Case Study 004.Paddock Mapping using the CropScan 3000H The missing link in the BIG DATA

Introduction.

The ability to measure Protein, Oil and Moisture in real time as the Combine Harvester picks up the grain from the paddock has the ability change the way grain is currently marketed. But looking at the bigger picture the ability to map for Protein and nitrogen uptake has even bigger benefit to farmers in the long run.

There is a big push from the leading Ag manufactures around the world on the BIG DATA, this consists of streaming real time, weather, yield, Combine Harvester operating sensors, temperatures and pressures. If they can measure it strategically overlay and interrogated the data for hidden patterns and trends.

Considering in Australia the main aspects for payment for grain is based on the weight and protein of the grain you would assume that the yield and protein would be two key aspects that would be continuously monitored across the paddocks.

On board Yield monitors have around since the 1990's and on farm NIR grain analysers have been around since early 2000's but the ability to do both techniques in real time is very new and will become a powerful tool.

This study shows the data collected using CropScan 3000H On Combine NIR Analyser to map wheat protein across 12 paddocks on a farm in Urania South Australia.

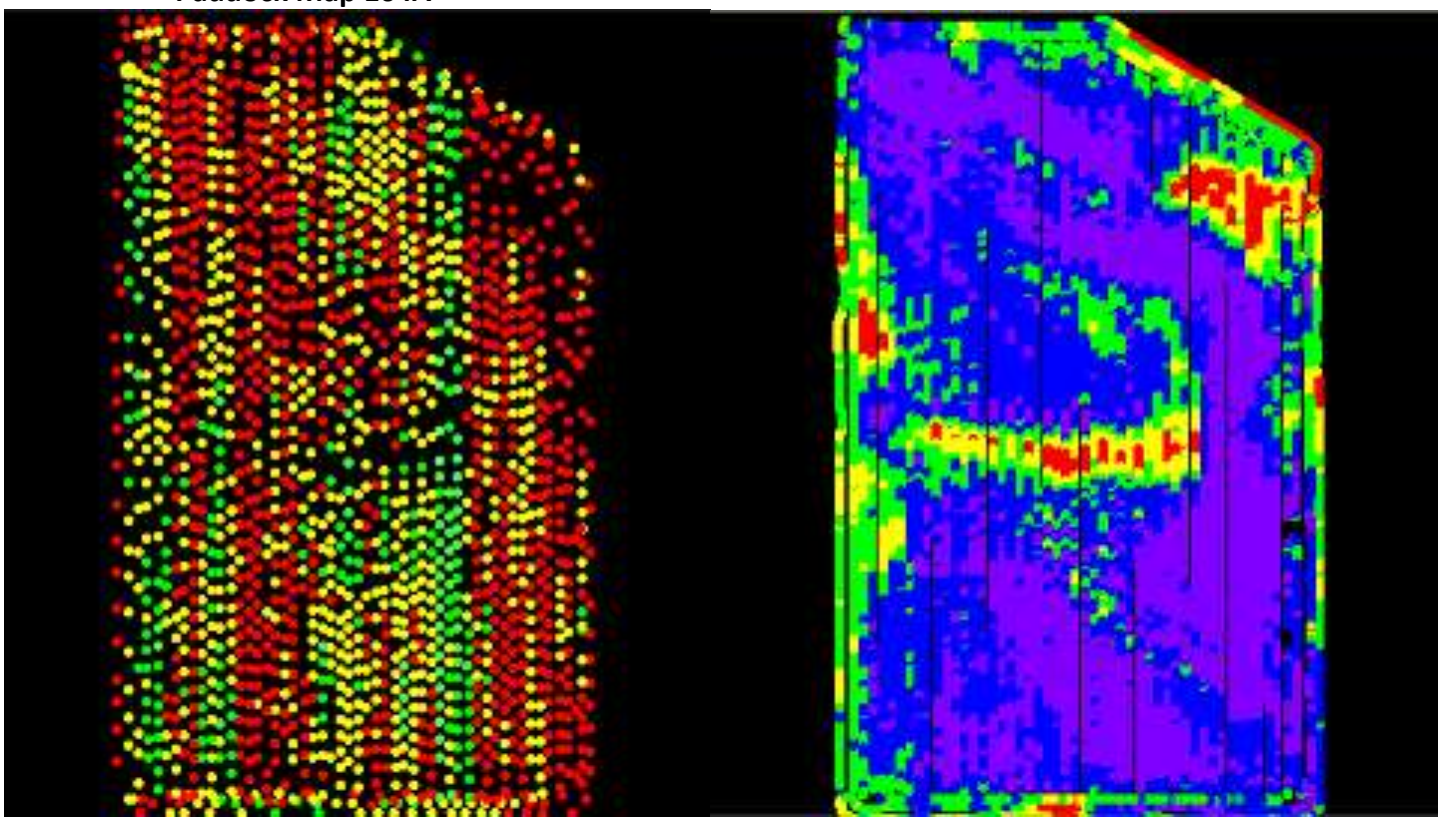
Description

The CropScan 3000H On Combine Analyser was fitted to a John Deere 970 Combine Harvester. The CropScan 3000H generated a real time paddock map for protein on the in cabin touch screen PC. The below maps show the protein, yield collected from the John Deere on board Yield monitor and radiometric soil maps.

