



Yield Prophet - Mid September

David Cameron, Agronomist, Farmanco Management Consultants

The Liebe Group acknowledges the support from the GRDC and the Department of Agriculture, Fisheries and Forestry



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This edition of Yield Prophet explores how the crops are performing during grain fill. It includes information of plant available water presented at the Liebe Group Field Day on the 9th September to show how the profile has dried over the last two weeks.

Season to Date and BOM Season Outlook

Ongoing dry weather keeps us in a decile 1 season at both Hyde's site (Figure 1) and McAlpine's site (Figure 2).

Figure 1: Dalwallinu Season to Date (Hyde's site)

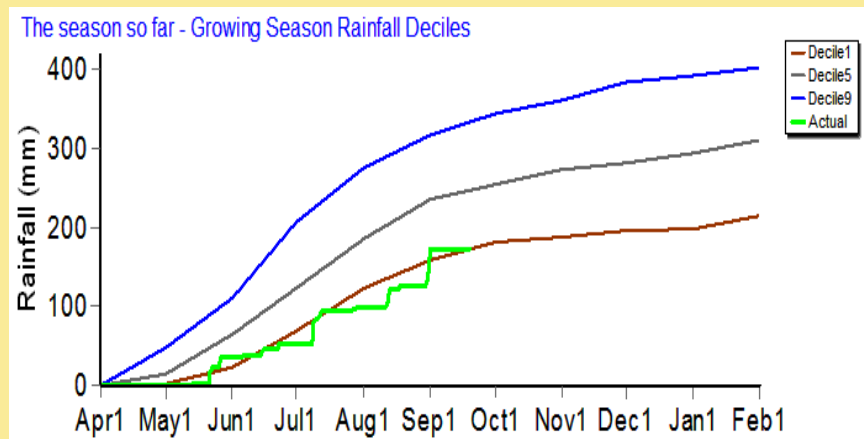
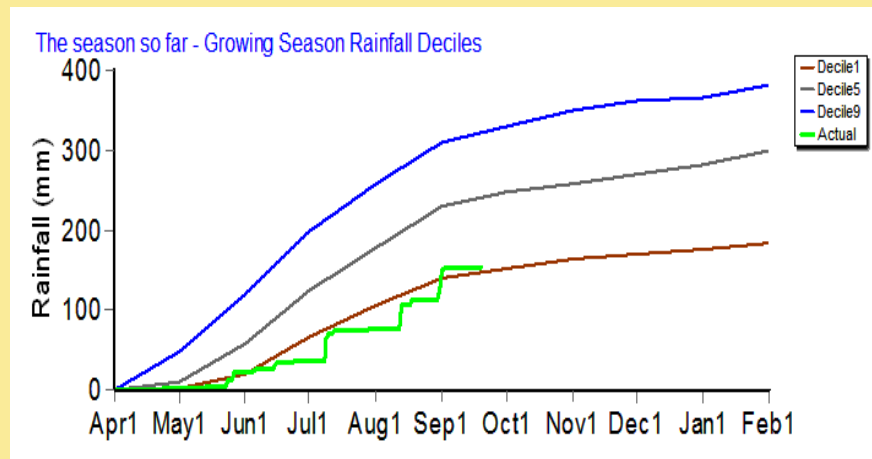


Figure 2: McAlpine's Season to Date



**SPRING ON THE SANDPLAIN
Field Walk**

Friday 8th October
Liebe Group
Long Term Research Site
Buntine-Marchagee Road,
West Buntine

2pm-5pm
Beer and nibbles afterwards

Members: FREE

Contact:
Nadine Hollamby
(08) 9664 2030

This report has been created with assistance from:



The patchy rain that came early in the season rain at Nankivell's keeps this site at Decile 2 (Figure 3).

