

2014 Executive Summary

The AgroSpray Research Farm (ARF), located in Oxford County, Ontario, has over 100 acres of field-sized research trials. Our research focuses on combining environmentally-responsible nutrient application and modern technology to maximize agricultural yields. As demonstrated in our climate summary, the cool, wet spring delayed planting, and the cool weather in August also slowed the 2014 growing season. Despite the challenges of the season, we have some interesting and informative results from both corn and soybean trials, detailed on the pages which follow.

Overall, the trials highlight the importance of matching fertilizer programs to the nutrient needs of the specific fields and farms, as dictated by soil test results. For example, the field used for our Liquid Starter Fertilizer Comparison in Corn was low in calcium and potassium. Treatment 5 in this trial included LiberateCa and Sure-K, meeting these deficiencies and achieving the strongest yield. AgroSpray's liquid fertilizer products allow for the creation of speciality mixes; notably, even calcium and phosphorus can be combined, unlike in traditional fertilizer programs.

Our soybean trials demonstrate the benefits of a foliar feed application of Ferti-Rain. This fertilizer has a balanced mix of N-P-K and micronutrients, thus allowing the plants to optimize yields.

Finally, a new trial this year allowed for the direct comparison of liquid and dry fertilizers. The results demonstrate the strong performance of AgroSpray's liquid fertilizer products, especially when looking at yield, moisture, and test weight together.

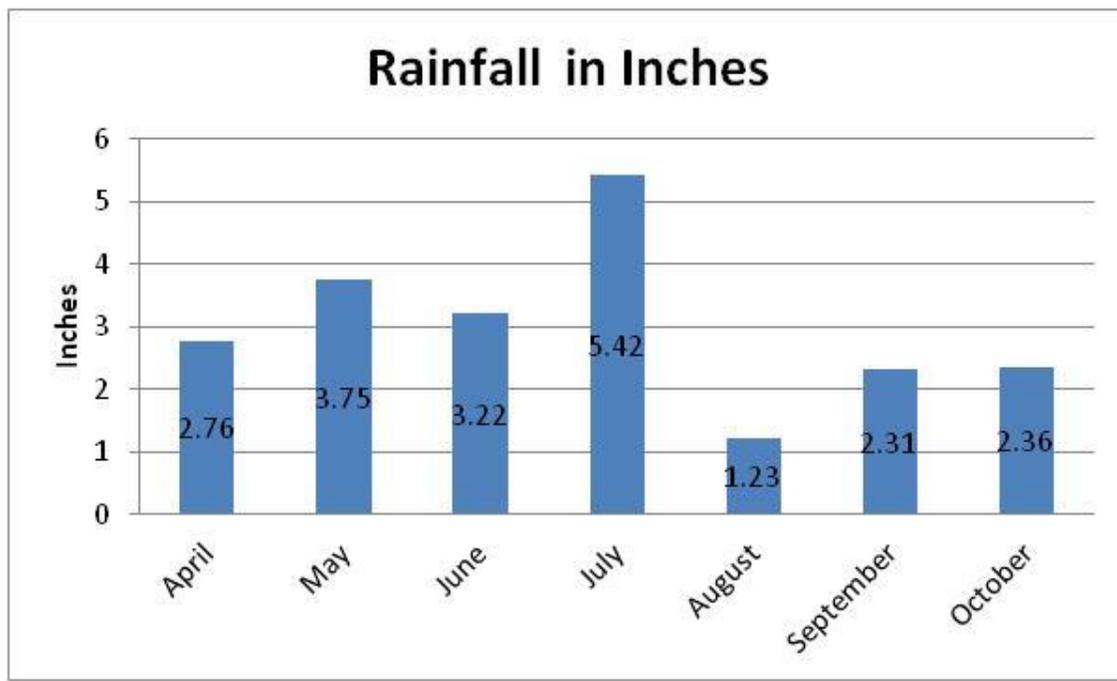
Our Area Sales Managers are eager to work with you to build on the knowledge presented in this report, and to help you develop custom fertilizer mixes to meet your specific soil needs.

2014 Soil Test Data

<u>Trial</u>	<u>pH</u>	<u>OM</u>	<u>CEC</u>	<u>P (ppm)*</u>	<u>K (ppm)</u>
Liquid Fertilizer Comparison in Corn	7.1	2.7	9.9	41	106
Side-Dressed Fertilizer on Corn	6.9	2.1	7.3	35	90
Micronutrients in Starter Fertilizer on Corn	6.7	1.6	6.6	54	90
Foliar Feed on Soybeans (Early)	6.9	2.3	8	70	114
Foliar Feed on Soybeans (Late)	6.9	2.0	8.6	68	110
Late Foliar Feed Nitrogen on Soybeans	6.7	1.3	4.8	101	81
Dry Starter vs. Liquid Starter Fertilizer Comparison	6.9	1.8	6.6	63	102
Foliar Micronutrients on Soybeans	7.0	1.4	5.3	59	64

*Bicarb phosphorous test

ARF 2014 Climate



Temperature (Fahrenheit)

