Plant Science Says

Happy Thanksgiving!

Volume 15, No. 10 November, 2012

MSU Ag Fair

The MSU Ag Fair (formerly Ag Appreciation Weekend) was held the weekend of October 26. Our Department was represented by The Schutter Diagnostic Lab, The Cereal Quality Lab, Dave Sands' Lab, Florence Dunkel and her research on sustainable food systems, a booth getting the word out about our new major Sustainable Foods and Bioenergy Systems and the Townes' Harvest Garden, The Montana State Seed Testing Lab, The Montana Seed Growers Association, The MSU Seed Potato Certification Program, and The Turfgrass Management Class.

Please go to the last page of this newsletter for more images of our participation in the MSU Ag Fair.

Strobel Receives E.O. Wilson Award

On Thursday, October 4, Gary Strobel was presented the E.O. Wilson - Biodiversity Technology Pioneer Award at the SUB for his work on biodiversity of endophytes. The following day he, Suzan Strobel, and Dr. Wilson of Harvard University, were hosted by George Keremedjiiev, of the American Computer Museum, on an excursion to Yellowstone Park led by Glenn Plum, the YNP chief naturalist. A wealth of stories were traded while an incomparable day in Yellowstone country unfolded. Strobel was recognized for his innumerable contributions to many aspects of microbial biodiversity especially as it relates to endophytic life forms. He is pictured here with Dr. Wilson overlooking artist's point.

Photo courtesy of Suzan Strobel

Rik L. Miller, a Story of Success

Rik L. Miller, President of Dupont Crop Protection, graduated from MSU's former Plant and Soil Science Department in 1983 with a B.S. in Agronomy, emphasis on plant and soil science and biochemistry. During his time at MSU, he worked for Ron Lockerman as a lab and field technician from 1980 to 1983. He began his career with Dupont in 1984.

and from 1984 to1995 he held a variety of roles in sales, product, and marketing management across the United States and in 1996 was appointed group leader for the DuPont Crop Protection Specialty Business (specialty crops and vegetation management markets). From 1996 to 2005 he was appointed to progressive sales and marketing management positions in Crop Protection.

In 2005, he was named global business leader for DuPont Crop Protection's diversified specialty, vegetation management, forestry and railroad segments and relocated to Wilmington, Delaware. One year later, he joined the DuPont Crop Protection leadership team as global marketing director.

In 2010, Mr. Miller transferred to Geneva, Switzerland, as regional director of Europe, the Middle East, and Africa for Crop Protection. He returned to Wilmington, Delaware, and was named to his current position in February, 2011.

Adventures in Hyderabad
By Norm Weeden

This month I had the opportunity to travel to Hyderabad (pronounced Hy'derbad), India and attend the Sixth International Conference on Legume Genetics and Genomics. This conference is a particularly important forum for legume genetics because it brings together researchers throughout the world to present their results and discuss recent advances and new directions in legume crops. Previous conferences have been held in Cairo, Adelaide, Lyons, Guadalajara, and Asilomar (CA).

It was my first visit to India, but I had been somewhat prepared by Priyanka Biswas, who worked in my lab for the last two years before returning with her husband to Calcutta this summer. She had attended the university in Hyderabad (well known for its agriculture and biotechnology programs) and was well acquainted with the area of the city where the conference was held. My flight went through Denver, then London (going west would have been about 1000 miles shorter but the connections were worse). The 10-hour flight from London to Hyderabad took us over Romania, the Black Sea, Turkey, Iraq, and the Strait of Hormuz—all places I had never seen, so even the long flight was very interesting.

Hyderabad is located on an eastward sloping plateau in central India approximately midway between the Western and Eastern Ghats. From 30,000' above, the whole region appears verdant and uninhabited, but that changed drastically when we touched down at the airport, which even at 4 am in the morning was teeming with passengers.

Fortunately, we (there were several people I knew on the same flight) were met at the airport by representatives from the conference and were taken by bus directly to our hotels, so we did not have to adapt to the rigors of Hyderabad's traffic immediately. [Note: I never saw an accident while there, but neither did I understand even the basic rules of driving except that one generally drove on the wrong side of the street and was not supposed to hit another vehicle, bicyclist, pedestrian or animal on the road]. I was very happy to leave the driving to the professionals!

