

Plant Science Says



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2012 National Association of Plant Breeders Meeting By Duke Pauli



This past August I was lucky enough to visit the wonderful metropolitan area of Indianapolis, Indiana, for the annual meeting of the National Association of Plant Breeders (NAPB). NAPB

is a recently formed group of plant breeders from both the private and public sector with the intention of raising awareness about plant breeding and the impacts that it has on our society; appropriately enough, the title of this year's meeting was "Sustaining Life through Plant Improvement."

I started the meeting off by throwing open the curtains of my hotel room to find myself staring at the vast, expansive landscape of America's heartland, or perhaps the lack thereof as it was dominated by a flat horizon. Hopefully the talks would be more impressive than scenery, and luckily they were. The afternoon session focused primarily on the education of graduate students where our very own Dr. Jamie Sherman gave a presentation on web-based learning and the potential impacts it could have on the future of plant breeding. This was interesting to hear as myself and Jay Kalous are part of a large collaborative grant in which one of the components is online, interactive learning.

This conference is by far one of the more fun ones, if you will, since it allows for the opportunity to interact with plant breeders working on entirely different crops like loblolly pines, roses, and various fruit crops.

This conference is also unique in that half of the participants are graduate students, allowing for the establishment of new professional relationships. The best parts of this year's meeting were the tours of Dow's corn breeding operation (private capital can make for some nice "research" stations) and the Purdue Research Farm. We were lucky enough to have Dr. Gebisa Ejeta, winner of the World Food Prize and one of Bill and Melinda Gates favorite recipients of funding, talk to us about the meaning of plant breeding in its current capacity and the continued, vital role it plays in people's lives. He also highlighted the impact that advanced breeding methods and current research can have on improving the quality of life for people not as fortunate as ourselves. There were also talks about the most current breeding methods including the incorporation and utilization of the vast genomic data that is becoming available and the practices that make the most use of it. On the third day, there were student presentations as well as more tours of private breeding companies. In all, this meeting was a pleasure to attend as it offered a plethora of great educational as well as professional opportunities. It would have just been better if it was in an area with at least some topographical features.

Ivie Lab Happenings By Frank Etzler



I spent the last half of July (16th to the 28th) in Ottawa, Ontario, Canada. I was invited to work at the Canadian National Collection of Insects maintained by Agriculture and Agri-

Food Canada (similar to our USDA). While there, I helped choose specimens for the Barcode of Life Database (BOLD) in order to expand click beetle representation, and helped curate their collection of click beetles.

The Ivie Lab (Mike and Donna Ivie, Charles Hart, and myself) went down to the Chiricahua Mountains of Southeast Arizona to stay at the Southwest Research Station from August 1st to the 8th. This station is an extension of the American Museum of Natural History. We attended a workshop on weevils, a very diverse and economically important group of beetles. This group includes many crop and ornamental pests, as well as the infamous bark beetles. We learned how to identify subfamilies, genera, and species with better accuracy from the best weevil workers in North America. They were joined there by Ian Foley, Montana's Pest Management Program Manager and a former student of Dr. Ivie.



2012 Weevil Workshop, Class and Instructors. Dr. Michael Ivie (4th from left), Charles Hart, Frank Etzler (Crouching in front, from the left), Ian Foley (6th from right, back row)

5th Annual President's Luncheon By David Baumbauer

Towne's Harvest Garden staff hosted the 6th Annual 'President's Luncheon' at the Horticulture farm on July 12. Joining President Cruzado were Deans Matt Caires and Helen Melland and Department Head Tracy Sterling. Faculty included Bill Dyer, Bruce Maxwell, Allison Harmon, Carmen Byker, and Fabian Menalled. Twenty-five students also attended. Vegetables and eggs served were from the farm and the

other ingredients were almost all from local sources. After lunch, the group toured the farm and the new Horticulture Barn.



MSU President Waded Cruzado with the students who prepared the salads - Wendy Gans and Katie Bates. The recipe for the Harvest Grain Salad recipe is on page 9.



