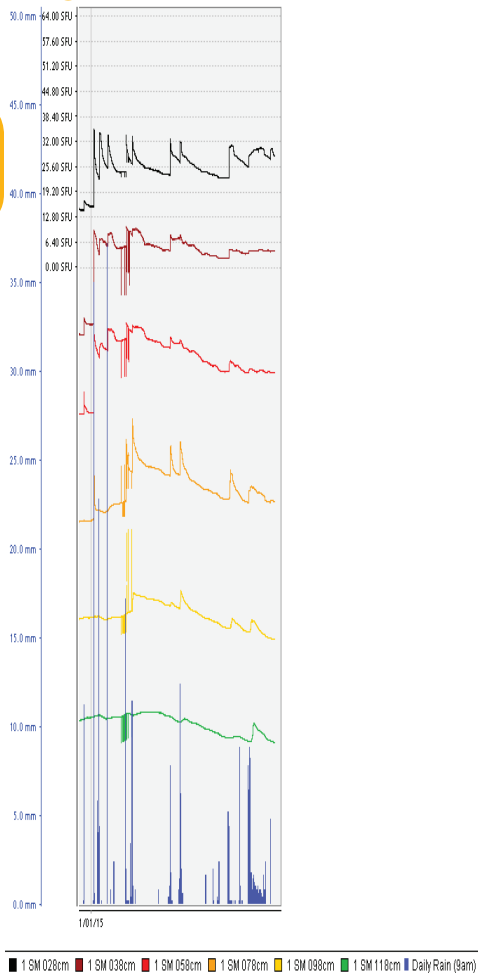
This paddock had high starting soil moisture levels due to good summer rain and with some recent rain, the 'bucket' has 110mm rain available.

The Yield Outcome for Nitrogen Scenarios graph, where the pink line is 0 nitrogen applied from now on, the blue line shows yield potential after 20 kg N/ha (or 43 kg/ha urea) is applied and the red line after 40 kg N/ha (or 87 kg/ha urea). There is little distance between the lines suggesting there is little benefit to be had from applying extra nitrogen.

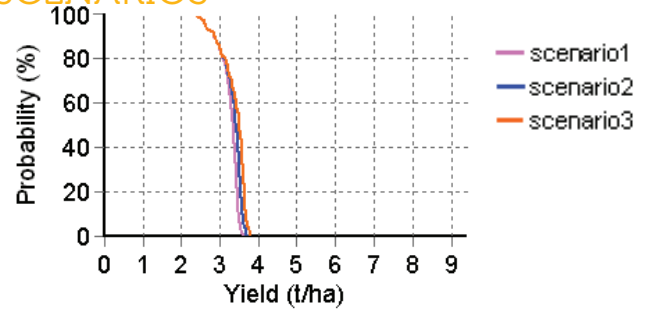
This crop was toppedressed with 100kg/ha urea on 31st July so at this stage, it would not be profitable to apply any more nitrogen.

Soil moisture probe data is registering soil water content down to 118 cm.

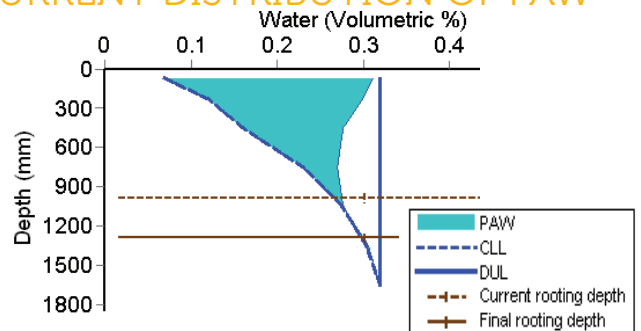
PROBE



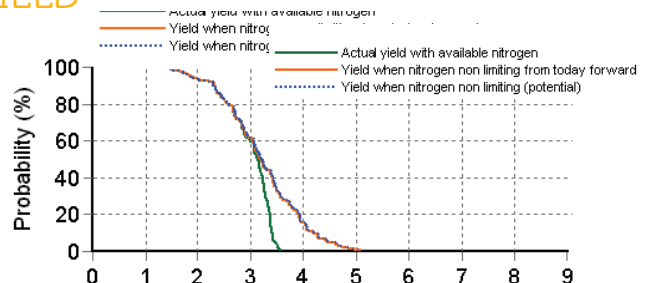
YIELD OUTCOME FOR NITROGEN SCENARIOS



CURRENT DISTRIBUTION OF PAW



YIELD



ARIAH PARK SW (BLOCK 1 EAST PROBE)



