

Bioceres S.A: Ag Biotechnology Expansion

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ABSTRACT

In this case we present an investment decision-making situation in which a stockholder of an Argentine Agribusiness Biotechnology company has to analyze the company's strategy and decide if he will further invest in the firm. The company name is Bioceres; it is a fully integrated crop productivity provider in the areas of seed traits, biologicals, molecular farming and metabolic engineering. It has annual revenues of around 150 million dollars, and net losses of 10 million dollars. In the near future Bioceres will launch, at a global scale, its leading technology called HB4[®], which provides drought and salinity tolerance to crops such as soybeans, alfalfa and wheat. By early 2019 Bioceres is intending to go public in the American stock market.

Keywords: Business Case; Ag Biotechnology; Investment; Business Models.

1 Introduction

Miguel Terrero is an Argentine agricultural producer, and a businessman who is constantly looking for new business opportunities beyond farming. Lately, he has become interested in the ag biotechnology sector, and bought some stocks of a company called Bioceres. Currently, in December 2018, he is considering future investments in this company, as he is attracted by the technologies it is developing and aiming to sell at a global scale.

Bioceres is a knowledge-based company founded in the city of Rosario, Argentina. In 2001, in the midst of one of the worst economic crisis the country had ever faced, 23 farmers founded Bioceres to provide sustainable and environmentally-conscious crop productivity solutions. Through its different business units, the company develops and commercializes several bio-technologies for fast growing markets of agricultural inputs and agro-based industries. Bioceres develops products in areas such as crop protection and crop nutrition, seed traits and seed treatments, and agro-industrial enzymes with applications for the food and energy markets.

Bioceres plans for 2019 included an initial public offering (IPO) of shares in the American stock-exchange market. The goal was to obtain 130 million dollars to fund the company's international expansion and pay a portion of its outstanding debt.

Even if Bioceres has very promising technologies in the pipeline and interesting intellectual property assets (such as 217 patents and patent applications), it still has to launch its most promising technology: HB4® a drought and salinity tolerance trait for soybeans and wheat. Furthermore, even if revenues and operating income have increased significantly —especially after the purchase of a bio-based solutions company called Rizobacter in October 2016—, Bioceres still has to show a positive bottom line. Expectations are that once the HB4® technology gets full approval in the USA¹ and China² in the next couple of years, it will be launched into the market and bring profits to the company.

After going through Bioceres' reports, Miguel (who is not proficient in financial investments, accounting or the stock market technicalities) has to make an investment decision. He has to reconcile the high promises that Bioceres new technologies bring in terms of opening new commercial opportunities with the financial reports. Months before Bioceres goes public in the American stock market in 2019, Miguel is considering an increase of his investment in Bioceres. He is thinking of a long-term investment. However, he faces many uncertainties: how to evaluate this investment, the risks involved, and Bioceres' future strategies to create and capture value.

2 Bioceres and the Bioeconomy Opportunity.

Federico Trucco, Bioceres' CEO, believes that the use of bio-technology tools applied to the country's abundant natural resources is a great opportunity to further develop Argentina's agribusiness. In his vision, thanks to biotechnology, the country would no longer be an efficient 'commodity' crop provider and would become an international player of high value-added-products. As Federico says, Argentina needs *'to move from the granary agriculture of today to be the protagonist of a post-granary agriculture, based on a more comprehensive use of the photosynthesis process to double the agricultural GDP'* (BioEconomía, 2018). Needless to say, this 'bio-based economic vision' is the driving force behind Bioceres new projects.

Bioeconomy is an increasingly accepted approach towards a society less dependent on fossil resources, in a world that will have to meet growing demands for food and fiber to feed a population that estimated in more than ten billion people in the coming decades. Bioeconomy can be seen as the sustainable, eco-efficient transformations of renewable biological resources into food, energy and other industrial products (Bioeconomía Argentina, 2015).

The availability of new arable land, renewable fresh water and fossil fuels is increasingly limited. These resources can no longer be used without restrictions. Additionally, projections regarding climate change suggest that global greenhouse gas balances are strongly dependent on current world economy practices.

¹ It already has an approval for human and animal safety, it was still under review for the environmental approval.

² Which is expected to take place in 2020.

Bio-economy would promote new productive strategies to ensure the global balance of food, fiber and energy, as well as the improvement of environmental sustainability.

It has been observed that the demand for higher crop yields is quite dramatic as a result of the global population increase, an expanding middle class, the trend towards urbanization, the decrease in agricultural land per capita, the claim for a reduced use of environmentally harmful chemicals and the consequences of unfavorable weather patterns for farming.

This demand cannot be met by conventional farming alone. Agricultural biotechnology products are currently a viable solution to meet this expected higher crop yields demand. Global food projections for the period 2005-2050 under different scenarios show that the average food demand is estimated to increase by 74% (with values ranging from 62% to 98%), assuming that the world population grows by 42% (to 9.3 billion) in that period (Valina et al. 2014). The OECD(2010) estimates that the global middle-class population is expected to grow from 1.8 billion in 2009 to 3.2 billion by 2020, and 4.9 billion by 2030. As household income rises, so does the demand for protein-rich diets, which drives an additional demand for grains. The trend toward urbanization is also causing a large drop in the availability of arable land per capita.

