

# Rationalizing Biorationals

**Why retailers, foodservice providers and produce suppliers can fast track sustainability with “biopesticides.”**

BY MIRA SLOTT



**I**t's the perfect storm. Corporate sustainability has become omnipresent in the U.S., as buyers and sellers of produce vie to balance the environmental, social and economic aspects to maximum advantage, both internally and at point of sale.

Further, consumers increasingly consider product origin and make-up in their buying decisions. A supermarket's strategies in this arena can win or lose a consumer's patronage. Retailers, in turn, are building preferred supplier partnerships based on their own sets of sustainability metrics.

Muddying the waters, persuasive social media campaigns orchestrated by anti-GMO (genetically modified organisms) and anti-pesticide advocacy groups are gaining mainstream momentum and influence, amid and despite an onslaught of misinformation and unscientific claims.

Concurrently, government regulatory bodies in the U.S. and abroad, as well as private food industry power players, are implementing stricter restrictions on pesticide use in food production, including variant regulations and labeling. These actions parallel rapid advances in more sustainable food production technologies, which are rippling through the produce industry supply chain.

While currently under the radar at the consumer and retail levels, a wave of innovative non-traditional pesticides may be the sea change to brave this perfect storm.

The timing couldn't be more right for industry executives to harness a burgeoning global trend: fruits and vegetables grown and harvested with biorationals, also referred to as biologicals or biocontrols, and categorized as biopesticides by the Environmental Protection Agency (EPA). [See Biorationals sidebar on page 188.]

These non-traditional pesticides — also non-GMO and in certain cases permissible for use in organic certification — correlate to all three legs of sustainability, typified as low-impact products that deliver economic, health and/or environmental benefits, according to Rick Melnick, chairman of the board and director of the Biopesticide Industry Alliance (BPIA), based in McFarland, WI. Melnick also is manager, global brand management and communications, Valent BioSciences Corporation, headquartered in Libertyville, IL, which supplies biorational products to 95 countries. In June, 2014, Valent opened the world's largest dedicated biorational manufacturing facility in Osage, IA.

## Biorationals In A Global Economy

Year-round supply of produce has become the norm. Since companies grow for consumers all around the world, they have to be aware of pesticide-level tolerances in every country. More recently, food companies and retailers are creating standards for MPL's (Maximum Pesticide Levels) that are more stringent than government levels.

Big food buyers in Europe are demanding higher MPL standards for both their domestic and international produce suppliers, while banning use of numerous chemicals in the production process, says Dr. Willem Ravensberg, president of the International Biocontrol Manufacturers Association (IBMA), and science and policy manager, Business Unit Microbials at Koppert Biological Systems, based in the Netherlands.

GlobalGAP rules endorse Integrated Pest Management (IPM) systems that recommend less and less chemicals whenever possible, he continues. "When Greenpeace was doing exposés on pesticide use violations by farmers scrambling to combat resistant pests in the late 1990s and early 2000s, it shocked consumers. Retailers were getting caught in the cross-fire and trying to repair the damage," says Dr. Ravensberg.

It triggered a rise in alternative pesticide products for conventionally grown produce as retailers tightened supplier requirements. "Retailers don't want any finding of residues because they will get the blame in the media," he says.

Complicating matters, unlike the EPA's specialized Biopesticide Division, which was established in 1994, European legislation and registration for biopesticides runs the gamut and is not categorized clearly like in the U.S. "We need to set low risk boundaries between biocontrols, conventional pesticides and sustainable pesticide use directives that prioritize non-chemical solutions," he emphasizes.

"In Europe, you find heightened consumer concern about pesticide use and residues on produce," says Melnick. "You see the pull-through in demand for produce grown and harvested with lower levels of pesticides, and this demand is invariably linked to purchase decisions throughout the supply chain."

This translates to what produce is offered and merchandised on supermarket shelves. "If you talk to someone in the retail industry in Europe, pesticide residue levels are leveraged as marketing tools at the retail level, where here in the U.S. we haven't really gotten to that point yet," says Melnick.

However, "large U.S. retailers and food-service providers, looking to get ahead of the game, are very much in tune with European chain initiatives," says Melnick. "Big and powerful buyers have sustainability campaigns in place to demonstrate they are proactive with sustainability, and one aspect is an integrated approach to pest management."

## European Retailers Lead The Way

Pesticide issues play an integral role in European retail sustainability programs, such as Tesco's Nature's Choice, Marks & Spencer's Field to Fork, and Sainsbury's eco-friendly brand platform in the U.K., according to David Cary, executive director, International Biocontrol Manufacturers' Association (IBMA), based in Guildford, U.K. For instance, as part of its mission to combat declining biodiversity, Sainsbury's partnered with farmers to dramatically increase bee population habitats. Taking it to the retail floor, Sainsbury's worked with a bee specialist to establish 100 Bee Hotel nesting sites in its stores, engaging and educating consumers.

