# WSU Mount Vernon Newsletter

Northwestern Washington Research and Extension Center March 2016

## March 5

**WWFRF Winter Field Day**
**9am-3:30pm**
This year's theme is Cherries
nwfruit.org/winter-field-day

## July 7 Field Day

**WSU Mount Vernon**
**3:30pm** Field Tour
**6pm** Barbecue

## Skagit County Master Gardeners' Know & Grow Workshops:

**March 15**
**Creating a Sustainable Landscape**

**April 12**
**Understanding Your Climate Zones**

**May 17**
**100 Tips for Being a Better Gardener**

**June 14**
**Attracting our Native Pollinators**

All workshops are held in the Sakuma Auditorium from 1-2:30pm.

# Message from the Director

My first six months in Mount Vernon have been a delight. The faculty, staff, and students extended a warm welcome in August and the agricultural community throughout Northwest Washington has provided valuable input regarding goals and desires for how WSU can continue to support a viable future for agriculture in the region. It has been helpful to me to see first-hand how complex and innovative the regional agricultural system really is and to interact with the community on a day to day basis. At the recent Skagit Ag Summit, WSU Interim President Dan Bernardo emphasized the importance of the University-private sector partnership and mentioned WSU Mount Vernon ["WSU's Crowned Jewel"] as a great example of that partnership.

WSU Mount Vernon hosted USDA Secretary Tom Vilsack and US Representative Suzan DelBene in October of 2015. For those of you who weren't able to able to attend, you can read about the visit and the forum on Representative DelBene's website: https://delbene.house.gov/media-center/in-the-news/us-agriculture-secretary-visits-mount-vernon. Very few WSU administrators have the pleasure of hosting the Secretary of Ag in the first few weeks on the job!


There are many opportunities and challenges facing WSU Mount Vernon. The research Center has grown substantially since the opening of the Agricultural Research & Technology Building nearly 10 years ago. We now have 10 faculty research and extension programs actively managed from Mount Vernon. The resident graduate student population has far exceeded original targets (and space) and has become central to the organizational research and extension model. Providing adequate laboratory and greenhouse space as well as modern equipment and distance education technology (to support the student classroom experience) are all significant challenges that were not imagined when the new facility was opened a decade ago. The adage "if you build it, they will come" is a perfect description for what has happened here in Mount Vernon. It is a testament to the vision in the community for what this research station could become.

The best part is that growth is not complete. Our strategic plans still prioritize a resident soil scientist. Last fall, faculty in the Department of Crop & Soil Sciences partnered with WSU Mount Vernon to request a soil science position resident in Mount Vernon and the Deans listed this position as a priority College hire for the next round! Many additional faculty expertise areas have been discussed for the long-term plan, including concerns for ensuring continuity of existing programs. Part of fulfilling the vision of continuity and expansion of research and extension programs has been proposed through the WSU Western Washington Ag Initiative / Everett Campus program that President Bernardo also mentioned in his keynote at the Summit. As of this writing, the outcome of deliberations in the State Legislature is unclear, but I think that the College has demonstrated with this request that it has clear intent to build and enhance agricultural research expertise and capacity working in Northwest Washington.

If you haven't had the opportunity to meet me yet, please give me a call, send me an email, drop by, or invite me for a visit. I think you'll find I'm quite approachable and like new challenges to work on. You can learn a little more about me from my bio here: http://mtvernon.wsu.edu/people/kruger.html.

# Graduate Student Feature

**Plant pathology student pairs passions for environmental conservation, agriculture**

A young scientist doesn't ordinarily get to combine two passions into one research project, but Abby Beissinger isn't your typical graduate student. The 27-year-old Chicago native, who will complete her WSU master's degree in plant pathology this fall, spent two years as an AmeriCorps volunteer teaching urban agriculture and gardening to inner-city kids in Massachusetts and a summer with the Student Conservation Association leading trail crews through a Chicago nature preserve.

*NWREC potato research plot, Mt Vernon, WA*
*Photo Credit: Babette Gundersen*

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It wasn't until her senior year as an undergraduate at the University of Wisconsin-Madison that Beissinger discovered her passion for plant science. "I fell in love with the subject of plant pathology my senior year as an undergraduate at the University of Wisconsin-Madison," she said. "I randomly signed up for a plant pathology class as an elective, and I was floored by how cool it was. The instructor took an anthropological approach to teaching about the Irish potato famine and its fungal origin and social impacts. That was the first example I had of how plant disease affects the human food chain and livelihoods."