Figure 3: Field Day Site at Nankivells - Season to Date

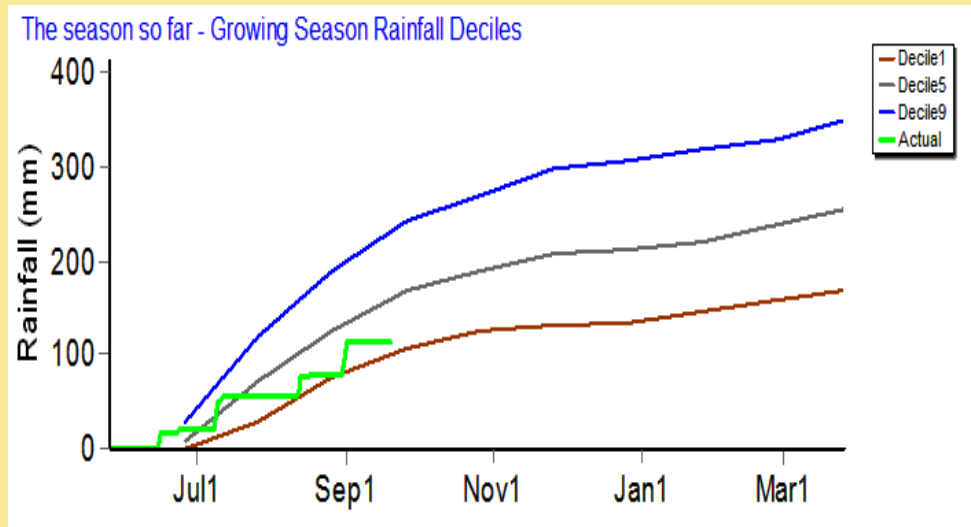
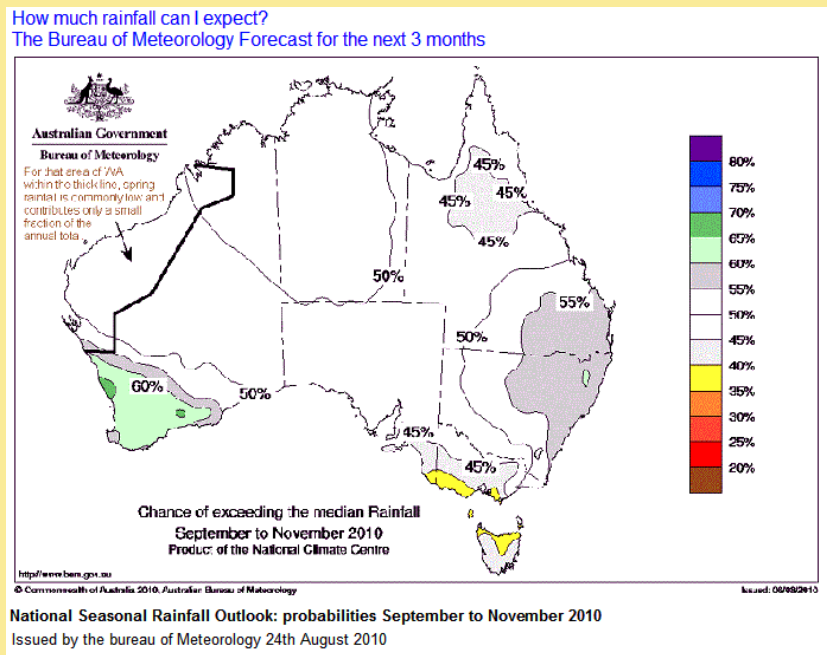


Figure 4: BOM Season Outlook Sep-Nov



The Bureau of Meteorology (BOM) has indicated a 60% chance of receiving median rainfall for the 3 month period, September - November (Figure 4). This is really an average amount of rain for this period. Good rain falling on the 1st September recharged the profile (Figure 6, 8 and 10). This soil water gives the crop some 'breathing space' for the weather systems to move through until a useful one bearing rain appears.

Plant Available Water (PAW)

The Plant Available Water for the 20th September in Figures 5, 7 and 9 shows how quickly the profile is drying out when compared back to the 7th September (Figures 6, 8 and 10).

