

Plant Science Says



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Dilemma/Debate: Council of Educators in Landscape Architecture Conference 2016

By Rebekah VanWieren

In March, Jennifer Britton and I attended our academic conference for the field of Landscape Architecture, CELA (Council of Educators in Landscape Architecture). The conference was located in Salt Lake City and hosted by Utah State University and their Landscape Architecture and Environmental Planning Department.

This year's conference theme was *Dilemma/Debate*, exploring "research, scholarship, and creative activity that highlights the 21st century dilemmas facing our profession", and how constructive debate and discussion impacts future work and solutions. In addition to the conference theme track, CELA is organized into 11 thematic tracks, ranging from pedagogy, landscape planning and ecology, landscape performance, people-environment relationships, and urban design. My presentation was on the preliminary findings of a study looking at the evolution of landscape representation (i.e. drawings and graphic communication) in projects that have won students American Society of Landscape Architecture awards. We have coded over 400 images in this study that uses iconography research methods, and the findings shed light on audience preferences for how we communicate design ideas. The constructive discussion following my presentation, testament to the conference's theme, will serve me well with future related work!

A highlight from the conference was attending two panel sessions with some of my favorite researchers in the field. The first one, *Healthy Landscapes, Healthy Living*, was organized by Dr. William Sullivan, Professor of Landscape Architecture at University of Illinois, and included work looking at how landscapes and design impact human health and well-being. One fascinating study looked at whether or not restorative landscapes, (outdoor environments that have been found to improve people's attention and mental capacity after spending time in them), are still restorative if you are using a laptop while in the outdoor space. The answer is no (*of course with some limitations of generalizability*). The subjects that used a laptop for a break while outside performed worse on simple cognitive and attention tests than those that didn't take a break at all. The subjects that took a break in the restorative landscape and did "nothing", performed best on the post-tests.

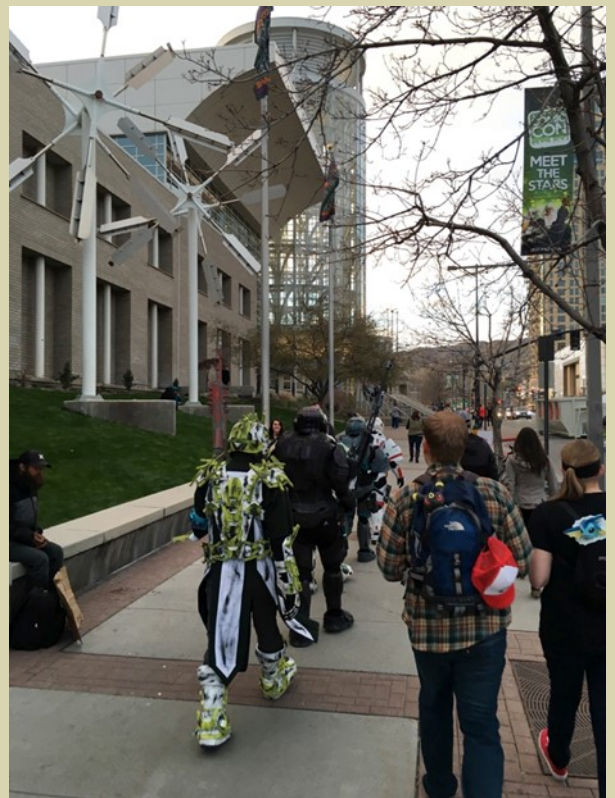
The second panel was related to strategies for the long-term data collection on how well designed landscapes perform in terms of ecology, economy, and cultural characteristics. This initiative is associated with Landscape Architecture Foundation's (LAF) case study investigations, where they have awarded grants to academic-private partnerships for pre- and post-design measurements of implemented projects. To date, these case studies have effectively quantified some of the ecological-related impacts (especially related to stormwater) of landscape architecture work. The panel discussed current efforts and challenges on collecting qualitative data to demonstrate cultural-related impacts, and on standardizing data collection for all LAF case



Experiencing the nearby City Creek indoor/outdoor mall provided great spaces to observe landscape design and construction detail...



...as well as provocative spaces to discuss "what is nature?" and connections between nature, people, and consumer culture.



