2025 PNW Cherry and Stone Fruit Research Priorities

Request for Proposals (RFP)

The Washington Tree Fruit Research Commission (WTFRC) and the Oregon Sweet Cherry Commission (OSCC) are seeking cherry and stone fruit research proposals in the following priority areas.

Fruit Quality and Safety (how to achieve better fruit quality in the market)

1. Develop SOP of basics on how to consistently grow the best quality cherries.
    a. Nutrition and PGR's.
    b. Optimum balance of vigor.
    c. Optimum balance and management of crop load (e.g. do new varieties tend to alternate bear? See: Pearl series, SweetNote; how to manage new varieties esp. pruning)
    d. Soil health.
    e. Irrigation near harvest for optimum firmness
    f. Determine export ability by variety
    g. Postharvest management for stem quality retention (e.g. stem quality: Skeena/Sweetheart/Early Robin).
    h. Mitigation of heat stress (e.g. ho to profitably grow Skeena/Bing and other varieties that suffer from high heat)
2. BMP for cherry packing lines to ensure spoilage prevention and food safety
    a. BMP for hydrocoolers to eliminate potential for microbial contamination.
    b. Review of current practices and the reduction that occurs from our current controls.
3. Storage technology: efficiency and suitability of new technology (such as below freezing storage)
4. Fruit abscission: understanding of the underlying mechanism (why did fruit release between stem and cherry this year?; PGR's such as GA esp. in years of mixed maturity, ethephon: variety specific response)
5. Cold hardiness (e.g. both going in and out of winter, ABA application to defoliate, e.g. for new variety rootstock combinations: Black Pearl/Krymsk)
6. Stone fruit physiology: understand ripening (e.g. why did apricots ripen before Bing in 2023, why did fruit not size)

Insect & Disease Management

Projects in this area needs to consider pesticide resistance management.

1. Powdery mildew:
    a. new chemistry (especially for organic producers) and optimum timing.
    b. Same programs/different outcomes: why? (coverage/improper application?)
2. Spotted wing drosophila (SWD) detection and management.
    a. Understand when cherries are susceptible to SWD damage.
    b. PNW specific insect biology (source, movement, overwintering, population density spikes and regional differences) and introduction of new technologies to optimize field management.
    c. New chemistry.
    d. Timing of applications.
3. Shot hole/leaf spot: develop comprehensive treatment programs.
4. Investigate bacterial diseases in sweet cherry (e.g. Eutypa die-back, how to deal with it in young trees, ID

bulletin to help field ID esp. when symptoms are similar, BMP to prevent spread, how to best collect samples; chemical control beyond kasumin; rootstock effect on scion, resistant varieties)

5. Determine suitability and limits of UV-C or far UV-C for postharvest disease control.
6. MRL's for all markets.

Labor efficiency

1. Tree architecture and training systems.
2. Automation of orchard (i.e. irrigation……).

Sustainability

1. Develop a comprehensive Life Cycle Assessment for PNW sweet cherries
    a. Carbon sequestration on the farm (accounting and budgeting).
    b. Carbon credits: how to utilize as part of orchard profitability.
    c. Understanding ESG's (physical farm inputs, economics).
2. Understand farm input economics

Little cherry disease (LCD) identification, management, and elimination

1. Optimized or new testing methods for early disease detection (especially on non-fruiting trees): Research-informed solutions to reduce costs, turn-around time, and improve detection of recent infection (especially for non-symptomatic trees/rootstocks in orchard and nursery settings).
    a. Methods for rapid, reliable identification of infected trees in orchards and nurseries, building on continued research (e.g. canine detection, artificial noses).
    b. How can we deal with false negatives? (e.g. whole plant sampling/detection via volatiles or sensors) Special focus on nursery mother trees and stock, where symptoms do not exist.
    c. Scouting: ways we can improve/optimize scouting speed (i.e. camera based systems mounted on vehicles etc.).
2. Biology
    a. Novel approaches to dealing with and living with LCD (e.g. options that prolong the viability of the orchard).
    b. Determine difference in virulence (e.g. between WA/OR or amongst strains)
    c. Better understanding of the latency period (non-symtomatic, why are some varieties taking longer to express symptoms?)
3. Leafhoppers/Vectors
    a. Development of an integrated pest management program for X-disease vectors that can be implemented areawide. (Including options for ground cover management; cost-effective postharvest program that considers SWD resistance mgt.).
    b. Innovative, sustainable strategies for disease management.
    c. Develop dynamic spray program based on the risk of spreading.
    d. Biological control agents
    e. Titer threshold for X-disease acquisition from trees. Are leafhoppers able to pick up X-disease from low titer sources (low titer trees and weeds)? Do leafhoppers feed enough or differently on weeds to overcome different low titers and acquire phytoplasma? Determine the probability of acquisition from low titer trees, it seems to be >50% from high titer trees.
    f. Role of weeds in X-disease transmission. Are they contributing pathogens, or just leafhoppers?
4. Resistance
    a. Develop resistant or tolerant varieties to ensure productivity, despite presence or risk of X- disease phytoplasma, little cherry virus 1 or 2.
    b. Screen rootstocks for LCD resistance and for hypersensitivity, especially Krymsk.

Scion breeding program additional target areas

1. Powdery mildew resistance
2. Postharvest evaluation
3. LCD resistance
4. Pseudomonas resistance

Technology

Projects that work across several different crops are encouraged. Of special interest are proposals addressing methods assessing labor utilization or for the reduction of manual labor needs in orchards. Please refer to the current Technology Roadmap for more detailed background: https://treefruitresearch.org/about-us/technology-roadmap/

Those projects will be moved into the technology committee.

- Partial or full automation of pruning, thinning, spraying, insect monitoring, harvest.
    - Three state (CA/OR/WA) collaboration to automate cherry harvest.
- Accurate crop estimation (yield, size profile)
- Timeline for pruning based on physiology to develop roadmap for pruning robots.

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 2024 Request for Proposals (RFP), before submitting a preproposal.

Detailed instructions for preproposal submissions may be found at: https://treefruitresearch.org/proposal-process-instructions-and-documents/pre-proposal/instructions/

Preproposals should be submitted by **August 23, 2024**, to: submit@treefruitresearch.com

For general information about the funding process please consult the Proposal, Review, and Funding Process Description Document: https://treefruitresearch.org/proposal-process-instructions-and-documents/proposal-review-and-funding-processes/