Marketing & Communications

In Q1 of 2019, CAHNRS Communications published 72 online articles that highlight accomplishments in academics, research, and Extension. CAHNRS and Extension websites received 1,088,580 total page views (an 11% increase over last quarter) and garnered 551,185 new site visitors (a 9% increase over last quarter). We increased our audience size and engagement on all social media platforms, and our web team continues to provide support and training to faculty and staff.

SOCIAL MEDIA UPDATE

<u>Facebook</u> 51 Posts 3,477 Likes 79,222 Reached 3,454 Fans (+1.03%)
Top Post: <u>Chris Pratt Country Living Expo</u>

Twitter 326 291,837 5,718 4,833
Tweets Impressions Engagements Followers (+1.0%)

OTHER NOTEWORTHY PROJECTS

- 2019 Reconnect Magazine
- CAHNRS Honors Event
- Voice of the Vine

TOP NEWS STORIES

- WSU tops USDA research and development list for second year in a row—By Karen Hunt, WSU Office of Research (with CAHNRS input) | Published March 8, 2019 in Capital Press, Northwest Wine News, Growing Produce, WSU INTO, Farm Progress, other outlets
- Northwest scientists defend lentils from root-rotting disease—By **Seth Truscott** | Published Feb. 19, 2019 in Farms.com, WA State Magazine Social Media, Newsi, social media
- Hollywood action star Chris Pratt captures WSU expo prize
 By Scott Weybright | Published Feb. 1, 2019 in CAHNRS News, WSU Insider, social media
- <u>Plant immune response blueprint found; disease resistance targeted</u>—By **Scott Weybright**| Published Jan. 10, 2019 in WSU Insider, EurekAlert!, Phys Org, YakTriNews, other outlets

Faculty Highlights

- Sindhuja Sankaran (BSE) gave an invited Tech Talk at the Google X office in Mountain View, CA on 14 March 2019, 'Phenomics data management in Washington State'. Google's Artificial Intelligence team is interested in exploring collaborations with WSU in the agricultural domain. Also discussed were potential sponsored research projects, student internship opportunities, and co-authored research publications
- **Drew Lyon** (CSS) received the 2019 Western Society of Weed Science Fellow Award Public Sector. He is also a finalist for the American Society of Agronomy President-Elect
- Ron Mittelhammer (SES) received the WSU V. Lane Rawlins President's Award for Distinguished Lifetime Service
- Scott Harper (PP, CPCNW) was interviewed for a story in Science Magazine, "Something is rapidly killing young apple trees in North American orchards. Scientists are stumped."
- Betsy Beers (Ent.) was interviewed for a story on NPR, "9th Circuit Court Could Make EPA Ban Toxic Pesticide."
- Manoj Karkee (BSE) was interviewed for a feature story by the Washington Post "Farmworker vs Robot."

- Jen McIntyre (SoE) was interviewed for a story on NPR, "Why salt became king in Seattle snow storms."
- **Faith Critzer** (SFS) was interviewed for a feature story by the Washington Post "Why you need to be wary of food poisoning at farmers markets."
- Scot Hulbert (PP) and Jill McCluskey (SES) were promoted to the rank of Regents Professor.
- Pete Jacoby (CSS) was named vice leader of the American Society of Agronomy's Sensor-based Water
 Management Community. He will moderate the Society's 2019 symposium in San Antonio (TX) and advance to the
 role of Community Leader in 2020.
- **Stefano Musacchi** (TFREC, Hort) gave an invited presentation at the 62nd International Fruit Tree Association Annual Conference in Rochester NY on Feb 25, 2019.
- **Jim McFerson** (Wenatchee TFREC, Hort) gave an invited presentation on "Science Solutions to Labor Challenges: Specialty Crop Industry's Perspective" in Arlington VA at the USDA Agricultural Outlook Forum on Feb 21 2019.
- Joan Davenport (CSS) was presented with the WERA 103 Leadership Award at the 13th Biannual Western Nutrient Management Conference.
- Allan Felsot (Ent.) received the Excellence in Teaching Award from the Pacific branch of the Entomological Society
 of America.