Month	Mean Max	Mean Min	Mean	High (Date)	Low (Date)
April	53.5	33.6	43.4	74.0 (21 st)	16.6 (16 th)
May	67.2	46.2	56.8	85.0 (13 th)	35.2 (17 th)
June	78.7	56.4	67.7	88.2 (16 th)	44.4 (7 th)
July	76.2	55.3	66.0	84.9 (22 nd)	45.4 (5 th)
August	77.1	54.3	65.7	85.6 (26 th)	45.9 (19 th)
September	70.6	48.3	59.4	84.8 (5 th)	35.3 (19 th)
October	58.8	41.2	49.6	72.5 (3 rd)	27.5 (27 th)

Foliar Feed on Soybeans (Early)



Cropping Year: 2014

Date of Planting/Harvest: May 27/October 21

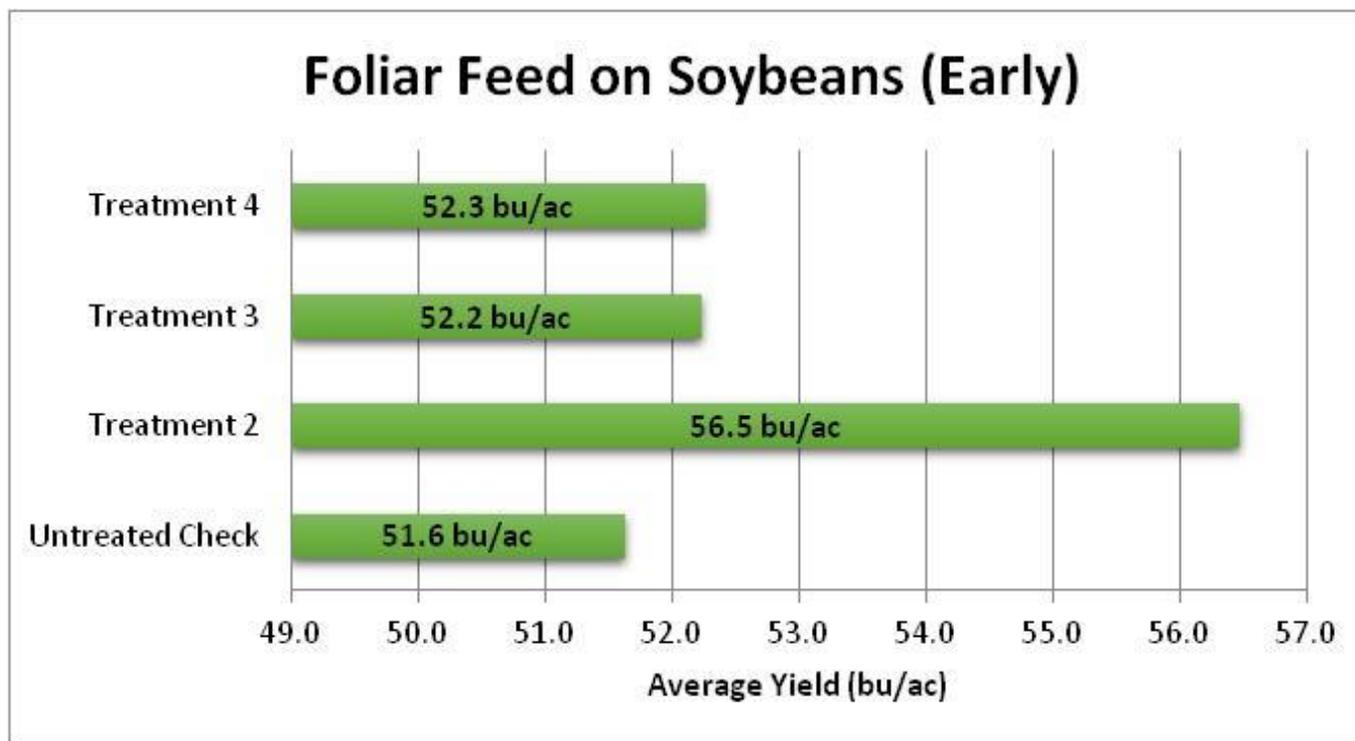
Hybrid: PS2393NR2 (2.3 RM)

Population: 155,000 seeds/acre

Plot Size (replications): 12 - 30" rows x 930ft (4)

Application Date (stage): June 25 (R2)

The Spring of 2014 saw cool temperatures and an excess of rainfall, which slightly delayed the soybean planting season in Southwestern Ontario. This left some producers wondering if foliar fertilization could help to improve soybean growth and yield. Therefore, here at ARF, we set out to determine the effects of early (R2) and late (R4) foliar fertilization on soybeans that started the growing season in cool, wet conditions.



Treatment	Product	Rate
Untreated Check		
2	Ferti-Rain	3 GPA
3	Sure-K	3 GPA
4	Sure-K	3 GPA
	Manganese	2 L/ac

Ferti-Rain continues to be an outstanding foliar feed product on soybeans.

