MARRONE BIO INNOVATIONS INC
Form 10-K
March 30, 2016
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UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

x **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2015

or

¨ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission File Number: 001-36030

Marrone Bio Innovations, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**20-5137161**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

1540 Drew Avenue, Davis, California 95618

(Address of principal executive offices and zip code)

(530) 750-2800

(Registrant s telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Class	**Exchange on which registered**
Common Stock, $0.00001 par value	**NASDAQ Global Market**

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ¨ No x

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ¨ No x

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes x No ¨

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes x No ¨

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 or Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of the registrant s knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ¨

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company.

Large accelerated filer ¨	Accelerated filer ¨
Non-accelerated filer ¨ (Do not check if a smaller reporting company)	Smaller reporting company x

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ¨ No x

As of June 30, 2015, the last day of the registrant s most recently completed second quarter, the aggregate market value of the registrant s voting and non-voting common stock held by non-affiliates was $20,508,703 based upon the closing price of the common stock as reported on the NASDAQ Global Market. This calculation excludes the shares of common stock held by each officer, director and holder of 5% or more of the outstanding common stock as of June 30, 2015. This calculation does not reflect a determination that such persons are affiliates for any other purposes.

Indicate the number of shares outstanding of each of the issuer s classes of common stock, as of the latest practicable date.

Class	Shares Outstanding at March 23, 2016
Common Stock, $0.00001 par value	24,583,831

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant s Proxy Statement for its 2016 Annual Meeting of Stockholders are incorporated by reference in Part III of this Annual Report on Form 10-K where indicated. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant s fiscal year ended December 31, 2015.

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Special Note Regarding Forward-Looking Statements and Trade Names

This Annual Report on Form 10-K includes a number of forward-looking statements that involve many risks and uncertainties. Forward-looking statements may be identified by the use of the words would , could , will , may , exp believe , should , anticipate , outlook , if , future , intend , plan , estimate , predict , potential , target similar words and phrases, including the negatives of these terms, or other variations of these terms, that denote future events. These forward-looking statements include: our plans to target our existing products or product variations for new markets and for new uses and applications; our plans and expectations with respect to growth in sales of our product lines and with respect to Bio-Tam 2.0; our ability and plans to develop, register and commercialize additional new product candidates and bring new products to market across multiple categories faster and at a lower cost than other developers of pest management products, including research, development and field trial plans; our expectations regarding registering new products and new formulations and expanded use labels for existing products, including submitting new products to the EPA; our belief that challenges facing the use of conventional chemical pesticides will continue to grow; our beliefs regarding the growth of markets for, and unmet demand for, bio-based products; our beliefs regarding market adoption of our products and our ability to compete in our target markets; our intention to maintain existing, and develop new, supply, sales and distribution channels and extend market access; expectations regarding potential future payments under strategic collaboration and development agreements; our plans and expectations relating to our debt agreements; our plans to grow our business while improving efficiency, including by focusing on a limited number of product candidates, taking measures to reduce expenses and expanding our sales and marketing team; our plans with respect to manufacturing; our plans to seek third-party collaborations to develop and commercialize more early stage product candidates; our intention to continue to devote significant resources toward our proprietary technology and research and development; our expectations that sales will be seasonal and the impact of continued drought and other weather-related conditions; our ability to protect our intellectual property in the United States and abroad; our beliefs regarding the effects of the outcome of certain legal matters; our anticipated impact of certain accounting pronouncements; our ability to use carryforwards; our expectations regarding market risk, including interest rate changes, foreign currency fluctuations and commodity price changes; and our future financial and operating results. These statements reflect our current views with respect to future events and our potential financial performance and are subject to risks and uncertainties that could cause our actual results and financial position to differ materially and adversely from what is projected or implied in any forward-looking statements included in this Annual Report on Form 10-K. These factors include, but are not limited to, the risks described under Part I Item 1A Risk Factors, Part II Item 7 Management s Discussion and Analysis of Financial Condition and Results Operations, elsewhere in this Annual Report on Form 10-K and those discussed in other documents we file with the U.S. Securities and Exchange Commission (SEC). We make these forward-looking statements based upon information available on the date of this Annual Report on Form 10-K, and we have no obligation (and expressly disclaim any such obligation) to update or alter any forward-looking statements, whether as a result of new information or otherwise except as otherwise required by securities regulations.

As used herein, MBI , the Company , we , our and similar terms refer to Marrone Bio Innovations, Inc., unless the context indicates otherwise.

Except as context otherwise requires, references in this Annual Report on Form 10-K to our product lines, such as Regalia, refer collectively to all formulations of the respective product line, such as Regalia Maxx, Regalia Rx or Regalia SC, and all trade names under which our distributors sell such product lines internationally, such as Sakalia, Sentry R or Milsana. Our logos, Grandevo®, Regalia®, Venerate®, Zequanox®, Haven™, Majestene™ and other trade names, trademarks or service marks of Marrone Bio Innovations, Inc. appearing herein are the property of Marrone Bio Innovations, Inc. This Annual Report on Form 10-K contains additional trade names, trademarks and service marks of other companies, such as Bio-Tam® 2.0. We do not intend our use or display of other companies trade names, trademarks or service marks to imply relationships with, or endorsement or sponsorship of us by, these other

companies.

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PART I

ITEM 1. BUSINESS

We make bio-based pest management and plant health products. Bio-based products are comprised of naturally occurring microorganisms, such as bacteria and fungi, and plant extracts. Our current products target the major markets that use conventional chemical pesticides, including certain agricultural and water markets, where our bio-based products are used as alternatives for, or mixed with, conventional chemical products. We also target new markets for which (i) there are no available conventional chemical pesticides or (ii) the use of conventional chemical pesticides may not be desirable or permissible either because of health and environmental concerns (including for organically certified crops) or because the development of pest resistance has reduced the efficacy of conventional chemical pesticides. All of our current products are approved by the United States Environmental Protection Agency (EPA) and registered as biopesticides. We expect our future products will include plant health products qualified as biostimulants, which may require state registrations, but do not require EPA registration. We believe our current portfolio of products and our pipeline address the growing global demand for effective, efficient and environmentally responsible products to control pests, increase crop yields and reduce crop stress.