Comic Con sightings walking to dinner.

studies to establish a robust database for comparative case study research that has potential for more impactful findings.

Finally, you know things are going to become a lot more interesting when you hear "Rilo Ken" announced to pick up his lunch order. A Comic Con conference was simultaneously held in the Salt Palace Convention Center across the street, which definitely made the urban landscape much more dynamic!

2016 International Wheat Stem Sawfly Conference

By Jim Berg

The International Wheat Stem Sawfly Conference was held at Colorado State University, in Fort Collins, March 15-16 in the Lory Student Center with nearly 50 growers and researchers from both the public and private sector. Attendees and presenters from Montana included Jim Berg, Hikmet Budak, Luther Talbert, Andrea Varella (all PSPP), Dayane Andrade dos Reis (LRES), Tatyana Rand (USDA-Sidney), and Lochiel Ward (grower- Big Sandy). David Weaver (LRES) was an on-line video presenter from Bozeman. There were also

presentations from Canada, Colorado, Kansas, Nebraska, and Wyoming.

The first day of presentations started with the history and current status of wheat stem sawfly (WSS) in Canada and the USA by Brian Beres, an agronomist from AgCanada in Lethbridge, Alberta.

State WSS updates were given by Colorado, Montana (Weaver), and Nebraska. WSS is prevalent in the Southwest Panhandle of Nebraska. Lower WSS infestation rates were found in Montana winter wheat varieties (Bearpaw, Judee, and Warhorse) that were grown in Nebraska, compared to locally adapted varieties. WSS has been confirmed in Colorado since 2010 and as of 2015, 69% of sites tested in eastern Colorado had WSS. Also, 6/8 sites tested in 2015 in Western Kansas had WSS.

The Tuesday afternoon session included a grower panel representing Colorado, Montana, (Lochiel Ward), and Wyoming. Continuous cropping (of wheat) has intensified the situation in Colorado and new management rotations were discussed (wheat – corn – millet- fallow, or wheat – corn – fallow) as better alternatives. Lochiel Ward stated that his area around Big Sandy was more suited to the standard wheat – fallow –wheat rotation and that he has gotten good quality wheat with swathing his crop before it lodges due to WSS. He prefers large fields (200 acres+) and leaving 12” stubble for retention of WSS parasites. Wyoming has found a 25-40% yield drag using Montana solid stemmed varieties (over adapted) and would like taller varieties for snow retention.

The afternoon concluded with a number of presentations regarding classical approaches (Tatyana), pheromone trapping (Weaver), and population modelling to predict and potentially control WSS.

Limagrain Seed Company hosted hors d’oeuvres and gingerbread ale made with a new malting barley variety at the Mayor of Old Town tap house near campus.

Wheat breeding and genetics were the order of the day for the Wednesday morning session. Jim Berg (Developing Solid-Stemmed Winter Wheat Cultivars for Montana), Andrea Varella (Effect of Solid Stem Alleles on WSS Host Selection and In-Stem Mortality), and Luther Talbert (New Avenues for Developing Sawfly Resistant Varieties) were the PSPP presentations. These talks were followed by Kansas State and Colorado State breeding updates.

MonDak Ag Days and Trade Show and Glendive Sugar Beet Growers Meeting By Jessica Rupp

This year’s MonDak (Montana/North Dakota) Ag Days were held at the Richland County Fairgrounds in Sidney, Montana March 3-4. Emceed by our own Richland County Agricultural Extension agent, Tim Fine, the event drew attendees from all over Montana and North Dakota. Jessica Rupp, Myron Bruce, Fabian Menalled from MSU and Brad Bauer, Gallatin County Natural Resources agent, representing the climate science team attended. On Thursday, the meeting began with a presentation on the use of UAV’s (unmanned aerial vehicle) in agriculture, highlighting their growing importance to growers. Unfortunately, weather did not permit a demonstration by Brandon Ewen, a Montana producer and UAV enthusiast. The meeting continued with presentations focusing on the use of cover crops. Fabian Menalled presented on herbicide resistant weeds and the stewardship of herbicides, while Tim Fine spoke on the discovery of glyphosate-resistant Marestalk. Following a fundraiser lunch hosted by Sidney’s FFA, the wife of one of our local sugar beet growers, Rhonda Steiger, discussed her active role in “Women of Biotech,” a group formed to present pro-GMO information across the region. The afternoon contained talks focusing on sugar beet health strategies by Jessica Rupp and Mohamed Khan, NDSU. An additional talk on weed control was given by