Retailer Albert Heijn in the Netherlands has been producing an IPM (Integrated Pest Management) sticker on fruit and vegetable products, with small cards on display showing tools that are used, and how biopesticides work, but educating consumers on the alternatives remains a challenge.

"As far as consumer awareness of pesticide residues, that's pretty much a given; they don't want to be consuming pesticide residues," says Cary. "Unfortunately, there is not as much information passed down to consumers on what the alternatives are." There has been a reluctance to do that at the risk of pitting one technology against another, and implying that some products in the department are good and some are bad.

"We do have to spread the word of what's happening, but we have to be a bit more artful, not creating a scare. We are advancing the way we produce our food, using less conventional pesticides as we find out the impact on the environment; and biopesticides are a tool of tomorrow. We have to do this education together. We have our part to play and so do the supermarket groups. It's a huge responsibility to manage this sea change and to convey it to consumers without a great deal of alarm," says Cary.

"Consumers in Europe wouldn't be aware of biocontrols. They may say green pesticides, but when asked, 'What do you mean by that?' they don't know. We want to promote low risk

products, but to a consumer, that's difficult to explain," adds Dr. Ravensberg.

"Some of the supermarket groups are very active in working with their suppliers to change what products they're using, relying more on biopesticides and other methods to control pests," says Cary. "Supermarket chains in Europe and in the U.K. have pilot demonstration farms, where farmers use biocontrols and train other farmers on how it's done," he says.

"I'm aware of some grocery chains in Europe that only allow extremely limited amounts of residues on the produce they buy, and even if it's at the legal level, the

## WHAT ARE BIORATIONALS?

**B**iorationals are typically derived from natural or biological origins, and include biological pesticides, as well as products used for crop stress management, enhanced plant physiology benefits, root growth management and post-harvest benefits. It could be bacteria with no human toxicity but toxic to a harmful caterpillar, or mimic a chemical in nature, explains Rick Melnick, chairman of the board and director of the Biopesticide Industry Alliance (BPIA), based in McFarland, WI. "Some products are like pheromones, a mating disrupter. There's a biochemical that an insect gives off in mating season. You could go out and spray in an orchard and confuse insects not to mate."

"We use the term biologicals; Valent Biosciences calls them biorationals," says Ashish Malik, vice president of marketing for West Sacramento-based Bayer CropScience. "We don't like to refer to them as biopesticides. Biological products produce an enhancement to the crop, and in some cases could provide pest protection, but not necessarily. All biologicals are non-GMO, and in certain cases can be used for organic certification, depending on how the product is formulated," he explains.

Biopesticides are one of the fastest emerging segments of agrochemicals used in crop production. Growth of the biopesticide segment now outpaces growth in the conventional segment as pressure mounts for an integrated approach to pest management.

In 1994, EPA established the Biopesticides and Pollution Prevention Division to facilitate the registration of biopesticides as a means to safer pesticide use, and to encourage their development as part of its integrated pest management programs.

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chains will reject the product,” says Tim Damico, vice president, NAFTA sales and marketing, Certis USA, headquartered in Columbia, MD. “We see this trend emerging in the U.S. Retailers are not necessarily saying they want residue-free produce, but are taking steps to move toward more sustainable products that are produced with less chemicals,” says Damico.

Sustainability is by extension use of biorationals, and can be an important selling point in the produce buyer/seller relationship. “We have a customer in Mexico using a large volume of our biorational products, and each year the customer meets with Wal-Mart to communicate the proactive steps being made in sustainability. The use of biorationals figures heavily in that presentation,” says Melnick.

## Anti-Residue Sentiment Grows In The U.S.

In the U.S., consumer concerns with pesticide use levels have generally been relegated to a niche following, but this may alter, as claims — albeit often unscientifically based and/or misleading, by organizations such as the Environmental Working Group (EWG) — ramp up and are given weight by media outlets and popular television shows like *The Dr. Oz Show*.

EWG is infamous for its annual “Dirty Dozen” report, a scientifically flawed referendum on residue levels on a changing list of 12 produce items, recommending that consumers switch to “healthier” organic alternatives. Regardless of the veracity of such claims, demand for more sustainable products is likely to intensify down the pipeline, giving U.S. retailers cause to employ strategies that address it.

Other initiatives for new EPA labeling options coming down the pike could also incentivize sustainable merchandising opportunities for products produced with biorationals.

“There’s been a call for labeling that would indicate a product has positive benefits. It’s easy to make an exclusionary list or put warnings on something,” says Melnick. “And endorsing products is outside of government’s purview, so it has to be very careful on how it proceeds with labeling initiatives.”

