



# WEATHER OR NOT



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## WELCOME

Here's the second of six Weather or Not newsletters to be delivered on a monthly basis right through to December 2015. Eight sites in the FarmLink district have been set up with soil moisture probes installed by Cropsol Consulting Services and Yield Prophet® by the Birchip Cropping Group. Weather or Not provides an overview of the seasonal prospects, crop resources and climate and weather analysis and the agronomic implications of each. It also outlines the latest agronomic considerations and nitrogen inputs at the relevant growth stage.

Since the last edition most areas received 25 to 60 mm with some locations registering 70 to 100 mm. This has freshened crops up prior to the cold weather setting in

and slowing down growth. We have had some significant frost across the region with some more events forecast in the near future.

In some cases, nitrogen has been applied early to canola crops but growers are opting to delay their N applications to cereal crops to see how the forecast shapes up.

Crops seem quite clean of weeds which seems to be a reflection of good planning of herbicide use.

## FORECAST

The July to September outlook from the Bureau of Meteorology doesn't provide for much rain. All relevant models monitoring temperatures in the Pacific Ocean show El Niño to be strengthening and it is likely this climatic influencer will persist

until the end of the year. This typically means drier conditions across eastern Australia and warmer temperatures in southern Australia.

To the west of Australia, there is currently a positive Indian Ocean dipole typically leading to high pressure over south eastern Australia, and therefore less rainfall, at this time of year. The Bureau is indicating a rainfall outlook in south east Australia expected to be 'average to below average' with forecast accuracy being 'moderate' at present. This outlook doesn't yet apply to spring. A great source for understanding the seasonal outlook is the Climate and Water Outlook July-September video on the Bureau of Meteorology's website at <http://www.bom.gov.au/climate/outlooks/#/overview/video>

## MORE ABOUT YIELD PROPHET

Matching crop inputs to yield potential during the growing season can be stressful and costly. Even with years of farming experience, matching your N fertiliser program with the seasonal yield potential, can be difficult.

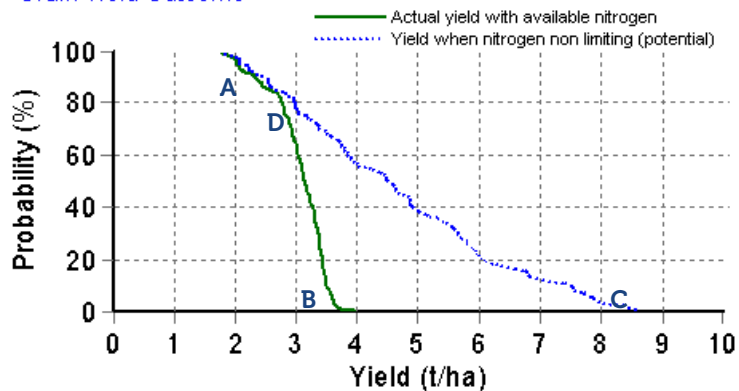
Yield Prophet is an adaption of the Agricultural Production Systems sIMulator (APSIM) which generates crop simulations and reports to assist in matching crop inputs to yield potential.

The Yield Prophet crop simulations are created by combining the essential components of growing a crop including:

- a **soil test** sampled prior to planting
- a **soil characterisation** selected from the Yield Prophet library of ~1,000 soils selected as representative of the production area
- 100 years of historic rainfall data and current climate data taken from the nearest Bureau of Meteorology (BOM) weather station or current climate data from your privately owned weather station (optional)
- individual **crop details**
- **fertiliser and irrigation applications** during the growing season.

These components are used to simulate the yield potential of your crop. With a full set of simulated yields for 100 years of rainfall and temperature data,

Grain Yield Outcome



the yields are ranked highest to lowest to give a probability of exceedance curve, expressed as percentages. The convenient thing about percentages is that they directly relate to deciles. For example, an 80% probability in Yield Prophet also represents a decile 2 year. The information is then presented with two (and sometimes three) lines, one where yield potential is expressed with unlimited nitrogen to represent the maximum potential, and the other where potential is expressed with no extra N added ie. the expected yield if it just grew with the nitrogen available in the soil measured at soil sampling time.

### KNOW WHAT YOU'RE LOOKING AT...

The gap between the two lines represents the opportunity to apply more nitrogen and the likelihood of it being effective. The results at either end of the curve are extreme and their occurrence is rare ie. they are based on the highest and lowest simulated yields from 100 years of data. Don't be confused by the inclusion of these extremes in Yield Prophet, they serve a useful purpose for ground truthing and even grain marketing. Based on your knowledge of the paddock, are the likely yields within this

range? If not, the simulation can be altered with soil classification changes or more accurate rainfall data to ensure the tool is running at optimum. It also gives you some confidence that the yields have a strong chance of falling within these extremes which could assist with marketing your final product. Remember, these extremes are one in 100 year events and should not be viewed as typical!

As the year progresses, scenario analysis can be conducted to reflect yield potential of different rates of nitrogen application which provides a more accurate idea of how much nitrogen to add....or not!

### IN PRACTICE...

In the wheat crop example above, Yield Prophet estimates that given the worst season finish on record, this crop would yield at least 1.8t/ha (a). Given the best season finish on record, the crop would achieve a yield of 3.8t/ha (b) with the current levels of nitrogen and 8.5t/ha (c) with unlimited nitrogen.

We can also see in this graph that given at least a decile 2, (d) (Pr 80%) season finish, the crop's yield potential would be limited by nitrogen, indicating that we can be confident this



crop could benefit from the application of nitrogen.

## YIELD PROPHET DOESN'T TAKE OUT ALL THE GUESS WORK....

If average growing conditions eventuated for the remainder of the season could the crop achieve a particular yield (eg. at probability 50%) if it had unlimited nitrogen? When answering this question you have to use your experience: remember that these yields are based on growing conditions that exclude frost, disease, weed infestation, chemical damage etc. - these factors are NOT incorporated into the Yield Prophet simulation. In addition, factor in the starting soil conditions when reviewing the chart, remembering that stored soil moisture, or lack of it, can have a significant impact on the yield potential of the crop.

