

# Plant Science Says



# Happy Thanksgiving!

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## Giroux Receives Award



Dr. Mike Giroux was recently awarded the Young Crop Scientist Award. This award is being given to Dr. Giroux by the Crop Science Society of America and is awarded to a

person who is under 40 years for outstanding contributions to the field of crop science. He was nominated by Jack Martin.

Mike will be receiving his award at the annual 2007 Crop Science Meeting in New Orleans from November 5 - 8th. Congratulations Mike!

## FALL LANDSCAPE TOUR 2007, PORTLAND OREGON By Bill Pond

Seven senior landscape design students spent Labor Day weekend visiting Portland area special landscapes. Piling into an MSU van, the group went on a six-day adventure driving over 1,600 miles to the Pacific Coast and back. Accompanied by Assistant Professor Bill Pond, they visited the Portland, Oregon area to explore contemporary landscape projects. The sightseeing included eighteen built landscapes and a hosted tour of the office and work of the award winning Landscape Architecture design firm Greenworks.



Of particular interest in the tour was studying onsite innovative work demonstrating creative storm water management applications. Many examples of sustainable urban landscapes visited demonstrated cleaning and recycling rain water through bioswales, infiltration and porous pavement systems. The students

visited many examples of these types of work such as Tanner Springs Park,; the Hoyt Street Rain Garden Courtyard, the Portland Convention Center Rain Garden, the River East Office Center, and the and various Green Street projects around Portland.

Oregon's number one industry is plant nursery production. Of horticultural interest, the Northwest region is a gardener's paradise. One place we visited, the Portland's Washington Park, offers the International Rose Test Garden that is the oldest rose test garden in the United States. It also is home to one of the west coast's most famous Japanese gardens. Another project visited by the students was the Oregon Garden. This region's horticultural bounty is presented in all its green glory at this park. The Garden covers over 80 acres and demonstrates over 38 different theme gardens.

The explorers spent Labor Day at the beach in Gearhead. Besides enjoying the spectacular coastline , some feasted on fresh seafood. The final highlight of the trip was getting close to sea lions, looking them in the eyes and hearing their barking.



## **Great Plains Diagnostic Network - Annual Meeting and Nematology Workshop, October 2-4, 2007**

**By Nina Zidack, Mary Burrows and Will Lanier**

The first week of October, the Schutter Diagnostic lab crew traveled to the home of the Wildcats, Kansas State University in Manhattan, Kansas for the Great Plains Diagnostic Network (GPDN) annual meeting. This is the 6<sup>th</sup> year of the GPDN and this meeting was of particular importance due to the recent successful appropriation of USDA-CSREES funding for a new 5-year cooperative agreement for the National Plant Diagnostic Network (NPDN). The focus of the meeting was to establish the objectives for diagnostics in our region, and how we can improve our response to pest outbreaks, whether they occur naturally or as a biosecurity threat.

In addition to discussing the governance, structure, and budgeting aspects of the new 5-year grant, we had 'break-out sessions' to help identify priority areas for our region. The plant pathologists identified three focus areas including: initiating a region-wide survey for virus diseases of small grains, enhanced pest ID and management training for "advanced" Master Gardeners, and development and validation of new diagnostic techniques in our labs. The entomologists would like to see enhanced image capabilities for remote diagnosis and uniform funding for entomology programs within the NPDN.

Nina proposed a web-based seminar series for our region to enhance communication and education. The weekly seminar series will be initiated in January and will run through mid-March with all 9 states in the GPDN participating. We will keep you posted as the schedule develops so that members of our department can also take advantage of regional expertise in Plant Pathology and Entomology.

Will Lanier provided an on-line demonstration of new educational tools that will be used to train individuals in a broad range of agricultural fields to become "First Detectors" of pest outbreaks. These are

interactive training and testing modules that are self-guided and promise to be a valuable resource for providing field practitioners with a knowledge base to determine if a pest outbreak is of high consequence, and guidance on how to direct specimens through the appropriate diagnostic channels.