SITE DESCRIPTION

PROPERTY: Ian Hyde, Dalwallinu

SOIL TYPE: Loamy Clay

ROTATIONS:
2009 = Volunteer Medic Pasture

VARIETY: Bonnie Rock

SOWING DATE:
25/5/2010

SITE DESCRIPTION

PROPERTY: Liebe Group Long Term Research Site, West Buntine.

Stuart and Leanne McAlpine, West Buntine.

SOIL TYPE: Deep Yellow Sand

ROTATIONS:
2009 = Lupins
2008 = Wheat
2007 = Wheat

VARIETY: Magenta

SOWING DATE: 28/5/2010

Figure 5: Hyde's Loamy Clay PAW 20th September

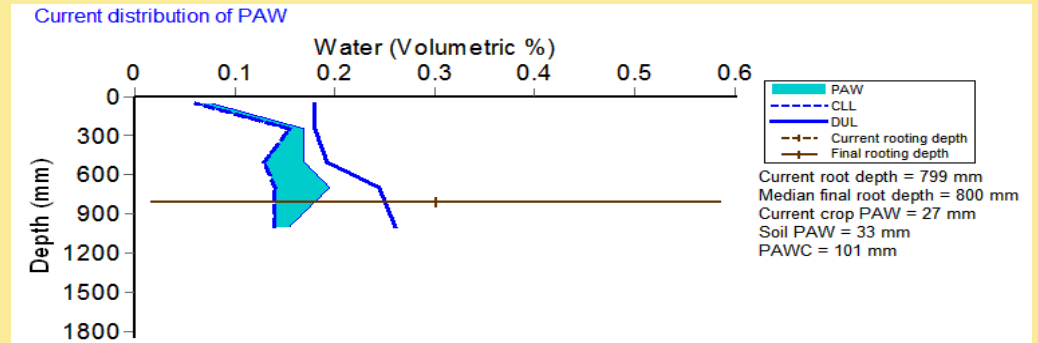


Figure 6: Hyde's Loamy Clay PAW 7th September