Grant Funding

CAHNRS Office of Research faculty received <u>\$5.5M</u> in extramural support in the form of new/ongoing grants, contracts, agreements and services rendered. A selection of awards (with award total) is given below:

New Grants Include:

- Rebecca McGee (CSS, USDA) was awarded a \$1.1M SCRI from USDA-SCRI for research to develop better lentils.
- **Jim Pru** (AS) was awarded a \$230K grant from the National Institutes of Health to study functions of non-erythroid hemoglobin at the maternal:fetal interface.
- Ian Burke (CSS) was awarded a \$247K grant from USDA-OREI to integrate biological, cultural, and mechanical/physical tools for long-term suppression of creeping perennial weeds in northern Great Plains and Pacific Northwest cropping systems.
- Kiwamu Tanaka and Cynthia Gleason (PP) were awarded a \$490K grant from USDA-AFRI Foundational program to
 research a biodegradable immunostimulant and its rhizosperic delivery system to control powdery scab disease of
 potatoes.
- **Cynthia Gleason** was awarded a \$450K grant from USDA-AFRI Foundational program to study molecular mechanisms of root-knot nematode parasitism on potatoes: potential targets to engineer durable resistance.

<u>Large Grants that Received Yearly Renewals Include:</u>

- Carol Miles (Hort.), Growing new roots: Grafting to enhance resiliency in U.S. vegetable industries, USDA-SCRI,
 \$244K
- Andrei Smertenko (IBC), CAREER: Asymmetry of microtubule dynamics in plant cytokinesis: the role of microtubule-nucleating protein MACET-1, NSF-MCB, \$215K
- Juming Tang (BSE), Center of Excellence for Food Safety Technologies Using Microwave Energy, USDA-AFRI, \$999,417
- Kulvinder Gill (CSS), Feed the Future Innovation Lab for Climate Resilient Wheat, USAID, \$100K

John Stark (WSC) and Jen McIntyre (SoE), Biological Effectiveness of Green Stormwater Infrastructure, DOI-US F/W, \$167K

Publications

CAHNRS faculty published **155** articles in peer-reviewed journals and conference proceeding: these are catalogued in our Weekly Published Research Archive (<u>available here</u>). A selection of these publications, which appeared in journals that rank in at least the 90th percentile in their respective fields, as determined by Thomson Reuters InCites, is provided below with their 5-year impact factor.

DISCOVERY

- Maren Friesen (PP/CSS), "Rapid establishment of a flowering cline in Medicago polymorpha after invasion of North America," <u>MOLECULAR ECOLOGY</u> – Impact Factor 6.9 – 94th percentile in Ecology
- Cameron Peace (Hort.) and Nnadozie Oraguzie (Hort.), "Prediction of genetic value for sweet cherry fruit maturity among environments using a 6K SNP array," <u>HORTICULTURE RESEARCH</u> Impact Factor 3.9 95th percentile in Horticulture
- Stephen Ficklin (Hort.), "Co-expression networks provide insights into molecular mechanisms of postharvest temperature modulation of apple fruit to reduce superficial scald," <u>POSTHARVEST BIOLOGY AND TECHNOLOGY</u> – Impact Factor 3.2 – 93rd percentile in Horticulture
- Deepti Singh (SoE), "Investigating the Causes of Increased Twentieth-Century Fall Precipitation over the Southeastern United States," <u>JOURNAL OF CLIMATE</u> – Impact Factor 5.6 – 92nd percentile in Meteorology & Atmospheric Sciences
- Maren Friesen (PP/CSS), "Dynamic genomic architecture of mutualistic cooperation in a wild population of Mesorhizobium," ISME JOURNAL – Impact Factor 11.7 – 98th percentile in Ecology
- **Sammy Perone** (HD), "Empirical Tests of a Brain-Based Model of Executive Function Development," <u>CHILD DEVELOPMENT</u> Impact Factor 5.5 92nd percentile in Educational Psychology
- Kevin Murphy (CSS), "Quinoa intake reduces plasma and liver cholesterol, lessens obesity-associated inflammation, and helps to prevent hepatic steatosis in obese db/db mouse," <u>FOOD CHEMISTRY</u> Impact Factor 4.9 95th percentile Food Science & Technology
- **Girish Ganjyal** (SFS), "Metabolic fingerprinting unveils quinoa oil as a source of bioactive phytochemicals," <u>FOOD</u> <u>CHEMISTRY</u> Impact Factor 4.9 95th percentile Food Science & Technology
- **Sean Long** (SoE), "Geometry and magnitude of extension in the Basin and Range Province (39 degrees N), Utah, Nevada, and California, USA: Constraints from a province-scale cross section," <u>GEOLOGICAL SOCIETY OF AMERICA BULLETIN</u> Impact Factor 4.5 90th percentile in Multidisciplinary Geosciences
- **John Peters** (IBC), "Protein Scaffold Activates Catalytic CO2 Hydrogenation by a Rhodium Bis(diphosphine) Complex," <u>ACS CATALYSIS</u> Impact Factor 11.8 92nd percentile in Physical Chemistry
- Sarah Roley (SoE), "Isotopic evidence for episodic nitrogen fixation in switchgrass (Panicum virgatum L.)," <u>SOIL BIOLOGY & BIOCHEMISTRY</u>— Impact Factor 5.4 96th percentile in Soil Science
- Cameron Peace (Hort.), "Elucidating the genetic background of the early-flowering transgenic genetic stock T1190 with a high-density SNP array," MOLECULAR BREEDING Impact Factor 2.3 90th percentile in Horticulture
- Mark Lange (IBC), "Assessment of flux through oleoresin biosynthesis in epithelial cells of loblolly pine resin ducts," <u>JOURNAL OF EXPERIMENTAL BOTANY</u> Impact Factor 6.0 94th percentile in Plant Sciences
- Dennis Johnson (PP), "From pathogen to endophyte: an endophytic population of Verticillium dahliae evolved from a sympatric pathogenic population," <u>NEW PHYTOLOGIST</u> – Impact Factor 7.8 – 97th percentile in Plant Sciences

