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.

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Product Pipeline

Our pipeline consists of product candidates in various stages of development, including biostimulant and plant health products that do not require EPA registration, products submitted to the EPA for registration and other promising product candidates under development, as well as other early-stage discoveries. We have been implementing a prioritization plan for our pipeline candidates, focusing first on those that are expected to have the greatest near-term growth potential. We are seeking collaborations with third parties to develop and commercialize more early stage candidates.

Haven (MBI-505)

Anti-transpirant

Crop Protection, Turf and Ornamentals: Enhances Crop Yields and Plant Health

Subject to State Registrations; Under Development

Haven (MBI-505), a plant health product candidate that helps prevent plants from drying out, or anti-transpirant, is based on a technology of naturally-derived, plant-based compounds that we licensed from Kao Corporation for use in the United States. The licensed patents are directed to methods of promoting plant growth and increasing biomass and crop yield. We developed new formulations and are conducting field trials showing that Haven protects and enhances yields by reflecting heat from leaves, which reduces plant water loss, allowing plants to thrive better in sun-stressed environments. Field trials in 2014 in the United States and Chile demonstrated a reduction in sun-stressed fruit and an increase in quality characteristics on citrus, apples and grapes, increased yields on walnuts, almonds and wheat, often equal to or better than the commercial standard, and increased turf growth. Unlike competing products, Haven does not leave an undesirable white deposit on crops.

MBI-010

Bioherbicide

Crop Protection, Home and Garden, Turf: Targets Weeds

Under Development

MBI-010 is based on the same species of bacteria used to produce Venerate and Majestene, which we isolated using a proprietary discovery process that identifies herbicides that inhibit a certain plant enzyme. MBI-010 produces several herbicidal compounds, some of which are novel, that are rapidly taken up by germinating seeds and by the roots of seedling and mature weeds. MBI-010 has demonstrated effectiveness against a range of weeds, including weeds resistant to leading conventional chemical herbicides, either after or before the weeds emergence. MBI-010 has also demonstrated a novel mode of action (inhibiting histone deacetylase enzymes), and some of its active compounds are transmitted systemically through the vascular structure of weeds. We have filed a patent application with respect to

the MBI-010 formulation uses and its associated natural product compounds as an herbicide. We also received an issued U.S. patent on the process we used to discover MBI-010 and certain other bioherbicides. We expect to submit MBI-010 to the EPA in late 2016 or early 2017.

MBI-601

Biofumigant

Crop Protection, Home, Industrial: Targets Plant Disease, Nematodes and Insects

Under Development

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MBI-601 is a biofumigant based on a novel and proprietary genus of fungus, *Muscodor,* which was discovered by a professor at Montana State University. We obtained a co-exclusive license for several strains and species of this fungus, which produces a suite of gaseous natural product compounds that have been shown to control certain species of harmful fungi and bacteria that cause plant diseases and to control nematodes and some insect species. We believe that MBI-601 may be used for agricultural and industrial applications, including post-harvest control of fruit and flower decay and pre-planting control of plant diseases and nematodes as a viable alternative to methyl bromide and other chemical fumigants, which are subject to significant regulatory restrictions and for which few effective, non-toxic alternatives are available. We submitted MBI-601 to the EPA in April 2014. In 2014, we obtained a license to an artificial mixture of the gaseous compounds produced by the *Muscodor* fungus, which extends the potential uses of this technology by enabling development of products at a potentially lower cost and better shelf stability than versions using the living fungus.

MBI-110

Biofungicide and Plant Health

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

Under Development

MBI-110 is based on microbial fermentations of a newly identified *Bacillus* strain we isolated using our proprietary screening platform. MBI-110 is being developed as a biofungicide, targeting difficult to control plant diseases such as *Sclerotinia* white molds, gray mold and downy mildews. We have identified compounds, some of which are novel, produced by the microorganism in MBI-110 that control a broad range of plant diseases. We have filed a U.S. patent application covering fungicidal uses and have been issued a U.S. patent on related claims. We submitted MBI-110 to the EPA in January 2016. Several field trials were conducted in Europe in 2014 and the United States in 2013 and 2014 that showed good efficacy against white molds and downy mildews.

Other Products and Candidates

In addition to the above, pursuant to an agreement with Isagro USA, we intend to distribute Bio-Tam 2.0, a biofungicide for soil-borne disease control and grapevine disease control that complements our existing products, particularly Regalia. Bio-Tam 2.0 recently gained EPA registration for grapevine trunk diseases caused by *Eutypa*, *Botyrosphaeria* (Esca), *Phomopsis* and other fungi, which are responsible for significant economic losses to the wine and grape industry worldwide, including the Western United States, and for which there are few registered conventional chemical pesticides.

We have also developed patented technology relating to a number of other product candidates, including MBI-304, a bionematicide product candidate based on the microorganism used in Grandevo; MBI-011 and MBI-005, bioherbicides that have received EPA approval; and MBI-302, a bionematicide with an EPA registration package that is nearly complete. We are also developing MBI-507, a plant health product and plant root and growth biostimulant based on the living spores of a new *Bacillus amyloliquefaciens* strain, for which we have received an issued U.S. patent on these claims. We are seeking collaborations with third parties to develop and commercialize certain of these and other promising early-stage candidates, but as resources permit, we may choose to move some of these product candidates forward internally.

We have also discovered several microorganisms with algaecidal activity and over 25 additional fungicide, herbicide, insecticide and nematicide candidates using our proprietary screening platform. In addition, we have produced a collection of microorganisms from taxonomic groups that research suggests may enhance nutrient uptake in plants, reduce stress and otherwise increase plant growth.

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Our Discovery and Product Development Process

Our proprietary technology comprises a sourcing process for microorganisms and plant extracts, an extensive proprietary microorganism collection, microbial fermentation technology, screening technology and a process to identify and characterize natural compounds with pesticidal activity. Our technology enables us to isolate and screen naturally occurring microorganisms and plant extracts in an efficient manner and to identify those that may have novel, effective and safe pest management or plant health promoting characteristics. We then analyze and characterize the structures of compounds either produced by selected microorganisms or found in plant extracts to identify product candidates for further development and commercialization. We have screened more than 18,000 microorganisms and 350 plant extracts, and we have identified multiple product candidates that display significant levels of activity against insects, nematodes, weeds, plant diseases and invasive species such as zebra and quagga mussels, aquatic weeds and algae. We also have produced a collection of microorganisms from taxonomic groups that may enhance nutrient uptake in plants, reduce stress and otherwise increase plant growth. Our product candidates come primarily from our own discovery and development, as well as in-licensed technology from universities, corporations and governmental entities.

Our proprietary product development process includes several important components. For all of our product candidates, we develop an analytical method to detect the quantity of the active natural product compounds that are produced by the microorganism or that are extracted from plants. For microbial products, we develop unique proprietary fermentation processes that increase the active natural compounds produced by the microorganisms. We also scale-up fermentation volumes to maximize yields consistently in each batch. Similarly, for our plant extract-based products, we develop a manufacturing process that increases the amount of active natural compounds extracted from plant materials.

Our deep understanding of natural product chemistry allows us to develop fermentation and formulations that optimize the concentrations, efficacy and stability of compounds produced by microorganisms or plants. These methods allow us to produce products that are highly effective and of a consistent quality on a commercial scale. With the successful commissioning of our manufacturing facility, we have added a wealth of know-how and have demonstrated an ability to manufacture products that are effective and of a consistent quality on a commercial scale.

Our commercial products are sold in various formulations and are tailored to meet customers needs and display performance characteristics such as effectiveness, shelf life, compatibility with other pesticides and ease of use. Our senior management s numerous years of experience in the development of commercial products and formulations have resulted in a highly efficient product development process.

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Our discovery and development process is illustrated in the following diagram:

Discovery

We have found over 25 candidates for commercial development from our proprietary discovery process, including Venerate, a new bacterial species and bioinsecticide, MBI-011, a burndown bioherbicide, MBI-010, a systemic bioherbicide, MBI-302 and MBI-303, bionematicides, MBI-110, a biofungicide, and MBI-507, for plant health, as well as several bioalgaecides, additional biofungicides, bioherbicides, bionematicides and plant growth enhancers. Key aspects of our discovery process include:

Collection and isolation. Using our years of experience, we target selected habitats and niches of high biodiversity to collect soil, compost, insects, flowers or other biological matter from which we isolate our

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proprietary microorganisms on proprietary media. We capture information in a microorganism database such as taxonomic groups, geographical locations, types of samples, niches and habitats where collected and biological activity. We also isolate microorganisms that improve the efficiency of plants to uptake nitrogen and phosphorous. In addition to isolating our own microorganisms, which make up approximately 90% of our collection, we have had collaborations with three companies plus the Scripps Institution of Oceanography to diversify our sourcing of microorganisms.