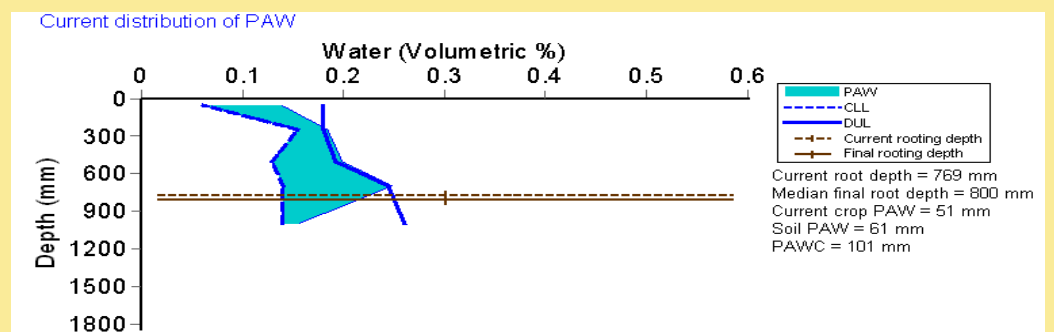


Figure 7: McAlpine's Sand PAW 20th September

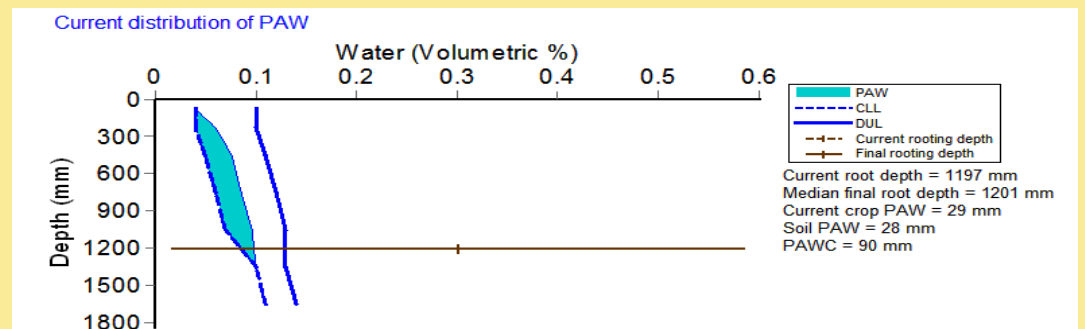
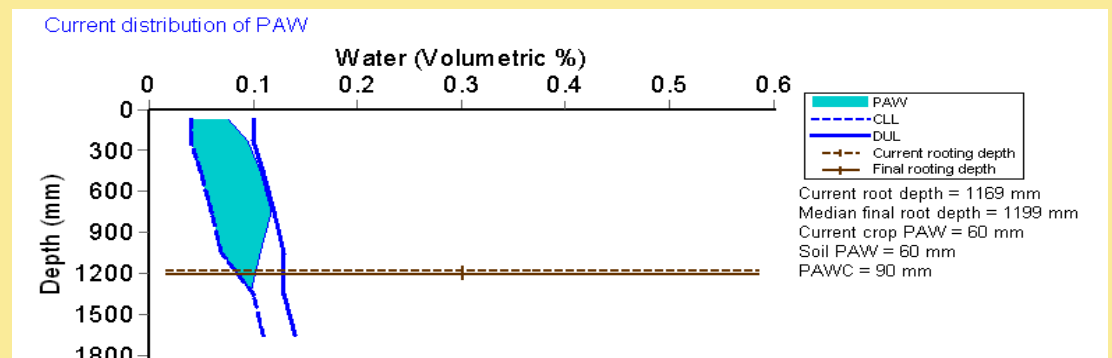


Figure 8: McAlpine's Sand PAW 7th September



SITE DESCRIPTION

PROPERTY: Liebe Group Main Trial Site.

Rob Nankivell, East Maya.

SOIL TYPE: Red Loam

ROTATIONS:

2009 = Field Peas

2008 = Wheat

2007 = Wheat

VARIETY: Wyalkatchem

SOWING DATE: 1/6/2010

Figure 9: Nankivell's Red Loam PAW 20th September

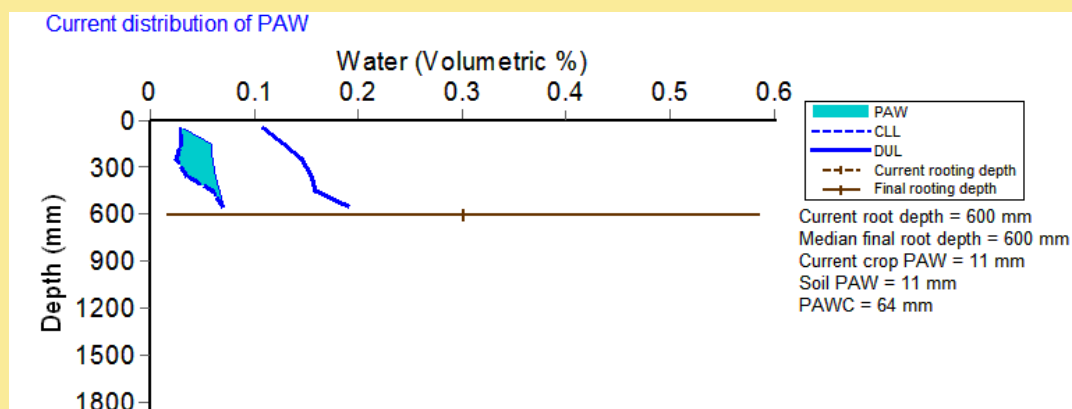
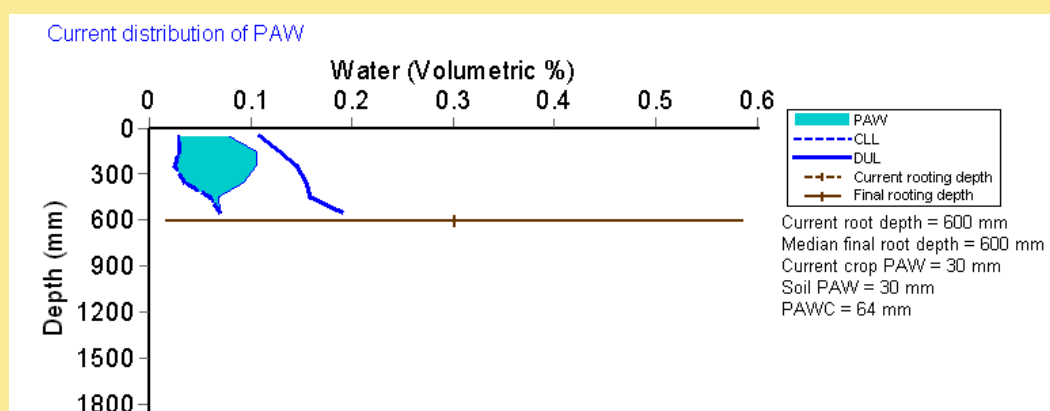


