FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

BIOTECHNOLOGY POTATO PARTNERSHIP FACT SHEET

Global population is projected to exceed 9 billion by 2050, food production must rise by at least 60% to feed our growing world. The Feed the Future Biotechnology Potato Partnership is committed to providing science based answers to sustaining farmers and solving hunger to secure our planet and future.

Why potatoes? Potatoes feed the hungry. They are the third most important food crop in the world behind wheat and rice. The potato produces more nutritious food, more quickly, on less land and in harsher climates than any other major crop. They contain no fat, sodium or cholesterol. One potato provides nearly half an individual's daily need of Vitamin C and includes more potassium than a banana.

More than a billion people worldwide eat potato. Since the early 1960's, the growth in potato production has rapidly overtaken all other food crops in developing countries. The potato is a fundamental element in food security for millions of people across the globe.

Smallholder farmers in Bangladesh and Indonesia are fighting an uphill battle against late blight disease. Advances in late blight resistant biotech potatoes are offering new hope to these farmers and their countries.

Fighting Late Blight Disease

Late Blight is the most serious potato disease worldwide, caused by the water mold, Phytophthora Infestans, that destroys leaves, stems, and tubers. The fight against late blight is as old as the potato. The disease spreads very quickly and can result in total crop loss. Late Blight was responsible for the great Irish potato famine of the mid 1800's. To protect crops, farmers spray heavy concentrations of fungicide which increases input costs and labor; and increases potential risks to the population and environment. The Feed the Future Biotechnology Potato Partnership is finding effective alternatives to fighting Late Blight through biotechnology.

The Partnership is a five-year $5.9 million cooperative agreement between Michigan State University and USAID to develop and bring to market a three resistance gene Late Blight (3R-gene) resistant potato in famer-preferred varieties in Indonesia and Bangladesh. The late blight resistant potato is expected to bring relief to smallholder farmers by reducing input costs, increasing yields and reducing the exposure of chemical fungicides which are harmful to human and environmental health leading to improved livelihoods.

The project also addresses capacity development of target countries, transferring the skills and expertise to local researchers and governments that lead to self-reliance and independent success.

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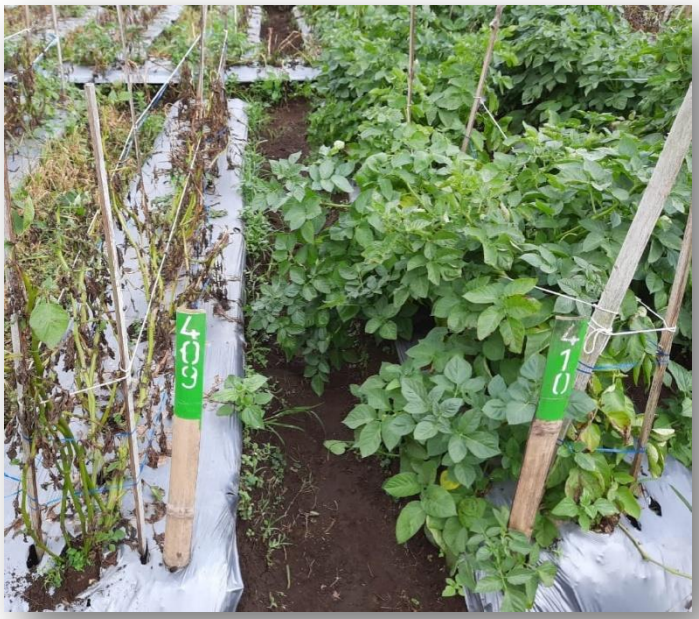
UNIVERSITY OF MINNESOTA
University of Idaho
Simplot PLANT SCIENCES
MICHIGAN STATE UNIVERSITY

Project Update – Year 5 (10/19-9/20)

Unparalleled Success

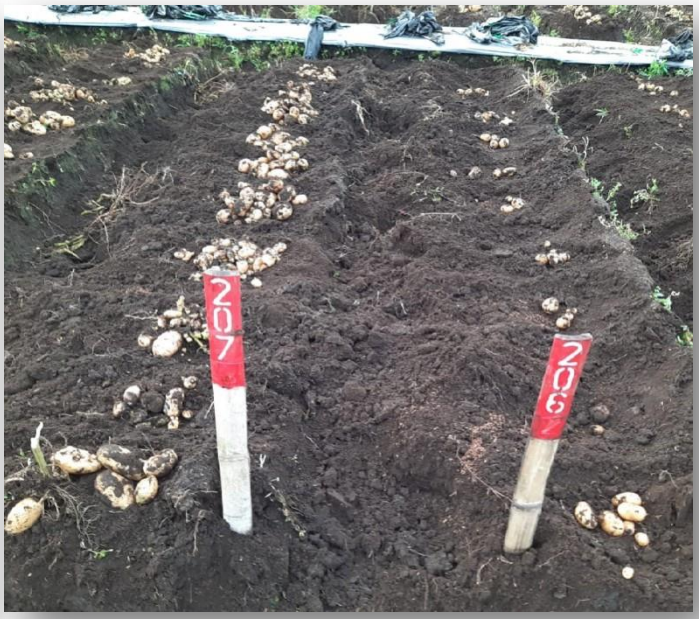
The project's unique partnership between Michigan State University and U.S. based Simplot Plant Sciences builds on the strengths of public research and private sector technological advancement. This collaboration has allowed the project to achieve milestones unparalleled in traditional development projects. Within a time-span of less than five years, two target country farmer-preferred potato varieties have been transformed using 3R-gene technology that provide durable resistance to late blight disease while meeting the highest international standards for genetically modified materials through rigorous lab testing. The potatoes have continued to perform to the highest standards in agronomic greenhouse and field trials conducted by MSU.

After much testing and research in the U.S., Indonesia has begun field testing of the transformed lines. Indonesia, due to its wet and humid weather conditions, experiences extremely high year-round late blight pressure making it an ideal location for durable resistance testing. The performance of the 3R-gene lines has been remarkable as highlighted in the photos below.



MSU Diamant control **MSU Diamant 3R-gene**

The control line has completely succumbed to late blight disease while the 3R-gene line shows complete resistance.



MSU Diamant 3R-gene **MSU Diamant control**

Yield differences between the 3R-gene line and the control line.

Due to strict regulatory requirements of genetically modified products, the potatoes will undergo several multi-location field trials in both target countries to collect the necessary data to receive commercialization status. The project expects that farmers in both Bangladesh and Indonesia can begin to see the benefits of this technology in their fields within three-five years.

The partnership consists of agreements between USAID, Michigan State University, The University of Minnesota, The University of Idaho, The Bangladesh Agricultural Research Institute, the Indonesian Center for Agricultural Biotechnology Genetic Resources Research and Development, the International Potato Center, and the J.R. Simplot Company.

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