

PNW PEAR RESEARCH PRIORITIES FOR 2020

Fresh and Processed Pear Growers of Oregon & Washington



The task of the Pear Research Sub-committee is to solicit and support research on pears that can provide a favorable return on investment to the broader pear industry. The committee seeks research proposals that have clear, obtainable objectives. We encourage scientists to pursue other public and private sources of funding as appropriate, and to leverage pear grower funding to support applications for larger projects such as USDA Crop Protection, Sustainable Agricultural Research and Education (SARE), Organic Research Education Initiative (OREI), Specialty Crop Research Initiative (SCRI), or state Specialty Crop Block grants.

The economic viability of pear production has been severely challenged over the last few seasons, to the point that many growers are seriously questioning the sustainability of their operations over the next 3-5 years. Input costs are increasing rapidly, especially related to labor and pest management. Changing environmental conditions have brought on more frequent challenges regarding flash blooms/poor fruit set, increased risk of infectious disease (i.e. fireblight), greater incidence of stress-related disorders (i.e. sunburn and cork spot), and unpredictable frost events which reduce yields and downgrade surviving fruit. Consistent crops of high yields of quality fruit in targeted box sizes are crucial to maintain profitability but are proving to be increasingly elusive to many growers. Both pear production and warehousing are heavily dependent on human labor; concerns with labor availability, efficiency, and costs are a consistent concern through all the topics listed below.

The 2019 PNW pear crop was challenged by inconsistent fruit set, small fruit size, and low packouts due to cork spot and fruit marking from psylla and frost; when combined with increasingly expensive labor and a strong US dollar which has dampened exports, prospects for profitability are relatively poor. Despite these financial constraints, the pear industry has demonstrated its commitment to science by recently approving a 45% increase in its voluntary research assessment in hopes of finding science-based solutions for its numerous challenges.

We have identified three key areas or “legs of the stool” that can improve grower returns:

1. Production of consistent volumes (40-50 bins/acre) of clean, quality fruit in target sizes
2. Delivery of consistently ripened, quality product to increase consumer satisfaction and consumption
3. Reduced warehouse losses due to decay, repacking, and/or shrinkage

Ultimately, we need to replace our old orchards with compelling pear varieties grown on compact trees that are precious, productive, accessible to equipment, human labor, and sprays, and which deliver more consistent fruit quality and maturity. The path to that goal is largely tied to a long-term commitment to genetics and breeding programs, but our committee also seeks to address a number of short-term needs which will enable our industry’s survival until we are in a position to reap the rewards of improved germplasm in rootstocks and scions.

Highest Research Priorities

We welcome all research proposals that address challenges to pear production, packing, and storage in the PNW; we have identified the following areas as our highest priorities and offer some detailed ideas under each heading not to be restrictive, but in hopes of attracting proposals which address some of the specific needs and concerns brought forward by our stakeholders.

IPM: Mitigating impacts of pear psylla, mites, and fire blight with reduced inputs from the grower

MITES: focused research on 2-spot mite management, improving predation, and understanding stresses caused by climate as well as having some chemical control options - role of heat cycle/climate impacts on mites, psylla, and codling moth - reduce overwintering adult psylla populations or their egg laying capacity (should we consider area-wide postharvest programs?) - novel practices to improve pear integrated control (conventional & organic) including more

focus on natural enemies – assess threat posed by building pressure from BMSB – can we reduce our overall inputs/sprays? – many growers spraying as frequently as they can (e.g. every 2 weeks) to stay on top of psylla & mites; can we more closely match sprays to insect phenology for better results? – do overhead sprinklers help or hurt?

FIRE BLIGHT: work with newly labeled phages for fire blight control (timing/phytotoxicity/efficacy) - reduce inoculum levels during infection periods - understand the physiology that makes some varieties much more susceptible to tree losses once blight infections take place

POSTHARVEST QUALITY: Delivering a product that creates repeat business and draws in new customers

FRUIT RIPENING: understanding ripening triggers – are there industry usable tools to measure fruit ripening potential - survey consistency of product delivered to the consumer (is the industry hitting targets/does it have targets?) – is there a measure for flavor? – can we ripen MCP-treated fruit for a good eating experience? – options for packing-line sorting (dry matter? sugars?) of field-run fruit of varying maturity to store and ripen more homogenous lots of fruit – limited capacity of ripening rooms – inconsistency between ripening programs

IMPROVE AND EXTEND STORAGE LIFE: new tools for scald other than MCP or wraps - use of sensors to evaluate dry matter quality index – reduced losses to decay & disorders - post-harvest programs that collaborate regionally and nationally - automate warehouse to reduce labor and improve fruit handling (especially bagging) – pre- and post-harvest application of growth regulators, fungal antagonists, and/or fungicides to improve quality and reduce storage losses – managing phenolic browning and scuffing observed with later handling of fruit

VALUE ADDED PRODUCTS: commercial implementation of fresh sliced product

FOOD SAFETY: actual vs. perceived risks – packinghouse & bin sanitation strategies

HORTICULTURE: Maintaining consistent yields of targeted fruit sizes and grades with reduced production inputs

CROP LOAD MANAGEMENT: production of consistently high fruit quality – improved chemical thinning of Bartlett - improving fruit set/reducing fruit drop, especially in older canopies (could be pollination - PGRs - tree architecture/light issues – water - nutrition) - managing vigor impacting fruit set and sizing while not stimulating vegetative growth – fruit quality of bourse vs. lateral buds? – biennial bearing, esp. in Bosc – alternative/native pollinators (bees)

WATER/NUTRITION: understanding nutritional and orchard impacts on post-harvest decay - improved integration of horticultural, water management and nutrition strategies to mitigate stress disorders, particularly cork spot – management strategies to reduce vigor – most cost-effective forms of calcium at various times of season

PHYSIOLOGY: renovation of older canopies to improve light & spray penetration, accessibility to labor and machines – renewal pruning strategies to maintain calm, productive trees - effects of constant oil/calcium sprays on tree health – is “psylla shock” a real concern?

GENETICS: Developing new plant material that provides durable solutions for production, packing, and storage challenges and delivers superior product to consumers

ROOTSTOCKS: support for long term breeding program while continuing to investigate available rootstocks - regional demonstration plantings in partnership with commercial operations

SCIONS: new varieties to excite consumers - consideration of starting a PNW-based breeding program? – curation/evaluation of promising varieties from other countries

“OMICS” RESEARCH: molecular techniques to augment and expedite breeding program efforts and/or improve current standard germplasm – early identification of fruit prone to disease or disorders