Figure 10: Nankivell's Red Loam PAW 7th September



Projected Water and N Use

The crop on the loamy clay is able to extract sufficient water from this soil for the next 9 days without stress (Figure 11). A median water use of 1.1mm/day over the next 10 days, will supply the crop for up to 24 days at this rate where there is 27mm of PAW. (The 1.1mm/d of water use is an approximation derived from the Evap + Daily Water Use, which is transpiration). In reality the rate of water use slows down as the plant stresses and wilts. The crop uses less, and the evaporation losses are reduced because there is less water which is deeper in the profile.

Figure 11: Projected water use for the next 10 days for the crop on Hyde's loamy clay

Mean projected crop performance and requirements for the next 10 days assuming no rain and no added fertiliser.

Date	Growth Stage	Evap (mm)	Daily water use (mm)	Daily N use (kg/ha)	Water available to roots above stress threshold (mm)	Water available to roots above crop lower limit (mm)	N available to roots (kg/ha)
20-Sep	72.3	0.2	1.1	0.6	8.2	24.1	23.9
21-Sep	72.8	0.2	1.1	0.5	7.0	22.9	23.4
22-Sep	73.2	0.2	1.1	0.5	5.8	21.7	23.0
23-Sep	73.6	0.2	1.1	0.4	4.7	20.6	22.6
24-Sep	74.1	0.2	1.0	0.4	3.6	19.5	22.3
25-Sep	74.5	0.2	0.9	0.4	2.7	18.6	21.9
26-Sep	74.9	0.2	0.9	0.3	1.8	17.7	21.6
27-Sep	75.4	0.3	0.8	0.3	1.1	17.0	21.3
28-Sep	75.8	0.3	0.8	0.3	0.3	16.2	21.1
29-Sep	76.3	0.3	0.8	0.3	-0.6	15.3	20.8

The water available to roots above the stress threshold is the amount of PAW (mm) above one third of the total water holding capacity of this soil. If the water values are below this stress threshold the water available to roots above the stress threshold will be negative.



Disclaimer:

Information in this report is of a general nature and any decisions should be made using information from a range of sources. No responsibility is taken for incorrect information printed.

Figure 12 show that the crop on the sand is using a lot of water. It will experience some moisture stress in the next couple of days, although it is still able to draw its requirements for the next 17 days (PAW 29mm/median water use of 1.7mm/d).

Figure 12: Projected water use for the next 10 days for the crop on McAlpine's sand.

Mean projected crop performance and requirements for the next 10 days assuming no rain and no added fertiliser.

Date	Growth Stage	Evap (mm)	Daily water use (mm)	Daily N use (kg/ha)	Water available to roots above stress threshold (mm)	Water available to roots above crop lower limit (mm)	N available to roots (kg/ha)
20-Sep	55.9	0.3	2.0	0.1	2.4	24.0	11.1
21-Sep	57.1	0.3	1.9	0.1	0.3	21.9	11.1
22-Sep	58.2	0.3	1.7	0.1	-1.5	20.1	11.0
23-Sep	59.3	0.3	1.6	0.1	-3.2	18.4	10.9
24-Sep	60.4	0.3	1.4	0.1	-4.8	16.8	10.9
25-Sep	61.5	0.3	1.4	0.0	-6.3	15.3	10.8
26-Sep	62.7	0.3	1.2	0.0	-7.5	14.1	10.7
27-Sep	63.8	0.3	1.2	0.0	-8.7	12.9	10.7
28-Sep	65.0	0.4	1.1	0.0	-9.6	12.1	10.6
29-Sep	65.8	0.3	1.0	0.0	-10.7	10.9	10.6