Crop type: canola

Cultivar: 45Y86

Sowing date: 22 April 2015

Soil type: sandy loam changing to sandy clay at depth

Directional guide: -34.383 | 147.1494

Historic average yield: canola - 1.45t/ha

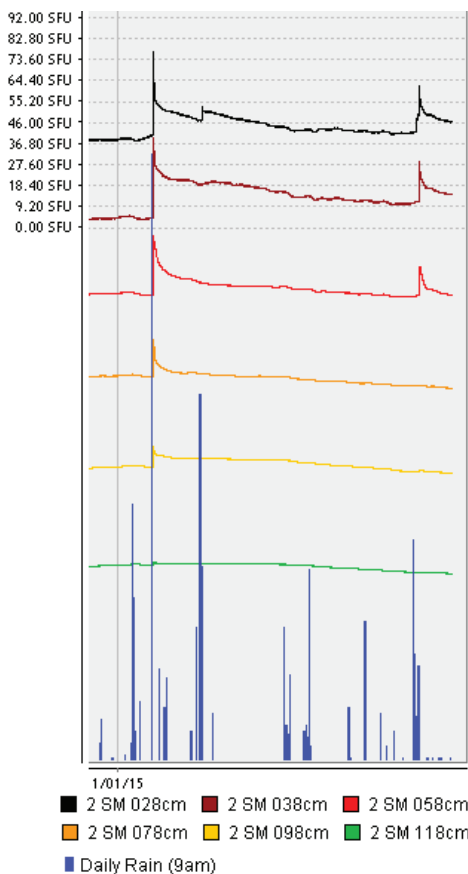
The yield potential of this paddock hasn't altered considerably since the last report with a 50% canola yield potential ranging from 2.5 t/ha (with available N) and 3t/ha (N unlimited). Soil water is excellent. The 'bucket' is 83% full with total plant available water at 102 mm and the plant available water capacity at 122 mm. The grower spread 100 kg/ha urea on 15 June and earlier nitrogen was applied with starter fertiliser in April. There is currently 95 kg/ha of soil N available which is adequate for this early stage and cold temperatures. As the days warm up and canola growth increases, look for opportunities to apply more nitrogen.

The Yield Outcome for Nitrogen Scenarios graph shows a response to nitrogen where

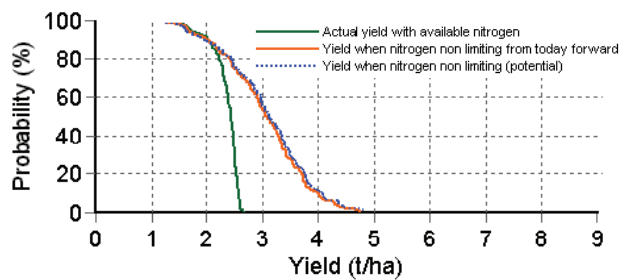
the pink line is 0 nitrogen applied from now on, the blue line shows yield potential after 30 kg N/ha or 65 kg/ha urea is applied and the red line after 60 kg N/ha or 130 kg/ha urea. The scale on this graph is narrow however, it shows a 50% probability of a 0.5 t/ha increase in yield with the addition of 60 kg N/ha. At this stage, monitor crop and reassess N requirements around stem elongation.

Soil moisture probe data is registering soil water content increases in June down to 58 cm. This is in response to good rainfall in the last month. The relative inactivity between early January rainfall and May is due to technical difficulties with the sensors.

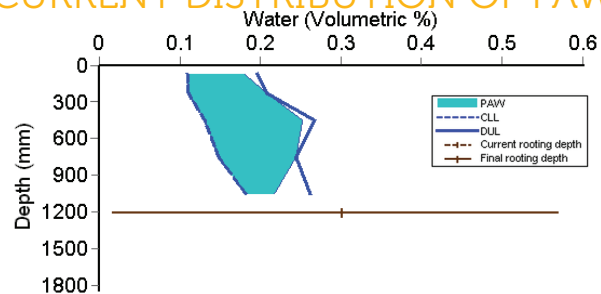
PROBE



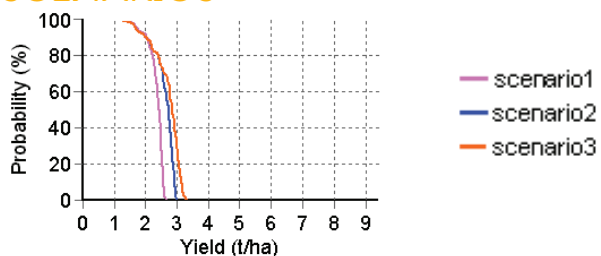
YIELD



CURRENT DISTRIBUTION OF PAW



YIELD OUTCOME FOR NITROGEN SCENARIOS





BECKOM NORTH (PROBE A)

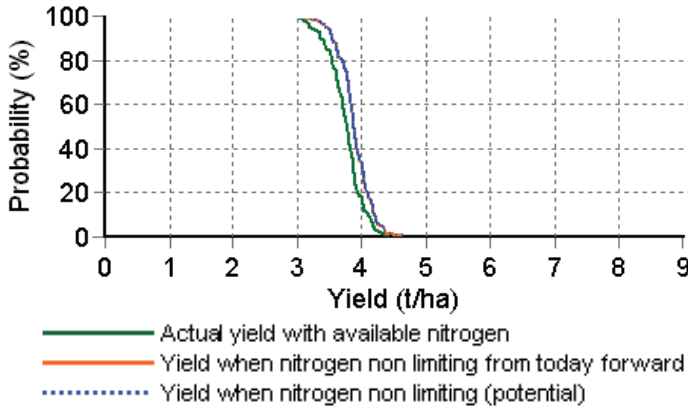
Crop type: wheat
Cultivar: condo
Sowing date: 19 May 2015
Soil type: sandy clay
Directional guide: -34.2895 | 146.9493
Historic average yield: wheat - 2.4t/ha

This wheat crop is at Zadoks cereal growth stage 32 (2nd node) and has 73 kg/ha N available. There are good soil water levels with 139 mm total soil plant available water. The yield graph shows a 100% probability of receiving a 3 t/ha crop. The yield