The farmer wants to collect three years of paddock yield and protein data to see if there are correlations between yield and protein and soil types and protein. With this information and the ability to variable rate fertilization the farmer want to balance his yield and protein.

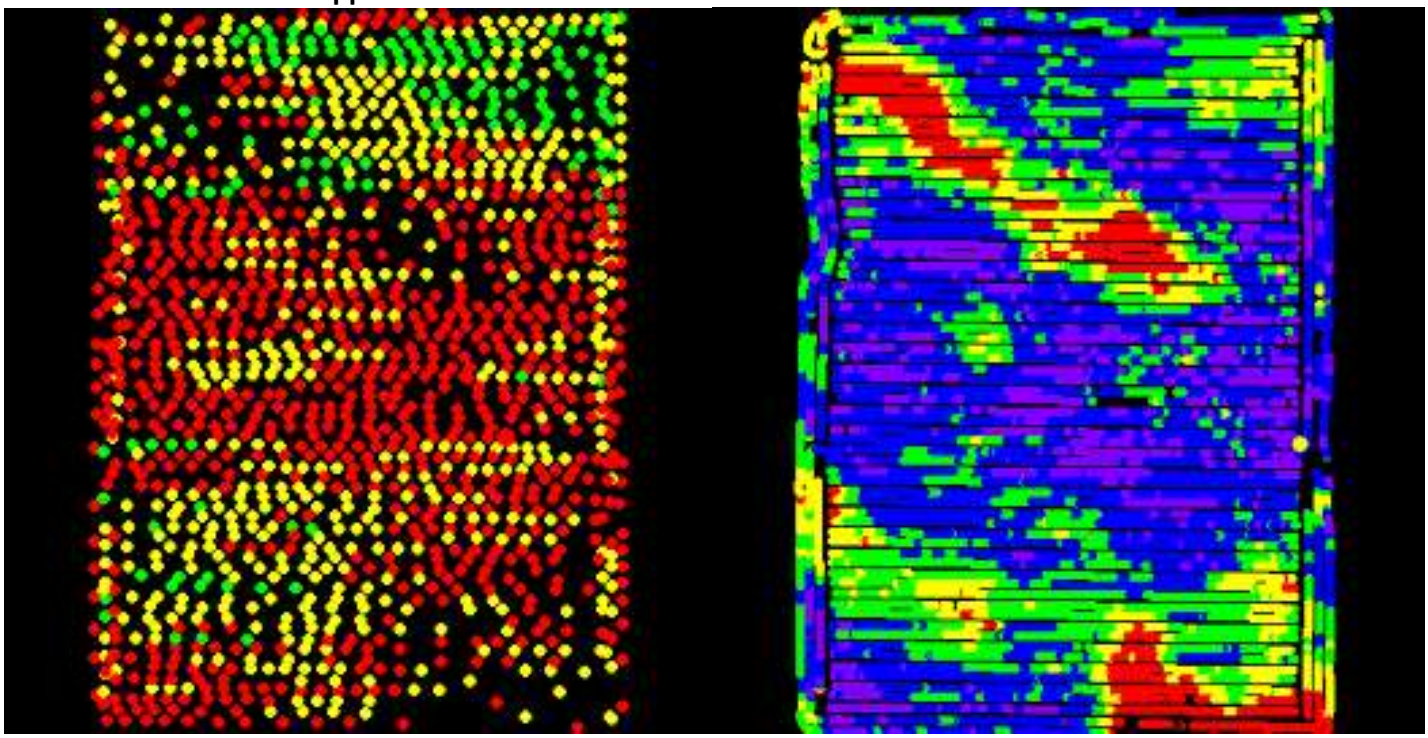
Paddock Maps

Paddock Map 164A



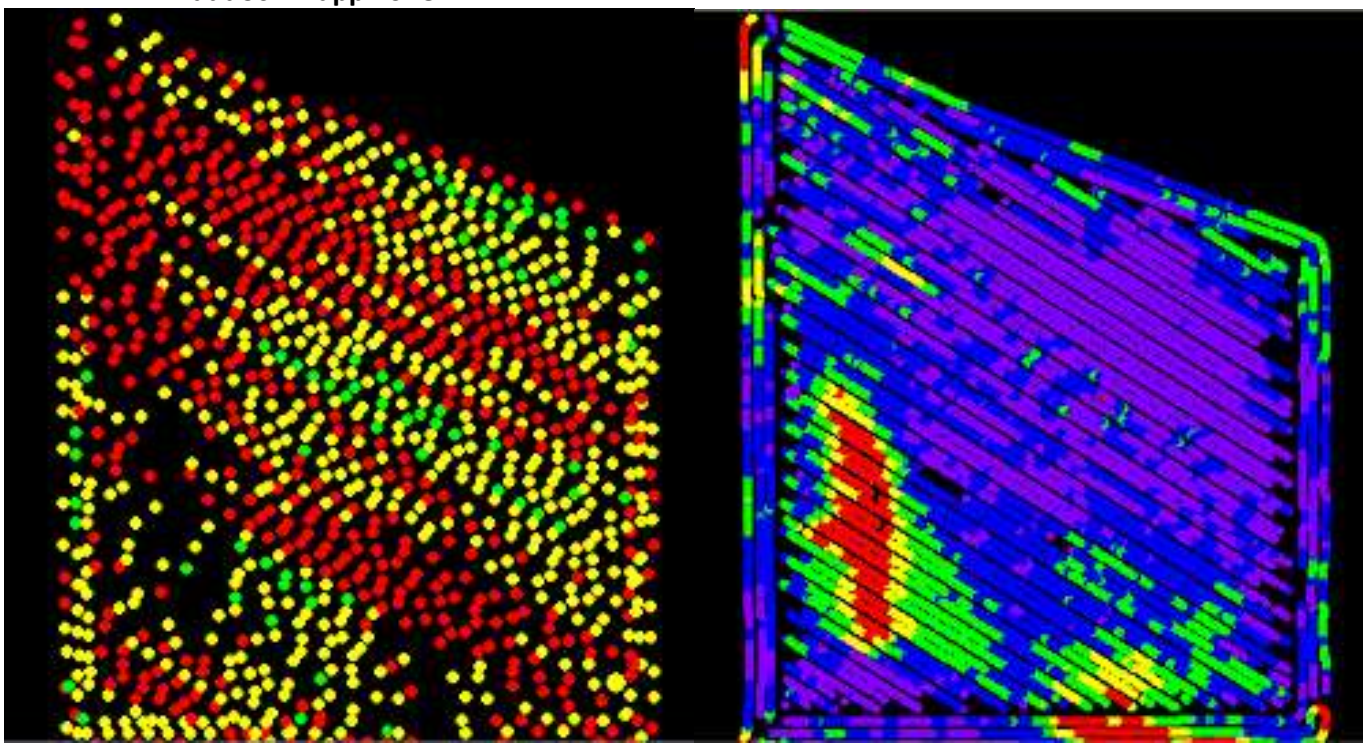
Protein **Yield**

Paddock Mapp 164B



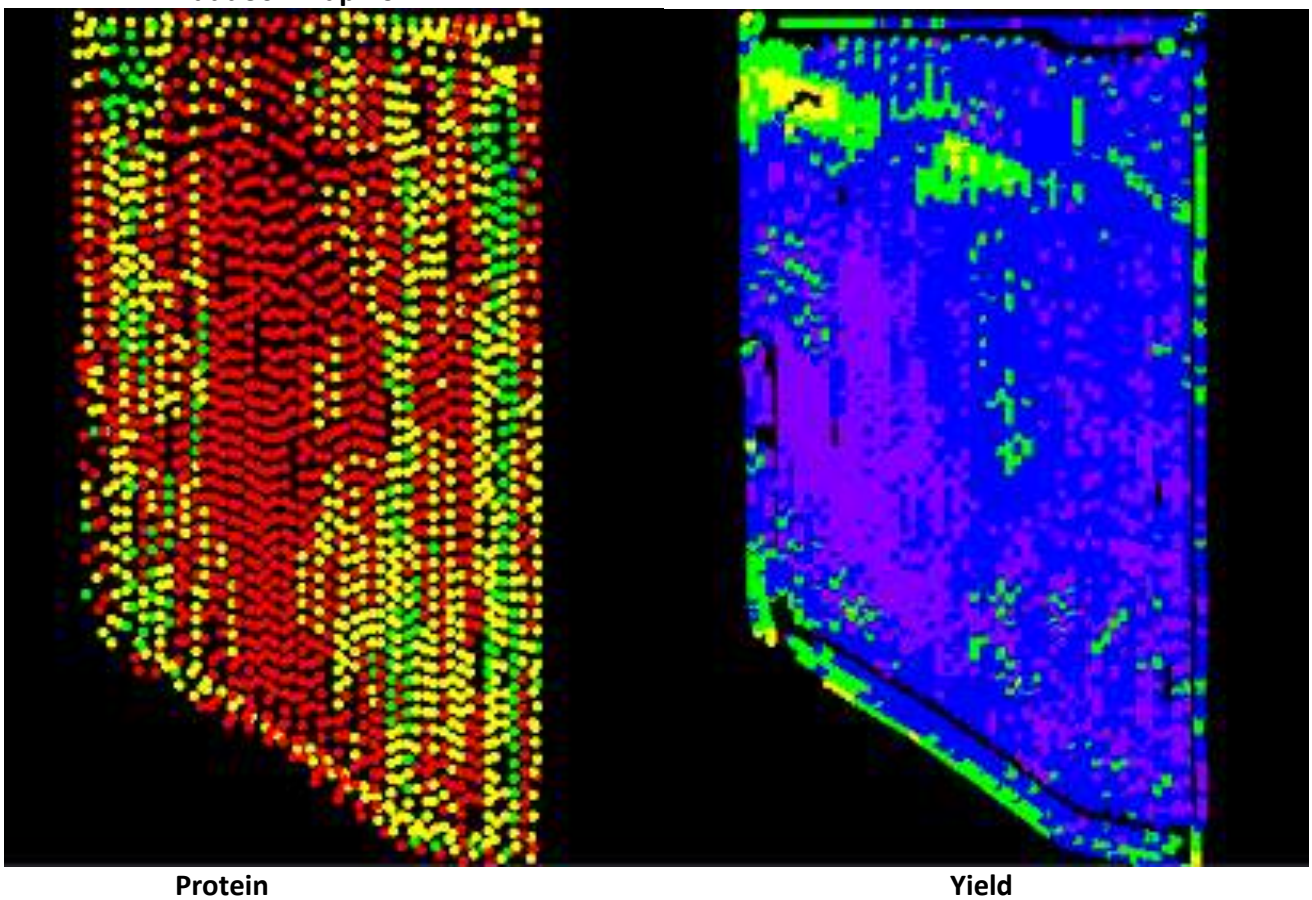