We currently primarily sell our products to the crop protection market. Our four commercially available crop protection product lines are Regalia, for plant disease control and plant health, Grandevo and Venerate, for insect and mite control, and Majestene, for nematode control. These products can be used in both conventional and organic crop production, and are sold to growers of specialty crops such as grapes, citrus, tomatoes, vegetables, nuts, leafy greens and ornamental plants. We have had some sales of Regalia for large-acre row crops such as corn and soybeans. In March 2016, we also entered into an agreement with Isagro USA to distribute Bio-Tam 2.0 for soil-borne disease control and grapevine trunk disease control, which complements our existing products, particularly Regalia. In addition, we have developed Zequanox, a commercially available product line that we sell to the water treatment market. Zequanox selectively controls invasive mussels that cause significant infrastructure and ecological damage across a broad range of in-pipe and open-water applications, including hydroelectric and thermoelectric power generation, industrial applications and recreation. We believe that our existing crop protection products, or variations thereof, can also be specifically targeted for industrial and institutional, turf and ornamental, home and garden and animal health uses such as controlling grubs, ants, flies and mosquitoes in and around schools, parks, golf courses and other public-use areas.

We have been implementing a prioritization plan that focuses our resources on continuing to improve and promote our commercially available products, advancing product candidates that are expected to have the greatest impact on near-term growth potential and expanding our international presence and commercialization. Our goal has been to reduce expenses, conserve cash and improve operating efficiencies, to extract greater value from our products and product pipeline and to improve our communication to and connection with the global sustainability movement that is core to our cultural values.

In connection with this strategy, we have significantly reduced overall headcount, while building a new sales and marketing organization with increased training and ability to educate and support customers in specialty crop markets, as well as providing our product development staff with greater responsibility for technical sales support, field-trials and demonstrations to promote sales growth. For markets other than high-value specialty crops, such as row crops and seed treatments, we are seeking to expand our network of distribution partners, focusing on regional and national distributors operating in countries that present a significant opportunity for near-term revenue generation. In addition, our research and development efforts are now focused on supporting existing commercial products with a focus on reducing cost of product revenues, further understanding the modes of action, manufacturing support and improving

formulations. Accordingly, while we believe that we have developed a robust pipeline of novel product candidates, we are currently limiting our internal efforts to four product candidates: MBI-010, a bioherbicide that is based on the microorganism in Venerate and Majestene, which we plan to submit to the EPA in late 2016 or early 2017; MBI-110, a biofungicide, which we submitted to the EPA in January 2016; Haven (MBI-505), a plant health product that does not require EPA registration; and

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MBI-601, a biopesticide that produces gaseous natural compounds, or biofumigant, which we submitted to the EPA in April 2014. Simultaneously, we are seeking collaborations with third parties to develop and commercialize more early stage candidates on which we have elected not to expend significant internal resources.

We believe that, collectively, these measures will best position us to respond to the business challenges reflected in our financial results for recent periods, but our long-term, global vision for our business and our commitment to that vision remains fundamentally unchanged.

Industry Overview

Pest management is an important global industry. Phillips McDougall, an independent advisory firm, estimates the 2014 agrichemical market (crop protection) at $56.6 billion, with Brazil ranking first at $11.6 billion in sales, followed by the United States at $9.2 billion. Most of the markets we currently target or plan to target primarily rely on conventional chemical pesticides, supplemented in certain agricultural markets by the use of genetically modified crops. Conventional chemical pesticides are generally synthetic materials that directly kill or inactivate pests. However, demand for effective and environmentally responsible bio-based products continues to increase. The global market for biopesticides, which control pests by non-toxic mechanisms such as attracting pests to traps or interfering with their ability to digest food, was valued at $3.6 billion in 2014 and is projected to grow to $6.9 billion in 2019, reflecting a 13.9% compound annual growth rate of over the period, according to BCC Research, an independent market research firm. In comparison, global synthetic pesticides sales were projected at a 5.7% compound annual growth rate for the same period. We believe these trends will continue as the benefits of using bio-based pest management and plant health products become more widely known.

Crop Protection

Conventional Production. Growers are constantly challenged to supply the escalating global demand for food, while reducing the negative impact of crop protection practices on consumers, farm workers and the environment. The dominant technologies for crop protection are conventional chemical pesticides and genetically modified crops. Major agrichemical companies have invested billions of dollars to develop genetically modified crops that resist pests or have high tolerance to conventional chemical pesticides. The market for genetically modified crops was estimated at $21.0 billion in 2014, according to Phillips McDougall. In addition, according to the International Service for the Acquisition of Agri-biotech Applications, a third-party not-for-profit organization, in 2014, 182 million hectares (484 million acres) were planted with genetically modified crops in 28 countries, with the United States, Brazil, Argentina, India and Canada planting the most (in that order). Soybean, corn, cotton and canola plantings have made the greatest inroads, accounting for 50%, 30%, 14% and 9%, respectively, of genetically modified seeds planted globally.

Conventional chemical pesticides and genetically modified crops have historically been effective in controlling pests. However, there are increasing challenges facing the use of conventional chemical pesticides such as pest resistance and environmental, consumer and worker safety concerns. Governmental agencies are further pressuring growers, distributors and manufacturers by restricting or banning certain forms of conventional chemical pesticide usage, particularly in the European Union, as some conventional chemical pesticide products are being phased out, as well as at local levels, where many city and county governments have prohibited the sale of certain conventional chemical pesticide products, magnifying the complexity of agrichemical companies distribution and regulatory compliance. At the same time, a number of supermarket chains, food processors and key purchasers of specialty fruits, nuts and vegetables are imposing synthetic chemical residue restrictions, limiting options available to growers close to harvest. Consumers, scientists and environmental groups have also voiced concerns about the unintended effects of genetically modified crops, including pest resistance and contamination of non-genetically modified crops. In response to consumer and environmental group concerns and restrictions by importing countries, several large-scale food

purchasers have demanded that their contracted growers supply them only non-genetically modified crops.