Some 300 organizations opposing genetically modified organisms have been highly effective communicators in spreading misinformation and fear across the Internet, pushing for mandatory GMO labeling rules with a symbolic skull and crossbones logo

## OVERCOMING MISCONCEPTIONS

In the evolution and advancement of technology, the industry has had to thwart many misconceptions in the marketplace about biorational products: that biorationals don’t work; are expensive; are complicated and difficult to use; are intended to replace traditional chemicals; are only for use in organic growing systems; are all created equal; and are not reliable.

“We’ve come a long way in the past 15 years, and the evidence of their value is clear,” says Rick Melnick, chairman of the board and director of the Biopesticide Industry Alliance (BPIA). “When these large companies invest in biorationals, they’re reacting to what they see as business opportunities.”

Extension specialists are used to evaluating products in a certain way. Biopesticides or biorationals are unique. Each is a little bit different — the precision of the application timing, how long until the effects are visible, and all these things vary from product to product. As a result, it doesn’t make sense to evaluate these kinds of products in the same way one evaluates conventional chemicals. Biopesticide companies provide protocols on how they are used, but researchers don’t always follow them. Therefore, research assessments on biopesticides were not always accurate, says Melnick.

“One misconception — which we have largely overcome — is that biorationals don’t

work. In the early days, companies could fly under the radar and call a product natural, and then bring something to the market that didn’t do anything. That created a perception that natural products or biorationals don’t work,” he continues. “Over time, the market has sorted itself out. The products that didn’t work went away and the ones that did work over time have become proven and trusted.”

Another issue is related to organic. “Our products are hugely important for the organic industry, where choices are extremely limited,” Melnick explains. A lot of biorational products are certified organic, but the misconception is they are only used for organic when 95 percent of our sales are for conventional production, he emphasizes.

“There have been great advances made in the science in the last 5 to 10 years with products seen as contemporaries to their conventionals in ways of meeting performance expectations,” says Tim Damico, vice president of Columbia, MD-based Certis USA. “As companies scale up and become more efficient and enhance their fermentation capabilities, biologicals will benefit from economies of scale. As an organization, we’re working to bring costs down and transfer those savings to our customers,” he continues. “Years ago, biopesticides were thought not that effective and too high priced. This has changed, and some are just as competitive as conventional alternatives.” **pb**

and undermining consumer confidence, according to Cathleen Enright, executive vice president, food & agriculture, Biotechnology Industry Association (BIO), based in Washington, D.C.

There are three states with GMO labeling laws already, and there are bills being debated in 30 states and Puerto Rico, says Enright. These anti-GMO groups are moving their arguments to include negative associations with pesticide use and erroneous claims of dangerous residues on produce, she says. In January this year, General Mills and Post reformulated their cereals with “No GMO’s” on the label, a telling sign of the sway these groups have on private industry. “Whether produce is grown organically, or with biopesticides or GMO technology, we have to stick together as an industry,” says Enright. Communicating how food is grown to generate more balanced and accurate articles is critical, she explains.

## Walking A Fine Line

“All the consternation in the organic movement was the fear-mongering of conventional produce, which was one of the tactics used in the industry,” says Melnick. “It rubbed a lot of people the wrong way. The same dynamic applies here, pointing to low pesticide residue or no residue in particular produce. Are you saying the rest of the produce aisle is laden with pesticides?”

Melnick explains the marketing dilemma. “This is the challenge we face. The last thing retailers want to talk about at point of sale is less pesticides because then they are implying something else about their entire inventory. On the other hand, sustainability is a broader concept because biorationals have a position impact on product quality, including more marketable fruit, longer shelf life and low environmental impact. These are attributes that are important to the entire chain.”

“The last thing we want to do is say other

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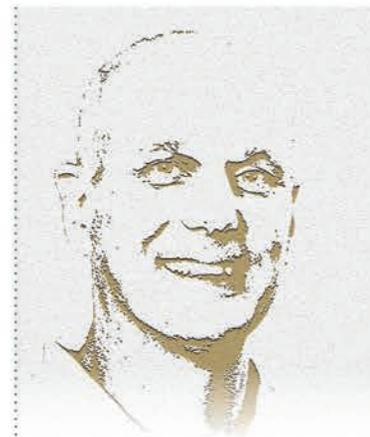
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*“Biopesticides represent flexibility to our markets. MRL issues are unlikely.”*

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chemicals are bad; biorationals work in an integrated partnership with conventionals. There are times where biorationals make sense and vice versa,” emphasizes Melnick. “We are not saying synthetic pesticides are bad; what we are saying is the best program is an integrated program, and growers are learning and demanding it more and more.”

“We are strictly dedicated to stay as a biopesticide business,” says Certis USA’s Damico.

“The point we want to get across, not only

## MERGERS, INTEGRATED PEST MANAGEMENT

In the crop protection industry, there have been a number of mergers and acquisitions in the past couple years of major conventional crop protection corporations buying biopesticide companies. Mega companies, such as Bayer, Monsanto, BASF and Syngenta, see a need for an integrated offering by using biorationals with conventional crop protection in a synchronous way.

