

Plant Science Says



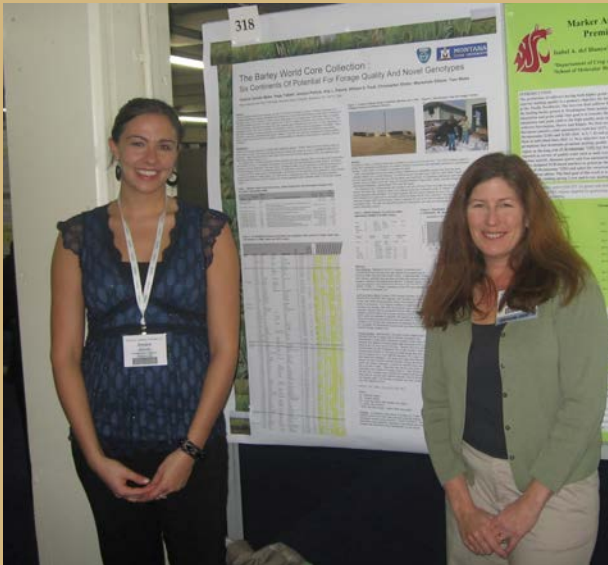
Happy
Valentine's
Day!

February, 2007

Plant and Animal Genome Meeting

By Vicki Carollo Blake

This year's Plant and Animal Genome Meeting in San Diego, California was the 15th international conference celebrating advancements in genomics. Unlike other conferences that change venues yearly, PAG is always held at the Town and Country Convention Center in San Diego, CA. In most years, this location offers a warm escape for researchers to come together. Although



California was experiencing record cold temperatures this year (high 20's, while Bozeman was well below zero), a fine and educational time was had by all. Attending from the Blake lab was Tom Blake and McKenzie Ellison that presented a poster on 'Barley qGPC6H: Fine Mapping Using Recombinant Interval Families' (Note: this work was primarily done by Leila Feiz, now in Mike Giroux's lab); Jeremy Jewell that presented his Master's work in a poster entitled "Quantitative Trait Loci for Barley Feed Quality"; Victoria Carollo Blake and Jessica Patrick that presented a poster entitled "The Barley World Core Collection: Six Continents of Potential for Forage Quality and Novel Genotypes" (see photo); and Hope Talbert. Victoria has been serving as PAG meeting organizer on the Abstract and Website Committee since the 2000 conference. This year there were over 2,000 researchers from all

corners of the world, over 1,000 posters presented, 400 workshop presentations and 50 vendors attending. Abstracts from all PAG conferences are online and searchable via the meeting website at <http://www.intl-pag.org>.

Cross-species identification of Mendel's *I* locus (Armstead et al., *Science* 315:73, 2007)

By Norm Weeden

Perhaps you can remember back to the introductory genetics course you took in which Gregory Mendel's experiments on the inheritance of traits in peas were described. Way back in the 1860's, Mendel worked with seven traits and established that the variation in each of these traits was inherited as a simple dichotomy between two choices (tall or dwarf habit, round or wrinkled seeds, green or yellow cotyledons, etc.). In the genetics class, you undoubtedly learned that each trait displayed a 3:1 segregation ratio when the seeds from a hybrid plant were grown and that each trait assorted independently of the others. What you probably did not learn was that nobody knew what the actual coding sequences for these traits were.

In 1990, a British group identified the gene responsible for the round/wrinkled seed variation. It turned out to be a transposon (jumping gene) that had inserted itself into the gene coding the starch branching enzyme, causing it to produce a defective enzyme. Thus wrinkled peas have mostly straight chain starch (amylose), while normal round peas have lots of branched chain starch (amylopectin). Later that decade, a group from the U.S. and the U.K. demonstrated that Mendel's dwarfing mutant was caused by a mutation in the coding sequence for the enzyme catalyzing one of the last steps in gibberellin synthesis. Thus the dwarf plants are short because they cannot synthesize the hormone (gibberellin) that promotes cell elongation.