Most of the presentations, discussion groups, and poster sessions were held in a large wing of the Hotel Marriott (for those of you familiar with the Plant and Animal Genome Conference, think Town & Country but smaller). The Marriott is located in an urban setting on Hussain Sagar Lake (a lake that actually connects the twin cities of Hyderabad and Secunderabad). Unfortunately, the hotel was not quite on the lake, and to get to the lake shore required crossing a very busy 4-lane road. A number of us made this crossing (remember, drivers are not supposed to hit pedestrians), but it was always a harrowing experience. The 1.6 km walk between the Marriott and the closest other hotel (where a group of us stayed) required crossing and walking along this road, a route that we soon named the 'Valley of Death.' Thus, for the

first three days of the conference most of us stayed very close to the Marriott.

However, we didn't have much desire to leave the Marriott because the conference was well run, the presentations and posters interesting, and there were many colleagues to see and catch up with. My own 'must see' contacts included colleagues from India, Spain, Australia, England, France, Poland, New Zealand, China, Mexico, Canada, and even a few from the USA that I don't run into at the meetings I normally attend. Every break provided a stimulating opportunity to go over new approaches or meet new researchers. Breakfast and lunch were served every day (more food than I could eat) and the heavy snacks during the evening sessions were more than enough to keep us going until bedtime. Food included lots of rice, vegetables, chicken, lamb, curry and many dishes I did not recognize.

The fourth day was the 'travel' day, when we all piled on buses and hit the high points of Hyderabad. The major historical sites in the city included the Charminar (see photo), built to celebrate the end of the plague, the Mecca Masjid (one of the oldest mosques in India), the Qutub Shahi Tombs (the resting place of seven kings from the 15th and 16th centuries), and Golconda Fort (the residence of those kings and a number of other rulers of Hyderabad). For those readers familiar with Tolkien's *The Fellowship of the Ring* trilogy, this fort reminded me very much of that at Gondor, with moats, multiple walls, secret passages, and special acoustic tricks. Unfortunately, the fort took nearly 70 years to build and was completed only 30 years before the king moved into what became downtown Hyderabad. About a hundred years later the monarchy was overthrown by Mughals from the north, and after a few rapid changes in possession, the eventual owner of the fort for the next 200 years turned out to be the tax collector (and his descendants) for one of the Mughals!

Inside Golconda Fort (note the huge granite boulders partly forming some of the walls). Photo courtesy of Norm Weeden.

Charminar, Hyderabad, India. Photo courtesy of Norm Weeden

That afternoon we all went to the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), which

The newly constructed biotech building at ICRISAT. Photo Courtesy of Norm Weeden

along with CYMMYT, IRRI and several other institutes belongs to the Consortium of Centers supported by the Consultative Group on International Agricultural Research (CGIAR). ICRISAT has the responsibility for the maintenance of the world's germplasm collection of chickpea, pigeon pea, sorghum, and groundnut (peanut), as well as conducting agronomic, breeding, genetic, and biotechnical research on each of these crops. The facilities at ICRISAT were very impressive, and the building for Translation Research on Transgenic Crops (see photo) was so new that the first floor laboratories had yet to be occupied.

That evening ICRISAT hosted us with a banquet and entertainment by dancers from all over the country. At the end of the performance, the dancers encouraged all of us to join them for a dance on the stage, and the Director of ICRISAT was one of the first to accept the challenge.

The conference continued for another day and a half, although I had to leave early the last day to make connections back to Bozeman for Monday classes. Overall, it was a wonderful experience to meet new people and chat again with long-time acquaintances. I have abstracts for the papers presented if anyone is interested. Hyderabad is an amazing place, and many of the attendees were able to visit other parts of India after the conference. For me, those other regions will just have to wait until another trip.

Listening and Learning on the Reservations
By Florence Dunkel

It was a lovely frosty Fall Friday early in the morning. Students clutched containers of hot liquid as they piled into cars at the Marsh Laboratory and caravanned with their professor, Dr. Florence Dunkel and an LRES graduate student of Dr. Cliff Montagne from Mongolia. They were beginning a long weekend visit to the Crow (Apsaalooke) and Northern Cheyenne Reservations in south central Montana. For many students and the TA, it was their first time on a reservation and they were going to live there for two to four days.

September 28 to October 1, 2012, students, professor, and graduate teaching assistant listened and learned 24/7 with only breaks for sleeping. This was the introduction of students in AGSC 465R Health, Poverty, Agriculture: Concepts and Action Research to their Northern Cheyenne and Apsaalooke site mentors. It was also students' first oral and behavioral exam on their cultural preparation and understanding of how to use the holistic process and participatory diagramming.

