

2024 Apple Crop Protection Research Priorities



Request for Proposals (RFP)

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

Some of the priorities listed do not specifically ask for organic options or pollinator protection. We are interested in having organic practices and pollinator protection considered in all proposed work, when appropriate. Collaboration of scientists between institutions and across states and agencies is highly encouraged. 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.

RESEARCH PRIORITIES

HIGH PRIORITY

Codling Moth (CM): We are not looking for demonstration trials. We request replicated controlled studies and research that provides statistically significant paths forward for pest management. Projects with an organic emphasis are preferred since control of the insect is currently challenging. Priorities are listed in order of importance.

1. CM Management
 - a. Understanding GDD model (when to start counting) and how previous seasons relate.
 - b. Validation of monitoring tools: comprehensive evaluation of all commercially available CM lures
 - c. Crop protection product efficacy testing of current and new materials (i.e. Spear®-Lep, Virosoft CP4, Entrust) especially development, refinement and deployment of new organic control strategies (i.e. trapping, nematodes, new products, relative contribution of oil, EC effects, extended coverage); BMP to ensure efficacy for new modes of action such as peptides.
2. Resistance bioassays for CM and other pests with suspected resistance evolution to current insecticides
3. Mass trapping and sterile insect release: comprehensive approaches
4. CM management on an area wide basis (education effort, SOP's, implementation, point person to contact)

Fire Blight:

- Build program options for growers (focus on entire season and weather events)
 - o Season-long risk assessment in modern orchards including, but not limited to
 - Secondary bloom
 - Summer infections via overhead cooling
 - Risk in fall when temperatures are 70-80°F

- Product efficacy testing of new materials and development of SOP's for optimized efficacy (especially focus on shoot blight control, getting to the end of the season, orchard sanitation, new materials)
- Continued product resistance testing
- Non-tree host plant: ID & control

Postharvest Decay:

Projects are sought that connect the field to the warehouse that will result in a SOP between the two

1. Decay Management:

- Organic preharvest products to manage postharvest decay
- Survey of decays in WA to ID new ones
- Resistance management for blue and grey mold (ex. coordination between field and warehouses to avoid loss of products)
 - o Reduce levels coming into the warehouse
 - o Expand into new products
- Reasons for new decay organisms (life cycle vs. commercial practices)

2. Patulin: Build on ongoing work funded by WTFRC

- Determine if new strains of blue mold affect patulin production
- Develop SOP for organic apples to minimize patulin production
- Develop updated whole supply chain SOP to manage patulin

Soil Health Improvement:

- Efficacy testing of wide range of new products (i.e. biological inoculants) to increase soil fertility (example: mycorrhizal fungi) including economic feasibility and suitability under Washington state conditions and efficacy testing to verify product ingredients (preferred annual results)
 - a. Quick test to verify mycorrhizal fungi are present and alive
 - b. Test consistency of products
 - c. Develop an SOP to keep 'biologicals' alive
- Replant best management: steps after fumigation to restore soil health?
- Develop/adapt a system of standard soil health metrics for WA conditions.

Pesticide Residue Management:

- Continue WTFRC work (include new fungicides)
- Get new materials on list to test ASAP (living document: new products, new challenges)
- Determine BMP's for pesticide efficacy under prolonged evaporative cooling conditions.
- How do variable rate sprayers affect MRL's?

Weed Management

- BMP scenarios utilizing products that are still available to use
- New products for young trees (< 3 yrs)
- Develop a regional resistance management program
 - o Determine resistant weeds by region
- New technologies (microwave): determine efficacy and economic feasibility
- Organic tank mix options and what works best

Understanding Carbon Footprint of Apple Orchards

Technology projects in apple crop protection or across several different crops are encouraged. Those projects may be moved into the technology committee. Specific interest:

- Automated insect monitoring and scouting programs

- Adoption of precision crop protection application methods (needs to include efficacy data)
 - Plant health monitoring, pest, and disease identification with sensors
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MEDIUM-HIGH PRIORITY

Thrips: Thrips are becoming more of an issue in other varieties not seen before such as Honeycrisp and Cosmic Crisp. Spinosad work great but at the cost of our natural enemies and at the worse time. We need other options.

- More management options especially for organic
- Alternative/new material that does not impact pollinators and natural enemies

Woolly Apple Aphid:

- Determine which beneficials to use and how to attract them to the trees to feed
- Organic materials, increase options
- Develop alternative treatment options if key pesticide is lost (Diaznon)

Oriental Fruit Moth:

- Determine location and distribution of the insect populations and create awareness and ID (might be mistaken for CM)
 - Efficacy of commercially available pheromones (application method, type of pheromone)
 - Develop a DD-model
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MEDIUM PRIORITY

Pollinator Safety:

- Refugia for increasing pollinators
- Best management tactics to protect pollinators

Apple Replant:

- Develop an SOP for mustard seed program

Beneficial insects:

- Determine timing, rates, release techniques of beneficial release
- Rearing techniques that are more economically feasible to growers

Mealybugs:

- Organic and conventional control strategies

Mouse and Rodent Control:

- Organic control methods

San Jose Scale (Especially Organic):

- Develop an effective spray program
- Determine which beneficials to use
- Use of pheromones

Apple Leafcurling Midge (Organic):

- How to manage it in newer plantings/young trees
- New tools esp. for organic (i.e. attracts and kill, mass trapping)

OBLR (Organic & Conventional): Extension Project

- New products or good tank mix beyond Bt
- Develop a detailed spray program
- Align model output vs. ground truth (effects of Bt on model)

Powdery Mildew (Conv./Organic)

Campylopus/lygus (Conv.)

- Monitor and tools to manage esp. in Golden, Gala, Honeycrisp

LOW PRIORITY

Brown Marmorated Stink Bug:

- Pesticides to control populations

Spider Mites, Leafrollers, Apple Maggot

Extension:

- Update the orchard pest monitoring guide (bilingual)

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 2023 Request for Proposals (RFP), before submitting a preproposal.