PLANT SCIENCE SAYS

February, 2002

San Diego Conference
by Suzanne Mikkelson and Hope Talbert

The Plant Animal, and Microbe Genome Conference was held January 12 thru January 16 in San Diego. Attendees from our department included Norm Weeden, Luther Talbert, Nancy Blake, Jamie Sherman, Suzanne Mickelson, Vladimir Kanazin, and Hope Talbert. Conference attendance continued it's steady growth from one hundred participants ten years ago, to almost 2,000 scientists from 30 countries this year. The meeting consisted of a series of plenary lectures, interspersed with group meetings and workshops and over 800 poster presentations. Range of research subjects included virtually all major agricultural species of plants and animals, as well as a few exotics, such as orchids, oysters etc. Many life science companies and vendors organized presentations of their products and their research. Some presentations were scientifically interesting, some were pure commercials.

The conference had it's share of interesting presentations. One of the most memorable ones was a talk by Dr. Francis Collins, Head of the Human Genome Program at NIH. Along with a wealth of scientific data he related a few stories and anecdotes related to the work of the Human Genome Consortium. For example, how long does it takes an average graduate student vs. full professor to find a canonic picture of Watson and Crick with their double helix DNA model on the photomosaic cover of the issue of 'Nature' dedicated to the completion of the draft of a human genome sequence. (Hint for the answer - it's a normal distribution curve ...)

The audience was very interested in the results of work of Dr. Paul Keim from Northern Arizona University, who's lab maintains the largest in the world collection of Bacillus anthracis strains. His work, research on subject of diversity within this genus and it's phylogeny, relatively obscure just a few month ago, suddenly became highly visible and relevant.

Dr. Steve Goff of Torrey Mesa Research Institute (formerly known as Novartis Agricultural Discovery Institute, subsidiary of Syngenta, spinoff from Novartis) reported results of rice genome sequencing. Despite going through all of those organizational changes, a relatively small group of scientists backed by the financial support of this pharmaceutical giant managed to accomplish this enormous task in a very short time. The rice genome is only second (after Arabidopsis), and so far the largest completely sequenced plant genome. Biggest surprising outcome of this research - much higher than expected level of similarity between the rice and Arabidopsis genomes. Biggest headache - how to identify genes, deserving attention and further research in this ocean of information.

Detailed information about this and previous Plant and Animal Genome conferences, along with the abstracts of all past posters and presentations, as well as information about travel awards for young scientists to attend this meeting could be found on www.intl-pag.org.

Bob's Byte

All of us can occasionally use some computer training to use our computers more effectively. In the past, ITC has offered classes on campus to help in this regard. However, these classes are limited in both time and scope of material covered and are only held at preset times. To help in this regard, the State of Montana has signed an agreement with Element K. Element K offers online courses for Office Productivity, Business and Management Skills, and Workplace Safety. There's even an online technical library that gives users access to hundreds of technical reference books.

The University is currently evaluating how appropriate or applicable these courses are for our environment. It appears that selected University staff will have access to their site for a month or so to answer these questions.

Some of the advantages of going with online training are:

1. You can access the site anytime
2. You only need to take the lessons on an as needed basis.
3. You can repeat lessons as often as needed

If you would like to take a look at course offerings, go to the following link: <http://www.elementk.com/>. Once there, click on catalog and take a look at the Office Productivity Courses or any of the others for that matter.

The cost for this still needs to be worked out, but it appears that charges will not be out of line.

I will let you know what the outcome of all this is later this s ster.

New Employees (Gary Strobel)
David Ezra

Hello, My name is David Ezra and I am a post doc in Dr. Gary Strobel's Lab. I am an Israeli, married with 3 children. I was borne and raised in a town called Haifa on the shore of the Mediterranean Sea in Israel. After I finished high school I joined the Israeli army for 3 years, as required from all the 18 years old in Israel. I have earned my first degree in biology in Tel Aviv University. My Ms.c. thesis was completed in the same university in the Department of Plant Sciences in the field of plant biotechnology, and my PhD. thesis was done in the same department in collaboration with the Volcani institute with Professor Issac Barash and Dr. Shulamit Manulis in the field of plant microbiology and plant pathology. For my post doc I have decided to enlarge my knowledge and change the field of work to biochemistry of fungi.

Israel is entirely different from Montana. First of all the weather is different. Israel is a very warm and dry place. We hardly have snow in the winter and when we do have snow in the high mountains and Jerusalem everybody drives from all over the country to see the wonder. Israel is not as quiet and safe as Bozeman. We have some "disagreements" with our neighbors and as a result we suffer from frequent terrorist attacks on buses and other civilian places. Moving to Bozeman is a good change for my family and me in regard to that. But the main difference, I think, is the difference in size; Israel can fit into Montana about 50 times, which makes Israel one of the most populated places in the world.

New Graduate Student
Robyn Klein
Phylogeny and Medicinal Plants

Well, academia finally caught up with me again. Guess I've been dancing around it all the time.