Foliar Feed on Soybeans (Late)

Cropping Year: 2014

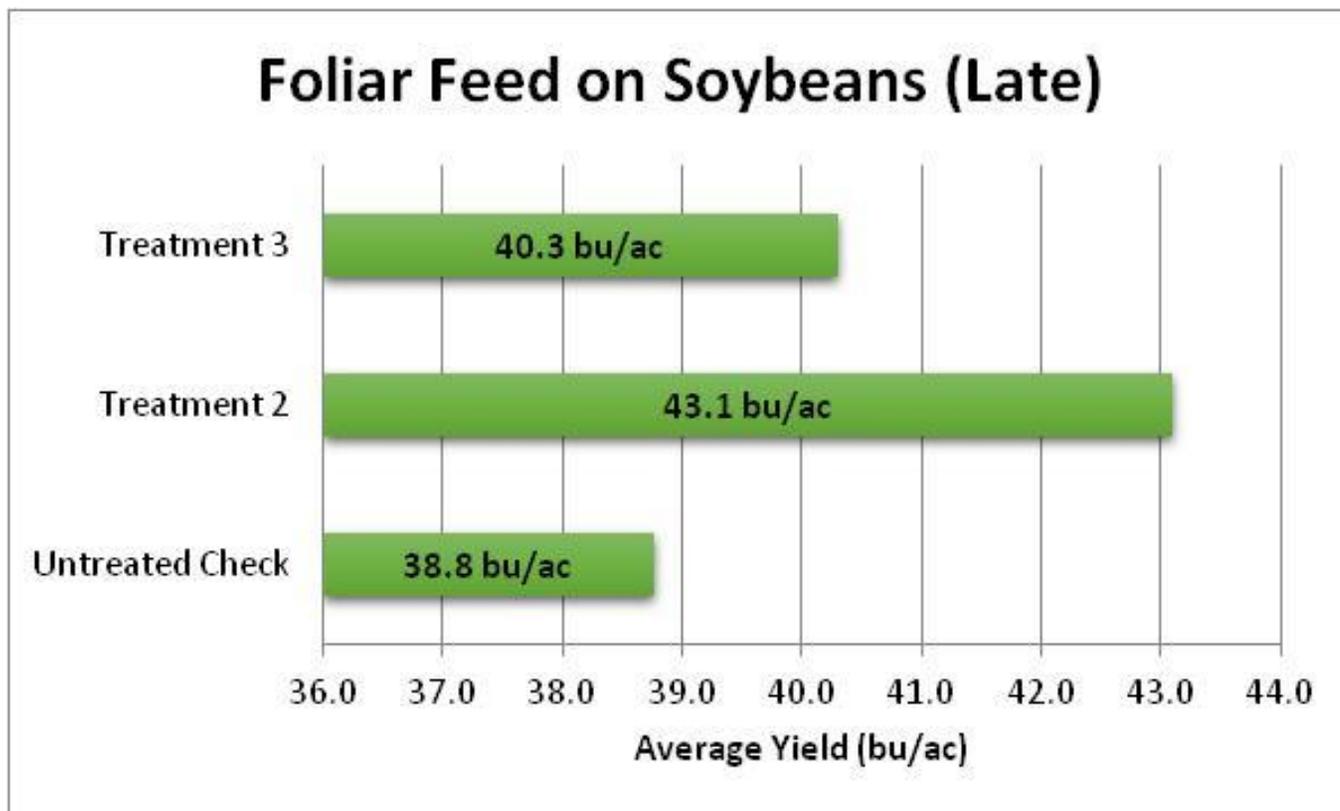
Date of Planting/Harvest: May 30/October 20

Hybrid: PS1162R2 (1.1 RM)

Population: 185,000 seeds/acre

Plot Size (replications): 12 - 30" rows x 2400ft (3)

Date of Application (stage): July 20 (R4)



Treatment	Product	Rate
Untreated Check		
2	Ferti-Rain	3 GPA
3	iNPaKt + Mn	3 GPA

Regardless of application stage, Ferti-Rain is a foliar feed product which achieves consistent results.

Late Foliar Feed Nitrogen on Soybeans

Cropping Year: 2014

Date of Planting/Harvest: May 24/October 28

Hybrid: PS1315NR2 (1.3 RM)