The water available to roots above the stress threshold is the amount of PAW (mm) above one third of the total water holding capacity of this soil. If the water values are below this stress threshold the water available to roots above the stress threshold will be negative.

The crop on the red loam (Figure 13) has 11mm of PAW available to it. The rate of use in this crop has slowed to 0.7mm/d which means the crop will hang in for another 15 days.

Figure 13: Projected water use for the next 10 days for the crop on Nankivell's red loam.

Mean projected crop performance and requirements for the next 10 days assuming no rain and no added fertiliser.

Date	Growth Stage	Evap (mm)	Daily water use (mm)	Daily N use (kg/ha)	Water available to roots above stress threshold (mm)	Water available to roots above crop lower limit (mm)	N available to roots (kg/ha)
20-Sep	59.4	0.2	0.6	0.0	-9.8	9.3	20.0
21-Sep	60.6	0.2	0.6	0.0	-10.6	8.5	20.0
22-Sep	61.7	0.2	0.5	0.0	-11.4	7.7	19.9
23-Sep	62.8	0.2	0.5	0.0	-12.1	7.0	19.9
24-Sep	64.0	0.2	0.5	0.0	-12.7	6.4	19.9
25-Sep	65.0	0.2	0.4	0.1	-13.3	5.8	19.8
26-Sep	65.8	0.2	0.4	0.1	-13.8	5.3	19.7
27-Sep	66.6	0.2	0.4	0.1	-14.2	4.9	19.7
28-Sep	67.4	0.2	0.4	0.1	-14.5	4.6	19.6
29-Sep	68.2	0.2	0.3	0.1	-14.7	4.4	19.5

The water available to roots above the stress threshold is the amount of PAW (mm) above one third of the total water holding capacity of this soil. If the water values are below this stress threshold the water available to roots above the stress threshold will be negative.

It is interesting to note that the Daily N use is low in the sand and red loam soils which have less available N (Figures 12 and 13) compared to the loamy clay (Figure 11). The sand and the red loam are expected to experience moisture stress sooner, so less N will be seen by the crop, and because crop growth is limited by stress, the N demand drops.

N Budgets and Distribution

The N budgets are presented in Figures 14 to 16 and show the lower levels of N in the sand and red loam soils. The distribution of N shows how the crop on the loamy clay (Figure 17) can still access good levels of N. Interestingly, a significant portion of lies N below the root zone at this site. There are lower levels of N in the root zone on the sand and red loam, as seen in Figures 18 and 19.

HARVEST: AN OPPORTUNITY TO CART, CREATE OR CRUSH WEED SEEDS

A workshop hosted by the Australian Herbicide Resistance Initiative (AHRI)

Monday 12th October
Wubin Sports Club

8.30am-12pm

Members: FREE

Please RSVP by Monday 4th October for catering purposes to Neree Martinez on (08) 6488 1512 or neree.martinez@uwa.edu.au

Figure 14: Hyde's N Budget.

Nitrogen Budget	
Initial N status @ 24-May	124 kg/ha
Mineralisation since 24-May	-4 kg/ha
N applications	31-May: 11 kg/ha
	21-Jul: 16 kg/ha
	: kg/ha
	: kg/ha
	: kg/ha
	: kg/ha
Total N in plant	75 kg/ha
De-nitrification since 24-May	0 kg/ha
Leaching	0 kg/ha
Current N status:	72 kg/ha

Figure 15: McAlpine's N Budget.

