



FEED THE FUTURE

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



USAID Feed the Future Biotechnology Potato Partnership: 2019 Update

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Biotechnology Potato Partnership

The Project

The Feed the Future Biotechnology Potato Partnership is a USAID funded multi-institution cooperative agreement to use cutting edge bioengineering technology to improve farmer and consumer preferred potato varieties in Indonesia and Bangladesh. Biotech potato products, currently in production, have stacked resistance genes, offer broad-spectrum resistance to late blight (*Phytophthora infestans*), the most devastating potato disease in the world. Once the products complete in-country governmental regulatory approval, our project's stewardship plan will work with in-country government institutes and seed industry partners to distribute to smallholder farmers in Indonesia and Bangladesh.



Terraced potato plots in central Java, Indonesia. No vacant land is left unplanted by the locals, who predominantly earn their living as potato farmers.

The Partnership

The project is based at Michigan State University and is collaborating with scientists at University of Minnesota and University of Idaho. The J.R. Simplot Company is an invaluable industry partner. Our in-country collaborators are the Bangladesh Agricultural Research Institute (BARI), the Indonesian Center for Agricultural Biotechnology Genetic Resources Research and Development (ICABIOGRAD) and the Indonesia Vegetable Research Institute (IVEGRI).

Training and Capacity Update

The Feed the Future Biotechnology Potato Partnership provides strategic human and institutional capacity building support to in-country partners to ensure sustainable use of agricultural biotechnology for future generations. Scientists from both countries visited MSU for training sessions. To follow up on this training, in-country evaluations were conducted using a Capacity Evaluation Manual developed by the MSU team. Manual activities evaluated the in-country team's skills with laboratory safety, tissue culture handling, greenhouse mini-tuber production, molecular identification analysis, and pathology testing. In addition a non-transgenic confined field trial was conducted. All activities simulated the skills and procedures required for handling transgenic material. In-country scientists completed the manual, submitted checklists, photos, research data and followed regulatory requirements (as if they were using a transgenic potato) at all stages. Our project gained valuable information during this process that will aid in the successful importation and evaluation of the Simplot 3R-Gene potato product.



Tissue culture propagation (Bangladesh)



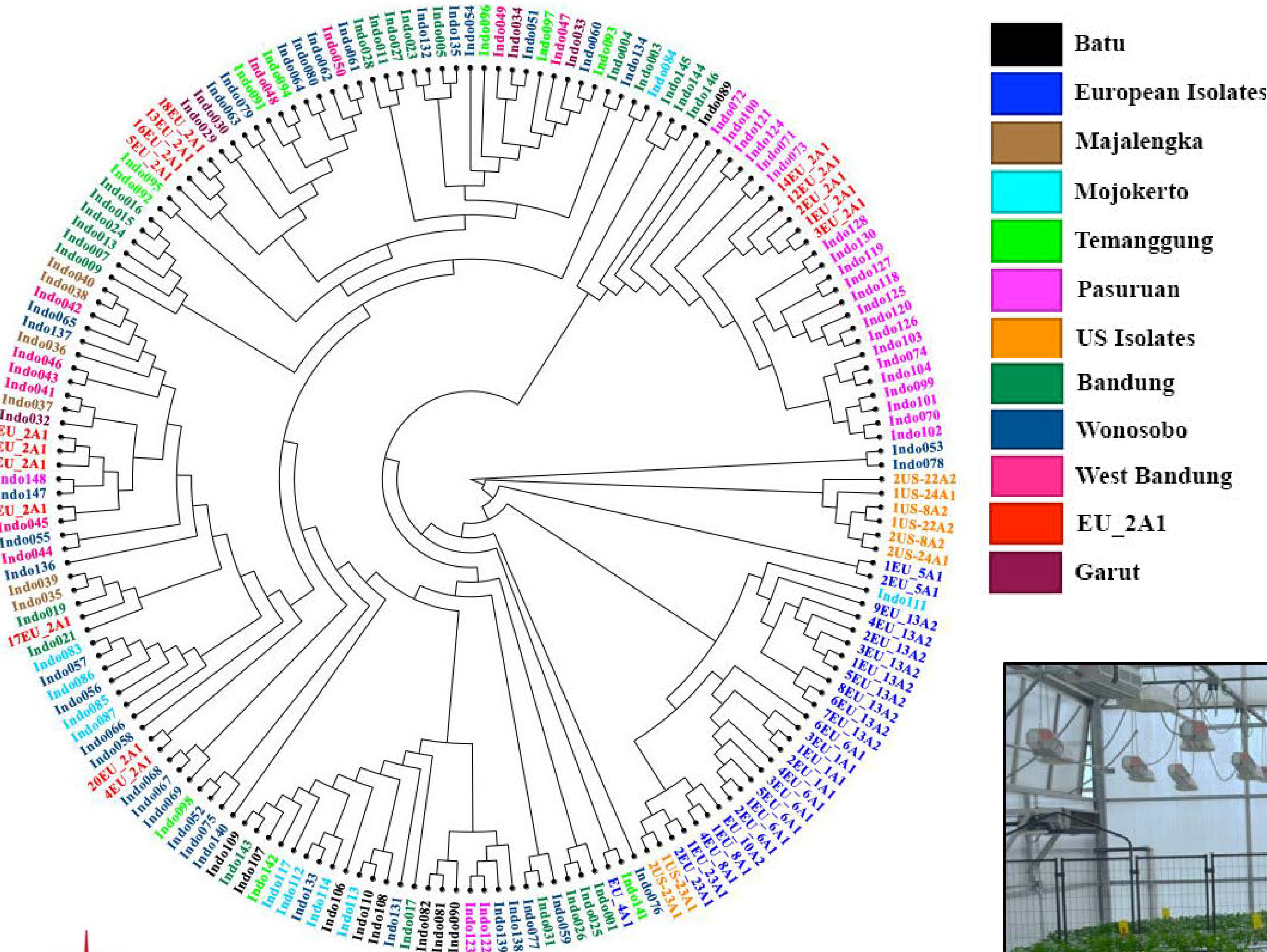
Greenhouse tuber production (Indonesia)