MSU and I go back to 1985 when I boldly walked into Dr. John Cardellina's office in Chemistry and asked him what plant compounds he was researching. This led to becoming his lab group's "oracle," finding wild plants they wanted to elucidate. I had been studying the medicinal plants of Montana and attending yearly herbal conferences in California, and was thirsty for anything on the subject. One of Dr. Cardellina's students, Andrea Stierle, taught me the beauty of spectroscopy. Slowly I was getting hooked.

In 1991, both Andrea and Matt Lavin helped me on a personal project to investigate whether a Chinese and a Montana species of *Astragalus* were closely related. A simple TLC analysis (via Andrea Stierle) and an addition to Dr. Lavin's chromosome comparison of Montana *Astragalus* species offered some exciting clues.

In 1993, Andrea invited me to participate in a summer program for Native American students interested in chemistry at Montana Tech. We scoured the mountains for interesting specimens, brought them back to the lab and ran them through some chromotography. What a rush.

My preoccupation with pharmacognosy (the study of natural compounds) then extended to Dr. Florence Dunkel's entomology lab in 1993, which resulted in her exciting research on *Artemisia tridentata* for stored crops.

All this time I was studying medicinal plants on my own while working at the Lone Mountain Ranch and volunteering as a firefighter in Big Sky. I got the knack of plant identification, and since other folks here in Bozeman wanted to know how to key out plants, I started teaching through Bozeman Adult Education. But I was still thirsty for more and so after a year of getting my husband used to the idea, I left for six months and attended the Southwest School of Botanical Medicine in Albuquerque to study with the indefatigable herbalist, Michael Moore.

The Southwest magic put a spell on me and I just couldn't go back to my job as computer specialist in the Physics Department. So I started the Sweetgrass School of Herbalism, and specialized in a couple of subjects: plant identification, plant constituents, toxicology, and ethnobotany of the flora of Montana. I currently serve on the faculty of both the Southwest School of Botanical Medicine (www.swsbm.com) and the Rocky Mountain School of Botanical Studies (www.herbschool.com), and have also taught at the Dominion Herbal College (Vancouver, BC), the National School of Phytotherapy (Albuquerque, NM), and the Yellowstone Institute. I'm one of about 200 professional members of the American Herbalists Guild, though there is no state or national recognition for such achievement. I've published in the *Australian Journal of Medical Herbalism*, as well as dozens of other mostly lay publications and recently authored a chapter in *Planting the Future: Saving our Medicinal Herbs*. You'll see my articles in the *Community Food Co-op Newsletter* and *Kelseya*, the newsletter of the Montana Native Plant Society.

Harvesting St. John's Wort (Hpericum perfoliatum) to make into tincture and salve

I'm also the chair of the Governor's Task Force on Wild Medicinal Plants. Our group recently passed legislation on commercial wildcrafting in Montana.

Keying out plants at the Spanish Peaks trailhead

F[illegible]less bibliophile that I am, I review the literature for those interested in herbal medicine through my publication, *Robyn's Recommended Reading*. Although that project is now on hiatus, you can visit my website for lots of suggestions on herbal and pharmacognosy books and journals at www.rrreading.com. If you would like a back issue, just let me know.

I'm currently teaching a new course through the Office of Extended Studies, Herbal Medicine Laboratory. You are all quite welcome to come visit us as we make salves, percolations, macerations and fluid extracts. I also teach Medicinal Plants of Montana (PS 280), a 1-credit course during the summer, and Herbal Medicine, a 3-credit course in the fall.

Oh, and what AM I doing in Plant Sciences? Well, Dr. Lavin is responsible for the gentle push back into academia and is my very brave advisor. I am no normal graduate student, after all. A few years older than I should be, but a few years wiser in some ways, my thesis involves investigating the phylogenic and phytochemical characteristics of plant species with immunomodulatory properties. This is a relatively new area where mustards, mushrooms, ginsengs and nightshades [illegible] paths in a fascinating evolutionary dance. What DOES a self-respecting ginseng have in common with a mustard from the Andes?

It is a real honor to be a part of the Department of Plant Sciences and Plant Pathology. The faculty and staff have been very encouraging and helpful. Though I must admit, those seminars involving genetic research are definitely a challenge at the moment.

By the way, in a remarkable twist of fate, while I am now in academia, Dr. Cardellina is curiously on staff of the Council for Responsible Nutrition, a trade association for the dietary supplement industry. Maybe there is such a thing as human isomers after all!

Litao Yang (Andreas Fischer)

Litao Yang is a new postdoc in Dr. Fisher's lab. Her research will focus on Barley DNA microarray involved in nitrogen metabolism. She moved to Bozeman from Gene Protein Technologies, LLC in Savoy, Illinois in early January 2002. She received her PhD from University of Nebraska-Lincoln in 1997.

