



2020
Tree Fruit
IMPACT REPORT

Washington State University Tree Fruit Endowment

An investment in the future

In 2013, state fruit growers finalized a promise for a \$32 million endowment fund—the largest gift in Washington State University’s history—to make WSU a globally competitive tree fruit research institution. Developed in partnership with the Washington Tree Fruit Research Commission, the endowment was initiated through grower-voted assessments in the apple, pear, cherry, and stone fruit industries.

The fund supports priority research projects, modern test orchards and equipment, outreach efforts, and personnel, energizing WSU’s Tree Fruit Research and Extension Program to solve the challenges of today, and prepare for a more profitable and sustainable tomorrow.

Priorities are guided by the Tree Fruit Endowment Advisory Committee (EAC), whose membership is appointed by organizations including the Northwest Fresh Pear Committee, Washington State Fruit Commission, Washington Tree Fruit Research Commission, and the Washington Apple Commission.

Current EAC Members

- ✓ SAM GODWIN, Chair, Godwin Family Orchard
- ✓ SEAN GILBERT, Gilbert Orchards
- ✓ TEAH SMITH, Zirkle Fruit
- ✓ ALAN GROFF, Foreman Fruit Company
- ✓ DOUG GIBSON, Underwood Fruit
- ✓ JASON MATSON, Matson Fruit Company
- ✓ ROBIN GRAHAM, Stemilt Ag Services



WSU TREE FRUIT
ENDOWMENT



– From the Dean –

Working together for a resilient industry

Over the past year, I’ve witnessed the resiliency of both our WSU research family and Washington’s tree fruit communities. Even in these times of uncertainty, our scientists, students, growers, and industry partners have continued to work together to overcome the challenges that face us.



That partnership is embodied by the WSU Tree Fruit Endowment which fuels research and sets priorities in tandem with producers and enterprise. Now in its seventh year, this fund allows WSU to bring the latest research and ideas directly to the orchard, the packinghouse, and the dinner table.

Over the last year, the Tree Fruit Endowment has allowed us to pursue many innovations in orchard management, storehouse practices, disease defense, improved genotypes, and fruit quality in apples, pears, and cherries.

Thanks to the Endowment, we have expanded the WSU Tree Fruit Extension Team’s efforts to build awareness and improve management of Little Cherry Disease, which devastated

cherry orchards in decades past and has resurfaced in Washington.

With the impacts of the pandemic bringing unprecedented complexities to tree fruit and many other sectors of Washington state agriculture, WSU Extension scientists are working alongside the tree fruit industry to answer questions and address best practices related to COVID-19.

The Cosmic Crisp® apple rolls ahead this year, with more than 15 million trees planted in Washington state, and major launch activities continuing into 2021.

Finally, in a welcome surprise, the endowment’s special assessment, which completed in 2019, drew in additional funds that we will use to enhance outreach and infrastructure at both of our Prosser and Wenatchee centers.

Our success would not be possible without your support, and I thank you for your ongoing involvement. On behalf of our college and its faculty, I’m humbled by your strength in challenging days, and proud to partner with you in innovation and discovery that keeps this industry strong.

André-Denis Wright
CAHNRS Dean



- Information and Technology Transfer Endowment -

The Extension ITT endowment was established to support WSU Extension positions that address specific industry challenges, and to develop coordinated and effective communication with industry partners.

Karen Lewis leads the WSU Tree Fruit Extension Team, a collaboration of WSU Extension specialists and the Washington Tree Fruit Research Commission who work to support the industry through outreach and applied research.



Karen Lewis



Jenny Bolivar Medina

Members include **Faith Critzer**, **Tianna DuPont**, **Gwen Hoheisel**, **Wendy Jones**, **Bernardita Sallato**, recently hired ITT specialist **Jenny Bolivar Medina**, and WTFRC project manager **Tory Schmidt**.