Fermentation. For our microbial products, before testing the selected microorganisms for activity against pests, we ferment them to produce sufficient quantities for testing. We grow the selected microorganisms in proprietary media, which maximizes their pesticidal properties. In addition, we use proprietary fermentation processes that are designed to replicate those that would be required for large-scale fermentation and commercial production, avoiding the time and expense of an unsuccessful scale-up.

Primary screening. We use automated, miniaturized biological assays to test the selected microorganism s or plant extract s effectiveness against several weed, insect and nematode pests and plant pathogens and algae. We compare those results to conventional chemical pesticide standards. When a microorganism shows a high level of pesticidal activity, we conduct further tests to determine the spectrum of activity, mode of action, stability and activity on plants. We also test for the microorganisms ability to reduce plant stress and promote growth.

Novel and proprietary screening methods for weeds and nematodes. We have used proprietary assays based on specific enzymes that find systemic herbicidal compounds from microorganisms, one of which is the subject of an issued patent covering identification of compounds that act systemically through plants vascular systems. We have developed a rapid, efficient method to find microorganisms that produce compounds with a high level of activity against plant parasitic nematodes.

Natural product chemistry. Using high-performance liquid chromatography (HPLC) with diode array detection technology, liquid chromatography-mass spectroscopy (LCMS), gas chromatography-mass spectroscopy (GC-MS) and nuclear magnetic resonance (NMR), we compare the natural product compounds produced by each of the selected microorganisms with known compounds. This allows us to eliminate those microorganisms that produce known toxins and to select those that we believe are novel and safe. From the selected microorganisms, we identify and characterize the natural product compounds responsible for their pesticidal activity by using HPLC, LCMS, GC-MS and NMR equipment. We then develop analytical methods to measure the quantity of these compounds in individual fermentation batches, determine the quantities needed to maximize efficacy and to ensure consistent levels of these compounds from batch to batch.

Genetic identification. After confirming pesticidal activity during our primary screen, we perform the initial genetic identification of the microorganisms. Further characterization of the genome of our early stage candidates is contracted with one of several genome sequencing service companies. This characterization allows us to determine novelty compared to discoveries from others, the relatedness to human or animal pathogens, genes for compounds that are not expressed in fermentation or detected by our chemists, and information about the possible mode of action on the target pest. We also file additional patent applications based on the results of these genetic identification processes.

Product Development

We believe that by maintaining a strong reputation in the industry, many opportunities come to us for development in addition to our own discoveries from our in-house efforts. Once we discover or are brought an opportunity, we make a preliminary assessment of the commercial potential of a natural product determined through laboratory, greenhouse and initial field tests. We then select product candidates we have discovered in-house or in-licensed for further

development. Key aspects of our product development process include:

Development of the manufacturing process that maximizes the active natural product compounds. For our microbial biopesticide products, we develop proprietary processes that increase the yield of both the

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microorganism and the active natural product compounds produced by the microorganism during fermentation. Similarly, for our plant extract-based products, we develop proprietary processes that increase the amount of active natural compounds extracted from plant materials. This process development allows us to produce products that have superior performance. For our microbial products, we then scale-up these proprietary processes in progressively larger fermentation tanks. We develop quality control methods based on the active natural product compounds rather than just the microorganisms or plant extracts. This approach results in a more consistent and effective product.

Formulation. We are able to develop proprietary wettable powder, liquid and granule formulations that allow us to tailor our products to customers needs. This allows us to develop product formulations with enhanced performance characteristics such as effectiveness, value, shelf life, suitability for organic agriculture, water solubility, rain resistance, compatibility with other pesticides and ease of use. Formulation is critical to ensuring a bio-based pest management and plant health product s performance. Our understanding of the natural product chemistry allows us to develop formulations that maximize the effectiveness and stability of the compounds produced by the microorganisms or plants.

Field testing. We conduct numerous field trials for each product candidate that we develop. These field trials are conducted in small plots on commercial farms or research stations by our own field development specialists as well as private and public researchers to determine large-scale effectiveness, use rates, spray timing and crop safety. We conduct crop protection product field trials globally in both hemispheres to accelerate the results of our field trials and provide alternate season learning opportunities. As the crop protection product candidate nears commercialization, we conduct demonstration trials on the farm. These trials are conducted with distributors, influential growers and food processors on larger acreages. For Zequanox, we have been working with large power and industrial customers both in the United States and Canada to obtain field trial data to help with product commercialization efforts and to obtain efficacy data.

Sales, Marketing and Distribution

In the United States, we sell our products through our own internal sales force, which consists of 8 employees focused on managing distributor relationships and creating grower demand for our products. In addition, a dedicated team of 4 employees provide technical service support to both our customers and sales representatives on the use of our products in IPM programs, both for conventional growers as well as for an expanding number of organic growers. Our sales force covers all major regions in the United States, including California and the Pacific Northwest, the Southeast, the Northeast, the Mid-Atlantic and the Midwest regions, with an emphasis on high-value specialty crops (fruits, nuts and vegetables). We currently sell our crop protection product lines, Regalia, Grandevo, Venerate and Majestene, through leading agricultural distributors, including members of the Integrated Agribusiness Professionals group. These are the same distribution partners that most major agrichemical companies use for delivering solutions to growers across the country. For our water treatment product line, Zequanox, we are seeking sales and distribution partners for in-pipe and open water uses. Zequanox is currently being marketed and sold directly to a selected group of U.S. power and industrial companies.

With respect to sales outside of the United States, we have signed exclusive international distribution agreements for Regalia with major international distributors such as FMC (for certain markets in Latin America), Syngenta (for specialty crop markets in Africa, Europe and the Middle East) and Engage Agro (for markets in Canada and professional turf and ornamental plant markets in the United States). We also 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. For example, we are in discussions and have testing agreements with distributors in Brazil, Australia, New Zealand and Europe, and for certain other foreign markets for Grandevo and Venerate.

We have also recently entered into an agreement with Isagro USA with respect to distribution of their Bio-Tam 2.0 product line in California, Oregon, Washington and Arizona. We believe we can leverage our existing sales, marketing and distribution network to bring in additional revenues from sales of this product, while enhancing our overall product portfolio.

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We derived approximately 89%, 91% and 95% of our total revenues from Regalia and Grandevo for the years ended December 31, 2015, 2014 and 2013, respectively. In addition, we currently rely, and expect to continue to rely, on a limited number of distributors for a significant portion of our revenues since we sell through highly concentrated, traditional distribution channels. For the year ended December 31, 2015, our top two distributors accounted for 38% of our total revenues.

While the biopesticide industry has been growing, customers in the crop production and water treatment sectors are generally cautious in their adoption of new products and technologies and may perceive bio-based pest management products as less attractive than conventional chemical pesticides. Growers often require on-farm demonstrations of a given pest management or plant health product, and given the relative novelty of our water treatment products, consumers of those products will continue to require education on their use. We are implementing the following strategies to accelerate adoption rates and promote sales of our bio-based pest management and plant health products:

Rebuilding a focused and effective sales and marketing team that shares our values. We were significantly negatively impacted by the departures of our former chief operating officer, who led our sales and marketing teams, and significant members of our sales staff in the third quarter of 2014. Over the last year, we have been rebuilding our sales and marketing teams, including hiring highly experienced personnel to train our sales force and a new head of marketing to guide an expanded marketing department. In addition, we are more effectively organizing the data and educational material that we have amassed over nine years of operations on our bio-based products as well as organic and sustainable agricultural practices in order to train and equip our sales staff to communicate with and educate distributors and growers. We believe that hiring and training a sales and marketing staff with a high level of technical expertise and knowledge regarding the capabilities of our bio-based products is essential to expanding adoption of our products by growers and sales to distributors. In addition, we are expanding our field development team to include more technical service activities to support sales.