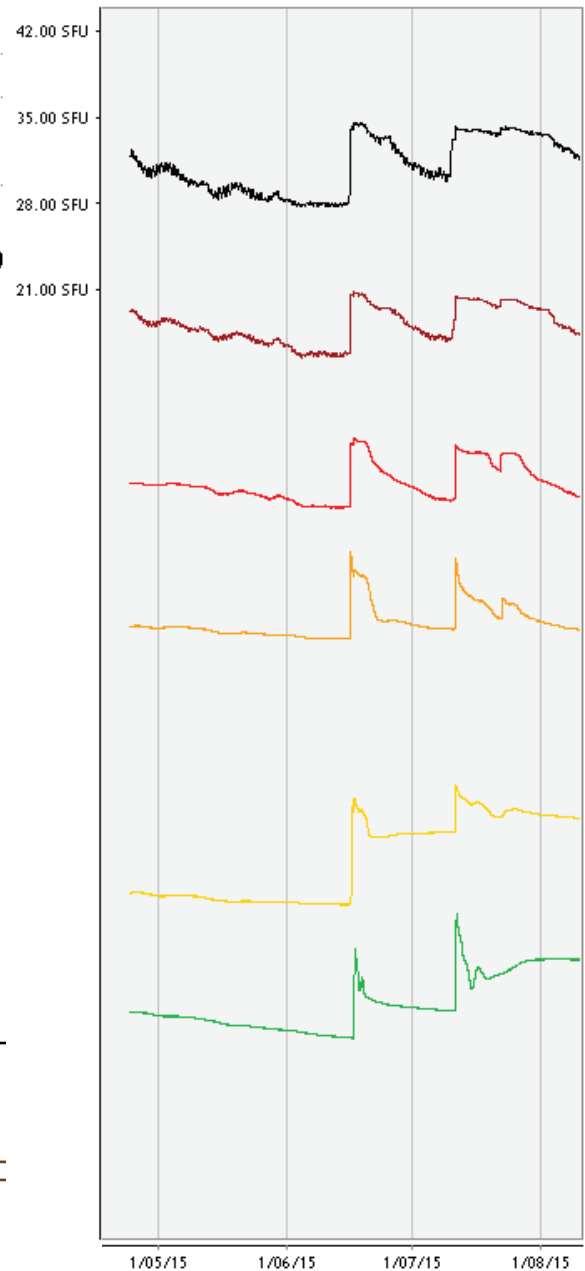
outcome for nitrogen scenarios graph shows a \$200 /ha return on with the addition of 40 kg/ha N compared to no N applied.

The soil moisture probes are showing good rainfall at depth (118cm).

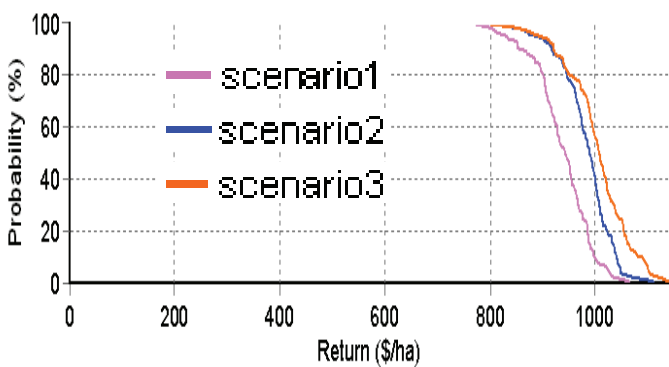
YIELD



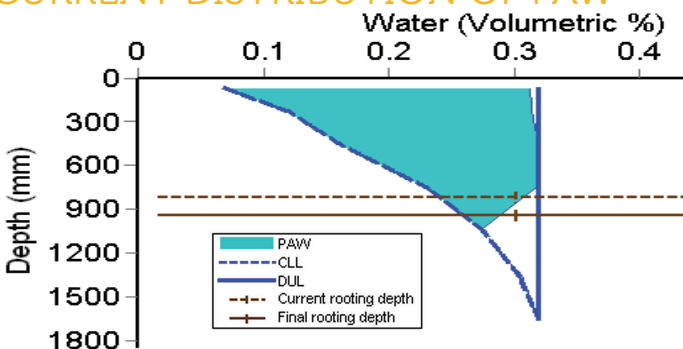
PROBE



YIELD OUTCOME FOR NITROGEN SCENARIOS



CURRENT DISTRIBUTION OF PAW



■ A South SM 028cm ■ A South SM 038cm ■ A South SM 058cm
 ■ A South SM 078cm ■ A South SM 098cm ■ A South SM 118cm

GREENETHORPE WEST (PROBE 0)



Crop type: canola

Cultivar: gem

Sowing date: 26 April 2015

Soil type: sandy loam over a sandy clay and heavy clay

Directional guide: -34.013 | 148.2542

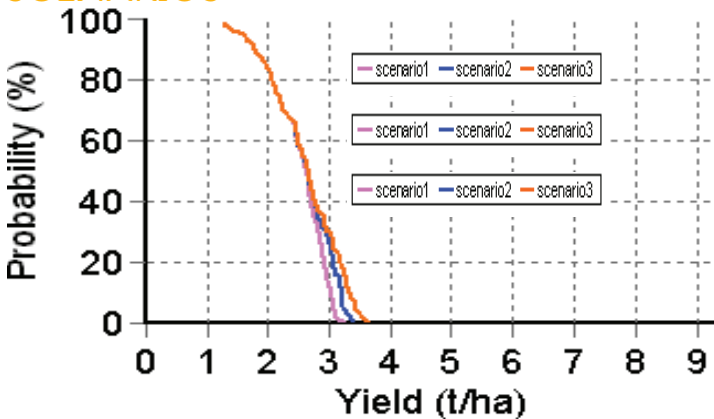
Historic average yield: canola - 1.8t/ha

This canola crop received 100 kg/ha of urea on the 14th of July. The yield graph, generated on the 5th of August, is now showing a minimal response to topdressing with nitrogen in this canola crop with 40% likelihood of a response to nitrogen (decile 6 or better) and yield potential of about 3t/ha at this point.