In addition to discussing the future of the GPDN, we had the opportunity to tour the newly completed and soon-to-be operational Biosecurity Research Institute facility. This state-of-the-art Biosafety Level 3 (BSL-3) containment facility will be a resource for studying plant pathogens such as stem rust race UG-99, food-borne illnesses such as *E. coli*, and animal diseases including hoof and mouth disease. With Halloween approaching, we all felt this place was creepier than any haunted house. The animal unit includes a functioning slaughter house (the only BSL-3 slaughter facility *in the world!*). All research animals have a one-way ticket into the facility with their trip culminating in a tissue digester capable of dissolving a 1200 lb animal in less than 2 days.



*Doug Jardine discovered soybean rust (*Phakopsora pachyrhizi*) shortly before we arrived in Kansas. While he was out scouting, his office was turned into a rust pustule.*

After the GPDN meeting was over, Nina Zidack and Mary Burrows attended a Nematology workshop which provided a great opportunity to hone up on our nematode ID skills, and learn techniques for molecular identification of the little worms. Nina was particularly relieved that she could ID *Pratylenchus*, especially considering that

Wendy Johnson will be leaving us to go back to, of all places, Kansas!

Mary spent an extra day in the sunflower state to visit Dallas Seifers in Hays, KS to talk about virology (woo-hoo!) and saw field sorghum for the first time (kinda like field corn). The most frequent comment from other participants was "Why would you go to Hays? That's such a long drive." Mary's response was: "I'm from Montana."

### **NSF Awards 26 New Grants to Seed Plant Systems Biology**

The National Science Foundation (NSF) has awarded a four-year, \$4.6M grant to a project team led by John Browse at Washington State University to continue research that uses biochemical genomics to reveal components of biosynthesis pathways necessary to produce novel fatty acids in oilseeds.

The types and respective quantities of fatty acids in vegetable oils have a direct impact on the fuel properties of biodiesel. The basic knowledge from this project is intended to enable the design of a new generation of specialty crops that will become the "green factories" of the future, providing for the production of industrial lubricants, solvent oils and biodiesel.

The award was one of 26 new grants made by the NSF totaling \$85.8 million during the tenth year of its Plant Genome Research Program (PGRP).

The project team, which also includes researchers from Michigan State University, SUNY Stony Brook, and Montana State University (Chaofu Lu), will use genomics to access the network of genes and proteins that synthesize and accumulate novel fatty acids in seeds.

Evolution of new enzyme functions, together with the co-evolution of additional biochemical and cell biological traits, has provided hundreds of potentially useful chemicals in seed oils, including the hydroxylated, conjugated and cyclopropane fatty acids to be studied in this project.

Providing a detailed description of genes and proteins required for optimal pathway function requires the integrated deployment of four strategies, according to the researchers:

-Investigate and optimize the activities of enzymes for unusual fatty acid synthesis using bioinformatics and protein engineering.

-Carry out extensive sequencing of seeds sampled through the period of oil synthesis, and use functional genomic screens to identify co-evolved enzymes (and other protein functions) required for incorporation of the novel fatty acid into the oil.

-Perform biochemical analysis of the identified proteins and quantify their contributions to the accumulation of unusual fatty acids through expression in transgenic plants.

-Analyze protein-protein interactions in membranes to gain insight how these pathways are physically organized.

Experiments will attempt to reconstruct the native pathways in transgenic plants using expression of multiple genes and pathway engineering.

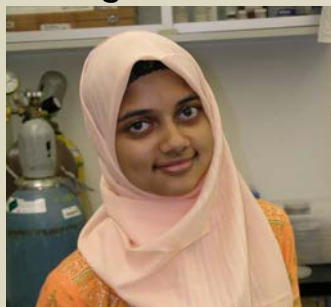
**Aravind Jukanti Takes New Position**



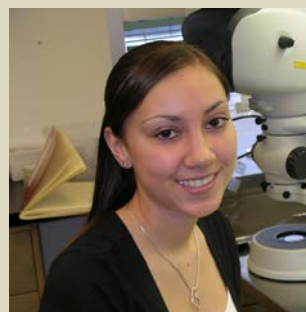
Aravind Jukanti has accepted a position as a post doc at the Donald Danforth Plant Science Center in St. Louis Missouri. This position will be funded for four years by NSF.