Develop an extensive demonstration program. We believe that for growers to be convinced that a bio-based pesticide or plant health product works, they often must see it for themselves. Growers risk their crop each time they try a new product, and often produce only one crop per year on any given plot of land. Further, bio-based pesticide and plant health products are often applied differently and at different times than conventional chemical pesticides and so may be used incorrectly by an inexperienced grower or advisor, decreasing efficacy. We typically conduct on-farm demonstrations with growers in the first year they try one of our products on smaller plots of land to ensure successful application, promoting the continued use of our products in future years across more acres. In addition, we work with distributors to determine which crops to emphasize in a given year and which area to maximize the effectiveness of our demonstration program.

Target early adopters of new pest management technologies. For crop protection products, we target large commercial growers in the United States, who generally set industry standards through more widespread adoption of new pest management technologies they initially test on portions of their crops. We also target organic growers, who are more willing to take risks on new products as they have had few alternatives and great demand for increased yields. We plan to continue to recruit these growers and their consultants to participate in demonstrations and field trials, enabling them to become familiar with our bio-based pest management and plant health products, to experience their benefits firsthand and to promote the use of our products with other growers in their regions. For Zequanox, we have developed strategic relationships with early adopters in the power generation business to do efficacy demonstrations while perfecting the formulations and application of the product.

Educate growers and water resource managers about the benefits of our bio-based pest management products. We will continue to perform on-farm and in-facility demonstrations and provide field data packages to support and validate our product claims. We will also continue to participate in trade shows and conferences to educate growers,

their licensed pest control advisors and water resource managers about the benefits of our bio-based pest management products. When in the field, our sales and technical service team members have access to a wealth of information regarding our products and on pre-loaded tablet computers to assist in solving growers

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and distributors problems real-time. We have provided a free application for mobile phone users to assist in calculating tank mix quantities, as well as webinars and an online course on bio-based pest management products, which can be taken by growers for continuing education credit to maintain crop protection product applicator licenses. We intend to continue to expand our efforts to work with utilities, especially through potential distribution partners, which we believe will create increased demand for Zequanox in adjacent market spaces beyond the power and industrial treatment opportunities we are currently targeting.

Develop and leverage relationships with key industry influencers. We will continue to develop relationships early in the product development process with influential members within our target markets, including large innovative growers, technical experts at leading agricultural universities, licensed pest control advisors, wineries, food processors, produce packers, retailers and power facilities. We believe that educating industry influencers about the benefits of Regalia, Grandevo, Venerate, Majestene, Zequanox and our future products increases the likelihood that they will recommend our products to our distributors and end users.

Focus our own sales and marketing on the United States, while signing strategic agreements for international markets, turf, ornamental plants and consumer retail. Because of the concentration of large growers in the United States, we can access these customers through our own sales force. For international markets for Zequanox, we intend to develop strategic partnerships with large suppliers and distributors of water products. For Regalia, Grandevo, Venerate and Majestene, we have distribution agreements with leading agrichemical companies and national and regional distributors. For future products, distribution agreements will be developed with regional and national distributors or large multinationals on a case-by-case basis, depending on their expertise in the regions. We have engaged distributors that are selling Regalia in Canada for specialty crops, in the United States for turf and ornamental plants, and in parts of the Midwestern United States for row crops. We have also engaged a distributor, Engage Agro, who is selling Grandevo and Regalia in the United States for turf and ornamental plants as Grandevo PTO and Regalia PTO, respectively. We have an exclusive relationship with Scotts Miracle-Gro for the consumer retail market, and have recently submitted dossiers to Canadian regulators for consumer retail uses of Regalia and Grandevo as part of our relationship with Scotts Miracle-Gro.

Manufacturing

We have substantially transitioned our manufacturing processes in-house to our Bangor, Michigan facility, which was formerly used as a biodiesel plant prior to our acquisition in July 2012. Biopesticide formulation, microbial fermentation and product packaging are among the facility s core competencies. We believe in-house manufacturing enhances control and flexibility in production while lowering manufacturing costs over time to achieve desired margins, in addition to strengthening intellectual property security. The facility has significant room for expansion to install drying capacity and larger fermenters to accommodate production of multiple products at higher volumes.

We now ferment our Grandevo and Zequanox products in our manufacturing facility, but use a third-party contractor for formulating them into spray-dried powders. The facility also accommodates full-scale production of Regalia. While we have the ability to produce the majority of our products using our own manufacturing capacity, we currently exclusively use third parties to manufacture Venerate and Majestene as a result of regulatory requirements that would require additional capital investment to produce these products in-house, and we expect to continue to utilize third-party manufactures for supplemental production capacity to meet excess seasonal demand. Once manufactured, we may use our own facility or third parties to package and label products.

The active ingredient in our Regalia product line is derived from the giant knotweed plant, which we obtain from China. We have scaled production of Regalia using a single supplier to acquire raw knotweed from numerous regional sources and perform an extraction process on this plant and create a dried extract that is shipped to our manufacturing

plant for production and packaging. We do not maintain a long-term supply contract with this supplier. While there can be no assurance that we will continue to be able to obtain dried giant knotweed plant extract from our supplier in China at a competitive price point, we estimate that our current supply of the

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ingredient will be sufficient to manufacture product to meet the next 12 months demand. Should we elect or be required to do so, we do not believe that we would have substantial difficulty in finding an alternative supplier as we have identified and received quality knotweed from a number of new possible suppliers, although there can be no assurance that we will continue to be able to obtain dried extract from China at a competitive price point.

Research and Development

As of December 31, 2015, we had 35 full-time equivalent employees dedicated to research and development and patent related activities, 7 of whom hold Ph.D. degrees, plus 4 sales and field development personnel who focus on technical support and demonstration and research field trials. Our research and development team has technical expertise in microbiology, natural product and analytical chemistry, biochemistry, fermentation, entomology, nematology, weed science, plant physiology, plant pathology and aquatic sciences. Our research and development activities include discovery, product development, product support, regulatory, patent and field trial activities, which are principally conducted at our Davis, California facility as well as by our field development specialists on crops and mussel-infested facilities in their respective regions. We have reduced the size of our research and development staff compared to prior periods as part of our measures to streamline business operations, but we have made, and will continue to make, substantial investments in research and development. Our research and development expenses, including patent expenses, were $13.5 million, $19.3 million and $17.9 million for the years ended December 31, 2015, 2014 and 2013, respectively.

Intellectual Property Rights

We rely on patents and other proprietary right protections, including trade secrets and proprietary know-how, to preserve our competitive position. As of December 31, 2015, we had 25 issued U.S. patents and 87 issued foreign patents (of which 5 U.S. patents and 37 foreign patents were in-licensed), 29 pending U.S. provisional and non-provisional patent applications (of which 1 was in-licensed), and 179 pending foreign patent applications (of which 5 were in-licensed) relating to microorganisms and natural product compounds, uses and related technologies. As of December 31, 2015, we had received 16 U.S. trademark registrations and had 7 trademark applications pending in the United States. As of December 31, 2015, we also had received 61 trademark registrations and had 19 trademark applications pending in various other countries.

When we find a microbial product in our screen that kills or inhibits one or more pests or pathogens in at least three replicated tests and identify the microorganism and its associated chemistry, we file a patent application claiming any one or more of the following:

- the microorganism, its DNA products, as well as mutations and other derivatives;
- the use of the microorganism for pest management;
- novel natural product compounds, their analogs and unique mixtures of compounds produced by the microorganism;
- the new use of known natural product compounds for pest management;

formulations of the microorganism or compounds; and

synergistic mixtures of the microorganism or compounds with conventional chemical or other pesticides.

One of our commercially available products and certain of our lead product candidates are based on microbes we have identified using our proprietary discovery process, including Venerate, Majestene and MBI-010, which are based on a *Burkholderia* bacterium, with respect to which we have 10 issued patents and 36 pending patent applications (both U.S. and foreign), and MBI-110 and MBI-507, which are based on a *Bacillus* strain, with respect to which we have 3 issued patents and 13 pending patent applications (both U.S. and foreign).