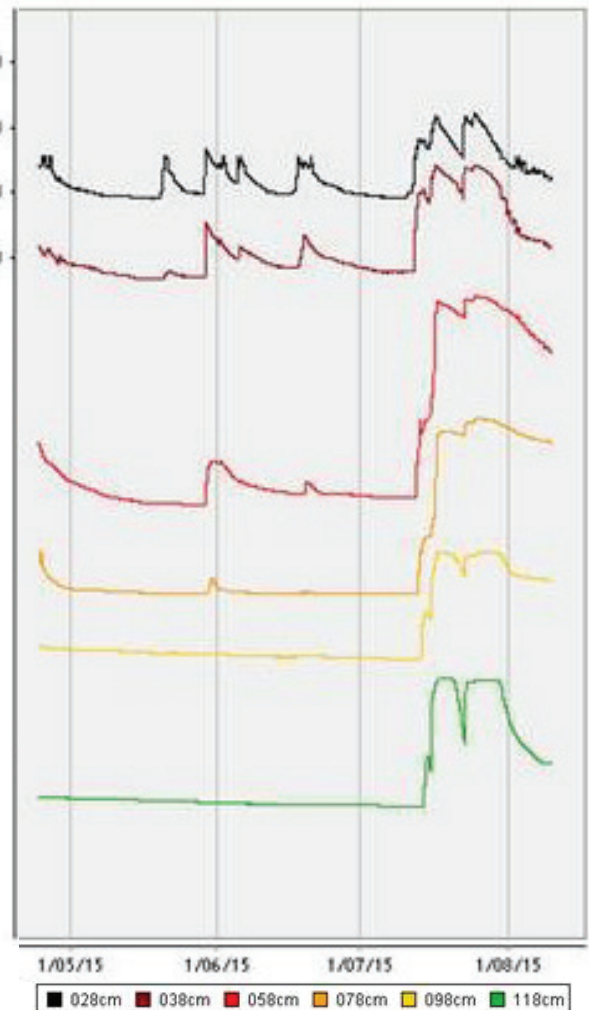
Rainfall events are registering at depth (118cm) and with the season currently tracking at a decile 7, it is possible this crop may benefit marginally from the application of nitrogen but only if the seasonal outlook improves. Monitor and look to apply nitrogen if significant rainfall is forecast.

This is due to good soil nitrogen: plant available N is excellent at 158 kg/ha N and total soil plant available water is 80mm.

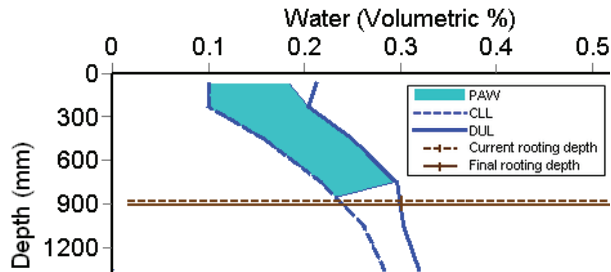
YIELD OUTCOME FOR NITROGEN SCENARIOS



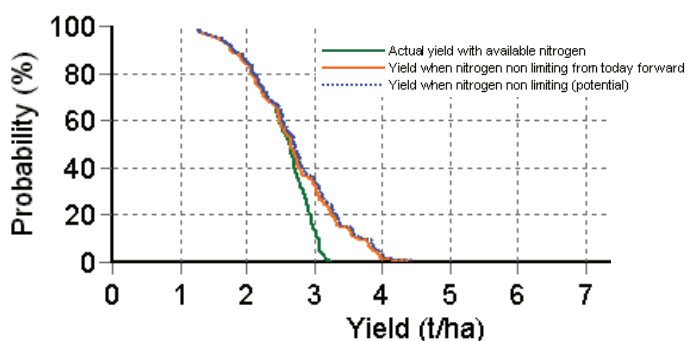
PROBE



CURRENT DISTRIBUTION OF PAW



YIELD





DIRNASEER NE (PROBE 0)

Crop type: wheat

Cultivar: Sunvale

Sowing date: 13 May 2015

Soil type: red chromosol

Directional guide: -34.6131 | 147.7621

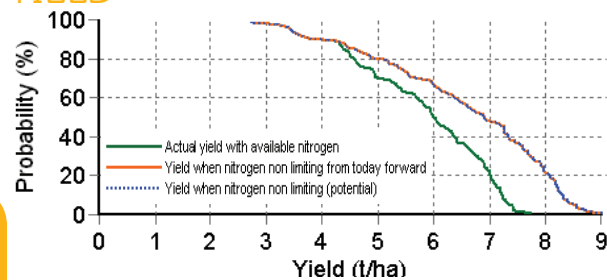
Historic average yield: wheat - 3.0t/ha

The grower applied 100kg/ha urea on 31st July. This crop is at Zadock cereal growth stage 31 in reality but the simulated growth stage is coming out as GS16. This is sometimes typical of Yield Prophet and should correct in future reports. Regardless, Yield prophet is showing a response to topdressing at the 90% probability mark, that is, in a decile one year or better, a yield benefit is likely with the addition of more nitrogen. At the 50% probability mark, yield potential ranges have increased from 6 t/ha with the crop utilising current soil N stores only (currently this is

143 kg N/ha in total) and 7t/ha with nitrogen unlimited. There is 143 kg/ha of N currently available to the crop. Soil moisture levels are also good with moisture registering down to 118 cm in the soil moisture probes.

