

Plant Science Says



Happy Halloween!

Volume 17, No. 9 The Department of Plant Sciences and Plant Pathology October, 2015

Adventures in Mendelland By Norm Weeden

Earlier this month I traveled to Brno, a city in the eastern Czech Republic (Moravia) to attend a celebration of the 150th anniversary of Gregor Mendel's presentation of his ideas regarding the mechanism of inheritance in hybrid plants. The Augustinian monastery in Brno is where Mendel actually carried out his experiments, and it now hosts a museum presenting various aspects of Mendel's life and work. A group of about 100 of us gathered there for several days to discuss Mendel (briefly) and advances in plant genetics since Mendel (much more extensively). For those of you who have taken my Advanced Plant Genetics course, you will be interested to know we covered topics such as polyploidy and polyploid complexes, heterosis, sex chromosomes,

apomixis, and genetic diversity. You would have felt right at home!

We also took advantage of some of the special features of the city - dinner in the tunnel complex under the abbey (dating back to the 1500's and most recently used as a disco), a violin concert in the large hall where Mendel and his fellow monks ate meals, and one day of lectures in the building where Mendel actually presented his paper. We also travelled to Silesia, Mendel's birthplace.

Brno, at nearly 400,000 inhabitants, is the second largest city in the Czech Republic and boasts a large Gothic church in addition to the more Romanesque church associated with the abbey. The layout of the city definitely has a Middle Ages flavor, with a series of town squares filled with farmer's markets and live entertainment (music) or beer gardens where one could sit outside and enjoy the festivities (except during the brief showers). Half of its streets are cobblestone and there was relatively little traffic in the parts of the city we visited.

Brno is located in a wide valley near the junction of the Svatka and Svitava Rivers, which eventually flow into the Morava River (the main river of Moravia) and then to the Danube at the border with Austria. The countryside is mostly rural outside the city, consisting of a patchwork of woods and cultivated areas. Compared to Montana, the region has virtually no mountains, is much greener (and wetter) in the summer, and is warmer in the winter. It was ruled by the Hapsburg monarchy from 1526 until the end of World War I, so there are lots of German names that pop up when talking about the country and even the name of the city when Mendel worked there was Brünn, not Brno. The city is easy to get to by bus or rail from Prague, Vienna, or Dresden, so if you happen to be in the region I recommend a visit (and say hello to Gregor for me!).



Norm Weeden with a friend in Brno, Czechoslovakia

Course Focus

BIOO 435 - Plant Systematics

By Matt Lavin

Students in Plant Sciences, Range Science, Land Resources, and the various Biology degree options often have to learn how to identify plant species as part of their studies of vegetation and restoration. BIOO 435 is therefore designed to introduce to such students upwards of 200 of the most common plant species that inhabit riparian, shrub-prairie, and disturbance-prone settings in Montana. Because nearly 3,000 plant species occur in Montana, the course is also designed to familiarize students with how to use taxonomic keys so that they can leave the course being able to potentially identify the many plant species previously never seen. In order to use taxonomic keys successfully, however, students have to know how to sight identify, at least to some degree, a given plant not just to the species, but also to the genus or family. This is why the 200 or so common Montana plant species are introduced in BIOO 435. The ability to sight-identify these to the family, genus, and species level actually facilitates the use of taxonomic keys on unknown plant specimens. Such ability helps to create mental landmarks in the otherwise difficult and bumpy landscape of the world created by taxonomic keys. Without such mental landmarks, taxonomic keys are practically impossible to use. The taxonomic keys used in BIOO 435 are those in the book, "Manual of Montana Vascular Plants" by Peter Lesica (2012).

Students meet once a week on Monday afternoons. Confining the class to this time often enables people with jobs to take the course; for example, those who work for government or environmental consultant agencies. The noon hour "lecture" is spent introducing the plant families and genera that will be studied that afternoon. Relevant plant families and genera are typically collected that morning in the field and are brought in for display during lecture. For lab, students are given about 15 plant specimens that have been pressed and dried during the summer when the plants were in flower. The afternoon is then spent partly indoors preparing a reference set of plant species for that day, as well as outdoors, where students can see the relevant plant species in fall conditions.



Photograph of the very common and native Vicia americana, American vetch, which grows in open dry sites and, like other members of the genus Vicia, has a predilection for disturbance-prone or frequently disturbed sites. The genus Vicia is one of the few dry-site inhabiting viney herbs in Montana (evinced in part by the leaves that terminate in tendrils).

Photographs of all of these species are taken so that the 3-dimensionality and close-ups of flowers, fruits, and other diagnostic traits can be readily accessed via a collection on www.flickr.com. These photographic collections include sets for local sites in Bozeman, such as Burke Park (http://www.flickr.com/photos/plant_diversity/sets/72157620805880377/) and the Gallagator Trail (http://www.flickr.com/photos/plant_diversity/sets/72157620806308215/). These photos are augmented by a collection of about 200 plant species given to the students during the semester. Students can opt to make a taxonomically organized reference collection from these specimens which can be taken with them at the end of the semester. Such a collection is, or should be, invaluable as reference specimens to students, for example, involved in regional vegetation studies.