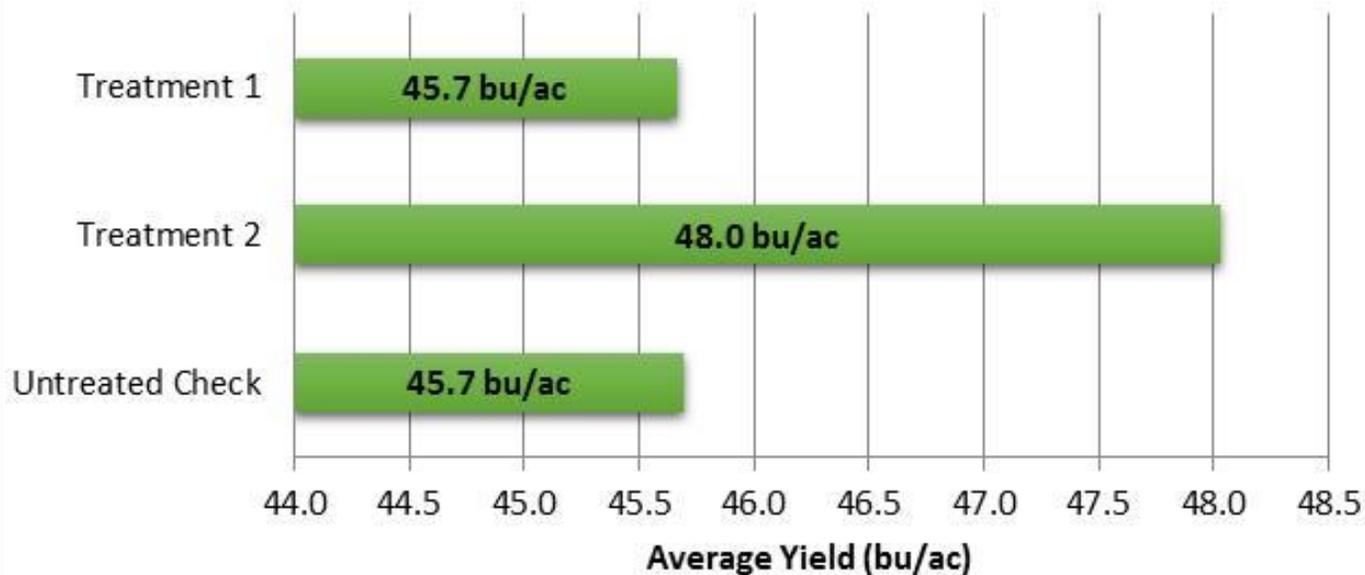
Population: 164,000 seeds/acre

Plot Size (replications): 12 - 30" rows x 4320ft (3)

Date of Application (stage): August 2 (R4)



Foliar Feed Nitrogen on Soybeans



Treatment	Product	Rate
Untreated Check		
1	NResponse	3 GPA
2	Ferti-Rain	3 GPA

Ferti-Rain has once again demonstrated its benefits as a foliar feed.

ARF's 100 bu/ac Liquid Fertilizer Soybean Yield Challenge



Cropping Year: 2014

Date of Planting/Harvest: June 5/October 23

Hybrid: PS1162R2 (1.1 RM)

Population: 190,000 seeds/acre

Plot Size: 2.74 ac

Additional Information: Sure-K 3GPA + Micro 500 1L/ac applied June 30; Priaxor Fungicide + Ferti-Rain 3 GPA applied August 1.

This first year of our soybean yield challenge was held at a satellite location, in Princeton, Ontario, approximately 5 km east from the home ARF site, on a **2.74 acre** (total harvested) plot. Due to the cold, wet spring, the plot was planted with PS1162R2 (1.1 RM) on **June 5th**, at a population of 190,000 seeds/ac. The first foliar feed application was applied at the third trifoliolate stage, and included Sure-K at 3 GPA and Micro 500 at 1L/ac. Priaxor Fungicide was applied, alongside Ferti-Rain at 3 GPA on August 1st. The trial was harvested on **October 23rd**. The average yield was **76.9 bu/ac**, at a moisture of **15.2%**.

One of the major challenges of soybean production in southwestern Ontario this year was **white mold** (*Sclerotinia sclerotiorum*), due to the cool, wet growing season. This disease is prevalent in highly managed, high yield potential soybean crops. In this trial, approximately **9%** of soybean plants were affected by this pathogen, despite the inherent tolerance of this soybean variety and a fungicide application. Overall, however, this was a strong yield result for our first year of this trial, and we will build on these findings in the second year.



Dry Starter vs. Liquid Starter Comparison

Cropping Year: 2014

Date of Planting/Harvest: May 24/November 13

Hybrid: A6757G8 (2950 CHU)