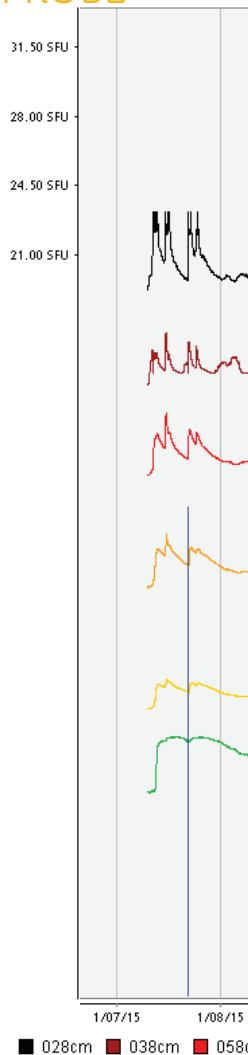
The current distribution of plant available water graph shows the 'bucket' is nearly full and roots are growing into a full profile. The graph showing the Yield outcome for 3 nitrogen scenarios: 0 N applied (pink line), 20 kg N applied (blue line) and 40 kg N applied (orange line) shows at 50% mark, probability of the addition of nitrogen generate an improved

YIELD

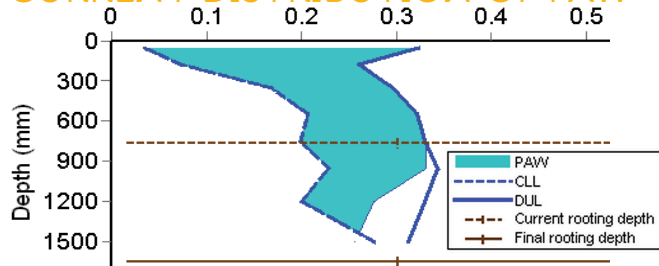


PROBE

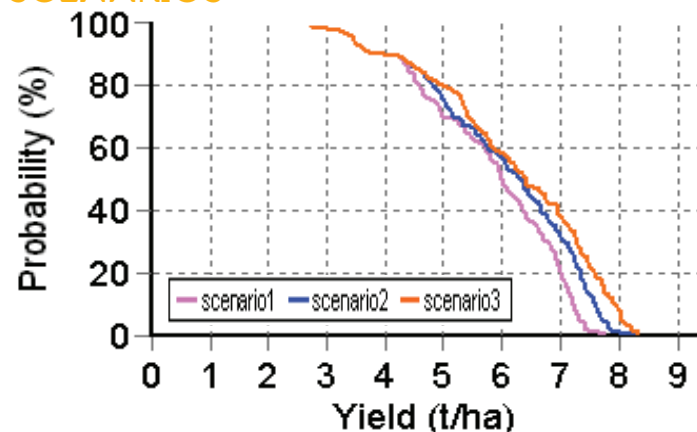
increase in returns of around \$100/ha with the addition of 20 kg/ha N (44 kg/ha urea). This means there are marginal gains to be made and with the current climatic outlook, more N is unlikely to reach current yield potential.



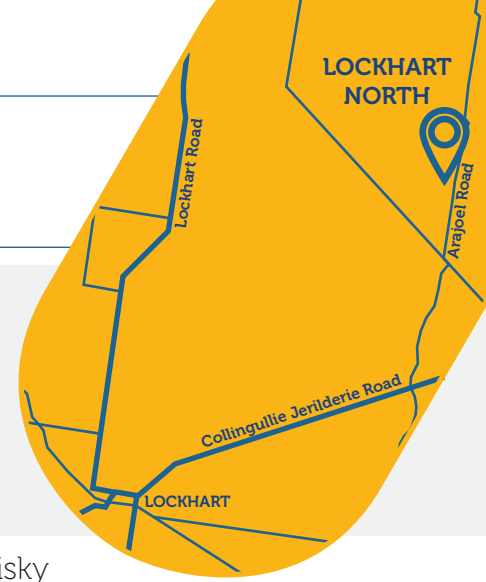
CURRENT DISTRIBUTION OF PAW



YIELD OUTCOME FOR NITROGEN SCENARIOS



LOCKHART NORTH (PROBE 0)



Crop type: wheat

Cultivar: Suntop

Sowing date: 12 May 2015

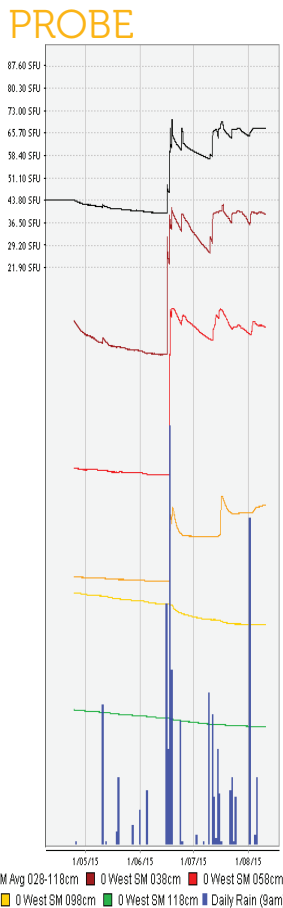
Soil type: sandy clay loam over light clay

