

# APPLICATION NOTE -31

CropScan  
On Combine Grain Analyser

## CANOLA 24 CALIBRATION

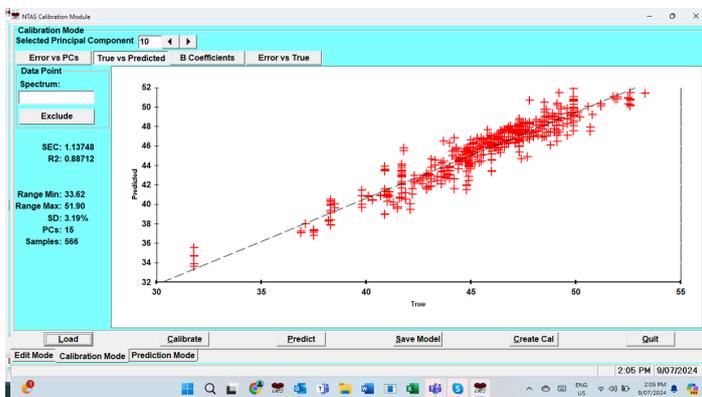


Figure 1 Protein Calibration Plot

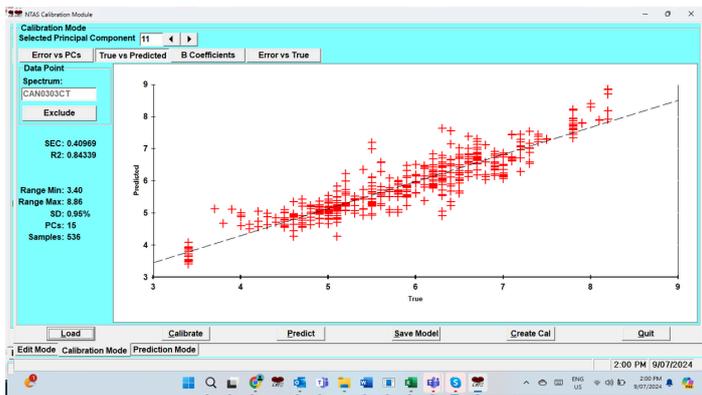


Figure 2 Moisture Calibration Plot

## DATA ANALYSIS

The 575 samples were scan and analysed by the CropScan and Foss

The sample prediction results have been accessed for precision and accuracy,

- Precision is defined as the ability of an analyzer to measure the same sample twice. Typically, 10 samples of grain are analyzed in duplicate on the CropScan. The Standard Deviation of Differences between the duplicate readings is referred to as the Standard Deviation of Differences
- Accuracy is defined as the difference between a reference method and the CropScan predicted results.

The Standard Deviation of Differences between the reference method and the CropScan are referred to as the Standard Error of Prediction (SEP). The following values represent 95% confidence levels or 2 X SEP.

## INTRODUCTION

Validation of Canola Protein, Moisture and Oil Predictions Using CropScan 4000VT and Foss Nova Infratec Instruments.

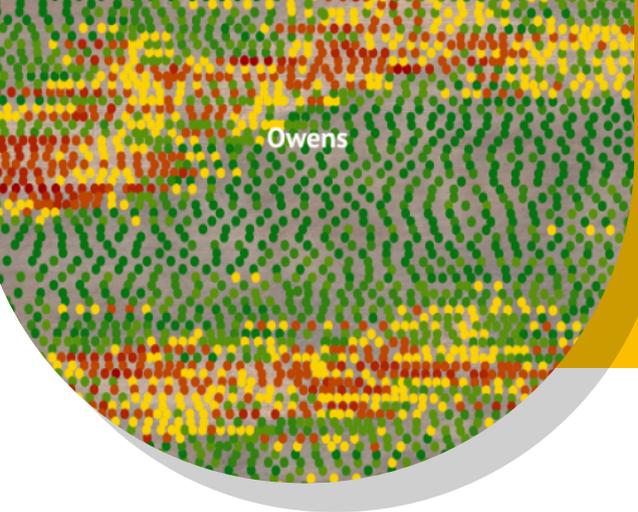
- Objective: To assess the accuracy of Canola protein, moisture and oil predictions made by the CropScan 4000VT compared to the reference values obtained from the Foss Nova Infratec.
- Methodology Overview: 575 samples were analyzed, and scanned in duplicate to evaluate model prediction and robustness

## METHODOLOGY

- Sample Collection: 575 Canola Samples where collected from a Grain Buyer and Canola Trial research group from rural NSW.
- Instrumentation:

The CropScan 4000VT On Combine Grain Analyser is a Near Infrared Sensor which measures Protein, Moisture, Oil, and Starch. The Foss Nova Infratec instrument is an NTEP Certified Near Infrared Analyser used to reference the prediction of Protein, Moisture, Oil, and Starch and benchmark against the most common NIR sensor at grain elevators and receiving sites.