When analysing these outputs, different people also have different tolerances to risk and expectations about a given season. Therefore, it is important that you base your decisions around parameters that you feel comfortable with. You can ask yourself questions like 'am I comfortable with an X% probability of achieving an X return on my N fertiliser investment?' or 'am I comfortable with having an X% chance of losing money?'

Also note that Yield Prophet can't take the stress, emotion, risk or personality type out of your decision making.

## NO SCIENCE DEGREES REQUIRED...

You don't have to be an expert to get the most out of Yield Prophet. Like all good decision making tools, Yield Prophet doesn't provide guaranteed outcomes – but guidelines based on research instead. Its power lies in the quick analysis of vast amounts of information to help you make an informed decision. It is possible to calculate yield potential without Yield Prophet, but it would either take days to do so or wouldn't be as accurate. Yield Prophet has been used effectively by farmers since 2003 – many in drought conditions were the decision not to apply nitrogen has saved tens of thousands in urea costs. Conversely, the strategic application of N in other, good rainfall scenarios has considerably improved profitability.

Yield Prophet is utilised by agronomists, researchers, grower groups and farmers to help integrate cropping management decisions. Use these resources to get more out of your simulations. The simulation model is also constantly being upgraded and expanded. It has recently been adopted by the peanut and sugar cane industries. Keep an eye on the website for updates and news.

To view the full Weather or Not reports online, go to: [www.yieldprophet.com.au](http://www.yieldprophet.com.au) in the user login area, Username: famlink, Password: famlink

To view each paddock, select from the 'Select Grower' dropdown menu. The



information provided is in Read-Only format.

To use Yield Prophet on your farm, contact the Birchip Cropping Group on 03 5492 2787.

## SOIL MOISTURE PROBES

Soil water values are obtained from soil moisture probes with capacitance sensors installed in the root zone of the crop. The sensor reading changes in response to the amount of water in the soil providing an indication of soil moisture in real-time. The measurements are passed on by telemetry to the web.

The soil moisture probes give a reading of soil water. These values are generated by measuring the reflectance from an electric field emitted by the sensor to give a raw reading. These readings are then converted into a meaningful value by passing them through a calibration curve for the particular soil. A common misconception is that they are actual readings of soil moisture.

At present, all crops are growing in cold conditions and will be extracting some moisture from the soil however, we expect to see more movement in these reports as crop growth advances and we move into spring.



# 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:** canola - 1.2t/ha

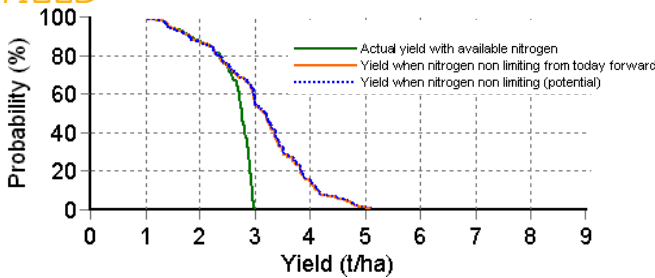
Yield prophet is showing a response to nitrogen in this canola crop at the 80% probability mark, that is, in a decile two year or better, a yield benefit is likely with the addition of nitrogen. There is a 50% probability of a 0.4 t/ha yield increase 2.7 t/ha to 3.1 t/ha with nitrogen unlimited.

The roots are nearly down to 1 m and has access to nearly all of the 116 kg N/ha available to it in the soil. The 'bucket' is just over 50% full (91 mm available) so this crop is well resourced with nitrogen and water. Monitoring the seasonal outlook prior to topdressing is a good strategy. The Yield Outcome for

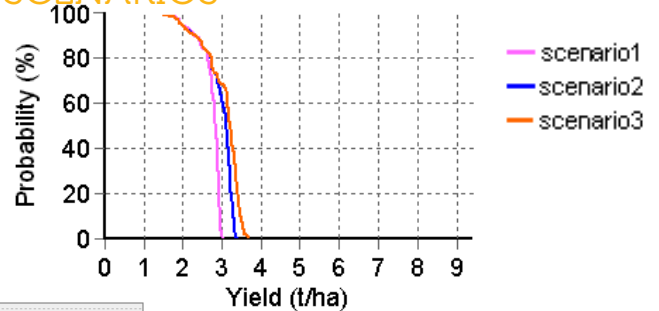
Nitrogen Scenarios graph, where the pink line is 0 nitrogen applied from now on, the blue line shows yield potential after 30 kg N/ha (or 65 kg/ha urea) is applied and the red line after 60 kg N/ha (or 130 kg/ha urea). The scale on this graph is narrow however, it shows a 50% probability of only a slight, 0.2 t/ha, increase in yield with the addition of 60 kg N/ha. At this stage, monitor crop and reassess N requirements around bolting.

Soil moisture probe data is registering soil water content increases in June down to 98 cm. This is in response to good rainfall in the last month.