- Claudio Stöckle (BSE), "A SIMPLE crop model," <u>EUROPEAN JOURNAL OF AGRONOMY</u> Impact Factor 3.8 98th
 percentile in Agronomy
- Jeff Vervoort (SoE), "Generation of I-type granitic rocks by melting of heterogeneous lower crust," <u>GEOLOGY</u> Impact Factor 5.5 – 99th percentile in Geology
- Thomas Okita (IBC), "Targeted Endoplasmic Reticulum Localization of Storage Protein mRNAs Requires the RNA-Binding Protein RBP-L," <u>PLANT PHYSIOLOGY</u> – Impact Factor 6.6 – 95th percentile in Plant Sciences
- Kiwamu Tanaka (PP) and David Gang (IBC), "Extracellular ATP Shapes a Defense-Related Transcriptome Both
 Independently and along with Other Defense Signaling Pathways," <u>PLANT PHYSIOLOGY</u> Impact Factor 6.6 95th
 percentile in Plant Sciences
- John Browse (IBC), "Tri-Hydroxy-Triacylglycerol Is Efficiently Produced by Position-Specific Castor Acyltransferases," PLANT PHYSIOLOGY – Impact Factor 6.6 – 95th percentile in Plant Sciences
- Jeff Vervoort (SoE), "Deciphering the zircon Hf isotope systematics of Eoarchean gneisses from Greenland: Implications for ancient crust-mantle differentiation and Pb isotope controversies," <u>GEOCHIMICA ET</u> COSMOCHIMICA ACTA – Impact Factor 5.1 – 95th percentile in Geochemistry & Geophysics
- John Reganold (CSS), "Diversifying conservation agriculture and conventional tillage cropping systems to improve the wellbeing of smallholder farmers in Malawi," <u>AGRICULTURAL SYSTEMS</u> – Impact Factor 3.8 – 96th percentile in Multidisciplinary Agriculture
- Matthew Carroll (SoE), "Local Community Agency and Vulnerability Influences on a Montana Wildfire," <u>JOURNAL OF FORESTRY</u> Impact Factor 2.7 92nd percentile in Forestry
- Cameron Peace (Hort.), "Validation of SNP markers for fruit quality and disease resistance loci in apple (Malus x domestica Borkh.) using the OpenArray (R) platform," <u>HORTICULTURE RESEARCH</u> Impact Factor 3.9 96th percentile in Horticulture
- Sachin Rustgi (CSS), "Substrate channeling in oxylipin biosynthesis through a protein complex in the plastid envelope of Arabidopsis thaliana," <u>JOURNAL OF EXPERIMENTAL BOTANY</u> Impact Factor 5.5 94th percentile in Plant Sciences

