Interview

Shifting perceptions on biopesticides

by Jon Evans

William Foster is president and chief executive officer of the US biopesticide company, BioWorks, and current chair of the US-based Biopesticide Industry Alliance (BPIA). Jon Evans talked to him about opportunities in the biopesticide market.

JE: What qualities make a successful biopesticide product?

WF: That's a good question and there are two ways to look at it. One answer is: the same qualities that make a successful chemical pesticide. The product has got to work, it has to have efficacy and must be able to control the diseases and pests that are claimed on the label. So from that standpoint it's no different to a chemical pesticide.

What is unique about biopesticides are the three Rs: resistance management; REIs (restricted entry intervals); and residues. Because most biopesticides have multiple modes of activity, there's less chance of resistance developing in a particular insect or a particular disease, or even a weed for that matter. Biopesticides are an excellent part of an integrated pest management (IPM) programme, where the grower may be applying two or three chemical pesticides and then wants to throw in something entirely different. So they use a biopesticide that has a completely different mode of action.

So that's one use. Obviously, biopesticide companies would like to see biopesticides used more frequently. Certainly one advantage that a biopesticide has is that it can be an excellent tool in pest management.

The majority of biopesticides – I don't know of any that aren't this way – have low REIs. For most, if not all biopesticides, it's in the region of 0-4 hours. They also generally have no pre-harvest intervals. After a biopesticide has been applied, the farmer can go in there and harvest right away.

Finally, residues. Biopesticides are generally considered exempt from tolerances [maximum residue limits], which means that residues on leaves and fruit are totally acceptable. This is because they're considered safe.

JE: What are the main challenges that BioWorks currently faces?

WF: The broad answer is that there are very few profitable biopesticide companies. Many biopesticide companies are start-ups with venture capital funding and they put together this tremendous financial model that says: if we get 1% of the total global pesticide sales we'll be successful. This means that they only have to achieve annual sales of $300 million and the investors will be happy, and they'll be acquired by a large chemical company or they'll go through an IPO (initial public offering) and start trading their shares on the stock market. That doesn't happen. Most biopesticide companies are unprofitable or marginally profitable.

There are a few large biopesticide companies out there – Certis, Valent BioSciences, Koppert – that are decent size companies, with sales of $50-100 million, and these are certainly profitable.

BioWorks is unique in that it is one of the few small, profitable biopesticide companies. BioWorks has a broad US domestic and international distribution system and a network of sales people, and we're actively functioning. We just need more good products that we can sell in the market place.

So it's new products and, to a more limited extent, geographic expansion. We're selling into North America and we're selling into Europe, but we're looking to grow into Asia and South America.

JE: Are you both developing new products in house and licensing them in from other organisations?

WF: I don't want to spill too many beans. But one of the reasons why BioWorks has been successful is because we think we know how to successfully commercialise products. We believe we know what the growers' concerns and issues are and how to go out there and actively sell a product, and make money during the process.

It's one thing to say: I'm going to generate all kinds of advertisements and send out fliers and do this and do that; but that really doesn't generate sustainable revenue. There are lots of good products out there, but they're just being poorly marketed.

Our goal really isn't to become a large R&D-driven company. We are a market-driven company and whether a new product is internally developed or externally accessed we can add it to our portfolio and commercialise it and sell it through our established distribution network.

continued . . .

. . . continued

JE: What are the main challenges currently facing the biopesticide industry?

WF: The BPIA did a survey in 2003 that looked at perceptions and attitudes to biopesticides. This survey highlighted the fact that biopesticides are considered “snake oils”. Because a biopesticide doesn’t “smell like a chemical” and because it doesn’t instantly kill the target insect or target disease, it’s perceived as a “wimpy product”.

There are a couple of issues. One is just the awareness that the products actually exist. People don’t even know that they exist and the perception is that they’re just not as effective as chemical pesticides. Well, in many instances they are more effective than chemical pesticides. The problem is with traditional chemical pesticide evaluation models, which focus on curative control. Many biopesticides are not curative, so if you spray a biopesticide versus a chemical pesticide, the chemical pesticide will kill the insect immediately or cure the disease immediately, whereas the biopesticide product won’t. On the basis of this kind of trial, biopesticide products don’t work.