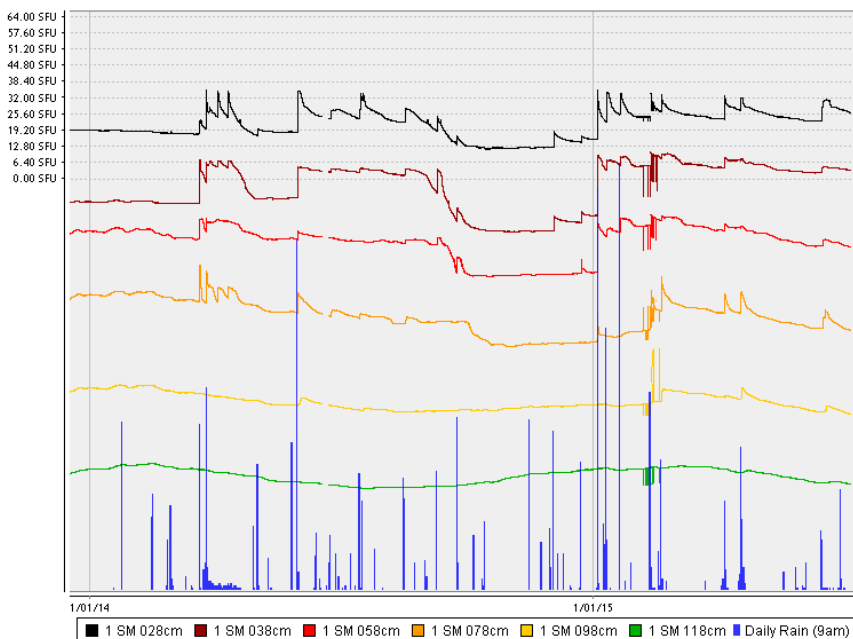
## YIELD



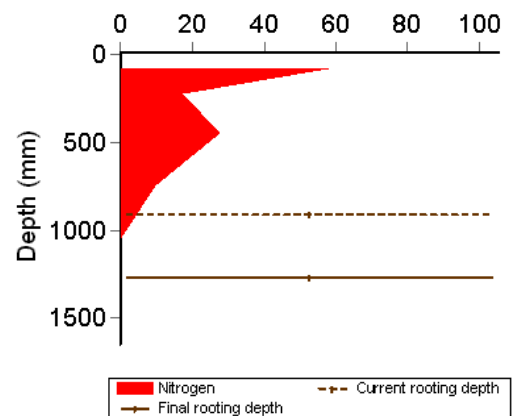
## YIELD OUTCOME FOR NITROGEN SCENARIOS



## PROBE



## CURRENT SOIL NITROGEN



# 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

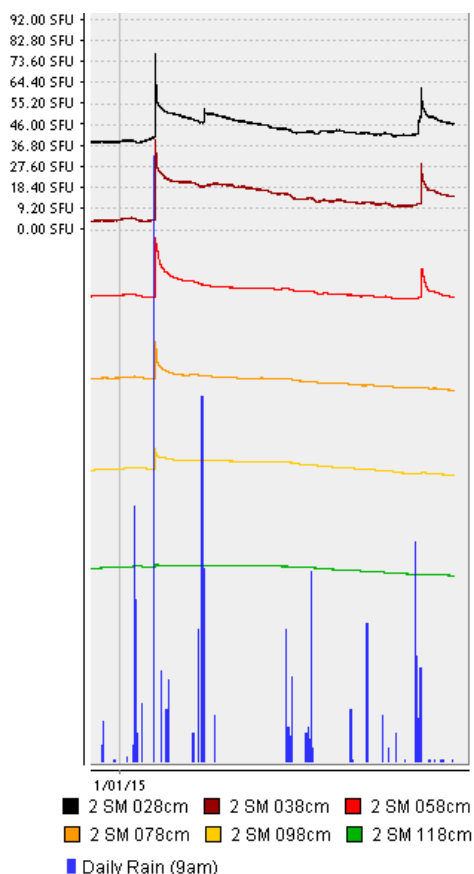
The yield potential of this paddock hasn't altered considerably since the last report with a 50% canola yield potential ranging from 2.5 t/ha (with available N) and 3t/ha (N unlimited). Soil water is excellent. The 'bucket' is 83% full with total plant available water at 102 mm and the plant available 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

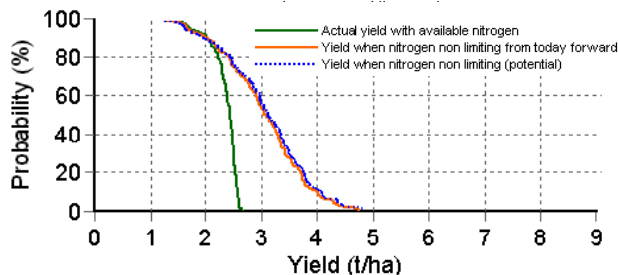
the pink line is 0 nitrogen applied from now on, the blue line shows yield potential after 30 kg N/ha or 65 kg/ha urea is applied and the red line after 60 kg N/ha or 130 kg/ha urea. The scale on this graph is narrow however, it shows a 50% probability of a 0.5 t/ha increase in yield with the addition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

