



BIOPESTICIDE LTD.
Certified: Natural

Biopesticide Ltd. is a multinational biotech startup company centered in Pécs, Hungary. Our mission is to provide farmers effective, innovative, and environmentally sound biopesticides against bacteria causing plant diseases.



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The problem

XOO (*Xanthomonas oryzae* pv. *oryzae*) and Xaj (*Xanthomonas arboricola* pv. *juglandis*) are closely related bacteria species causing bacterial leaf blight in rice and walnut blight, respectively. Both can result in 50-80% crop loss in infected areas.

Rice being a staple food for much of the world and walnuts being a high unit price premium good, both diseases are a massive problem from both an economic and a food security standpoint. According to The Hindu, XOO affects Asia's annual rice production by 60%.

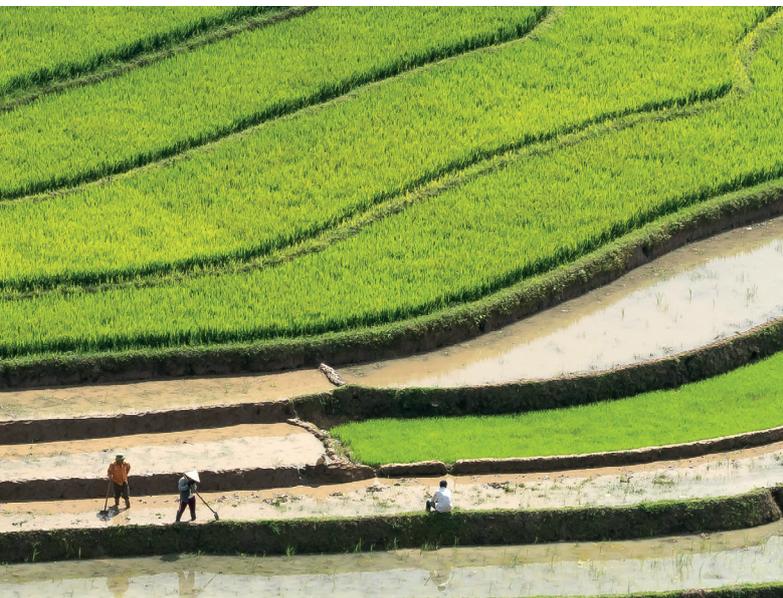
Currently, there are no effective measures against the two diseases. Antibiotics are used against them, but the long-term consequence is that the bacteria become resistant, making the problem worse in the long run. Genetically modified varieties may be somewhat more resistant, but they do not entirely rule out the possibility of infection and deprive producers of important target markets such as the EU. Copper, while somewhat effective, can not be used during flowering, is toxic in large concentrations, and bacteria also become resistant to it in the long run.



The solution

Biopesticide Ltd. owns the IP of two bacteriophage-based biopesticides, one for XOO and one for Xaj.

Bacteriophages are naturally occurring organisms; in fact, it is estimated that there are more than 10³¹ bacteriophages on the planet, more than every other organism combined. They are classified as viruses; however, they only attack their specific host bacteria and have absolutely no effect on other bacteria, plants, or animals (including humans).



XOOPhage

XOOPhage is our biopesticide against the bacteria causing leaf blight in rice. In a Bio-efficacy trial conducted by Tamil Nadu Agricultural University (India), including multiple glasshouse experiments and a field trial, our best-performing phage cocktails achieved 50-80% disease reduction and a 10-12% increase in crop yield over control. Our main target markets for XOOPhage are rice producing countries in Asia.

XajPhage

XajPhage is the tradename for our bacteriophage cocktail against Xaj, the bacteria causing walnut blight. Based on the results of a field experiment conducted by the Research Institute for Fruit Growing Pitesti, XajPhage was effective in minimizing the effects of walnut blight and was significantly more potent than the copper-based formulation. We are planning to market XajPhage in the most significant walnut producing countries of the EU.