Protein **Yield**

Paddock Mapp 164C



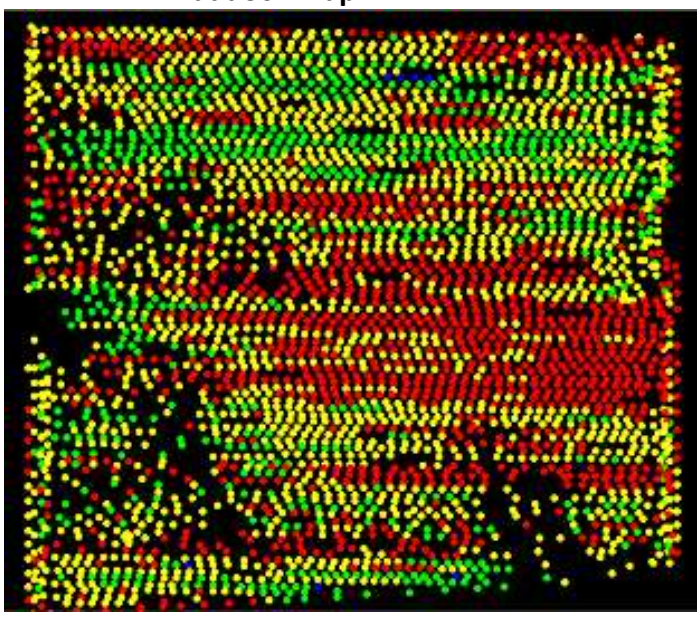
Protein **Yield**

Paddock Map 164D

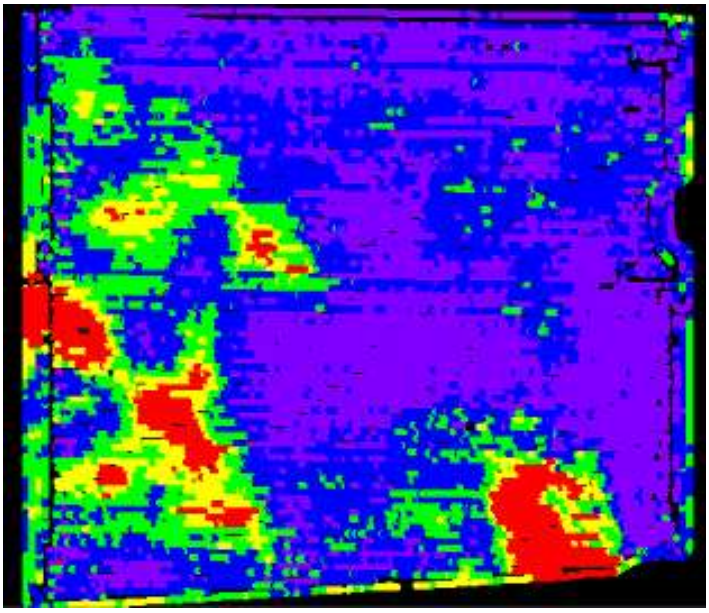


Protein **Yield**

Paddock Map 221A

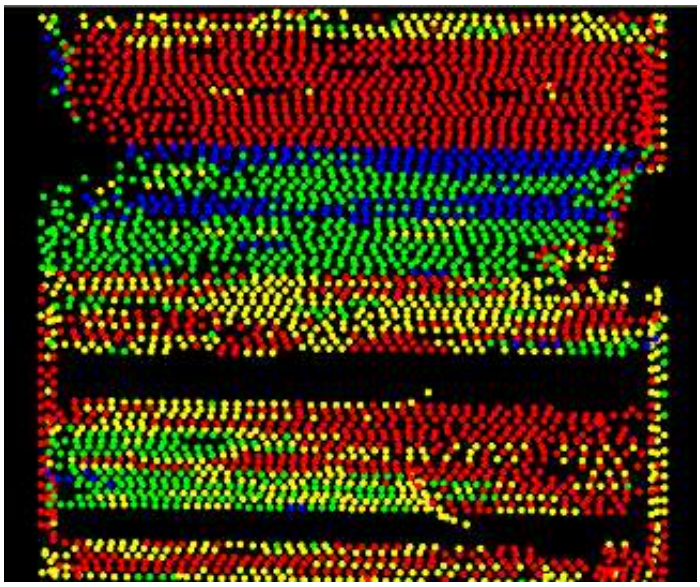