FAO (2012) estimates that the ratio of arable land to population has declined by over 50% from 1962 to 2010. As a result, according to a report from Statista, the number of people fed per hectare is expected to increase by more than 100%, from 2.3 up to 5.6 people from 1960 to 2020.

According to the ISAAA (2016) , conventional crop technology alone cannot either address this huge demand nor feed the increased growing population. Sustainable approaches based on the best conventional crop technology, the best adapted germplasms, as well as the best available biotechnology are required to increase crop productivity to meet the growing demands of a growing population. In the past 20 years biotech crops have confirmed that they have and can deliver substantial agronomic, environmental, health, economic and social benefits.

The rapid adoption of biotech crops reflects the multiple and substantial benefits obtained worldwide. At present, 2 billion hectares of biotech crops are grown commercially. Furthermore, in many countries, the adoption rate of biotech main crops has exceeded 90% both in developing and industrial countries as well. As of 2016, the adoption of GM varieties of soybean expanded to over 90%, corn, 80% and cotton has reached a high of 65%. In Argentina, in 2016 approximately 24 million hectares of biotech crops were planted. The percent of hectares planted with different varieties of biotech soybean, corn and cotton was 100%, 97% and 95% hectares, respectively.

This bio-economic approach represents a great opportunity for Argentina, a country rich in resources of biological origin, with successful experiences in the productive use of natural resources and featuring a reasonably developed scientific and technological infrastructure. Argentina now faces the double challenge of recomposing its strategic balance in terms of energy and territorial matters. The country also needs to find new sources of growth to generate income and create jobs. Bioeconomics can certainly make a huge contribution to such goal (Bioeconomía Argentina, 2015).

Bioceres aims to be a front runner in this new emerging bio-economic world, and to position itself as a leading company, regionally and globally. This approach involves a significant number of topics, including intellectual property protection for GMO and non-GMO crops, the distribution effects of new bio-technologies among consumers, farmers, and seed companies, etc.

3 Bioceres: An Overview

Bioceres was founded in 2001 in the city of Rosario by twenty-three leading farmers, who shared a common dream: Argentina could become a benchmark in the development of agricultural biotechnology, and at the same time, these inventions may lead to increased competitiveness.

Initially, it was established as an investment society focused on the creation, management and funding of ventures linked to the development of technologies, products and knowledge in ag biotechnologies and related fields. Early enough the partners concluded that such model had an unavoidable flaw: it would prevent Bioceres from capitalizing from their 'failures': to learn from those initiatives that did not thrive in order to leverage that knowledge into other projects.

This led Bioceres to create its own research and development center, which was called Institute of Agro Biotechnology of Rosario (INDEAR) and launched in 2004. It became the heart of Bioceres, not only because it was the R&D arm to support the different projects, but also because it was the 'scientific service' area, which provided these 'high-end' services to other institutions and biotech companies (See Annex 1: "Bioceres' Milestones").

Through INDEAR, Bioceres could make strategic partnerships with other research groups, normally through 'public-private' agreements, which was a key feature to manage the risks these projects involved. By means of these partnerships, Bioceres entered into research projects through INDEAR, obtaining a first option in those successful projects. This gave the company the opportunity to have many projects with different profiles in terms of risks and timing.

Bioceres became a fully-integrated provider of crop productivity solutions, with the aim of sourcing, validating, developing and commercializing agricultural technologies and products. Thanks to its research capabilities, the company has developed a multi-discipline and multi-product platform capable of providing solutions throughout the entire crop cycle, from pre-planting to post-harvest and storage. The platform is designed to bring cost-effective high-value technologies to market through an open-architecture approach.

Bioceres is a cell-organized group, in which the cells (firms of the group) are part of the same body, Bioceres Holding. Being part of this body implies freedom to act, and at the same time, the need to act in a coordinated way: to know 'who we are', 'what we do', 'when we say yes and when no', etc. The cell organization based on different companies allows Bioceres to partition its assets, aiming at maximizing them. Therefore, the firm can serve different 'clients' from different industries from different 'counters': Those who are linked to seeds will be served from Bioceres Semillas; those related to energy, from another area and the bioreactors, from yet another area (See Annex 2: "Organizational Structure").

In order to bring products to market in an efficient and cost-effective manner, the company has established multiple joint ventures, formed non-joint venture collaborations, as well as created and acquired multiple companies. The joint ventures include partnerships with important industry participants, such as Florimond Desprez³, De Sangosse⁴ and Arcadia Biosciences⁵.

With Arcadia Biosciences from the US, in 2012, Bioceres established a 'joint-venture' called Verdeca. The goal of this joint venture is the development, de-regulation, and commercialization of biotechnological events for soybean improvement in the five principal production markets: Argentina, Brazil, China, USA, and India, and two consumption markets: Japan and the European Union. Globally, the soybean has a market of 120 million hectares, with 360 million tones in production, mostly in USA, Brazil, and Argentina. Together, these countries concentrate 80% of the market.

The key contribution of Bioceres to Verdeca is its core transgenic technology: HB4[®], which is a trait that makes crops drought and salinity-tolerant. This transgenic technology has been developed not only for soybeans, but also for other crops such as wheat and alfalfa.

HB4[®] helps increase the yield of multiple crops by an average 13% to 19% under various growing seasons and conditions, including sporadic drought episodes. HB4[®] is also able to provide this

³ Florimond Desprez is an independent and family company that works as a breeder of varieties and as a producer of seeds that meet the needs of extensive crops. It was created in France in 1830.