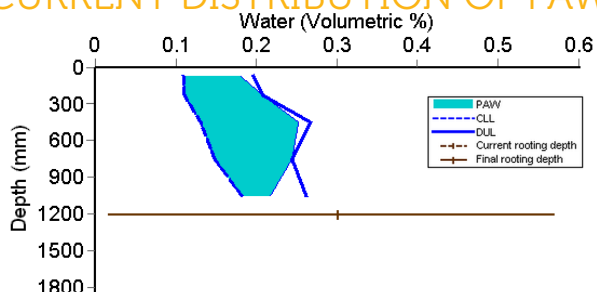
## PROBE



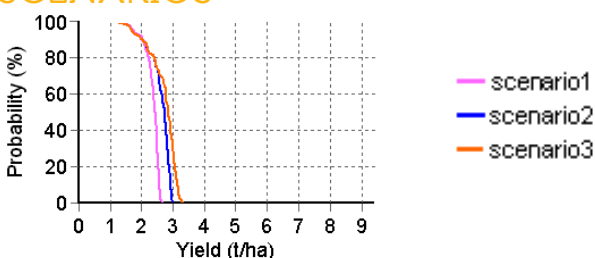
## YIELD



## CURRENT DISTRIBUTION OF PAW



## YIELD OUTCOME FOR NITROGEN SCENARIOS





# BECKOM NORTH (PROBE A)

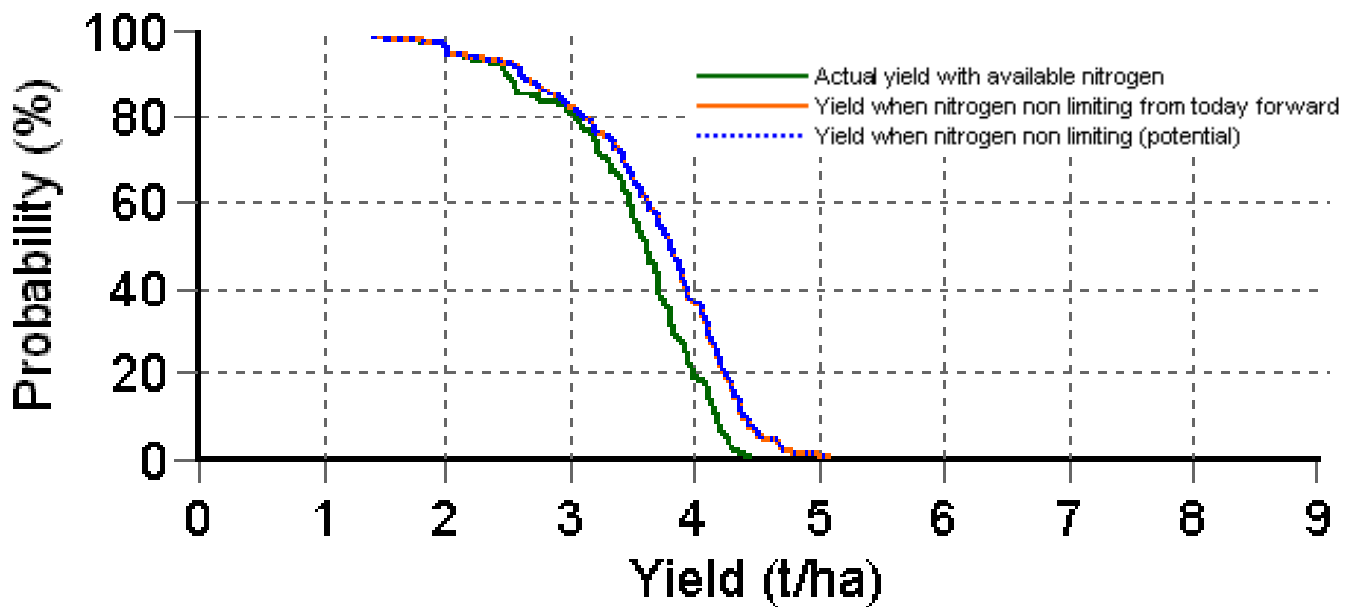
**Crop type:** wheat  
**Cultivar:** H45  
**Sowing date:** 19 May 2015  
**Soil type:** sandy clay  
**Directional guide:** -34.2895 | 146.9493  
**Historic average yield:** wheat - 2.4t/ha

This wheat crop has progressed to the Zadocks growth stage 14 and still has adequate nitrogen. There is currently 88 kg N/ha available to the crop with 90 mm total soil plant available water, both of which are adequate to get the plant to the start of stem elongation without topdressing nitrogen. The grain yield outcome graph shows a slight (less

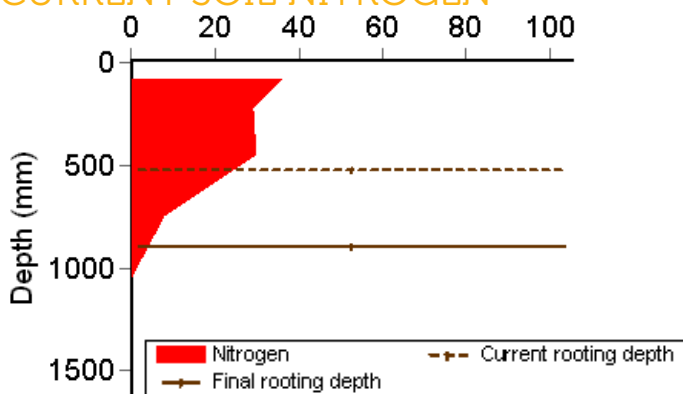
than 0.3 t/ha) yield response to the addition of nitrogen suggesting this crop is unlikely to require topdressing at this stage and has adequate available nitrogen to get it through to the end of tillering (GS30).

Monitor crop and reassess nitrogen requirements at growth stage 30.

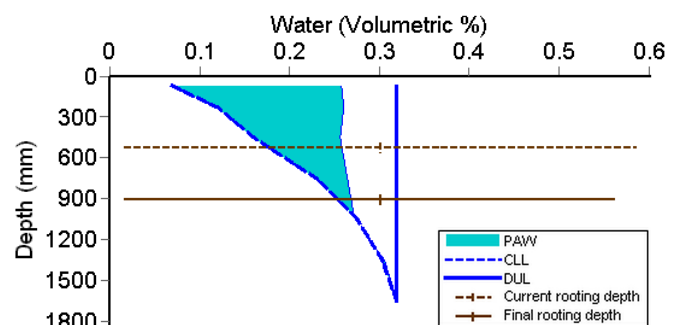
## YIELD



## CURRENT SOIL NITROGEN



## CURRENT DISTRIBUTION OF PAW



# 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

Yield prophet is showing a response to topdressing with nitrogen in this canola crop at the 80% probability mark, that is, in a decile two year or better, a yield benefit is likely with the addition of more nitrogen. There is a 50% probability of a 0.5 t/ha yield increase 2.1 t/ha to 2.6 t/ha with nitrogen unlimited.

The distribution of soil nitrogen graph still shows excellent nitrogen levels at depth (total 177 kg/ha) and therefore suggests a potential subsoil constraint issue or a nitrogen fixing crop grown in the previous season.

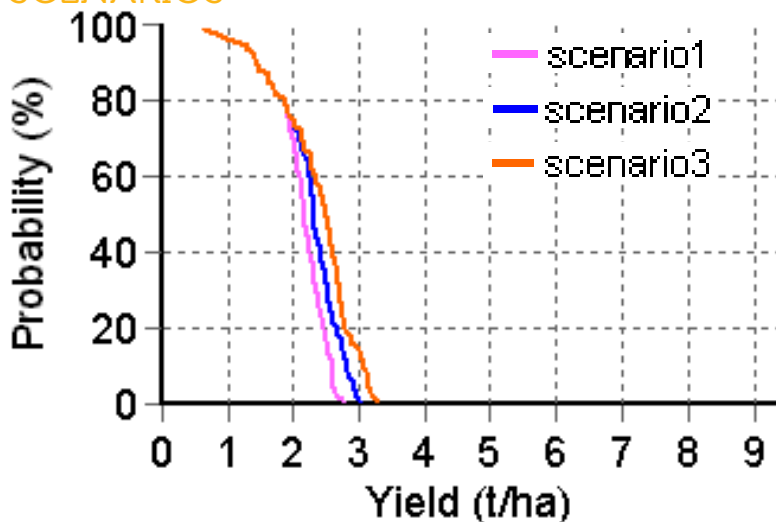
Soil constraints can severely restrict tap root penetration and hence water and nutrient

uptake.