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We have also entered into in-license and research and development agreements with respect to the use and commercialization of Regalia, Grandevo and Zequanox, as well as certain products under development, including Haven (MBI-505) and MBI-601. Under the licensing arrangements for our commercially available products, we are obligated to pay royalty fees between 2% and 5% of net sales of these products, subject in certain cases to aggregate dollar caps. The exclusivity and royalty provisions of these agreements are generally tied to the expiration of underlying patents. For Regalia, the licensed patent is related to a method of extraction of knotweed. These patents acquired for Regalia and in-licensed for Zequanox will expire in or around 2017, although we have filed separate patent applications with respect to both product lines and have been issued two U.S. patents with respect to Regalia and two for Zequanox. In addition, the in-licensed U.S. patent for Grandevo is expected to expire in or around 2024, but there is a pending patent application relating to Grandevo that could expire later than 2024, if issued, and we have also filed separate patent applications for Grandevo of which four have been issued on a novel compound and uses for nematodes, corn rootworm and a variety of insects. While third parties thereafter may develop products using the technology under the expired patents, we do not believe that they can produce competitive products without infringing other aspects of our proprietary technology, and we therefore do not expect the expiration of the patents or the related exclusivity obligations to have a significant adverse financial or operational impact on our business. Certain additional information regarding the intellectual property associated with commercially available products based in part on in-licensed technology follows:

Regalia. We entered into an exclusive license agreement with a company co-founded by Dr. Hans von Amsberg, a former employee of German chemical producer BASF, in May 2007 for U.S. and limited international use of a U.S. patent and technology used in our Regalia product line. We have also filed patent applications with respect to new formulations of Regalia. Two U.S. patents have been issued on the synergistic combinations with biopesticides and conventional chemical pesticides and one patent has been issued on the new uses for soil and roots.

Grandevo. We entered into a co-exclusive license agreement with the USDA in November 2007 for the use in the United States of a U.S.-issued patent and a U.S. patent application relating to the *Chromobacterium subtsugae* bacteria used in our Grandevo product line. We have filed patent applications on the compounds produced in the bacterial cells, gene sequences and new uses for the *Chromobacterium subtsugae* bacteria, and for new uses and new formulations of our Grandevo product line. Four U.S. patents have been issued on a novel compound produced by the bacteria for uses on a variety of insects, use for corn rootworm populations and for nematode control. While a second company has licensed the USDA s patent with respect to the *Chromobacterium subtsugae* bacteria and could develop products based on the same underlying intellectual property, we have not provided this company access to the proprietary technology we have developed relating to Grandevo.

Zequanox. We entered into a license agreement with The University of the State of New York in December 2009 pursuant to which we were granted an exclusive license under the University s rights for the worldwide use of a U.S.-issued patent and a Canadian-issued patent relating to the *Pseudomonas fluorescens* bacteria used in our Zequanox product line. Two U.S. patents have been issued on the natural, mussel-killing compounds in the bacteria, and we have filed patent applications relating to various Zequanox active ingredients.

Regulatory Considerations

Our activities are subject to extensive federal, state, local and foreign governmental regulations. These regulations may prevent us or our collaborators from developing or commercializing products in a timely manner or under technically or commercially feasible conditions and may impose expenses, delays and other impediments to our product development and registration efforts. In the United States, the EPA regulates our bio-based pest management products under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the Federal Food, Drug and Cosmetics Act (FFDCA) and the Food Quality Protection Act (FQPA). In addition, some of our plant health products are regulated as fertilizers or biostimulants in each of the fifty states.

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In 2004, the United States Congress passed the Pesticide Registration Improvement Renewal Act, which was reauthorized in 2007 and 2012, a result of efforts from an industry coalition of pesticide companies and environmental groups, to codify pesticide approval times in return for user fees. This law facilitates faster approval times for biopesticides, with EPA approvals typically received within 16 to 24 months, compared with 36 months or longer for conventional chemical pesticides. Registration processes for state and foreign governments vary between jurisdictions and can take up to 12 months for state governments, such as California and New York, and up to 36 months or more for foreign governments. In some instances, California and Canada will conduct joint reviews with the EPA, which allows some pesticides to receive concurrent approvals in California, Canada and the United States. However, in most instances, most foreign government submissions will not occur until after a U.S. registration has been secured. To register a crop protection product with the EPA, companies must demonstrate the product is safe to mammals, non-target organisms, endangered species and the environment. To demonstrate the bio-based pest management product s safety, required studies must be conducted that evaluate mammalian toxicology, toxicological effects to non-target organisms in the environment (ecotoxicological exposures) and physical and chemical properties of the product. The registration dossier is subject to both scientific and administrative reviews by EPA scientists and management before registration approval. The scientific review involves thorough evaluation of submitted data and completion of risk assessments for human dietary and ecotoxicological exposures. Upon completion of this process, the registration package, including the proposed label, is sent to the Office of General Council for legal review. The final step in the registration process is administrative sign-off by the EPA director of the Biopesticides and Pollution Prevention Division.

In addition to EPA approval, we are required to obtain regulatory approval from the appropriate state regulatory authority in individual states and foreign regulatory authorities before we can market or sell any pest management product in those jurisdictions. Foreign governments typically require up to two seasons of locally generated field efficacy data on crop-pest combinations before a product dossier can be submitted for review. California and foreign jurisdictions also require us to submit product efficacy data, which the EPA historically has not required, but may request.

While these regulations substantially increase the time and cost associated with bringing our products to market, we believe that our management team s significant experience in bringing our and other companies technologies through EPA, state and foreign regulatory approval, efficient development process and ability to leverage our strategic collaborations to assist with registrations, particularly in Europe and Latin America, will enable us to overcome these challenges.

Since our plant health products (which are classified by the EPA as biostimulants) are not used to control pests, they currently fall outside the legal scope of FIFRA, FFDCA and FQPA and, therefore, we do not need to submit applications for EPA registrations for such products. However, we must still submit state registrations for our plant health products, and those containing microbes of foreign origin may also need to be deregulated (or determined not to be a plant pest) under the Plant Protection Act by the USDA Animal and Plant Health Inspection Service prior to use in field trials or for large scale release. Nevertheless, the regulatory process is significantly accelerated compared to that for biopesticides.

Regalia. The EPA granted approval for the Regalia SC formulation in August 2008, for the Regalia 5% (Regalia) formulation in May 2009, for the Regalia 20% (Regalia Maxx) formulation in January 2010 and for a ready to use consumer formulation in January 2010. Regalia is currently registered in all U.S. states and Puerto Rico. We have also registered Regalia Maxx in Brazil, Mexico, Canada, South Africa, Ecuador, Turkey, Panama, El Salvador, Guatemala, Honduras, Peru, the Dominican Republic, Morocco and Tunisia. We submitted an Annex 1 registration dossier to the European Union. Our Regalia registration package has completed initial review by regulatory authorities in the United Kingdom, which is serving as lead for completing the Annex 1 (active substance) listing of Regalia for the European

Union. The UK-generated risk assessment has completed its technical review by the European Food Safety Authority, and it is currently being reviewed by the European Commission for Annex 1 listing consideration. In addition to obtaining the Annex 1 listing, we must obtain

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Annex 3 authorization approval from each country in which we plan to market and sell products. Regalia Maxx will be marketed as Sakalia by Syngenta in Europe and much of the Middle East and Africa. In January 2016, we launched a new formulation of Regalia that no longer contains hexanol, which is difficult to source and is likely to experience future regulatory restrictions. This new formulation of Regalia disperses better in water and is easier to mix and rinse from containers and spray equipment.

Grandevo. In August 2011 and May 2012, the EPA granted approval for the Grandevo insecticide technical grade active ingredient and a wettable powder formulation, respectively. The wettable powder formulation is registered in all 50 states as well as Puerto Rico and the District of Columbia. 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 we also received permission to field test Grandevo in Brazil, Australia, New Zealand and South Africa, allowing us to prepare the dossiers for submission in those countries. We submitted dossiers for Grandevo registration in Europe and Canada in 2015, with the Netherlands recently finding the Grandevo dossier meeting completeness check requirements in July 2015 and officially starting the dossier review for the EU. Grandevo is also currently being field evaluated in a Brazilian government sponsored emergency use program to control an outbreak of *Heliocoverpa armigera* infestations in cotton and soya. Grandevo was submitted to the emergency use program in October 2014 and is under active review and field evaluation by Brazilian regulatory agencies. Concurrently, we have other field trials either underway or planned in Brazil for 2016 on a variety of insect pests in order to have additional crop-pest uses added to the regulatory dossier and label.