Directional guide: -35.1036 | 146.8754

Historic average yield: wheat - 2.43t/ha

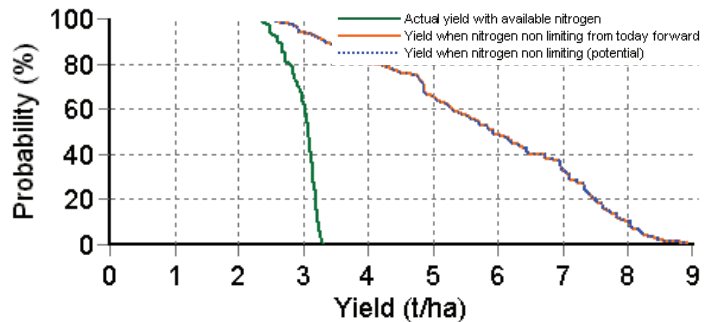
This wheat crop, approaching GS30, has had a dream run and is now in need of some N. Given the worst season finish on record the crop would be expected to yield 2.5t/ha and with an average finish has a 5.6t/ha potential. The yield graph is showing the crop is guaranteed to need extra N before the year is out if it is to reach its potential. The only question is how much nitrogen is required? At 4 August Yield Prophet was showing that N reserves were getting low, 34kgN/ha, and stress starting to occur. It is the ideal time for additional nitrogen to be applied. That said, Yield Prophet is showing that this site has a full profile and is at risk of waterlogging. Thus any applications of N could volatilise.

Where 0 N applied (pink line), 20 kg N applied (blue line) 40 kg N applied (orange line), the outcomes from nitrogen comparison report is showing a 100% chance of a response to 20kgN/ha and a 90% chance a yield response to additional 20kgN/ (40kgN/ha total). The \$ return these same scenarios consistent with the yield responses.

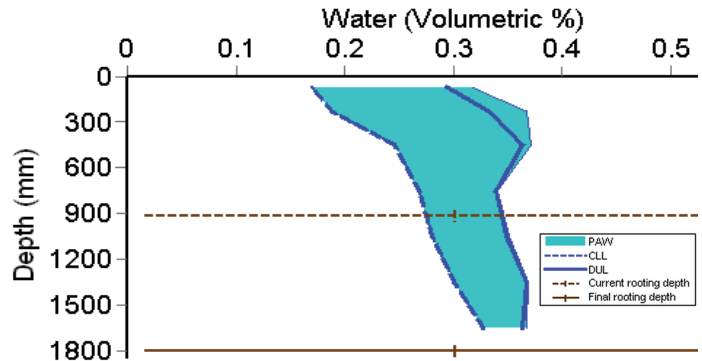


Farming is inherently risky therefore when investing in your crop it is desirable to get twice the amount invested back, a 2 for 1 return on investment. Although not displayed the nitrogen profit report is showing a 70% and 90% chance of achieving a 2 for 1 return on investment for scenario 2 and 3 respectively. The higher probability associated with the higher N application is a consequence of higher protein and quality likely to result from the additional N.

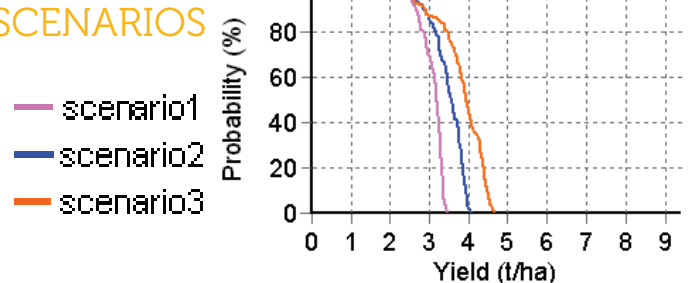
YIELD



CURRENT DISTRIBUTION OF PAW



YIELD OUTCOME FOR NITROGEN SCENARIOS



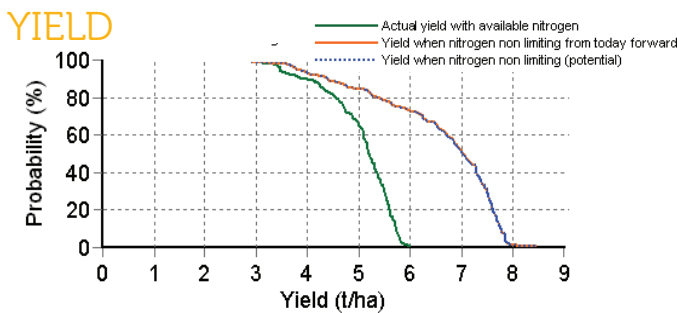


TAIC Paddock 16 (PROBE A)

Crop type: wheat
Cultivar: Spitfire
Sowing date: 10 May 2015
Soil type: sandy clay
Directional guide: -34.4171 | 147.5316
Historic average yield: 2.06 t/ha

This crop is at Zadock cereal growth stage 31 in reality but the simulated growth stage is GS16. This is sometimes typical of Yield Prophet and should correct in future reports.