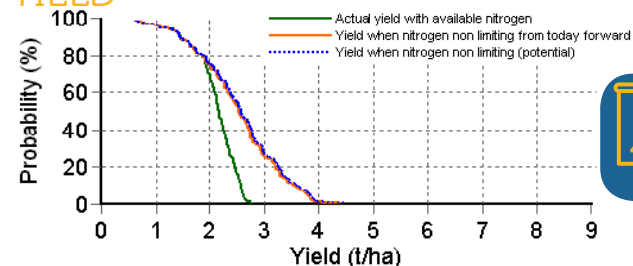
Total soil plant available water is 51mm with a plant available water capacity of 107mm. More rainfall is therefore expected to increase yield potential. Monitor this paddock closely for signs of deficiency and reassess at booting.

Rainfall events in May and June are registering down to 78cm however these increases in moisture appear to be quite high at each of the sensors. This is likely to be as a result of preferential rainfall ie. the water is running down the sides of the probe. This is expected to settle for future readings.

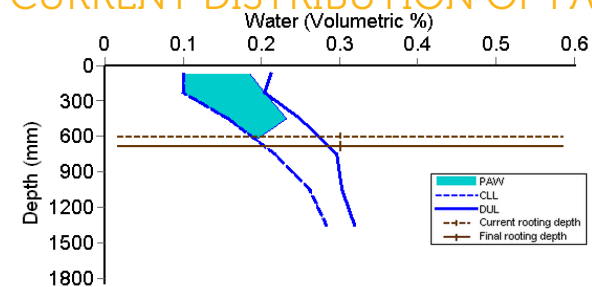
## YIELD OUTCOME FOR NITROGEN SCENARIOS



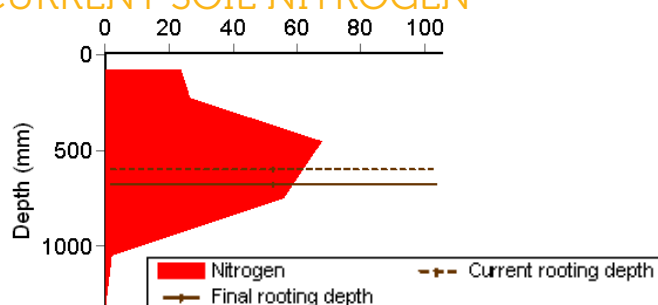
## YIELD



## CURRENT DISTRIBUTION OF PAW



## CURRENT SOIL NITROGEN





# DIRNASEER NE (PROBE 0)

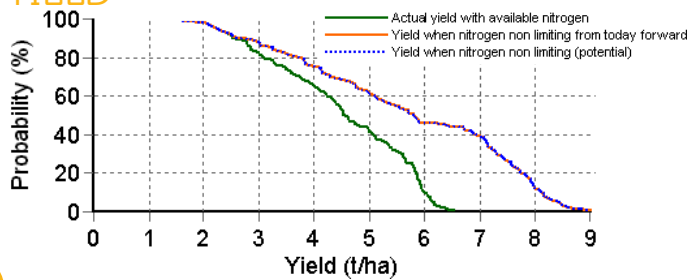
**Crop type:** wheat  
**Cultivar:** Sunvale  
**Sowing date:** 13 May 2015  
**Soil type:** red chromosol  
**Directional guide:** -34.6131 | 147.7621  
**Historic average yield:** wheat - 3.0t/ha

Yield prophet is showing a response to topdressing with nitrogen in this zadocks growth stage 14 wheat crop 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 from 4.5 t/ha with the crop utilising current soil N stores only (currently this is 140 kg N/ha in total) and nearly 6t/ha with nitrogen unlimited. Soil moisture levels are also good

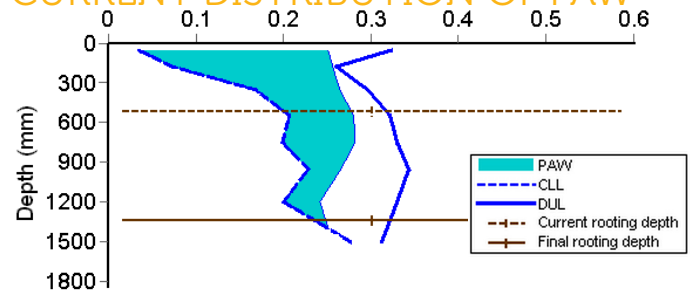
with total plant available water at 120mm. The graph showing the Grain Yield outcome for 3 nitrogen scenarios: 0 N applied (pink line), 30 kg N applied (blue line) and 60 kg N applied (orange line) shows a 0.5t/ha yield gain for applying 60 kg N or 130 kg/ha of urea.

Continue to monitor this crop for future opportunities to apply N and reassess at growth stage 30 (stem elongation).