Tom Peters of NDSU. Thursday was rounded out with a social and banquet dinner featuring Ag comedian Damian Mason. Friday's Ag Days focused on elements of Livestock Production, but Myron, Jessica, Tom, and Mohamed headed on to Glendive, MT to a growers meeting. We were able to visit numerous county agents both on the way and on the return trip, as well. It was a great trip. We would like to say a special thank you to Sidney Sugars for their hospitality, and look forward to many more trips to Sidney!

The National Plant Diagnostic Network (NPDN) Meeting
By Eva Grimme

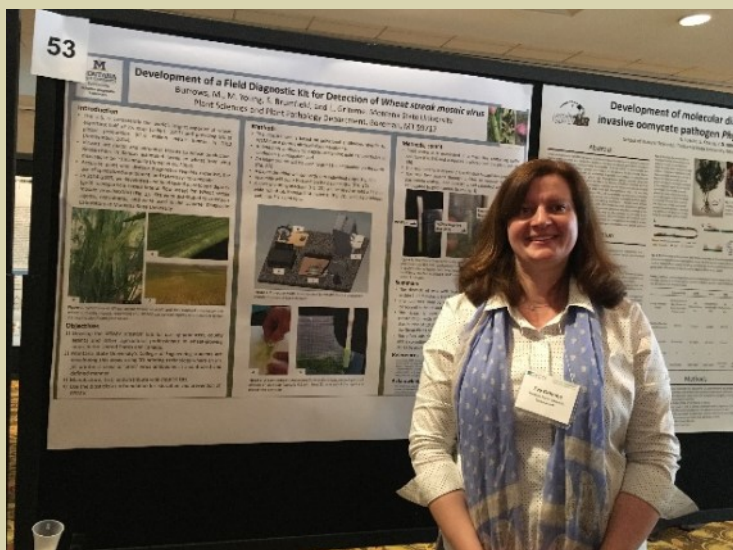
Drs. Mary Burrows, Laurie Kerzicnik, Bright Agindotan, and Eva Grimme attended the 4th national meeting of the National Plant Diagnostic Network (NPDN), in Washington, D.C. on March 8-12. The NPDN is a nationally distributed system of plant diagnostic laboratories at land grant universities, plant industries, and state departments of agriculture. Over 100 NPDN laboratories facilitate early detection of plant pests and diseases and provide support to regulatory and extension programs. The conference offered technical presentations, poster sessions, and workshops on plant health diagnostics and diagnostic infrastructure and organization. Our Schutter Diagnostic laboratory presented three posters (see photos for the first two).



Laurie Kerzicnik: "Spider Diagnostics: Reducing fears and myths."



Laurie Kerzicnik with the Arlington Air Force Memorial in the background



Mary Burrows, Mark Young, Susan Brumfield and Eva Grimme: "Development of a field diagnostic kit for detection of wheat streak mosaic virus."

The third poster was presented by Bright Agindotan and Mary Burrows: "Seedborne fungi isolated from pulse crop seeds in Montana."

With more than 200 participants, the conference provided great networking opportunities with fellow diagnosticians as well as federal agencies and professionals from the industry. Mary Burrows gave an oral presentation on "Diagnostics in the Information Age" and received an award for her outstanding support for the NPDN. Laurie supported the meeting by moderating an oral presentation session.

Besides the many interesting aspects of attending a professional meeting, sightseeing in DC was a must. We had the great opportunity to visit most of the memorials, including the Lincoln and Jefferson Memorial, war memorials (WW II, Korean, Vietnam), the Washington Monument, the Pentagon, the Arlington Air Force Memorial and glimpses of the White House and the Capital building.

