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Q&A with Bruce Caldwell, CEO of 3Bar Biologics delivering a Microbe Inoculant System that helps Farmers Crop Productivity while Reducing Reliance on Synthetic Chemicals

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- Bruce Caldwell

CEOCFO: ***Mr. Caldwell, what is the concept at 3Bar Biologics?***
Mr. Caldwell: 3Bar Biologics is dedicated to helping farmers increase the productivity of their crops while reducing their reliance on synthetic chemicals. The way we are doing is with beneficial microorganisms.

CEOCFO: ***Are many or most farmers looking for a better way these days or is it a more enlightened group?***
Mr. Caldwell: There is a huge challenge in global agriculture today to increase our productivity to produce more food, but at the same time, improve our environmental footprint and carbon footprint.

CEOCFO: ***What products and services do you offer?***
Mr. Caldwell: We are a young company, right now we have commercialized our first product which we call Bio-YIELD®. It is a product that is applied to row crops, corn soybeans and wheat.

CEOCFO: ***How does Bio-YIELD® work and how is it different?***
Mr. Caldwell: You can think about it like a probiotic for plants. These are living organisms that colonize the young plant. By surrounding the plant with living, beneficial microbes, we are helping the plant take up nutrients and fight off stress. As a result, the plant is able to yield more at harvest time.

CEOCFO: ***How did you know what microbes work for each specific plant?***
Mr. Caldwell: The microbes we are commercializing were actually discovered at The Ohio State University. Like many other research teams, they have been investigating the interactions between soil microbes and plants and how to improve the productivity of plants by shifting the population of microbes. 3Bar is focused on delivering those microbes in an active form so that the farmer can achieve the same result that the original researcher observed in the discovery process.

CEOCFO: ***How does it work and how is it used?***
Mr. Caldwell: It is a very efficient, easy and precise application. Our focus is to get some viable microorganisms on every seed as it is planted and they can grow in the seed and then as the seed sprouts and grows, our microorganisms grow with the roots of the plant.

CEOCFO: ***Is there something that can deter that growth or prevent it? Is there protection needed for the microbes?***
Mr. Caldwell: The microbiome of the soil is very complex, so there are many types of microorganisms in soil. Some of them are beneficial, and some of them are pathogens and are harmful to the plant. Our focus is to colonize that seed very

early with a fast growing microbe that is good for the plant and that helps it to take up those nutrients and fight off stress early, so you can get a healthier plant earlier in its life.

CEOCFO: ***Where does cost come into play?***
Mr.Caldwell: Our product is very cost effective, so the farmer has a very low input cost for them. The economic return pays for itself very quickly. On average, after three years of testing in Ohio, a typical yield increase would result in over a 400 percent return on investment for the farmer.

CEOCFO: ***Do farmers, by and large, understand or are they skeptical of something new that might not protect their crops? How do you bridge that gap when you are presenting your products?***
Mr. Caldwell: Farmers have a lot of variability that they are dealing with, starting with the weather, so they are not going to change over their practices of their entire farms to any new product in one season. Our approach is to encourage them to do a trial on a small portion of their farm and look at the results at harvest time. We believe that the vast majority of farmers will see that economic return and then in the following year, they will increase the amount of product they use on their farms. We plan for a three-year adoption curve.

CEOCFO: ***How are you reaching out today to let people know about Bio-YIELD®?***
Mr. Caldwell: We are working with existing distributors and cooperatives who are selling other supplies to farmers so Bio-YIELD® become part of the relevant set of products they are selling and it fits with current practices and equipment.

CEOCFO: ***What is the competitive landscape?***
Mr. Caldwell: Biologics and agriculture is one of the fastest growing sectors of inputs, and for some great reasons. The promise of increasing yield and reduced use of chemicals is attractive to everyone. The science around biologics is rapidly improving. Just like the research on the human microbiome and how we might leverage that is improving, it is the same thing with plants.

CEOCFO: ***Where do you stand with funding?***
Mr. Caldwell: We are in our fourth year of existence and we have had a commercialized product for three years. For the first three years, we kept the company going with grants and revenue. As we started to get traction in the industry, we decided to take on outside investment to increase our growth rate. We just recently closed our initial seed round of two million dollars.

CEOCFO: ***How will you be using that?***
Mr. Caldwell: With this new investment, 3Bar can accelerate the development of new solutions that support a market that is ripe for change. We are also expanding our testing beyond just the eastern Corn Belt, so increasing geography and types of crops that we are testing on because we believe this approach with more effective microbes can benefit many different types of crops.

CEOCFO: ***Is your focus to see what other crops can work this way? Are there other microbes you are looking at?***
Mr. Caldwell: Our initial target is row crops in the Midwest and that is because our initial discovery partner is Ohio State University. However, we believe the delivery system can be effective for many other types of microbes beyond those discovered at Ohio State, so we are very interested in working with other organizations who are doing the discovery work on microbes and we see ourselves as a partner to focus on improving the delivery and cost effectiveness of those microbes.

CEOCFO: ***What surprised you as you have been working in this arena?***
Mr. Caldwell: I would say the level of collaboration in the industry has surprised me. As we have started to attend conferences and present our work among our competitors, we are actually turning many of those relationships into collaborative relationships. There is a high level of collaboration both with other startup companies, smaller companies and also with large corporations.

CEOCFO: ***Are you looking to license other sciences or is what you have going to keep you busy for a while?***
Mr. Caldwell: We are in active discussions both on in- licensing and out-licensing technology. That is part of our business strategy.

COECFO: ***What gave you the confidence this could be a good product, be commercialized and viable alternative?***
Mr. Caldwell: I saw the opportunity for the whole class of microbes that we are commercializing. I had read a lot of very well founded peer review literature and research on these types of microbes, but there are very few commercial products. I saw a big gap between what is going on in research and what is actually available commercially.

CEOCFO: ***Does the soil in the Midwest matter? Where does soil itself come into play?***
Mr. Caldwell: A big question with biologics is how important localization or local adaptation is. Plants just like animals cannot survive anywhere in the world without beneficial microbes. The idea of improving the population around the plant can be effective in every corner in the world, although the exact types of microbes, the species and strains used may differ. A big area of research in the industry is how far you can travel with a single organism that is effective all around the world or if we can get even better results with more localized microbes.

CEOCFO: ***Why pay attention to 3Bar Biologics?***
Mr. Caldwell: We believe that we are disrupting the way microorganisms are being delivered in agriculture. We are starting with plants but a similar approach can also work for animals and humans. We think by delivering more active, viable organisms, we are going to improve the consistency and performance across a wide range of applications.