



Scientists across the U.S. have designed automated and mechanized devices to reduce labor needs and costs and make harvest easier, more efficient, and less dangerous, including:

- A device that eliminated ladder falls, reduced the time **apple** pickers spent in awkward, dangerous postures, and increased the number of apples harvested per second by **50%** (Pennsylvania State University).
- A system with a **90%** picking rate that keeps **apple** damage at about **10%** (Washington State University).
- A 12-armed robot with machine vision that accurately detects and picks apples (Washington State University).
- Simple, energy-efficient automated **chestnut** harvest tools for growers who can't afford mechanical harvesters, but are too large to harvest manually (Michigan State University).
- A smaller robotic **cotton** end-effector to replace mass cotton harvesting machines, which can cause soil compaction and pollution (Mississippi State University).
- A computer-controlled orchard platform that increases harvest throughput **26%** (University of California, Davis).
- Affordable automated technologies to improve **blueberry** harvest efficiency and overcome labor shortages and high labor costs (University of Georgia).

This research is part of Hatch Multistate project W3009, which is supported in part by the USDA NIFA through Hatch Multistate Research Fund capacity grant allocations to State Agricultural Experiment Stations at participating land-grant institutions.