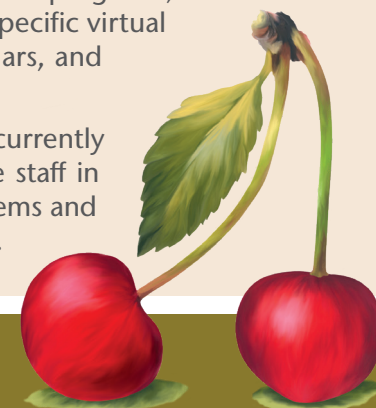
- Over the last year, use of Treefruit.wsu.edu grew by 23 percent. Additions and updates were made to sections on WA 38, Little Cherry Disease, soils and nutrition, post-harvest defects and disorders, and disease. Videos and Spanish language content were added.
- *Fruit Matters* monthly newsletter has increased to 2,061 subscribers. Articles have a strong readership, with 64,485 page views last year.
- **Cody Molnar**, Extension ITT coordinator, has helped grow awareness and improve management of Little Cherry Disease. He has expanded training and distributed information focused on helping growers and field staff identify, sample, and remove infected trees, as well as control disease vectors. The

new materials, available online and in print in English and Spanish, have reached thousands of stakeholders. A community advisory group was created to help direct and disseminate information.



Cody Molnar

- Apple defect and disorder posters are now available for purchase.
- Due to COVID-19 social distancing restrictions, team members have developed and delivered online educational programs, including topic-specific virtual field days, webinars, and web meetings.
- Searches are currently underway to hire staff in post-harvest systems and communications.



- Tree Fruit Endowed Chairs -



Physiology and Management

Stefano Musacchi is WSU's Endowed Chair for Tree Fruit Physiology and Management. Based in Wenatchee, he researches tree training, pruning, and management techniques for top fruit quality and high-performing orchards.

The Tree Fruit Endowment has enabled important work by Musacchi and his team, including:

- Improving pruning techniques to minimize blind wood in WA 38 trees.
- Determining the relationship between dry matter accumulation in WA 38 fruit and consumer acceptance. This study showcased the high level of consumer satisfaction for WA 38 fruit, while emphasizing that consumer acceptance can be reduced when dry matter increases over 18 percent or if the apples are too small, ultimately helping define quality parameters for this important new apple.
- Leading national NC140 apple rootstock trials to evaluate innovative genotypes from around the world. Two trials have been established with the new Geneva® rootstocks to test them under Washington conditions.
- Studying new potential apple pollinizer genotypes with improved resistance to quarantine-related diseases, such as bull's eye rot, speck rot, Sphaerospora rot, and fire blight.
- Studying controlled pollination through bee exclusion with a single row drape net for Washington organic production. This practice can be combined with the well-known effects of single row drape net for sunburn mitigation and codling moth exclusion, with the possibility to thin fruit with reduced or eliminated chemicals.

Postharvest Systems

Carolina Torres leads research that enhances the profitability and sustainability of Northwest pome and stone fruit growers and packers. She works out of the WSU Tree Fruit Research and Extension Center in Wenatchee.

Tree Fruit Endowment funds have helped Torres advance the following projects:

- Completed the Postharvest Systems laboratory setup and equipped the Center's Fruit Handling building with cold storage rooms and a state-of-the-art sorting line for apples and pears.
- Incorporated two postdoctoral researchers studying the metabolome—the complex web of chemicals that interact within living things—in apples and pears, and began hyper-spectral imaging to sort and study fruit after harvest. Both research areas help optimize the tree fruit industry's cold chain.
- Started a cherry postharvest research program by conducting preliminary studies on stemless cherries, as well as a post-harvest assessment of cherry seedlings from the WSU breeding program.
- Carried out preliminary research to extend green color in Bartlett pears, post-harvest.
- Supported WA 38 production by:
 - ✓ Performing and reporting packing cull analyses to provide technical information for improvement of the 2020 crop.
 - ✓ Developing recommendations for harvest criteria in commercial storage for the 2020 and 2021 crops.
 - ✓ Creating a WA 38 defect guide to help growers and packers identify common defects and disorders found in this new cultivar.



