

Bringing New Technology in the Areas of Computers, Electronics and Computer Vision to Agriculture, Blue River Technology is solving one of the Biggest Challenges of our Century in Feeding the World in a Sustainable Way

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Agriculture Technology
(Private)**

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**Jorge Heraud
CEO / Co Founder**

BIO:

Jorge Heraud has 14 years of work experience bringing high technology products into the agriculture and industrial markets. He brings deep industry knowledge as Blue River builds customer relationships and a direct agricultural distribution channel. In various positions at Trimble Navigation, Jorge has brought over 20 high technology products to the agricultural market, including GPS-based automatic guidance products, spray control products, agricultural displays and others. Many of these products are of similar complexity to the one envisioned by Blue River Technology. Jorge's roles in these launches have ranged from research lead to product management to general manage-

ment. He holds a BS in Electrical Engineering PUCP in Lima, Peru, an MS in Electrical Engineering from Stanford University, an MS in Engineering Management and an MS in Management from the Stanford Graduate School of Business.

Company Profile:

We are a Venture Capital funded, fast-moving, Stanford-derived startup. Our mission is to create advanced technology to improve agriculture. Our team brings expertise in Robotics, Computer Vision, Machine Learning, and Precision Agriculture.

**Interview conducted by:
Lynn Fosse, Senior Editor**

CEOCFO: Mr. Heraud, Blue River has advanced technology for better agriculture. What are you actually doing?

Mr. Heraud: At Blue River, our vision is to bring new technology in the areas of computers, electronics and computer vision to agriculture. Many of the advances that have happened in agriculture in the last few years have been mostly in the areas of biotech and genetics. Those advances have been great and they have increased agriculture productivity significantly. However, they do not work in all conditions and, in some cases, have met customer resistance because of potential harm from herbicides and genetically modified organisms. In the US the response to this has been a growing organic food movement. There are a lot of producers now that sell organic and many consumers that only eat organically grown foods as a reaction to this chemical intensive agriculture. Our plan at Blue River is to use technolo-

gies such as computers, electronics and computer vision to come up with an alternative solution to chemical intensive agriculture.

CEOCFO: What gave you the idea?

Mr. Heraud: I have been working in agriculture for over ten years. I was at Trimble Navigation for most of that time in a variety of positions including engineering, business development and acquisitions as well as agricultural improvement. It was here that I developed a really good understanding of agriculture and its need for technology solutions. I developed a deep understanding for the weeding problem from the perspective of the farmer who is forced to make choices that they do not always like. In order to be competitive farmers are compelled to use herbicides and genetically modified crops. It is the only way of staying afloat. My partner, that co-founded the company with me, Lee Redden, has a background in computer vision and robotics from Stanford University, as well as family background in Agriculture. Between the two of us we decided to start this company in May 2011.

CEOCFO: What are you specifically working on now? What are some of the ideas that you are bringing to development?

Mr. Heraud: We are working on a machine that can automatically detect which plant to keep and which plant to kill. In agriculture getting rid of weeds is one of the basic needs. Many of the companies that work in the area of technology and agriculture, such as Monsanto or Syngenta, are providing solutions for weed control. Weeds grow very fast. If you do not eliminate the undesired plants from the crops

they overtake the crops. At Blue River Technology we are building a machine that automatically detects and eliminates these weeds and undesired plants. Our first product is going to be going to do weeding and thinning in lettuce.

CEOCFO: How will it work? What will you be replacing with your product and how will it work?

Mr. Heraud: Lettuce plants are grown close to each other. As many of the lettuce plants do not germinate, a crew of workers goes through the field and eliminates undesired plants, so that the plants that remain are spaced correctly. Depending on the variety, there should be about ten inches between lettuce plants. Then the plant can reach maturity, be round and have the quality customers want. If you have plants that are too close to each other the plants do not grow fast enough and when harvest time comes the plants are not ready to be harvested. In the thinning operation, growers hire crews to make sure that the plants all stay about ten inches apart. What our machine will do is exactly the same, except instead of using crews of twenty five people to go through the field the machine will be operated by a single person and will do the job somewhere between thirty and fifty times faster than the current hand method.

CEOCFO: That would definitely be a major change. Where are you in the development process?

Mr. Heraud: We have developed our prototype and we have been testing it in Salinas, California. We have worked in fields about twenty times in this last year, testing and trying different configurations so we have a complete prototype. Our next step will be to build a commercial machine and start a thinning service in the first half of next year. The way we are going to get there is by a Series A funding round led by Khosla Ventures where we raised over three million dollars. We will be increasing the size of our staff so we can move faster in product development and then complete this machine for commercial operation next year.

CEOCFO: Is the lettuce community aware of what you are doing?

Mr. Heraud: Oh, yes. We have really good engagement with them. Farmers love it! They just love it! They are fascinated by the fact that a machine can do this. Our machine solves a number of problems; one of them is labor availability. As discussed on some of the news reports, the labor shortage is a very big factor this year, for many reasons. There are several reasons that immigration has fallen and there are no workers to work with crops, so the growers are really suffering a labor shortage. In addition, in the past, people working in the fields have been identified as a potential source of contamination. They have taken a lot of steps to reduce contamination, but if people walk through the field while the lettuce is growing it is very easy to lead to contamination; especially with lettuce which grows so close to the ground.

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CEOCFO: What was the hardest part in putting the machine together and connecting technology and concepts? What was biggest challenge that you were able to solve?

Mr. Heraud: The biggest challenge is in the technical side. We are using computer vision to recognize the plants. It is pretty unique technology. It was not possible just a few years ago. Much of this technology is being used in advanced robotics and in military applications. There aren't many places where recognition technology is being used in commercial applications like the one we are speaking about. That has been where we have spent the bulk of our development time, in making sure that we recognize the lettuce through the fields at one, two, or even three miles an hour, being able to recognize exactly its location.

CEOCFO: What is ahead for Blue River?

Mr. Heraud: We want to release this product in the first half of next year. The most critical activity is to locate and attract exceptional engineers to join our team. We are looking for computer vision engineers, mechanical and robotics engineers and start our commercial operation. We are growing very fast. One of our big challenges is attracting motivated people that will make this happen. We are very excited about our mission. We want to attract people that are also excited about our mission; that is giving an alternative to chemicals in agriculture or chemical intensive agriculture. We want people that are not afraid of the challenge; that are just willing to come and learn with us. They are willing to push the boundary. Besides that, it is a launching a commercial service. In the long term we want to move into other crops. There is approximately forty billion dollars just in the US spent on weeding. It is a very large market.

CEOCFO: What should people reading about Blue River remember most?

Mr. Heraud: We are really excited at Blue River and I think your readers will also find it exciting. It is the potential impact this technology can have in bringing an alternative to herbicide in agriculture that can really change the way the humans and the environment interact. We are solving one of the biggest challenges of our century, by feeding the world and doing it in a sustainable way. The way we farm right now is not sustainable. We have all been hearing about all the bad things happening in the environment and global warming. We are doing the same level of damage in agriculture by putting unnecessary chemicals into the ground. One of the biggest challenges for the world is going to be growing food and producing quality products and in a sustainable way. That is what Blue River is about. Another thing that excites me is working with this amazing group of people that are excited about pushing the boundaries of technology and pushing the boundaries of what has been done. Finding these people and recruiting them is just a fun thing to do.