

SUMMARY OF 1994 AND 1995 BEAN FOLIAR NUTRIENT TRIALS IN THE WILLAMETTE VALLEY OF OREGON

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1994 Trials:

Foliar nutrient trials have been of interest for several years on snap beans. In 1994 three replicated small plot trials were conducted. Table 1 summarizes the applications and the resulting yields. Significant bean yield responses were recorded. Foliar nutrients applied in a tank mix with Ronalin fungicide at early bloom gave over 1 ton per acre (2.24 metric tons per hectare) more beans compared to the growers standard programs. The 1994 trials compared several foliar nutrient packages with and without the addition of select plant growth regulator products, (PGR's). The addition of PGR's did not add value to the nutrient packages.

The nutrient packages applied were based on plant tissue samples collected and sent to Albion Laboratories for analysis through their T.E.A.M.(r) program. The top three nutrients identified as the most likely limiting were applied in the nutrient package. In 1994 zinc, magnesium, and copper were most frequently low, based on the laboratory analysis. The addition of N-P-K, (5-12-5) was added to bring the total mix between 1-1.25 gallons per acre (9.35-11.69 liters per hectare) applied.

Table 1, Illustrates the type of response received in 1994 and how the addition of micronutrients, as Metalosates, to a bean program can enhance yields.

Table 1 Snap Bean Yield Results in 1994.			
Treatment #	Treatments	Av. Yield* (T/AC)	MT/Ha
2	5-12-5+ Metalosate Zn, Mg, and Cu	11 .79a	26.41
9	5-12-5+ Micro Mix + PGR "C"	11.17ab	25.03
4	5-12-5+ PGR "C"	10.91ab	24.44
6	5-12-5	10.76ab	24.11
8	5-12-5 + Micro Mix + PGR "B"	10.32bc	23.12
7	5-12-5+ Multi-Mineral	10.08bc	22.58
1	Growers Standard Program, (GSP)- Check	10.04bcd	22.49
10	5-12-5 + Micro Mix + PGR "A"	9.89cd	22.16
3	5-12-5+ PGR "B"	9.58cd	21.46
5	5-12-5+ PGR "A"	9.34d	20.90

*Average yields followed by the same letters are not significant at the 90% level of probability.

This can best be seen by comparing treatment #8, which has micronutrients and PGR Source "B" to treatment #3, without micronutrients. Similar responses were seen when comparing treatment #9 to treatments #4 and #10 to treatment #5.

The best yield response in 1994 came from treatment #2, which had 5-12-5 plus Albion(r) Zinc, Manganese, and Copper Metalosate. This treatment was the best at all three locations. These nutrients were also determined by the Albion Laboratories report to be the most likely limiting nutrients.

Figure 1 below illustrates the average yield response due to the application of micronutrients. Micro Mix treatments resulted in an average 0.5 ton per acre (1.12 metric tons per hectare), while the Albion Metalosate treatments yielded an average 1.8 ton per acre (4.03 metric tons per hectare) more beans, when compared to treatments without micronutrients applied.

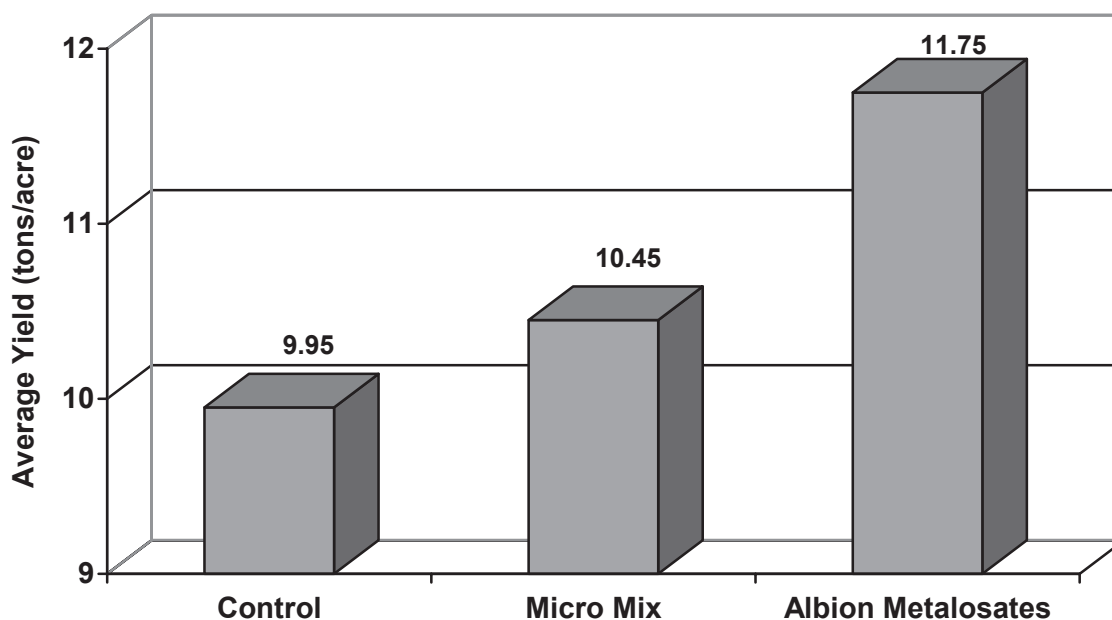


Figure 1. Micronutrient Response in Snap Beans. (Application at 10% bloom).

