

Abstract

The Ultimate Canola Challenge (UCC) is a program to challenge growers to obtain higher yields and profitability.

UCC has simple protocols available to help implement an on-farm trial. Protocols cover on-farm trial fundamentals like leaving a check strip, treatment replication, trial randomization and a sample trial layout. Along with the protocols, a data collection sheet is available for download to keep records of trial information.

Background

UCC started in 2013, originating from the idea of pitting agronomists or researchers against each other in head-to-head competitions to see who could produce better canola yields.

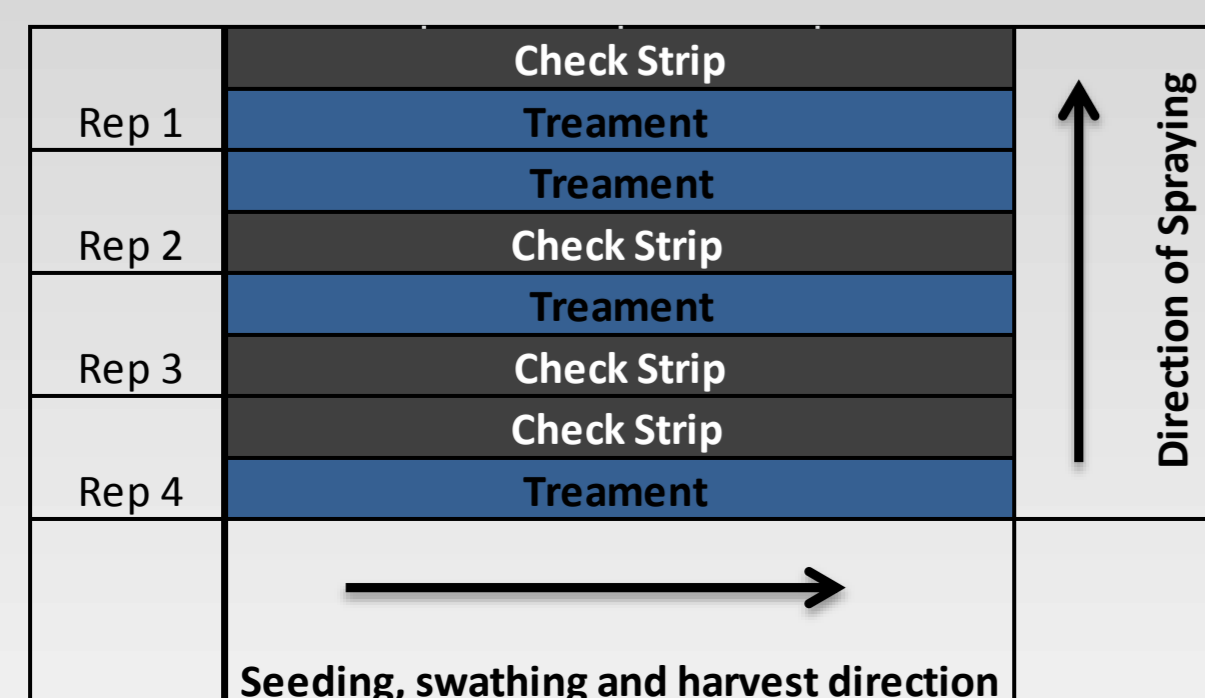
The approach of UCC is to test whether various canola products, such as micro-nutrients and macro-nutrients, could increase yields and profitably when used in conjunction with the CCC recommended best management practices for canola. These were tested in small plots at multiple research locations across the prairies for two years.

In 2015, the UCC evolved into a vehicle to encourage canola growers to evaluate new products and practices by conducting their own field scale trials.