Educational sign explaining crop rotation for the HORT 345 Class Garden

HORT 336 – Landscape Construction by Jennifer Britton

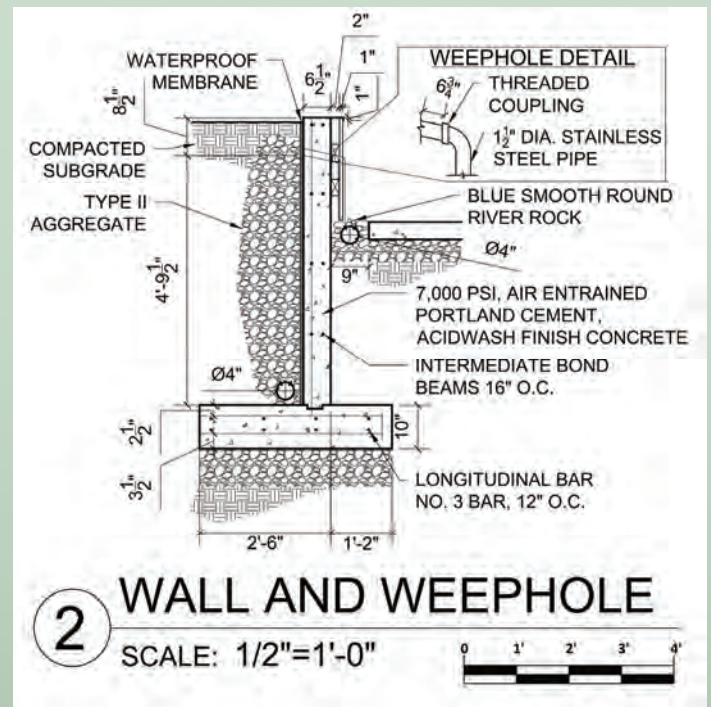
"A rock pile ceases to be a rock pile the moment a single man contemplates it, bearing within him the image of a cathedral."



For students in Environmental Horticulture pursuing the Landscape Design option, HORT 336-Landscape Construction serves as an introduction to materials and construction

methods. So what does this mean you ask? As designers, we communicate with permitting agencies and contractors through drawings: plans, sections, elevations, details. These drawings indicate the thickness of concrete, placement of rebar, deck fasteners, all things functional and all things aesthetic- basically every built element. We submit these drawings to permitting agencies such as the City of Bozeman where they review for code compliance, public safety, health and welfare. These same drawings, also called contract drawings, are used for bidding and legal accountability. Pretty important stuff when you consider the price tag attached to construction and moreover the cost of correcting mistakes.

To introduce students to landscape construction we meet for studio class twice a week on Wednesday and Friday from 10:00-12:50. We begin with a basic understanding of construction documentation principals and compound on those little by little to give an overall understanding of the subject. The class curriculum mimics work they will experience in their future careers with studio projects organized around one site design - the grounds of a hypothetical office building. Students are tasked with creating a design required to contain paving, retaining walls, deck, and fence. Each of these components becomes the semester's projects with students completing a coherent set of construction drawings in conformance with industry standards. We investigate structural qualities and limitations of construction materials and students participate in decision-making activities pertaining to



Drawing by Willy Chandler, Landscape Construction student

their designs. Although we have brief lectures on relevant technical information needed to complete assignments, class time also provides opportunity for critique and feedback. Projects range from 2-4 weeks in duration with pin-up presentations for each project.

To have students experience construction forensics (when things go wrong), we take construction "walkabouts" on campus and in the surrounding neighborhoods, where students can see relevant construction practices and examine construction failures in-situ. Students also explore alternative building materials and sustainable practices through a materials research project and tour of the Refuge Sustainable Building Center in Bozeman; and to incorporate service-learning and concepts of social sustainability, students participate for one weekend day in construction with Habitat for Humanity or other volunteer organizations.

It is my goal that students leaving HORT 336 will have experience in investigating more than one answer to any construction project and develop extensive understanding into the generation of graphic plans. I hope students will have the

ability to realize for themselves how their designs, selection of materials and installation methods effect people, environment and place.

Publications

Cathy Cripps

A range-wide restoration strategy for whitebark pine (*Pinus albicaulis*)

Keane, Robert E.; Tomback, D.F.; Aubry, C.A.; Bower, A.D.; Campbell, E.M.; Cripps, C.L.; Jenkins, M.B.; Mahalovich, M.F.; Manning, M.; McKinney, S.T.; Murray, M.P.; Perkins, D.L.; Reinhart, D.P.; Ryan, C.; Schoettle, A.W.; Smith, C.M. 2012. A range-wide restoration strategy for whitebark pine (*Pinus albicaulis*). Gen. Tech. Rep. RMRS-GTR-279. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 108 p.