With a B.S. in anthropology and a new fascination for plant pathology, Beissinger headed west to WSU in 2014 to continue her education in agricultural science. After two semesters in Pullman, she connected with plant pathologist Debbie Inglis, joining Inglis' vegetable pathology team at WSU Mount Vernon. "Dr. Inglis is considered a potato to disease expert, and I specifically sought out a partnership with her because of my interest in potatoes," Beissinger said. "Fortunately for me, Dr. Inglis had already received funding through a Washington State Department of Agriculture Specialty Crop Block Grant for a research project titled, "Protecting Specialty Potatoes from *Potato virus Y*." That project is now the focal point behind Beissinger's master's thesis.

*Potato virus Y* or PVY has become a "serious worldwide problem" due to its adaptability and devastating impacts on crop yield and tuber marketability," Beissinger said. In addition, strict sanitation practices are required to produce virus-free seed. PVY is a single-season virus spread by aphids and not easily controlled in the field through traditional insecticide applications. "Pesticides don't work very well on PVY because it's spread by non-colonizing aphids looking for a quick meal," Beissinger said.

Her main goal is to help growers learn to identify the virus' common symptoms -- leaf mosaic (light and dark green 'islands' on leaf tops), veinal necrosis (blackening leaf veins), rugose (leaf surface wrinkling) and leaf drop (leaf branch droop from the plant stem).

"PVY can spread in a field in a matter of seconds, so that makes it essential for farmers to be able to recognize the foliar symptoms visible above ground, so they can remove any infected plants from their fields."

She is also studying alternative hosts, such as weeds, to see whether other plant species in this area harbor the virus and might be used to help control the spread of PVY-infected aphids via field inoculums or trap crops.

In what she described as the "aha" moment of her project, Beissinger interviewed approximately 15 growers to learn how the virus has impacted them. "During the next phase of my thesis work, I will be analyzing the data and identifying some management strategies that might be helpful to growers and give them some tangible benefits, such as a reduced presence of PVY in this region," she said.

"It's cool to be able to bring together my backgrounds in sociology and plant pathology and be able to have that kind of potential impact on the community as a graduate student, as opposed to just being stuck in a lab somewhere," Beissinger added. "The experience I've had here, working with scientists, growers, industry representatives, and other students has helped me understand how research is meant to be share with everyone."

# A ground-breaker in many fields

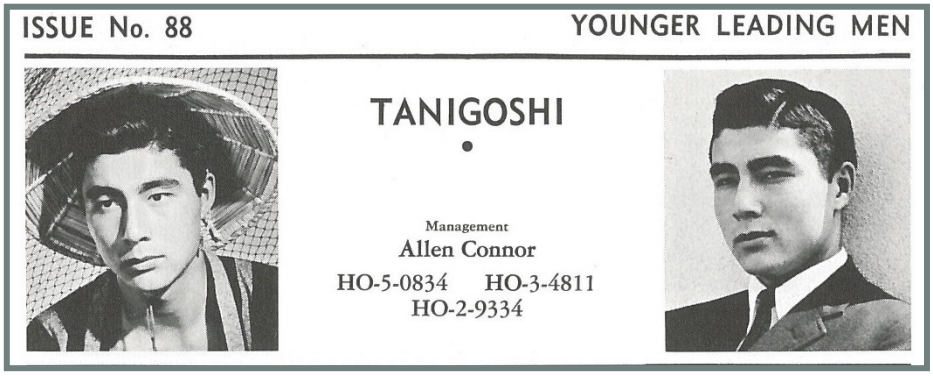
## WSU Mount Vernon's first entomologist leaves behind storied career legacy

If recently retired WSU Mount Vernon entomologist Lynell Tanigoshi were to write his memoirs based on his professional path over the past four decades, he might well choose the title, "A Series of Serendipitous Events."

Before the 75-year-old WSU professor emeritus gained recognition in the discipline of biological control of agricultural mites and insect pests with their natural enemies in citrus, avocado, apple and small fruit crops, his career options were wide open. His pre-entomological work resume ranged from family and truck farming to grocery services and television acting.

**Bit by the acting bug**

"I was a junior working my way though Long Beach State College (now known as Cal State University Long Beach), where lots of young folks in those days wanted to work as an extra in Hollywood and TV," Tanigoshi said. "I just happened to meet a fellow classmate who was earning $50 per appearance, and that really piqued my interest. That was a lot of pocket money back in those days." Tanigoshi was a match for the 'Asian' profile desired by many filmmakers and television producers at that time. "By serendipity, I got a call from an agent who was a friend of the family, and that's how I eventually ended up landing my first speaking role."