Protein

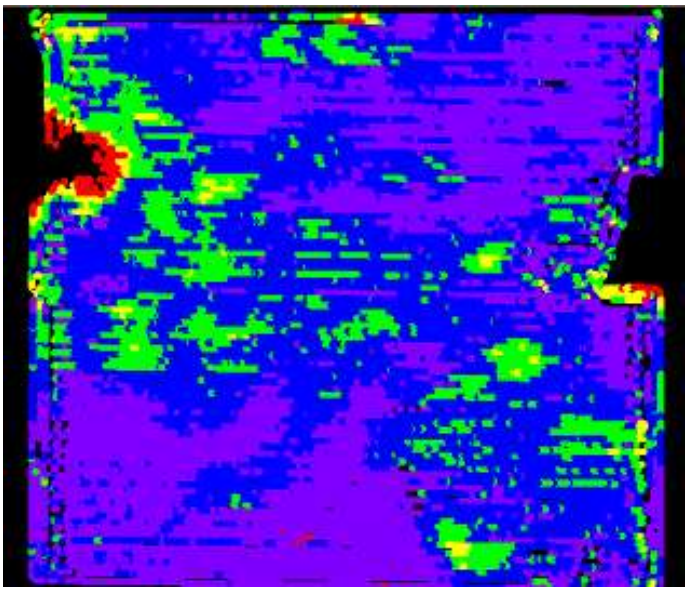


Yield

Paddock Map 221B

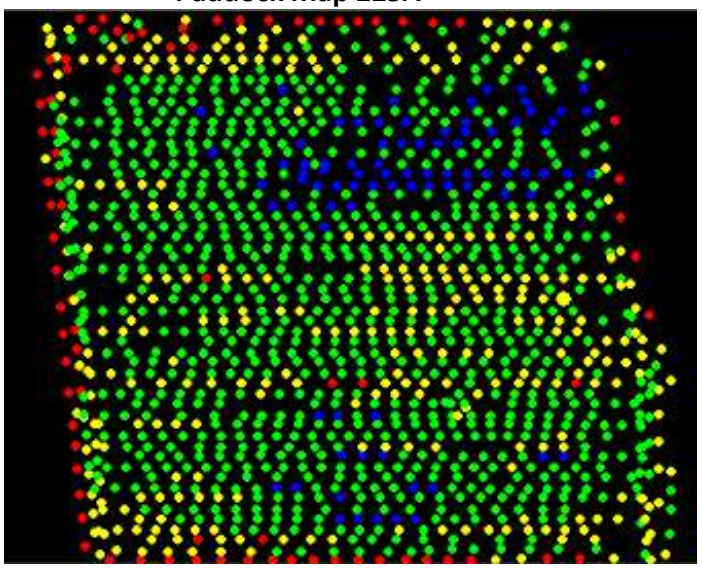


Protein

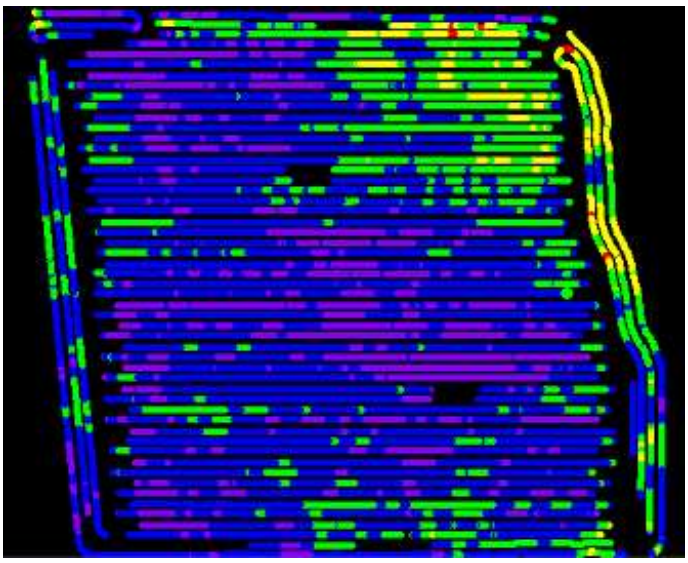


Yield

Paddock Map 225A