Population: 31,000 seeds/acre

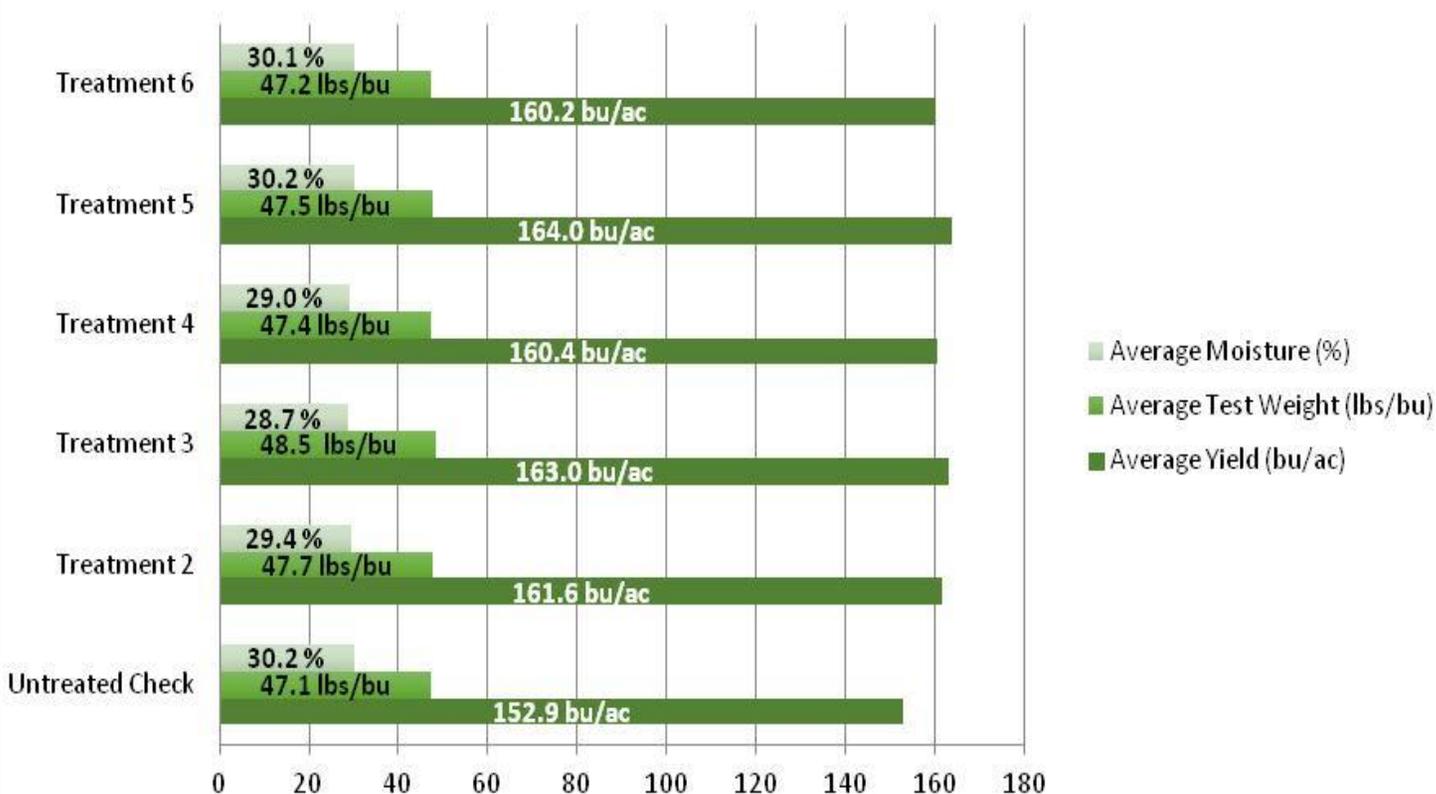
Plot Size (replications): 12 - 30" rows x 900ft (3)

Additional Information: side-dressed with 40 GPA 28% + 2.5 L/acre eNhance June 20 (V6).



Early corn seedling growth can be markedly increased by the banding of fertilizer with the seed (Baweja and Bates 1971). This early growth stimulation leads to a subsequent increase in grain yield (Bates 1971). Although the benefits of starter fertilizer have been clearly established, one of the most commonly asked production questions by growers is still “Which is better, dry or liquid starter fertilizer?” The goal of this study is to collect local data on the response of corn yield, moisture and test weight to both liquid and dry starter fertilizers applied at commercial rates.

Dry Starter vs. Liquid Starter Comparison



Treatment	Product	Rate
2	Pro-Germ	3.5 GPA
	Sure-K	4 GPA
	LiberateCa	1 L/ac
	Micro 500	1 L/ac
	Boron	1 L/ac
	eNhance	1 L/ac
3	Pro-Germ	3.5 GPA
	Kalibrate	4 GPA
	LiberateCa	1 L/ac
	Micro 500	1 L/ac
4	19-19-19	150 lbs/ac
5	21-0-21	150 lbs/ac
6	MESZ	150 lbs/ac

A key strength of AgroSpray’s liquid fertilizers is the ability to tailor mixes to the needs of the specific fields, allowing farmers to achieve high yields, high test weights, and lower moistures.

Foliar Micronutrients on Soybeans



Cropping Year: 2014

Date of Planting/Harvest: May 28/October 30

Hybrid: PS2082NR2 (2.0 RM)

