

Micro-Nutrient Enhancement of Liquid Starter Fertilizers

Purpose:

This one-year study was initiated in the spring of 2005, in order to evaluate the claims that micronutrient/bio-stimulant additions to starter fertilizer can significantly increase corn yields. There are many claims attesting to the fact that enhancing starter fertilizers with various micronutrients can boost corn yields, and this replicated study is part of the ongoing investigation into these assertions.

Methods:

The ability of Stoller X-Tra Power to increase corn yields was evaluated on sites in Wellington, Elgin, and Middlesex Counties. Test sites consisted of both field scale and small plot scale areas. In the field scale plots, X-Tra Power was either applied, or not applied, in strips down the length of the field. X-Tra Power was applied in furrow, with the liquid starter, at a rate of 1.0 litre/acre. Each co-operating farmer maintained all other normal management practices. Where it was acceptable to the co-operating farmer, a control strip of no starter and no X-Tra Power was applied as well. In the small plots, an additional treatment was added where X-Tra Power was applied to the leaves of the corn plants at the 3-5 leaf stage. All treatments received liquid starter fertilizer. A hydroponic pail study was also conducted at the University of Guelph at the Arkeil Research Station. Corn was grown in pails and X-Tra Power was applied to the pail surface at planting and then again continuously every week up until mid-grain fill. Basic soil fertility samples were taken to a depth of 15 cm at the field and small plot sites to determine soil characteristics and nutrient analysis of each of the sites. To determine final yield, the field length plots were harvested by machine and weighed off individually. The small plots and pails were individually hand-harvested to obtain final yield.

Results:

Of the seven field length trials, only one site had a significant yield advantage that could be attributed to the X-tra power product. This site produced increased yields of 14 bushels/acre where X-Tra Power was applied. At the other four sites, yields in the plots that received X-Tra Power were either equal to or less than those plots that received X-Tra Power. On average there was no advantage to the X-tra power treatment. (Table1)

Table 1. Impact of Stoller X-Tra Power on corn yields averaged over 7 sites in 2005

Treatment	Yield (bu/ac)
Starter only	150.5
Starter + X-Tra Power	150.8

The small-scale plots produced similar results. Out of the eight, hand-harvested, small plot sites, three produced yields that were highest in the X-Tra Power plots where the yield increase ranged from half a bushel/acre to 7 bushels. At all the other sites, the plots that received no X-Tra Power produced the highest yields. Where an extra treatment was added to determine the affect of applying the Stoller product at the 3-5

leaf stage as well, no yield increase was observed over applying just starter, but there was a slight increase over applying Stoller only at planting time. (Table 2)

Table 2. Impact of Stoller X-Tra Power on corn yield averaged over eight small plot test sites in 2005

Treatment	Yield (bu/ac)
Starter only	157.8
X-Tra Power at plant	151.4
X-Tra Power at plant & 3-5 leaf stage	158.4

The pail study produced very different results to the other two studies. Final corn yields for both years of the study were able to show a significant benefit to applying X-Tra Power. (Table 3)

Table 3. Impact of Stoller X-Tra Power on corn yield for hydroponic pail study

Treatment	Yield (bu/ac)		
	2004	2005	Average
No X-Tra Power	155.4	235.0	195.2
X-Tra Power	204.5	267.0	235.8

Summary:

The results of this one-year study, in both the field length and small plot sites, were unable to corroborate the claims made regarding the benefits of applying micronutrients/ bio-stimulants to the corn crop. Only six out of fifteen sites were able to produce greater yields where Stoller X-Tra Power was applied, and most of these produced only minimal yield differences. However, for the hydroponic pail study, where the X-tra power was applied weekly results showed a significant advantage yield advantage to using this product.

It appears from this study that if there is some potential advantage to micro nutrients/bio-stimulants it is both rate and timing sensitive and that a single low dose applied at planting is not likely to impact corn productivity.

Next Steps:

If further research in this area is to be done, multiple rates and timings should be included as part of the protocol.

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