It is my hope that students who leave BIOO 435 will be able to make first-hand observations of the plant world and realize for themselves that there is not much of a difference between native and introduced plant species and that introduced species rarely become problematic weeds. With nearly 3,000 plant species in Montana alone, it is difficult for any one of these species, or even a small subset, to gain an advantage over the others.

New Employees

Richelle O'Leary - Seed Lab



I was brought into this world on a dark and stormy Monday night, breaking through the negative stereotypes of Monday and proving that it is, in fact, a fun day. The first daughter of Tom and Taleen O'Leary, the former, a carpenter like Jesus, I brought them all the joys and blessings only a daughter could.

I was raised in the rural farming town of Highwood, Montana, where I was able to run amuck but always under the watchful, sometimes intrusive, eyes of members of the small community. After completing high school, I moved to the big city of Bozeman and began my undergraduate degree.

As a student at MSU, I worked hard for the money, so hard for the money as a part-time employee at the Montana State Seed Lab. Some years later, I graduated with a B.S. in Sustainable Food and Bio-energy Systems and promptly moved to northern California to work on an organic fruit and vegetable farm. After eight months sharpening my gardening skills and learning some basic Spanish, I returned home for a brief spell before heading to Kauai. While on the small island, I worked on a goat dairy and fruit and vegetable farm where I slowly learned to assert my dominance over the goats and adjusted to different methods of farming. After spending seven months on Kauai, I realized that I needed to start making some money and returned to Montana.

I was welcomed back to the Seed Lab last April and have begun my seed analyst training under the tutelage of Bridget Westfall, the competent new lab manager, and Faye Jorgensen. In my leisure time, I enjoy general sarcasm and mockery, people watching and free food.

Montana Ag Live October Schedule

October 4

Lance McNew, MSU Wildlife specialist, will address the interface between man and

beast...or woman and vole, as the case may be!

October 11

Kate Fuller, MSU agricultural economist, will help us look at how the Farm Bill is affecting Montanans today.

October 18

Luther Talbert, MSU spring wheat breeder, will be talking about the grain breeding programs and what adaptations or natural events are changing the needs of today's growers.

October 25

Susan Tallman, NRCS Area Agronomist for SW Montana, will discuss the status of cover crops, soil health issues and erosion issues in irrigated fields.

Grants

Tracy Dougher, City of Bozeman, "Median Strip Native Grasses Project"

Ryan Thum, Minnehaha Creek Watershed District, "Occurrence and Distribution of Eurasian, Northern and Hybrid Watermilfoil in Lake Minnetonka and Christmas Lake: Plant Community and Sample Collection"

Invited Lectures

Gary Strobel has just returned from a two week long lecture trip to China. While there, he presented a series of lectures at SW University of China in Chongqing and also the National Academy of Forestry in Beijing. At SW University, the third largest in China, he was presented with an honorary Professorship acknowledging his work on endophyte biology. His presentations were mainly centered on various aspects of endophyte biology and chemistry. He also gave a presentation at both locations on "Advice to a Young Chinese Scientist" which was received with some enthusiasm. In Beijing, Strobel was also the guest of Professor H. Deng, formerly of Princeton University, who is now Director of a beautiful newly endowed Proteomics lab at Tsinghua University.

While in China, I found time to observe giant pandas. They are not only a Chinese national treasure but are also beloved by



Strobel receiving an honorary Professorship from SW University of China

people the world over. They are found only in Sichuan, Shaanxi and Gansu provinces. In total there are fewer than 2,000, of which 70% are distributed within the territory of Sichuan Province. Therefore, when visitors



from home and abroad come to Chengdu, Sichuan, one of their main objectives will be to see this lovely animal for themselves.

Located just 6 miles (10 km) away from downtown, the Chengdu Research Base of Giant Panda Breeding was created to imitate the natural habitat in order that they might have the best possible environment for rearing and breeding. It cares also for other rare and endangered wild animals in a 92 acre area, 96% of which is verdure. Giant pandas, lesser pandas, black-necked cranes, and white storks as well as over 20 species of rare animals are fed and bred there throughout the year. Verdant bamboo, bright flowers, fresh air, a natural hill scene and a beautiful artificial view are merged ingeniously at the base. The photos show several three month old pandas who are still not ambulatory at this young age and a mama panda trying to save her baby from harm.

Farewell to Ed and Charissa

Charissa and Ed are moving to Boise, ID, just seven hours and 14 minutes away from beautiful Bozeman, Montana. Charissa and Ed became engaged in late May of 2015 and are excited to head out on the next big adventure together! Charissa graduated in June 2015 and has been working as a Research Associate in the Dougher Lab from August to October. Ed has been working as a Research Assistant for the Schutter Diagnostic Lab and the Cripps Mycology Lab from June to October.