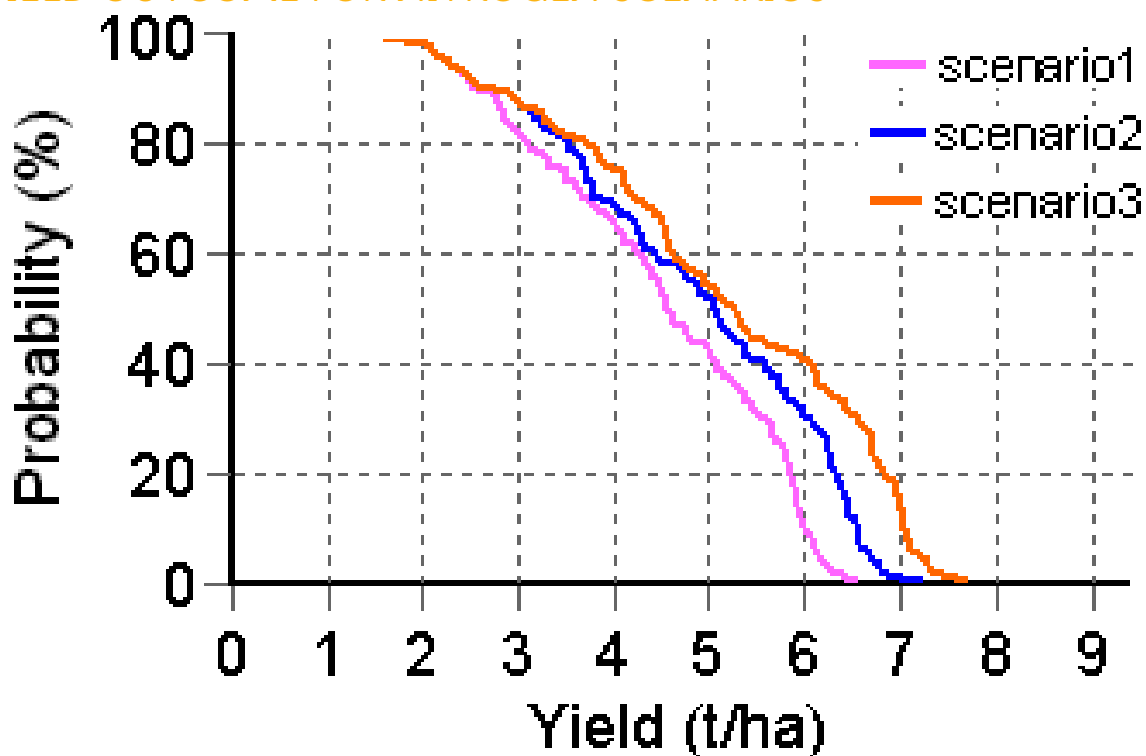
## YIELD



## CURRENT DISTRIBUTION OF PAW

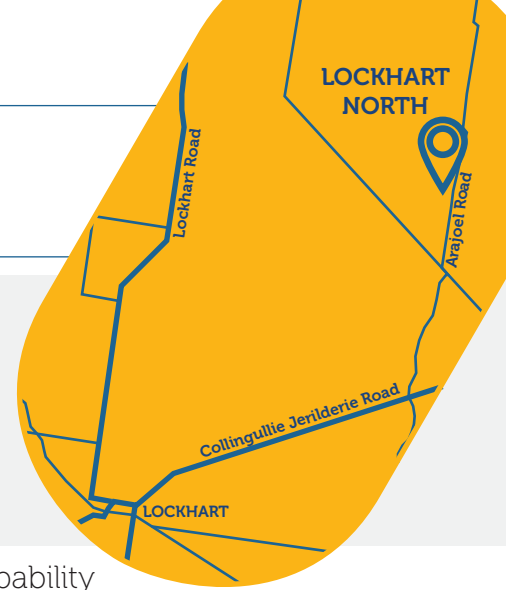


## YIELD OUTCOME FOR NITROGEN SCENARIOS





# 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

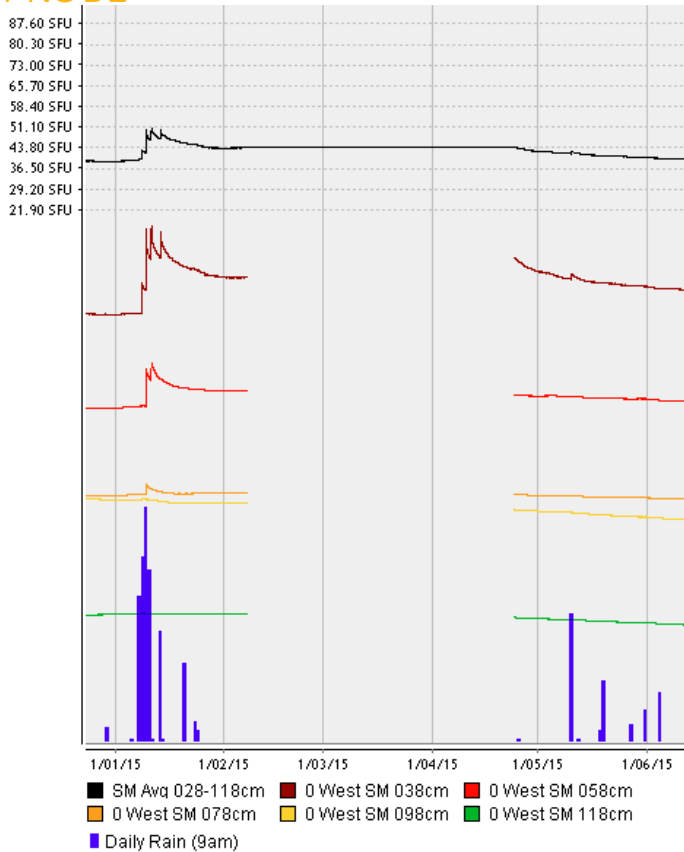
The season at this paddock is tracking at a decile 7 for growing season rainfall. Roots have grown to a depth where available nitrogen is high and available: 140 kg/ha N currently available to the canola crop. The soil water 'bucket' supplying 118 mm of plant available water, this crop has a 50% percent probability of yielding 2.5 t/ha without additional nitrogen.

In the Yield Outcome for Nitrogen Scenarios graph, the pink line represents the likely a yield response 0 N applied from now on, the blue

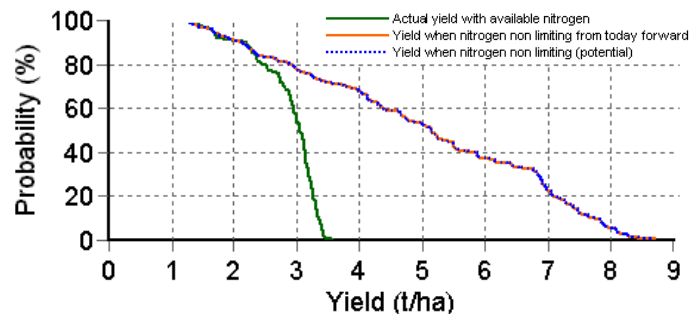
line represents the probability curve of a response to 30 kg/ha N and the orange line, a response to 60 kg/ha of N. There is a consistent 0.5t/ha yield increase with the application of 60 kg/ha N (130 t/ha urea) from the 60% probability or less. This indicates the opportunity to topdress with nitrogen at later stages once the seasonal outlook is clearer.