⁴ DE SANGOSSE is an international player in the supply of crop protection, plant nutrition, and pest control products.

⁵ Arcadia Biosciences, Inc. (Nasdaq: RKDA), an agricultural food ingredient company.

higher yield without adversely impacting yields under optimal growing conditions, which is a distinctive and important factor compared to other stress tolerance technologies.

HB4[®] has been approved for use in soybeans in Argentina in 2015. By 2017 the U.S. Food and Drug Administration (FDA) completed its full review of the company's safety evaluation for HB4[®] soybeans, allowing products derived from HB4[®] soybeans to be used commercially in human food and animal feed in the US. Also, an environmental safety data petition has been submitted to the US Department of Agriculture (USDA); this submission is currently under review. Upon completion, the USDA is expected to issue a Determination on Nonregulated Status, which will complete the approval processes in the US and allow the commercial production of HB4[®] soybeans. It has also recently obtained regulatory approvals in Brazil, and the Chinese approval is expected by 2020.

In 2013 and 2014, two new joint ventures were established: In 2013, Trigall Genetics with the French company Florimond Desprez to develop and commercialize HB4[®] technology for wheat; and later, in 2014, with S&W seed in order to do the same for alfalfa.

In October 2016, Bioceres acquired 50.01% of the shares of Rizobacter6, a global leader in soybean biological products. This company is the global leader in soybean seed inoculants, with almost a 20% market share and products sold in more than 30 countries. "Rizobacter has an established platform of both biological and chemical solutions for crop nutrition and protection, which constitutes a unique complement to Bioceres' seed biotechnologies," added Federico Trucco, Bioceres' CEO (Bioceres Newsroom, 2016).

By the end of 2016, Bioceres had bought 28% of Chemotécnica's share capital. Chemotécnica's main activity is the synthesis of active principles and crop protection (herbicides, fungicides, and insecticides). The purchases of Rizobacter and Chemotécnica have provided Bioceres not only complementary products (seed traits, biological, crop protection, and crop nutrition products) but also national and international distribution capabilities, with presence in 30 countries, to sell agricultural input products.

4 Bioceres' Business Model

Bioceres is a technology integrated company. It covers many different areas, including biotechnology, genetics, biological, and crop protection and crop nutrition technologies. Its focus is the management of the photosynthesis processes in real time, in the fields of crop productivity solutions and value-added products. It aims to reduce the footprint impact of introducing products into the market, in the context of a lower demand for fossil products and a higher demand for more ecological friendly ones.

In the biotechnology industries, the development and regulatory approval for products and technologies require a highly evolved and complicated process that can last from 12 to 14 years. This process involves obtaining the approval from different government institutions, in each country where the seed or grain is produced and/or commercialized. The evaluation process covers: product efficiency, environmental impact, and food safety for animals and humans. Furthermore, capital allocation requirements can be onerous due to the expensive research activities usually associated with life sciences research and the strict requirements for regulatory approval that are imposed on genetically modified crops and technologies. Thus, biotech companies are widely exposed to high technological, regulatory, and financial risks. All this has to be considered when structuring business models for biotech companies.

In terms of value proposition, Bioceres is a provider of crop productivity solutions, focused on improving crop yields and increasing the value of crops' products. An example of the first is the HB4[®] technology, which is currently in the launch process and provides drought tolerance for soybeans and wheat. To increase the value of crops, Bioceres sells an enzyme for the production of cheese called chymosin. Value capture tools available to the company are licenses, service fees, seed treatment products, as well as crop nutrition and protection product revenues (See Annex 4: Bioceres' Financial Information).

Bioceres' most important resource is its unit of technology sourcing and product development subsidiary, the 'Institute of Agro-Biotechnology of Rosario' (INDEAR). Another important resource is

⁶ Bioceres expects to exercise a mandatory call option for an additional 9.99% of Rizobacter upon the successful completion of the future IPO.

the network of relations with farming, as most of Bioceres' 326 stockholders are farmers, processors, distributors and have some commercial participation in Latin American agriculture. The company has also developed links with the government: Bioceres is one of a handful of selected companies collaborating with the Argentine Ministry of Science, Technology and Productive Innovation in the design of research grants aimed at the biotechnology sector.

One of the key skills that Bioceres has developed is being very innovative in obtaining funding based on various sources: shareholders, government funds, partners, market capital:

- To attract new stockholders, Bioceres offers them the possibility of purchasing stocks through different financial tools promoted by the Ministry of Science and Technology of Argentina. These tools allow new investors to obtain tax refunds from the Argentine government when buying Bioceres' stocks.
- Bioceres has developed a know-how to access different research subsidy programs that the Argentine government provides for biotechnology projects and consortia. Generally, for every dollar invested in technology sourcing, twenty dollars are invested by third parties (whether through grants or otherwise), thus mitigating the associated high financial risks associated with such early stage discoveries.
- In some cases, strategic partners in their joint-ventures with Bioceres commit to make financial investments in the project.
- More recently, in the beginning of 2018, Bioceres raised capital through financing from two important actors: Monsanto and BAF Capital, the latter is a Swiss based Company with a specific focus in the Latin American region and focused on financing agribusiness exporters (Preliminary Prospectus, 2018).

Bioceres' business model is driven by three key pillars: Cost-efficiency in technology sourcing, a partnership strategy product development in order to reduce risks, and a multiple market access strategy to maximize market reach and the rate of technology adoption.