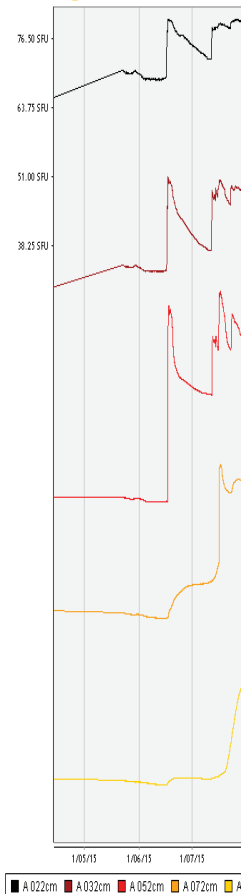
Conditions in this wheat crop suggest it has a good chance of benefitting from a further application of N (it got 60kg applied on 31 July). The yield chart below shows a yield response to N in 90% of years or given at least a decile



1 season finish. In response to 40+mm of rain since the last report the minimum yield (100% probability) has increased from 2t/ha to 3t/ha and at the 50% probability, yield potential (N unlimited) has increased from 6.5 to 7.0t/ha.

Despite no N fertiliser applications to this paddock in the past month soil N reserves still remain at 98 kg/ha. The soil water 'bucket' is nearly full and is wet to 1 meter. Plant available water capacity is 191mm and current total soil plant available at 175mm.

PROBE

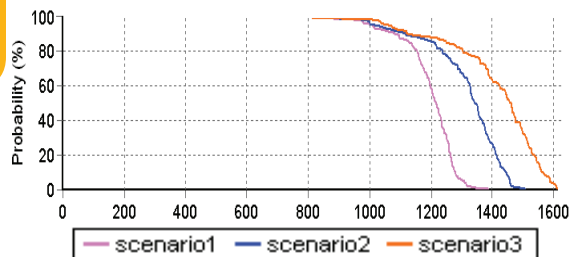


The soil moisture probe readings are also showing good moisture and wet to 92 cm from mid July onwards. Given the good soil water it is not surprising that this paddock is showing a potential response to additional N.

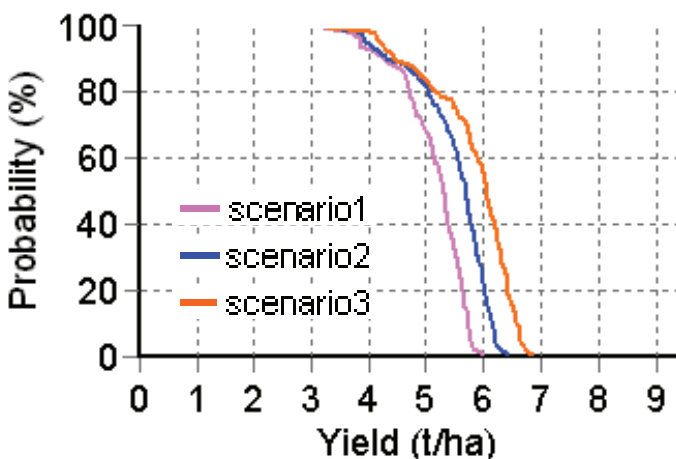
Where scenario 1 is 0, 2 is 20 and 3 is 40 kgN/ha the Return and Yield Outcome graphs show a positive response to 40 kg N/ha in 80% of years. If this paddock is to reach its potential it is very likely to need more N.

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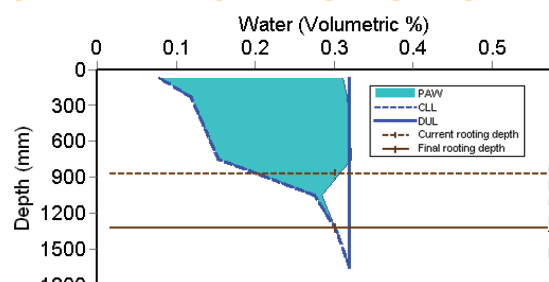
RETURN



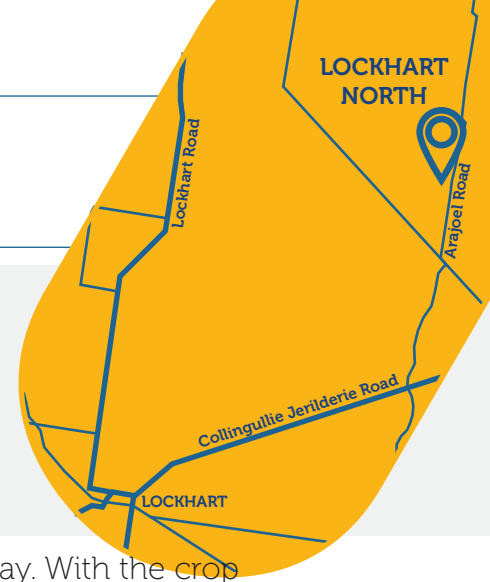
YIELD OUTCOME FOR NITROGEN SCENARIOS



CURRENT DISTRIBUTION OF PAW



LOCKHART NORTH (PROBE 1)