Venerate. In February 2014, the EPA granted approval for Venerate. Venerate is currently registered in 48 states and Puerto Rico, with registration pending in New York and Hawaii. In 2014, we submitted Venerate registration dossiers in Canada and Mexico. Several key regulatory efficacy trials to support Venerate Annex 1 listing in Europe have been completed and ongoing work will enable us to submit a dossier for Venerate in 2016. As with Grandevo, Venerate is also currently being field evaluated in a Brazilian government sponsored emergency use program to control an outbreak of *Heliocoverpa armigera* infestations in cotton and soya. Venerate also was submitted to the emergency use program in October 2014 and is under active review by Brazilian regulatory agencies. Concurrently, we have other field trials either underway or planned in Brazil for 2016 on a variety of insect pests in order have broader uses available.

Majestene. In October 2015, the EPA granted product registration for Majestene. Majestene is currently registered in more than 25 states, including key states of Florida, Georgia, South Carolina, North Carolina, Wisconsin, Idaho, Washington and Oregon. We are currently preparing 2015 efficacy trial data to support product registration in California, with a regulatory submission to support tomato, strawberry, potato and corn uses in California made in the first quarter of 2016. With additional efficacy trial data expected in 2016, we expect to submit an expanded crop label to states in late 2016 or early 2017.

Zequanox. In July 2011, the EPA granted a conditional approval of the technical grade active ingredient in an early formulation of Zequanox. A spray-dried powder formulation, which is an improvement over the end product approved in July 2011, was approved with an unconditional registration in March 2012, and this formulation is now commercially available. We also received approval for Zequanox for use in hydroelectric plants in Canada in November of 2012. We received EPA approval for open water uses in June 2014. Currently, Zequanox is being evaluated by several U.S. and Canadian federal, state and provincial entities as an invasive mussel eradication, native mussel habitat restoration and harmful algal bloom prevention tool in the Great Lakes region under the auspices of government programs. In-pipe and open water labels have been approved in all targeted states, with the exception of California where in-pipe uses are currently registered and the open water use label is under evaluation.

As with any pesticide, our pest management products will continue to be subject to review by the EPA and state regulatory agencies. The EPA has the authority to revoke the registration or impose limitations on the use of any of our pest management products if we do not comply with the regulatory requirements, if unexpected problems occur with a product or if the EPA receives other newly discovered adverse information. See Part I-Item 1A-

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Risk Factors Risks Relating to Our Business and Strategy Our inability to obtain regulatory approvals, or to comply with ongoing and changing regulatory requirements, could delay or prevent sales of the products we are developing and commercializing. Our research and development activities are also subject to federal, state and local worker safety, air pollution, water pollution and solid and hazardous waste regulatory programs and periodic inspection. We believe that our facilities are in substantial compliance with all applicable environmental regulatory requirements.

Competition

For pest management products, performance and value are critical competitive factors. To compete against manufacturers of conventional chemical pesticides and genetically modified crops, we need to demonstrate the advantages of our products over these more established pest management products. Many large agrichemical companies are developing, and have introduced, new conventional chemical pesticides and genetically modified products that they believe are safer and more environmentally friendly than older conventional chemical products.

The pest management market is very competitive and is dominated by multinational chemical and life sciences companies such as Arysta, BASF, Bayer, Dow Agrosciences, DuPont, FMC, Monsanto, Sumitomo Chemical and Syngenta. Universities, research institutes and government agencies may also conduct research, seek patent protection and, through collaborations, develop competitive pest management products. Other companies, including bio-specialized biopesticide businesses such as AgraQuest (now a part of Bayer), Certis USA (now a part of Mitsui), Novozymes (in a joint venture with Monsanto) and Valent Biosciences (now a part of Sumitomo) may prove to be significant competitors in the bio-based pest management and plant health market. In addition, we could face competition in the future from new, well-financed start-up companies such as AgBiome and Indigo.

In many instances, agrichemical companies have substantially greater financial, technical, development, distribution and sales and marketing resources than we do. Moreover, these companies may have greater name recognition than we do and may offer discounts as a competitive tactic. There can be no assurance that our competitors will not succeed in developing pest management products that are more effective or less expensive than ours or that would render our products obsolete or less competitive. Our success will depend in large part on our ability to maintain a competitive position with our technologies and products.

Employees

In connection with our recent changes in business strategy, we have significantly reduced overall headcount, while building a new sales and marketing organization which provides for increased training and a better ability to educate and support customers in specialty crop markets as well as transitioning our product development staff to undertake greater responsibility for technical sales support, field trials and demonstrations to promote sales growth. As of December 31, 2015, we had 86 full-time equivalent employees, of whom 9 hold Ph.D. degrees. Approximately 35 employees are engaged in research and development and patent related activities, 17 in sales and marketing (including 4 sales and field development personnel who focus on technical support and demonstration and research field trials), 21 in operations, including manufacturing, supply chain and quality assurance, and 13 in management, accounting/finance and administration. None of our employees are represented by a labor union.

Corporate Information

We were originally incorporated in the State of Delaware in June 2006 as Marrone Organic Innovations, Inc. Our principal executive offices are located at 1540 Drew Avenue, Davis, CA 95618. Our telephone number is (530) 750-2800. Our website address is www.marronebioinnovations.com.

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ITEM 1A. RISK FACTORS

Our operations and financial results are subject to various risks and uncertainties, including those described below, which could adversely affect our business, financial condition, results of operations, cash flows, growth prospects and the trading price of our common stock.

Risks Relating to Our Business and Strategy

We have a limited number of commercialized products, have incurred significant losses to date and anticipate continuing to incur losses in the future, and we may not achieve or maintain profitability.

We are an early stage company with a limited number of commercialized products. We have incurred operating losses since our inception in June 2006, and we expect to continue to incur operating losses for the foreseeable future. As of December 31, 2015 and 2014, we had an accumulated deficit of $203.6 million and $159.8 million, respectively. For the years ended December 31, 2015, 2014 and 2013, we had a net loss attributable to common stockholders of $43.7 million, $51.7 million and $32.6 million, respectively. As a result, we will need to generate significant revenues to achieve and maintain profitability, and we may not be able to achieve profitability in the near future or at all, which may depress our stock price.

Through December 31, 2015, we have derived substantially all of our revenues from sales of Regalia and Grandevo. In addition, we have derived revenues from strategic collaboration and development agreements for the achievement of testing validation, regulatory progress and commercialization events, and from sales of other products. Accordingly, there is only a limited basis upon which to evaluate our business and prospects. Our future success depends, in part, on our ability to market and sell other products, such as Zequanox, Venerate and Majestene, as well as our ability to increase sales of Regalia and Grandevo and to introduce new products. An investor in our stock should consider the challenges, expenses and difficulties we will face as a company seeking to develop and manufacture new types of products in a relatively established market. We expect to derive future revenues primarily from sales of Regalia, Grandevo, Zequanox, Venerate, Majestene and other products, but we cannot guarantee the magnitude of such sales, if any. We expect to continue to devote substantial resources to expand our research and development activities, further increase manufacturing capabilities and expand our sales and marketing activities for the further commercialization of Regalia, Grandevo, Zequanox, Venerate and Majestene, and other product candidates. We expect to incur additional losses for the foreseeable future, including at least the next several years, and may never become profitable.

There is uncertainty about our ability to continue as a going concern.

Our consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities in the normal course of business. We currently estimate that by the fourth quarter of 2016, without entering into strategic agreements that include significant cash payments upfront, significantly increasing revenues from sales or raising additional capital through the issuance of equity or debt, we will be below the minimum cash balance requirement in our promissory notes with affiliates of Waddell & Reed. Further, although under a promissory note with Five Star Bank our lender has waived a requirement to remain below a maximum debt-to-worth ratio under this agreement through December 31, 2016, we expect that immediately after this waiver has expired, we will be in violation of this covenant as well. Breach of covenants included in our debt agreements, which could result in the lenders demanding payment of the unpaid principal and interest balances, would have a material adverse effect upon our business and would likely require us to seek to renegotiate these debt arrangements with the lenders. If such negotiations are unsuccessful, we may be required to seek protection from creditors through bankruptcy proceedings. These circumstances raise substantial doubt about our ability to continue as a going concern, which depends on our ability to obtain further waivers of our covenants, or raise additional capital

and increase revenues. Our consolidated financial statements do not include any adjustments that might be necessary should we be unable to continue as a going concern.