Those laboratories involved in mapping of genes on the pea genome are constantly on the lookout for candidate genes that may be the basis of

another of Mendel's genes. Last year, British and Swiss researchers working in plant senescence contacted my lab about a possible candidate gene for the green/yellow cotyledon color gene in pea (designated *I*). They had previously proposed a different gene (*pheophorbide a monoxygenase* or *Pao*) as a candidate, but Matt Moffet had shown that *Pao* is located on a different pea chromosome than *I*. What was interesting about the new candidate gene was that a mutated form of this gene caused meadow fescue plants (*Festuca pratensis*) and other grasses to 'stay green' beyond the normal period of growth during the summer. Luther Talbert tells me he has incorporated this mutation into some of his spring wheat cultivars to give an additional week or so of growth during the summer. The mutation is called *Staygreen* (*SGR*) in *Festuca*, and similar mutations have been found in ryegrass, arabidopsis and even soybean. When Matt Moffet mapped this gene in pea, it co-segregated perfectly with Mendel's *I* gene. All the pea lines tested with green cotyledons possessed mutant forms of the gene (several different mutations were identified), providing compelling evidence that this sequence was indeed responsible for the variation Mendel used for his pioneering experiments 150 years ago.

What is particularly exciting about this study is that it shows how cross-talk among plant geneticists working in different species can now be extremely productive, even for genera as divergent as *Festuca* and *Pisum*. Just think of the possibilities even in our own department!

Colin Campbell and Anna Heryford Awarded 2006 Forage Legacy Scholarships By Ray Ditterline

Colin Campbell and Anna Heryford each received \$500.00 scholarships from the Montana Forage Legacy fund.



Anna Heryford, Dr. Ray Ditterline and Colin Campbell

Colin Campbell is a junior majoring in Animal Science - Livestock Management option. He is originally from Fulton County, Illinois and has completed his first semester at MSU, after receiving his A.S. degree from Spoon River College in Canton, IL. Colin plans to return to the family farm, and he developed strategies to add 100 head cow-calf pairs and a feedlot enterprise to complement the farming. He wrote a transition plan to displace portions of the current corn and soybean acreage to include more improved pastures, silage and hay production to support the added cattle enterprise. The strength of Colin's project was the creation of a sound financial plan that demonstrated cash flow and potential profit in three years. Collin has a 3.45 GPA, and he has been active in collegiate livestock judging (Captain), Post-secondary Agriculture Students of Illinois (Vice-President), FFA soil and grain judging teams, and numerous other organizations. He and his wife Caty intend to return to Illinois in 2008 after graduation.



Anna Heryford, Dr. Dennis Cash and Colin Campbell

Anna (Bronec) Heryford is a junior majoring in Animal Science - Livestock Management option. Anna grew up on the R&R Bronec Grain and Cattle ranch near Carter, MT. The family operation consists of dryland wheat and barley and Black Angus cow-calf production on the headquarters and summer leased pasture in Glacier County. The strengths of Anna's project were an exceptionally thorough inventory and balance of pasture AUM's, and pasture rotation, grazing and rest schedules. She developed a new six-year small grain-crop fallow rotation that would include Austrian winter pea as an annual forage. She noted several pastures needing renovation, and selected appropriate species for the new tame pastures. Anna demonstrated a thorough understanding of integrating dryland cropping and livestock systems for Montana.

Anna is a graduate of Fort Benton High School where she was active in daily farm and ranch chores and 4-H. She has a 3.74 GPA at MSU, and is active in Collegiate Cattlewomen, Ag Student Council, is the student member of the Animal Biosciences Facility Committee and other student organizations. Upon graduation she plans a career in "something to do with beef cattle nutrition".

This Forage Legacy scholarship was established for students enrolled in PS 342 – Forages to encourage critical and innovative thinking. A major requirement of PS 342 is an extensive term paper with an integrated forage-livestock enterprise plan. All PS 342 students are eligible, and the criteria used by the scholarship selection committee were: Creativity and solutions presented in the term paper, scholastic achievement and demonstrated leadership in extracurricular activities and service. All 24 papers were thorough and well-written, and the selection committee chose two outstanding recipients for 2006.

New Employees

Noraziah Zin – Strobel Lab – 232 PBB

By Carol Flaherty



Growing up in a small Malaysian village, Noraziah M. Zin was awed by her great uncle having a doctoral degree. Now with a doctorate of her own, the devout Moslem, wife and mother of four is

on leave from the University of Malaysia to work at Montana State University for three months.

"When I was 13 years old, I remember thinking, 'I should get a Ph.D,' even though I had no idea what one was," said Zin. With the encouragement of her mother and grandmother, who were illiterate, Zin pursued her education, received a degree in biotechnology from the University Kebangsaan Malaysia and earned a doctorate in bacteriology at the University of Strathclyde in Glasgow, Scotland.

Three years ago, Zin, then a lecturer in biomedical science at the University of Malaysia, attended a conference in Yemen for Islamic scientists. Listening to MSU's Gary Strobel speak on novel medicinal compounds created by creatures that live between the cells of plants, Zin said she felt sure that her native Malaysia,

with its varied climates, forests and jungles, could be an important source of these potential medicines. She met with Strobel the next morning to learn more about his work. He also sent her a video called "Jewels of the Jungle," which described his search for such compounds in jungles around the world and work to develop medicines from them.