TRANSLATIONAL

- Bin Yang (BSE), "Genomics and biochemistry investigation on the metabolic pathway of milled wood and alkali lignin-derived aromatic metabolites of Comamonas serinivorans SP-35," <u>BIOTECHNOLOGY FOR BIOFUELS</u> – Impact Factor 6.7 – 91st percentile in Biotechnology & Applied Microbiology
- Kirti Rajagopalan (CSANR), Michael Brady (SES), Claudio Stöckle (BSE), "When Should Irrigators Invest in More Water-Efficient Technologies as an Adaptation to Climate Change?" – WATER RESOURCES RESEARCH – Impact Factor 4.7 – 98th percentile in Limnology
- **Mei-Jun Zhu** (SFS) and **Juming Tang** (BSE), "Dry inoculation methods for nonfat milk powder," <u>JOURNAL OF DAIRY SCIENCE</u> Impact Factor 3.1 94th percentile in Dairy & Animal Science
- Girish Ganjyal (SFS), "Disruption of lignocellulosic biomass along the length of the screws with different screw elements in a twin-screw extruder," <u>BIORESOURCE TECHNOLOGY</u> – Impact Factor 5.9 – 96th percentile in Agricultural Engineering
- Jeff Vervoort (SoE), "Deep-crustal metasedimentary rocks support Late Cretaceous "Mojave-BC" translation," <u>GEOLOGY</u> – Impact Factor 5.5 – 99th percentile in Geology

- Juming Tang (BSE), Shyam Sablani (BSE), and Mei-Jun Zhu (BSE), "High temperature water activity as a key factor influencing survival of Salmonella Enteritidis PT30 in thermal processing," <u>FOOD CONTROL</u> Impact Factor 3.9 91st percentile in Food Science & Technology
- **Bin Yang** (BSE), "Depolymerization of corn stover lignin with bulk molybdenum carbide catalysts," <u>FUEL</u> Impact Factor 5.0 91st percentile in Chemical Engineering
- Cameron Peace (Hort.) and Kate Evans (Hort.), "A DNA test for routinely predicting mildew resistance in descendants of crabapple 'White Angel'," <u>MOLECULAR BREEDING</u> – Impact Factor 2.4 – 91st percentile in Horticulture
- Shaojin Wang (BSE), "Transient cooling and operational performance of the cryogenic part in reverse Brayton air refrigerator," <u>ENERGY</u> – Impact Factor 5.6 – 94th percentile in Thermodynamics

REVIEWS/BOOKS

- Bin Yang (BSE), "Identifying and creating pathways to improve biological lignin valorization," <u>RENEWABLE & SUSTAINABLE ENERGY REVIEWS</u> Impact Factor 10.1 98th percentile in Green and Sustainable Science & Technology
- **Helmut Kirchhoff** (IBC), "Evaluation of Lipids for the Study of Photosynthetic Membranes," <u>PHOTOSYNTHESIS:</u> <u>METHODS AND PROTOCOLS</u>, Book Series: Methods in Molecular Biology
- **John Peters** (IBC), "A new era for electron bifurcation," <u>CURRENT OPINION IN CHEMICAL BIOLOGY</u> Impact Factor 7.2 92nd percentile in Biophysics
- John Peters (IBC), "Control of electron transfer in nitrogenase," <u>CURRENT OPINION IN CHEMICAL BIOLOGY</u> Impact Factor 7.2 – 92nd percentile in Biophysics
- Shaojin Wang (BSE), "Microwave processing: Effects and impacts on food components," <u>CRITICAL REVIEWS IN FOOD SCIENCE AND NUTRITION</u> Impact Factor 6.8 97th percentile in Food Science & Technology
- Stephanie Hampton (SoE), "Long-term perspectives in aquatic research," <u>LIMNOLOGY & OCEANOGRAPHY</u> Impact Factor 4.0 – 95th percentile in Oceanography
- Helmut Kirchhoff (IBC), "The structural and functional domains of plant thylakoid membranes," <u>PLANT JOURNAL</u> Impact Factor 6.1 – 95th percentile in Plant Sciences
- Mark Lange (IBC), "Enzymology of monoterpene functionalization in glandular trichomes," <u>JOURNAL OF</u> EXPERIMENTAL BOTANY Impact Factor 6.0 94th percentile in Plant Sciences
- Deepti Singh (SoE), "Indian summer monsoon: Extreme events, historical changes, and role of anthropogenic forcings," <u>WILEY INTERDISCIPLINARY REVIEWS-CLIMATE CHANGE</u> – Impact Factor 5.4 – 95th percentile in Meteorology & Atmospheric Sciences
- **Lorrie Carris** (PP), "One stop shop II: taxonomic update with molecular phylogeny for important phytopathogenic genera: 26-50 (2019)," FUNGAL DIVERSITY Impact Factor 9.4 98th percentile in Mycology
- Mei-Jun Zhu (SFS), "Anthocyanins/anthocyanidins and colorectal cancer: What is behind the scenes?" <u>CRITICAL</u> <u>REVIEWS IN FOOD SCIENCE AND NUTRITION</u> – Impact Factor 6.8 – 97th percentile in Food Science & Technology