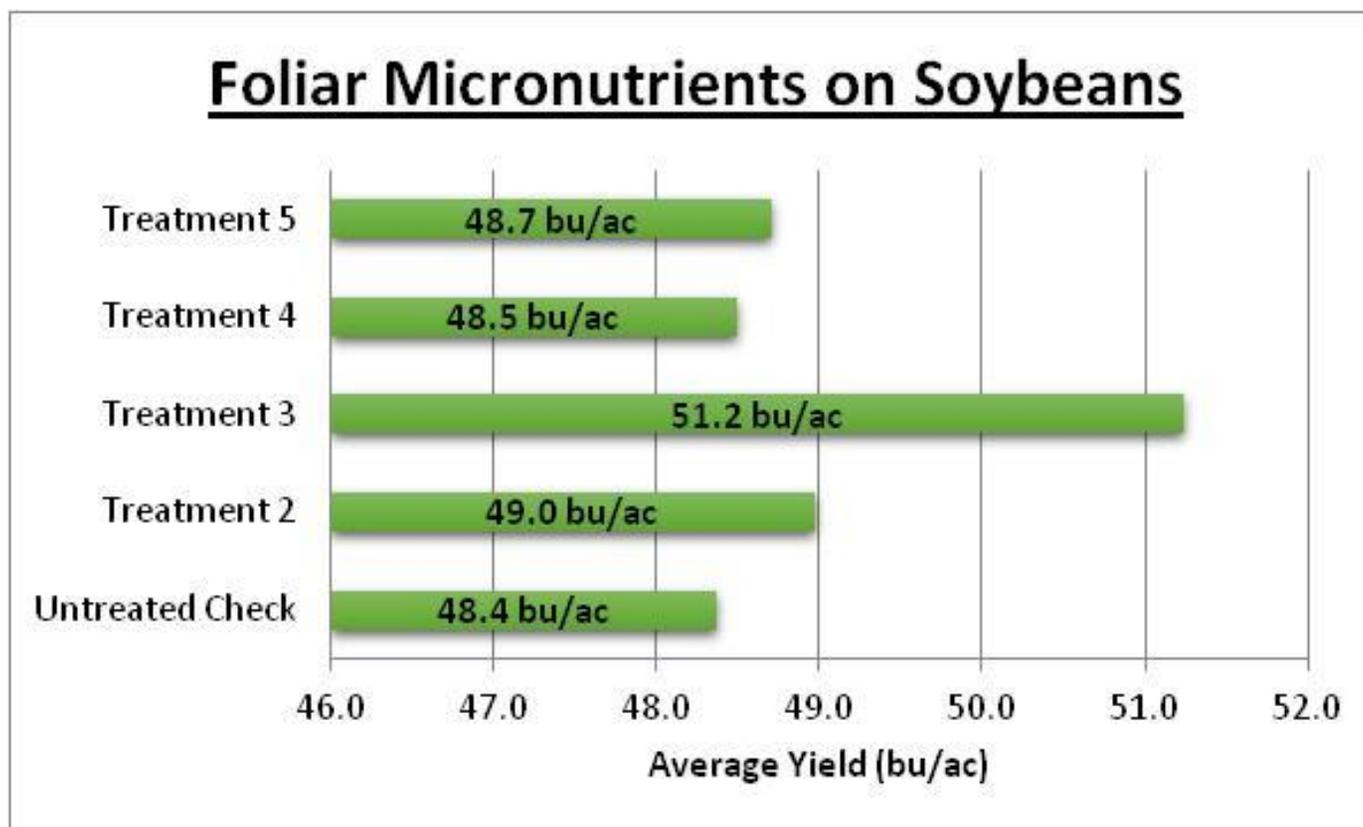
Population: 185,000 seeds/acre

Plot Size (replications): 12 - 30" rows x 675ft (3)

Date of Application (stage): July 23 (R1)

Starter Fertilizer: Sure-K 3 GPA + LiberateCa 1 L/ac

Agricultural fields are often found deficient in one or more of the micronutrients – boron, copper, manganese, iron, zinc and molybdenum (A&L Agronomy Handbook 2001). In many cases, “deficiency of certain micronutrients is the factor responsible for ineffective utilization of the major and secondary nutrients supplied in fertilizer and liming programs” (A&L Agronomy Handbook 2001). The addition of micronutrients to a fertilizer program is becoming increasingly important, as increased yields means a higher removal of micronutrients from the soil (A&L Agronomy Handbook 2001).



Treatment	Product	Rate
Untreated Check		
2	Sure-K	3 GPA
	Micro 500	2 L/ac
3	Ferti-Rain	3 GPA
4	Micro 500	2 L/ac
	eNhance	1 L/ac
5	Molybdenum	1 L/ac

Increasing soybean yields necessitates greater micronutrient uptake; the micronutrient composition in Ferti-Rain addresses this need.

Executive Summary

The AgroSpray Research Farm (ARF), located in Oxford County, Ontario, has over 100 acres of field-sized research trials. Our research focuses on combining environmentally-responsible nutrient application and modern technology to maximize agricultural yields. This report provides some of the cumulative results from trials carried out in both the 2013 and 2014 growing seasons.

In 2013, there was a cool, wet season in Oxford County. In 2014, there was another slow start to the year. Temperatures did reach seasonal highs until August, when temperatures began to dip below seasonal norms. There were also excessive rainfall levels in 2014. The trials highlight the strengths of Agro-Culture Liquid Fertilizer (ACLF) products, even in challenging growing conditions.

Overall, the trials emphasize the importance of matching fertilizer programs to the nutrient needs of the specific fields and farms, as dictated by soil test results. For example, the field used for our Foliar Feed on Soybeans (Early) trial in 2013 had a potassium deficiency, and the soybeans with the Sure-K application had a strong yield. ACLF products allow for the creation of speciality mixes; notably, even calcium and phosphorus can be combined, unlike in traditional liquid fertilizer programs.

Our soybean trials demonstrate the benefits of a foliar feed application of Ferti-Rain. This fertilizer has a balanced mix of N-P-K and micronutrients, thus allowing the plants to optimize yields. The Ferti-Rain in these trials was applied as early as the R2 stage (or full bloom stage) in one foliar feed trial, and as late as the R4 stage (or full pod stage) in another trial, suggesting that the timing of the foliar application is not of key significance.

Our Side-Dressed Fertilizer on Corn trial highlights the strengths of ACLF nitrogen products. An application of High NRG-N increases yields over the standard 28% UAN application; notably, less volume of High NRG-N is necessary than of the standard 28% UAN, which allows growers to cover more ground with fewer fill-ups. High NRG-N is also a slow release and stabilized form of nitrogen, which is important in years with high amounts of rainfall.

