



2022 Apple Horticulture and Postharvest Research Priorities

Request for Proposals (RFP)

The Washington Tree Fruit Research Commission (WTFRC) is seeking apple research proposals in the following priority areas.

Achieving sustainable production and consistent fruit quality for profitable orchards:

Optimization of yield potential in ***the orchard*** via development of integrated systems and interrelated models:

- understanding of pollination biology/fertility
- water and nutrient management (balance tree growth and development to maximize cropping potential of premium fruit)
- managing soils: how to measure, manage, and maintain soil fertility
- systems approach for understanding and managing the root cause of bitter pit & calcium-related disorders under Washington conditions
- utilization of genetic/genomic and other tools to understand the inherent mechanism that guide cropping system performance
- best practices for pre-harvest decay pathogen reduction strategies for conventional and organic orchard systems

Enhanced ***postharvest*** efficiency to promote sustainability and long-term economic viability of pome fruit businesses by increasing packouts. We seek projects that aim at understanding/managing/reducing decay and physiological disorders while maintaining/enhancing food safety.

- next generation maturity indices as risk assessment tools to manage fruit quality and physiological disorder prevention
- Optimized sanitation protocols with focus on decay pathogen reduction
- Develop a training program for postharvest process water management strategies to manage decay and foodborne pathogens
- Food safety and sanitation (practical approaches to be implemented directly into operations, when appropriate in conjunction with pathology and fruit quality management):
 - o Estimate the potential financial benefit of optimized sanitation protocols on packouts for high value varieties, such as Honeycrisp. Cost-benefit analysis of food safety controls.
 - o Develop best practices for drenching and fogging to avoid bacterial and fungal growth
 - o Organic approaches to packing line food safety
- Assess effectiveness of new biocontrol agents or other novel agents for decay control

***Abiotic stress management* and *climate change*:**

- Systems approach to understanding the basis of fruit over color development to enable harvest of fruit at optimum maturity and to reduce the number of picks needed (high priority in 2021):
 - o Genetic, biochemical, physiological, environmental factors
 - o Develop best practices to manage and increase over color
- understanding chilling requirements for apple trees

- understanding maturation patterns and storage potential based on in-season climate (examples: smoke, frozen fruit protocol, heat damage of fruit, dramatic temperature drops in season, abnormal maturation patterns)

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- Develop a best practices document to mitigate the impact of greasiness on the ability to wax fruit
- Determine detailed protocols for use of ethylene action/synthesis inhibitors/promoters
- Green spot: Determine the extent of the issue, the underlying cause and develop management strategies to mitigate green spot in *COSMIC CRISP®*
- Develop comprehensive best practices document for the entire production chain by integrating all existing work

Technology projects for apples alone or across several different crops are encouraged. Of special interest are proposals addressing methods assessing labor utilization and/or for the reduction of manual labor needs in orchards. Those projects may be moved into the technology committee. Specific priorities:

- Cost-effective high-density systems for automation
- Non-destructive crop stress modeling
- Real time fruit growth measurement
- Smart Orchard Project
- Economic analysis: for available and novel technologies (how to make the economics work), focus on Key Performance Indicators (KPI's)

Some of the priorities listed do not specifically ask for organic options. We are interested in having organic practices considered in all proposed work when appropriate. Also, proposals are expected to include an industry outreach component if the sought-out project outcomes are anticipated to directly translate into management changes. Maintaining profitable and sustainable tree fruit companies is of utmost importance to our industry, and economic considerations need to be included in project designs.

Novel ideas in areas not listed as priority are encouraged. It is suggested to contact Ines Hanrahan (hanrahan@treefruitresearch.com) to discuss any ideas outside of the priorities identified by the 2022 Request for Proposals (RFP), before submitting a preproposal.

Detailed instructions for preproposal submissions may be found at: <https://treefruitresearch.org/proposals-reports/pre-proposal/instructions/>

Preproposals should be submitted by **October 22**, 2021, to: amy@treefruitresearch.com

For general information about the funding process please consult the Proposal, Review, and Funding Process Description Document: <https://treefruitresearch.org/proposals-reports/new-researcher-onboarding/>

For more information or context please contact: hanrahan@treefruitresearch.com