The real issue is that biopesticides aren’t being tested in the right way. This is something that BioWorks has been doing very extensively: making sure that we understand the research protocol and testing our products so that we know that they’ll work. It’s very, very easy to test a biopesticide under certain conditions to make sure it doesn’t work. The chemical companies have done such a good job that a lot of the consultants and researchers have set up protocols to evaluate products based on how they work under chemical pesticide evaluation programmes, and that doesn’t always apply to the effectiveness of a biopesticide.

One of our struggles is to convince growers that these are viable products, they do work, here’s how to use them, here’s how not to use them. The reason why there’s such a heavy emphasis on education from the BPIA standpoint is that there are a lot of “snake oils” out there, that’s the problem. There are companies that are selling products that have not gone through the US EPA registration process and they’re making covert insect and disease control claims, but they haven’t been tested thoroughly.

JE: What advice would you give to a biopesticide start-up company?

WF: To identify their target markets. They need to be very, very clear on what the greatest value of their product is and to what particular market. They need to spend money as if they didn’t have any. The roadside is cluttered with biopesticide companies that had grandiose revenue plans. These companies raised money to support this revenue growth, which never occurred, but their spending always remained the same. It’s not atypical to hear of companies spending up to $100 million and never achieving profitability. So biopesticide start-ups need to spend money very judiciously and they cannot expect product sales to be the classic “hockey stick” response, where it ramps up slowly and then just takes off, with sales doubling and tripling every year. That just doesn’t happen. Grower adoption of biopesticides is very slow.

JE: Do you think that it’s more difficult being a biopesticide start-up company than a biopharmaceutical start-up company?

WF: It’s a lot less expensive to be in the biopesticide area, which is one of the reasons why you have a glut of biopesticide companies. A start-up company can license some technology from a university, go out and raise a couple of million dollars, get the product marketed, get the product produced, and start to sell it. They don’t go through the EPA registration process, which can be $500,000-1 million. They start selling the product based on university research that shows it controlled a particular insect or disease. “Well I can’t tell you it controls that disease,” the salesperson will say, “but here’s some research to show that it does.” So they skirt the registration process, yet they try to sell a product. For a pharmaceutical company, you’re looking at tens to hundreds of millions of dollars to get to the various stages before you can actually bring a product to market.

The difference is that a single pharmaceutical product can have sales of hundreds of millions of dollars. In the biopesticide arena, the total of all biopesticide sales in the world is probably around $200-250 million. In essence, it’s a very small market.

JE: Do you think that the biopesticide industry needs to consolidate further and, if so, when will it happen?

WF: I’d say it’s started already on a very small basis. Two companies merged two or three years ago: Auxein and Mycotech formed Emerald BioAgriculture. You hear of companies forming strategic alliances more so than actually merging.

What’s going to make it happen even more? I think a couple of things. The shareholders of these small companies will actually realise that the growth projections that they bought into aren’t going to materialise and that they want something out of their investment; anything at all. Then they’re going to put pressure on the board and management to do something. I expected this to start to happen a couple of years ago, but it hasn’t happened as fast as I thought.

JE: So it’s due to happen any minute?

WF: I’ve been saying that for years. There have always been discussions about a consolidation within the biopesticide industry and there are a couple of companies that have been trying to position themselves to do that. The problem is that it’s unprofitable companies merging with unprofitable companies to create much larger unprofitable companies. From my standpoint, no-one has

continued . . .

. . . shifting perceptions on biopesticides *continued*

come up with a valid exit strategy for shareholders. If we roll up five biopesticide companies, the total sales may be $30-40 million, so you're starting to develop some critical mass. But if then we're going to go to an IPO, a company really has to have sales of $100 million or more to have any credibility on the market, at least in the US. So there are inherent difficulties in funding a roll-up strategy and seeing it successfully implemented.

JE: Which regional markets are currently the most important for biopesticide products?

WF: Certainly the US and the EU are currently the two largest opportunities. The EU talks about harmonisation of the registration process, but keep in mind that biopesticide companies have to register their products in every EU member country to be able to go out and sell their products and make insect control claims. There is no harmonisation of the registration process in the EU. They talk about it, they say they're getting close, but really it's country by country and different countries have different requirements. So you still have to pick the countries that are the biggest opportunities for you.

In the US, it's a little bit easier because once you get EPA registration, getting state registration is pretty easy. It's not like you have to get federal registration and then go state by state and provide different information or re-format the presentation or something like that. Except for California, which is unique.