"It was the right place at the right time," Zin said. She went home and began to apply for grants that would allow her to study with Strobel so that she could continue the work back home. She received grants from her government and the United Nations to allow her to collect samples in Malaysia, travel to Montana and work with Strobel.

In mid-December, she, her husband Azman Musa, and their four children ranging from 2 to 12 years old, set off for the United States.

"I was overwhelmed with the people. I had thought that after Sept. 11 people might dislike Moslems, but in Seattle people came up to us with smiles," said Zin. "Here in Bozeman everyone has been so nice. The teachers were helpful when I enrolled my two oldest children. Everyone was so welcoming. I feel so happy."

Her two youngest children went home with her husband to Malaysia in early January. Zin and her two oldest will remain here until March.

Asked if it was unusual for a Moslem woman to have the freedom and encouragement to pursue advanced degrees, Zin said that people "should not confuse religion and culture." She said the Moslem religion puts no restrictions on a woman's profession, though she must fulfill her responsibilities. Her culture encourages education.

"For Moslems, the door is wide open for women to excel as long as they know their responsibility, to know your responsibility as a woman, as wife and as mother," Zin said.

Her father died when Zin was 1 1/2 years old, leaving eight children to be cared for by her mother and grandmother. Both women inspired their family, and several among the eight children are now teachers.

"They were very strong women," she said. She was told that getting an education and understanding Islam were the most important things she could do. She observes the traditional five times of prayer a day and the Moslem

restrictions on alcohol and food preparation, getting meat prepared in accordance to Moslem laws by ordering it from a company in Idaho.

She says she hopes to pass along those values to her children, and to pass along a love of learning to her students.

"I love to teach. I may wake up not feeling well, but I think, 'I have a lecture.' I do the lecture and I recover."

She also hopes to make a scientific contribution, perhaps finding medicinal compounds in the plants she brought from Malaysia to study in Strobel's lab.

"I would like to give some research that can help people to cure disease. I have a long way to go."

John Dudas – Accounting Tech – 324 LJH



I am John Dudas and I have joined PSPP as an Accounting Associate. I have been on sabbatical for the past 15 months during which time I've been playing in the mountains, traveling, running

marathons and working on writing initiatives. Prior to that, I served as the Controller for a small biotechnology company in Bozeman. Having spent 15 years in the Boston area, I earned a Masters' Degree in Accountancy at Bentley College and built a career in business management before deciding to move west in 2003 in order to unplug from the northeast culture. Quality of life (relationships, experiences and discretionary time) is important to me, and I'm doing my best these days to align my lifestyle with these values. Let's go for a hike!

Publications

E. Grimme, N. K. Zidack, R. A. Sikora, G. A. Strobel, and B. J. Jacobsen. "Comparison of *Muscodora albus* Volatiles with a Biorational Mixture for Control of Seedling Diseases of Sugar Beet and Root-Knot Nematode on Tomato." Plant Disease Feb '07.

Bob's Byte

By Bob Johnston

Do you have a problem with excess spam? If so, and if you use Outlook for email consider



adding a **Free** program called Spambayes to your email client.

The following is from the Spambayes web site: SpamBayes will attempt to classify incoming email messages as 'spam', 'ham' (good, non-spam email) or 'unsure'. This means you can have spam or unsure messages automatically filed away in a different mail folder, where it won't interrupt your email reading. First SpamBayes must be trained by each user to identify spam and ham. Essentially, you show SpamBayes a pile of email that you like (ham) and a pile you don't like (spam). SpamBayes will then analyze the piles for clues as to what makes the spam and ham different. For example; different words, differences in the mailer headers and content style. The system then uses these clues to examine new messages.

For instance, the word "Nigeria" appears often in spam, so you could use a spam filter, which identifies anything with that word in it as spam. But what if your business involves writing a guidebook on Nigerian Wildlife Conservation? Clearly a more flexible approach is necessary. Additionally spammers will adapt their content over time and will no longer use the word "Nigeria" (or the words "Lose Weight Fast", or any number of other common lines). Ideally the software will be able to adapt as the spam changes.

So, that is what SpamBayes does. It compares the spam and the ham and calculates probabilities. For instance, for me, the word "weight" almost never occurs in legitimate email, but it occurs all the time in 'lose weight fast' spam. SpamBayes can then look at incoming email, extract the most significant clues and combine the probabilities to produce an overall rating of "spamminess". It flags the messages so that your mailer can handle the different message types. You might set it up so that ham goes straight through untouched, spam goes to a folder that you ignore (or delete without checking) and the unsure messages go to another folder which you can review for errors.

