Bean Foliar Nutrition Studies (Ontario, 2025)

Background

Limited knowledge exists to help Ontario snap bean growers and agronomists design optimum crop nutrition strategies in processing snap beans. Furthermore, numerous companies are marketing various crop nutrition products to be applied foliarly at various crop stages. While many claims of increased crop health, stress tolerance, and crop yield exist, these claims are rarely backed up with solid agronomic research data in processing snap beans.

Objective

Evaluate commercially available foliar nutrition and/or biostimulant products in the Ontario marketplace on their respective yield impacts on processing snap beans.

Materials & Methods

All preplant crop nutrition was managed as per industry standards. At the site near Tupperville that hosted the “early planting”, Permit was applied pre-emerge and Reflex was applied post-emerge on all treatments except for the untreated plots. Weed control for the untreated plots was done by hand. At the site near Glanworth that hosted the “late planting”, Permit was applied pre-emerge and Reflex was applied post-emerge to **ALL** replications.

Individual plots of a standard full season cultivar (Jaguar) were planted with enough replicated plots to test up to nine (9) unique treatments, including an untreated check. Tupperville had 9 treatments tested including an untreated check (**no** herbicide applied) while only 8 treatments were tested in Glanworth (there were no plots left completely untreated, i.e. no herbicide or foliar products applied).

Following the post-emerge herbicide application but prior to the foliar treatments being applied, a plant tissue sample was collected by making a representative composite sample using the plots that would be receiving each treatment (i.e. for each treatment a composite sample was created by sub-sampling all four (4) replications). There were a total of eight samples collected from both sites. A composite tissue sample was not collected for plots that received only Reflex in Tupperville.

The following treatments were applied pre-bloom, roughly 5-7 days following the Reflex application.

1. Untreated - **Tupperville Only**
2. Priaxor Fungicide @ 120 mL/ac
3. Alpine K20-S + BioMag @ 3 L/ac
4. Timac Agro - Fertileader Vital @ 1.2 L/Ac
5. NutriAg - Truphos Platinum + Alexin @ 0.70 L/ac + 0.30 L/ac
6. Bioforge @ 250 mL/ac
7. Megafol @ 1 L/ac
8. BioLiNE Gold @ 0.5 L/ac
9. Reflex @ 0.4 L/ac

In Tupperville, the untreated check was not treated with Reflex and weed control was done manually. In Glanworth, there was not an untreated check, all plots were treated with Reflex.

This process was duplicated across two sites, separated by 28 days between planting dates in order to separate harvest dates and accommodate for mechanical harvest. Site #1 was located near Tupperville, ON and hosted the “early planting” which was planted May 26th. Site #2 was located near Glanworth, ON and hosted the “late planting” which was planted June 23rd.

Disclaimer: This document is intended for informational and general guidelines only and does not supersede pesticide label directions. All users of this document are expected to read and follow all individual product labels before using any of the listed products.

Harvest

At harvest, all plots were mechanically harvested, for a total of 36 individual samples in Tupperville and 32 individual samples in Glanworth. Total sample weight was recorded for each individual plot while sieve distribution and seed size for each treatment was not determined as this was beyond the scope of this project. Optimal harvest timing for this trial was determined by pregrading the “Jaguar” grown in the Bean Cultivar Evaluations that occurred at the same locations. The Tupperville site was harvested on July 29th, with a pregrade seed size of 102 mm. The Glanworth site was harvested on August 22nd, with a pregrade seed size of 105 mm.