Simulated confined field trial (Bangladesh)

PATHOLOGY UPDATE

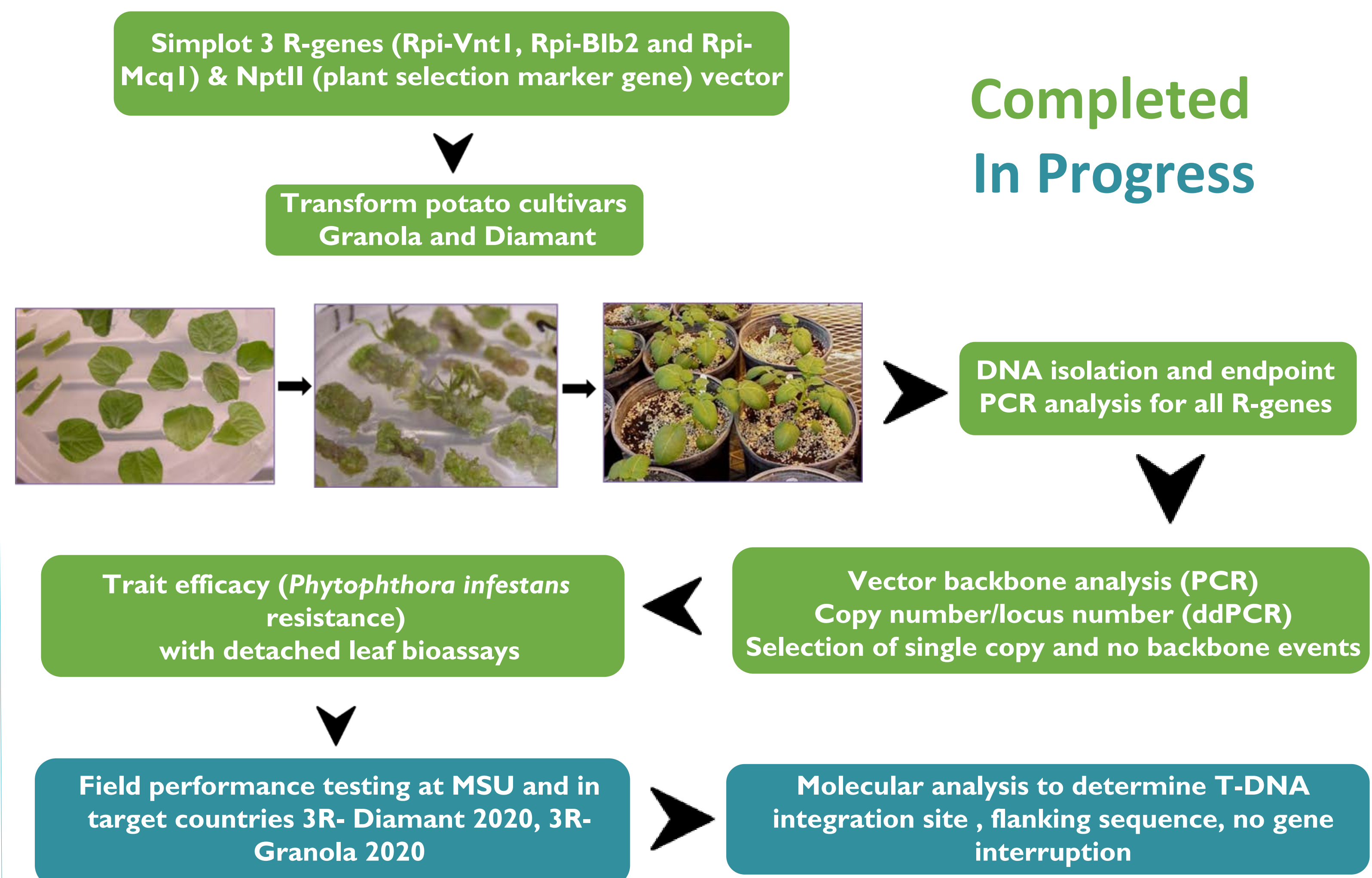
P. infestans characterization is an important objective in our project. Genotypic characterization of isolates was conducted to understand the genetic composition of *P. infestans* populations in Bangladesh and Indonesia and to further evaluate the resistance strength of the three genes used in our 3R-gene FTFBPP potato products. All the isolates collected in Indonesia differed from US standards. EU_2A1, EU_4A1 and EU_6A1 isolates were found in Indonesian *P. infestans* populations, but the majority of isolates clustered separately from the known isolates. Indonesian isolates from East Java clustered separately from Central and West Java isolates. Of the 146 isolates collected, 131 multilocus genotypes were found. Genotyping of isolates from Bangladesh showed that they clustered with European genotype Blue 13 (EU_13A2).



- Batu
- European Isolates
- Majalengka
- Mojokerto
- Temanggung
- Pasuruan
- US Isolates
- Bandung
- Wonosobo
- West Bandung
- EU_2A1
- Garut

PRODUCT DEVELOPMENT UPDATE

Simplot 3R-Gene Product Development



3R-Gene Product Performance MSU



2019 NFT Tuber production of 3R Diamant events Harvested tubers will be used for confined field trials



2019 3R-Gene Diamant transplants for Agronomic and Pathology field testing at Michigan State University