Jennifer Schilling (Tom McCoy/Pam Border)

I am happy to be joining Dr. Weeden's laboratory and Pam Border as a Research Associate. I am originally from Montana and graduated with a B.Sc. in Horticulture from Montana State University in 1998. The past three years I have been studying abroad and finishing a degree that is equivalent to an M.Sc. In Horticulture while residing in Norway. In those past three years I have been closely working with the Jiffy Pot Company and wholesale growers dealing with the effects of hormone treatments and storing conditions of *Pelargonium* cuttings on rooting and the quality of cuttings.

I am very interested in many aspects of plant culture, and physiology. I also have interests in just about anything that I can do in nature (collecting mushrooms, learning about wild plants, skiing, running, camping…..).

I am engaged to a German man who is currently working towards his Masters degree in Chemistry. We are hoping that he will find a university or company to conduct his research with for his thesis, beginning September so we can stay in the United States.

I am looking forward to meeting many new people here and perhaps seeing some old familiar faces again. It is great to be back here at MSU again!

New Graduate Student

Christopher Mahoney (Cathy Cripps)

Greetings, My name is Christopher Mahony. I am a recent addition to the Masters Program in Plant Sciences and Plant Pathology. I will be studying with Dr. Cathy Cripps. Specifically we will be working with mycorrhizal alpine plants, with high altitude restoration/reclamation as an end goal.

Briefly, my journey thus far has taken me from a small liberal arts school in upstate New York, with an undergraduate degree in Political Science, to Montana State University, with a few stops in between.

I have spent the past few years enrolled in undergraduate coursework designed to qualify myself for the Masters Program in Plant Science. Having spent one semester abroad in Morocco and another two semesters enrolled at the University of Montana in their forestry program, and three semesters here at Montana State University, taking background classes.

Education, however is only half the story. For the past three summers I have worked for the Forest Service. I have been involved in many different facets of natural resources with duties ranging from regeneration surveys to habitat typing to fire fighting tours in the boundary waters of Minnesota, rainforests of southeast Alaska, and the high alpine of the Gallatin National Forest. Additionally, between seasons I have had the opportunity to work with a watershed consulting firm specializing in stream re-vegetation. These different work experiences coincide with my own diverse interests. I am now prepared to focus my attention academically to high altitude restoration using mycorrhizal alpine plants.

It is my hope to integrate my education as a tool to better understand the natural processes that govern the physical world. It is also vital to incorporate my academic knowledge in a meaningful way as to enact positive results on the ground.

Grants

Luther Talbert, "Bringing Genomics to the Wheatfield" University of California-Davis.

Andreas Fischer, "Functional analysis of grain nitrogen accumulation by use of DNA microarrays" CSREES/USDA

On The Personal Side

Jason Walling became engaged to Sarah Zimmerley on December 8, 2001. They plan to me married in the summer of 2003. Sarah is a graduate student in LRES.

Tim and Lisa Anderson are the proud parents of a baby daughter named Annelise. She was born on January 4 at 2:28 a.m., weighed 8 lbs 7 ozs and is 20 ½ inches long . Congratulations!

February Birthdays

Mike Sun	2
Maria Hernandez	3
Abhijit Sanyal	5
Norm Weeden	12
Thanya Sripo	12
Phil Bruckner	17
Pam Border	23
Shirley Gerhardt	26

Spinach Salad with Toasted Walnuts

Salad:

Package baby leaves spinach
1 red onion, sliced
3/4 cup walnut pieces, toasted
1/4 cup feta cheese, crumbled

Dressing:

½ cup mayonnaise
½ cup honey
½ cup balsamic vinegar
2 cloves garlic, crushed

1/4 t ground cummin

Mix dressing ingredients in a jar and shake well. Pour over salad ingredients just prior to serving.

Transplanting by Bob Gough

The time it takes to grow a transplant depends upon the species, the temperature at which you are growing them, and upon how large a transplant you want. In general, most vegetable transplants should be blocky and about 6 inches tall. Taller plants will be leggy and are more apt to bend or break when set outside. You should never let transplants become old enough to flower or set fruit before planting them to the garden. Consider the following table before you begin your sets.

Temperatures and Times Required for Growing Plants for Field Transplanting

Vegetable	Day Temperature (F)	Night Temperature (F)	Time (weeks)
Broccoli	65	55	6
Brussels sp.	65	55	6
Cabbage	65	55	6
Cauliflower	65	55	6
Cucumber	75	65	4
Eggplant	75	70	7
Lettuce	60	55	6
Muskmelon	75	65	4
Onion	65	55	11
Pepper	70	65	7
Sum squash	75	65	4
Tomato	70	65	6
Watermelon	75	70	4

Transplants grow best if there is a 5 to 10 degree difference between day and night temperature. This is called thermoperiodicity and we don't completely understand the physiology behind it.

To determine when to start your sets, determine when you will field plant, then count back the necessary number of weeks. Don't give in to the urge to start your plants too early--you'll only wind up with lousy plants.