Whitebark pine (*Pinus albicaulis*), an important component of western high-elevation forests, has been declining in both the United States and Canada since the early Twentieth Century from the combined effects of mountain pine beetle (*Dendroctonus ponderosae*) outbreaks, fire exclusion policies, and the spread of the exotic disease white pine blister rust (caused by the pathogen *Cronartium ribicola*). The pine is now a candidate species for listing under the Endangered Species Act. Within the last decade, with major surges of pine beetle and increasing damage and mortality from blister rust, the cumulative whitebark pine losses have altered high-elevation community composition and ecosystem processes in many regions. Whitebark pine is a keystone species because of its various roles in supporting community diversity and a foundation species for its roles in promoting community development and stability. Since more than 90 percent of whitebark pine forests occur on public lands in the United States and Canada, maintaining whitebark pine communities requires a coordinated and trans-boundary effort across Federal and provincial land management agencies to develop a comprehensive strategy for restoration of this declining ecosystem. We outline a range-wide strategy for maintaining whitebark pine populations in high mountain

areas based on the most current knowledge of the efficacy of techniques and differences in their application across communities. The strategy is written as a general guide for planning, designing, implementing, and evaluating fine-scale restoration activities for whitebark pine by public land management agencies, and to encourage agency and inter-agency coordination for greater efficiency. The strategy is organized into six scales of implementation, and each scale is described by assessment factors, restoration techniques, management concerns, and examples.

Cheryl Moore-Gough

Cheryl Moore-Gough has had another piece published in *Fine Gardening* magazine. The October 2012 (# 147) issue's feature entitled *Healthy garden* includes her piece entitled "Save your favorite tomatoes." The article resulted in a question from a reader that has been spun into a piece on cherry seed stratification that will appear in *Fine Gardening's* issue No. 149.

New Employees

Lessa Racow



Teaching Landscape Graphic I this fall semester, Lessa Racow is the Principal Landscape Architect at her Bozeman based firm inContour. A Bozeman native, she has traveled and lived around the country and abroad in pursuit of her education and career until both brought her

back home to Bozeman in 2005. Lessa earned her Master of Landscape Architecture degree from the University of Melbourne, Australia and her Bachelor of Arts Degree in Studio Art at Mount Holyoke College in Massachusetts. She has extensive experience in the commercial and residential sector with projects ranging from public parks and sport fields to stormwater rain gardens and subdivision master planning.

Lessa resides year round in Bozeman with her husband Adam of Formescent Architects,

and four month old son Parker. In addition to her Landscape Architecture pursuits, she is the English riding coach for the MSU Equestrian Team and also trains and shows her own horse, a five year old Oldenburg mare named Geneva, in dressage and hunters.

Eric Berg



Hello Montana State University and the Plant Sciences and Plant Pathology Department; more specifically, hello to the landscape design students and faculty which I will be joining as an adjunct professor this fall semester. I hope to keep my qualifications brief as a

basis for my introduction. I am a local landscape architect, former graduate of MSU's landscape design program, and proud, native Montanan. My expertise in landscape architecture centers on sustainable design, specifically stormwater management and materials re-use. In addition to my MSU alumnus heritage, I have a Master of Landscape Architecture degree from the University of Washington. During my graduate studies, I served as a research assistant for the then fledgling Sustainable Sites Initiative (SITES™)—an interdisciplinary effort by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center and the United States Botanic Garden to create voluntary national guidelines and performance benchmarks for sustainable land design, construction and maintenance practices. My graduate work took a unique approach to combining my interest in sustainable material use with photography, a project that culminated in an exhibition of cement and concrete production in Western Washington State.

I returned to Bozeman in 2008, received my landscape architecture license in 2011 and currently practice landscape architecture and irrigation design/installation with a small landscape design/

build company, Morrison Design & Landscaping. In addition to my landscape architecture career, I practice freelance graphic design, produce two local podcast radio shows, and play guitar with a local band, The Bonnie Situation. I am very excited to bring my diverse experiences and expertise to the classroom and my alma mater this fall. See you around!

New Graduate Students

Andrea Varella - Luther Talbert, Advisor



My name is Andrea Corrêa Varella and I am from a small city named Jaboticabal in the Southeast region of Brazil. I graduated from São Paulo State University (UNESP) in 2009 with a bachelor's degree and a teaching license in Biology.

During my undergraduate studies I was enrolled in two major research fields: insect cytogenetic and insect ecology. I also worked as a volunteer at the university teaching biology to elderly students. In March of 2010, I was admitted to the Grad School at UNESP in the Agricultural Entomology Program. During the last two years, I have been studying aspects of population ecology of fall armyworm (a major maize pest in Brazil), in order to aid the development of a biological control program to manage this pest. Now I am starting my PhD in PSCP Dept. under the advice of Prof. Luther Talbert.

