Analysis of Crop Sensing for Nitrogen Application in Corn
(Ottawa Rideau SCIA Interim Partner Grant Project)

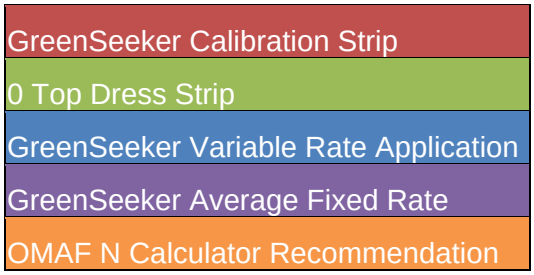
Purpose:

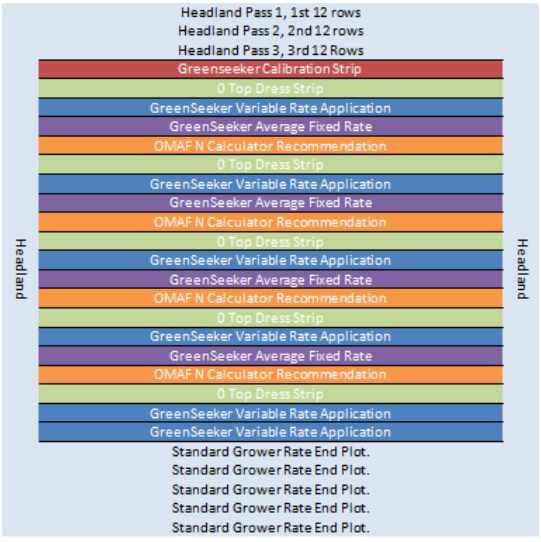
This Projects Purpose is to establish a ROI for Crop Sensing Technology within a standing corn crop in the V6 – V8 Stages. We are making an effort to educate our local organizations about the power of this New Technology, to help eliminate the fear of trying new things and thinking outside the box. We are looking to establish a Correlation between Crop Health and NUE (Nitrogen Use Efficiency) in Eastern Ontario and help to improve crop health with environmentally sound practices. (NUE) We are comparing these new field practices with older Standards in (Grower Best Management Practices) BMP

Methods:

In 2013 Growing season we setup 4 Plots with multiple growers, on different farms, and fields across our county. Within those plots we had a minimum of 2 repetitions, comparing the following, no side dress nitrogen(0-N) application, allowing the GreenSeeker System to determine the optimum application rate based on the Sensors on the toolbar. Next we will look at the application data from the GreenSeeker System and determine the average application per pass and apply the next repetition pass with the fixed rate of the GreenSeeker, from there we will apply a fixed rate based on the standard side dress grower rate base on a PSN Test or OMAFRA N Calculator (which ever is available at that time)

Figure 1. Plot Layouts

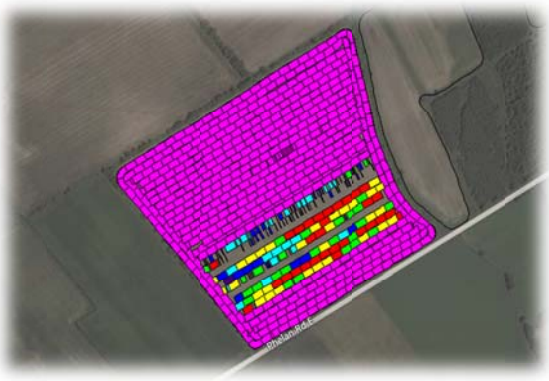




Results:

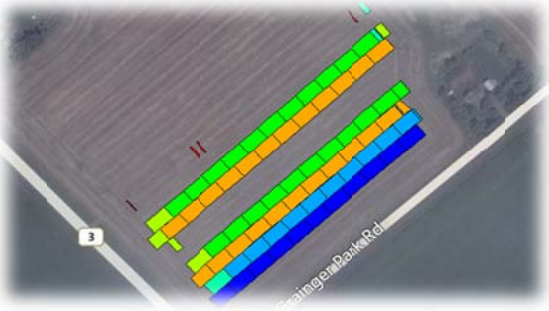
Figure 2. By Location Application and Yield Maps and Yields Recorded