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These factors are significant market drivers for conventional producers, and their impact is continuing to grow. An increasing number of growers are implementing integrated pest management (IPM) programs that, among other things, combine bio-based pest management products and crop cultivating practices and techniques such as crop rotation, with conventional chemical pesticides and genetically modified crops. Bio-based pest management products are becoming a larger component of IPM programs due in part to the challenges associated with conventional chemical pesticides and genetically modified crops.

Organic Production. Certified organic crops such as food, cotton and ornamental plants, are produced without the use of synthetic chemicals, genetic modification or any other bioengineering or adulteration. As such, organic growers are limited in the number of alternatives for pest management. The U.S. Department of Agriculture, or the USDA, approved national production and labeling standards for organic food marketed in the United States in late 2000. These standards have contributed to the growth of organic food consumption in the United States, and other countries have implemented similar programs. According to the Organic Trade Association, a business association, consumer demand for organic food has outpaced the available acreage in the United States, with $1.4 billion of organic food imported in 2013 and $49.0 billion of domestic organic food sales in 2014, or 5% of all food sales, up 11% over 2013. In addition, U.S. sales of non-GMO-labeled foods were estimated at $8.5 billion across 2,100 brands and 22,000 verified items in 2014, according to SPINS, a third party consulting firm. Globally, organic food sales reached $80.0 billion in 2014, with 43.7 million hectares planted, according to a study by the Research Institute of Organic Agriculture performed on behalf of the International Foundation for Organic Agriculture. We believe this growing demand is primarily driven by concerns about food safety and the adverse environmental effects of conventional chemical pesticides and genetically modified crops.

Water Treatment

Global demand for water treatment products was estimated to be $48.0 billion in 2012, according to The Freedonia Group, an independent market research firm, and the global market for specialty biocide chemicals for water treatment was projected to be $5.2 billion in 2013, according to BCC Research. Invasive and native pest species are increasingly a concern in diverse applications such as hydroelectric and thermoelectric power generation, industrial applications, drinking water, aquaculture, irrigation and recreation. However, discharge of water treatment chemicals to target these pests is highly regulated, and in many cases, such as with management of open waters and sensitive environmental habitats, use of conventional chemicals is prohibited.

One particular area of concern has been the damage caused by invasive zebra and quagga mussels, which clog pipes, disrupt ecosystems, encrust infrastructure and blanket beaches with razor-sharp shells. These species initially infested the Great Lakes region and have spread across the United States. Industry reports estimate that these mussels cause approximately $1.0 billion in damage and associated control costs annually in parts of the United States alone. There are limited treatment options available, many of which are toxic to aquatic flora and fauna. To date, most treatment options have been focused either on manual removal of the mussels, which is time consuming and costly, or conventional chemical treatments, which potentially jeopardize the environment and are thus heavily controlled by regulatory agencies.

The water treatment market also includes products to control algae, aquatic weeds and unwanted microorganisms. For example, one of the most effective and popular methods for controlling algae and unwanted microorganisms is chlorination. One of the major concerns in using chlorination in surface water supplies is that chlorine combines with various organic compounds to form by-products, some of which are considered possible carcinogens.

Other Target Markets

We are also taking steps through strategic collaborations to commercialize our existing crop protection products, or variations thereof, for other markets. Although conventional chemical pesticides have traditionally serviced the industrial and institutional, professional turf and ornamental, home and garden and animal health markets,

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governmental regulations are restricting their use, and reports indicate that end users increasingly value environmentally friendly products, with some households willing to forego pest control treatments entirely if alternatives to conventional chemical pesticides are not available.

Benefits of Bio-Based Pest Management and Plant Health Products

While conventional chemical pesticides are often effective in controlling pests, some of these chemicals are acutely toxic, some are suspected carcinogens and some can have other harmful effects on the environment and other animals. Health and environmental concerns have prompted stricter legislation around the use of conventional chemical pesticides, particularly in Europe, where the use of some highly toxic or endocrine-disrupting chemical pesticides is banned or severely limited and the importation of produce is subject to strict regulatory standards on pesticide residues. In addition, the European Union has passed the Sustainable Use Directive, which requires EU-member countries to reduce the use of conventional chemical pesticides and to use alternative pest management methods, including bio-based pest management products. Over the past two decades, U.S. regulatory agencies have also developed stricter standards and regulations. Furthermore, a growing shift in consumer preference towards organic and sustainable food production has led many large, global food retailers to require their supply chains to implement these practices, including the use of bio-based pest management and fertilizer solutions, water and energy efficiency practices and localized food product sourcing.

Aside from the health and environmental concerns, conventional chemical pesticide users face additional challenges such as pest resistance and reduced worker productivity as workers may not return to the fields for a certain period of time after treatment. Similar risks and hazards are also prevalent in the water treatment market, as chlorine and other chemicals used to control invasive water pests contaminate and endanger natural waterways. Costs of using conventional chemical pesticides are also increasing due to a number of factors, including raw materials costs, stringent regulatory requirements and pest resistance to conventional chemical pesticides, which requires increasing application rates or the use of more expensive alternative products.

As the cost of conventional chemical pesticides increases, the use of conventional chemical pesticides and genetically modified crops meets increased opposition from government agencies and consumers and the efficacy of bio-based pest management and plant health products becomes more widely recognized among growers, bio-based pest management products are gaining popularity and represent a strong growth sector within the market for pest management technologies. Growers are increasingly incorporating bio-based pest management products into IPM programs, and bio-based pest management products help create the type of sustainable agriculture programs that growers and food companies increasingly emphasize.

Bio-based pest management products include biopesticides, as well as minerals such as copper and sulfur. The EPA registers biopesticides in two major categories: (i) microbial pesticides, which contain a microorganism such as a bacterium or fungus as the active ingredient and (ii) biochemical pesticides, which are naturally occurring substances such as insect sex pheromones, certain plant extracts and fatty acids. Biostimulants, which are not registered by the EPA absent additional pest control usages, are microorganisms or natural substances derived from microorganisms or plants that growers use to reduce plant stress, stimulate plant physiology to increase yield, manage pest resistance and reduce chemical residues.