Students and mentors pause for a photo in Crow Agency, Montana following their final grant writing meeting for sustainable food systems while Bill Snider explains the significance of his wearing a Norwegian flag T-shirt on the reservation. Photo courtesy of Bob Diggs.

Very soon, students experienced what it was like to suddenly be in another country where their cell phones didn't work, where there was campaigning going on for different national elections, and where grocery stores or any kind of stores were rare. Quickly, students soon learned the importance of social connections and how these connections supersede whatever business needs to be done.

Meals were prepared together with fruit and vegetables from the home organic garden of Dunkel and husband and last year's hunt. They ate together and transitioned into long discussions afterward. This provided time for students to process this new, non-linear learning occurring with their professor and TA.

The holistic process drove the conversations with tribal members. First students confirmed the tribal member's desired quality of life and learned what resources were being used to achieve that quality of life. Quickly, tribal members got to the "forms of production" or how they wanted to involve AGSC students this semester in helping them produce these resources. Mainly students heard from tribal members who were former MSU students: Francesca Pine is now manager of the Greenhouse at Little Big Horn College and Meredith Tall Bull is organizer of the Botanical Teaching and Learning Center in the middle of Lame Deer, Montana on the Northern Cheyenne reservation. Francesca and Meredith assigned students to help them prepare for a USDA NIFA proposal they are jointly submitting November 17, 2012, to help them guide their people into building a sustainable, more traditional food system. AGSC 465R students soon captured on paper an intricate diagram summarizing a sustainable reservation food system envisioned by these two young tribal members.

After meeting with tribal historian, Mina Seminole, AGSC 465R students, Cassandra Dennis, Gretchen Troutman, and Kelli Stephens, confer with Northern Cheyenne site mentor, Josette Woodenlegs, at Cultural Center, Chief Dull Knife College campus, Lame Deer MT. Photo courtesy of Bob Diggs.

Students were sent home to Bozeman with the assignment to summarize the seven separate surveys and three sets of intensive interviews conducted over the past several years by their predecessors in this course. These surveys collected information from about 200 tribal members on perceptions of gardening, interest in gardening, including fresh fruits and vegetables into their diet, and returning to growing and eating the traditional gathered and home-grown foods of their peoples. Students continued their connection with site mentors through conference calls, e-mails, and more visits on their own to the reservations.

Since September, 2009, PSPP/AGSC 465R students have been engaged in collaboraive community-based research with members of the Northern Cheyenne and Apsaalooke (Crow) peoples living on these two Montana reservations.

Honey Bee Viruses as Biomarkers for the Sublethal Effects of Pesticides on Honey Bee Health
By David Baumbauer (with Michelle Flenniken)

Michelle Flenniken is a new research faculty member in PSPP whose research interests include honey bee viruses and the role they play in colony health. Michelle joins MSU from UC San Francisco where she worked studying viruses in migratory beekeepers' colonies and investigating honey bee antiviral immune responses.

I got a glimpse into this research while providing honey bees for her new project on virus - pesticide interactions funded by Project *Apis m.* a non-profit organization the supports honey bee research (www.projectapism.org).

The first step is to find frames of brood that contain emerging bees. One-day-old bees don't fly or sting so they are easier to work with in the lab. In addition, using newly emerged bees ensures that all the experimental subjects are the same age and have not been exposed to adult bees or the environment.

The adult bees are brushed off the frames which are then placed in cages which nest into an incubator that keeps the brood at the same temperature as the interior of the hive (the following photos are courtesy of David Baumbauer.)

Each day the newly emerged bees are moved from the incubator and chilled to immobilize them. The bees are pinned to expose the underside of the wing

attachment point which has a slightly thinner exoskeleton.

The device below delivers a precise amount of solution that contains a known quantity of virus.

Extremely fine glass tubes are fashioned into needles, so that the virus solution may be injected into each bee.

Ten bees receive the same treatment and are placed in a deli-container 'hive' for three days. The material at the top of the cup is almond pollen, the center contains food and the pesticide. Water is in the sponge at the bottom of picture. A small

piece of foundation is installed to make the deli container feel 'hivey'.

The deli cup hives are placed in an incubator set at 30°C. After three days, each bee is placed in a vial and 'prepared' for assessing the virus load by quantitative PCR and Western blot and chemical uptake by mass spectrometry. Transcriptome level gene regulation is also assessed by microarray, qPCR and/or RNASeq.