Discussion

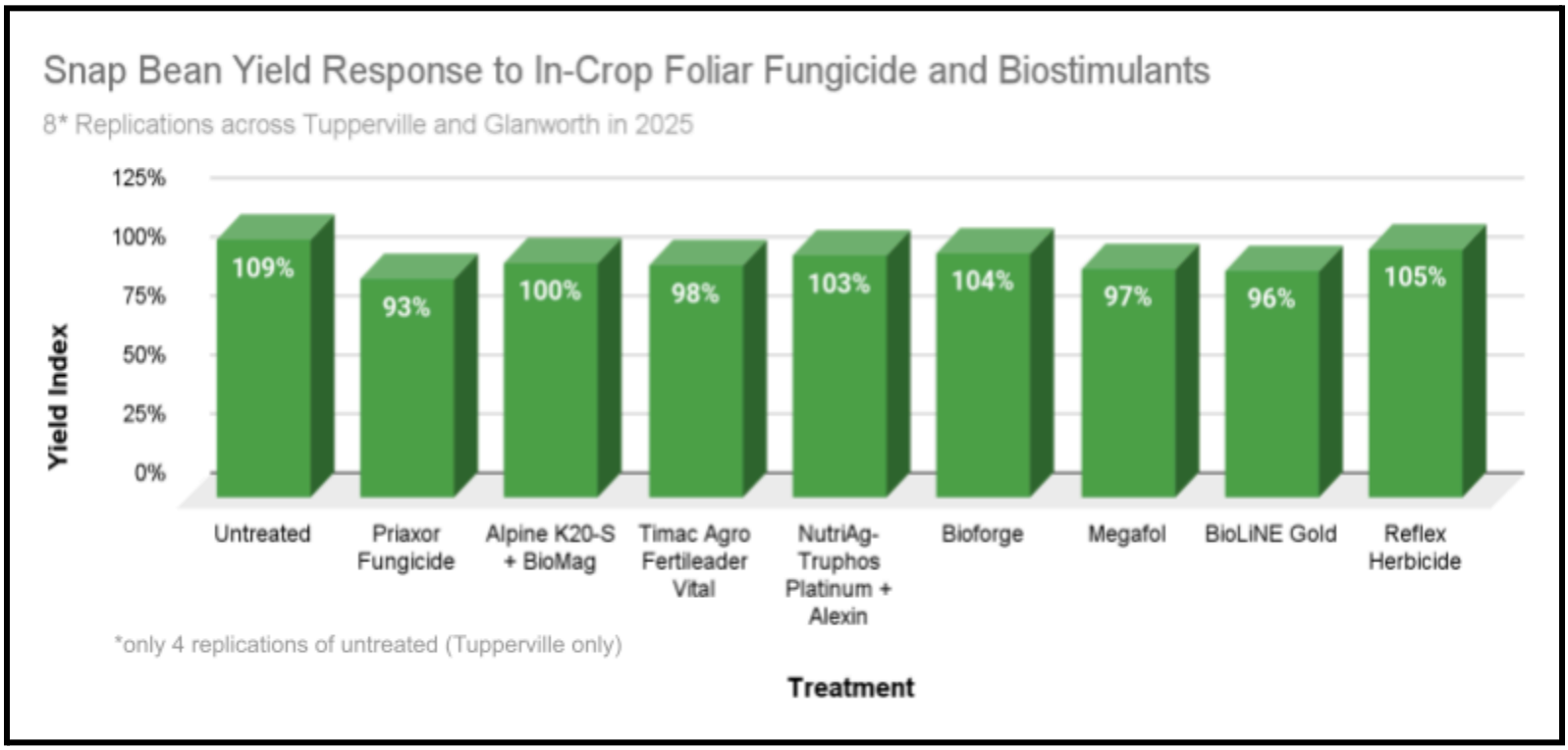
Most products tested were foliar nutrient supplement products, with some containing seaweed extracts or other organic acids. The expectation appears to be BioForge, which contains a known plant hormone in addition to some plant nutrients. Little is known about critical plant nutrient levels in snap beans, however tissue sample results suggested boron and copper were well below the sufficiency range, while magnesium was noted as being at the lower end of the sufficiency range in some samples. Nonetheless, there were no significant yield increases where products containing these micronutrients were applied. The untreated plots yielded the highest, suggesting the Reflex herbicide does inflict a yield penalty as the crop metabolizes the chemistry. This is challenged by the yield data coming from plots treated with Reflex only, showing a 120% yield index, however it is believed that the plots harvested to produce this data were in a more productive area within the trial.

