3000H On Combine Analyser

... Push your paddock to its fullest potential

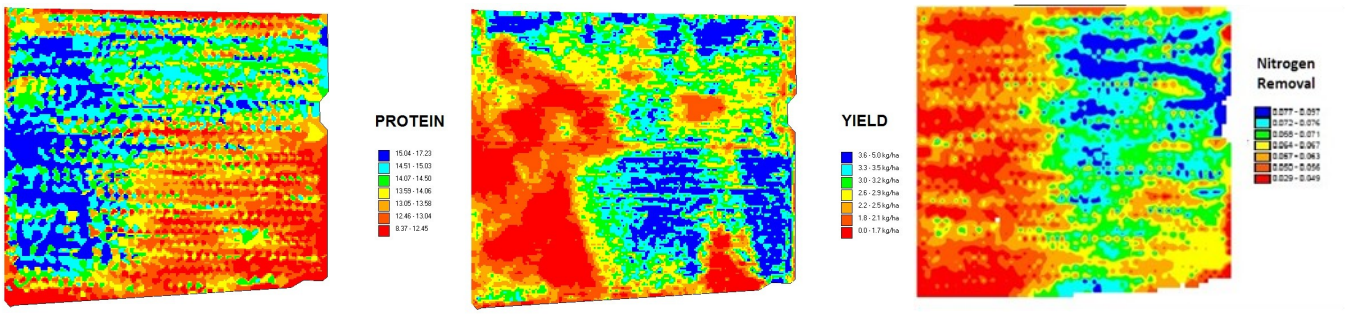
Nitrogen Removal Maps help find the "Sweet Spot" in the Protein/Yield Balance

Nitrogen Removal Maps provide farmers a more complete understanding of the uptake and availability of Nitrogen across their paddocks. The CropScan 3000H On Combine Analyser measure protein in real-time and saves the data along with the GPS coordinates across paddock approximately every 15 meters. This high density protein data can then be combined with the yield map for the paddock to generate a Nitrogen Removal Map which then lead to Variable Rate Nitrogen Fertilization application.

VRF has two major benefits for farmers:
1) reduction in N fertilizer costs
2) Optimization of the protein/yield balance.

The Protein Map, Yield Map and Nitrogen Removal Maps shown below are taken from a property on the York Peninsula, South Australia. In the Nitrogen Removal Map, the red zone that covers the left half of the paddock , shows that the yield has been effected by too much fertilizer. The protein content has been increased such that the grade of the wheat jumps to APH1, ie, >13.5% protein, yet the yield is less than the right half of the paddock. The "Sweet Spot" is shown in the bottom right hand corner where the yield is maximized and the protein is below 12.5%.

The Nitrogen Removal Map should be used in the following season to balance out the application of Nitrogen fertilizer so that the more Nitrogen is applied to the top right hand corner and less on the left hand side and the same in the bottom right hand corner.



Discussion:

It is recognized by agronomists and farmers that the "Sweet Spot" for optimizing profit is to maximize the yield and the protein. There is a point at which adding more Nitrogen fertilizer reaches the optimum yield after which more fertilizer can build protein. The trick is to work out where the "Sweet Spot" is for your paddocks.

In Australian hard wheat crops, a protein content of 11-11.5% is where the yield/protein balance is most likely to be optimized.

Cost Benefit Analysis:

In 2015 the farmer applied a blanket rate of Urea across this 185 Ha paddock of 56kg/Ha. Based on the price of Urea at $437/tone, he spent $12,194 on Urea. However based on the applying a Variable Nitrogen Rate, he should have only spent $10,632 and thereby saved $1,562.

The table shows the cost savings in Urea if he had applied fertilizer at a range of rates.