One of the take home messages I got from participating in this project is the complexity of all the interlocking puzzle pieces in honey bee colony health. The pesticide under investigation in this study is a common fungicide used by almond growers to protect blooms and developing almonds from fungal infection. While growers take precautions to avoid direct exposure of bees to pesticides, minute traces are probably picked up by bees while collecting pollen. Michelle is looking at one virus and one pesticide. Now add into the mix other parasites (*Varroa* mites, the microsporidia *)*, honey bee nutrition, weather, management decisions (pollination vs. honey production, re-queening, pesticides ...) and you should appreciate the difficulties identifying the 'cause' of Colony Collapse Disorder.

Urban IPM Program Sponsors Workshops
By Linnea Skoglund

The MSU Urban IPM program recently sponsored the workshops “Weed Identification for Landscape Professionals.” The half day workshops took place October 9 at the Yellowstone County Extension Office and October 10 at the Cascade County Extension office. We had 17 participants in each workshop. Those with commercial pesticide applicator licenses earned CEUs and everyone earned credits toward Urban IPM certification. As with our workshop last fall, Hilary Parkinson, plant ID diagnostician, and I collected weed samples and maintained them in the greenhouse. The lawns around the Plant and Animal Biosciences Buildings continue to be excellent sources of turf weeds.

Hilary began the sessions with hands-on training on the anatomy of monocots and dicots. With this knowledge, participants then used a dichotomous key custom made by Hilary to identify 20 plants. Most participants had never used a dichotomous key and it was gratifying for Hilary to see them put their newly acquired skills to use. We went through the answers on the key and awarded prizes for the most correct IDs. I talked about the insects and diseases that came through the Schutter Diagnostic Lab this year and the various causes of routine symptoms observed.

The Urban IPM program was created in 2009 at the urging of the landscape and nursery industry in Montana. One of the main areas of focus is the Certified Urban IPM Practitioner program. To become certified, twelve hours of approved education is required. Because it is the end of the certification cycle, credits from these workshops will carry over for any new enrollees. We now have 100 enrolled in the program and 31 certified practitioners.

MSU Crop and Pest Management School 2013
By Kevin Wanner

Enrollment is limited so register now for the Crop and Pest Management School held at Montana State University January 2-4, 2013. The 2½ day workshop will focus on small grains, with guest speaker Dr. Tim Murray, Professor and Chair of the Washington State University Department of Plant Pathology, talking about cereal diseases. Dr. Murray has twenty years of

experience researching small cereal grain pathology and an extensive publication record on that subject. Dr. Héctor Cárcamo, Research Scientist with Agriculture Canada in Lethbridge ,Alberta will speak on the use of trap crops in IPM and Dr. Brett Allen, USDA Research Agronomist from Sidney, Montana will talk about dryland cropping systems. In addition, twelve MSU staff from four departments will cover topics in weed, disease, insect and nutrient management as well as wheat breeding.

A registration fee of $195 provides workshop supplies, morning and afternoon refreshments, parking and the traditional pizza dinner at Colombo's. Crop consulting (CCA), private pesticide applicator and commercial/government pesticide applicator credits will be available. The schedule that includes instructions for registration can be found online at: http://plantsciences.montana.edu/mtproducerinfo.html

For more information contact Kevin Wanner, kwanner@montana.edu

MAES Seminar Schedule (all in 108 PBB)

Jennifer Britton – "Landscape Evaluation and Interpretation"
Tuesday, Nov. 13, 8:00-10:00

Kevin Wanner – "Using molecular tools to help manage wireworm and sawfly damage to Montana's crops "
Wednesday, Nov. 21, 10:00 – 12:00

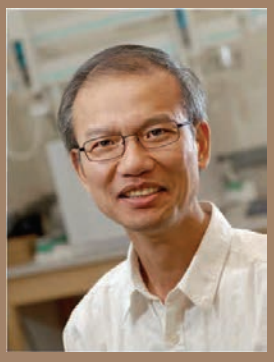
Chaofu Lu – "Engineering of Plant Oils for Industrial Applications"
Tuesday, Nov. 27, 9:00 -11:00

Cathy Cripps – "Mycology in Montana"
Thursday, Nov. 29, 1:30-3:30

Class Focus

BIOO 433—Plant Physiology - Chaofu Lu

This class is offered every spring semester. And is designed for upper level undergraduates (junior and senior) and graduate students, who have a basic knowledge of chemistry/biochemistry and



botany. Most of the students who take the class come from plant science related majors such as horticulture, plant biology, and crop science although many are from range science, wildlife management and others.

