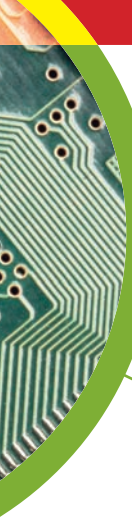
PHOTOS EDUARDO CESAR AND MARCIA MINILLO



Risk rewarded

Sale of Alellyx and CanaVialis to Monsanto for US$ 290 million is an example of wealth creation through competitive research

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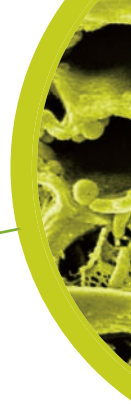
It was the largest business deal ever closed in Brazil involving biotechnology firms developed through venture capital. For US$ 290 million, equivalent to R$ 616 million, the multinational Monsanto acquired, on November 3, the Brazilian firms Alellyx Applied Genomics and CanaVialis, both headquartered in the city of Campinas (state of São Paulo) and created thanks to a venture capital fund, Votorantim Novos Negócios (Votorantim New Business), to seek technological solutions for the farming of sugarcane, orange and eucalyptus.

Alellyx was founded in 2002, resulting from a partnership of a group of researchers that took part, in the late 1990s, in the sequencing of the genome of the *Xyllela fastidiosa* bacterium (which causes citrus variegated chlorosis (CVC) in orange plantations), financed by FAPESP. It became a research company focused on creating products and technology to aid agriculture, based on molecular genetics. Alellyx is *Xyllela* spelled back to front.

To create CanaVialis in 2003, Votorantim Novos Negócios brought together researchers experienced in the genetic improvement of sugarcane, in particular those from Ridesa, the Inter-University Network for the Development of the Sugar and Alcohol Industry. CanaVialis is now the world's largest private-sector sugarcane improvement company. It is developing new cane varieties with genetic advantages and it has contracts with 46 sugarcane mills. Votorantim Novos Negócios investment to set up the two firms amounted to roughly US$ 40 million.

The two enterprises will continue to be managed independently and their 250 employees will be kept. Monsanto plans to center its global sugarcane research and development (R&D) work in their facilities. The key to the deal was the multinational's interest in investing in the emerging sugarcane market and turning this into the fourth crop in its business portfolio, along with corn, soy and cotton.

"Monsanto is choosing sugarcane as a global crop," noted André Dias, president of Monsanto in Brazil. "Global demand for sugar and biofuels is beginning to grow at a faster pace than sugarcane production levels. We hope that the CanaVialis and Alellyx acquisitions will allow us to combine our know-how on improving soy, corn and cotton crops with improving sugarcane. The objective



ELLIOT W. KITAJIMA/USP

is to increase this crop's productivity and to reduce the resources required to grow it," stated Dias. According to him, Brazil will become a sugarcane R&D platform for Monsanto. "The country will play an outstanding role not only as a technology generator, but also as a user of these technologies." Of the world's 20.2 million hectares of sugarcane plantations, more than 6.8 million hectares are in Brazil. The 2007/2008 crop is expected to yield 547 million tonnes, 15.2% more than the previous one. Half of this is earmarked for the production of ethanol, making Brazil the world's second largest producer of this fuel worldwide. The US ranks first, with ethanol extracted from corn.

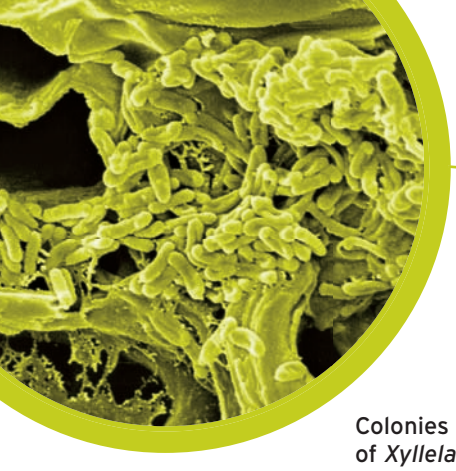
Monsanto currently invests US$ 800 million in R&D and sugarcane will start vying for a share of this investment. According to Ricardo Madureira, CEO of Alellyx and CanaVialis, the acquisition will allow the two firms to accelerate their R&D work. In 2009, for instance, CanaVialis is expected to release a variety of sugarcane with an early cycle, designed to be harvested at the start of the crop season, and with a higher level of sucrose, achieved through traditional genetic improvement. "We'd been working for a year and a half on this project, and in partnership with Monsanto," said Madureira. CanaVialis also developed genetically modified plants with Alellyx. In 2006, the first genetically modified variety of sugarcane went into trial on a plantation in the state of Paraná. This plant has a gene from the virus that causes mosaic, one of the diseases that attacks this crop. The gene manipulated by Alellyx made the plant resistant to the disease in the laboratory.

Monsanto CEO André Dias said he hopes that the acquisition will foster the launch of new technologies around 2016. "Though it is a long-term investment that completes our R&D portfolio, we hope to take germ plasm to other areas of cultivation around the world in the middle of the next decade," he stated. Monsanto is not alone in its interest in sugarcane. In late October, Sygenta AG, a Swiss multinational, announced that it is entering the sugarcane market and developing a new technology to cut the cost of planting per hectare by some 15%. The innovation should be released in 2010.