Nitrogen Budget	
Initial N status @ 24-May	81 kg/ha
Mineralisation since 24-May	-18 kg/ha
N applications	28-May: 6 kg/ha
	12-Jul: 12 kg/ha
	: kg/ha
	: kg/ha
	: kg/ha
	: kg/ha
Total N in plant	57 kg/ha
De-nitrification since 24-May	0 kg/ha
Leaching	0 kg/ha
Current N status:	23 kg/ha

Figure 16: Nankivell's N Budget.

Nitrogen Budget	
Initial N status @ 24-May	48 kg/ha
Mineralisation since 24-May	-8 kg/ha
N applications	31-May: 36 kg/ha
	15-Jul: 9 kg/ha
	: kg/ha
	: kg/ha
	: kg/ha
	: kg/ha
Total N in plant	64 kg/ha
De-nitrification since 24-May	0 kg/ha
Leaching	0 kg/ha
Current N status:	20 kg/ha

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Figure 17: Hyde's N Distribution.

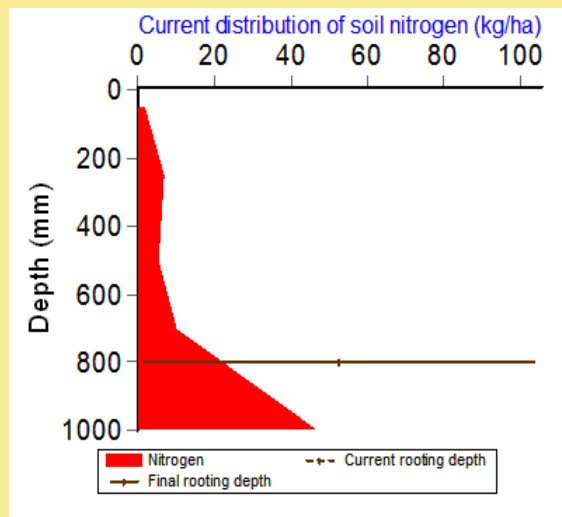


Figure 18: McAlpine's N Distribution.

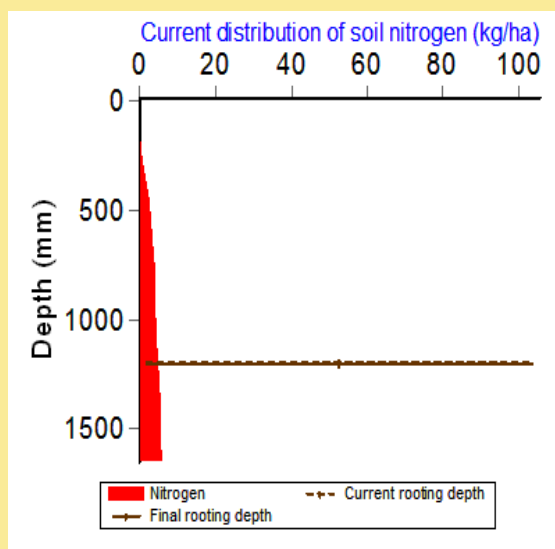
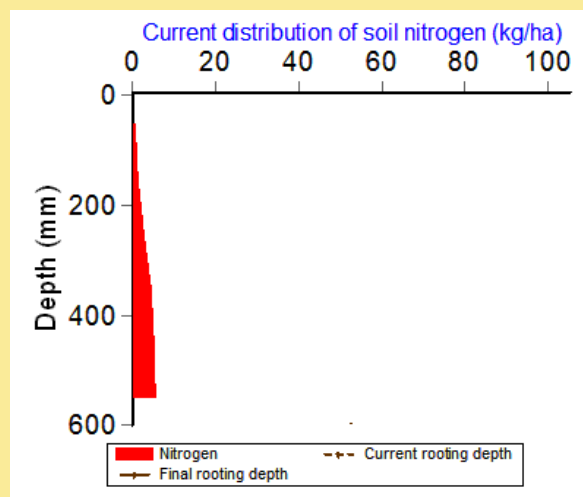