In terms of technology sourcing, Bioceres focuses on sourcing and validating promising early stage technologies, which are usually financed through public grants and other capital efficient sources. Through its agreements with institutions such as CONICET (National Scientific and Technical Research Council) and Argentine public universities, it has access to scientific projects at a relatively low cost. This allows Bioceres to manage many projects with a relatively low 'burn rate': For example, they spent 3 million dollars in R&D in the second semester of 2017, with incomes of more than 80 million dollars in that same period. This is comparatively a very good ratio for a biotech company, turning R&D dollars into good earnings (Preliminary Prospectus, 2018).

Regarding product development, Bioceres creates partnerships and joint ventures to develop validated technologies and products and to bring them to market. By co-funding projects at an average investment ratio of four dollars from partners to one dollar that they invest, Bioceres further reduces the financial burden and risk from product development activities while also increases its ability to develop multiple products (Preliminary Prospectus, 2018).

The production and market access pillar is focused on establishing multiple pathways to markets, to maximize market reach and the rate of technology adoption. Bioceres sells more than 300 products and licenses through such channels. The subsidiaries that support this pillar are Rizobacter, Bioceres Semillas, Synertech, AGBM, and Héritas.

5 Bioceres' Businesses, Products, and Markets

5.1 Industry, Markets and Competitors

The agricultural input industry includes three broad categories: a) crop protection (agrochemicals), b) crop seeds and biotechnological products, and c) crop nutrition and fertilizers. Each one of these segments has many product categories: for example, crop protection has the herbicide, insecticide and fungicide segments. Products are sold either as stand-alone or combined goods: such as seed treatment packs with seed germplasm, traits, biologicals and chemical components, which are traded as a single product. Presently, the relationship between crop seed and agrochemicals appears critical for the agricultural input firms in the global markets, due to complementarities between crop seeds genetically engineered to be tolerant to crop protection products such as herbicides and insecticides (Sheldon, 2017).

By 2016, the global agrochemical (crop protection) and seed sales reached 57 billion and 37 billion dollars respectively. For soybeans, the crop protection and seed global sales achieved 15 billion dollars in 2015, with 45% of revenues for seeds, 22% for herbicides, 18% for insecticides, and 15% for fungicides. Until recent years, the leading companies in the agrochemical and seed markets were Syngenta, Bayer, BASF, Dow Chemical, DuPont and Monsanto. However, with recent mergers and acquisitions, the six majors are now down to five: Bayer (Bayer & Monsanto), Corteva (Dow & DuPont), BASF, ChemChina (ChemChina & Syngenta,) and FMC. The global fertilizer market is worth 170 billion dollars with leading companies such as Yara, The Mosaic Company, Nutrien, K+S AG and Groupe OCP, among others (Nishimoto, 2019; Annex 3).

5.2 Bioceres' Businesses, Segments and Products

Bioceres is involved in specific agricultural input and bio-technology related businesses, in some segments of the broad ag input market categories: crop protection, crop nutrition, seed and integrated products (Annex 3 and 4).

In the crop protection markets, Bioceres sells adjuvants, insecticides, and fungicides. In 2018, sales figures corresponding to the products in this segment, were 46 million dollars with a revenue margin of almost 20 million dollars. The Argentine market for insecticides and fungicides is roughly 400 and 300 million dollars respectively; and the adjuvant market is around 120 million dollars, in which the company has a market share of 26%.

Crop nutrition products include inoculants, bio-fertilizers and chemical-based fertilizers. Sales in 2018 were 26 million dollars with a gross margin of 10 million dollars. Bioceres is, through Rizobacter, the world leader in soybean inoculants, a market of roughly 160 million dollars (2015), with a global market share of approximately 21%.

Seed and integrated products include seed traits, germplasms, and seed treatments. In 2018, sales in these categories of products were 19 million dollars. This segment is expected to grow more than any other segment, through the introduction of the HB4 technology into the market. HB4®, a seed trait for drought tolerance, can increase yields by an average of 13-19% across different crops. Considering that there are approximately 120 million hectares of soybeans under production (USDA, 2018) and that drought is an important abiotic factor limiting soybean production worldwide —accounting for about 40% crop loss (Pathan et al. 2007)— there is an important market opportunity for this technology. *“Bioceres is known to be the only company with a product that works for drought tolerance in soybeans, and has associated patents”*, explains Federico Trucco in an interview (Goldschmidt, 2018), signaling that this trait will be a driving force for the future of the company.

Bioceres aims to offer a seed differentiated product in the soybean and wheat seed markets, integrating the seed's germplasm with the inoculant, fungicides and insecticides, and HB4 technology and other traits, to create non-replicable seed products for soybeans and wheat, with the names of BioSoy and BioWheat. This would enhance the value capture opportunity for the firm, compared to merely licensing the technology to third parties.

The main targeted markets for the HB4 technology are, in the short term (3 years), the Argentina and Brazil soybean seed markets, with a planting area of 53 million hectares. And in the mid-term (5 years), entering the US soybean seed market would add up to a total of 87 million hectares. A significant proportion of this land suffers from abiotic stress problems, which means that

addressing yield losses caused by abiotic stresses opens new opportunities to sell drought tolerant seeds in the global seed markets.

