

RosBREED

DISEASE RESISTANCE × HORTICULTURAL QUALITY → SUPERIOR CULTIVARS



WWW.ROSBREED.ORG

Rosaceae Nemesis

Apple Fire Blight

Fire blight is a dreaded disease, regularly attacking entire orchards, quickly reducing fruit production and even killing young trees. Modern high-density orchards are usually planted with highly susceptible rootstocks like the Malling series. Many current scion cultivars, including, Fuji, Gala, and Granny Smith, are much more susceptible than some older cultivars, like Red Delicious. Despite research to improve management programs, available measures are costly and not always effective in controlling the bacterial pathogen (*Erwinia amylovora*), especially in organic systems. Fire blight is a disease nemesis for every U.S. apple grower, regardless of their production area.

One key RosBREED goal is the development of donor parents in rosaceous crops that enhance

the probability of producing progenies combining superior horticultural quality with durable disease resistance. In apple, fire blight resistance is found in Splendour and cultivars from the Purdue-Rutgers-Illinois (PRI) cooperative breeding program, e.g., Enterprise and Goldrush (Figure 1). Splendour has excellent flavor attributes and is a parent of several cultivars: Aurora Golden Gala, Pacific Rose™, and Pacific Queen™, but its fire blight resistance is not characterized genetically. RosBREED will identify genetic loci controlling Splendour-derived resistance using families segregating for this trait (Figure 1). Resistance in PRI germplasm is derived from the wild source originally used to provide apple scab resistance, *Malus floribunda* clone 821. RosBREED will also combine new and available information on resistance alleles derived from Splendour and PRI cultivars to develop reliable, efficient DNA tests and implement them in apple breeding programs.

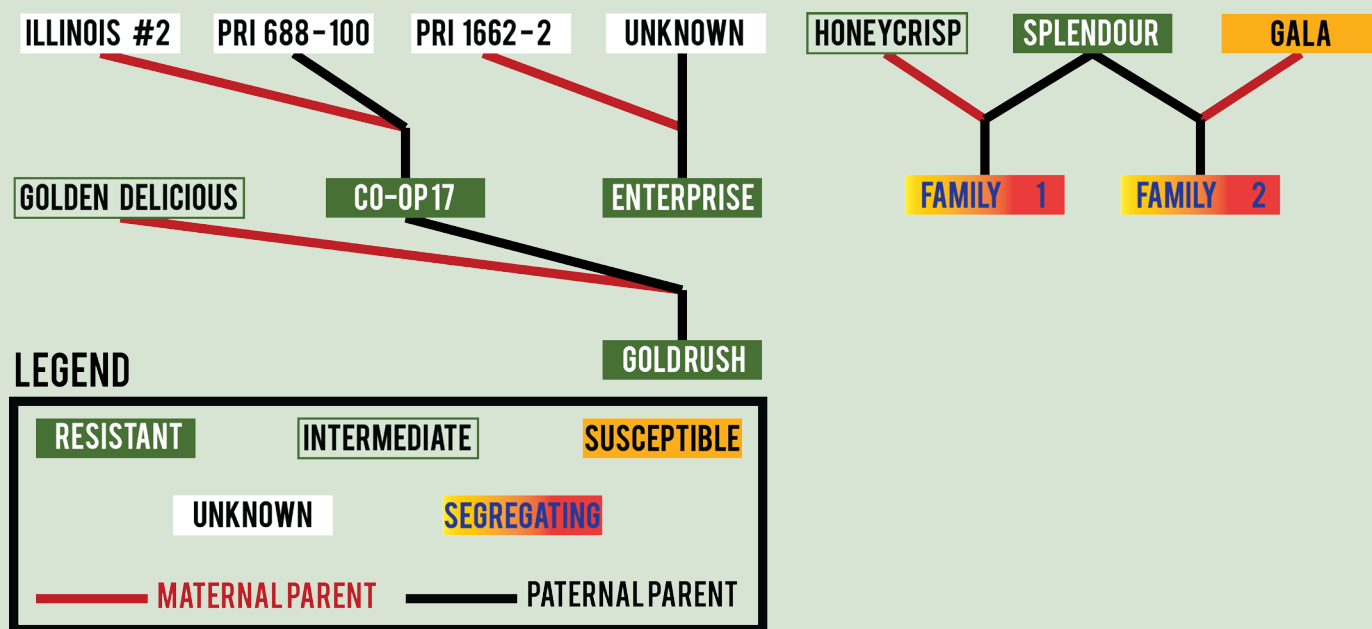


Figure 1. Pedigrees of fire blight resistance sources exploited in RosBREED. Families 1 and 2 are segregating for resistance. We are mining these founding parents, cultivars, and progenies for resistance alleles to develop breeding parents that are multiple resistance allele donors.



United States Department of Agriculture

National Institute of Food and Agriculture

RosBREED is a Coordinated Agriculture Project composed of a multi-state, multi-institution, and multi-disciplinary team of scientists dedicated to the accelerated genetic improvement of U.S. rosaceous crops using diagnostic DNA tools. This project is funded through the USDA-NIFA Specialty Crop Research Initiative by a combination of federal and matching funds.

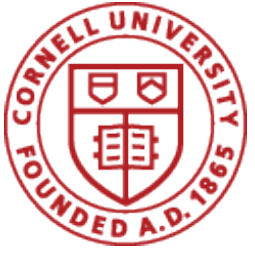
RosBREED

DISEASE RESISTANCE × HORTICULTURAL QUALITY → SUPERIOR CULTIVARS



WWW.ROSBREED.ORG

Acknowledgements:



Bear Mountain Orchards, Inc.



United States Department of Agriculture
National Institute of Food and Agriculture
Agricultural Research Service

RosBREED is a Coordinated Agriculture Project composed of a multi-state, multi-institution, and multi-disciplinary team of scientists dedicated to the accelerated genetic improvement of U.S. rosaceous crops using diagnostic DNA tools. This project is funded through the USDA-NIFA Specialty Crop Research Initiative by a combination of federal and matching funds.