The Side-Dressed Fertilizer trial also demonstrates a second option for those growers interested in continuing the use of their traditional 28% UAN program. The addition of eNhance to the fertilizer mix reduces the necessary amount of 28% UAN, as it helps to stabilize nitrogen. Please speak with your Area Sales Manager to explore the best nitrogen program to fit your needs.

Our Area Sales Managers are eager to work with you to build on the knowledge presented in this report, and to help you develop a custom fertilizer program to meet your specific soil needs.

Foliar Feed on Soybeans (Early)

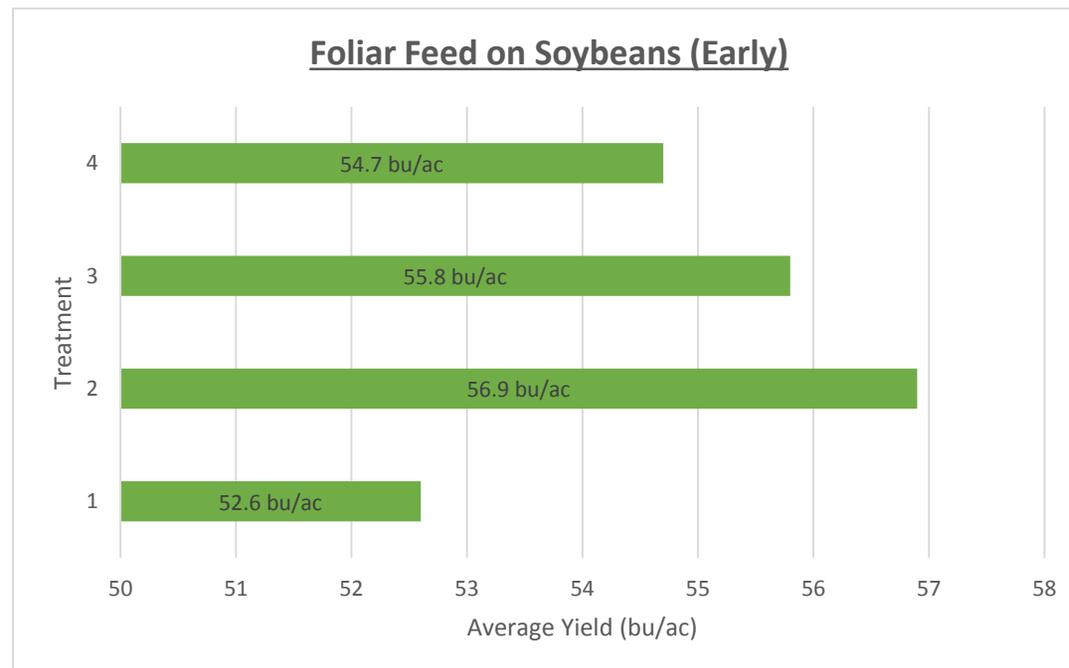
Cropping Years: 2013 & 2014

Hybrid: PS2393NR2 (Maturity Group 2.3)

Replications: 3 replications for each treatment in each trial

Application Stage: R2 – Full Bloom

The Spring of 2013 and of 2014 saw cool temperatures and an excess of rainfall, which slightly delayed the soybean planting season in Southwestern Ontario. This left some producers wondering if foliar fertilization could help to improve soybean growth and yield. Therefore, here at ARF, we set out to determine the effects of early (R2) and late (R4) foliar fertilization on soybeans that started the growing season in cool, wet conditions.



Treatment	Product	Rate
1	Untreated Check	
2	Ferti-Rain	3 GPA
3	Sure-K	3 GPA
4	Sure-K	3 GPA
	Manganese	2 L/ac

When a field has a potassium deficiency, Sure-K is a good option for a foliar feed on soybeans. Ferti-Rain has also proven as a strong and consistent foliar feed option.

Foliar Feed on Soybeans (Late)