Zambia and Why to Avoid Angry Giraffes by Jamin Smitchger

In celebration of the International Year of Pulses as declared by the United Nations Food and Agriculture Organization, I was one of ten graduate students the Crop Science Society of America and USAID sent to Zambia to increase international knowledge of grain legumes. The UN designation aims to heighten public awareness of the nutritional benefits of pulses as part of sustainable food production. The idea is to promote pulse-based proteins, further global production of pulses, better crop rotations, and address the challenges in the trade of pulses. Grain legumes are increasing in importance in Africa because they are a high quality source of protein, which is desperately lacking in the developing world.

The Pan African Grain Legume Conference, which was sponsored by organizations such as USAID, The Bill and Melinda Gates Foundation, CIAT, ICRISAT, and many other smaller NGO's, was the largest grain legume conference in Africa to date. The energy and enthusiasm of researchers from all over the globe could be clearly felt. I met many people who are the brains of the pro grain legume movement in Africa, and I really got a feel for the flavor of the African culture. While the conference was specific to Africa, I did learn a good bit about the dozens of grain legumes grown in Africa, and it is likely that we could grow a number of these legume crops in Montana. For example, researchers at Texas A&M have developed a black-eyed pea (cowpea) variety that matures in just 60 days. Some fast-maturing grain legume crops that are adapted to areas

south of the Sahara Desert can live with just seven inches of annual rainfall. It would be interesting to see what makes those crops so drought tolerant.

I was warned that traveling to Africa was dangerous, and I thought I understood the risks. After all, Africa contains the world's most dangerous insect, the anopheles mosquito, which kills nearly a million people each year, and I was vaccinated against various diseases that were endemic in Africa. Unfortunately, nobody warned me that GIRAFFES are dangerous and should be avoided at all costs. You can view my violent encounter here <https://www.youtube.com/watch?v=WQBc5gVExmU>, complete with me running for my life. Although I should have known better, I was confident in my knowledge that giraffes are vegetarian, which just goes to show you that book-larnin only goes so far. However, how many people on earth can say that they were ever attacked by a giraffe?!!!

I was also able to see the famous Victoria Falls, which is one of the seven natural wonders of the world, and I went on a three hour safari after the conference was finished. I saw water buffalo, giraffes, a hippo, impalas, waterbucks, warthogs, and rhinos. The rhinos are comfortable being around humans because they are guarded 24/7 by seven rangers with AK-47's in order to prevent poaching. I was able to get within 30 feet of the rhinos without alarming them, shockingly close.



Wide-mouthed Rhinos



Victoria Falls - One of the seven natural wonders of the world (note that the actual breadth of the falls is actually wider than this picture).



One of the nicer mud huts in Kalingula Village.

Africa is a special place, with its own unique set of challenges. Currently one out of every ten people in Zambia are living with HIV/AIDS; the average life expectancy is 53 years; malnutrition is rampant; and the average annual income is 1200 US dollars. Poverty is apparent anytime you venture into the city or countryside. There are many researchers in Africa who understand the problems Africa faces and they are determined to find solutions. It was heartening to see the passion of African researchers, many of whom were trained in the United States, and it is apparent that the solutions Africa needs rest securely in their hands. Here in the United States, we need to do our best to support these scientists. The future of Africa greatly depends on it.



Zebras grazing in the African Bush.



The Bank of Zimbabwe holds notoriety for being the bank that printed the quadrillion dollar note due to runaway inflation. The notes are completely worthless except for the lesson they provide in regard to monetary policy.

Montana Ag Live!

The first program this spring will be on Sunday, April 3, and the panel will consist of members from The Montana Wheat and Barley Committee, the Montana Grain Growers Association, and the Montana Stock Growers Association. Discussion will center around "How the activities of these organizations relate to Montana's economy and also to the public's perception of Montana's ag products."

April 10— Heather Rimel, Manager of the Montana Seed Growers Association will discuss "Montana's seed industry and the importance of utilizing quality seed in order to produce superior crops."

April 17 - Monica Ebert, director of Montana's Wool Lab, will inform viewers on "The function of Montana's Wool Lab and its importance to the sheep industry in Montana and the region."

April 24 - Shannon Arnold, Associate Professor in Ag Education will discuss "Educating the Future of Agriculture including such successful programs as using horses to teach life skills to youths and adults."