The market value opportunity estimated by the company for the soybean seed integrated product including HB4 would be, in the short-term, of about 1 billion dollars of revenues a year; and around 2 billion dollars for the global market in the mid-term⁷.

Bioceres is the only firm with patented technologies for soybean drought in global markets, including Argentina, Brazil and the US; it is expected to get a patent approval in China by 2020. This gives the company a leading (monopolistic) position in this seed trait segment for a period up to 2033, year in which the HB4 licensed patent expires. As there are no substitutable approved technologies available up to now for soybean drought, and it would take a long period (5-10 years) to develop the technology and obtain all the environmental and health approvals for many countries as Bioceres did. The innovative nature of the HB4 technology applied to soybeans and other crops would ensure Bioceres a leading position and a very limited competition in drought tolerant seed products for a period of time.

6 Bioceres' IPO in the US Stock Market

In 2018 Bioceres attempted an international IPO for the first time. On January 23, 2018, Bioceres S.A. announced the launch of its initial public offering (IPO) of shares in the international (US) and local (Argentina) stock exchange markets. The aim was to obtain around 130 million dollars to fund the company's international expansion and pay a portion of its outstanding debt (Bioceres Newsroom, 2018, January 23rd). *"The capital raised will basically be for a growth plan having to do with the commercialization of products that today are ready for the market,"* Trucco said. *"There is going to be a minor acquisition and repayment of debt"* (Reuters, 2018).

There are 25,644,300 shares issued up to date. The company aims to issue up to 24,000,000 new shares in the global offering (US and Argentina), probably in 2019, which would make a total of 49,644,300 shares.

In Argentina, Bioceres will offer the general public up to 15,044,273 ordinary shares, with the possibility of increasing to 17,404,534 ordinary shares. The public offering of the ordinary shares in Argentina was initially authorized by the Argentine Securities and Exchange Commission (*Comisión Nacional de Valores*).

Concurrently, in the US, Bioceres will offer 11,818,182 ordinary shares, which may be represented by American Depositary Shares ("ADSs")⁸, filed with the US Securities and Exchange Commission. Additionally, Bioceres intends to grant the underwriters a 30-day option to purchase up to an additional 1,772,727 ordinary shares represented by ADSs at the initial public offering price, less underwriting discounts and commissions. The initial public offering price was expected to be between US\$10.00 and US\$12.00 per ordinary share.

This number of ordinary shares offered is based on the assumption that the full capital increase of 24,000,000 ordinary shares previously authorized by the shareholders on December 17th 2014 (and ratified by Bioceres' Board of Directors on December 15th, 2016) will be offered in the global offering.

⁷ This is based on Bioceres estimates, according to the value that HB4 could create for soybean farmers. Roughly, the targeted market for the HB4 trait in Argentina and Brazil would be 21.5 million hectares of soybeans, or 32 million seed bags (1.5 bags per hectare). The average value creation would be 60 dollars per hectare (40 US\$/bag), and a premium price of 10 dollars per bag over non-HB4 seeds. The non-HB4-seed bag price is 22 dollars. Multiplying the value of a bag of HB4-soybean-seeds (32 dollars, adding 22 + 10) per 32 million bags would give 1.0 billion dollars (Bioceres Crop Solutions. 2019. EcoSoy Market Opportunity).

⁸ American depositary shares (ADS) come into play when a foreign company wants its shares to trade on a major American exchange as U.S. dollar-denominated equity. US securities laws prevent foreign corporations that have shares trading in a foreign market to directly list their shares on U.S. stock exchanges (exceptions do occur, such as for Canadian companies).

However, there are shares allocated to specific purposes, such as the repayment of the Monsanto and BAF convertible loans and the BAF Bridge Loans, the Equity Incentive Plans and the pre-emption⁹ and accretion rights of existing shareholders¹⁰ (Preliminary Prospectus, 2018).

Specifically, Bioceres intends to use about \$15.3 million of IPO proceeds to repay all or a portion of its outstanding debt, \$10.0 million for investments in seed and integrated products segment, \$5.0 million for investments in commercially expanding agro-industrial biotech solutions business, and \$15.0 million to exercise mandatory call option for an additional 9.99% of Rizobacter.

However, in 2018, Bioceres S.A. was forced to delay its initial public offer twice: First, in February 2018 due to the existing high volatility of the international markets, and the increase of the CBOE Volatility Index; then, at the beginning of May 2018 after a volatile week rocked the Argentine currency, bond and stock markets (See Annex 5). Bioceres is now looking forward to the year 2019 for a new offering in the NASDAQ Market (Annex 6).

7 The Investment Decision

In November 2018 Bioceres announced the execution of a definitive share exchange agreement with Union Acquisition Corporation, a special purpose acquisition company¹¹. Bioceres informed that it would contribute with its agricultural solutions business in exchange for equity of Union Acquisition. This transaction is expected to result in a combined company with an anticipated initial enterprise value of approximately 456 million US dollars (Bioceres Newsroom, 2018, November 9th).

By December 2018, Miguel was trying to make sense of all the information he obtained from Bioceres, in view of the prospect of the company's launch into the US financial market. He was seeking to grasp Bioceres' strategy, the risks involved in investing in this firm, the impact of the HB4[®] trait, etc.

Essentially, he wanted to answer the question: Should I invest in Bioceres?