Research & Extension Events

 Faculty at IAREC hosted the 1st annual meeting for FRAME (Fungicide Resistance Assessment Mitigation and Extension), a project funded through the USDA Specialty Crop Research Initiative. Twenty-five project personnel attended the event as well as 65 growers and consultants participating in the Extension workshop. FRAME is a multi-state research and Extension effort led by Michelle Moyer (VE, ANR).

WSU Extension Highlights

FACULTY HIGHLIGHTS

- Margaret Viebrock (YFP) was awarded the national 2019 Distinguished Service Award from the American Association of Family and Consumer Science.
- Sara Serra (Wenatchee TFREC, Hort.) delivered two invited presentations on "d'Anjou pear sorting by predicted dry
 matter and its effect on consumer preference" at the 73rd Lake Chelan Horticulture Day, Jan 21, 2019, and the 2019
 Oregon State University Extension Winter Horticulture Meeting, February 13, 2019.
- **Linda Chalker-Scott** (Puyallup REC, Hort.) co-authored and published the 3rd edition of Gardening with Native Plants of the Pacific Northwest.
- Dale Moore (ANR) received the 2019 Sahlin Faculty Excellence Award in Outreach and Engagement.

PUBLICATIONS

- Alison White (YFP) and Lauren Scanga (YFP), "Volunteer Research and Knowledge Competency Codebook: A Too for Identifying Volunteer Needs," JOURNAL OF EXTENSION, FEB 2019
- Lee Kalcsits, Stefano Musacchi, Sara Serra (Wenatchee TFREC, Hort.), "Use of protective netting in Washington state apple production," <u>WSU EXTENSION BULLETIN</u>, TB60E 2019

GRANT FUNDING — CAHNRS Extension faculty received **\$5.2M** in extramural support in the form of new/ongoing grants, contracts, agreements and services rendered. A selection of awards (with award total) is given below:

New Grants Include:

- Jordan Jobe, Doug Collins, Anand Jayakaran (WA Stormwater Cent.), Floodplains for the Future Puyallup, White
 & Carbon River, WA Ecology, \$565K
- **Anand Jayakaran** and **John Stark** (WA Stormwater Cent.), The effectiveness of trees in mitigating stormwater runoff in Western Washington, WA Natural Resources, \$117K

Large Grants that Received Yearly Renewals Include:

- Carol Black (Ent.), Pesticide Regulatory Education Program, EPA, \$218K
- Michael Lubliner (Energy Program), Washington State Energy Code, NEAA, \$256K
- Laura Hill, Brittany Cooper, Louise Parker (HD), "Evaluation for the Communities Prevention and Wellness Initiative," HHS-SAMHSA, \$400K
- Christopher Blodgett (Child and Family Res.), CLEAR Trauma-Informed Schools Network, HHS-SAMSA, \$587K

Extension Events, Community Outreach

Ferry County and Colville Confederated Tribes Broadband Action Team (BAT) —It was announced by WA Dept of Commerce and Community Economic Revitalization Board (CERB) that Ferry County would be awarded a \$50,000 grant for the Broadband Action Team Planning Study. This Planning program project consists of a feasibility study to identify the broadband infrastructure inefficiencies in Ferry County, in collaboration with the Colville Confederated Tribes. This planning grant was championed by Extension faculty and has created synergy with the tribe and the county for collaboration beyond broadband, and these collaborations have expanded to include other departments.