Course Focus

HORT 231—Woody Ornamentals

By Bill Hoch



Woody Ornamentals (HORT 231) is a pleasure for me to teach, as woody landscape plants have always been one of my primary interests and are at the center of most of my research. First and

foremost, this course must instill the fundamentals that are requisite to a competent professional in the green industry, specifically, knowing the identity, culture and uses of common woody plant species. However, I also use this course as a vehicle to teach concepts of plant ecology, physiology and pathology, and how these apply to plants growing in the landscape.

This course meets three times each week for two hours, organized into weekly cycles: a lecture to introduce new plants and address each plant's ornamental features, landscape uses, cultural requirements, diseases and insect problems; plant walks to review information and familiarize students with multiple specimens of each plant; and a test. Repetition is central to this course, as all information is randomly tested multiple times throughout the semester, building the information pool as the semester progresses. This course also provides three teaching assistants with valuable teaching experience and the opportunity to refresh and broaden their knowledge of woody plants.



Campus Landscape Manager Roger Evans works with a group of students during a tree pruning lab.



In mid-October we take a week to focus on tree pruning to provide students experience with the important concepts underlying the training and maintenance of long-lived woody plants. Finally, students' knowledge of landscape plants is rounded-out with an introduction to woody plants that are not hardy in Montana, which includes many of the most popular landscape plants in the U.S. While this course instills the fundamentals of identifying, using and maintaining woody landscape plants, I think my most important goal is to have every student leave this course appreciating woody plants as much as I do!

Grants

Jessica Rupp, Montana Department of Agriculture, "Potato improvement through Precision genome editing".

Mary Burrows, Montana Department of Agriculture, "Regional pulse crop diagnostic laboratory".

Norm Weeden, Montana Department of Agriculture, "Introgression of the genes in SS-41 into commercial germplasm".

Mark Young, "National Institute of Health, "Understanding the Healthy Gut Virome and its Role in Human Health".

Invited Talks

Strobel, G. University of Central Florida, "Microbial Jewels of the Jungle", March 21, 2016.

Publications

David L. Parrott, Li Huang, Andreas M. Fischer, "Downregulation of a barley (*Hordeum vulgare*) leucine-rich repeat, non-arginine-aspartate receptor-like protein kinase reduces expression of numerous genes involved in plant pathogen defense". *Plant Physiology and Biochemistry*, vol. 100, March 2016, pages 130-140.

Gary Strobel, Cover photo for the January 2016 issue of *Microbial Ecology*. The warm

waters of Mammoth Hot Springs in Yellowstone National Park constantly flow from the numerous vents in the area. The main thermal features include many calcite dams resulting in highly colorful pools. Small streams also flow in this area and are heavily laden with

inorganic salts as well as numerous species of thermophilic microbes. Here, on a cold winter's day, microbial mats and salt deposits in a small stream mix with ice sheet sand crystals to form beautiful geometric patterns in the stream bed.

Bare Root Trees

By Toby Day, Extension Horticulturist

There are three main ways that nurseries sell trees: Balled and burlapped (B&B), containerized, and bare root. Spring is the time of the year in which you plant bare root trees from the nursery. Bare root trees are grown in the field and dug from the ground when they are dormant. The trees, although often smaller than B&B or containerized trees, often have characteristics that make them preferred over the other conventional methods of buying or planting trees. Here are some reasons why:

Bare root costs less. Bare root trees are often more than half the cost of containerized or B&B trees. Therefore, for the same price of other methods, you can plant several trees!

They are easier to plant. Because they are so much lighter and easier to handle than B&B and containerized, most anyone can plant a bare root tree with just a shovel. No machinery or back-breaking work moving them around.

They establish faster. Because the trees are planted dormant and have the majority of their root system intact (up to 200% more roots than B&B), they establish into the native soil faster and will often be fully established in one year, rather than several years in some cases with B&B. Oftentimes, bare root trees will catch up in size to the larger containerized or B&B trees in only a few years due to fast establishment.

You can prune out bad roots. When planting bare root trees, you can remove any broken, diseased or crossing/girdling roots with hand pruners before planting. This cannot be done with B&B and is really hard to do with containerized trees without disturbing the rootball.