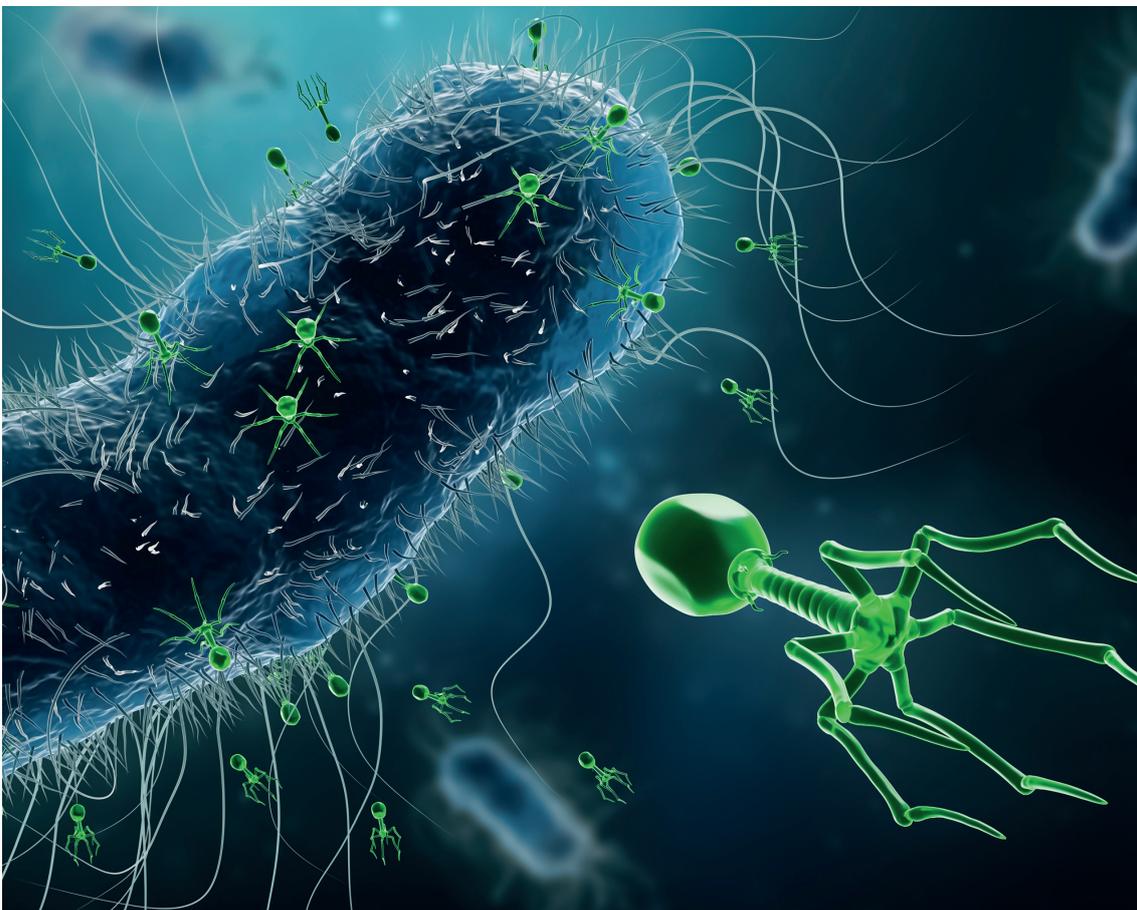
Scientific background

Bacteriophages are small particles; these are naturally occurring enemies of bacteria. These particles are highly specific, i.e., these can only destroy the targeted bacterium species, leaving other (including useful) bacteria unchanged.

The bacteriophages we use are found in nature, and they only contain proteins and DNA.

We only isolate, characterize, and select but do not genetically modify them. They have high specificity for their target bacterium species and can not infect other organisms. Thus we have non-GMO products that can also be utilized in biofarming.

Their mode of action completely differs from antibiotics or agrochemicals, so they can be used when those don't work. Bacteriophages are also capable of mutations, so the target bacteria can't grow resistance against them.



Target locations

We are planning to launch our products in the following countries and geographical areas, but our long-term goal is to make them available in all areas where the two diseases occur.

India:

India is the second largest rice producer globally, with more than 43 million hectares utilized for paddy production and more than 120 million metric tons produced annually. In the financial year 2018-19,

India exported around 12 million tons of rice, much of which was sold to EU countries, thus having the ability to defend against XOO with non-GMO products is an essential aspect to Indian farmers. Currently, we are in the process of setting up a subsidiary, Biopesticide Hindustan Pvt. Ltd., to handle the registration of our product and day-to-day operations down the line.

Vietnam:

Vietnam is among the world's top 5 rice producers. With almost 8 million hectares allocated for paddy production, the country produces around 43 million metric tons annually. Currently, we are in the process of setting up a representative office in Ho Chi Minh City, close to the Mekong Delta, the most significant rice producing area of the country.

Europe:

Although walnuts are only produced on 120,000 hectares in the EU, the high unit price of walnuts makes walnut blight a cause for significant economic loss. The fact that walnuts are a premium product and the higher solvency of European walnut growers allow us to set higher profit margins in the EU.