We believe many bio-based pest management products perform as well as or better than conventional chemical pesticides. When used in rotation or in spray tank mixtures with conventional chemical pesticides, bio-based pest management products can increase crop yields and quality over chemical-only programs. Agricultural industry reports, as well as our own research, indicate that bio-based pest management products can affect plant physiology and morphology in ways that may improve crop yield and can increase the efficacy of conventional chemical

pesticides. In addition, pests rarely develop resistance to bio-based pest management products due to their complex modes of action. Likewise, bio-based pest management products have been shown to extend the product life of conventional chemical pesticides and limit the development of pest resistance, a key issue facing users of conventional chemical pesticides, by eliminating pests that survive conventional chemical pesticide treatments. Most bio-based pest management products are listed for use in organic farming, providing those

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growers with compelling pest control options to protect yields and quality. Given their generally lower toxicity compared with many conventional chemical pesticides, bio-based pest management products can add flexibility to harvest timing and worker re-entry times and can improve worker safety. Many bio-based pest management products are also exempt from conventional chemical residue tolerances, which are permissible levels of chemical residue at the time of harvest set by governmental agencies. Bio-based pest management products may not be subject to restrictions by food retailers and governmental agencies limiting chemical residues on produce, which enables growers to export to wider markets.

In addition to performance attributes, bio-based pest management products registered with the EPA as biopesticides can offer other advantages over conventional chemical pesticides. From an environmental perspective, biopesticides have low toxicity, posing low risk to most non-target organisms, including humans, other mammals, birds, fish and beneficial insects. Biopesticides are biodegradable, resulting in less risk to surface water and groundwater and generally have low air-polluting volatile organic compound content. Because biopesticides tend to pose fewer risks than conventional pesticides, the EPA offers a more streamlined registration process for these products, which generally requires significantly less toxicological and environmental data and a lower registration fee. As a result, both the time and money required to bring a new product to market are reduced.

Our Solution

We produce bio-based pest management and plant health products that are effective and generally designed to be compatible with existing pest control equipment and infrastructure. This allows them to be used as alternatives for, or mixed with, conventional chemical pesticides, as well as in markets for which there are no available conventional chemical pesticides or the use of conventional chemical products may not be desirable or permissible because of health and environmental concerns. We believe that compared with conventional chemical pesticides, our products:

- can be competitive in both price and efficacy;
- provide viable alternatives where conventional chemical pesticides and genetically modified crops are subject to regulatory restrictions;
- comply with market-imposed requirements for pest management programs by food processors and retailers;
- are environmentally friendly;
- meet stringent organic farming requirements;
- improve worker productivity by shortening field re-entry times after spraying and allowing spraying up to the time of harvest;

are exempt from residue restrictions applicable to conventional chemical pesticides in both the agriculture and water markets; and

are less likely to result in the development of pest resistance.

In addition, our experience has shown that when our products are mixed with conventional chemical pesticides, they can:

increase the effectiveness of conventional chemical pesticides while reducing their required application levels;

increase levels of pest control and consistency of control;

increase crop yields;

increase crop quality, including producing crops with higher levels of protein, better taste and color and more attractive flowers; and

delay the development of pest resistance to conventional chemical pesticides.

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We believe that the benefits of our products will encourage sustained adoption by end users. For example, we have seen that growers that have used our products on a trial basis in one year have generally continued to use our products in higher levels in subsequent years.

Our Competitive Strengths

Focus on Bio-Based Products

Our belief in and commitment to our vision is our greatest strength. We believe that the world needs more organic and sustainable products and practices, and our goal is to champion that cause. Our experience has shown that by using bio-based pest management and plant health products, growers can benefit the environment and produce more healthy food while improving yields. However, bio-based products have application methods and modes of action that differ fundamentally from conventional chemical products. While major agrichemical companies sell bio-based products, we do not believe that those companies have sufficiently prioritized bio-based products or invested in the internal and external education that is essential to successfully promote these products, and those companies are often conflicted when marketing both conventional chemical products and bio-based products. In contrast, we believe MBI has long been recognized as a thought leader in the bio-based product industry, and we have consistently sought to educate growers in the use and benefits of these products, both alone and mixed with conventional chemical products. We believe our drive to convert acres to these sustainable practices will make us disruptive.

Commercially Available Products

We have five commercially available product lines: Regalia, Grandevo, Venerate, Majestene and Zequanox. All five of these product lines are EPA approved, and Regalia is also approved in Canada, nine Latin American countries (including Brazil), South Africa and parts of Europe. Zequanox is approved in Canada for hydropower facilities, with a label expansion to other industrial and open water uses pending, and is the only product EPA-approved for open water application other than copper, which is rarely used due to its negative environmental effects and uneven efficacy in open water applications. All five of these commercialized lines are subject to patents and trade secrets related to the work we have done to characterize, formulate, develop and manufacture marketable products. In March 2016, we entered into an agreement with Isagro USA to distribute Bio-Tam 2.0, an EPA-approved biofungicide that complements our existing product lines, particularly Regalia. We believe these product lines, along with our other EPA-approved and EPA-submitted products and other pipeline product candidates, provide us with the foundation for continuing to build the leading portfolio of bio-based pest management products.

Robust Pipeline of Novel Product Candidates

Our pipeline of early-stage discoveries and new product candidates extends across a variety of product types for different end markets, including herbicides, fungicides, nematicides, insecticides, algaecides (for algae control), molluscicides (for mussel and snail control) and plant growth and plant stress regulators. Our product candidates are developed both internally and sourced from third parties. Our research and development process enables us to discover, source and develop multiple products in parallel, which keeps our pipeline robust. We are developing the microorganism in Venerate and Majestene, a *Burkholderia rinojensis* bacterium that we isolated using our discovery process, as MBI-010, a bioherbicide. We also have additional product candidates at various other stages of development, including MBI-601, a fungus that produces volatile compounds and works as a soil biofumigant, which was submitted to the EPA in April 2014 and MBI-110, a new *Bacillus*-based fungicide, that has demonstrated activity against downy mildew, *Sclerotinia* and other crop diseases, which we submitted to the EPA in January 2016. In August 2014, we received EPA approval of MBI-011, a weed-controlling biochemical, sarmentine, discovered and isolated from a pepper plant species, and we are currently pursuing third-party manufacturers to synthesize the natural

compound at a cost that allows us to introduce the product to the market.

