

# THE ROI OF BORON ON CORN

*How to utilize Soil Sampling results and Validate: A Case Study*

The logo for Deveron, featuring the word "DEVERON" in a blue, sans-serif font. A stylized graphic of three green and blue diagonal lines is positioned between the "V" and "E".

## VALIDATING BORON APPLICATION

*How to utilize your fields soil sampling results?*

In 2018, the Wilson Brothers, a Deveron grower, decided to do an on-farm boron trial. This farm has been a test farm for their operation in multiple different farming strategies. The Wilson Brothers are progressive farms that have been utilizing precision agriculture for many years. For instance, they have over 10 years of variability zones for their farm in southwestern Ontario which they use for applying variable rate seeding, nitrogen and fertility.

The Wilson Brothers soil sample their farm every 3-4 years and have never tested for boron previously. Boron deficiency has become a popular topic of discussion in the agriculture industry in recent years. The grower always tested for sulphur but after discussion with Deveron, they decided that testing for boron, zinc and manganese was the right option.

*Measure every  
acre and validate  
each application to  
power your in-  
field decisions*

Deveron soil sampled the farm using the fields existing soil polygons, the field was sampled and tested. The soil test results came back as the grower expected with a low pH, drastic requirements needed for calcium and magnesium, phosphorus was variable, potassium was low and surprisingly the boron levels were low as well. The grower expected these results, except for the boron due to the farm history and more recent soil tests.

Deveron ran the growers field yield, polygon samples and results through the S.O.I.L insights tool (Statistically Obtained Ideal Levels) to see what the most limiting nutrient was in the field. The S.O.I.L tool identified areas where potassium was affecting the high yielding areas of the field and the variability across the field. But boron was discovered to be one of the top three limiting nutrients in over half of the field.

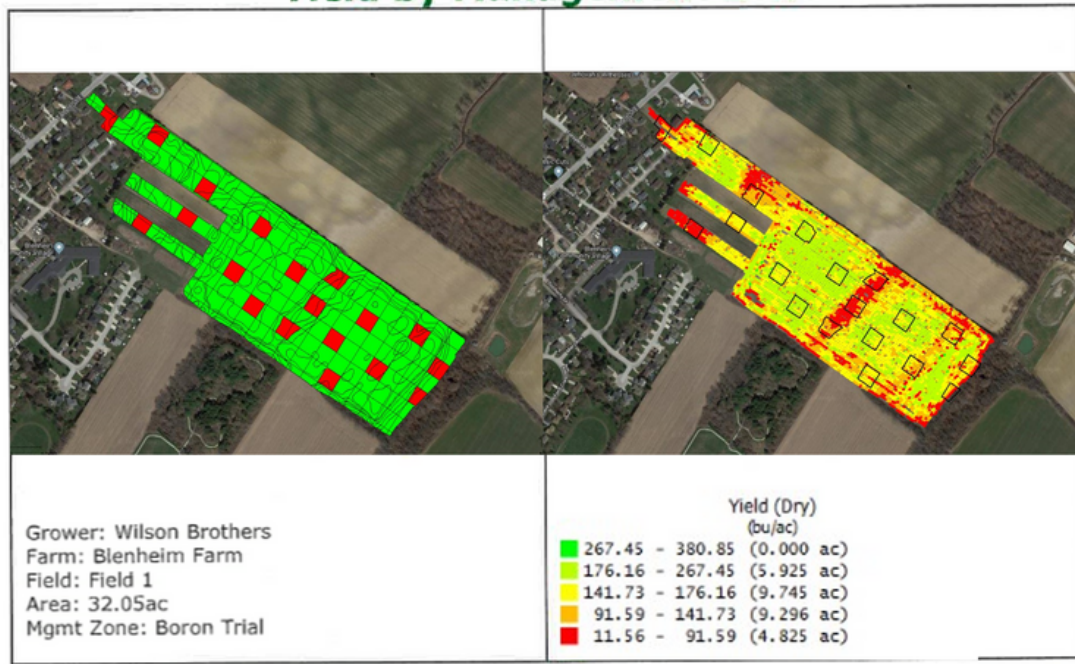
Deveron worked with the Wilson Brothers to create a prescription to apply boron with the goal to analyze the data at the end of the season to see the return on investment (ROI). A spray/no spray prescription was created, the whole field as sprayed with boron and veriblocs with the rate of zero (no spray) were added throughout the field strategically placed in high, medium and low yielding zones. The no spray blocks were important to include for validation of the boron application at the end of the season.

The grower applied 1.23 lbs per acre of boron with the sprayer following the prescription that was loaded on their monitor. They immediately followed with an application of 28% nitrogen, incorporated both into the soil and planted corn in the field the next day.



The 2018 season was a challenging one, the grower had to replant low areas of the field which was followed by a drought during the summer. When it came time for harvest it was the growers worst corn yield in ten years due to the drought. It was not for the zero test blocks in the boron prescription, the grower would have assumed that the low corn yield was the result of the boron negatively affecting his crop in the drought.

## Yield by Management Zone



The veriblocks that Deveron had included in the prescription were key as they were used to validate the effects that boron had on the yield. Once Deveron had gathered the 2018 corn yield data, as well as the applied data from the sprayer, they were able to analyze the boron effects on the deficient and non-deficient zones.

The analysis showed that boron increased the yield in the low yielding zones by 25 bushels and by 7 bushels in the high yielding zones, having an increase of 13 bu/ac on average across the field. Deveron also provided the grower with their ROI and it showed that they had a 419% ROI in the low areas and a 28% ROI in the high yield zones. Overall, the grower was able to see a 196% ROI on applying boron, on average of \$40.99/ac net profit in a year where they had their worst yield in a decade.

Despite the lowest yields in a decade, applying boron had a beneficial impact and ultimately helped increase the yields on average 13.17 bu/ac. This trial was a proven success for the grower while also allowing them to effectively use three of Deveron's services - S.O.I.L insights, prescription validation and analysis with a positive outcome. Now that Deveron had provided the grower with enough information and a better understanding of how to work on their field variability, the next steps for the grower is to do more boron testing and validation on the rest of their farm operation in the years to come.

### S.C.R.I.P.T. ANALYTICS

Yield By Zone Applied	Yield By Zone Untreated	Bus Difference	Price per Bus	Gross Profit	Cost of Treatment/ac	Net Profit	R.O.I
on.low	136.64 off.low	113.53	23.11	\$4.70	\$108.61	20.91	\$87.70 419%
on.medlow	135.12 off.medlow	113.18	21.94	\$4.70	\$103.13	20.91	\$82.22 393%
on.medhigh	129.93 off.medhigh	117.74	12.18	\$4.70	\$57.26	20.91	\$36.35 174%
on.high	133.08 off.high	127.41	5.67	\$4.70	\$26.66	20.91	\$5.75 28%
Field Average	147.81 Field Average	134.64	13.17	\$4.70	\$61.90	20.91	\$40.99 196%

80 kg	176.32 lbs	30 Ac	\$5.877333333 Lbs/ac product
67% Guaranteed Analysis of 8203	or	21.00% B	1.23 Actual Lbs of B/acre

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