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We expect to require additional financing in the future to meet our business requirements and to service our debt. Such capital raising may be costly, difficult or not possible to obtain and, if obtained, could significantly dilute current stockholders equity interests, and we may be unable to repay our secured indebtedness.

In our August 2015 private placement transaction, we issued senior secured promissory notes in the initial aggregate principal amount of $40.0 million, which accrue interest at a rate of 8% per annum, with $10.0 million payable three years from the closing, $10.0 million payable four years from the closing and $20.0 million payable five years from the closing. In June 2014, we borrowed $10.0 million pursuant to a promissory note with a bank, which accrues interest at a variable interest rate, 5.25% per annum as of December 31, 2015, and which is repayable in monthly payments through June 2036. We also completed private placements in October 2012 and April 2013 of promissory notes in the aggregate principal amount of $12.5 million, which accrue interest at 18% through maturity in October 2017. The debt agreements with respect to these transactions contain various financial and other covenants, as discussed below, and our obligations under the loan agreements are secured by all of our real and personal property assets and general intangibles.

As we expect to continue to incur significant losses until we are able to significantly increase our revenue, we expect to need significant additional financing to meet the financial covenants or pay the principal and interest under our debt agreements, as well as to maintain and expand our business. We may seek additional funds from public and private stock offerings, corporate collaborations and licenses, borrowings under lease lines of credit or other sources. Additional capital may not be available on terms acceptable to us, or at all. Any additional equity financing may be significantly dilutive to stockholders, and debt financing, if available, may include restrictive covenants and bear high rates of interest. In addition, our existing loan agreements contain certain restrictive covenants that either limit our ability to, or require a mandatory prepayment if we incur additional indebtedness and liens and enter into various specified transactions. We therefore may not be able to engage in any of the foregoing transactions unless we obtain the consent of our lenders or prepay the outstanding amounts under the debt agreements, which could require us to pay additional prepayment penalties. In addition, we may incur substantial costs in pursuing future capital financing, including investment banking fees, legal fees, accounting fees, securities law compliance fees, printing and distribution expenses and other costs. We also may be required to recognize non-cash expenses in connection with certain securities we issue, such as warrants, which may adversely impact our financial results.

Certain of our debt agreements also contain financial covenants, including maintaining minimum current, debt-to-worth and loan-to-value ratios and certain cash balance requirements, in addition to provisions providing for an event of default if there is a material adverse change in our financial condition and if we are in default under certain of our other agreements. While we are not currently in default under any of these agreements, and none of our lenders have previously declared an event of default on our indebtedness, prior to our recent receipt of waivers from our lenders, we had not been in compliance with certain of these covenants. In addition, if we fail to pay any principal or interest under our indebtedness when due, or are otherwise in violation of certain covenants under our debt agreements, this may result in the acceleration of our indebtedness, and we may not have sufficient funds to repay that indebtedness.

If we cannot raise more money when needed, or are unable to use our future working capital, borrowings or equity financing to repay or refinance the amounts outstanding under our debt agreements or to renegotiate our debt arrangements with lenders, we may have to reduce our capital expenditures, scale-back our development of new products, reduce our workforce or license to others products that we otherwise would seek to commercialize ourselves. Any of these eventualities would likely have a material adverse impact on our value and the value of our equity. Further, we may not be able to continue operating if we do not generate sufficient revenue from operations needed to stay in business, and we may be required to seek protection from creditors through bankruptcy proceedings. See Part II-Item 7- Management s Discussion and Analysis of Financial Condition and Results of Operations Liquidity

and Capital Resources below.

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Our business may fail if we are not able to increase sales.

Our future success will depend on our ability to significantly increase sales from the bio-based pest management products we have commercialized, both domestically and abroad. Our initial sales of our primary formulation of Regalia and our initial formulation of Grandevo occurred in the fourth quarter of 2009 and the fourth quarter of 2011, respectively. We began selling Zequanox in the second half of 2012, Venerate in May 2014 and Majestene in December 2015. However, while we have invested considerable resources in the launch of our products, various factors have impeded growth in sales of these products.

For example, we believe adverse conditions in the U.S. agricultural industry, including low commodity prices, may have reduced demand for our products. Further delays in regulatory approvals of certain of our products in Europe and other jurisdictions may slow international growth, and any delay in a product launch that causes us to miss a growing season may require us to wait a year to enter that market. The extended drought in California and other markets has reduced demand for our products as fewer acres are planted, changes in weather patterns in Florida resulted in a shortened bloom cycle for the citrus market and few pesticide and plant health products being used, and certain of our strategic collaborations have not resulted in significant increases in sales of Regalia outside of the Unites States. Due to our prioritization plan, we have not committed sufficient resources to Zequanox in order to market it full-scale, and our collaboration efforts with regard to this product may not result in increased sales. In addition, the departures of our former chief operating officer and significant members of our sales staff in the third quarter of 2014 and subsequent turnover in our sales and marketing department disrupted the 2014 launch of Venerate as well as growth in sales of our other commercialized products, including Regalia and Grandevo. Further, we believe that following the announcement of the matters relating to our recent restatement, some customers and potential customers were concerned about our reported investigation efforts, and therefore, were reluctant to do business with us until after we had reached a settlement with the SEC.

Lower than expected sales growth may result in an increase in write-offs and inventory obsolescence if we are not be able to use raw materials or sell finished goods before they expire, and may result in higher proportional operating expense levels, increases in our cost of product revenues and decreases in product margins as we are unable to manufacture products as efficiently at low volumes and underutilization of our Bangor, Michigan manufacturing facility results in increased relative overhead and operating costs in addition to decreased allocation of depreciation and other costs to production and inventory. If we are unable to establish a successful sales and marketing infrastructure internally and increase sales of our commercialized products, our financial results will be adversely affected, our available cash and ability to raise additional capital will decrease and our business may fail.

We have limited experience in marketing and selling our products and will need to expand our sales and marketing infrastructure.

We currently have limited sales and marketing experience and capabilities. As of December 31, 2015, we employed 17 full-time equivalent sales and marketing personnel, 4 of which focus on technical support and demonstration and conducting field trials and 3 of which focus on marketing. Many of these sales personnel are recent hires following the departures in the third quarter of 2014 of our former chief operating officer, who led our sales and marketing teams, and significant members of our sales staff. These new personnel have required significant training to attain a high level of technical expertise and knowledge regarding the capabilities of our bio-based products compared with conventional chemical pest management products and techniques in order to educate growers and independent distributors on the uses and benefits of our products. We will need to further develop our sales and marketing capabilities and find partners in order to successfully increase sales of our commercially available products and to commercialize other products we are developing, which may involve substantial costs. We will also need to further expand our field development team to include more technical service activities to support sales. There can be no

assurance that our specialists and other members of our sales and marketing team will successfully compete against the sales and marketing teams of our current and future competitors, many of which may have more established relationships with distributors and growers. Our inability to recruit, train and retain sales and marketing personnel, or their inability to effectively market and sell the products we are developing, could impair our ability to gain market acceptance of our products and cause our sales to suffer.

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If we are unable to maintain and further establish successful relations with the third-party distributors that are our principal customers, or they do not focus adequate resources on selling our products or are unsuccessful in selling them to end users, sales of our products will be adversely affected.

In the United States, we rely on independent distributors of agrichemicals to distribute and assist us with the marketing and sale of Regalia, Grandevo, Venerate, Majestene and other products we are developing. We also intend to leverage these relationships to sell Bio-Tam 2.0 in California, Oregon, Washington and Arizona. These distributors are our principal customers, and revenue growth will depend in large part on our success in establishing and maintaining this sales and distribution channel. However, there can be no assurance that our distributors will be successful in selling our products to end users, or will focus adequate resources on selling them, and they may not continue to purchase or market our products for a number of reasons.

For example, many distributors lack experience in marketing bio-based pest management and plant health products, which generally must be used differently than conventional chemical pesticides. Distributors may not continue to market our products if they receive negative feedback from end users, even if we believe our products are being blamed for damage to treated plants caused by other pesticides with which our products have been combined (whether properly or improperly). In addition, many of our distributors are in the business of distributing and manufacturing other, possibly competing, pest management and plant health products, including internally developed and commercialized bio-based products as well as bio-based products developed by larger agrichemical companies that negotiate to bundle such specialty products with other high demand products. As a result, our distributors may earn higher margins by selling competing products or combinations of competing products. Our recent Audit Committee investigation, financial restatement and SEC investigation imposed additional work on our distributors, which has been perceived negatively in some cases, and distributors may also react negatively to additional sell-through reporting requirements we may require of them to apply our own revenue recognition policies. If we are unable to establish or maintain successful relationships with independent distributors, we will need to further develop our own sales and distribution capabilities, which would be expensive and time-consuming, and the success of which would be uncertain.