The testing is done in a laboratory under controlled conditions. Field predictions would experience higher errors due to environmental factors such as dust, temperature, and chaff.



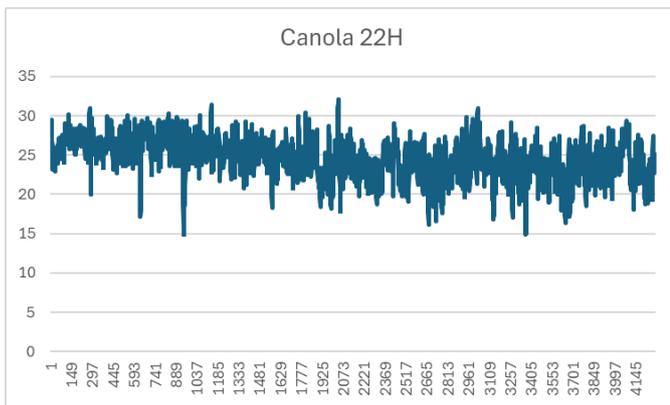
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## FIELD RESULTS

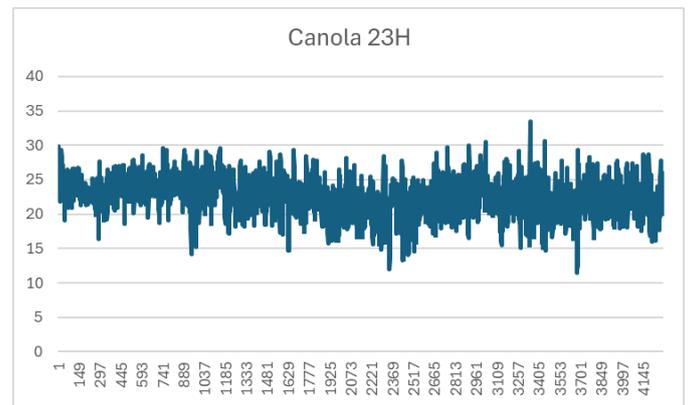
The field results are shown below comparing a Canola Field using Canola 22H, Canola 23H and Canola24H. Canola 24H indicates to be more stable and robust compared to Canola 22H/23H.

