

The “environmentally-friendly” genetically modified of Arcadia Biosciences

Meeting with Eric Rey, CEO of Arcadia Biosciences, an American biotechnology company that develops, amongst others, genetically modified crops aiming at reducing the impact of agriculture on environment.

What are the main activities of Arcadia Biosciences and its most advanced products?

Eric Rey: We develop agricultural biotechnologies which contribute to the respect of the environment and others that contribute to improving human health. One of our key products allows cultivating plants whilst using 50% less nitrogen fertilizer, the agriculture fuel. On average, plants only absorb 50% of nitrogen and the other half pollutes soil and water. Source of nitrous oxide, nitrogen fertilizer contributes to greenhouse gas. None of our products are currently on the market, but within a year, we will market oil enriched in omega 6 (gamma linolenic acid), a fatty acid with anti-inflammatory characteristics.

How and why do you develop salt-tolerant rice?

Salinity costs \$3 billion every year to agriculture. Some croplands become progressively out of production because their soil or irrigation water are too salinized. Furthermore, before soil becomes completely infertile, yields decrease every year. As irrigation water contains salt, salinization increases. We have developed a technology based on anti-sodium pumps which concentrate it in the vacuoles.

Are plants thus salinized?

The genetically modified plant can live because the vacuole is not biologically active. At the moment, we use this process to develop a plant aimed at feeding cattle. We decrease therefore the irrigation water toxicity and give livestock farmers an advantageous product because they do not need to give salt to their animals. This salt-tolerant technology is also being assessed for other cultivable plants. There is no such problem for tomatoes for instance, as salt is in the leaves and not in the fruit.

You plan to sell to Chinese farmers, rice that requires less nitrogen fertilizer to grow. How do you plan to convince them to buy it?

China is only one step. Rice is the less efficient cultivated plant to absorb nitrogen. When rice fields are spread with nitrogen fertilizer, two third are not absorbed by the plant. Chinese farmers use in large quantity nitrogen fertilizer, which pollutes their rivers and contributes to greenhouse gases emissions. The idea is to have Chinese farmers saving money by buying less fertilizer whilst adopting environmentally-friendly processes. In order to work, crop prices must not go up.

Do you count on the Chinese government to pay the difference?

We know that if Chinese farmers use this technology, rice cultivation will account for less green house gas emissions. We want to give them the opportunity to acquire carbon credit as it is already the case for certain Chinese industries including steelwork according to the Kyoto protocol's clean development mechanism (sale of these credits to industries in the developed countries that signed the protocol). We try to convince

Chinese authorities to extend this system to agriculture, considering that agriculture is the fourth biggest contributor to greenhouse gas emissions.

What do you expect by coming to France considering the public opinion's objections and Nicolas Sarkozy's declarations on the GM crops?

In Europe and in France more particularly, the environmental issue is central and research is active. From what I read of your president's declarations, it is clear that he supports research. I consider that France is an important country for Arcadia Biosciences because it leads debates and assesses the various choices that are available. In my opinion, the French position concerning GMO illustrates the will to get into a new technology with the basis of scientific research. Since he became president, Nicolas Sarkozy puts the environment protection at the heart of his program. This means in my opinion that he will appreciate technologies developed by Arcadia Biosciences.

What do you have to say to the Europeans who are hesitant?

Food, dead zones and global warming are current global problems. Our technologies can contribute to solve them. So far, it has never been proven that GMO are detrimental to health. This is a question of choice: not to look for new technologies because life is good as it is, or take one's responsibilities and use new technologies.