The scope of plant physiology as a science is very broad, ranging from biophysics and molecular genetics to plant development and environmental physiology.

Photosynthetic metabolism not only provides carbon and energy for the growing plant, but also determines the capacity of the plant to withstand environmental stress. The growth of roots, stems, leaves, flowers and seeds are regulated by a host of interacting factors such as hormones, light, temperature, nutrition and carbon metabolism. Plant physiology is a very active field of study and new revelations about how plants work are being published almost daily in predominant scientific journals such as Annual Review of Plant Biology, Plant Cell, The Plant Journal, and Plant Physiology among others.

In this class, we'll approach this subject from the perspective of the life of a typical angiosperm - from seed germination and plant development to how plants do things in their everyday life to flowering and plant death. Along the way, we will address topics of current relevance, such as the effects of increasing atmospheric CO_2 on plants, the use of plant materials for biofuels and renewable chemical feedstocks. The ultimate goal of this class is to uncover the inner workings of plants which we all depend on for our existence.

New Employees

Nancy Cooke - Montana Seed Growers Association

Growing up in Southern California, I loved being near the

ocean but always preferred cooler weather and snow. After graduating from UC Irvine, I took what was supposed to be a two month trip to Europe with my roommate. We landed in Garmisch-Partenkirchen, Germany, a ski resort in the Bavarian Alps and wound up staying eighteen months so we could travel, hike and ski. That started my lifelong passion for travel. Another passion is quilting and I like to talk about that any time.

My love of the outdoors and skiing continued and I knew I wanted to live in a ski area. I moved to Big Sky and worked several jobs before meeting Bob and Vivian Schaap who owned Lone Mountain Ranch. I started working there and stayed for 25 years! Over the years I managed the office, managed a retail ski/fly shop, worked on a project to redecorate and remodel all of the guest cabins and Dining Lodge and then became Director of Sales and Marketing. It was a wonderful place to work and the Ranch's exceptional cross country ski trails were right out the door. I made many lifelong friends at the Ranch, both among the guests and crew members. I worked at the ranch with the PSPP Accountant, Tamara Parnell, for five years.

I always thought that if I stopped working at the Ranch, I would like to be affiliated with MSU. I am really looking forward to working with Ron and Heather and learning about the agricultural industry in Montana.

Invited Lectures

Gary Strobel Gives Lectures Across the Country

Gary Strobel has been busy this term giving invited lectures at various universities, companies and conferences. He presented several invited lectures to the MSU honors students and as a result many of these undergrad students have expressed an interest in working on endophytes and are now anxiously engaged in his lab on various projects dealing with the products and biology of endophytes from Florida and Pacific Coastal plants. In addition, Strobel visited and lectured in the Department of Chemistry and Biochemistry at UC San Diego and the Department of Plant Sciences at BYU. In both cases, graduate and undergraduate student classes were invited to hear the lecture that he presented. Strobel also visited with numerous faculty members at these institutions and shared mutually scientifically interesting ideas and concepts. Finally, Strobel presented a seminar at Katzen International in Cincinnati, Ohio, where he discussed plans to build a plant that makes Mycodiesel. Strobel also gave a report to the Montana Ethanol Group at a meeting in Billings. Overall, in each of these cases a great deal of interest has been generated regarding the recent discoveries in his lab on fungal hydrocarbons and their potential use as fuels and renewable chemicals.

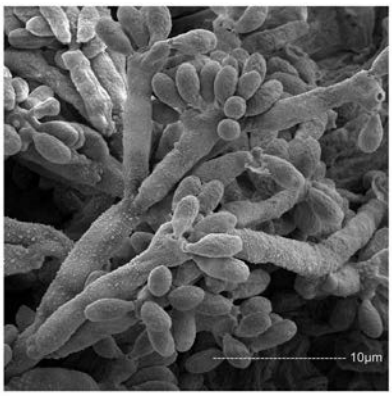


Photo courtesy of Gary Strobel

The SEM shows one of the fuel producing fungi- a Daldinia originally isolated by Morgan Mends in the Strobel lab. Her paper on this organism was just published (see Publications).

