

The Protein/Nitrogen/Yield Balance



Measuring Nitrogen directly from the combine harvester.



Variable Rate Nitrogen Fertilization Application

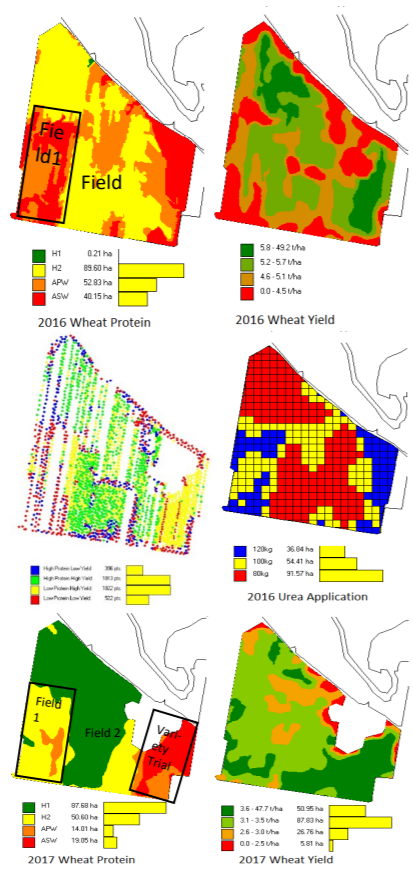
Protein and Yield Maps provide a simple means of developing a Variable Rate Nitrogen Fertilization prescription.

Based on the Protein and Yield maps from 2016, a farmer in Young NSW, developed a simple prescription to apply Urea at three rate to be used for the 2017 crop.

- Blue Zone: Protein < 10.5 = 120 kg**
- Yellow Zone: Protein 10.6 -11.5 = 100 kg**
- Red Zone: Protein 11.5 - 13.0 = 80 kg**

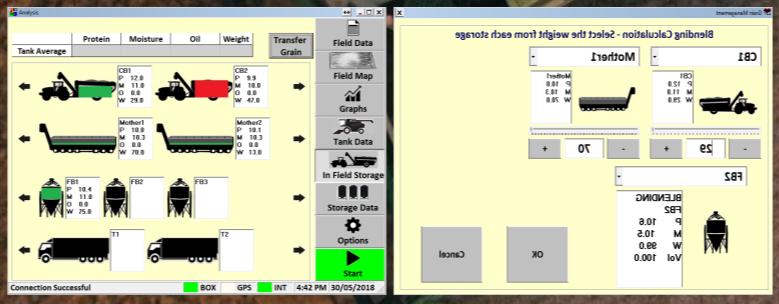
Outcomes for 2017 Crop:

- Reduced the variation in yield across this field had been reduced by 40% as compared to 2016.
- Increased income by \$2842 based on in field blending to raise the wheat from H2 to H1 grade and thereby gaining an extra \$10 per tonne.
- Segregated new variety trial that had lower protein wheat. Saved down grading H2 to APW. i.e., \$30/tonne.



Manage Grain Quality Directly from the Combine

CropScan 3300H Blending Estimator allows you to make real-time decisions on blending grain in the field to jump protein grades. Pick up \$30-50 per hectare.



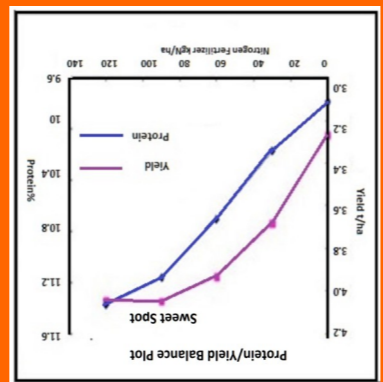
Next Instruments Pty Ltd
 B1 366 Edgar Street, Condell Park, NSW, Australia, 2200
 Tel: 612 9771 5444, Fax: 612 9771 5255
 Email: sales@nextinstruments.net Web: www.nextinstruments.net



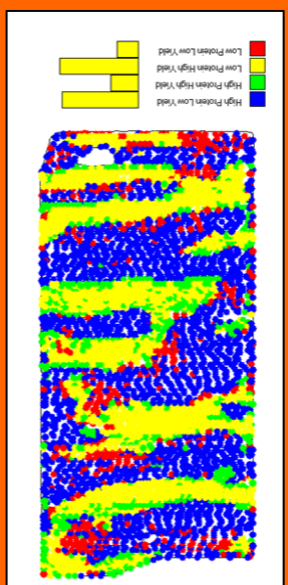
Cropscan 3300H On Combine Analyser

- On-the-go Protein, Oil, Starch, Fibre and Moisture Analysis.
- Real Time Field Mapping
- Manage Grain Quality from the Combine
- Increase Harvest Efficiency by 20%
- CropNet Web Site for remote access from Smart Phone, Tablet or PC.

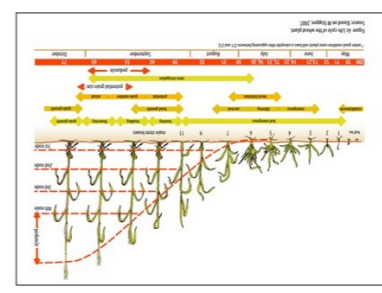
Protein and Yield Maps tell the complete story as to the availability and uptake of Nitrogen in the plant.
 Combining Protein and Yield data collected directly from the combine harvester allows a range of field maps to be generated: Protein, Yield, Nitrogen Removal, Gross Margin and Protein/Yield Correlation Maps.
 Four scenarios are possible:
 • Higher Protein/Lower Yield
 • Higher Protein/Higher Yield
 • Lower Protein/Higher Yield
 • Lower Protein/Lower Yield
 Zones where the Protein is lower than the field average, could have yielded higher if more Nitrogen fertilizer had been applied.



The Protein/Nitrogen/Yield Balance:
 Agronomists and researchers recognised that if the Protein level in the finished grains is less than 11.5%, then the plant would most likely have responded to more Nitrogen fertilizer. The Protein level in the grains shows when the plant had reached its optimum yield. When the Protein is above 11.5% then additional Nitrogen fertilizer goes to increase the Protein but not the Yield.



Nitrogen is required by plants at all stages of the development cycle. In the early stages of development, the Yield is setup by the number of Tillers that are produced. If there is not enough Nitrogen available in the soil then the plant will abort some Tillers and the Yield Potential will be reduced.
 The bulk of the Nitrogen taken up by plants is required during the Stem elongation and Leaf production stages. If the plant is under stress from moisture or nutrients then there will be less leaves available to undergo photosynthesis which will result in reduced Yield.
 During the Flowering stage, if there is sufficient Nitrogen then the plant will produce complete heads and if there not enough Nitrogen available then the plant may abort some heads or reduce the number of seeds thus reducing Yield.
 During the Filling stage the plant fills the seeds. If there is excess Nitrogen available then the plant will produce Protein as well as Starches.



How do plants utilise Nitrogen over the plant development cycle?
 The growth and development of plants undergoes a number of stages: Emergence, Tillering, Flowering, Filling and seed development. There are many other nutrients that influence the plants development, but Nitrogen is the definitely the next most important driver for plant development. Nitrogen is required by plants at all stages of the development cycle. In the early stages of development, the Yield is setup by the number of Tillers that are produced. If there is not enough Nitrogen available in the soil then the plant will abort some Tillers and the Yield Potential will be reduced.