Technology transfer - Fernando Reinach, Votorantim Novos Negócios's executive director, says the sale took place slightly earlier than originally envisaged. "We'd imagined that this would take at least eight years to happen," he stated. "However, this is the venture capital principle. You invest in scientific research with technological potential and take the greatest risk. You turn it into a business and later sell it to those who have the resources to invest in expansion. It is common for technology transfers to society to be conducted via large firms," explained Reinach, who teaches at the University of São Paulo (USP) and who was one of the coordinators, in the late 1990s, of the *Xyllela fastidiosa* sequencing. He stresses that although the sale was made to a foreign enterprise, the Alellyx and CanaVialis R&D complex will remain in Brazil. "It's the first major success case of a scientific research *venture capital* company in Brazil, which could open the way for new initiatives and investments," he stated. He recalls that when the *Xyllela fastidiosa* genome was published in the journal *Nature*, in 2000, one of the researchers in the program, João Paulo Kitajima, from Unicamp, tracked the firms that downloaded the sequencing as soon as the information was posted on the web. No Brazilian company showed any interest, contrary to several multinationals." I remember that, at the time, I wrote an article saying we were ill-prepared for success, because we had produced a scientific achievement, but the country lacked the structure to benefit from such a gain," he said. Although the two companies have been sold to a multinational concern, Reinach now regards the situation as quite different. "We're still short of Brazilian firms with the muscle to invest, but we'll have a global research center in Brazil and that makes a big difference," stated Reinach. "Monsanto has no sugarcane know-how. It's a new crop for them," said the researcher.

According to Reinach, the sales negotiations took eight months and other foreign companies had also joined the race to make this acquisition. "It was an auction," he says. As of last year, Monsanto had already established a technological partnering arrangement with CanaVialis and Alellyx for the development and marketing of Monsanto technologies as applied to sugarcane. An example of this is the BT technology, that can make the plant pest-resistant, and RR (Roundup Ready), which makes plants resistant to the herbicide glyphosate.

According to Carlos Henrique de Brito Cruz, FAPESP's scientific director, the sale of the two companies is a rare and encouraging example of the creation, in Brazil, of value and wealth as a result of internationally competi-



Colonies of *Xyllela fastidiosa*, which attacks orange plantations

tive, scientific research. "In this format, which consists of creating a small enterprise, creating intellectual property within it and selling it for more than was invested in it, I can only recall the case of Akwan Information Technologies, a firm from the state of Minas Gerais that Google acquired," says Brito Cruz. Akwan, a search engine created by professors from the Federal University of Minas Gerais, was acquired in 2005 and became Google's R&D center in Latin America. "This case shows an important possibility, which Brazil should exploit further. The fact that Monsanto is running its platform for sugarcane R&D in Brazil is also a positive element, because it shows, once again, that competitive research attracts investments and the activity of large global firms."

For physicist José Fernando Perez, FAPESP's scientific director from 1993 to 2005 and the articulator of the FAPESP Genome Program, whose first fruit was the sequencing of *Xyllela fastidiosa*, the sale of Alellyx and of CanaVialis is also important because it is taking place during a period in which international investments are in the doldrums. "The acquisition isn't taking place at a time when there's surplus cash, which enhances its importance. The sale allows to country to get investment when few are getting this. Who knows what other countries were competing with us?" asks Perez, who is currently the president of Recepta Biopharma, a biotechnology enterprise. According to him, the acquisition of Alellyx and CanaVialis is an indication of the success of the vision that led to the FAPESP Genome Program. "The leaderships that formed the program became involved with Alellyx. The return is unprecedented. I know of no scientific project that has resulted in an investment of this magnitude in Brazil," stated Perez, further adding: "The sale shows that engaging in science in our country can be an excellent business."

Fertile investment - Perez states that the sale success of the companies highlights how correct the policy of investing in them was – besides FAPESP's investment in genome research and the federal government's investment, the companies had been getting government funding for their projects from Finep (the Studies and Projects Financing Agency) and BNDES (Brazil's National Social and Economic Development Bank). "The investment of public funds was so successful that it enabled a very advantageous sale. Biotechnology is an area that demands high investment with a slow return. At a certain point in time, enterprises demand a larger capital injection and only large companies achieve this. It's a cycle that must be completed for research to result in products with high commercial value and that reach society." Perez reminds us that, since the first presentation to the FAPESP's board of governors, the chief objective of the FAPESP Genome Program was to train human resources, at high speed, for developing biotechnology in Brazil.

However, the purchase of the two emerging firms by a single multinational made the federal government uncomfortable. In an interview to the daily newspaper *O Estado de São Paulo* on November 5, the minister of Science and Technology, Sérgio Rezende, said the news of the sale had "surprised and disappointed" him. "I don't know how much Votorantim invested in these enterprises during these years, but the public sector invested a lot of money," states Rezende. "The sale to any foreign group is disappointing." The minister reminded us that Finep had approved a R$49.4 subvention for the firms' research over the last three years – of which R$ 6.4 million had already been disbursed. "The two companies got a lot of government investment and just when this was beginning to pay off, they were sold for a fairly modest price," he said.

José Fernando Perez also lamented that there were no domestic companies with the appetite for investing in the two firms. "But the frustration is small relative to the success indicators," he said. Brito Cruz, FAPESP's scientific director, stated that, naturally, it would have been better if the purchase had been made by a Brazilian group. "But unfortunately it's not part of the tradition of Brazilian investors to bet on highly advanced scientific and technological activities, although there are notable exceptions that confirm the rule," he stated. ■