However, in this process of evaluation of Bioceres, he had some pending issues he wanted to respond before making his investment decision:

- a. Does Bioceres have a coherent business model? Is the business model sustainable?
- b. To what extent does the development of HB4[®] impact on the presumed value of the company?
- c. What other factors might you consider that could affect Miguel's investment decision?

Comment

For this case a teaching note is available through the authors.

⁹ To subscribe for Bioceres ordinary shares subject to the capital increase underlying the global offering in a number sufficient to maintain their proportionate holdings in our total share capital (Preliminary Prospectus, January 23rd, 2018, Page 68).

¹⁰ In order to facilitate the execution of the global offering, certain of Bioceres shareholders representing 93.05% of Bioceres total shares outstanding, assigned to AR Partners S.A., as exercise agent substantially all of their preemptive and accretion rights in respect of the shares to be issued pursuant to the capital increase underlying the global offering (Preliminary Prospectus, January 23rd, 2018, Page 68).

¹¹ A special purpose acquisition company (SPAC) is a publicly traded company that raises a blind pool capital through an initial public offering (IPO) for the purpose of acquiring an existing company.

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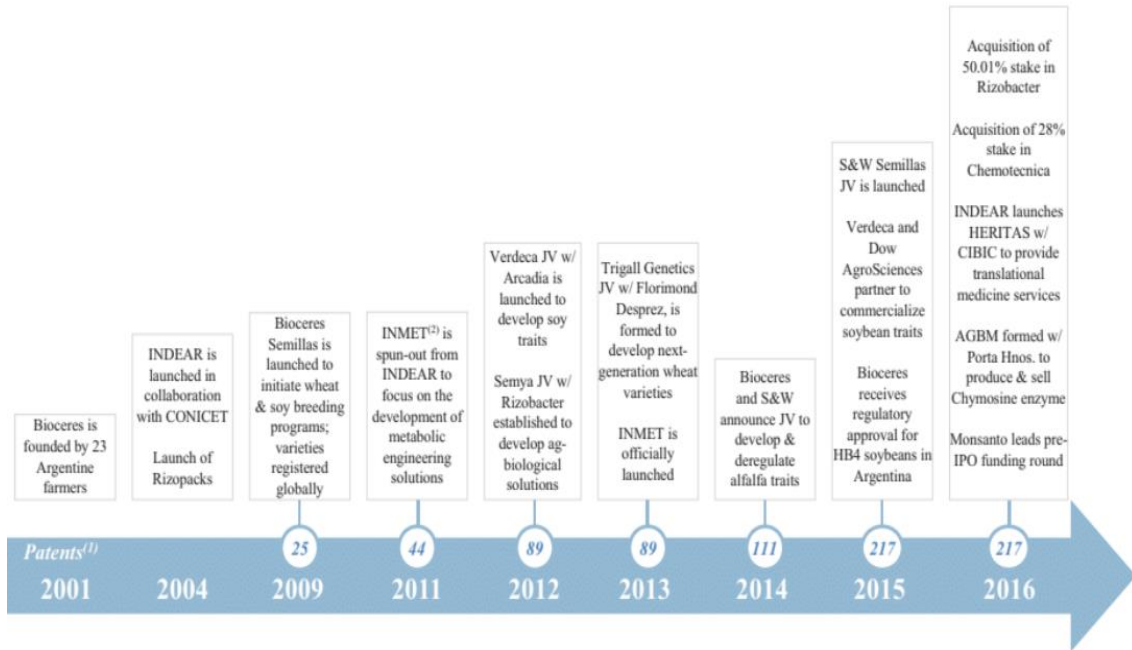
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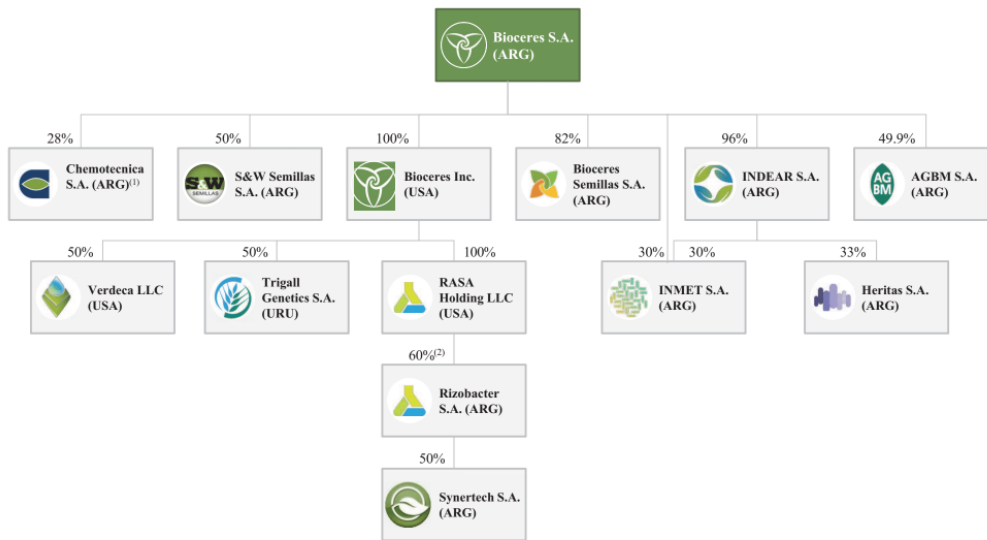
ANNEXES

Annex 1. Chronology of Bioceres' Milestones



- (1) Patents include issued and pending patents, both licensed and proprietary. The numbers show the progression over the years.
- (2) INMET was formed in 2011 and officially launched its operations in 2013.

