

# Bitotech Advancements Support the Potato Industry



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## Improving Performance and Sustainability

Since the 1990s, biotechnology has significantly impacted U.S. agriculture, with over 90% of corn, cotton, soybeans, canola, and sugar beets now grown using genetically engineered (GE) varieties. Recently, the USDA approved two new bio-engineered potatoes, offering potential benefits to the potato industry.

- The Kal.91.03 potato, based on the scab-resistant Kalkaska variety, improves long-term storage and chip-processing through *invertase* silencing.
- New potato varieties using the drought-tolerant *XERICO* gene show promise for enhancing water use efficiency, with increased specific gravity and yield observed.

These advancements support the commercial potato industry by improving crop performance and sustainability.

## Cold Storage Chip Processing

Using vacuolar acid invertase silencing (*Vinv*), the MSU scab resistant variety Kalkaska has excellent chip quality fried after six months storage at 40 F.



Chips made directly from 6 months storage at 40 F (4.4 C) degrees.



## Second Generation Disease Resistance

As part of the USAID Feed the Future Project, we have developed bio-engineered potatoes combining three late blight resistance R-genes and virus resistance to PVY and PLRV. We have USDA-APHIS Non-Regulated Status for these events.

- MSU2DR-01 for Late Blight and PVY resistance: (*RpiAmr1*, *RpiAmr3*, *RpiVnt1* and *RySto*)
- MSU2DR-02 for Late Blight, PVY and PLRV resistance: (*RpiAmr1*, *RpiAmr3*, *RpiVnt1*, *RySto*, and *Rladg*)



## New USDA Rule



Based on 30 years of evidence, the USDA finalized a new rule for the regulation of agricultural biotechnology in May, 2020.

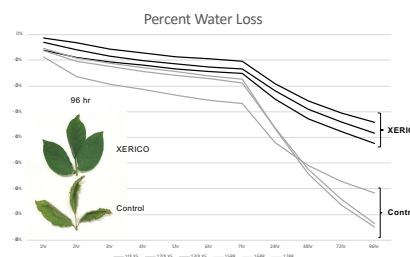
- Regulatory Status Review (RSR)

In the new RSR process, the USDA APHIS evaluates if a GE plant requires oversight based on the characteristics of the plant and its plant-pest risk, not the method used to develop it. If a plant developed using genetic engineering is found to be unlikely to pose a plant pest risk, APHIS will not require regulation.

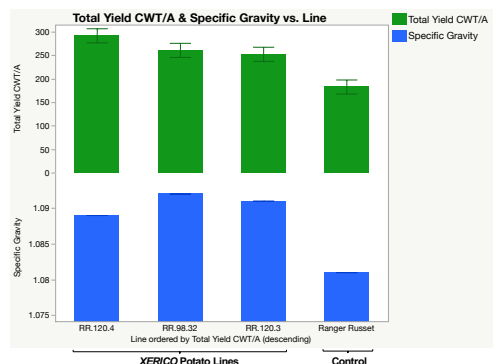
## Starch Increase and Drought Tolerance

*XERICO*: gene from *Arabidopsis* with similar genes in potato. We are using the drought-induced *XERICO* gene.

- Greenhouse studies verified drought tolerance.



- Agronomic field studies demonstrated no yield penalty and increased starch content.



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