- Research Orchards and Facilities: Your Support in Action -

The Research Orchards and Facilities Endowment keeps WSU tree fruit research labs, orchards, and equipment modern and effective. Current projects include:

IAREC cold rooms, workspace

The Irrigated Agriculture Research and Extension Center is receiving upgraded cold rooms and a workspace serving programs in stone fruit breeding, horticulture, plant pathology, and Extension.

In the cold rooms, apple and cherry fruit and wood can be stored at low temperatures, enabling a diverse array of experiments, including **Bernardita Sallato's** evaluation of bitter pit and green spot in apples, and **Jennifer Bolivar Medina's** work on apple fruit quality under deficit irrigation.

Expected to be complete by the end of 2020, the upgrade adds increased space to handle breeding material, enhancing capacity for cherry breeding and fruit quality evaluation. A modernized workroom provides a space for evaluation and small group demonstrations.

Upgraded fruit handling, storage

Wenatchee is also receiving upgraded research space and infrastructure for cold storage and fruit handling.

Increased space, illumination, a new commercial double sink, and rolling workbenches create improved research workspace directly adjacent to the sorting line, and in close proximity to new walk-in coolers.



WSU Extension Specialist Bernardita Sallato handles fruit in IAREC cold storage.



New fruit sorting sensor

Funded by the endowment, the WSU Tree Fruit Research and Extension Center is bringing a new Aweta InVision sensor online this fall, completing a new fruit sorting line.

The sensor line sorts fruit based on parameters including firmness, soluble solids, and internal defects, such as watercore and internal browning.

This non-destructive, state-of-the-art technology will enable all scientists at the Center to more efficiently establish and evaluate harvest and post-harvest experiments.

Physiological insights



A new portable gas exchange system at Prosser, expected to be available by the end of 2020, will allow WSU scientists to expand fundamental research in plant physiology.

Used in lab and field research, this device provides insight into the physiological status of trees.

Professor **Matt Whiting's** research team will oversee the system, which will be available to all tree fruit team members at IAREC and to faculty at Wenatchee.



Faster media prep

Food safety programs serving the tree fruit industry will benefit from the addition of an automated media preparation unit at Prosser.

This device autoclaves, cools, and automatically pours growth media into Petri dishes. It has the potential to save considerable staff time in preparing microbiological media, solving a primary bottleneck in **Faith Critzer's** Food Safety Lab.

"We use thousands of Petri dishes for our food safety research over the course of a week," Critzer said. "This equipment automates this process, allowing us to focus on research instead of preparation."

Critzer's group is conducting several projects validating current packinghouse practices, which operations can use to demonstrate management of food safety risks.



Supporting the industry amid an historic challenge

WSU Extension team members are providing training and resources to Washington's tree fruit industry as the COVID-19 pandemic continues to impact Washington state.

"We're working to help our stakeholders deal with COVID-19," said **Faith Critzer**, a WSU Extension produce safety specialist whose Endowment-supported program serves the industry.



"Growers may not have enough time to digest policies that have been developed."

She hosts ongoing, online Q&As and videos to help professionals and employees learn about mitigation, sanitation, labor, and other issues, with the assistance of WSU colleagues and representatives from the Washington Department of Labor and Industries.

"Extension is here to help you gain knowledge that keeps your orchards and businesses safe and sustainable," Critzer says.

- New WSU Leadership -

Tree Fruit

Chad Kruger is the new director of the Tree Fruit Research & Extension Center (TFREC) at Wenatchee.

The former director of WSU's research centers at Mount Vernon and Puyallup, Kruger took over from interim director Kate Evans. This appointment will be a return to familiar territory for Kruger, who worked for 11 years at Wenatchee as part of WSU's Center for Sustaining Agriculture & Natural Resources.

"This position brings me full circle and I'm really looking forward to meeting the challenges and opportunities that await me," Kruger says.