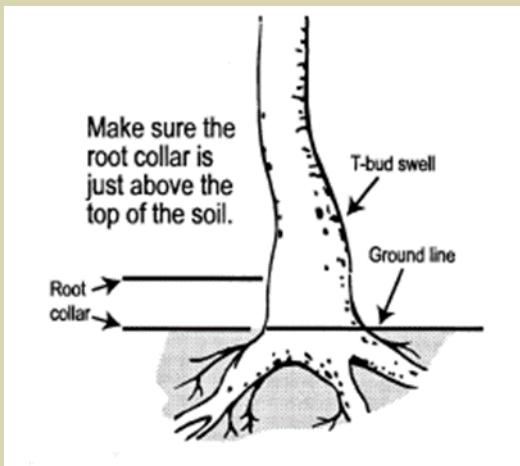
Microbial Ecology

Volume 71 Number 1
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Typical bare root tree (Redwoodbarn.com)



You can avoid planting too deep. Too many times, containerized and B&B trees are planted too deep, mostly because of the weight of the rootball sinking into the ground and because soil or mulch is often mounded around the trunk in the B&B digging or potting process. With bare root, you can be sure to keep the root collar flare at or just above the soil level when planting. Proper planting depth is the most important concept for long-term tree health.

When you get bare root trees from the nursery be sure that you are ready to plant and that the root ball is covered in either wet straw or newspaper and bagged for shipping.

You want to plant the bare root trees before they leaf out and are still dormant. If the tree is leafed-out, the success of bare root tree establishment greatly declines.

I found a decent YouTube video from Utah State University that shows just how easy it is to plant a bare root tree: <https://www.youtube.com/watch?v=U4j0LewYwuQ>.

New Arrivals!

Alan and Farah welcomed a baby boy to their family on Thursday, March 31. He weighed 9lb 5oz.

Mac and Jenny welcomed a baby girl to their family on Tuesday, March 29. She joins older brothers Eric and Ian. She weighed 7lb 5oz.



Congratulations to all of you!

Recipe of the Month

Cashew Chicken (pioneerwomancooks.com)

1/2 c Low Sodium Soy Sauce
 1 T Rice Vinegar
 1 T Packed Brown Sugar
 2 T Oyster Sauce
 1/2 t Toasted Sesame Oil
 3 T Vegetable Oil
 6 whole Boneless, Skinless Chicken Thighs, cut into small cubes
 Kosher Salt to Taste
 1 T Chopped Garlic
 1 T Chopped Fresh Ginger
 1 whole Green Bell Pepper, Chopped
 1/4 c Sherry Or Chicken Broth
 2 T Cornstarch



- 1/2 c Drained Canned Water Chestnuts,
Coarsely Chopped
- 1 c Unsalted Cashews (be Sure To Use
Unsalted)
- 2 whole Green Onions, Thinly Sliced
- Cooked Rice Or Noodles, For Serving (if
Desired)

In a bowl, mix together the soy sauce, vinegar, brown sugar, oyster sauce, and sesame oil. Set aside.

Heat the vegetable oil in a large skillet over high heat and add the chicken in a single layer. Sprinkle with a small amount of salt, then leave it alone for at least a couple of minutes to give the chicken a chance to brown. When the chicken has turned golden, stir it around so that it can brown on all sides. Throw in the garlic and ginger and stir to combine. Stir in the bell pepper and let it cook for 2 to 3 minutes.

While the pan is still hot, pour in the sherry. Stir it around, scraping the bottom of the pan to loosen all the flavorful bits. Turn the heat to medium-low and pour in the sauce mixture, then mix the cornstarch with 1/4 cup water to make a slurry and pour it in. Stir the sauce for 1 to 2 minutes to thicken, then add the water chestnuts and cashews and stir to coat everything with the sauce, adding a splash of water if the sauce is too thick.

Finally, sprinkle on the green onions. Serve with cooked rice or noodles.

April Birthdays

John Sherwood	12
Mike Giroux	12
Toby day	15
Eric Olson	17
Whitney Harchenko	19
Matt Lavin	20
Andreas Fischer	25
Charles Hart	25
Nina Zidack	26
Rebekah VanWieren	28