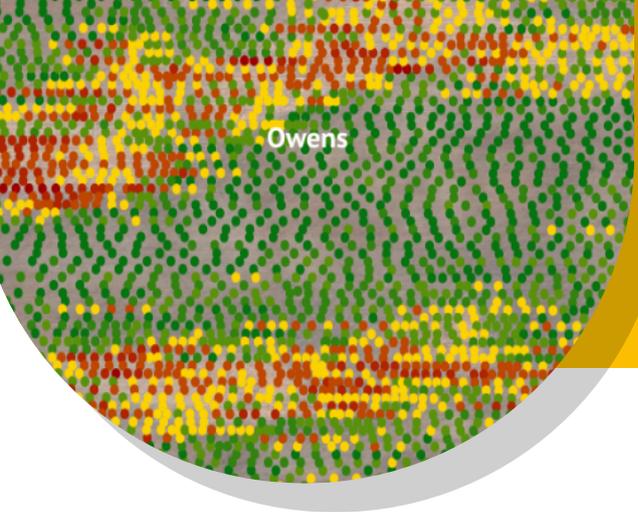


### CANOLA22H- PROTEIN



### CANOLA 23H- PROTEIN



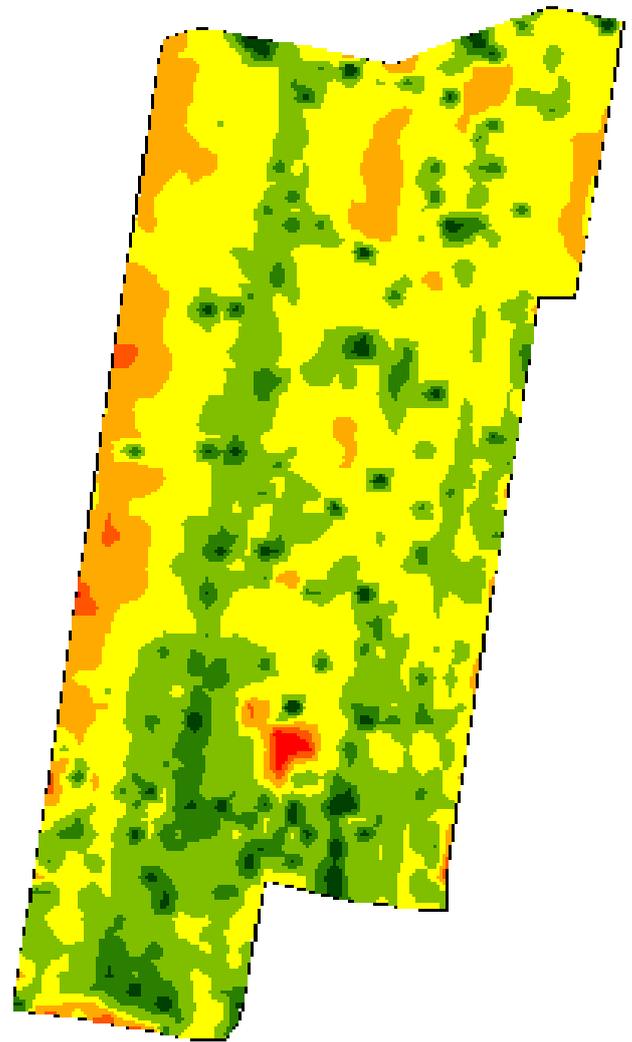
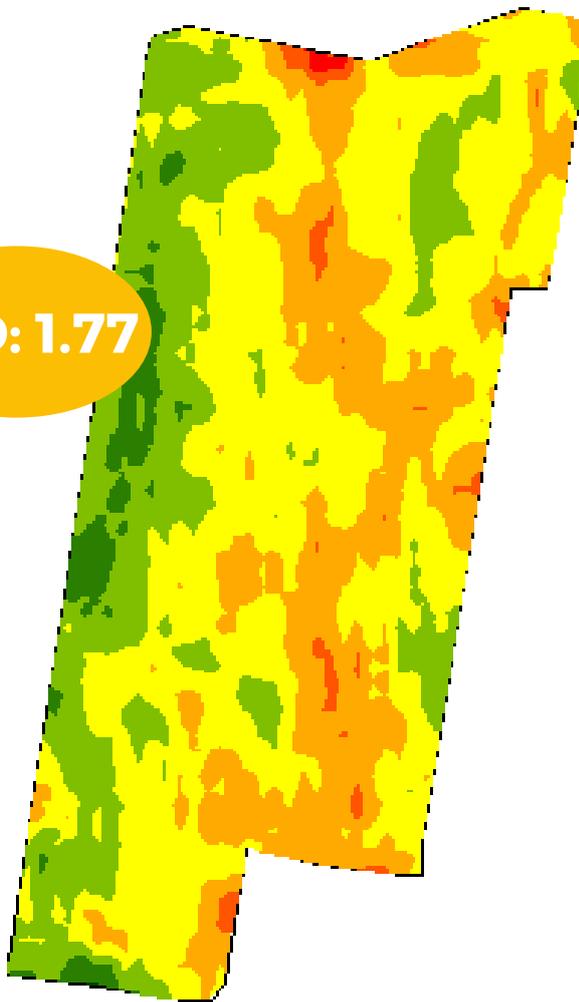


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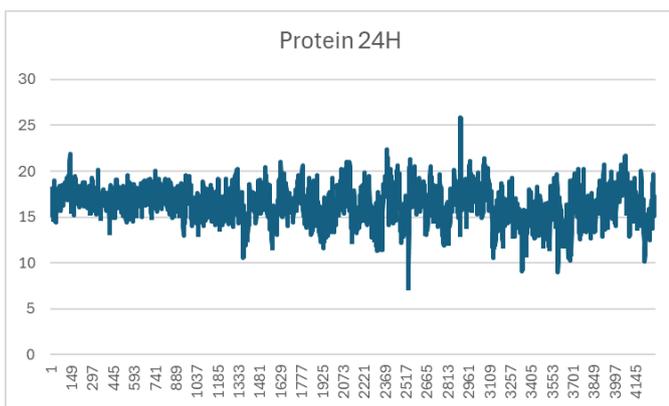
## FIELD RESULTS

The field results are shown below comparing a Canola Field using Canola 22H vs Canola 23H. Canola 23H indicates to be more variable compared to Canola 22H.