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Rapid and Efficient Development Process

We believe we can develop and commercialize novel and effective products faster and at a lower cost than many other developers of pest management products. For example, we have moved each of Regalia, Grandevo, Venerate, Majestene and Zequanox through development, EPA approval and first U.S. launch in approximately four years or less at a cost of $3.0 million to $6.0 million. Thereafter, we have continued to develop and refine these products, producing new formulations, applying for expanded use labels and seeking new markets, in each case at a cost of less than $10.0 million per product line. In comparison, a report from Phillips McDougall shows that the average cost for major agrichemical companies to bring a new crop protection product to market has been over $250.0 million, and these products have historically taken an average of nearly ten years to move through development, regulatory approval and market launch.

Proprietary Discovery Process

Our discovery process allows us to efficiently discover microorganisms and plant extracts that produce or contain compounds that display a high level of pesticidal activity against various pests and target specific unmet market needs. After we identify pesticidal activity, we subject the microorganisms and plant extracts to tests to determine effects on plant growth, nutrient uptake and drought and salt stress. We then use various analytical chemistry techniques to identify and characterize the natural product chemistry of the compounds, which we optimize and patent. Four of our product candidates, one of which is EPA-approved, are what we believe to be newly identified microorganism species. We believe that four of our product candidates produce novel compounds that we identified, and four of our product candidates have been found to have, or produce compounds with, a novel mode of action. Our proprietary discovery process is protected by patents on the microorganisms, their natural product compounds and their uses for pest management, as well as a patent application we have filed on a screening process to identify enzyme-inhibiting herbicides. We also maintain trade secrets related to the discovery, formulation, process development and manufacturing capabilities. By conducting our own discovery with a focus on unmet market needs, as well as working with outside collaborators, we are able to access the broadest range of products for commercialization, giving us an advantage over other natural bio-based pest management companies. For example, we identified MBI-110 in our discovery screen by targeting downy mildews, a problem for which there are few biological and chemical solutions.

Management Team with Significant Industry Experience

Our management team has extensive experience in bio-based pest management products and the broader agriculture industry. Our chief executive officer and other key employees average over 25 years of experience and include individuals who have led agrichemical sales and marketing organizations, top scientists and industry experts, some of whom have served in leadership roles at large multinational corporations and governmental agencies, commercialized multiple products, brought multiple products through EPA, state and foreign regulatory processes, filed patent applications and received patents, led groundbreaking research studies and published numerous scientific articles. In addition, our chief financial officer brings over 30 years of financial management experience spanning a variety of industries, including over 13 years of service as several public companies chief financial officer. Our general counsel has over 30 years of experience, including over 25 years with public companies, in senior legal, sales and operating roles, including general counsel, vice president of sales and chief operating officer.

Our Growth Strategy

Accelerate Adoption of New Products, Product Applications and Product Lines

Our goal is to provide growers of specialty and row crops with complete and effective solutions to a broad range of pest management and plant health needs. Due to the competitive nature of the industry and the seasonality of crop growing, speed is essential to ensure widespread adoption. Accordingly, we have launched targeted placements of our products with early adopters in the United States relatively early in the product commercialization stage and for a limited number of indications. These growers, many of whom have unmet market needs, help us to troubleshoot and refine our products and to maximize their value proposition, enabling

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us to efficiently develop new formulations and expand uses and market penetration with minimal up-front capital investment per product line. We also believe we will be able to leverage growers positive experiences using our Regalia, Grandevo, Venerate and Majestene product lines to accelerate adoption of new products, product applications and product lines, including Bio-Tam 2.0. We believe product diversity allows us to compete with larger companies, to strengthen relationships with growers and distributors and to not be dependent on any one product or product category. Further, by offering and developing multiple products simultaneously, we believe we are perceived as a technology leader and can gain the benefits of increased momentum with distributors and end users. We will continue to target early adopters of new pest management and plant health technologies with controlled product launches and educate growers and water resource managers about the benefits of bio-based pest management products through demonstrations to accelerate commercial adoption of our products.

Deliberately Expand Applications of Our Product Lines

We want growers to know and trust that our products work. Although our initial EPA-approved master labels cover our products anticipated crop-pest use combinations, we launch early formulations of our pest management and plant health products to targeted customers under commercial labels that list a limited number of crops and applications that our initial efficacy data can best support. We then gather new data from experiments, field trials and demonstrations, gain product knowledge and get feedback to our research and development team from customers, researchers and agricultural agencies. Based on this information, we enhance our products, refine our recommendations for their use in optimal IPM programs, expand our commercial labels and submit new product formulations to the EPA and other regulatory agencies. For example, we began sales of Regalia SC, an earlier formulation of Regalia, in the Florida fresh tomatoes market in 2008, while a more effective formulation of Regalia with an expanded master label, including listing for use in organic farming, was under review by the EPA. When approved, we launched this new formulation into the Southeast United States in 2009 and nationally in 2010. In 2011, we received EPA approval of a newly expanded Regalia master label covering hundreds of crops and various new uses for applications to soil and through irrigation systems, and we recently expanded Regalia for use in large-acre row crops as a plant health product, in addition to its beneficial uses as a fungicide. Similarly, ongoing field development research on the microbe used in our insecticide product Venerate led to our October 2015 registration of Majestene as a nematicide. In addition, as Grandevo has shown activity against larval and adult mosquitos, we intend to expand testing to determine if the application of Grandevo can be expanded to include this important disease vector. We believe we have opportunities to broaden the commercial applications and expand the use of our existing products lines into several key end markets, including large-acre row crop applications, seed treatment, forestry and public health to help drive significant growth for our company.