Method/Materials

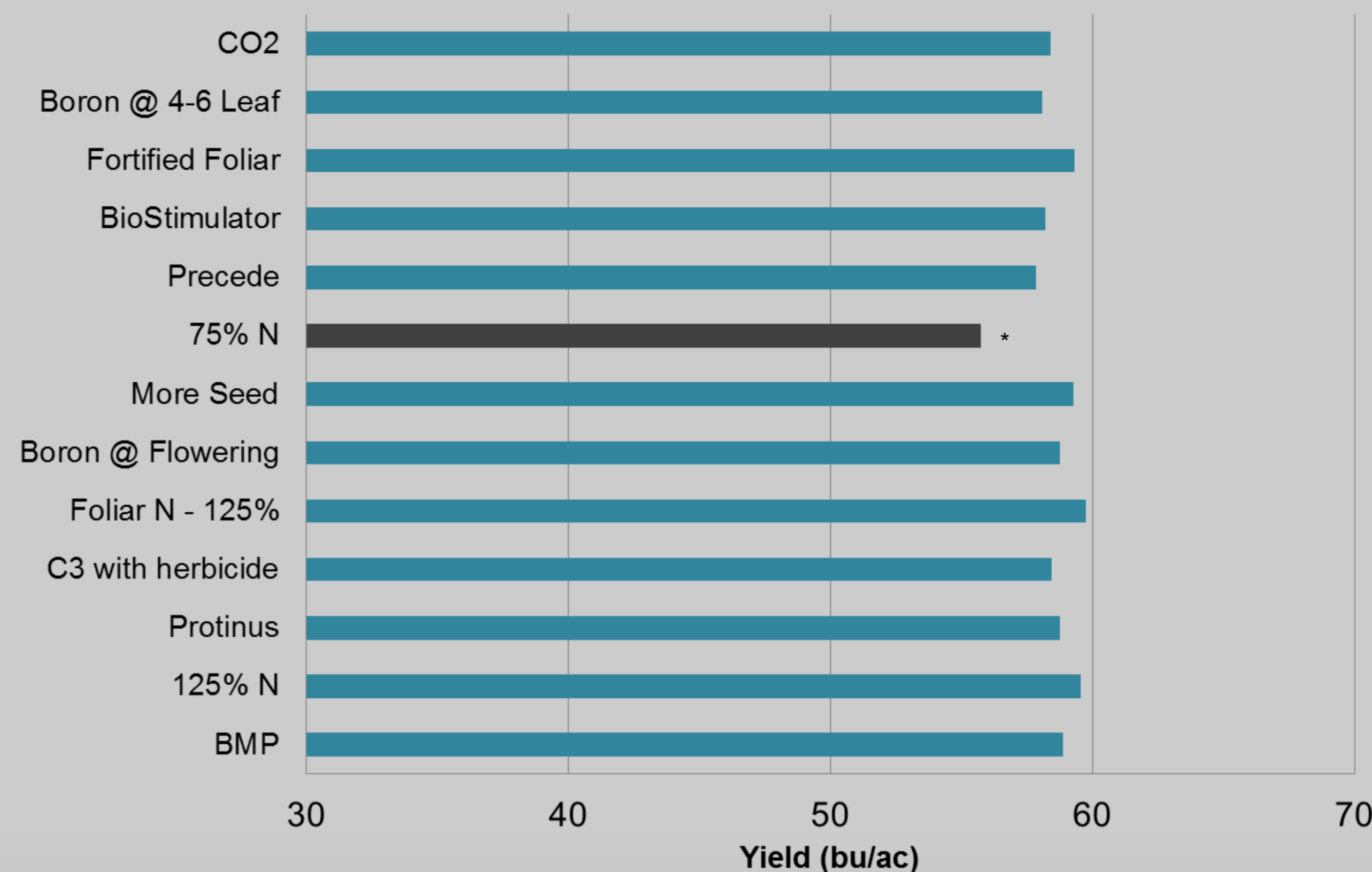
Coordinators and other participants protocols available at ultimateganochallenge.ca

- Small plots from 2013 – 2014 tested multiple products at 9 sites
- Field scale trials in 2015 tested Boron, using the “Foliar Products” protocol
- 2016 and 2017 field scale trials tested the “Increased Nitrogen Rate” protocol
- Field Scale Trials include:**
 - Leaving a check strip
 - Adding a treatment, while leaving all other factors the same
 - Replicating the check strip and treatments at least 4 times throughout the field
 - Randomizing plots throughout the field. For example:

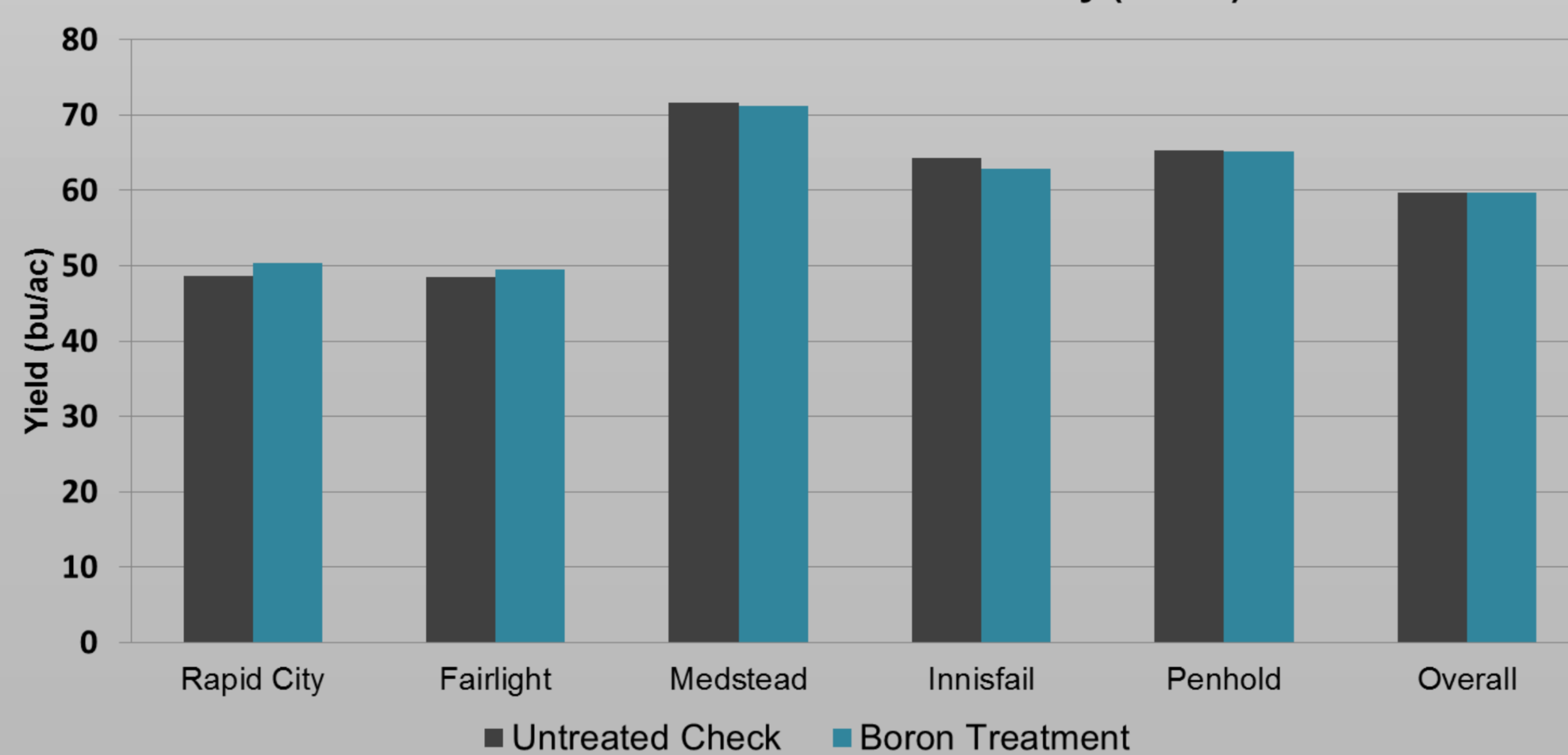


Boron Observations and Results

2013-2014 UCC Small Plot Results



2015 UCC Field Scale Boron Summary (bu/ac)

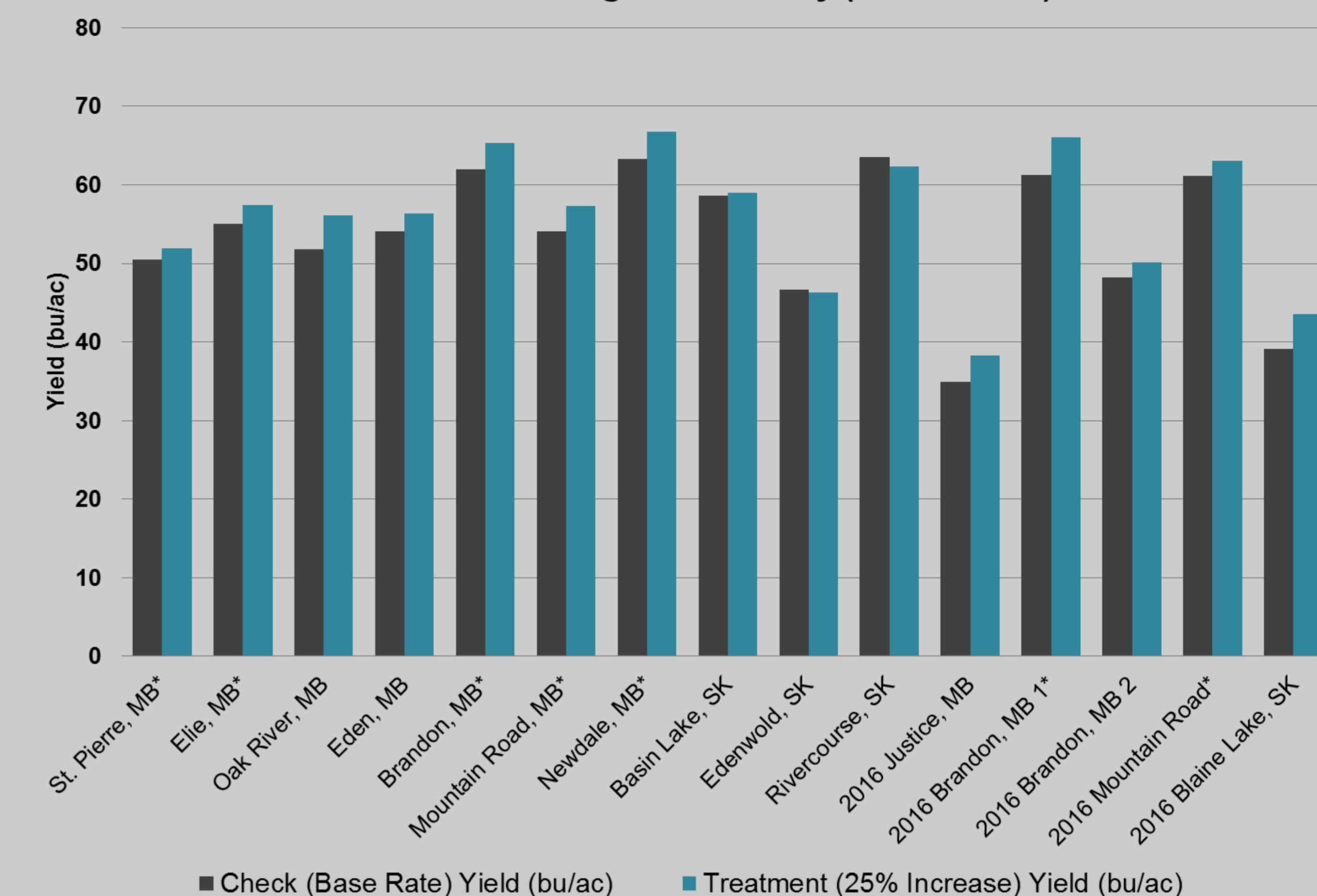


| Trial Location | Soil Texture | Soil Organic Matter | Soil Boron Levels | Soil pH |
|----------------|----------------|---------------------|-------------------|---------|
| Rapid City | Loam/Clay Loam | 5.0 | 0.7 ppm | 7.5 |
| Fairlight | Sandy Loam | 5.4 | 1.4 ppm | 7.6 |
| Medstead | Clay Loam | 3.6 | 0.2 ppm | 5.3 |

- No significant or statistical yield difference between untreated checks and boron treatments in small or large plot trials
- Three years of small plot boron trials do not show any consistent benefits to yield or quality when applying boron in canola
- One year of field-scale trials overall showed no significant yield difference when applying boron at various soil pH and organic matter levels
- Economics were not run on any sites since there was no statistical differences between the check and the treatment