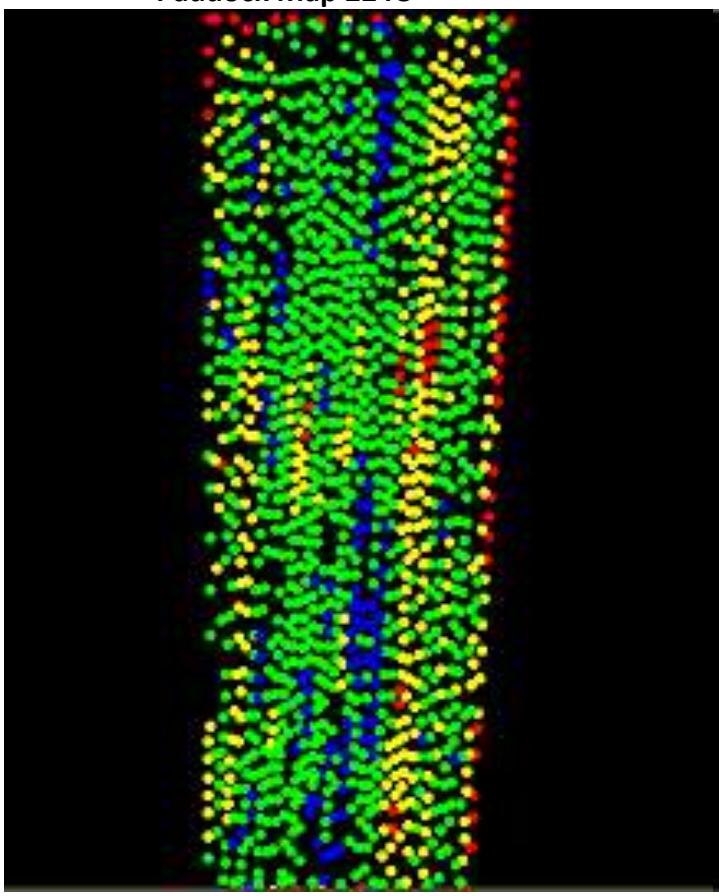


Protein

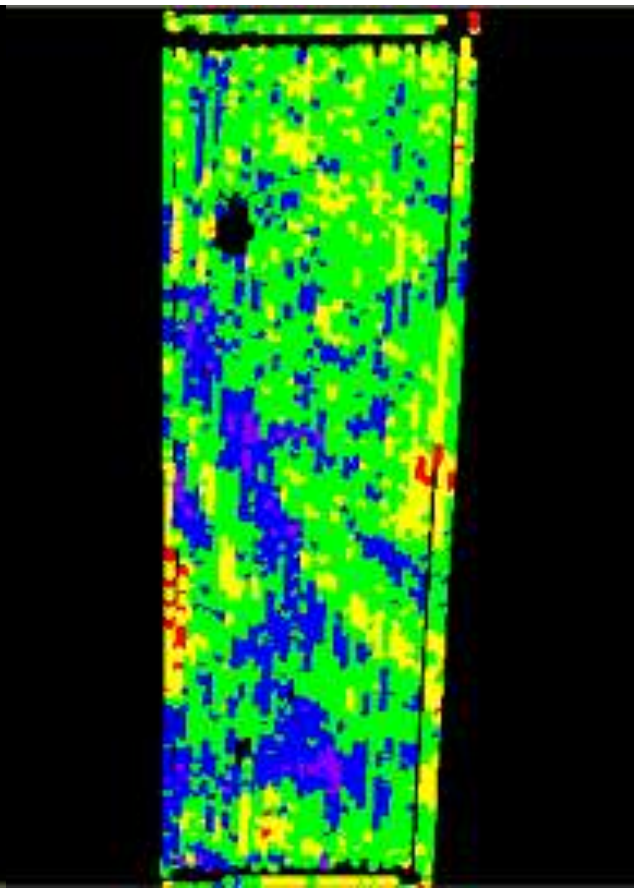


Yield

Paddock Map 224C

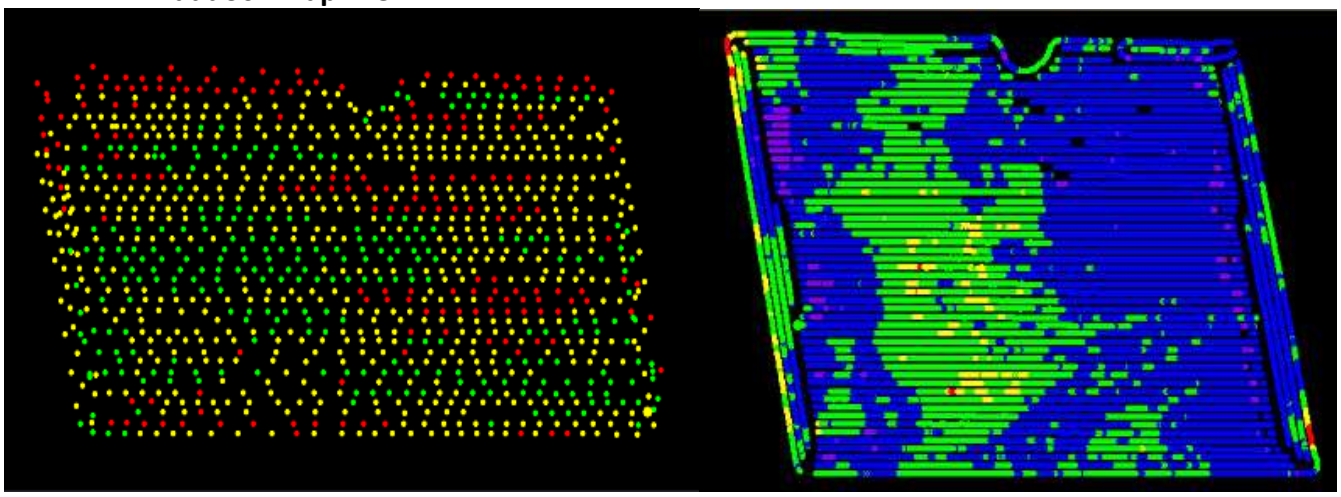


Protein



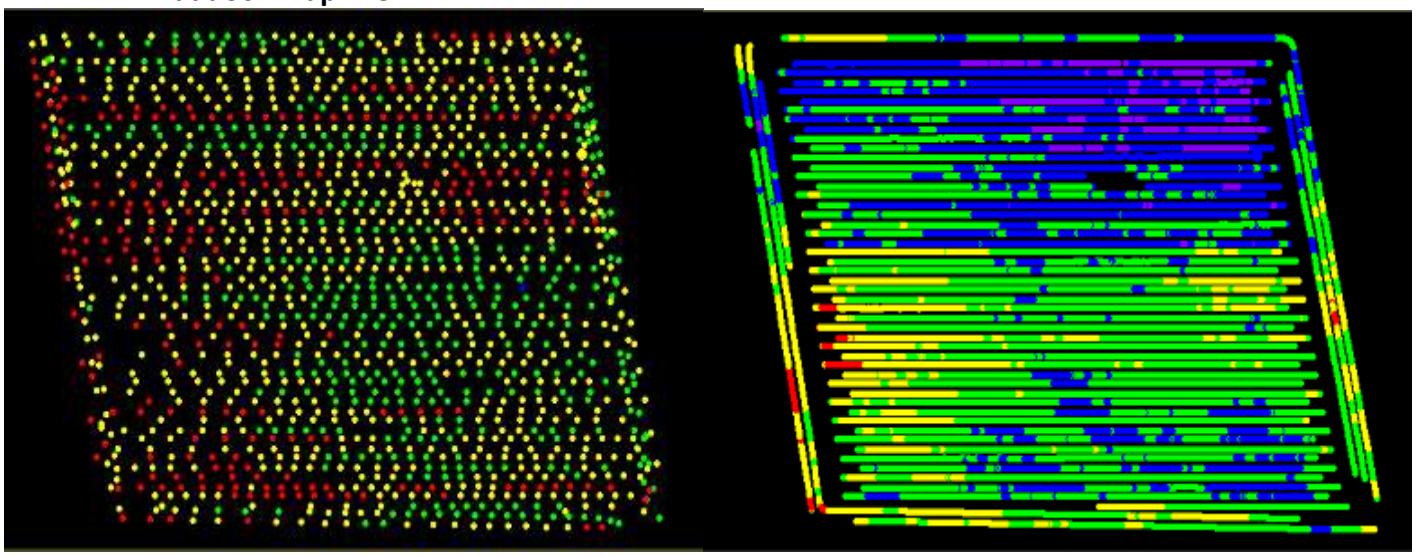
Yield

Paddock Map 225A