Focus on Proven Technology Families

We discover and develop more than one product line based on the same technology. For example, the *Burkholderia* microbe on which Venerate is based is also active against a broad range of nematodes, enabling development as our bionematicide product, Majestene, and produces several herbicidal compounds, enabling development as our bioherbicide product candidate, MBI-010. In addition, our product candidates MBI-110 and MBI-507 are based on microbial fermentations of a newly identified *Bacillus* strain we isolated using our proprietary screening platform, and the *Chromobacterium* species on which Grandevo is based may also yield a promising bionematicide product, which we have begun development as MBI-304. Developing multiple products based on the same microbe allows for a more efficient use of research, development and manufacturing resources and enables us to leverage capital invested in existing technologies.

Continue to Develop and Commercialize New Products in Both Existing and New Markets

Our goal is to rapidly and efficiently develop, register and commercialize new products each year, with the goal of developing a full suite of pest management and plant health products. For example, while our current crop protection products address plant diseases, insects and nematodes, we are developing products that control weeds as well as products for improving fertilizer efficiency and reducing drought and salt stress. Our bioassay

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screening has identified at least four microbes that display activity against blue-green algae associated with toxic algal blooms, which have resulted in seasonal closures of some drinking water supplies in the Great Lakes region, and we are seeking partners to move these early-stage discoveries forward.

Target International Markets

Expanding international sales is an important component of our growth strategy, but the global markets for pest management products are intensely competitive. Our plan is to focus on key countries and regions with the largest and fastest growing biopesticide and plant health product markets for specialty crops and select row crops. We intend to work with regional distributors and distributors in key countries who have brand recognition and established customer bases and who can conduct field trials and grower demonstrations and lead or assist in regulatory processes and market development.

Leverage Manufacturing Capabilities

We initially used third-party manufacturers to produce all of our products on a commercial scale. In 2014, we completed the repurpose of a manufacturing facility that we purchased in July 2012 by installing three 20,000 liter fermentation tanks and constructing a dedicated building to house them, which has enabled us to manufacture in-house certain of our products. We believe that greater control of our own manufacturing capacity allows us to scale-up processes and institute process changes more quickly and efficiently while ultimately lowering manufacturing costs over time to achieve desired margins and protecting the proprietary position of our products. We continue to use third party manufacturers for Venerate and Majestene and for spray-dried powder formulations of Grandevo and Zequanox.

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Our Products

Commercially Available Products

The table below summarizes our current portfolio of commercially available biopesticide products, which have been able to move through development, EPA approval and first U.S. market launch in four years or less and at a cost of $3.0 million to $6.0 million. We have continued to develop and refine these products after initial launch, producing new formulations, applying for expanded use labels and seeking new markets.

NAME	MARKET	TARGET	USE	STATUS
Regalia	Crop Protection, Home and Garden, Turf	Plant Disease/Plant Health	Protects against fungal and bacterial diseases and enhances yields	Commercially Available Domestically and Internationally
Grandevo	Crop Protection, Home and Garden, Turf and Ornamentals, Public Health, Forestry	Insects and Mites	Controls a broad range of sucking and chewing insects through feeding	Commercially Available Domestically; International Expansion Efforts Underway
Venerate	Crop Protection, Home and Garden, Turf and Ornamentals, Animal Health, Forestry	Insects and Mites	Controls sucking and chewing insects on contact	Commercially Available Domestically; International Expansion Efforts Underway
Majestene	Crop Protection, Turf	Plant Parasitic Nematodes	Controls soil-dwelling nematodes by preventing and reducing root galls, and by reducing adult reproduction and egg hatch	Commercially Available Domestically
Zequanox	Water Treatment	Invasive Mussels (In-Pipe and Open Water Habitat Restoration)	Controls invasive mussels that restrict water flow in industrial and power facilities and harm recreational waters	Commercially Available Domestically and in Canada

Regalia

Biofungicide

Crop Protection, Home and Garden, Turf: Targets Plant Disease, Improves Plant Health, Increases Yields

Commercially Available Domestically and Internationally

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Regalia, a plant extract-based fungicidal biopesticide, or biofungicide, is EPA-registered for crop and non-crop uses and approved for use on foliage and roots in all states in the United States, including California and Florida, where the majority of the specialty crops are grown. It is also approved for sale in Brazil (tomatoes, potatoes, dried beans), Ecuador (flowers), Mexico (citrus and tree fruit, berries, tomatoes, peppers, potatoes, cucurbits, flowers, potatoes and grapes), Turkey (covered vegetables), Canada (tomatoes, grapes, strawberries, cucurbits, apples, turf, blueberries, hops (emergency use), ornamental plants and wheat), Peru (grapes and quinoa), South Africa (grapes), Morocco (cucurbits, tomatoes and grapes), Tunisia (tomatoes) and Panama, Dominican Republic, El Salvador, Guatemala and Honduras (potatoes, tomatoes, peppers, tobacco, cucurbits, beans, avocados, citrus, peanuts, papayas and strawberries). Registration efforts are currently underway in China, with Regalia demonstrating efficacy in government-conducted trials on tomatoes, cucurbits, strawberries and grapes. University researchers have extensively tested the product against several important plant diseases, especially against mildews. We, and our commercial partners, have also conducted hundreds of trials in the United States and abroad, including five years of crop trials in Europe. The data show that Regalia is an effective addition to a disease management program against a broad range of diseases and can increase yields in crops such as strawberries, tomatoes, potatoes, soybeans, rice, wheat, alfalfa, sugarcane and corn.

Regalia is made from an extract of the giant knotweed plant and acts by turning on a plant s immune system, a process called induced systemic resistance. Regalia also enhances the efficacy of major conventional chemical fungicides, and we have received issued patents on this synergism. Regalia also is effective for seed treatment of soybean, corn and cotton, for which we have filed a patent application, and we have received an issued patent on the effects on root growth and yield when Regalia is applied to the seed or as a root stimulant. For example, in field tests and in actual grower use, Regalia has shown significant yield increases on strawberries, tomatoes, potatoes, soybeans, rice, wheat, alfalfa, sugarcane and corn, with less irrigation required for strawberries treated with Regalia.