Scobie Farm Plot



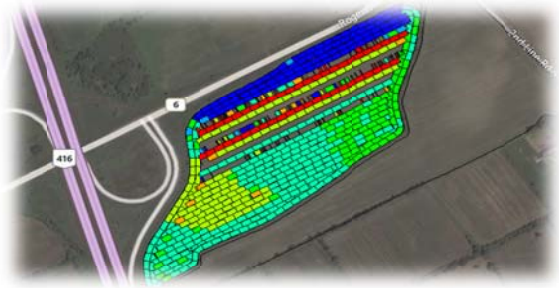
Scobie Plot Totals Ave Yield / bu		N Used
GreenSeeker Variable	202.25	31.14
GreenSeeker Fixed	201.25	44.65
PSN Test	196.40	40.10
0 Nitrogen	168.95	0

Double LL, Home Farm Plot



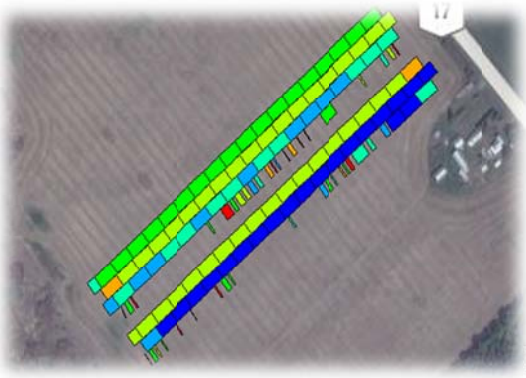
Double LL Totals Ave Yield / bu		N Used
GreenSeeker Rate Variable	172.5	4.68
Greenseeker Fixed	169.5	0
PSN Test	177	20.8
Fixed Rate 54 N/Ac	184	16.22

North Gower Farm Plot



North Gower Totals Ave Yield / bu		
GreenSeeker Variable	214.50	9.5
Greenseeker Fixed	216.75	10
Ontario N Calculator	212.75	17
0 Nitrogen	210.00	0

Dominion, Home Farm Plot



Dominion Totals Ave Yield / bu		N Used
GreenSeeker Rate Variable	182.80	8.95
GreenSeeker Fixed	209.95	45.48
PSN Test	209.35	26.86
0 Nitrogen	164.90	0

Summary:

This is the 2nd season that we have a set of results on this project. Utilizing the 2 main variables ($3.00 bu/Corn and $2.25/gal UAN 32%) that we had at the time of the application of the nitrogen side dress, The GreenSeeker was able to 1. detect the variability in the field, on the fly. 2. fairly accurately assess the Nitrogen use Efficiency (NUE) and 3. Adjust the rate quick enough to apply the correct amount of product where it was needed and thus showing a return on investment,. Granted this was a smaller return in the 2013 growing season then in the 2012 growing season, but where we would have blanket applied this field based on the OMAFRA or PSN Test we would have spent more on the side dress nitrogen and had more yield at the end of the season, but not more money in the bank. Year 2 of this project is showing very positive results towards this technology, and On-the-Go Variable Rate Crop Sensing should be considered throughout more regions.

Next Steps:

As an organization we have a few ideas on where to go with this next year, but have not come to a voted group decision. The Co-operators we are working with have yet to determine there cropping cycle for next year.

Optional possibilities up in the air today are:

- Soil Sample and Tissue Sample Comparisons.
- Collecting the NDVI with a Drone or UAV
- Using a Handheld Sensor and comparing accuracy of Spot checks
- Utilizing an NDVI Map and Creating a VRA Map
- Changing Plot Layout so that there isn't a 0 Ref Strip next to the GS Strip.

Acknowledgements:

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Project Contacts:

Jordan Wallace, Project Lead, Ottawa SCIA, 613-327-6377, Jordan@gpsontario.ca

Sean Cochran, Ottawa SCIA, 613-391-9476

Scott Banks, OMAF, scott.banks@ontario.ca