“We currently live in an environment conducive for biopesticide products. The same drivers exist in other regions around the world and are stronger in Europe than the U.S.,” says Ashish Malik, vice president of global marketing Biologics for West Sacramento, CA-based Bayer Crop Science, and also on the board of directors of BPIA.

“The way we define the industry and the food chain is what happens to produce after the farmer harvests products. Some are big companies that care about a global image and global brand, and oftentimes are driven by consumer pressure and consumer perceptions,” says Malik.

“In the context of the food chain player, sustainability and profitability, it’s very clear there are societal pressures, and resources on the environmental side of the equation are more expensive,” he says. However, Malik argues, “if the food chain just put those sets of requirements on their suppliers, what would happen is the cost of the product would increase, thus impacting profitability down the supply chain.”

To be sustainable, one has to be profitable. “The new biological products are extremely effective in an integrated solution. Cost to the farmer doesn’t change, and therefore cost savings are passed down the supply chain,” he says. **pb**

for our business but for the biopesticide industry as a whole, is that biological products are not just for organic growers. They are a key component for an integrated approach for conventional growers,” he says, noting, “probably 95 percent of biopesticide sales that occur are on conventional produce to conform to sustainability goals.”

Melnick points to challenges in building awareness and dispelling misconceptions of biorationals and in compelling U.S. retailers to get on board. The vast majority of retailers and foodservice providers are not aware of biorationals. “We hope more aggressive sustainable companies take the lead in buying food produced with systems that include these products,” says Melnick.

“This type of production does appeal to a certain percentage of the consumer base. If people realize these products are available, they will buy them. Retailers want the highest quality products to bring to their customers, and quality comes in lots of forms, whether the crispness or shape of apple, firmness of a banana, or the pesticide residue levels or impact on the environment.”

## Getting The Word Out

“We sell our biological products to farmers, but so much of the value is to the whole food chain,” says Ashish Malik, vice president of marketing for West Sacramento, CA-based Bayer CropScience. “It is a part of the answer to the sustainability initiatives of the food chain. An executive of the food chain needs to get educated, not about the individual products, but about the whole space and how they can say to their stakeholders how biopesticides are contributing to their sustainability initiatives,” says Malik.

“Biological offerings traditionally are exempt from residue tolerances and are deemed to be very safe to humans and the environment. The EPA will look at these products and say there is no need to establish a residue tolerance,” says Certis USA’s Damico.

“Biorationals more or less prevent residues from building up on crop. The value proposition we can offer merchandisers of different foods is to provide low residue or residue-free produce,” says Damico.

“Creating awareness of biorationals at the retail level is a little tough,” says Melnick. “That’s what we are trying to achieve. The produce industry is driven by quality and price, no blemishes and long shelf life. A component of that quality can be achieved with biorational products.”

By the time produce is made available to

## SETTING THE RECORD STRAIGHT: NOT ALL BT’S ARE THE SAME

While misunderstandings abound, “biorational products are non-GMO,” says Rick Melnick, chairman of the board and director of the Biopesticide Industry Alliance (BPIA). Among the most prevalent GMOs are Bt corn, Bt cotton, and Bt soybeans. Ironically, GMO technology had its genesis in Bts (*Bacillus thuringiensis*), but with simpler forms of the organism’s inherent toxicity. It is completely different than the original organism of Bt.

“Metabolites within the Bt organism are toxic to a caterpillar, but there is no toxicity to humans. The same is true with GMOs, but GMO technology imbeds this Bt gene in the plant so the plant expresses it, the caterpillar takes a bite, stops eating and starves and dies.

“Foliar-applied, biorational Bt’s contain multiple toxins and are far more complex than what is expressed in a GMO,” says Melnick. “There’s nothing genetically modified in a biorational. Bt is a ubiquitous soil-borne organism that we grow through fermentation. Because it’s called Bt corn and Bt cotton, there is a misconception that this is the Bt that we sell.

“It’s important to realize that there are thousands of *Bacillus* species naturally occurring in the environment, but only a few of these having these pesticidal properties, and people in science understand this.” **pb**

the buyers, they can be assured it is tested for residue levels enforced by whatever regulatory bodies are in place. That being said, there are crop protection and production products inherently more sustainable, and if consumers are aware that such products exist, demand can be created, Melnick adds.

The main piece of advice Melnick gives to produce industry executives is to get educated. “If you learn about the technologies and what they can do, it will generate reasons for how you can generate value for your company. If you have a customer base keen on sustainability issues, there is an opportunity to market the fact that you are providing high quality produce utilizing these important sustainable technologies. The value of biopesticides is there, and it’s already being realized, and being transferred right down the chain.” **pb**



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