Annex 2. Organizational Structure



- (1) Reflects our minority investment in Chemotecnica. See "Business—Significant Transactions—Chemotecnica Investment."
- (2) Reflects our syndicated ownership of Rizobacter, of which we currently control 50.01% and expect to increase to 60% upon the exercise of a mandatory call option for an additional 9.99% of Rizobacter.

Annex 3. Bioceres Ag input segments and Products; Global Ag Input Segments, Revenues, and Players

Based on file presented to the Securities and Trade Commission on March 14th, 2019, Form 20-F, page 73; and Financial Report 2Q 2019, page 29; Nishimoto, 2019.

https://www.ssc.gov/Archives/edgar/data/1769484/000110465919014892/a19-5480_120fr12b.htm#TableOfContents

https://s23.q4cdn.com/977783336/files/doc_financials/2019/Q2/2018-12-Bioceres-Inc-Crop-Business-Semillas-Combined-FS.pdf

BIOCERES				Global Markets		
Ag Input Segment	Key Products	Growth Drivers	Revenues and Gross Margin (1) (year ended June 30th, 2018)	Key Markets	Key Segments	Revenues
Crop Protection	Adjuvants Insecticides Fungicides	High-tech adjuvants increase spray efficacy by approximately 5%	46.4 Million dollars 44 % Gross Margin	Argentina Brazil Paraguay	Herbicides Insecticides Fungicides Adjuvants, baits, and others	57 billion dollars
Crop Nutrition	Micro-bead fertilizers Inoculants	80%+ reduction in logistic costs	26.1 Million dollars 42 % Gross Margin	Argentina Brazil Paraguay	General fertilizers Special fertilizers Biofertilizers and inoculants Other crop nutrition products	170 billion dollars
Seed & Integrated Product	BioWheat (2) BioSoy (3) Seed treatment pack HB4 drought trait	Integrated Products bring 10%+ yield advantage	19.5 Million dollars 68 % Gross Margin	Argentina Brazil Paraguay Uruguay	Conventional and GM seeds Seed treatment and traits	37 billion dollars

Notes: 1) Gross margin is calculated as total revenue minus cost of sales, divided by total revenue.

2) and 3) Integrated seed product including HB4 technology, for wheat and soybeans.

Annex 4. Bioceres' Financial Information(Source: <https://www.businesswire.com/news/home/20190318005843/en/>)**Annex 4.1. Bioceres' Consolidated Statement of Comprehensive Income (In US Dollars)**

	Six-month period ended 12/31/2018	Six-month period ended 12/31/2017	LTM ⁽¹⁾ period ended 12/31/2018	Year ended 06/30/2018
Total revenue	92.071.466	81.007.237	144.606.933	133.542.704
Cost of sales	-47.652.679	-47.866.280	-76.880.950	-77.094.551
Gross profit	44.418.787	33.140.957	67.725.983	56.448.153
% Gross profit	48,2%	40,9%	46,8%	42,3%
Operating expenses	-17.769.209	-21.926.674	-35.056.323	-39.213.788
Share of profit (loss) of JV	812.593	-72.238	-1.251.970	-2.136.801
Other income or expenses, net	-298.562	286.772	28.055	613.389
Operating profit	27.163.609	11.428.817	31.445.745	15.710.953
Finance result	-14.546.307	-13.192.795	-42.304.228	-40.950.716
Profit / (Loss) before income tax	12.617.302	-1.763.978	-10.858.483	-25.239.763
Income tax	-5.050.749	5.856.052	21.716	10.928.517
Profit / (Loss) for the period	7.566.553	4.092.074	-10.836.767	-14.311.246
Other comprehensive income or (loss) ⁽²⁾	-2.511.723	-11.651.111	-22.694.166	-31.833.554
Total comprehensive income / (loss)	5.054.830	-7.559.037	-33.530.933	-46.144.800

(1) Last twelve months.

(2) Includes (i) exchange differences on translation of foreign operations from joint ventures, (ii) exchange differences on translation of foreign operations, (iii) revaluation of property, plant and equipment, net tax from joint ventures and (iv) revaluation of property, plant and equipment, net of tax.

Annex 4.2. Consolidated Statement of Financial Position (In US Dollars)