*Prior to becoming an entomologist, Tanigoshi caught the 'acting bug' during his undergraduate college years in southern California. (Image from the 1961 Academy Players Directory, Issue 88, Part Two)*

He played the character Foon Chang in "The Widow O'Rourke Story," a 1963 episode of the network television series "Wagon Train," which aired from 1957 to 1965. "It was just one episode, but that was my quick and dirty experience with fame," he chuckled. "Producers commonly advised me to go on and get my degree, because a career in acting was never guaranteed for minority actors, especially in the '60s and pre-Watts days!"

Acting was part of the experience Tanigoshi described as "magical," considering he was of mixed-race, Japanese-American descent and coming of age at a time when post-World War II social prejudice was still simmering across the United States.

"Because of the example my parents and grandparents set through their hard work and

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perseverance in pursuit of the 'American Dream,' I was able to live this life that seemed Japanese kids growing up in the 1950s and '60s shouldn't be living," he said. "I went to a nice high school in Huntington Beach, California, enjoyed idyllic beach times, lettered in three sports and was voted class president."

**Behind barbed wire**

Earlier times had not been so easy for the Tanigoshi family.

Born in the Russian neighborhood of Boyle Heights in East Los Angeles, Tanigoshi was not even two years old when his life was dramatically interrupted. Just five months after the December 7, 1941, Japanese attack on Pearl Harbor, then-president Franklin D. Roosevelt signed Executive Order 9066, ordering 120,00 people of Japanese descent living in the United States into forced internment.

The Tanigoshis were given less than two weeks to fill one suitcase each of select possessions and abandon their home before being shipped by train with shades dawn into forced relocation for the remaining three-year duration of the war. They soon found themselves crammed with up to 18,000 other Japanese Americans into wood and tar-paper housing at the Poston internment camp southwest of Parker, Arizona, in the middle of the Sonoran desert. "We were told that the incarceration was for our safety," Tanigoshi said, "but the machine guns in the watch towers were pointing in at us."

Although conditions were harsh, Tanigoshi harbors no resentment of his boyhood behind barbed wire. After 14 months, he and his father, mother and sister were allowed to move eastward to Denver, Colorado, where his dad worked in the produce department of a large grocery store. "Life was easier living in our own rented home, compared with the communal barrack life and lack of privacy in Poston," he said. "We remained in Denver until the end of the Pacific war in early September 1945."

*Pre-kindergartener Lynell Tanigoshi stands by his farmstead home, circa 1945. (Photo courtesy of Lynell Tanigoshi)*

Fortunately for Tanigoshi's parents, who like other Japanese-Americans were prevented by law from owning land during the internment period, the surrogate who held title to his grandfather's farm honorably returned it to the family.

"That was very serendipitous for us," Tanigoshi said. "Three generations of our family was able to move back to grandfather Shiba's 10-acre truck farm, located on rich alluvial soil with an abundance of Artesian well water in Westminster, CA." That's where he was first introduced to agricultural science and later opportunities not previously available to his parents and their Nisei generation.

"I experienced the freedom of safely living and exploring on our own farm property with our dogs, cats, chickens, rabbits and racing pigeons, while spending memorable long, summer days working with my mother and grandmother in the strawberry field to make ends meet," Tanigoshi said. "Things were loosening up in the 1950s; there was this sense that there was a positive change happening in those post-war years that stirred my curiosity and imagination about life sciences."

**A turn toward science**

By his sophomore year in high school, he said, Cold-War politics and propaganda had resulted in major curriculum shifts toward mathematics and biological, physical and technological sciences -- including higher-education programs supporting the southern California aircraft and weapons industry. "I vividly remember watching Sputnik I race across the sky in early October 1957 and being scared that it was marked with a big 'USSR' and not 'USA'," Tanigoshi said. "That sparked a real turning point in my life."

Despite the Space Age shift in American life, Tanigoshi's mother wanted him to be a dentist. "She wanted me to be able to get off the farm and potentially earn a good salary," he said. "That is still the dream of minority mothers today for their children."

With "hands too calloused for the dexterity required to fill cavities with silver," he said, he instead went on to earn his master's in biology at Long Beach State College and a Ph.D. in entomology and plant pathology at the University of California Riverside. "My hands became expert at pinning insects and making countless numbers of glass slides of chigger mites for Dr. Dick Loomis at LBSC," said Tanigoshi. "I still owe a debt of gratitude to him as my most memorable mentor."