We wish Aravind and his family all the best.

**Undergrad Scholars in Strobel Lab**



Both Raima Amin and Angie Mitchell, working in Gary Strobel's lab, received undergraduate research scholar



grants from MSU to work on bioactive endophytes. Raima is studying the endophytes of some plants she collected this summer in the Sunderbands of Bangladesh and Angi

is working on a novel isolate of *M. albus* that she obtained from wild pineapple in the upper Amazon of Bolivia.

**Employees**

**Mary Bateson (Mark Young)**



My name is Mary Bateson, and I'm happy to have joined the Plant Sciences Department this October. I'm working in the labs of Mark Young and Trevor Douglas, and am very excited to begin

delving into areas of research that are new for me. My previous 21 years of employment was working with Dave Ward in the Department of Microbiology and then Land Resources and Environmental Sciences, studying the microbial ecology of hot spring microorganisms. Some people in Plant Sciences may recognize my name as the person who ran a DNA sequencing service for several years.

My recreational interests include hiking, cross country skiing, gardening (and especially composting), quilting and knitting.

**Huffing for Stuffing**

**By John Dudas**



Hello Plant Sciences; I'd love to have your support, please, by volunteering and participating in our inaugural fund raiser event: Huffing For Stuffing Thanksgiving Day Run. We are raising money for the Gallatin Valley Food Bank

on Thanksgiving. This idea brings together the popularity of running events on Thanksgiving morning with the strong local running/recreational community and Bozeman's proclivity to support local worthy causes.

We've raised \$9000 in cash sponsorships and have reputable media sponsors in the Bozeman Daily Chronicle, Moose Radio and ABC/Fox TV. We anticipate several hundred participants and seek 100 volunteers. Check us out online at:

[www.huffingforstuffing.com](http://www.huffingforstuffing.com). Hope you'll come out and have some fun with us!

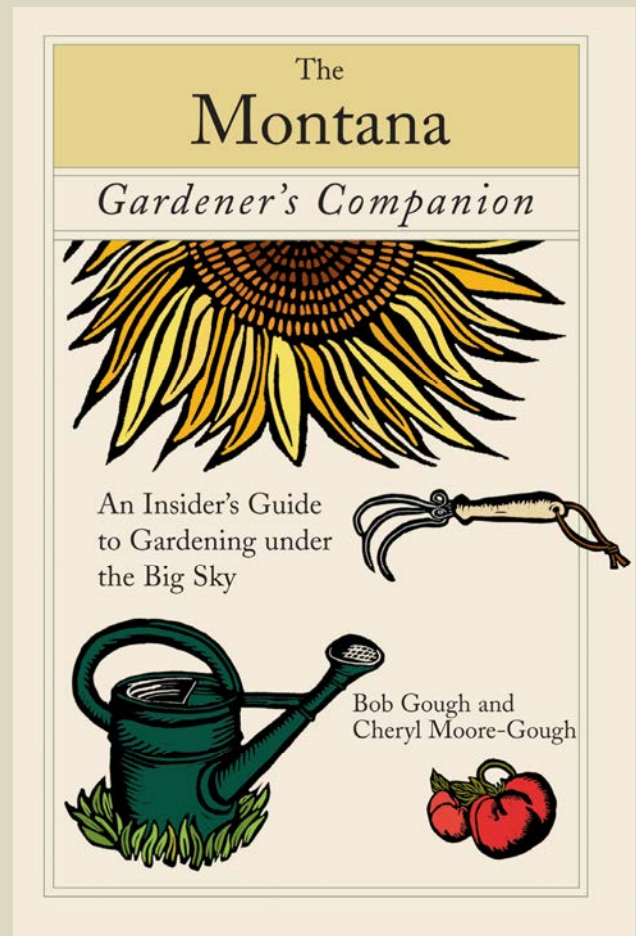
### Grants

Cathy Cripps, "Investigation of mycorrhizal fungi associated with whitebark pine in Glacier National Park" funded by the Glacier Park Nursery. We have previous funding to study the native fungi of whitebark pine in Waterton Lakes National Park, Yellowstone National Park and the New World Project site. Inoculation trials of whitebark pine seedlings with native fungi are the next step in our research.