Recent rainfall events are not registering at the sensors. This will be investigated and reported in future newsletter editions.

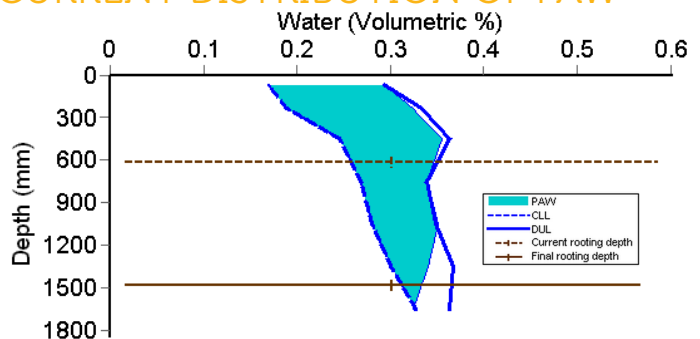
## PROBE



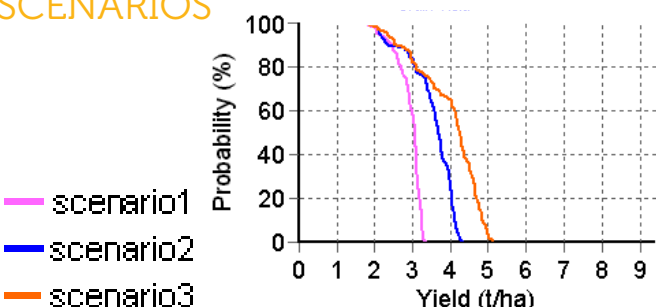
## YIELD



## 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 (ref. NSW DPI)

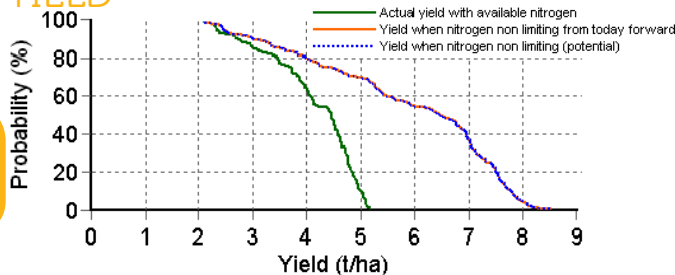
Yield prophet is showing a response to topdressing with nitrogen in this Zadocks cereal growth stage 15 wheat crop at the 90% probability mark, that is, in a decile one year or better, a yield benefit is likely with the addition of more nitrogen. At the 50% probability mark, yield potential ranges from 4.5 t/ha with the crop utilising current soil N stores only (currently this is 140 kg N/ha in total) and 6.5 t/ha with nitrogen unlimited.

Total soil N is 112 kg/ha and 22 kg/ha has been taken up by the crop. The soil water bucket is also 73% full with total soil plant available water is also excellent at 139mm.

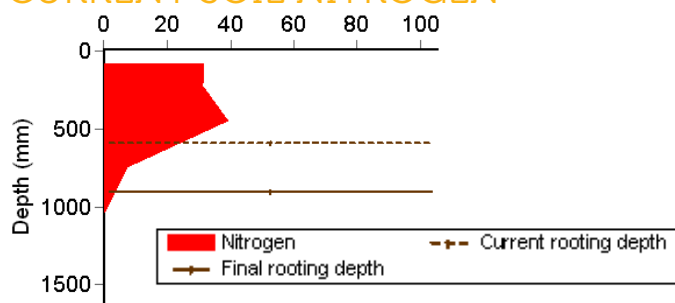
This crop is not under any nitrogen stress and has enough to last through to stem elongation (GS 31) a good strategy would be to delay nitrogen applications until after then when the season outlook is clearer is more certain.

There were technical problems with the moisture probe at TAIC however rainfall has been registered from the end of May onwards down to 72 cm. We expect more activity in future reports.