This means in the US it's much easier to get a registration and to start selling a biopesticide product than in the EU. The difference is that the mentality within the EU is much more receptive to biopesticides than in the US. The struggle for registration is a little bit greater in the EU, but the impression of biopesticides held by growers is that they're viable and work. There isn't this jaundiced viewpoint on biopesticides that is sometimes present in the US.

JE: Which regional markets will become more important in the future?

WF: Asia, just from the sheer size, is very important. Certainly the country that comes to mind with everyone is China. Doing business in China can be very challenging, but it's so big and there appears to be a commitment from the regulatory officials in China to adopt biopesticides. The key question is: how do you go about participating in the market in China and be profitable?

JE: What crop markets are currently the most important for biopesticide products?

WF: The easy answer is: high-value crops, which is really anything beyond your classic row crops, such as maize and soybeans. It's where low REIs and low residues are important, where pest resistance may be developing and where worker safety issues are important. That's where the opportunities are. How you actually go out and capture that market depends on the product and the target pest, and the product needs to be priced accordingly.

JE: What do you think are the main factors affecting the growth of the biopesticide market?

WF: Well, there are a couple of responses. One is that, in general, the global chemical pesticide market is not growing; it's probably staying stagnant at best. So any growth that is occurring in the biopesticide market means that we're taking market share away from chemical pesticides. The reason why the biopesticide market is growing is because the products being tested are more effective and companies are being smarter in how they're marketing the products.

We realise that the perception of biopesticides being "snake oils" is still prevalent. How can we go about competing against this perception? This is where the BPIA has come in. We've developed standards that involve certain biopesticides getting a BPIA-approved rating. This is based on meeting certain regulatory hurdles, and demonstrating consistent product quality and efficacy. So it's sort of like having a Good Housekeeping seal of approval. Much easier said than done.

JE: Can you envisage the major agrochemical companies taking more of an interest in biopesticides?

WF: They've dabbled in biopesticides in the past and for the most part they're now out of it. The question is: why are they no longer involved? One of the reasons is that the revenue growth that everyone had projected for biopesticide products has not materialised. So is a multi-billion dollar, multinational company going to worry about a four or five million dollar product that has certain production nuances and may have shelf-life issues, and are they going to spend the time to promote the product? I think their answer is that they would rather go ahead and find effective products that are chemically-based.

JE: What are the most active biopesticide research areas at the moment and what agent types, ie bacteria, fungi etc, are receiving the most interest?

WF: From what I've seen, certainly disease control is pretty active, followed by insect control.

In developing a novel product, a biopesticide company is really targeted towards what problems growers are having and how it can resolve them. Then, from its portfolio, it can pick a bacterium or a fungus, depending on which is most appropriate. No one's really saying: let's focus on bacterial products to get on the market place. They're saying: let's look at disease control products, and there can be any number of possible solutions to developing these products.

JE: Are novel biopesticide agents primarily coming out of research carried out by biopesticide companies or by universities and governmental research agencies?

WF: I don't know. The university system in the US and worldwide has carried out research on a wide variety of

continued . . .

. . . continued

biopesticides. It's easy to find those products, the key is to make those products commercial and profitable. I also know companies that are developing products internally. It's hard to say one way or another.

JE: What can the BPIA achieve that individual biopesticide companies cannot?

WF: Firstly, it's regulatory issues. As an industry, we can now talk about regulatory concerns we may have in getting our products registered. Certainly, the BPIA has a very good relationship with the EPA and we're now even asked to participate in certain EPA regulatory events just because people are aware of the BPIA. So, on the regulatory side we're doing pretty well.

The other goal within BPIA is to improve the perception of biopesticides in the marketplace and that is a much longer term, much more difficult goal to achieve. What we're all trying to do as a group, as an industry alliance, is to improve the perception of biopesticides. Companies can try and do that individually, but it's going to be much more difficult than if we work together.

JE: What do you consider to be the BPIA's greatest successes to date?

WF: We've developed standards for efficacy and quality for biopesticides, and service operating principles for BPIA member companies. We've established regular and ongoing meetings with senior officials at a variety of regulatory agencies both in the US and in Canada. We are also participating with a number of other industry associations, including chemical industry associations, to try to make sure that certain regulatory questions are being addressed. The BPIA has decided to participate with other chemical pesticide organisations to have a voice when talking to state and federal regulatory officials.

◆ *Jon Evans is a freelance science writer.*