The three trial average yield response with the Albion micronutrient treatment was a 1.06 ton per acre (2.38 metric tons per hectare) yield increase, compared to the grower's standard program.

1995 Trials:

In 1995, five replicated small plots and two split field trials were conducted. The primary purpose of the 1995 trials was to confirm the use of plant tissue analysis as a means of predicting the nutrients most likely to be limiting during the remainder of the growing season. A second objective was to compare selected sources of micronutrient products, to determine if one source of micronutrient was better than others.

Table 2 below shows that the source of micronutrients can make a difference in yield responses. These data are the average of 5 replicated trials conducted in 1995. Treatments #1 and #2, and treatments #3 and #4 are source comparisons. The same nutrient levels were applied within each treatment grouping. Treatment #5,15 not directly compared to treatments #1-4, because it has a different nutrient analysis.

Treatment #	Treatment	Average Yield	Average Yield Change	Average Yield Change %	Net R.O.I.
1	8-0-0-9, ALBION Mg, Cu, and Ca Metalosates	10.68 T/Ac 23.93 MT/Ha	+1.28 +2.87	+13.7%	+\$238/Ac +\$588/Ha
2	8-0-0-9, SOURCE "B" Mg, Cu, and Ca	10.09 T/Ac 22.61 MT/Ha	+0.69 +1.55	+7.4%	+\$131/Ac \$324/Ha
3	5-12-5, ALBION Zn, Mg, and Cu Metalosates	10.43 T/Ac 23.37 MT/Ha	+1.03 +2.31	+11.0%	+\$1 84/Ac +\$454/Ha
4	5-12-5, SOURCE "B" Zn, Mg, and Cu	9.90 T/Ac 22.18 MT/Ha	+0.50 +1.12	+5.7%	+\$91/Ac +\$225/Ha
5	TRIPLE 20 PLUS MICROS	9.98 T/Ac 22.36 MT/Ha	+0.58 +1.30	+6.2%	+\$106/Ac +\$262/Ha
6	GSP-CONTROL	9.40 T/Ac 21.60 MT/Ha	0	0	0

Table 2. Snap Bean Yield Results in 1995

The most important information that came out of these studies was that the addition of foliar nutrients, (micronutrients) added considerable value to the income generated per acre.

In 1995 treatments #1 and #2, most closely filled the nutrient demands as identified by the plant tissue analysis (T.E.A.M.). Treatment #1, with Albion Metalosates, gave the best yield response compared to another micronutrient source, identified as source "B", applied at the same level of micronutrients added. A second comparison can be seen between treatment #3 and #4. In treatment #3, the Albion source of micronutrients had over twice the yield increase compared to the response from the "B source of micronutrients.

Triple 20 plus is a dry formulation of 20-20-20 containing a blend of micronutrients. It was included in these trials to compare it to the Grower's Standard Program, (GSP). Triple 20 plus has been used as a general foliar nutrient treatment, often applied without the aid of plant tissue analysis. These trials show that the Triple 20 plus program does provide added value, but it is not as good as a program based on the Albion plant tissue analysis recommendation, coupled with Albion's Metalosate micronutrients.

Although not shown in these data, several treatments containing Triple 20 Plus with supplemental Albion Metalosate micronutrients were applied. The yield results of those treatments were comparable to the Albion treatments (#1 and #3) above.

Conclusion:

Plant tissue testing (T.E.A.M.) on snap beans is a good method for determining the most likely in-season limiting nutrients. Trials conducted in 1994 and 1995 show that when following the Albion plant tissue recommendations, greater yield responses (+0.5 to 0.7 ton per acre, 1.12-1.57 metric tons per hectare) were obtained than when applying micronutrients without the testing.

The use of Albion Metalosate micronutrients gave greater yields, (+0.5 tons per acre, 1.12 metric tons per hectare) compared to other sources of micronutrients, and considerably greater yields, (1.28 tons per acre, 2.87 metric tons per hectare) and net return on investment, (.4238 per acre, \$588 per hectare) than the grower's standard programs.



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