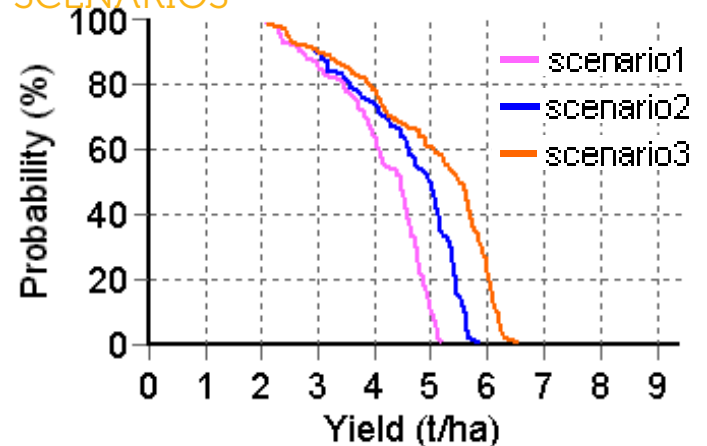
## YIELD



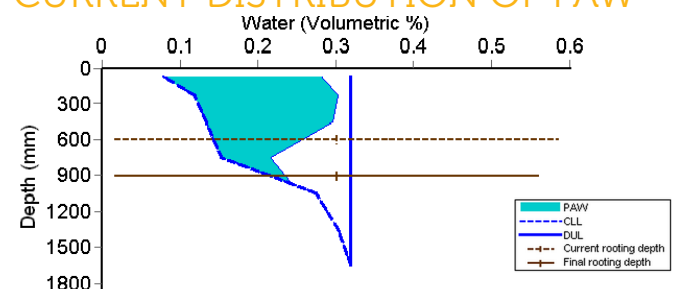
## CURRENT SOIL NITROGEN



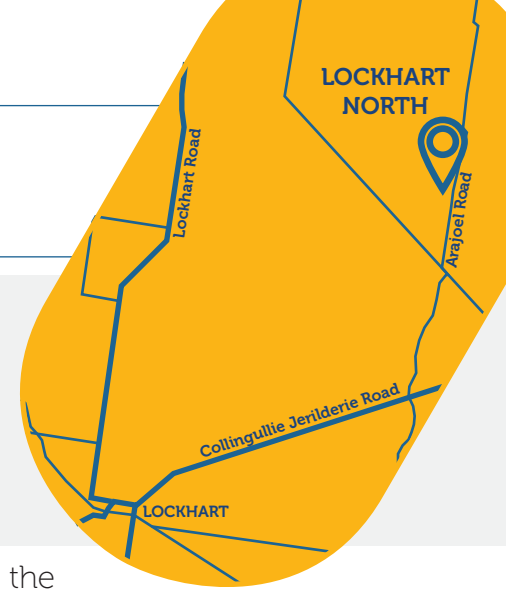
## YIELD OUTCOME FOR NITROGEN SCENARIOS



## 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

Yield prophet is showing a response to topdressing with nitrogen in this canola crop at the 80% probability mark, that is, in a decile two year or better, a yield benefit is likely with the addition of more nitrogen. At the 50% probability mark, yield potential ranges from 3 t/ha with the crop utilising current soil N stores only (currently this is 86 kg N/ha in total) and 5 t/ha with nitrogen unlimited.

Soil water is excellent. The 'bucket' is 85% full with total plant available water at 127 mm and the plant available water capacity at 148 mm.

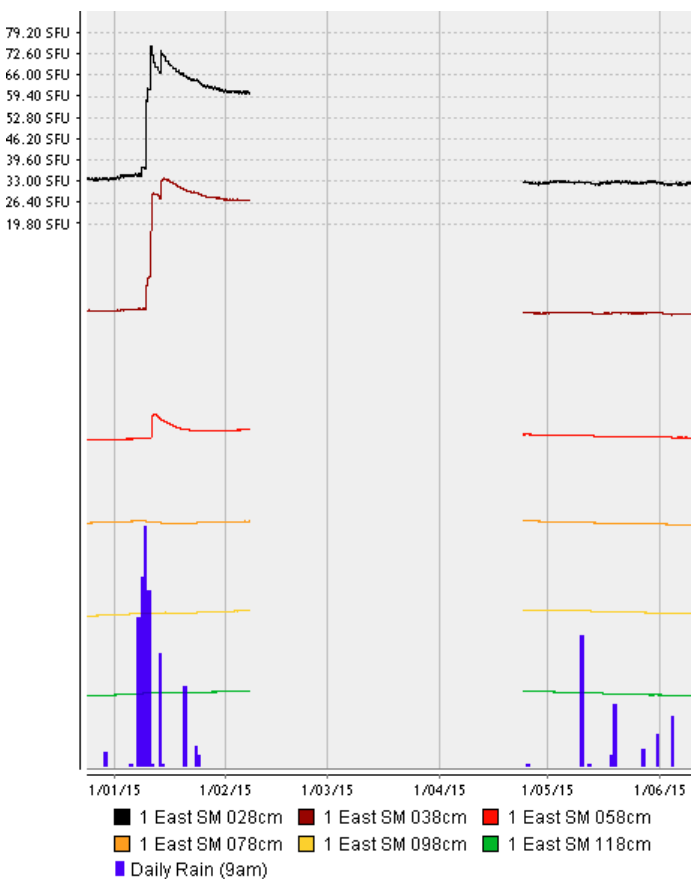
The grain yield outcomes for nitrogen

scenarios graph shows the probability curve of a response to 0, 30 and 60 kg N/ha applied as scenario 1, 2 and 3 respectively. This indicates a 90% chance yield increasing in response to any application and a 50% probability of 2 t/ha yield increase with the addition of 60 kg N/ha (or 130 kg/ha urea).

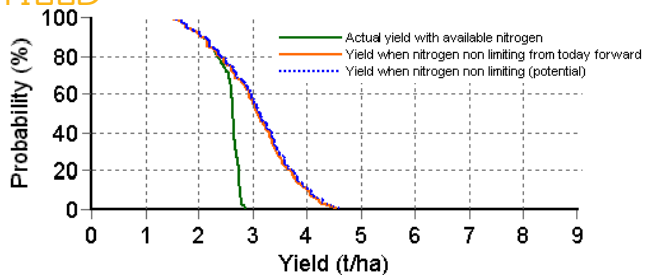
Continue to monitor this crop for future opportunities to apply N and reassess at booting.

Rainfall events are not registering at the sensors. This will be investigated and reported in future newsletter editions.

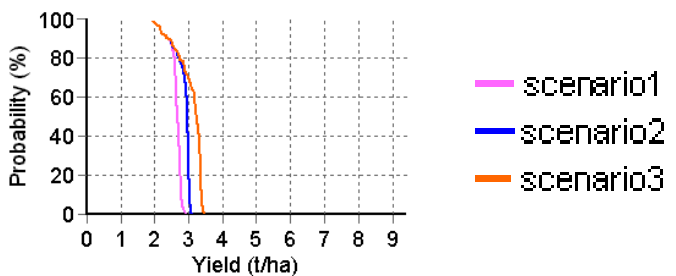
## PROBE



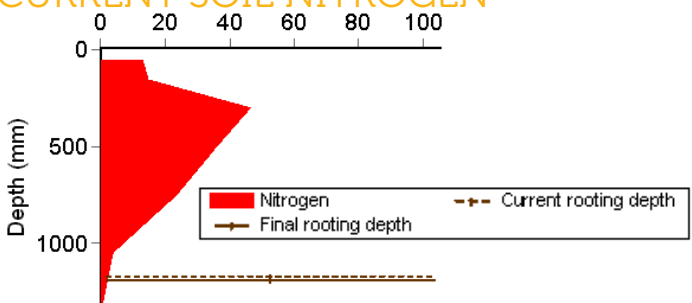
## YIELD



## YIELD OUTCOME FOR NITROGEN SCENARIOS



## CURRENT SOIL NITROGEN





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