ASSETS	12/31/2018	06/30/2018
CURRENT ASSETS		
Cash and cash equivalents	\$4.251.154	\$2.215.103
Other financial assets	\$4.567.406	\$4.550.847
Trade receivables	\$82.120.771	\$52.888.427
Other receivables	\$5.084.534	\$4.240.205
Income and minimum presumed income taxes recoverat	\$61.834	\$2.082.269
Inventories	\$24.097.484	\$19.366.001
Total current assets	\$120.183.183	\$85.342.852
NON-CURRENT ASSETS		
Other financial assets	\$346.575	\$243.358
Other receivables	\$1.409.634	\$4.979.507
Income and minimum presumed income taxes recoverat	\$570.231	\$126.653
Deferred tax assets	\$624.646	\$5.601.821
Investments in joint ventures and associates	\$27.144.578	\$19.072.055
Property, plant and equipment	\$42.703.375	\$40.177.146
Intangible assets	\$35.181.602	\$26.657.345
Goodwill	\$21.556.423	\$14.438.027
Total non-current assets	\$129.537.064	\$111.295.912
Total assets	\$249.720.247	\$196.638.764
LIABILITIES	12/31/2018	06/30/2018
CURRENT LIABILITIES		
Trade and other payables	\$42.911.186	\$27.708.830
Borrowings	\$89.924.339	\$65.308.928
Employee benefits and social security	\$5.194.969	\$4.411.713
Deferred revenue and advances from customers	\$1.234.024	\$1.007.301
Income and minimum presumed income taxes payable	\$708.189	\$2.569
Government grants	\$4.754	\$17.695
Financed payment - Acquisition of business	\$19.338.121	\$20.223.590
Total current liabilities	\$159.315.582	\$118.680.626
NON-CURRENT LIABILITIES		
Borrowings	\$18.026.397	\$25.708.205
Government grants	\$9.124	\$15.532
Investments in joint ventures and associates	\$2.048.254	\$2.012.298
Deferred tax liabilities	\$14.974.403	\$13.591.942
Provisions	\$502.199	\$845.486
Financed payment - Acquisition of business	-	\$2.651.019
Total non-current liabilities	\$35.560.377	\$44.824.482
Total liabilities	\$194.875.959	\$163.505.108
EQUITY		
Equity attributable to owners of the parent	\$24.830.569	\$13.713.484
Non-controlling interests	\$30.013.719	\$19.420.172
Total equity	\$54.844.288	\$33.133.656
Total equity and liabilities	\$249.720.247	\$196.638.764

Annex 4.3. Adjusted EBITDA Reconciliation (In US Dollars)

The table below provides a reconciliation of our loss for the period/year to Adjusted EBITDA.

	Six-month period ended 12/31/2018	Six-month period ended 12/31/2017	LTM ⁽¹⁾ period ended 12/31/2018	Year ended 06/30/2018
Profit / (Loss) for the period	\$7.566.553	\$4.092.074	-\$10.836.767	-\$14.311.246
Income tax (benefit)/expense	\$5.050.749	-\$5.856.052	-\$21.716	-\$10.928.517
Finance results	\$14.546.307	\$13.192.795	\$42.304.228	\$40.950.716
Depreciation of property, plant and equipment	\$1.084.831	\$1.159.959	\$2.155.753	\$2.230.881
Amortization of intangible assets	\$992.292	\$1.135.677	\$1.998.091	\$2.141.476
Inventory purchase price allocation charge	-	\$2.257.378	-	\$2.257.378
Stock-based compensation charges	\$8.921	\$34.219	\$4.707	\$30.005
Adjusted EBITDA	\$29.249.653	\$16.016.050	\$35.604.296	\$22.370.693

(1) Last twelve months.

Annex 4.4. Segment Revenues and Cost Information Year 2018 (in US dollars)

The following tables present information with respect to the Group's reporting segments:

Period ended December 31, 2018	Seed and integrated products	Crop protection	Crop nutrition	Combined
Revenues				
Sale of goods	\$18.951.726	\$46.435.705	\$26.141.232	\$91.528.663
Royalties	\$518.933			\$518.933
Rendering of services	\$10.910			\$10.910
Government grants				
Grants	\$12.960			\$12.960
Total revenue	\$19.494.529	\$46.435.705	\$26.141.232	\$92.071.466
Cost of sales	-\$6.285.219	-\$26.078.960	-\$15.288.500	-\$47.652.679
Gross margin per segment	\$13.209.310	\$20.356.745	\$10.852.732	\$44.418.787
Period ended December 31, 2017	Seed and integrated products	Crop protection	Crop nutrition	Combined
Revenues				
Sale of goods	\$17.309.050	\$45.702.056	\$17.733.705	\$80.744.811
Royalties	\$150.335			\$150.335
Rendering of services	\$83.424			\$83.424
Government grants				
Grants	\$28.667			\$28.667
Total revenue	\$17.571.476	\$45.702.056	\$17.733.705	\$81.007.237
Cost of sales	-\$8.897.005	-\$30.573.546	-\$8.395.729	-\$47.866.280
Gross margin per segment	\$8.674.471	\$15.128.510	\$9.337.976	\$33.140.957

Annex 5. Evolution of the Argentine Peso. January 2018-December 2018.
Source: Central Bank of Argentina.



Argentine peso has gone from 18.74 pesos/1 dollar in January 2018 to 38.85 pesos/1dollar in December 31st 2018, with currency depreciation of 107 % of the Argentine peso in one year.

Annex 6. NASDAQ Composite Index Evolution-January 2016 -December 2018. Source:
<https://fred.stlouisfed.org/series/NASDAQCOM>



The Nasdaq Composite Index is the market capitalization-weighted index of over 3,300 common equities listed on the Nasdaq stock exchange. The Nasdaq Composite is not limited to companies that have U.S. headquarters – something that sets it apart from a number of other indexes. An American depositary receipt (ADR) is a negotiable certificate issued by a U.S. bank representing a specified number of shares (or one share) in a foreign stock traded on a U.S. exchange. ADRs are denominated in U.S. dollars, with the underlying security held by a U.S. financial institution overseas. American depositary receipts were introduced in 1927 as an easier way for U.S. investors to purchase stock in foreign companies. Non-U.S. companies also benefit from ADRs, as they make it easier to attract American investors.