Nitrogen Observations and Results

2 Year UCC Nitrogen Summary (2016 - 2017)



* Denotes statistical significance

| 2 Year UCC Nitrogen Summary - Yield Adjusted to 8.5% moisture | | | | | | | | | |
|---|---------------------------------|--|------|---------|---------------------|----------------------|---------------------------|-----------------------|----------------------------|
| | Check (Base Rate) Yield (bu/ac) | Treatment (25% Increase) Yield (bu/ac) | CV | P-Value | Residual N (lbs/ac) | Base Rate N (lbs/ac) | Treatment Rate N (lbs/ac) | Lbs N/bu Yield (base) | Lbs N/bu Yield (treatment) |
| St. Pierre, MB* | 50.48 | 51.91 | 2.1 | 0.03 | 50 | 135 | 169 | 3.66 | 4.22 |
| Elie, MB* | 55.08 | 57.47 | 3.1 | 0.03 | 76 | 114 | 142 | 3.45 | 3.79 |
| Oak River, MB | 51.78 | 56.11 | 5.5 | 0.06 | 10 | 120 | 150 | 2.51 | 2.85 |
| Eden, MB | 54.12 | 56.29 | 3.5 | 0.09 | 20 | 173 | 216 | 3.57 | 4.19 |
| Brandon, MB* | 61.98 | 65.37 | 3.6 | 0.01 | 15 | 119 | 148.5 | 2.16 | 2.50 |
| Mountain Road, MB* | 54.05 | 57.31 | 5.4 | 0.02 | 25 | 178 | 216 | 3.76 | 4.21 |
| Newdale, MB* | 63.23 | 66.75 | 3.9 | 0.02 | 20 | 120 | 150 | 2.21 | 2.55 |
| Basin Lake, SK | 58.67 | 59.03 | 1.9 | NS | 60 | 80 | 100 | 2.39 | 2.71 |
| Edenwold, SK | 46.67 | 46.27 | 8.3 | NS | | 120 | 150 | | |
| Rivercourse, SK | 63.52 | 62.29 | 3.4 | NS | | 120 | 150 | | |
| 2016 Justice, MB | 34.91 | 38.27 | 11.7 | NS | | 164 | 205 | | |
| 2016 Brandon, MB 1* | 61.20 | 66.00 | 4.1 | 0.04 | | 142 | 178 | | |
| 2016 Brandon, MB 2 | 48.20 | 50.10 | 7.6 | NS | | 115 | 144 | | |
| 2016 Mountain Road** | 61.10 | 63.00 | 5.4 | 0.04 | | 200 | 250 | | |
| 2016 Blaine Lake, SK^ | 39.10 | 43.60 | 8.2 | NS | | 70 | 88 | | |
| 2016 Carrot River, SK 1A* | 57.10 | 57.90 | 6.1 | 0.04 | | 90 | 113 | | |
| 2016 Carrot River, SK 2^ | 56.70 | 55.10 | | | | 100 | 125 | | |

*Not adjusted yield. Grain moisture not available. Carrot River 2 only had 2 replications. All other sites had a minimum of 3 replications. *lbs N/bu based on residual N and applied N.

2016 UCC Nitrogen Economics

| | Nitrogen Cost | Base Rate Cost/ acre | Treatment Rate Cost / Acre | Base Rate Yield (bu/ac) | ROI/ acre on Base | Extra N Yield (bu/ac) | ROI/ acre on Treatment | Profitability of Extra Nitrogen |
|--------------------------|---------------|----------------------|----------------------------|-------------------------|-------------------|-----------------------|------------------------|---------------------------------|
| 2016 Brandon, MB 1* | \$0.48 | \$ 417.50 | \$ 435.50 | 61.2 | \$225.10 | 66 | \$257.50 | \$32.40 |
| 2016 Mountain Road* | \$0.50 | \$ 446.50 | \$ 471.50 | 61.1 | \$195.05 | 63 | \$190.00 | (\$5.05) |
| 2016 Carrot River, SK 1* | \$0.50 | \$ 391.50 | \$ 403.00 | 57.1 | \$208.05 | 57.9 | \$204.95 | (\$3.10) |

Costs and sale price based on average, not specific to each grower. Only varied cost is the base and treatment rates of Nitrogen. Average Nitrogen cost as reported by producer used (\$0.50/lb). Economics applied only to sites in 2016 that showed a statistically significant difference between the check and the treatment.

- There was a statistically significant response to adding extra Nitrogen overall
- Some sites showed a non-significant yield difference due to trial variability
- Making decisions off one site or one year will not give a good idea of product performance over a range of conditions and environments
- The variability inherent in field-scale trials means that making decisions from one site or one year may compromise estimations of product performance over a range of conditions and environments

Thanks to Kristen Phillips, Tone Ag, PAMI and all UCC participants for participating in the Ultimate Canola Challenge!