Charissa Bujak - Tracy Dougher, Advisor



I received my BS in biology from Northland College in Ashland, Wisconsin and through my cumulative work experience with government and non-government entities, I have

developed a keen interest in the interactions between invasive and native plant species in the built landscape. I am currently interested in pursuing native plant restoration and commercialization. I am thrilled to be a part of the Plant Science and Plant Pathology department at MSU and am looking forward to working with Dr. Tracy Dougher and associated students on the turfgrass and native plant plots on the MSU Horticulture Farm!

In my free time, I am an avid hiker, biker and camper in the warmer seasons and absolutely love ice-skating late at night when the air seems more crisp and cold! I enjoy seeing people's smiles, reading, writing, and storytelling over a hot cup of coffee or campfire. I am excited to explore the surrounding outdoor recreational areas and observe the different plant species and associated adaptations in the mountainous terrain of Bozeman.

Erin Burns - Bill Dyer and Fabian Menalled, Advisors



I recently received my M.S. in Plant Science from North Dakota State University in Fargo, ND. My research at NDSU surrounded the integrated pest management of Canada thistle (*Cirsium arvense*). Prior to my studies at NDSU I received my B.A. in Biology from the College of Saint Benedict in Saint Joseph, MN. Currently I am working on my Ph.D. surrounding herbicide resistance in wild oat (*Avena fatua*) with Dr. Dyer and Dr. Menalled.

I am originally from Maple Grove, Minnesota, and enjoy spending time at my family's cabin in northern Minnesota on Lake Ada trying to catch that elusive prize winning walleye. I look forward to starting my journey here in at MSU.

Riyadh Al-Khafaj - Alan Dyer, Advisor

Hello, I am Riyadh Alkhafaji, originally from Baghdad, Iraq. About forty years ago, I



came to this earth. My country is very hot and dry in the summer and cold and humid in winter. The summer period lasts about seven months, whereas the winter has four months. Fall and spring have just

one month. The temperature in summer is so high – up to 114 degrees F - whereas the low temperature in winter is about 32 degrees F. These climate conditions affect people, animals, plants and other organisms. Iraqi has a good environment for many kinds of plants. I like plants because they don't hurt anyone; plants have benefits for people, animals, other plants and our ecosystem. I can mention the benefits of plants such as food, clothing, medical materials, and other chemical compounds.

Production of food is the most important for all human beings right now because the number of people is increasing more and more. The entire world should produce more food for all people; therefore, protecting the strategic plants from agricultural pests is very important. Plant nematodes are one of these pests which the entire world should control.

One kind of plant nematode feeding just on wheat is *Pratylenchus neglectus*. Two researchers studied the damages of this pest on wheat in Montana. First, Wendy Johnson studied the discovery and distribution of root lesion nematode, *Pratylenchus neglectus*, in Montana. Second, Peter Zuck evaluated alternative crops for management of *Pratylenchus neglectus* in Montana winter wheat production. These papers report that the nematode problem was solved in some Montana fields and their results were significant, showing an increase in the production of wheat, a decrease in the damages of this nematode on wheat, and a decrease in the density of this plant nematode.

Johnson reports in her methods and materials that she chose seventeen Montana counties in 2006- 2007. She chose a survey to discover the *Pratylenchus neglectus*. Also, resistance was evaluated for eight modern and six historical cultivars. Also, Zuck reports in his methods and materials that he chose many kinds of plants in crop rotation such as fallow, barley, pea, lentil, canola, and camelina in 2008- 2009. These studies help the farmers of Montana with discovery, distribution, and control of *Pratylenchus neglectus*.

The wheat yield increased as result of using some techniques such as crop rotation. Crop rotation is planting many crops such as wheat, pea, and barley in the same land in alternate years. Crop rotation broke down *Pratylenchus neglectus* which prefers only wheat as a host. When farmers planted peas, the nematodes could not become a parasite on the peas. Consequently, nematodes died or decreased. The research of the papers showed crop rotation increased the yield of wheat.

These papers are significant because their study solved the nematode problem in some Montana fields. The papers declare that the population density of wheat nematode decreased as a result of using the crop rotation technique. When the farmers planted beans, the wheat nematode could not parasitize. It suffered from hunger and died.

Because the environment of north of Iraq is the same as the environment of Montana, these studies might benefit Iraqi too. Thus, plant pathologists of Iraq should check and discover *Pratylenchus neglectus*. Then, the farmers of Iraq should use these studies to control this pest to increase the wheat production, decrease the harmful of this nematode, and decrease the population density of wheat nematode.