The product candidates we select for development and commercialization may fail to generate significant revenues, and we may not be able to successfully enter into strategic collaborations with respect to our other product candidates.

We have been implementing a prioritization plan that focuses our research and development on products that are expected to have the greatest near-term growth potential. Accordingly, 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 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.

Successful development of product candidates will require significant additional investment, including costs associated with research and development, completing field trials and obtaining regulatory approval, as well as the ability to manufacture our products in large quantities at acceptable costs while also preserving high product quality. Difficulties often encountered in scaling up production include problems involving production yields, quality control and assurance, shortage of qualified personnel, production costs and process controls. In addition, we are subject to inherent risks associated with new products and technologies. These risks include the possibility that any product candidate may:

be found unsafe;

be ineffective or less effective than anticipated;

fail to receive or take longer to receive necessary regulatory approvals;

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be difficult to competitively price relative to alternative pest management solutions;

be harmful to consumers, growers, farm workers or the environment;

be harmful to crops when used in connection with conventional chemical pesticides;

be difficult or impossible to manufacture on an economically viable scale;

be subject to supply chain constraints for raw materials;

fail to be developed and accepted by the market prior to the successful marketing of similar products by competitors;

be impossible to market because it infringes on the proprietary rights of third parties; or

be too expensive for commercial use.

Our decisions regarding which product candidates to pursue may cause us to fail to capitalize on product candidates that could have given rise to viable commercial products and profitable market opportunities. In addition, we may not be successful in entering into new arrangements with third parties, on favorable terms or at all, with respect to product candidates we do not pursue internally.

Adverse weather conditions and other natural conditions can reduce acreage planted or incidence of crop disease or pest infestations, which can adversely affect our results of operations.

Production of the crops on which our products are typically applied is vulnerable to extreme weather conditions such as heavy rains, hurricanes, hail, tornadoes, freezing conditions, drought, fires and floods. Weather conditions can be impacted by climate change resulting from global warming, including changes in precipitation patterns and the increased frequency of extreme weather events, or other factors. Unfavorable weather conditions can reduce both acreage planted and incidence (or timing) of certain crop diseases or pest infestations, each of which may reduce demand for our products. For example, in 2013 and 2012, the United States experienced nationwide abnormally low rainfall or drought, reducing the incidence of fungal diseases such as mildews and the demand for fungicides such as Regalia. These conditions have been present in some of our key markets throughout both 2015 and 2014 as well, and have also resulted in further reductions in acreage planted throughout California and the Pacific Northwest. Shortened bloom cycles relating to changes in weather patterns also could reduce the amount of pesticides and plant health products used during a growing season. For example, in 2014, the Florida citrus market experienced a shortened bloom cycle as a result of changes in weather patterns, which negatively affected our sales of Grandevo in the Florida market. In addition, ideal weather conditions can reduce the incidence of diseases and pest infestations and increase yields without the use of additional pesticide and plant health applications. Increased yields can also reduce commodity prices causing growers to make a decision not to increase costs by reducing the amount of pesticides and plant health products used during a growing season. Since all of our products have different margins, changes in product mix as a result of these conditions could affect our overall margins.

If our ongoing or future field trials are unsuccessful, we may be unable to obtain regulatory approval of, or commercialize, our products on a timely basis.

The successful completion of multiple field trials in domestic and foreign locations on various crops and water infrastructures is critical to the success of our product development and marketing efforts. If our ongoing or future field trials are unsuccessful or produce inconsistent results or unanticipated adverse side effects on crops or on non-target organisms, or if we are unable to collect reliable data, regulatory approval of our products could be delayed or we may be unable to commercialize our products. In addition, more than one growing or treatment season may be required to collect sufficient data and we may need to collect data from different geographies to prove performance for customer adoption. Although we have conducted successful field trials on a broad range of crops, we cannot be certain that additional field trials conducted on a greater number of acres, or on crops for which we have not yet conducted field trials, will be successful. Moreover, the results of our ongoing and future

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field trials are subject to a number of conditions beyond our control, including weather-related events such as drought or floods, severe heat or frost, hail, tornadoes and hurricanes, or low or no natural occurrence of the pests intended for testing. Generally, we pay third parties, such as growers, consultants and universities, to conduct field tests on our behalf. Incompatible crop treatment practices or misapplication of our products by these third parties or lack of sufficient occurrence of the identified pests in nature for a particular trial could impair the success of our field trials.

Our inability to obtain regulatory approvals, or to comply with ongoing and changing regulatory requirements, could delay or prevent sales of the products we are developing and commercializing.

The field testing, manufacture, sale and use of pest management products, including Regalia, Grandevo, Zequanox, Venerate, Majestene and other products we are developing, are extensively regulated by the EPA and state, local and foreign governmental authorities. These regulations substantially increase the time and cost associated with bringing our products to market. If we do not receive the necessary governmental approvals to test, manufacture and market our products, or if regulatory authorities revoke our approvals, do not grant approvals in a timely manner or grant approvals subject to restrictions on their use, we may be unable to sell our products in the United States or other jurisdictions, which could result in a reduction in our future revenues.

We have received approval from the EPA for the active ingredients and certain end product formulations for Regalia, Grandevo, Zequanox, Venerate, Majestene and MBI-011. As we introduce new formulations of and applications for our products, we will need to seek EPA approval prior to commercial sale. For any such approval, the EPA may require us to fulfill certain conditions within a specified period of time following initial approval. We are also required to obtain regulatory approval from other state and foreign regulatory authorities before we market our products in their jurisdictions, some of which have taken, and may take, longer than anticipated.

Some of these states and foreign countries may apply different criteria than the EPA in their approval processes. Although federal pesticide law preempts separate state and local pesticide registration requirements to some extent, state and local governments retain authority to control pesticide use within their borders.

There can be no assurance that we will be able to obtain regulatory approval for marketing our additional products or new product formulations and applications we are developing. Although the EPA has in place a registration procedure for biopesticides like Regalia and Grandevo that is streamlined in comparison to the registration procedure for conventional chemical pesticides, there can be no assurance that all of our products or product extensions will be eligible for this streamlined procedure or that additional requirements will not be mandated by the EPA that could make the procedure more time consuming and costly for our future products.

Additionally, for California state registration and registration in jurisdictions outside of the United States, all products need to be proven efficacious for each proposed crop-pest combination, which can require costly field trial testing, and a favorable result is not assured. Because many of the products that may be sold by us must be registered with one or more government agencies, the registration process can be time consuming and expensive, and there is no guarantee that the product will obtain all required registrations. We have intentionally obtained registration in some jurisdictions and not in others. California is one of the largest and most important producers of agricultural products in the world. Because of its stringent regulation of pesticides and environmental focus, we also view California as one of the most natural and attractive markets for our products. However, California is also very stringent, is generally more time consuming and lacks legally mandated deadlines for its reviews of reduced-risk biopesticides. Therefore, gaining concurrent approvals with the EPA, other states and sometimes even other countries may not always be achievable. Even if we obtain all necessary regulatory approvals to market and sell our products, they will be subject to continuing review and extensive regulatory requirements, including periodic re-registrations. The EPA, as well as state and foreign regulatory authorities, could withdraw a previously approved product from the market upon receipt of newly

discovered information, including an inability to comply with their regulatory requirements or the occurrence of unanticipated problems with our products, or for other reasons.

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Bio-based pest management and plant health products are not well understood, which necessitates investment in customer education and makes effectively marketing and selling our products difficult.

The market for bio-based pest management and plant health products is underdeveloped when compared to conventional pesticides. Customers in the crop production sector and the water treatment sector are generally cautious in their adoption of new products and technologies. Growers often require on-farm demonstrations of a given pest management or plant health product. Initial purchases of the product tend to be conservative, with the grower testing on a small portion of their overall crop. As the product is proven, growers incorporate the product into their rotational programs and deploy it on a greater percentage of their operations. As a result, large scale adoption generally takes several growing seasons. Water treatment products must also pass efficacy and ecological toxicity tests. In addition, given the relative novelty of our water treatment products, consumers of those products will continue to require education on their use, which may delay their adoption.