Tanigoshi said he also appreciates the perks afforded throughout his career as an entomologist. "One of the highlights of my WSU career has been all the experiences I've had while traveling around the world," he said. A 1990 Fulbright Scholarship award sent him for a year to the University of Amsterdam and the Republic of Benin, where he consulted with internationally acclaimed scientists on the biological control of spider mites in Africa's staple food crop, cassava.

In the Dead Sea region of Jordan, Turkey, Syria and Morocco, Tanigoshi worked at regional research centers to determine the origin of the exotic Russian wheat aphid and its native natural enemies. His research on the cherry bark tortrix along the U.S. west coast led to explorations for its natural enemies in central Europe.

But it's his continuing WSU work closer to home on small fruit pests, such as the spotted wing drosophila, root weevils, aphids, leafrollers, and spider mites -- and as a mentor of the WSU Mount Vernon entomology program and on behalf of the Pacific Northwest growers -- that he finds most rewarding, now that it's time for this former high-school track star to "pass the baton," he said.

"I'm proud of the creativity of entomologist Bev Gerdeman and the technical expertise of research technologist Hollis Spitler and all they've contributed to the progressive-thinking entomology program here at the WSU Mount Vernon Research Center," Tanigoshi said. "As professor emeritus I'll be around for awhile to help ease them through the transition following my retirement, and I'll still be privileged to 'bug' fellow faculty, staff and students on my own time now. I thank everyone here for their friendship and the best of times."

*WSU Mount Vernon entomology team in its continuing battle against the invasive spotted wing drosophila: (from left) Tanigoshi, Bev Gerdeman and Hollis Spitler. (Photo by Kim Binczewski)*

# Program Updates

## Here's a glimpse of some current research projects:

**Bread Lab and Plant Breeding**

The Bread Lab and Plant Breeding Program at NWREC started from scratch about six years ago. This is the first WSU program to breed grains specifically for western Washington farmers and industry. Prior to the work of the breeding program farmers had little help in choosing the best varieties for their farming systems. In six years the lab has graduated 5 PhD students and has seen wheat it has developed planted not only in local fields but also in the White House garden and at the Governor's Mansion. The lab has formed partnerships nationwide and regionally with groups that strive to bring better food to more people. The three current PhD students in the Lab are some of the best in the nation and their voices through their writings and talks are already having a national impact. Bread Lab wheat and barley will be planted in inner city Philadelphia this spring in collaboration with the President's office of Drexel University as part of a program designed to offer the community novel ways to strengthen the knowledge, voices, and control in their food systems.

The philosophy of the Bread Lab is that it all starts with the farmer. Members of the lab are concerned with every step of the food system from the seed grown to the end use and how to make each one more profitable, affordable, nutritious, accessible, and meaningful. Getting the best variety to our local farmers is the first step in that mission.

**Small Fruit Pathology**

The Small Fruit Pathology program, led by Dr. Tobin Peever, performs research on the biology and epidemiology of Botrytis affecting small fruit crops and mummyberry affecting blueberry in the Pacific Northwest. We are entering our third year of sampling for a large study of fungicide resistance in Pacific Northwest berry crops and are trying to better understand how far this pathogen moves, how much it moves among different berry crops, and how fungicide resistance develops. Currently the buds of berry crops are transforming from their dormant stages, and so are the disease pathogens. Field trials are set up to monitor the development of blueberry mummyberry disease and a new information resource for growers has been developed. Updates on the status of spore release and risk of mummyberry disease development can be followed on the Small Fruit Pathology Website. Select the link Mummyberry Update. We hope that this new resource will be useful to blueberry growers in the region and help them manage this disease more effectively with fewer fungicide inputs.

**Small Fruit Horticulture**

Red Raspberry and Blueberry commission funding was received to support research led by Lisa DeVetter and PhD graduate students, Rachel Rudolph and Matt Arrington. Rachel will continue her research on alternative approaches for the management of soil borne diseases and pests in red raspberry that maintain soil health. Matt will continue his research on approaches to improve pollination and fruit set of Washington blueberry. WSU's Emerging Research Issues program provided continued funding for Curtis Faustich's MS research on cultivation of day-neutral strawberries with biodegradable mulches in western Washington.

Lisa DeVetter recently received the "Outstanding Young Professional Award" from the College of Agriculture and Life Sciences at Iowa State University.