Horticulture

Amit Dhingra was appointed the interim chair of the Department of Horticulture, June 1, 2020. Horticulture faculty perform research across Washington state on a wide variety of specialty crops, including apples, pears, and cherries.

Food Science

As interim director of the School of Food Science, **Girish Ganjyal** leads education, research, and outreach in healthier, more valuable foods and products. An Extension food processing specialist who works in support of the industries including Washington tree fruit, Ganjyal has led the School since January 2020.



- New Endowed Chairs -

CAHNRS is currently preparing to add four endowed faculty positions advancing tree fruit research. They are:

- Tree Fruit Entomology Endowed Chair**

This Endowed Chair will focus on insect behavior modifying tools for Integrated Pest Management in conventional and organic tree fruit production programs. The plan for this position was finalized by the Endowment Advisory Committee. The search will begin in 2021.

- Tree Fruit Pathology Endowed Chair**

This Endowed Chair will focus on effective management of diseases caused by bacteria and bacteria-like pathogens in tree fruit in Washington state and the Pacific Northwest. CAHNRS hopes to fill the position in early 2021.

- Tree Fruit Research Endowed Chair**

Funding for this Endowed Chair was completed this year. The EAC will meet to discuss the area of highest academic need identified by the industry to focus this position. The search may begin in 2023.



- Tree Fruit Soil and Rhizosphere Ecology Science Endowed Chair**

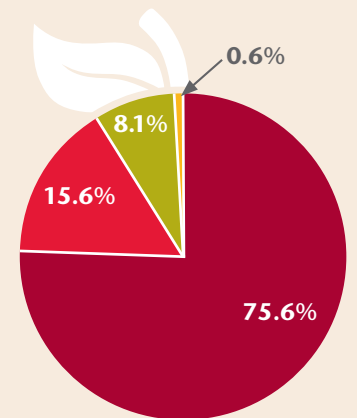
This Endowed Chair will address challenges to fruit production through improved understanding of soil processes and soil-plant interactions. The search is temporarily on hold.

How does the Tree Fruit Endowment work?

The Tree Fruit Endowment provides a dependable, perpetual source of funding. The endowment's principal is invested, and a portion of the growth on that investment, typically four percent, is paid out annually to fund strategic initiatives identified in collaboration with the Tree Fruit Endowment Advisory Committee.

Contributions by Commodity

Fruit	Total as of 6/30/2020
● Apple.....	\$24,211,426.22
● Cherry	\$5,000,000.00
● Pear	\$2,598,605.89
● Stone Fruit	\$189,967.89
TOTAL	\$32,000,000.00



Principal of Tree Fruit Endowments 6/30/2020

Pathology Chair	\$2,020,671.94
Physiology Chair	\$2,039,968.24
Info and Technology Transfer	\$12,068,682.96
Research Orchard and Facilities	\$8,010,302.63
Postharvest Systems Chair	\$2,059,810.83
Soil and Rhizosphere Ecology Chair	\$2,102,266.91
Entomology Chair	\$2,021,214.43
Research Chair	\$2,005,213.25
WTFRC Expendable Fund	Funded in 2021

Excess assessment funds to benefit Tree Fruit outreach and infrastructure

The special assessment created by growers to fund the Tree Fruit Endowment collected more than \$900,000 above the original \$32 million total.

The Washington Tree Fruit Research Commission plans to use the excess funds to benefit all contributing crops, and further improve the established endowment. Made in collaboration with the Commission, current plans call for the funds to establish start-up packages for Information and Technology Transfer positions, and to bolster infrastructure at Wenatchee and Prosser through joint proposals to be approved in 2021.

WSU thanks the Washington Tree Fruit Research Commission for its commitment to further the industry through the Tree Fruit Endowment.

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| ● Ines Hanrahan, Executive Director | ● Brent Milne |
| ● Jim Doornink, Chairman | ● Harold Schell |
| ● Luisa Castro | ● Sam Godwin |
| ● Jeff Cleveringa | ● Matt Miles |
| | ● Teah Smith |
| | ● Dena Perleberg Ybarra |

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