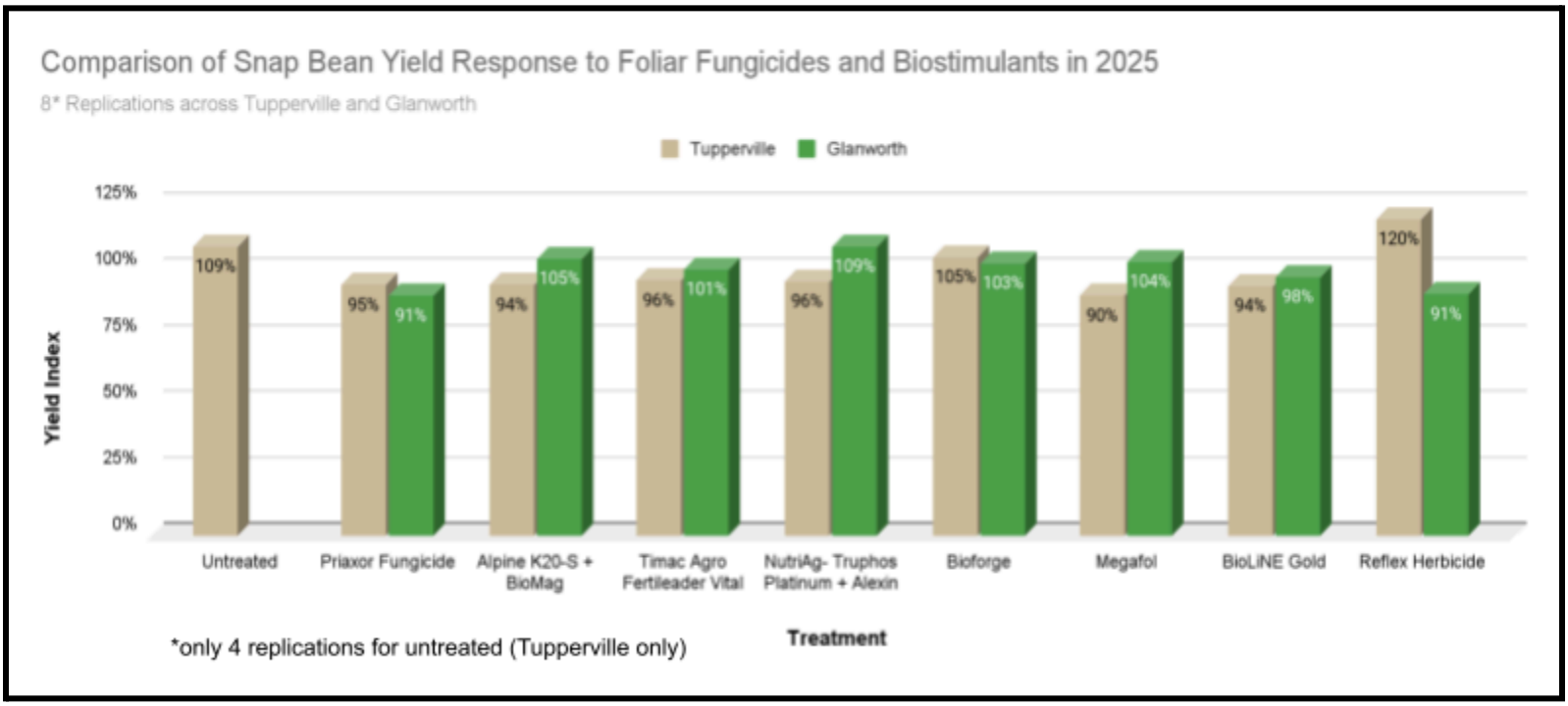
Unfortunately, the later planted trial did not have truly untreated plots to compare against other treatments. However, plots treated with foliar nutrient and/or biostimulant products all yielded better than the Reflex only treated plots, the opposite to the results noted in the early planted site. It is worth noting that the growing conditions at the later planted site were quite stressful (hot and dry) compared to the early planted site at the time of product application and the crop vigor was already poor going into this application period.

This trial will be repeated in 2026 to build more significance into the dataset.