Microsoft and 4-H Tech Change Makers - Microsoft and the National 4-H Council have developed an exciting national technology-focused program, 'Microsoft and 4-H Tech Changemakers', which will empower youth to help close the broadband internet gap. This partnership elevates teens as teachers to provide training and communication to assist

adults in their community with increasing their comfort level in utilizing new technology. A delegation of 4-H youth serving as Digital Ambassadors flew to Chicago for regional training, planning, and preparation to launch the program in their communities. WSU Ferry County Extension has one of the youngest youth participating in this national program. The Changemakers program will establish partnerships with schools, community and senior centers, and tribes in the area. In addition to economic development and urban advancements, the program could have a positive impact on rural Ferry County (WA), where 4-H youth could help improve technology adoption and other Extension programming that leads to more precision agriculture, improved emergency management, crop diversification, better forest management, irrigation efficiency, soil or water testing, and more. (Contact: **Trevor Lane**, Director of WSU Ferry County Extension)

The WSU Extension Food Sense team in Spokane County partnered with school nutrition service staff in Spokane Public Schools, Central Valley SD, West Valley SD, Mead SD and Cheney School District to give students the opportunity to taste locally grown foods in their school cafeteria. A recent school cafeteria tasting conducted by Food \$ense staff in 14 area schools featured lentil chili. To promote the activity a morning intercom announcement was written for the school. After the tasting, a newsletter article with the recipe was sent to the school office so they could include it in their parent communication. (Contact: Lori van Anrooy, Director of WSU Food Sense/SNAP-ed Program Manager Spokane County)

Tianna DuPont (Wenatchee TFREC, ANR) delivered 12 presentations to tree fruit growers at nine stakeholder-organized meetings (Manson, Omak, Royal City, Wenatchee, Yakima) from Jan 29 through Mar 14. Attendees received the latest information and shared their experiences on management strategies for little cherry disease, fire blight, and insect pest natural enemies.

Student News

- Multiple VE graduate students were recognized by the Washington Winegrowers Association for their excellence in research at the 2019 Convention & Tradeshow, including:
 - Katherine East 1st place graduate student poster; Margaret McCoy 2nd place graduate student poster; Arunabha Mitra 3rd place graduate poster award; Arunabha Mitra 1st place graduate student poster award (Oral Presentation)
- **Haitham Bahlol** and **Rajeev Sinha** (BSE graduate students) recieved the 'Best Graduate Poster Award' for their work on "Horticultural oil thermotherapy for pear psyllid management" at the 2019 BioAg Symposium.
- For the third consecutive year, students from Tom Collins' winery equipment and operations class traveled to the Napa Valley over Spring Break for a field trip. Fifteen students drove to Northern California where they received behind-the-scenes tours of wineries, vineyard operations, equipment manufacturers and suppliers. Over five days, students saw oak barrels being toasted, steel tanks being fabricated, the inner workings of winery pumps, glass bottles being molded and more.

Facilities, Infrastructure & Programmatic

- The WSU Wenatchee Research & Extension Center was recommended to receive a \$200K allocation by the Tree
 Fruit Endowment Advisory Committee. The investment will directly benefit fruit storage and handling
 infrastructure at the Center by remodeling an existing building and installing modern refrigeration and fruit
 handling equipment.
- The V&E Advisory Board had their biannual meeting November 9th at WSU Tri-Cities. During the meeting board members unanimously voted to initiate the process of elevating the V&E Program to a department. In January, Dean Wright communicated this intent to V&E faculty. Since January, two faculty meetings have been held to facilitate this transition. The first meeting was a listening session with the Dean and the second meeting outlined two committees that would be formed to help lead the transition. Faculty members from the V&E Curriculum Committee and the V&E Department Planning Committee will meet regularly with the Dean as they work toward their ultimate goal of forming the WSU Department of Viticulture & Enology.