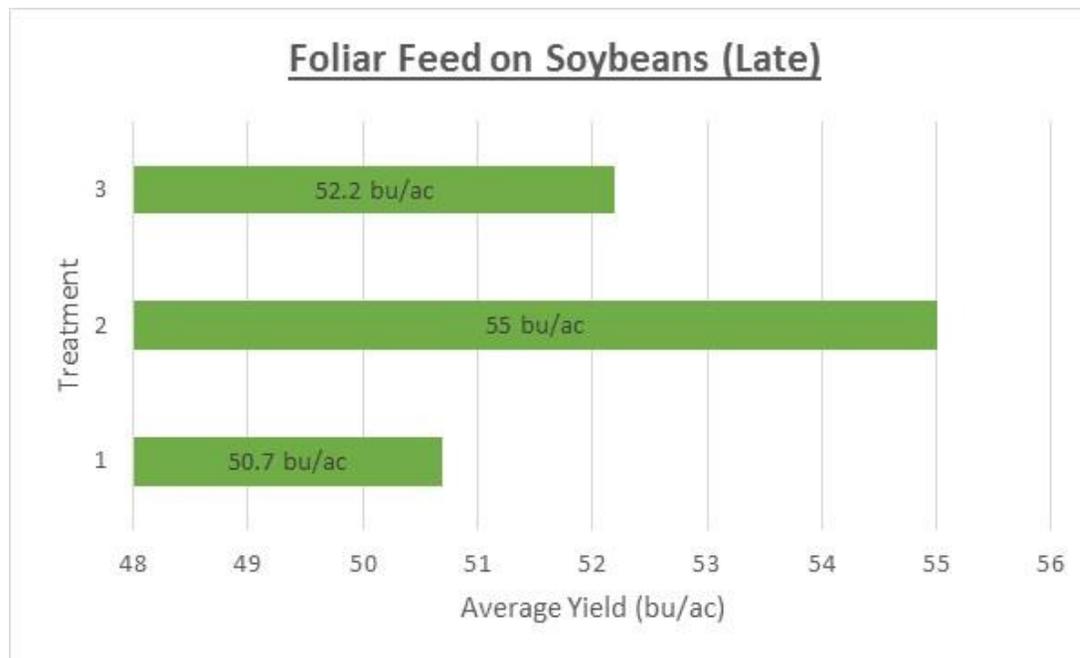
Cropping Years: 2013 & 2014

Hybrid: PS1162R2 (Maturity Group 1.1)

Replications: 3 replications for each treatment in each trial

Application Stage: R4 – Full Pod

Additional Information: No starter fertilizer applied to this trial.



Treatment	Product	Rate
1	Untreated Check	
2	Ferti-Rain	3 GPA
3	iNPaKt + Mn	3 GPA

Regardless of application stage, Ferti-Rain is a foliar feed product which achieves consistent results.

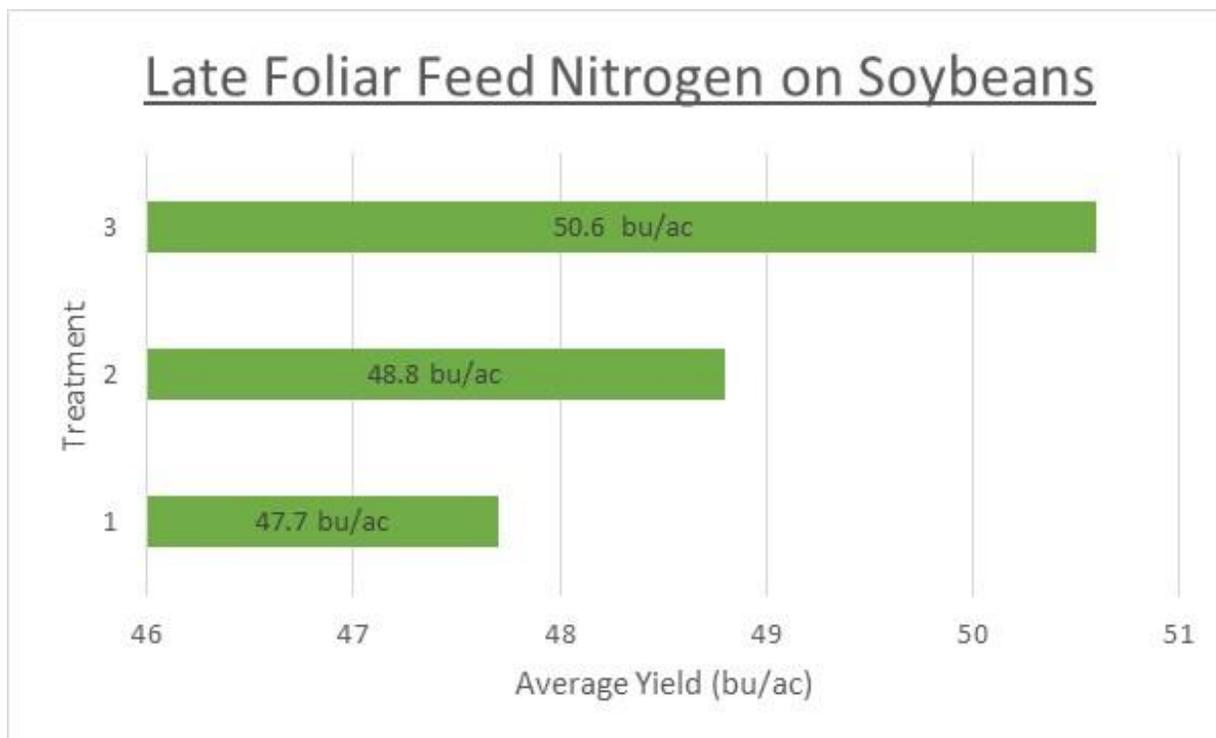
Late Foliar Feed Nitrogen on Soybeans

Cropping Years: 2013 & 2014

Replications: 3 replications for each treatment in each trial

Application Stage: R4 – Full Pod

Additional Information: No starter fertilizer applied to this trial.



Treatment	Product	Rate
1	Untreated Check	
2	NResponse	3 GPA
3	Ferti-Rain	3 GPA

Ferti-Rain has once again demonstrated its benefits as a foliar feed.