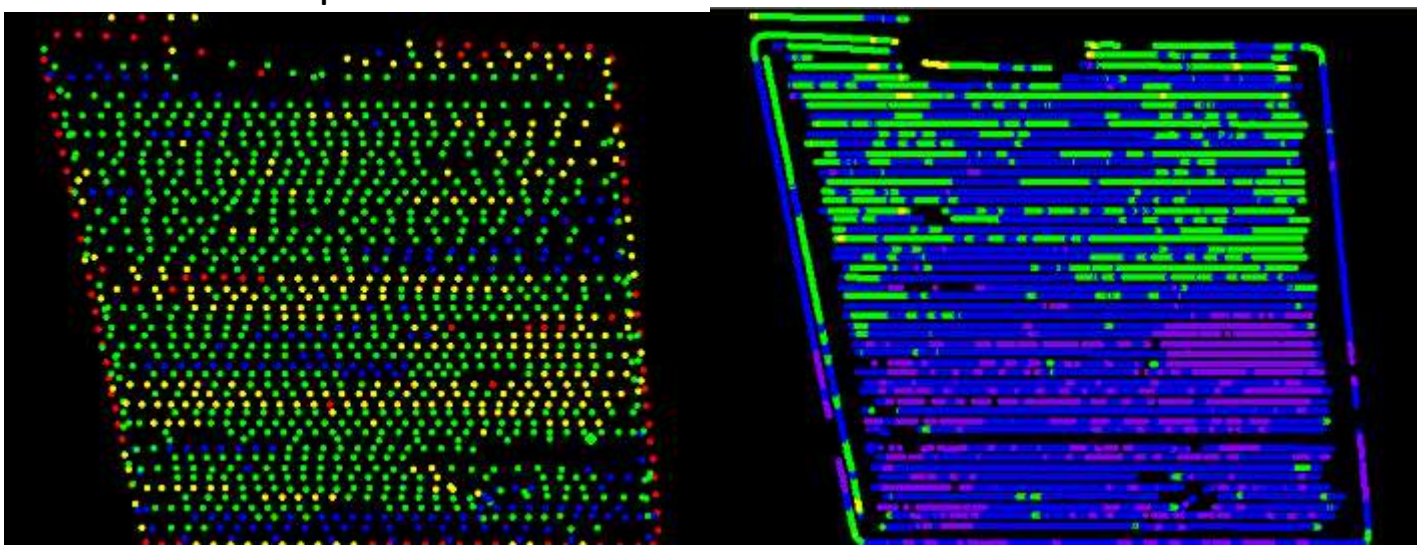
Protein **Yield**

Paddock Map 225B



Protein **Yield**

Paddock Map 225C



Protein **Yield**

3. Results

Table 3.1 shows the Viterra Recival Resuslt for each load VS the CropScan Protein results.