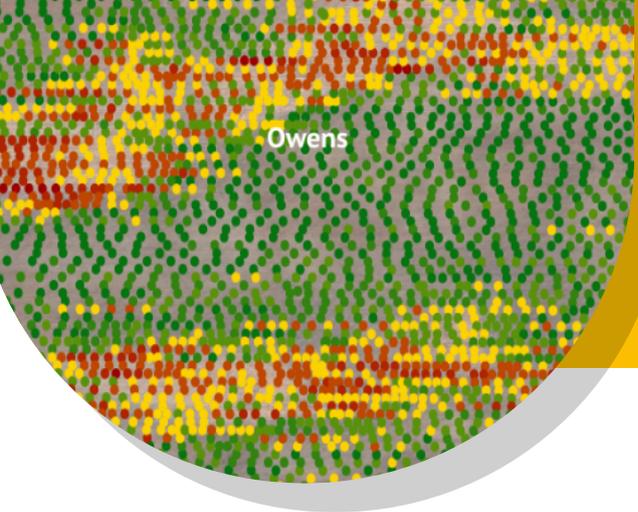
**STD: 1.77**



**CANOLA22H- PROTEIN**



**CANOLA 23H- YIELD**



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## RESULTS - CONT.

Table 1. shows summarized results for precision and accuracy of the CropScan 4000VT.

Table 2 and 3. Trend plot.

Table 4 Accuracy summary.

Sample ID	CropScan P%	CropScan M%	CropScan O%	Infratec P%	Infratec M%	Infratec O%
C1	19.6	6.8	42.2	20.7	6.7	42.6
C2	18.3	5.7	45.6	18.6	5.9	45.5
C3	18.4	5.9	45.3	18.8	6.1	45.1
C4	17.1	6.3	48.8	15.6	6.5	47.9
C5	16.5	5.2	48.4	16.1	4.9	49.0

Table 1 CropScan vs Infratec Samples

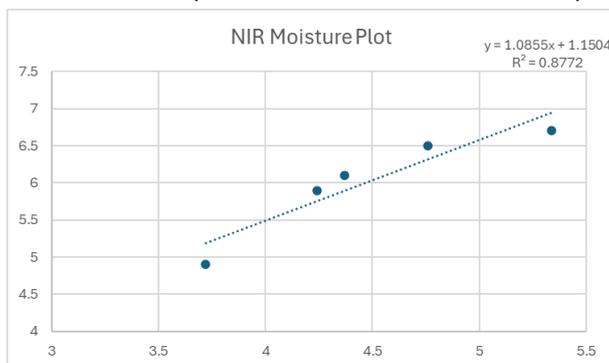


Table 2 NIR Moisture X Y Plot

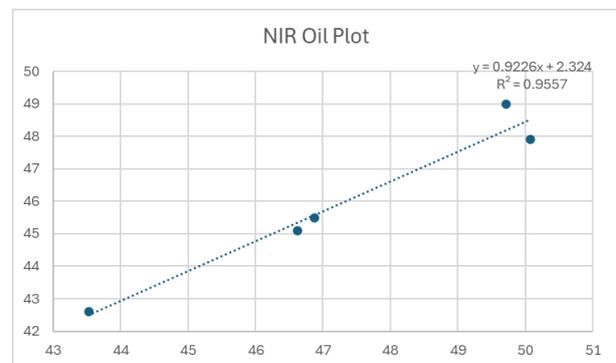


Table 3 NIR Oil X Y Plot

Prediction Error (SDD)	P %	M %	O %
	0.88	0.22	0.5

Table 4 CropScan precision

## CONCLUSION

Canola 24H shows a good level of accuracy of 0.8% for Protein and 0.22% for moisture and 0.5% for Oil under calibration conditions. The new Canola24H calibration performed better in both the static and in field conditions than the previous calibrations. The inclusion of the 2023 Canola Sieve Screen has been beneficial in keeping the Canola sample clean and free of pods and reduction of admixture.