**Dairy and Livestock**

Educational outreach season is in full swing with 14 presentations so far this year. Planning is underway for statewide meetings to disseminate results from the USDA APHIS National Animal Health Monitoring System's 2014-15 dairy study. An article about the pumpkin feeding and pumpkin silage trial results was included in the Feb. Whatcom Ag Monthly newsletter. The birdsfoot trefoil demonstration and variety test plots are being assessed for winter survival and monitored for emergence and growth; this forage has exciting potential for our area as a legume that tolerates wet soils, is non-bloating, produces excellent tonnage and may have natural anti-helminthic properties.

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## Program Updates

### Vegetable and Cider Horticulture

Graduate student Shuresh Ghimire (PhD 2019) is investigating the use of biodegradable mulch for pumpkin production, and developing methods to sample mulch once it has been tilled into the soil to determine if the mulch is biodegrading. Graduate students Sahar Dabirian (MS 2017) and Fairuz Buajaila (PhD 2018) are carrying out greenhouse studies to investigate methods to improve survival rate of grafting watermelon and tomato while reducing costs for grafted transplant production. Graduate student Whitney Garton (MS 2017) is carrying out three separate but related studies to control apple anthracnose, the single greatest factor limiting cider apple production in the maritime region of the Pacific Northwest. Graduate student Travis Alexander (PhD 2019) is investigating the impact of mechanical harvest and post-harvest storage of cider apples on juice and end-product quality.

### Vegetable Pathology

There have been several changes in the vegetable pathology program since the last newsletter. Debbie Inglis has resumed her position as full-time program leader. Lydia Tymon is a new post-doctoral research associate, and part of the Inglis' and Miles' teams researching both biodegradable crop mulches and vegetable grafting for Verticillium wilt control. Amy Salamone completed her M.S. thesis on temporary flooding rotations, and is now assisting Dr. Tymon in the lab. Abby Beissinger will finish her M.S. research this summer on Potato virus Y. Babette Gundersen continues to be a key player, capably assisting all efforts.

### Vegetable Seed Pathology

Lindsey du Toit's Vegetable Seed Pathology program welcomed Dr. Leonard Kiirika, Postdoctoral Research Associate, who will spend the next 2 years working on arbuscular mycorrhizal fungi in onion and carrot production in the Columbia Basin. The project is funded by the WSDA Specialty Crop Block Grant program. John Weber and Shannon Carmody are back at the WSU Mount Vernon NWREC after spending fall semester in Pullman, with both entering the second year of their MS degrees. Mike Derie, Barbara Holmes, and Sarah Meagher have been busy this winter running the 7th Annual Spinach Fusarium Wilt Soil Bioassay for spinach seed growers and seed companies, with 31 fields in northwestern Washington tested with the bioassay. The Spinach Fusarium Wilt Bioassay Open House took place on Feb. 18 and 19. Two new research publications from a former graduate student and a former postdoctorate in Lindsey's program include:

Alcala, A.C., Paulitz, T.C., Schroeder, K.L., Porter, L.D., Derie, M.L., and du Toit, L.J. 2016. *Pythium* species associated with damping-off of pea in certified organic fields in the Columbia Basin of central Washington. Plant Disease 100: *in press*.

Sharma-Poudyal, D., Paulitz, T.C., and du Toit, L.J. 2016. Timing of glyphosate applications to wheat cover crops to reduce onion stunting caused by *Rhizoctonia solani*. Plant Disease 100: *in press.*

### Weed Science

The weed science program has had a productive fall and winter! Tim Miller has presented noxious weed talks in Vancouver, British Columbia, Juneau, Alaska, and Corvallis, Oregon. He also was one of a team of three weed scientists presenting a 3-day national conference on Rights-Of-Way weed control in Aurora, Colorado in November. In October, Tim moderated the herbicide discussion at the federal IR-4 Program meeting in Chicago, which is charged with developing new herbicide registrations for ornamental crops such as nursery crops and ornamental bulbs. Tim also presented at the Weed Science Society of America annual meeting in San Juan, Puerto Rico in February. Tim and Scientific Assistant Carl Libbey attended the Washington State Weed Conference in Wenatchee last November, and will, with Fulbright Scholar Wiharti Purba, attend the Western Society of Weed Science annual meeting in Albuquerque this March. Tim has continued to give many invited presentations in Washington and Oregon this spring, discussing herbicide toxicology, herbicide mode of action, weed identification and control in berries, landscapes, and forest areas with a variety of audiences.