Paddock Name	CropScan Protein	Viterra Protein	Difference
146A	10.6	10.4	-0.2
146B	10.5	10.3	-0.2
146C	10.6	10.5	-0.1
146D	10.4	10.5	0.1
221A	10.8	11	-0.2
221B	10.7	10.6	-0.1
224A	11.9	11.7	-0.2
224B	11	11.1	0.1
224C	12	12	-0.1
225A	11.1	11.4	0.3
225B	11.1	11.2	0.1
225 C	12	12.2	0.2
225 D	10.8	11.2	0.4
		Bias	0
		SEP	0.2

Trend Plot

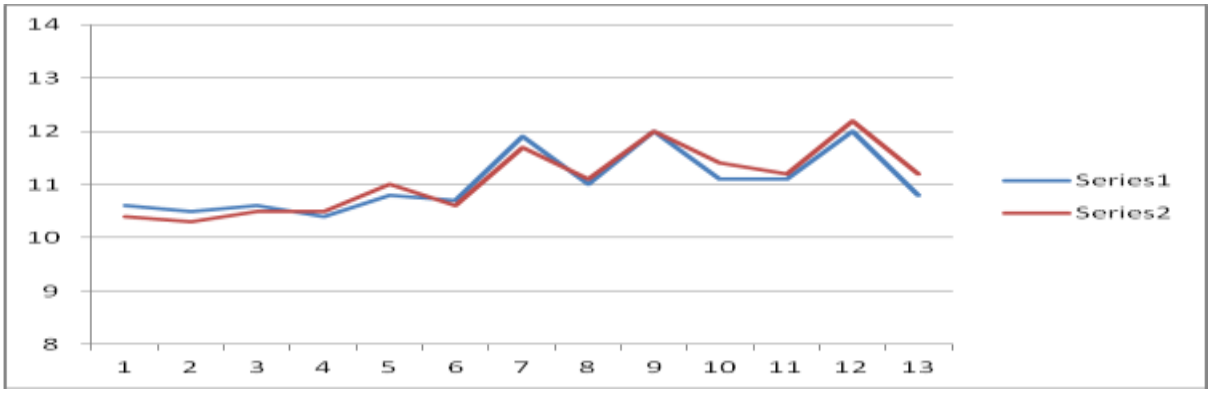


Figure 3.1 Trend Plot Viterra VS CropScan Protein Prediction

X Y Plot

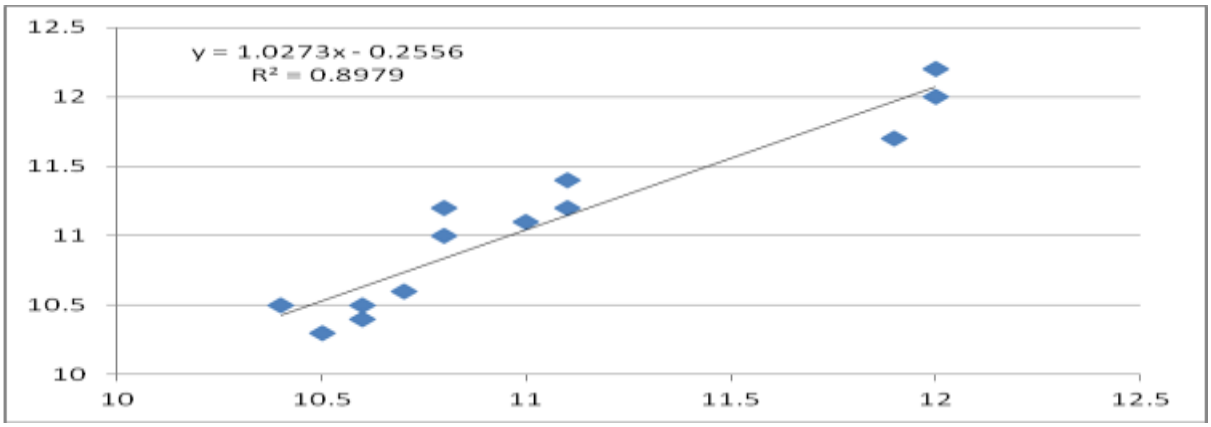


Figure 3.2 Correlation between the Viterra and the CropScan R2 0.89.

Conclusion.

The above study shows the ability of the CropScan 3000H to comprehensively map a wheat paddock for protein. The system generally analysis a sample every 11 seconds when the flow of grain is enough to fill the sample head on the clean grain elevator.

The maps show a good correlation between yield and protein across the farm. Some paddock correlate better than others but generally the low protein is in the high yield areas. Making note that the when the yield increases to 5-7 tonne the protein generally drops below 10.5%.

The data collect has been referenced back to Viterra as best as possible for a online analyser. Table 3.1 shows a excellect error between the recieval site and the CropScan give a high level of confidence the NIR is accurate.