Crop type: canola

Cultivar: Bonito

Sowing date: 22 April 2015

Soil type: sodosol

Directional guide: -35.1036 | 146.8754

Historic average yield: canola - 1.26t/ha

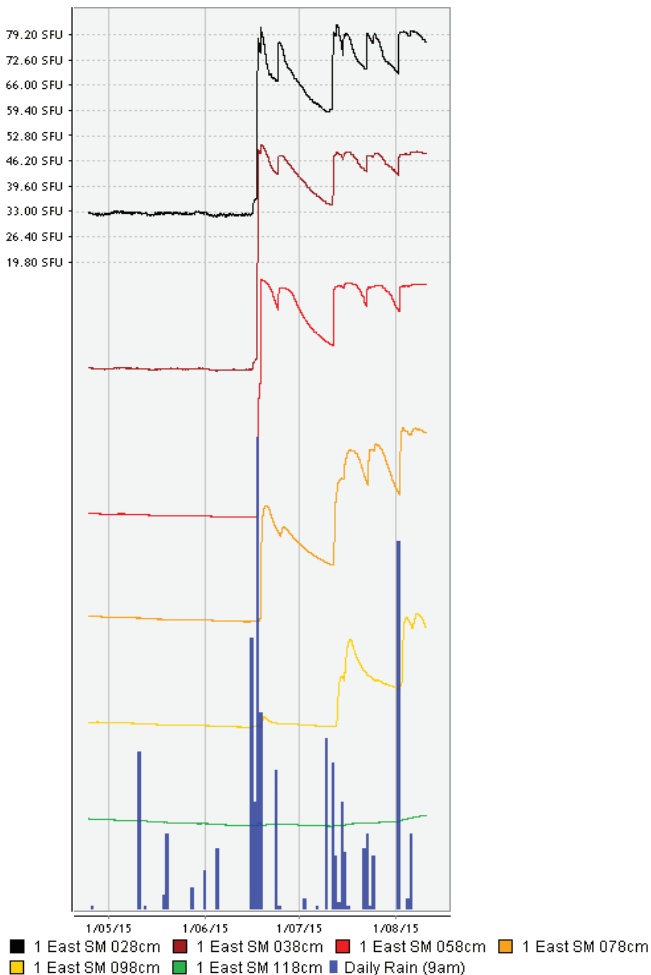
The canola crop at Lockhart North is very close to flowering and has had ideal growing conditions to date. With 152mm of water in the soil profile the Yield Potential for the crop is significant. Given the worst season finish on record the crop would be expected to yield 2.5t/ha and with an average finish has a potential of 3.5t/ha.

The yield chart is showing the crop has a 90% chance of benefitting from additional N. At 4 August Yield Prophet was showing that N reserves were at 68kgN/ha and being utilised

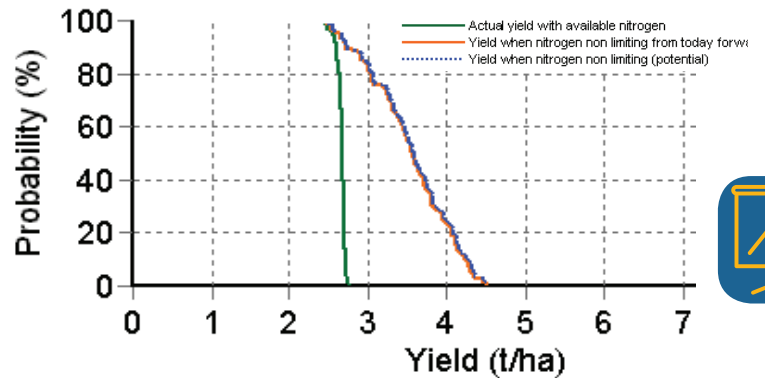
at a rapid rate, ~4kgN/day. With the crop approaching flowering nitrogen would need to be applied soon to allow the crop to gain the full benefit.

Where scenario 1 is 0, 2 is 20 and 3 is 40 kgN/ha The yield outcomes from the nitrogen comparison report is showing a 90% chance of a yield response to 20kgN/ha and an 80% chance of a yield response to an additional 20kgN/ha (40kgN/ha total).

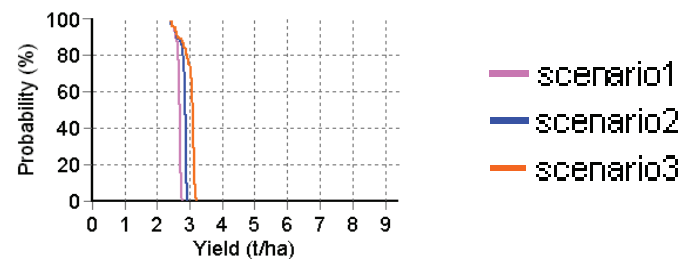
PROBE



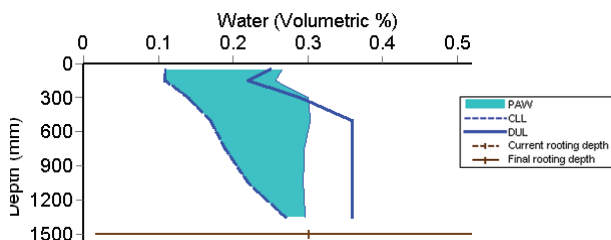
YIELD



YIELD OUTCOME FOR NITROGEN SCENARIOS



CURRENT DISTRIBUTION OF PAW





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FarmLink Research



FarmLinkResearch

FarmLink is a not-for-profit agricultural research and extension organisation in southern NSW made up of 300+ growers and collaborating with advisers and researchers. FarmLink coordinates and communicates private, public and grower group funded research and development activities within the region.



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