We obtained an exclusive license relating to the technology used in our Regalia product line while Regalia was in the process development and formulation stage of product development. In addition to developing the supply chain to commercially market the product, using our natural product chemistry expertise, we developed an analytical method to measure and characterize the major compounds in the plant extract, and we enhanced these compounds several times in new formulations, providing Regalia with a broader spectrum of activity and better efficacy than the original licensed product. In addition, we improved the physical properties of our Regalia formulations and developed four formulations that meet organic farming standards. We have filed several patent applications with respect to these innovations. In addition, we have received a U.S. patent for modulating plant growth by treating roots of plants with Regalia (or other compounds or extracts of knotweed) and transplanting the plants into soil. We have also received a patent on the synergistic combination of Regalia or knotweed extract and some important chemical fungicides.

We launched Regalia SC, an earlier formulation of Regalia, into the Florida fresh tomatoes market in December 2008. This formulation had a limited label with a few crops and uses on the label and it was not compliant for organic listing. In 2009, we began selling Regalia-based plant health products in the United Kingdom (under the name Sentry R by Plant Health Care) and Ecuador (under the name Milsana), and we later received a revised, broader label with hundreds of crops for a new organic formulation, which we subsequently launched into the Florida vegetables and Arizona leafy greens markets. In January 2010, we received state approval in California and immediately launched Regalia into the leafy greens and walnuts markets. Key markets include vegetables in the southeast, citrus in Florida, leafy greens and vegetables in California and Arizona, walnuts and stone fruit in California and pome fruit and grapes in California and the Pacific Northwest. In December 2011 and August 2012, we received EPA approval and California regulatory approval, respectively, for an expanded Regalia label that includes new soil applications, instructions for yield improvement in corn and soybeans and additional crops and target pathogens. Our product for row crops is sold separately as Regalia Rx and for international markets, where the Regalia trademark is allowed, as Regalia Maxx. We submitted Regalia for registration in the European Union, which is one of the largest fungicide

markets in the world. We received regulatory approval for Regalia in South Africa in June 2013, in El Salvador, Guatemala and Honduras in December 2013, in Peru in March 2014,

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in Colombia in June 2014, in Tunisia and Morocco in late 2014 and in Brazil, for tomato, potato and dry beans, in December 2014. We have recently received EPA approval for three new formulations (12%, 16% and 5% that eliminated the solvent, hexanol), which will be used for market segmentation and replacement of existing formulations. In 2016, we launched the new formulation of Regalia 5% that eliminated hexanol, a solvent that is difficult to source and is likely to experience future regulatory restrictions. This new formulation disperses better in water and is easier to mix and rinse from containers and spray equipment.

Regalia, Regalia Maxx and Regalia Rx are USDA National Organic Program compliant and OMRI-USA/OMRI-Canada listed.

Grandevo

Bioinsecticide

Crop Protection, Home and Garden, Turf and Ornamentals, Public Health, Forestry: Targets Insects and Mites

Commercially Available Domestically, International Expansion Efforts Underway

Grandevo is based on a new species of microorganism, *Chromobacterium subtsugae*, which was discovered by a scientist at the USDA in Beltsville, Maryland, and which we have licensed and commercialized. Grandevo is a powerful feeding inhibitor: insects and mites become agitated when encountering it and will not feed and starve, or, if they do ingest it, die from disruption to their digestive system. Grandevo also has repellent effects on and reduces egg hatching and reproduction of target insects and mites. Grandevo is particularly effective against chewing insects (such as caterpillars and beetles) and sucking insects (such as stinkbugs and mealybugs, as well as thrips and psyllids, which are respectively known as corn lice and plant lice). Trials to date and reports from grower use have shown instances of commercial levels of efficacy as good as the leading conventional chemical pesticides on a range of chewing and sucking insect and mite pests, including two invasive species of psyllid affecting citrus and potato crops. Grandevo has also shown significant control of other pests such as plant-feeding fly larvae, mosquitoes, white grubs in turf grass, leafmining caterpillar larvae and other leaf-eating caterpillars. Grandevo has also shown efficacy against corn rootworm, a major pest of corn, which has reportedly been resistant to corn engineered for rootworm control. Grandevo has shown efficacy against other soil pests, including wireworms, root maggots and nematodes. Field trials are ongoing to further characterize Grandevo s efficacy.

We obtained a co-exclusive license for the bacterial strain used in our Grandevo product line while Grandevo was undergoing primary screening as a potential product candidate. Since licensing the microorganism, we completed the testing and development necessary to produce and commercialize an EPA-approved product and have filed our own patent applications with respect to the microorganism, including its genome, synergistic combinations with conventional chemical pesticides, product formulations containing the bacterial strain as well as the chemistry produced by the microorganism upon which Grandevo is based. We have issued U.S. patents on one of these novel compounds produced by the bacteria and novel insecticidal and nematicidal uses.

We placed a prototype liquid formulation of Grandevo on a targeted basis under a limited label into the Florida citrus crop market in 2011. Commencing in the summer of 2012, we launched a dry formulation of Grandevo in markets across the United States where state registrations have been approved, targeting key markets, including citrus,

tomatoes, peppers, strawberries, potatoes, leafy greens and other fruits and vegetables. This dry formulation was approved by the EPA in May 2012 and has been registered in all 50 states as well as Puerto Rico. In May 2013, we received EPA approval for a revised label reflecting Grandevo s safety for bees. In addition, we submitted the registration dossier for Grandevo to Mexico and Canada and for emergency use in Brazil in October 2014. Grandevo has received completeness determination from the European Commission and is now cleared to begin the evaluation for Annex 1 listing and commercialization in the European Union with a draft decision expected in 2016. A June 2015 policy decision by the European Commission, the European Food Safety Authority and a Working Group of EU Member States has allowed Grandevo, which contains only non-

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viable *Chromobacterium subtsugae* cells, to be evaluated as a microbial pesticide. Until this recent EU decision, only pesticides containing live microbes could be evaluated under EU regulation. Grandevo is being assessed under the Netherlands Government s Green Deal Initiative, which has been created with an aim to speed up the sustainability of PPPs (plant protection products) in agriculture and horticulture by facilitating the authorization of green PPPs with a low risk for humans, animals and the environment. Efficacy trials recently completed in Europe will be used to support uses of Grandevo for the control of whitefly and thrips in Solanaceae (tomato, pepper and aubergine) and Cucurbitaceae (melon, cucumber and squash) crops.