Charissa has accepted a position as a Life Scientist with the Environmental Protection Agency in Boise, Idaho, through the Presidential Management Fellowship (PMF) program. Charissa applied to the PMF program in September 2014 and was one of 692 STEM finalists that were selected out of 7,800 applicants. During her two-year fellowship as a Presidential Management Fellow, Charissa will be working for the EPA Region 10, Pacific Northwest area (Alaska, Idaho, Oregon, Washington and 267 Indian Tribes) in the following 2 areas: 1) wetland program coordination, and 2) wetland



International Master Gardener Convention

By Toby Day, Extension Horticulturist

Dara Palmer and I recently attended the 2015 International Master Gardener Convention in Council Bluffs, Iowa (a suburb of Omaha, NE) September 22-25. The conference, sponsored by the University of Nebraska, had over 700 attendees from all reaches of the U.S. and included Master Gardeners from Canada and South Korea. "Horticulture in the Heartlands" was the theme of the conference and had programs including new technologies, QR codes, trends and futures, composting, propagation, grafting, professional development, program management, volunteer retention, resolving conflict, flower and landscape design, container gardening, working with communities, and a whole lot more!

National speakers gave keynote addresses which included J Schwanke, host of "Fun with Flowers" (<http://uBloom.com>); Mark Hirsch, fine art photographer at "That Tree: Shades of Wisdom," (www.thattree.net); Brent Heath of Brent and Becky's Bulbs (<https://brentandbeckysbulbs.com>); and Gary Oppenheimer, founder of Ample Harvest (AmpleHarvest.org). Each gave a unique perspective on their passions and related them to Master Gardener.

I was delighted to go on two of the tours which included a trip to the Arbor Day Farms, the location of Arbor Day Foundation started by Sterling Morton in April 1872. The Arbor Day Farm was especially unique to me as there was a heritage orchard full of apples that I could pick and taste (they would only let us pick one apple, but apples on the ground were fair game!). I also learned about orchard management at the historic



A 'Blue Pearmain' apple (one of my favorites) picked at Arbor Day Farms

protection and compliance assurance through on-the-ground wetland assessment, data compilation, and condition monitoring.

Charissa is looking forward to learning new things and is excited to start her fellowship with the Environmental Protection Agency in Boise, Idaho! Ed is excited to be applying to graduate schools for pursuing his PhD in mycology/ecology starting in Fall 2016. Ed's current top choices are the University of Tennessee, University of Minnesota, and Kansas State University.

Charissa and Ed have both learned so much during their time in the Plant Science and Plant Pathology Department and are extremely grateful for the abundant support, mentorship, and kindness they have received from the department. In particular, they would like to thank Dr. Tracy Dougher, Dr. Cathy Cripps, Dr. Mary Burrows, and Dr. Eva Grimme, without whom, their next journey would not be possible! Although they will definitely miss everyone in the Plant Science and Plant Pathology department, they are excited to advance in their career and adventure further into unexplored landscapes!



A greenhouse range at the Dallas Johnson greenhouses

Kimmel orchard and vineyard (<http://www.kimmelorchard.org>), which is also a University of Nebraska research farm. There were a lot of management ideas I took from the tour to apply at the Horticulture Farm here on campus. Another tour was of the Dallas Johnson Greenhouses in Council Bluffs, a 59 acre greenhouse facility that supplies many Lowes' and Home Depot' stores in a multi-state region. When we were there, they had just completed planting 400,000 new poinsettias. The greenhouses were all state of the art in planting, watering and fertilizing as well as robots that set the plants within each range.

It was also fun to catch up with Donna Knudson, wife of our former Animal Science Department Head, Glenn Duff. Donna is studying to be a Master Gardener for New Mexico State University in Las Cruces. It was also great to see all of the state and regional Master Gardener Coordinators at the convention.

The convention is a biannual event held on odd years with the Master Gardener Coordinator's Conferences occurring on even years. Next year, Montana and Wyoming will be hosting the Master Gardener Coordinator's Conference at Chico Hot Springs. Dara and I learned a lot from this conference regarding some of the issues that can arise while sponsoring a large conference such as this.

Recipe of the Month

Slow Cooker BBQ Chicken Pizza Soup

8 cups chicken broth
 4 skinless, boneless chicken breast halves
 1 (24 ounce) package frozen corn
 1 red onion, diced
 1 1/4 cups barbeque sauce
 4 cloves garlic, minced
 1 1/2 teaspoons salt
 1/2 teaspoon ground black pepper
 1/2 teaspoon garlic salt
 1/2 cup shredded mozzarella cheese, or to taste
 1/2 cup chopped fresh cilantro, or to taste



Combine chicken broth, chicken, corn, onion, barbeque sauce, garlic, salt, black pepper, and garlic salt in a slow cooker.

Cook on Low for 5 hours. Remove chicken from slow cooker and cut into bite-size pieces; return to slow cooker and stir. Ladle soup into serving bowls and top each serving with cheese and cilantro.

October Birthdays

Roshan Archarya	1
Florence Dunkel	10
Bob Sharrock	11
Jamie Sherman	20
Ed Barge	24

