



Request for Proposals (RFP) Supplemental File II Harvest

ABC Research on Almond Harvesting

Conventional almond harvest in California involves shaking nuts on ground, let nuts dry on orchard floor for several days, sweeping to windrow, and harvester to pick up. These steps cause concerns for dust generation, tree stress, microbial and chemical contamination, increasing insect damage, etc. In working toward to the 2025 harvest goal of “reducing dust from harvest by 50%”, established by ABC’s Board of Directors (BOD), ABC has funded multiple research projects improving current harvest practices and assessing feasibility of alternative harvesting. While many projects are still ongoing, the findings from a few projects have revealed promising results: 1) low-dust harvesters can reduce visible dust by more than 30%; 2) off-ground harvesters, minimizing dust generation by skipping sweeping and picking up, may be adoptable to some of California almond orchards; 3) off-ground harvest followed by alternative drying is a value proposition for growers; 4) the costs of inshell nut drying range from 1 to 5 cents per pound; 5) many existent commercial dryers or drying facilities are feasible and adoptable for drying of inshell almonds; 6) the loss from windfall nuts is within an acceptable level.

Recently Completed and Ongoing Projects on Almond Harvesting are:

- Quantitative and Qualitative Impacts of Windfall on Almond Yield and Quality
- Visible dust measurement and emission factors of low dust harvester
- Development of simple dust measurement techniques to aid in long-term dust reduction program for almond harvesting operations using drone technologies
- Improvement of current harvesting procedure to avoid sweeping and alternative harvesting without air blowing
- Techno-economic analysis of off-ground harvesting
- Mechanical drying efficiency and feasibility of off-ground harvested inshell nuts
- Development of alternative drying protocols for inshell nuts
- Effects of off-ground harvesting followed by mechanical drying on disinfestation, disinfection and microbial contamination risk.
- Field Screening of Size Controlling Rootstocks for Off-Ground Harvested Almond Orchards
- Evaluation of potential pest pressure reduction (Hull Rot and NOW) for early off-ground harvest
- Three-dimensional model-based analysis of the impact of variability in almond tree structure and configuration