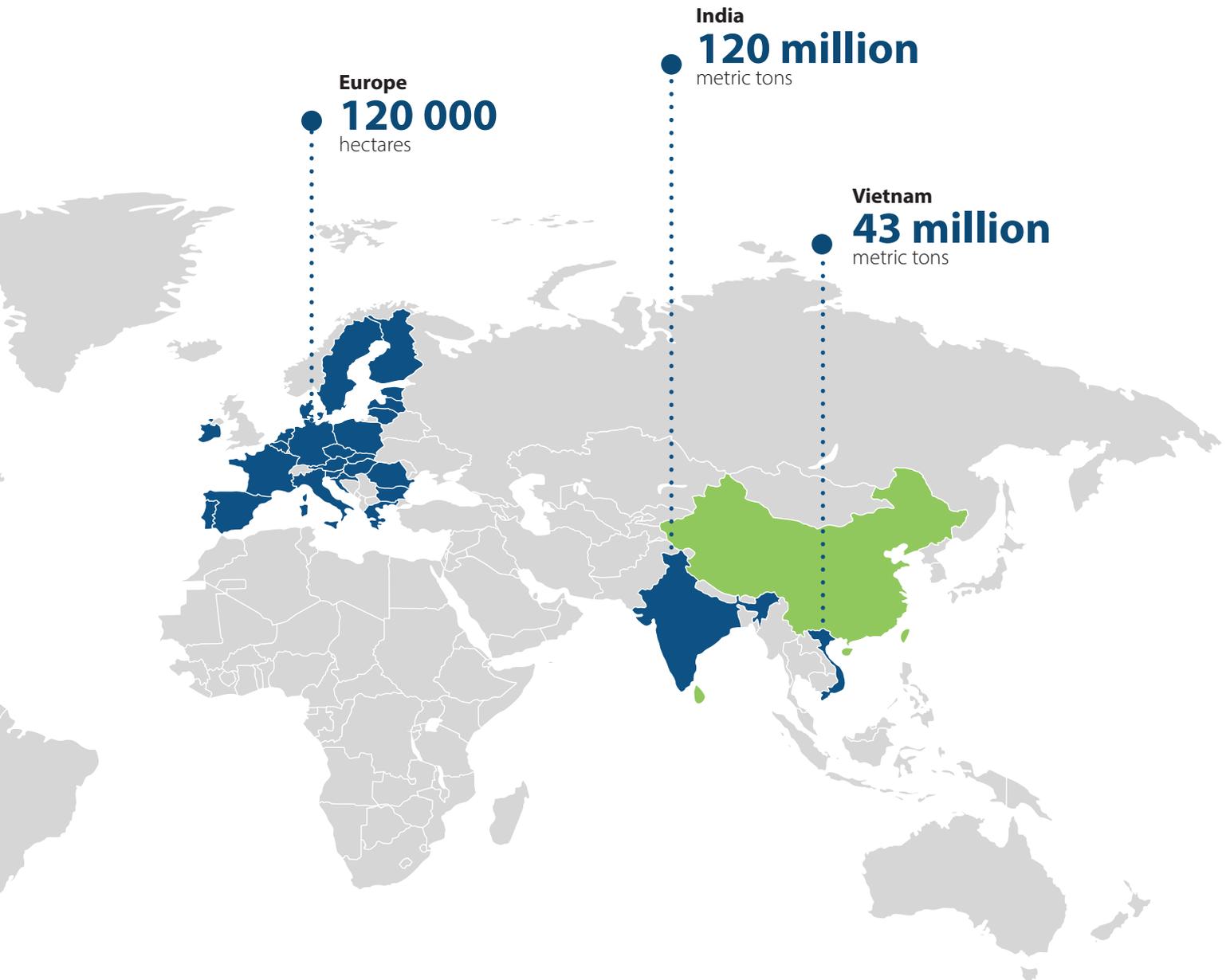
Future target locations considered

China:

As the largest rice producer of the world, China is an obvious option for future expansion.

Sri Lanka:

The Sri Lankan governments stance on agrochemicals makes makes the country a suitable environment for the rapid spread of our biopesticide.





Dr. Tamás Kovács
CEO, lead researcher

As a member of the scientific community who has been working with bacteriophages for 15 years, I have long been aware of the immense potential they hold. This project has proven that they can be utilized against plant diseases with no effective cure. I look forward to broadening our perspectives and using bacteriophage-based plant protection products for pathogens that are currently causing vast economic damage and food safety issues around the world.



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