	VRF Loading		Blanket Urea Loading			
	Cost of Urea using N Removal Map	Cost of Urea at 40kg/H	Cost of Urea at 56kg/H	Cost of Urea at 60kg/H	Cost of Urea at 70kg/H	Cost of Urea at 80kg/H
Cost	$10,632	$8,710	$12,194	$13,065	$15,243	$17,420
Savings		-$1,922	$1,562	2433	4611	6789
Savings/H		-10.4	8.4	13.2	24.9	36.7
% Savings		-22	13	19	30	39

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CropScan

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Case Study #:
DATE 2017

Setting your crop up

Key Points

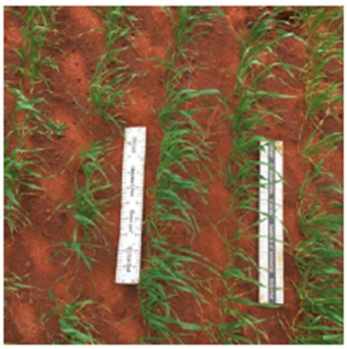
- Nitrogen management starts early.
- Manipulate tiller & canopy biomass through the use of nitrogen to set the crop up for high yield potential.
- Late nitrogen did not recover yield.
- Late nitrogen combined with low yield did not compensate with increased protein
- VRA is the only way to successfully avoid over fertilising the more fertile sections of a field.
- Rate x Timing x NUE

Farmer: SR & KL Monk
Location: Erigolia, Riverina
Enterprise: Wheat, barley, canola
Soil types: red brown earths to sand

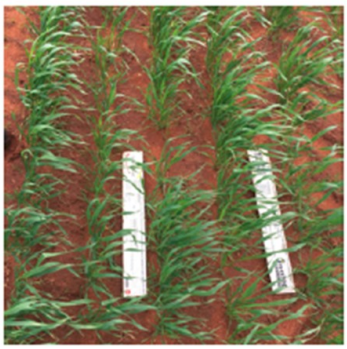
Precision Ag
Monitor: JD 2630
Header:JD 9650
Spreader : Bogballe M2W + Zurf
Swath: 36 m
2016: CropScan 1000H
Advisor: Thane Pringle
Organisation: Independent Precision Ag

Objective : To compare nitrogen treatments, by timing and rate to increase yield on traditionally low yielding areas.

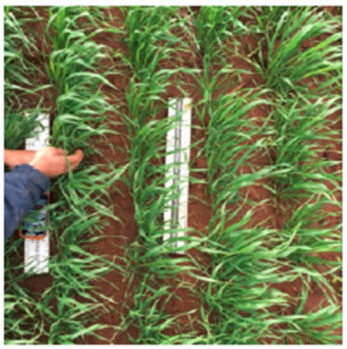
1 Wheat, Australian



2 Wheat, Australian



3 Wheat, Australian



4 Wheat, Australian

Conclusion: It is not just simply a case of nitrogen rate. It is a case of understanding the interaction between ***Rate x Timing x Crop Response.***
As can be seen in the table below, site 2 failed to produce enough tillers, had the lowest N uptake at DC30. 100 kg/ha urea applied late failed to recover yield. Site 4 started with the same V low base N, early nitrogen increased tiller numbers & nitrogen uptake. The crop recovers more early nitrogen to set it up for later applications to be more effective.
The protein trend shows you need to set your crop up early to achieve higher yield & higher protein.
VRA is the only way to match nitrogen inputs to match crop requirements in fields with different soils.

				Growth Stage DC 30			Fertiliser			
Site	Soil	Base N fertility	Plants m/sq	Tillers	Leaf N%	N Uptake	Mid Tillering	DC 33 Urea	Yield t/ha	Protein %
1	Red-Brown earth	Moder-ate	123	365	2.83	42	50 Urea	100kg	4.5	8.7%
2	Sand Rise	V low		185	2.14	12	0 Urea	100kg	2.34	9.1%
3	Sand Rise	V low	132	288	3.52	27	50 Gran-Am 50 Urea	100kg	3.7	8.7%
4	Sand Rise	V low		370	3.76	38	50 Gran-Am 85 Urea	100kg	5.5	10.4%