Monsanto Hires Bates

Stan Bates recently left us to begin his new position as a Foundation Seed Crop Specialist for the Monsanto Corporation in Nampa, Idaho. His main duty is to increase

the seed of carrot and onion hybrids and confirm their identity.

We wish you all the best Stan!

Invited Talks

Michelle Flenniken presented a talk at the American Society for Virology's Annual meeting entitled "Non-specific dsRNA Mediated Innate Response in Honey Bee" in July 2012.

Grants

Michelle Flenniken received a grant (\$43,500) from Project Apis m., a non-profit organization that supports honey bee research (see website: <http://www.projectapism.org>).

Hobo Spiders in Houses **By Ruth O'Neill, Research Associate,** **Wanner Crop Entomology Lab**



Hobo spiders are common in houses and apartments in Bozeman, but become most noticeable in August and September, the time of year when adults have reached full size and the males are

leaving their webs to look for mating opportunities. Hobos are big spiders with long legs and great sprinting skills. During most of the year they live fairly quietly underneath baseboard heaters or in cluttered corners in a low area of a basement room, but if you live in a basement apartment you can expect to see them moving around fairly regularly, even when it's not mating season.



The hobo spider has eight eyes arranged in two nearly straight rows.

Hobo spiders are brown, with variable mottled gray markings (sometimes herringbone-like) on the top of the abdomen, and long legs. Female body length (minus the legs) is

typically 1/2 inch, sometimes up to 2/3 inches. Males are smaller-bodied but have longer legs.

There are several similar-looking species that also show up commonly in Bozeman houses, close relatives of the hobo spider. These include the giant house spider (an even larger spider that actually kills and eats hobo spiders) and the barn funnel spider.



The arrows point to the six to eight teeth which can be found on the cheliceral retromargin.

Accurate identification of these look-alikes is difficult, but probably doesn't matter much from a practical standpoint.

Almost all spiders have venomous bites for the purpose of subduing their prey, and if their mouthparts are large enough they can inflict a painful bite. In the past hobo spiders have initiated some fear, even hysteria, about the supposed danger of their bite, but most spider experts now believe they are not particularly hazardous. In response, the original common name "aggressive house spider", was officially dropped by the American Arachnological Society. In Europe, where hobo spiders occur naturally, they have never raised any particular concern. Of course, any person bitten by a spider should try to collect it for identification, and should also be checked out right away by a physician because individual bite reactions vary. The most venomous spider in Montana is the black widow, whose black shiny globular body looks very different from that of a hobo spider. Brown recluse spiders have not been reported in Montana.

Hobo spiders are not markedly aggressive unless they are provoked. However, they like to climb around on furniture and bedding if they have easy access from the floor, and if they are pressed against a bite could be triggered.

Don't be tempted by pesticides to clean spiders out, most notoriously foggers. Chemical control is seldom useful against spiders, but can be dangerous for people (especially children). Instead, try these safe and effective preventives:

Keep spiders from coming into the house. Do not block doors open during warm weather. Seal off holes in screens and gaps around windows and between window sashes; also seal gaps around baseboards and where pipes penetrate walls and floors. Weatherstrip under doors to the outside, the garage, or the basement. Check ventilation openings to the outdoors. Passive vents can usually be screened off with coarse screening or fine-grade hardware cloth, which will prevent many unwanted animals from entering buildings without significantly reducing air flow through the vent.

Clean out cluttered areas and store small items in sealed bins.

Use glue traps. Glue traps are folding cardboard traps sold at hardware stores. These can be used around doorways and along floor edges to monitor for the presence of hobo spiders, and can contribute significantly to the reduction of spider numbers in the house.

Recipe of the Month

Harvest Grain Sweet Pea Salad

By Wendy Gans

1 cup kamut grain uncooked (makes about 3 cups cooked)

¾ cup walnuts

¾ cup cranberries

4 ounces feta cheese

¾ cup chopped chives

1 ½ cups snap peas chopped

approximately 3 T olive oil

salt, pepper, and cayenne to taste



Cook kamut grain- add one cup kamut to 3 cups boiling water. Bring heat to low, then let simmer for one hours, or until grain is soft and cooked. Let cool completely. Chop all other ingredients to desired bite size

and combine with cooked kamut. Amounts of each ingredient depend on personal preference of ratio. Lightly coat salad with olive oil, just enough to hold everything together. Sprinkle cayenne to desired spice.

September Birthdays

Tracy Dougher	1
Irene Decker	5
Rosemary Keating	15
Vipan Kumar	17
Gary Strobel	23
Mary Bateson	24
Afaf Nasseer	26
Bill Dyer	26
Mark Young	27
David Baumbauer	27