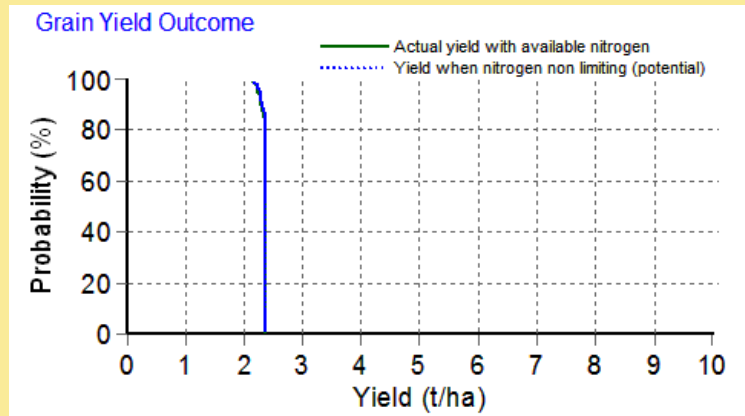
Figure 19: Nankivell's N Distribution.



Grain Yield Outcomes

These remain the same as those generated for the Spring Field Day. The model predicts there is enough water available on the loamy clay at Hyde's to yield 2.2t/Ha from this point. (Figure 20).

Figure 20: Hyde's Clay Loam Grain Yield Outcome.



The yield curve is also flat on the sand, suggesting the crop will yield 1.8t/Ha if the season finish is decile 1 (probability =90%). With a decile 5 finish to the season (average) the yield will be in the order of 1.9t/Ha. (Figure 21).

Figure 21: McAlpine's Sand Grain Yield Outcome.

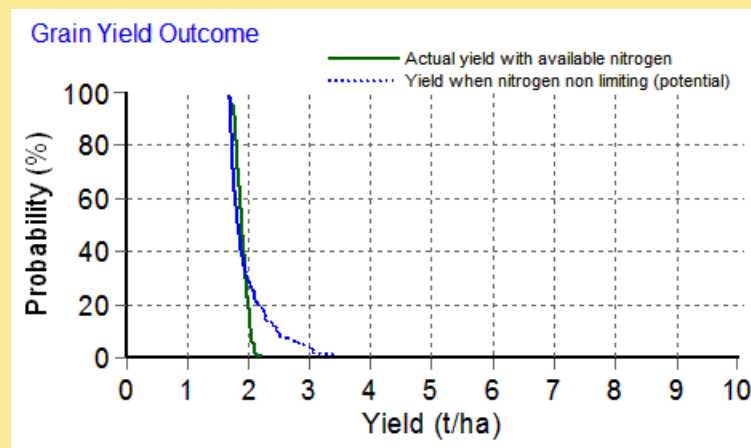
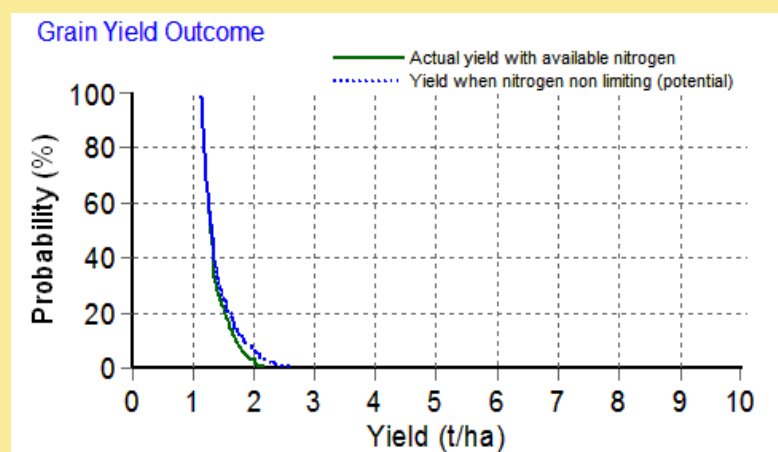


Figure 22 shows the red loam site to have enough water to yield just over 1t/Ha (Probability = 100%). If a decile 5 finish (probability = 50%) were to be received then a yield of 1.2t/Ha is predicted.

Figure 22: Nankivell's Red Loam Grain Yield Outcome.



Acknowledgements:

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