Also of note, both George Schaible and Jared Nigg, working in Strobel's lab have been awarded USP grants from the MSU undergrad scholars program. Jared works on the inducers found in plants that activate the pathways of terpenoid biosynthesis in Nodulisporium and has worked out appropriate assay systems and is well on his way to successfully having a scientific publication. His grant will come via the Governor's Energy Initiative Program. The same can be said for George who has isolated numerous endophytic fungi that are making products of enormous interest as fuels and renewable chemicals. He will work on the enzymes involved in the pathway of terpenoid biosynthesis.

Medical Entomologists and Vector Managers Stretch Views of Insects

Florence Dunkel recently attended an unlikely professional scientific meeting at Big Sky - the Northwest Mosquito and

Vector Control Association Fall Meeting on October 4-5, 2012. It was attended by medical entomologists and vector managers from Alaska, Canada, Washington, Oregon, Nevada, Idaho, and Montana.

Dunkel had agreed to give participants a new look at insects in the morning General Session. "Entomologists and World Hunger" was the agreed upon topic for the 45 minute presentation. Dunkel gave them that and more. She wove stories and data from her malaria vector management work in Mali in with her introduction to the main entrée presentation: "What's for Lunch? Have a Taste of the Sustainable World." The connection?-- What happens when scientists ignore local traditional ecological knowledge? Kids get sick, kids starve, kids die. Whose fault?

On the lighter side, she ended her presentation with a demonstration of *Galleria* Quesadilla. *Galleria melonella* is a lepidopteran pest of bee hives and is perfect as the main meat in a cheese quesadilla. Yes, there were no leftovers after the 100 or so vector managers were offered a taste.

Grants

Equipment Proposal Awards:

Michelle Flenniken	11,500
Alan Dyer	3,172
David Baumbauer	800
Deanna Nash, Mike Giroux, Luther Talbert, and Phil Bruckner	28,880
Bob Sharrock	25,000
Phil Bruckner	21,000

Barry Jacobsen and Nina Zidack, USDA, "Use of Bacillus mycoides isolate J (BmJ) induced resistance, rouging stylet oils and insecticides in management of Potato Virus Y. $130,625.

Publications

A photograph taken by Gary Strobel was recently featured on the cover of the October, 2012 issue of Microbial Ecology. The photo, a result of research by Joseph Schaar, is a beautiful example of sectoring in the endophytic fungus *Xylaria* sp.

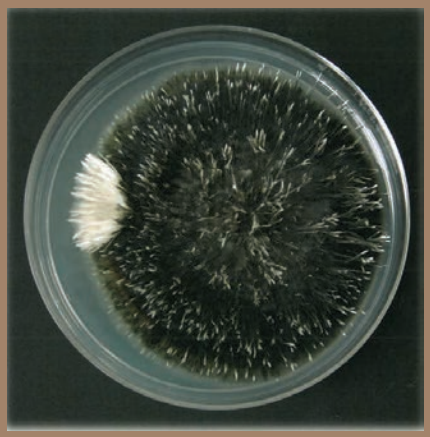


Photo Courtesy of Gary Strobel

It presumably is as a result of a spontaneous mutation that occurs in the culture as it grows on a plate resulting in a changed form of growth. In this case, the organism developed as an apparent frenetic growth of the white tipped stromata with both an extension of the tips and an apparent increase in number per square cm of the agar surface. This fungal species is found in both tropical and temperate rainforest and is commonly found as an endophyte. Isolates of xylaria are commonly making antibiotic substances and most often these compounds turn out to be one or more of the cytochalasins which are generally cytotoxic.

Dunkel, F. and A. Giusti. 2012. French students collaborate with Malian villagers in their fight against malaria. In J. Thomas, Ed. Etudiants sans Frontières (Students without Borders): Concepts and Models for Service-Learning in French. American Association of Teachers of French. In press.

Luong, Ky-Phuong, F.V. Dunkel**,** Keriba Coulibaly, and Nancy Beckage. 2012. Use of neem (*Azadirachta indica* A. Juss.) leaf slurry as a sustainable dry season management strategy to control the malaria vector *Anopheles gambiae* Giles s.s. (Diptera: Culicidae) in West African villages. J. Med. Ento. In press.