Results

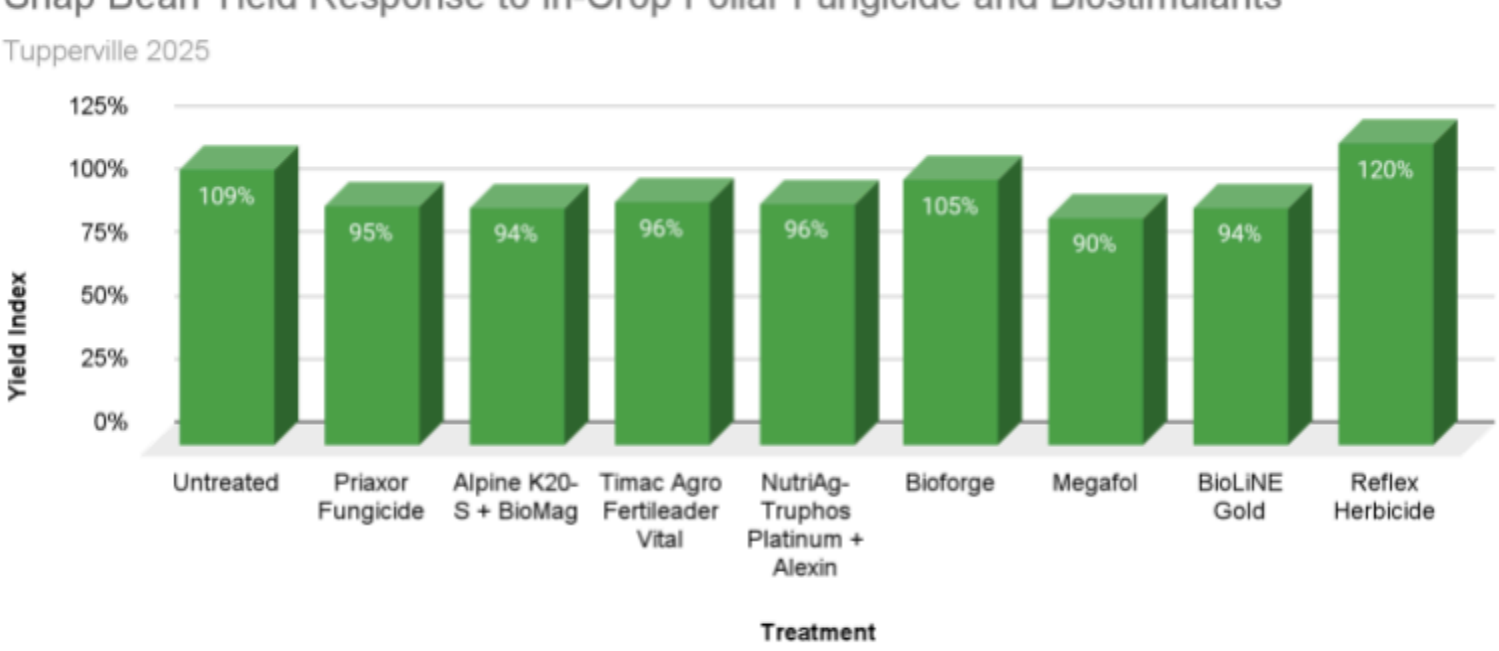
2025 Overall:





Early Planting- Tupperville, ON:

Treatment	PRE-APPLICATION TISSUE ANALYSIS												
	Sample Date	N%	P%	K%	S%	Mg%	Ca%	Zn ppm	Fe ppm	Mn ppm	Cu ppm	B ppm	Al ppm
Untreated	July 2	4.74	0.35	3.04	0.21	0.40	1.96	25	247	71	10.1	28.1	113
Priaxor Fungicide	July 2	4.75	0.36	2.81	0.21	0.49	2.26	23	288	51	9.3	31.2	129
Alpine K20-S + BioMag	July 2	4.67	0.41	2.88	0.21	0.41	1.73	27	215	52	9.5	30.7	119
Timac Agro Fertileader Vital	July 2	4.62	0.43	2.75	0.23	0.41	1.65	29	207	55	10.2	29.1	90
NutriAg- Truphos Platinum + Alexin	July 2	4.82	0.41	2.9	0.22	0.39	1.68	28	170	50	9.3	30.2	63
Bioforge	July 2	4.77	0.43	2.89	0.22	0.38	1.52	30	181	58	10.5	29.2	78
Megafol	July 2	4.83	0.44	2.92	0.21	0.42	1.74	28	203	43	9.3	31.9	82
BioLiNE Gold	July 2	4.67	0.43	2.87	0.2	0.39	1.56	28	205	44	9.9	30.6	86
Reflex	-	-	-	-	-	-	-	-	-	-	-	-	-



Late Planting- Glanworth, ON:

Treatment	PRE-APPLICATION TISSUE ANALYSIS												
	Sample Date	N%	P%	K%	S%	Mg%	Ca%	Zn ppm	Fe ppm	Mn ppm	Cu ppm	B ppm	Al ppm
Reflex Herbicide	July 21	4.17	0.40	2.47	0.25	0.36	1.57	30	918	42	8.8	21.9	429
Priaxor Fungicide	July 21	4.03	0.39	2.62	0.25	0.37	1.70	30	700	35	9.9	20.5	314
Alpine K20-S + BioMag	July 21	4.25	0.41	2.64	0.26	0.39	1.67	33	987	42	10.3	21.7	449
Timac Agro Fertileader Vital	July 21	4.53	0.43	2.74	0.27	0.38	1.57	34	547	34	9.5	21.6	242
NutriAg- Truphos Platinum + Alexin	July 21	4.16	0.40	2.73	0.25	0.37	1.51	32	742	38	8.9	21.0	339
Bioforge	July 21	4.35	0.42	2.44	0.26	0.40	1.66	33	787	40	10.0	20.5	366
Megafol	July 21	4.26	0.38	2.45	0.24	0.36	1.53	31	800	36	9.3	19.7	366
BioLiNE Gold	July 21	4.20	0.42	2.72	0.25	0.36	1.38	32	683	35	8.9	20.8	315