



Enzymes, Microbes, and Other Good Things

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George Rehm, Department of Soil, Water, and Climate

There's an old saying that goes something like this: "what goes around, comes around." This adage seems to be especially true in agriculture.

In the 1970's, there were several products that appeared with sales claims based on testimonials and little else. Many were sold as biological activators (enzymes), or wonderful miracles of various combinations. Some of these products were evaluated in field trials by faculty members of Land Grant Universities using a variety of test crops. Although there were many claims by the sellers of the products, the results were consistent. There was no yield benefit.

Today, apparently stimulated by the rising prices of commercial fertilizer, this class of products has, once again, appeared. The claims are varied. The products are supposed to do such things as stimulate microbial life, enhance root growth, activate nutrient uptake, etc. etc. It appears that many of the old products have been packaged in a different container with a different label. When thinking about microbial life, one wonders how these products distinguish between beneficial and harmful microorganisms. Both are present in soils. When confronted with these fabulous claims, it's reasonable to ask, "Should these products be evaluated in field situations?"

To answer this question, it's useful to look at past evaluations of similar products with different names. Two research studies are summarized as examples.

A study conducted by faculty at the University of Wisconsin evaluated the use of "AgraLife" and "Sea-Born Plus-F" in replicated trials under closely controlled conditions. "AgraLife", according to the label at that time, contained "multiple strains of genetically improved nitrogen-fixing blue-green algae, enzymes and chelated trace elements and minerals." It's interesting that many of the "stimulants" that are supposed to do good things contain extracts of seaweed or Kelp or fish or all three. This is just one of the many mysteries of life. "Sea-Born Plus-F" was sold as a 6-3-3 specialty fertilizer made from a blend of seaweed extract, and hydrolyzed fish supplemented with potassium hydroxide, phosphoric acid and urea. Following label instructions, the "AgraLife" was applied to the soil at a rate of 0.1 gallons per acre when the corn was 12 to 18 inches tall. The "Sea-Born Plus-F" was sprayed on the foliage at pre-tassel in early July at a rate of 1.5 quarts per acre.

The corn yields from this trial are summarized in the following table.

Treatment	Yield (bu./acre)
control (no N)	113
60 lb. N per acre	152
120 lb. N per acre	172
240 lb. N per acre	171
"AgraLife"	116
"Sea-Born Plus-F"	113

The conclusions were clear. As expected, the application of fertilizer N increased yield. The use of "AgraLife" and "Sea-Born Plus-F" had no positive effect on yield.

A second trial was conducted by faculty of Iowa State University. In this trial, "Sea-Born Plus F" was evaluated. The product was applied to the corn foliage as suggested on the label. The yields of two hybrids treated with this product are summarized below.

Rate of "Sea-Born Plus-F"	Hybrid 1	Hybrid 2
	- - - bu./acre	- - -
control	158.4	165.3
1 quart of product per acre	158.6	164.4

In addition to the smell, then is another important reason to avoid the products derived from fish and seaweed extract. They do not perform as advertised. So, should we expect anything different from products sold today with similar ingredients? No.

The results of trials evaluating products that claimed to stimulate microbial life were the same. Several trials have been conducted with similar products with similar claims. The results were consistent with those just cited. They did not improve crop yield.

There are, however, some microbes that are important for crop production. The Rhizobia in the soybean inoculant is probably the best example. There are always questions about the value of inoculating soybean seed at planting. In an effort to get a good comprehensive answer to this question, faculty at South Dakota State University, summarized results from 93 studies conducted at Midwestern universities.

Overall, 20% of the 93 sites showed a significant response to the inoculant. When there was a response, the average yield increase was 9.5 bushels per acre. Of the 93 sites, 56 indicated if soybeans had or had not been in the rotation previously. When there were 43 with a soybean history and 13 where soybeans had not been grown before. When there was a soybean history, 3 showed a significant response to inoculation. Twelve of the 13 sites with no history of soybeans in the rotation responded to inoculation with a significant yield increase.

This summary provides strong evidence that soybean inoculation is not needed in the traditional corn-soybeans rotation. Addition of bacteria (the Rhizobia species) could be useful in some situations. Otherwise, adding a few ounces of "other" microbes to an acre of soil is no different than adding a bucket of fresh water into the ocean. It's money wasted without a return.

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