

Background Information on Midwest Bio-Tech

Introduction

We have a lot of new users of the Chandler Crop Products as well as many other readers of the newsletter who are interested in the products but are not familiar with our history. So, we thought it would be appropriate to review our background in this business. As well, we will share some of the common experiences that our long-time users have observed over the years.

How did you get involved with these products?

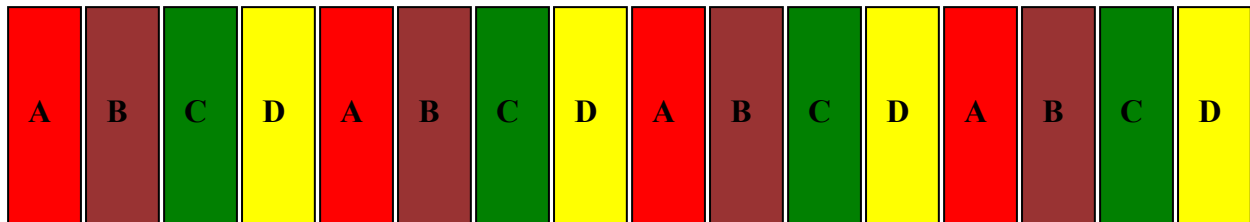
This is one of the most common questions that people ask us when we first meet. Our history with these products goes back over 30 years to the fall of 1978. At that time, we heard about a laboratory that planned to start registering a new line of biological products for livestock and crop uses in the Midwest, and we went to Salt Lake City, Utah, to check them out. At that time, they had about three years of experience with the products, and most of their data came from foreign countries due to the ease of registration and the centralized decision process. We liked what we heard, but we were not convinced that these products were really ready to be marketed in the US. So, we purchased enough of the various crop products to do some extensive testing on our own farm.

What kinds of tests did you conduct?

Over the years, we have conducted several different field trials with the crop products, but the first set of experiments that we started in the fall of 1978 convinced us that these products were for real. We took a field on our own farm that we normally farmed north-to-south and divided it into 16 plots running 800 feet east-to-west. In each block of four plots, we applied the following combinations of fertilizer and biological products:

- A. 40 rows at the full rate of fertilizer and no biological product
- B. 40 rows at the full rate of fertilizer and full biological treatment
- C. 40 rows at the half rate of fertilizer and full biological treatment
- D. 40 rows at the half rate of fertilizer and no biological product

The full-rate fertilizer application was based on a soil test taken from each plot, and the samples were numbered 1-16 and sent to Harris Laboratories for soil analysis. We requested a fertilizer recommendation for 160 bushel per acre (BPA) corn based on the initial soil analysis, and the resulting full-rate recommendation was 168 units of nitrogen. The full-rate plots in each block (A and B) were treated with this amount of nitrogen for each of four years, and the half-rate plots in each block (C and D) were treated with 84 units of nitrogen for each of the four years. The biological crop products were applied to plots B and C in each block of four plots at the recommended rate. The experiment was replicated four times across the 16 plots (see the figure below), and the same treatments were maintained in the same plots for each of four years.



What were the test results?

After the first year, we saw very little difference in the corn yields across the 16 plots. By the end of the second season, the half-rate fertilizer plots with the biological products (C) started to show a difference in both the appearance of the plants and in the yield. After the third and fourth years, the half-rate fertilizer plots with the biological product (C) still had the best average yield, and the four plots with full-rate fertilizer application and the biological treatment (B) had the second best yield average. After the fourth year, the average yield advantage for the half-rate fertilizer treatment with the biological products (C) was 8 BPA over the plots with the full-rate fertilizer treatment with the biological products (B). Also, the soil test results for the half-rate fertilizer plots were just as good as the full-rate fertilizer plots after four years.

After the first three years of the trials, our local fertilizer dealer started to take notice of the results. They felt that the yield disadvantage for the full-rate fertilizer treatment was due to our 160 BPA target yield, which they thought was too low. They believed the full-rate fertilizer application would show an advantage over the half-rate fertilizer plots if we increased our target to 200 BPA. Since they had been very helpful with making the split-rate fertilizer applications across the plots for the first three years, we agreed to conduct the experiment that they suggested for year four. We selected our best 40 acre plot on the farm, and we applied the fertilizer dealer's recommended fertilizer treatment on 20 acres and half of this rate on the other 20 acres. Before we pulled the planter in the field, we had a total investment of \$152 per acre in the full-rate part of this plot --- \$131 per acre in fertilizer and \$21 per acre in liquid lime. At harvest time, the full-rate side of the plot produced 154 BPA of #2 corn, and the half-rate plot produced 176 BPA of #2 corn. So, the half-rate fertilizer treatment generated another 22 BPA while saving \$76 per acre in fertilizer costs. Even with the low corn prices we faced in 1982, the difference in the net return was over \$100 per acre.

What did you conclude?

Based on these tests as well as field trials conducted in over 30 plots on other farms from 1979 to 1982, we decided to actively market these products in the Midwest. We also learned two main lessons from the combined results of these tests that have proven to be true over the past 30 years. First, we still need adequate fertilizer to raise corn and other crops, but the recommended application rates provided by many fertilizer dealers and soil testing labs are typically too high. We don't always need more fertilizer to produce higher yields, and there is some moderate level of fertilizer application rate that achieves a more profitable outcome. Many of these folks are now backing down from the high recommended rates due to high fertilizer prices and concerns about the environment, but this is something that we have known and have actively promoted to our users for years.

Second, we learned that biological products like Chandler Soil, Biocat 1000, Foliar, and Dry Seed Treat can release nutrients from the soil and plant residue and help the next crop to efficiently convert these nutrients into high quality grain and forage. However, like we saw in the replicated fertilizer plots back in 1979-1982, most of the gains from the biological products are realized after two or more years of continuous use. For example, many of the farmers who have used the Chandler Crop Products for at least 2-3 years in a row have been able to reduce their crop input costs by 40-50% from the levels they had paid before using these products.