### CSANR: Climate-Energy-Water Systems

A "side-benefit" of having Chad Kruger come west to direct NWREC is that he intends to shift some of his programmatic focus more toward Northwest Washington agricultural issues. Chad has worked in NW Washington since his arrival at WSU in 2004, primarily focused on anaerobic digestion and nutrient recovery technology for dairies, but also for municipal organics recycling facilities. Shortly after arriving at NWREC, Chad Kruger, Chris Benedict (WSU Extension Whatcom County), and Meijun Zhu (WSU Food Science) received a $500k grant entitled *Dairy Manure-Derived Fertilizers for Use in Raspberry and Blueberry Cropping Systems: Evaluation for Agronomic, Soil Health, and Food Safety Efficacy*. Chad's team published four new Extension Fact Sheets in late 2015 related to anaerobic digestion that are available on our AD topics page: http://csanr.wsu.edu/anaerobic-digestion/.

Gardens are maintained by:

- Skagit County Master Gardeners
- Native Plant Society
- Western WA Fruit Research Foundation


The volunteer gardens are open to the public everyday from dusk to dawn.

WASHINGTON STATE UNIVERSITY
*World Class. Face to Face.*

## Where Are They Now? Spotlight on former students

**Vegetable Pathology:**

Amy Salamone, M.S. in Plant Pathology (2015) is a plant pathology research technician at WSU Mount Vernon NWREC, and also for Weyerhaeuser Co., in Olympia, WA.

Marianne Powell, M.S. in Plant Pathology (2012) is now a plant pathologist with Seed Health Services, CSP Labs Inc., Pleasant Grove, CA.

Jennifer Niem, M.S. in Plant Pathology (2011) is now a researcher at the International Rice Research Institute in the Philippines.

Jessica Gigot, M.S. in Plant Pathology (2004), PhD in Horticulture (2011), MFA in creative writing from Seattle Pacific University is now a member of the Science Faculty at the Northwest Indian College, Bellingham, WA, and a recently published poet.

Raina Spence, M.S. in Plant Pathology (2002) now works for Simplot Plant Sciences in Boise, ID.

Ann Dorrance, Post-doctoral Research Associate (1996-97) is a soybean pathologist and Professor of Plant Pathology at the Ohio State University.

Eric Tedford, Post-doctoral Research Associate (1994-95) is Technical Product Lead for Fungicides, Syngenta, Greensboro, NC.

**Bread Lab and Plant Breeding:**

Lucas Patzek, PhD, Program Director, Ag Innovations, California
Jeff Endelman, PhD, Assistant Professor, University of Wisconsin
Karen Hills, PhD, Instructor, Edmonds Community College
Brook Brouwer, PhD, Organic Seed Alliance
Caitlin Price- Younquist, PhD, Extension Specialist, University of Wyoming

**Vegetable and Cider Horticulture:**

Jesse Wimer, M.S. Horticulture (2015) working for Seattle-based biotech company called Plant Health Care, Inc. and for Nash's Produce at two farmer's markets in Seattle.

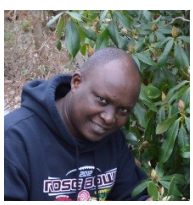
Jeremy Cowen, PhD (2015), Assistant Professor, WSU Extension Regional Horticulture Specialist, in Spokane. Works in specialty crop production; on horticultural education project at Airway Heights Corrections Center; and teaches HORT 320 in Pullman.

Kelly Ann Atterberry, M.S. in Horticulture (2015) owner of Bloom Apothecary bloom-apothecary.com; teaches classes at the clinic, in the community and at the Skagit Valley Food Co-op. Assists with a school curriculum with the American Pulse Association, launching early 2016, the International Year of Pulses.

## New people at WSU Mount Vernon:

Kevin Felt, a new temporary employee in Carol's Vegetable Horticulture program, is currently a student at Skagit Valley College. He will be completing a Biology transfer degree in Spring 2016, and will be transferring to the University of Washington in Fall 2016.

Ashley Heuchert, a new employee in the Small Fruit Horticulture Program, was born and raised in Wenatchee, Washington. Ashley transferred from Wenatchee Valley College, to Western Washington University in 2014 to pursue a degree in Cellular and Molecular Biology.



Leonard Kiirika, a new Postdoc in Dr. Lindsey du Toit's Vegetable Seed Pathology program. Leonard Kiirika was born in Meru District on the eastern slopes of Mt. Kenya. He joined Jomo Kenyatta University of Agriculture and Technology (JKUAT) Nairobi, Kenya to pursue a degree in Horticulture (2004).