To use spambayes go to this link:

https://sourceforge.net/project/showfiles.php?group_id=61702

If you decide to install the program, do the following first.

- 1: Create a folder called Junk E-mail or Spam
- 2: Move all the spam in your inbox to the folder you just created
- 3: When you run the program it will ask if you have already divided your email into good mail

and spam (bad mail). – say yes and then let the program know which folder has the good and bad mail.

4: The program will add an extra tool bar, which will allow you to add spam to the spam folder if the program fails to catch it. Usually after a week or so, Spambayes should be catching 95% or more of spam messages

When should I start growing vegetable transplants?

By Cheryl Moore 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 stocky 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 start your seeds.

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 temperatures. This is called thermoperiodicity and we do not 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 lean, lanky and weak plants.

To test the viability of seeds you stored from previous years, count out 25 (small seed) or 10 (large seed), wrap them in moist (not wet) paper toweling and place the package in a glass jar or zip-top plastic bag. Set the container in a warm place and loosely cover to keep the toweling moist. Open the toweling after 10 days or so and figure the percentage of seed that has germinated. Most fresh seed has a germination of 85 to 95%. If your seed is in that range, sow as you normally would. If your seed has between 50% and 85% viability, simply sow more thickly. If your seed has a germination rate less than 50%, discard it and hit the catalogs.

Wendy Lewis Marries Sam Johnson



Wendy Lewis married Sam Johnson on December 28, 2006. Wendy is working on her Masters in Plant Pathology with Dr. Alan Dyer. Jackie Campbell arranged the flowers for wedding. Congratulations Sam and Wendy!



Congratulations to Hussein Abdel-Hallem and Abeer Younes on the birth of their daughter, Miriam Lekha. She was born on January 16, 2007. Hussein, previously a post doc in Tom Blake's lab is now with the University of Georgia.



Congratulations to Aravind Jukanti and Deepa Shetkar on the birth of their daughter, Nithya Lekha. She was born on December 2, 2006. Aravind is a post doc in Andreas Fischer's lab.

Recipes of the Month

DANISH CHRISTMAS ROLLS – contributed by Judy Mathre (they are wonderful!)

Measure in to mixing bowl:

¼ c warm water

Add, stirring to dissolve, 1 package yeast

Stir in:

1 cup scalded milk

¼ c sugar

¼ c butter

1 egg

1 t salt

¼ t nutmeg

¼ t lemon extract

1/8 t almond extract

Half of 4 2/3 to 5 cups of flour

Mix with spoon until smooth. Add enough remaining flour to handle 3easily. Turn onto lightly floured board or cloth. Knead until smooth and elastic (about 5 min.) Round up in greased

bowl, greased side up. Let rise in warm place until double. Punch down; let rise again until almost double.

Roll dough into an oblong 12" wide and a little less than ½" thick. Spread with soft butter. Fold ½ of dough over the other half. Roll again and spread with soft butter. Roll and spread dough with butter four times. Cut into strips ¾" wide by 7" long. Twist each strip about 8-10 times. Wind the twisted strip around and around in the shape of a snail. Tuck end underneath on baking sheet. Let rise until light. Bake 8-10 minutes at 425.

Frost warm rolls with vanilla butter icing. Dip in chopped nuts (optional). Makes about 3 dozen rolls.

CHICKEN CHILI WITH PESTO

Swirl in a generous dollop of pesto before serving to liven up this classic white chili.

2 teaspoons vegetable oil

¾ cup finely chopped onion

¾ pound skinless, boneless chicken breast, cut into bite-sized pieces

1 ½ cups finely chopped carrot

¾ cup finely chopped red bell pepper

¾ cup thinly sliced celery

¼ cup canned chopped green chiles

¾ teaspoon dried oregano

½ teaspoon ground cumin

¼ teaspoon salt

1/8 teaspoon black pepper

1 (16-ounce) can cannellini beans or other white beans, rinsed and drained

1 (14 ½-ounce) can chicken broth

3 tablespoons pesto

Heat oil in a Dutch oven over medium-high heat. Add onion and chicken; sauté 5 minutes. Add carrot, bell pepper, and celery; sauté 4 minutes. Add chiles and the next 6 ingredients (chiles though broth); bring to a boil. Cover, reduce heat, and simmer 25 minutes. Stir in Pesto.