Grandevo is USDA National Organic Program compliant and OMRI-USA/OMRI-Canada listed.

Venerate

Bioinsecticide

Crop Protection, Home and Garden, Turf and Ornamentals, Animal Health, Forestry: Targets Insects and Mites

Commercially Available Domestically, International Expansion Efforts Underway

Venerate is based on a microbial fermentation of a new bacterial species we isolated using our proprietary discovery process. We have identified compounds produced by the microorganism in Venerate that control a broad range of chewing and sucking insects and mites, as well as flies and plant parasitic nematodes, on contact, which is complementary to the anti-feeding effects of Grandevo. In addition, because we currently sell Venerate in a liquid formulation and Grandevo in a powder formulation, we are seeking to exploit opportunities for market segmentation, including for combinations with liquid fertilizer and for low-volume aerial applications. Venerate was approved by the EPA in February 2014 and we began to sell Venerate in May 2014. We submitted Venerate for the Canadian Pest Management Regulatory Agency registration in April 2014 and submitted the registration dossier for Venerate to Mexico in April 2014. We have conducted field trials on several crops and insects and mites, many of which show efficacy as good as leading conventional chemical pesticides. Venerate has shown positive results in field trials against soil insects of corn, wheat and soybeans applied both in-furrow and as seed treatments, and has shown broad spectrum activity across a wide range of pests, including Asian citrus psyllid, corn rootworm, stinkbugs, caterpillars and weevils. Additional trials are in progress in 2016.

We have filed patent applications on the microorganism and the natural product compounds that demonstrate insecticidal and nematicidal activity, as well as product formulations containing the microorganism. Venerate is USDA National Organic Program compliant and OMRI-USA/OMRI-Canada listed.

Majestene

Bionematicide

Crop Protection, Turf: Targets Plant Parasitic Nematodes

Commercially Available Domestically

Majestene is a bionematicide we have developed based on the microorganism used in Venerate. This nematicide is active against a broad range of nematodes, and in field trials it has been as effective as or better than the leading conventional chemical nematicide against soybean cyst, root knot, lesion, stunt, reniform, lance and burrowing nematodes. Crops tested include soybean, corn, cotton, strawberry, turf, tomato, potato and banana. Usage for Majestene as a nematicide was approved by the EPA in connection with its approval of the labels for Venerate in 2014, and a modified label with refined rates, nematode species and crops was approved in October 2015. We have filed a patent application for use of the bacterial strain in Majestene for use as a nematicide. We conducted a targeted placement of Majestene with key, early adopter growers in 2015, with our first sales in January 2016.

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Zequanox

Biomolluscicide

Water Treatment: Targets Invasive Mussels (In-Pipe and Open Water Habitat Restoration)

Commercially Available in United States and Canada

USDA BioPreferred Program Certified Product

Zequanox addresses the problem of invasive zebra and quagga mussels, which clog pipes, disrupt ecosystems, encrust infrastructure and blanket beaches with razor-sharp shells. These mussels cause approximately $1.0 billion in damage and associated control costs annually in parts of the United States alone. There are limited treatment options available, many of which are time-consuming and costly, or harm aquatic flora and fauna. Zequanox is a biomolluscicide derived from a common microbe found in soil and water bodies, *Pseudomonas fluorescens*. Zequanox is an environmentally friendly, bio-based pest management product that is designed to kill over 75% of invasive mussels in treated pipe systems without causing collateral ecological damage. In July 2012, we conducted an open water trial in Deep Quarry Lake, Illinois, where the Zequanox treatment killed more than 90% of the tested mussels on the lake bed. This level of control in open water treatments was repeated in 2013. We generated revenues for treating an Oklahoma Gas & Electric facility in 2012 and 2013 and a First Light & Power facility along the Housatonic River in Connecticut in 2014. In addition, Zequanox was used by the Minnesota Department of Natural Resources and the Minnehaha Creek Watershed District s Aquatic Invasive Species Program in 2014 to treat an infestation of these invasive mussels in Christmas Lake, resulting in 100% control of the mussels in the tested area. Zequanox is approved in Canada and is the only product EPA-approved for open water application in the United States other than copper, which is rarely used due to its negative environmental effects.

At recommended application rates, Zequanox is not toxic to other aquatic life, including ducks, fish, crustaceans and other bivalve species such as native clams or mussels. Zequanox is safe to workers, less labor intensive and requires shorter treatment times as compared to conventional chemical pesticides. Zequanox can be used by power plants and raw water treatment facilities as an alternative to conventional chemical treatments such as chlorine, or as a complement to those products.

We entered into a license agreement with The University of the State of New York pursuant to which we were granted an exclusive license under the University s rights relating to the bacterial strain used in our Zequanox product line while the product s natural product chemistry was still under investigation. Since then, we have developed dry powder formulations, significantly improved the fermentation process for higher cell yield, allowing us to increase manufacturing scale, and filed patent applications relating to natural product compounds in the Zequanox cells we have identified and product formulations we have developed. In addition, we have received $1.1 million in grants from the National Science Foundation for work needed to commercialize the bacterial strain in Zequanox, which is currently being marketed and sold directly to U.S. power and industrial companies. In the fourth quarter of 2015, we implemented a new process at our manufacturing plant that reduced the cost of product revenues to be more competitive with other mussel treatment chemicals.

Due to our prioritization plan, we have not committed sufficient resources to Zequanox in order to market it full-scale and substantially improve margins. However, we are currently in discussions with large water treatment companies to further develop Zequanox and expand it commercially. In addition, we continue to work with state, federal and bi-national partners via the Great Lakes Commission s Invasive Mussel Collaborative and the EPA s Great Lakes Restoration Initiative to further develop Zequanox in the Great Lakes/Upper Mississippi River Basin as a habitat restoration tool and potential harmful algal bloom management tool as zebra and quagga mussels selectively feed on beneficial algae while rejecting toxic blue-green algae.