



AGRICULTURAL SYSTEMS

Plant Improvements Improve Livelihoods

Variations in climate, soil, resources and customer demand require plants that are bred and adapted to specific farming regions. Environmental changes cause new pests and diseases to emerge that create the need for improved plant varieties that can withstand these pressures. Land-grant universities are home to some of the world's leading plant breeders and variety programs to keep people adequately fed and farm operations profitable.

SUCCESSFUL EXAMPLES INCLUDE:

- Researchers in **Washington** are working to help grape growers roll back a devastating virus that withers vines and shrivels harvests. Grapevine leafroll disease is the most complex viral disease affecting wine grapes worldwide, costing growers millions of dollars in damaged vines and lost productivity. Uncontrolled, it can cause \$25,000 to \$40,000 in damages per hectare, reduce yield and harm fruit quality. The researchers discovered a genetic approach to successfully replicate one of the main culprits behind the disease, a virus known as leafroll 3. The advance opens the door for experiments and treatments to protect valuable Washington vineyards. Studies are in progress to infect grapevines with synthetic copies of the virus to unravel the many intrigues of leafroll disease in a systems biology approach for designing novel control strategies.
- Chile pepper processing in **New Mexico** is an industry worth more than \$500 million. Chile wilt disease can totally destroy fields, with potentially devastating economic and cultural effects throughout the state. Planting resistant varieties is the best way to manage the disease. New Mexico researchers are using molecular markers linked to resistance to identify disease-resistant plants that may lead to more effective breeding procedures. Next-generation gene sequencing technologies are helping to identify candidate genes for resistance. The goal is to provide chile farmers with a disease-resistant plant variety that can lower the risk of crop loss.
- Efforts made by **Georgia** researchers to supply stress-tolerant turfgrass and more efficient cultivars contribute to a healthier environment and economic benefits for the growers and their customers.
- Helping the vital potato industry continue to thrive is of utmost importance for potato researchers in **Oregon, Washington** and **Idaho**. This tri-state collaboration has produced 40 improved potato varieties with better resistance to diseases. In the past 10 years, the value of tri-state varieties has increased by approximately \$190 million. These varieties are now grown on more than 143,000 acres in the Pacific Northwest, with value to growers estimated at \$600 million.

AGRICULTURAL SYSTEMS

ABOUT LANDGRANTIMPACTS.ORG

The Land-Grant University System is a uniquely American institution, and has operated successfully for more than a century. The landgrantimpacts.org website documents and demonstrates the collective and individual impacts of the national system of joint teaching, research, and extension institutions.

Prepared by the National Impacts Database Communications Subcommittee, supported by ESCOP, ECOP and USDA/NIFA.

02/2020

Photograph provided by the USDA.