In addition, customers have historically perceived bio-based pest management products as more expensive and less effective than conventional chemical pesticides. To succeed, we will need to continue to change that perception. To the extent that the market for bio-based pest management products does not further develop or customers elect to continue to purchase and rely on conventional chemical pesticides, our market opportunity will be limited.

The high level of competition in the market for pest management and plant health products may result in pricing pressure, reduced margins or the inability of our products to achieve market acceptance.

The markets for pest management and plant health products are intensely competitive, rapidly changing and undergoing consolidation. We may be unable to compete successfully against our current and future competitors, which may result in price reductions, reduced margins and the inability to achieve market acceptance for our products.

Many entities are engaged in developing pest management and plant health products. Our competitors include major multinational agrichemical companies such as Arysta, BASF, Bayer, Dow Agrosciences, DuPont, FMC, Monsanto, Sumitomo Chemical and Syngenta, some of which have developed bio-based products for our target markets, as well as specialized bio-based pesticide and plant health businesses such as AgraQuest (now a part of Bayer), Certis USA (now a part of Mitsui), Novozymes (in a joint venture with Monsanto) and Valent Biosciences (now a part of Sumitomo). Many of these organizations have longer operating histories, significantly greater resources, greater brand recognition and a larger base of customers than we do. As a result, they may be able to devote greater resources to the manufacture, promotion or sale of their products, receive greater resources and support from independent distributors, initiate or withstand substantial price competition or more readily take advantage of acquisition or other opportunities. Further, many of the large agrichemical companies have a more diversified product offering than we do, which may give these companies an advantage in meeting customers needs by enabling them to offer a broader range of pest management and plant health solutions. In addition, we could face competition in the future from new, well-financed start-up companies such as AgBiome and Indigo.

Our product sales are subject to weather conditions and other factors beyond our control, which may cause our operating results to fluctuate significantly quarterly and annually.

The level of seasonality in our business overall is difficult to evaluate as a result of our relatively early stage of development, our relatively limited number of commercialized products, our expansion into new geographical territories, the introduction of new products, the timing of introductions of new formulations and products and our recognition of revenue on both a sell-in and sell-through basis, depending on the transaction. It is possible that our business may become more seasonal, or experience seasonality in different periods, than anticipated, particularly if we expand into new geographical territories, add or change distributors or distributor programs or introduce new products

with different applicable growing seasons, or if a more significant component of our revenue becomes comprised of sales of Zequanox, which has a separate seasonal sales cycle compared to our crop protection products.

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Notwithstanding any such seasonality, we expect substantial fluctuation in sales year over year and quarter over quarter as a result of a number of variables on which sales of our products are dependent. Weather conditions, natural disasters and other factors affect planting and growing seasons and incidence of pests and plant disease, and accordingly affect decisions by our distributors, direct customers and end users about the types and amounts of pest management and plant health products to purchase and the timing of use of such products. In addition, disruptions that cause delays by growers in harvesting or planting can result in the movement of orders to a future quarter, which would negatively affect the quarter and cause fluctuations in our operating results. For example, late snows and cold temperatures in the Midwestern and Eastern United States in the first and second quarters of 2014 delayed planting and pesticide and plant health applications. Customers also may purchase large quantities of our products in a particular quarter to store and use over long periods of time or time their purchases to manage their inventories, which may cause significant fluctuations in our operating results for a particular quarter or year, and low commodity prices may discourage growers from purchasing our products in an effort to reduce their costs and increase their margins for a growing season.

Our expense levels are based in part on our expectations regarding future sales. As a result, any shortfall in sales relative to our expectations could cause significant fluctuations in our operating results from quarter to quarter, which could result in uncertainty surrounding our level of earnings and possibly a decrease in our stock price.

We rely on the experience and expertise of our senior management team and other key personnel, and if we are unable to recruit or retain qualified personnel, our development and commercialization efforts may be significantly delayed.

We depend heavily on the principal members of our management, particularly Pamela G. Marrone, Ph.D., our founder, President and Chief Executive Officer, the loss of whose services might significantly delay or prevent the achievement of our scientific or business objectives. Although we maintain and are the beneficiary of $10.0 million in key person life insurance policies for the life of Dr. Marrone, we do not believe the proceeds would be adequate to compensate us for her loss.

We have a lean staff, and rely on qualified sales and marketing, research and development and management personnel to succeed. For example, the departures of our former chief operating officer and significant members of our sales staff in the third quarter of 2014 and subsequent turnover in our sales and marketing department adversely impacted our business by disrupting the 2014 launch of Venerate as well as the growth in sales of our other commercialized products, including Regalia and Grandevo. The process of hiring, training and successfully integrating qualified personnel into our operation is lengthy and expensive. The market for qualified personnel, such as experienced fermentation engineers and formulation chemists, is very competitive because of the limited number of people available with the necessary technical skills and understanding of our technology and anticipated products, and few sales and marketing personnel have prior experience with bio-based products. Perceived instability and risk in our business has made it difficult to retain qualified personnel and could impair our ability to meet our business objectives and adversely affect our results of operations and financial condition.

If we or our third-party manufacturers are unable to produce our products at a satisfactory quality, in a timely manner, in sufficient quantities or at an acceptable cost, our business could be negatively impacted.

We have transitioned the majority of our manufacturing processes in-house to our facility in Bangor, Michigan. If severe weather, a fire or natural disaster occurs, a contaminant grows in our fermentations, or a mechanical or labor problem leads to a reduced capacity or shutdown of our fermenters or other equipment, we may not be successful in producing the amount and quality of product we anticipate in the facility and our results of operations may suffer as a result.

We also continue to rely on third parties to formulate Grandevo and Zequanox into spray-dried powders and for all of our production of Venerate and Majestene, and from time to time, we expect to use third-party manufacturers for supplemental production capacity to meet excess seasonal demand and for packaging. Our reliance on third parties to manufacture our products presents significant risks to us, including the following:

reduced control over delivery schedules, yields and product reliability;

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price increases;

manufacturing deviations from internal and regulatory specifications;

the failure of a key manufacturer to perform its obligations to us for technical, market or other reasons;

challenges presented by introducing our fermentation processes to new manufacturers or deploying them in new facilities;

difficulties in establishing additional manufacturers if we are presented with the need to transfer our manufacturing process technologies to them;

misappropriation of our intellectual property; and

other risks in potentially meeting our product commercialization schedule or satisfying the requirements of our distributors, direct customers and end users.

We have not entered into any long-term manufacturing or supply agreements for any of our products, and we may need to enter into additional agreements for the commercial development, manufacturing and sale of our products. There can be no assurance that we can do so on favorable terms, if at all.

Our products have been produced in quantities sufficient to meet commercial demand. However, our dependence upon others for the production of a portion of our products, or for a portion of the manufacturing process, particularly for drying, may adversely affect our ability to develop and commercialize our products on a timely and competitive basis. If manufacturing capacity is reduced or eliminated at one or more of our third-party manufacturers facilities, we could have difficulties fulfilling our customer orders, and our net revenues and results of operations could decline.

We must accurately forecast demand for our products to obtain adequate and cost-effective capacity from our third-party manufacturers and to purchase certain of the raw materials used in our products at cost-effective rates. Our third-party manufacturers are not required to supply us products until we place and they accept our purchase orders, which generally occurs approximately one month prior to the anticipated product delivery date based on our own rolling forecasts. Our purchase orders may not be accepted and our third-party manufacturers may not be willing to provide us with additional products on a timely basis if they prioritize orders placed by other companies, many of whom are more established than us and order larger volumes of products. In addition, while raw material orders are generally placed one month in advance, because certain of the raw materials used in our products are in short supply or are subject to capacity demands, we place some raw material orders approximately six months in advance to avoid paying higher prices. Accordingly, if we inaccurately forecast demand for our products, we may be unable to meet our customers delivery requirements, or we may accumulate excess inventories of products and raw materials.

Failure to achieve expected manufacturing yields for our products could negatively impact our operating results.

Low yields may result from product design, development stage or process technology failures. We do not know whether a yield problem exists until our products are manufactured based on our design. When a yield issue is

identified, the product is analyzed and tested to deter