Mends, M.T., Yu, E., Strobel, G.A., Hassan, S.R.U., Booth, E., Geary, B., Sears, J., Taatjes, C.A., and Hadi, M. (2012). An endophytic Nodulisporium sp. producing volatile organic compounds having bioactivity and fuel potential. J. Petrolem and Envir. Biotech.3:3 http://dx.doi.org/10.4172/2157-7463.1000117

Master Gardener Training
By Toby Day
Extension Horticulture Associate Specialist

Although Halloween and all the pumpkin antics have passed, I wanted to share with you two great accomplishments in growing pumpkins that occurred this year. Many of you have seen the giant Atlantic pumpkin that I grew here in the Gallatin Valley that reached 380 pounds. It has been sitting in the PGC atrium for a few weeks now.

Toby Day and his 380 lb pumpkin. Photo courtesy of David Baumbauer.

However, as far as Giant Atlantic pumpkins go, mine was quite small compared to what I consider the first great accomplishment of 2012 (when discussing pumpkins). Emmett May, the Master Gardener in the Pablo area who got me hooked on growing these massive squash grew a 1030 pound Giant

Emmett May's 1030 pound pumpkin dwarf's this five pound pumpkin. Photo courtesy of Daniel Martynowicz

Atlantic and is again, the Montana giant pumpkin record holder for Montana. It is quite an accomplishment to grow a half-ton pumpkin in Montana. I know, I gave it quite a go this year using what I know about growing pumpkins and grew one only 1/3 the size. Congratulations Emmet May!

The second great accomplishment is that the first ever grown and weighed full-ton Giant Atlantic pumpkin was recorded at the Topsfield Fair in Topsfield, Massachusetts. Ron Wallace grew his behemoth 2009 pound pumpkin, which was not only the largest pumpkin, but is also recognized as the largest fruit ever grown in the world. For those of you who are breeders and want to know, he grew the pumpkin using the 1725 Harp seed and crossed it with the 1409 Miller.

Ron Wallace, 2009 pound World Record Holder

O.K., many of you don't know much about growing giant pumpkins, but if you want to know more or if you have always wanted to grow one, local growers such as Pete Fay from Rocky Creek Farms and Montana record holder Emmett May and I have been in conversations about starting a competition locally. I am trying to get Emmett (he has verbally committed) to come to Bozeman to give a talk about how to grow the Giant Atlantic pumpkin, and give away some (not all I am sure) of his techniques. I will keep you posted about this event in the future.

Recipe of the Month

Breakfast Casserole - brought to Friday coffee by Mary Burrows on 10/19.

1 lb of breakfast sausage
8 oz of diced ham
1/2 c of fresh chopped mushrooms
1 c of chopped onions
1 can of Rotel
18 eggs
1 c of cheese
1 32 oz package of hash browns
Salt and pepper to taste
Fresh baby spinach

Lightly brown sausage—just enough to crumble meat. Layer half o the hash browns in the bottom of the slow cooker, followed by half of the sausage and half of the ham. The next layer will be all the baby spinach, the mushrooms, and onions.

Repeat the first 3 layers (hash browns/ sausage/ham), and then top with a can of Rotel. Whisk the 18 eggs in a bowl, then pour over top. Sprinkle cheese over top of casserole and cook on low for about 8 hours.

November Birthdays

Jim Berg	4
Jack Martin	8
Steve Hystad	10
Harvey TeSlaa	15
Adam Richman	22
Charissa Bujak	26
Peggy Bunger	27

See next page for more images of the MSU Ag Fair.


Timothy Grass


International
Agriculture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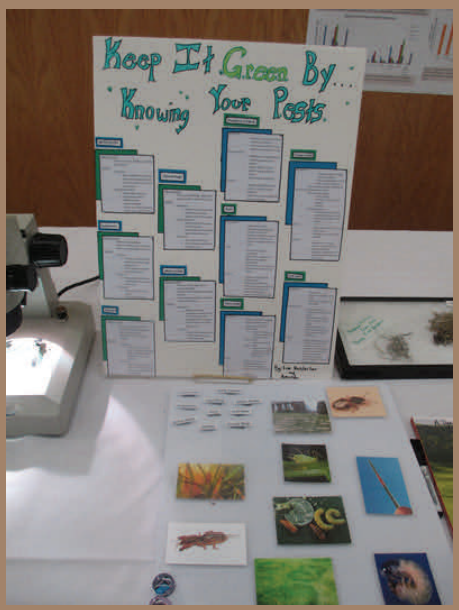
MONTANA SEED GROWERS ASSOCIATION
Don't
Jeopardize


Keep It Green By...
Knowing Your Pests


Fun Farm Facts
End-u
Analysis
Breedi
Department of