2024 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 grow the best cherries.
    a. Nutrition and PGR's.
    b. Optimum balance of vigor.
    c. Soil health.
    d. Irrigation near harvest for optimum firmness
    e. Determine export ability by variety.
    f. Postharvest management for stem quality retention.
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)
6. Stone fruit physiology: understand ripening (e.g. why did apricots ripen before Bing in 2023, why did fruit not size)

Insect & Disease 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 (especially in the Willamette Valley): 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)
5. Determine suitability and limits of UV-C or far UV-C for postharvest disease control.

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.
    b. How can we deal with false negatives?
    c. Scouting: ways we can improve/optimize scouting speed (i.e. camera based systems mounted on vehicles etc.).
2. Biology
    a. Can plant nutrition status influence susceptibility to infection?
    b. Novel approaches to dealing with and living with LCD.
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).
    b. Innovative, sustainable strategies for disease management.
    c. Develop dynamic spray program based on the risk of spreading.
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. Those projects will be moved into the technology committee.
- Partial or full automation of pruning, thinning, spraying, insect monitoring, harvest.
    o 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.