Chaofu Lu, "Biochemical Genomics: Quizzing the Chemical Factories of Oilseeds," Washington State University.

### Books

Gough, R.E., C.Moore-Gough. A Montana Gardener's Companion. Globe Pequot Press This book covers the basics of gardening as they are interpreted in the state of Montana. Many general recommendations do not apply under Montana conditions and can damage or kill our plants. Even recommendations for growing in "The Rocky Mountains" do not pertain to our entire state, the western parts of which lie in the Rocky Mountains while the eastern parts lie in the Northern Great Plains. The Montana Gardener's Companion gives pointers specifically useful to Montana gardeners in every part of the state, and includes references, resources, and a glossary to help get more information on Montana gardening. A page from this book is at the end of the newsletter.



### Publications

G. Strobel, "Tesoros ocultos de la jungle," Americas, Diciembre, 2007. Pg 38-45. This is a publication of the Organization of American States.

Chaofu Lu, Martin Fulda, James G. Wallis, John Browse (2006) A high-throughput screen for genes from castor that boost hydroxyl fatty acid accumulation in seed oils of transgenic /Arabidopsis/.

<http://www.blackwell-synergy.com/doi/abs/10.1111/j.1365-313X.2005.02636.x> /The Plant Journal/ 45 (5), 847-856.

doi: 10.1111/j.1365-313X.2005.02636.x

### Patents

Gary Strobel. Endophytic Gliocladium Species And Methods Of Producing Volatile Compounds And Hydrocarbons (provisional patent submitted 10/07).

Ren, Yen, Gary Strobel and D. Teplow. Volutellin A an Immunosuppressive Peptide from Volutella sp. (provisional patent 10/07) (Y. Ren, Gary Strobel and D Teplow).

## Protecting Climbing Roses in Winter By Cheryl Moore Gough

Many roses are marginal in Montana, though some species and cultivars grow quite well in some areas. If you haven't already done so, gently lay the canes down and use a heavy bent wire in a U-shape to keep them close to the ground. Cover the canes with evergreen boughs and/or leaves. Leaves of maple, elm, and some other trees will mat and restrict penetration of air and water to the roots. If you're going to use them, mix them with leaves of other species or with willow twigs or spruce boughs before you apply them. Before the soil freezes, mound it over the base of the bush to a height of about a foot to protect the roots. When it freezes, cover the mound with about 6 inches of leaves to keep it frozen. If you have little snow during the winter, try shoveling what you have over the rose bush to further insulate it against extreme cold. Remove all mulch and mounded soil in spring and train the canes back to a trellis.



## Bob's Byte Improving Your Cameraphone Photos

With cameraphones becoming one of the fastest growing segments in the digital camera market, it is important to make the most of them. The biggest problem is that though the newer ones have higher megapixels, better lenses and high capacity storage, the results aren't as appealing. Some of it could be due to lower quality cameras, but it is also often a result of poor photographic technique. So, below are a few tips for all you cameraphone owners that will help you get the most from your handy gadget!



### 1.) Light Up Your Subject

Lighting plays an important role, particularly since the cameraphone isn't as well equipped as a stand alone camera. The better the light around your subject is, the clearer your image is likely to be. Here are some easy tips: Shoot outdoors where there is natural sunlight or shoot indoors where the lights fall on the subject evenly all over. Some cameras have a built in flash that doubles as an LED torch. Use that to give a greater

clarity to your pictures, even if you're shooting outside.

### 2.) Don't Use the Zoom

It is best to come closer to your subject than to use the zoom on your cameraphone, because it could result in pictures that are less sharp and sometimes blurry in low light conditions. What's worse, if you don't come closer to your subjects, they will look like a speck in a large shot and therefore, they won't be distinguishable. Cameraphone images tend to be smaller due to low resolutions, so fill up your view finder with your subject to save having to zoom in on the subject in editing later (which decreases quality even more).

### 3.) Avoid Camera Shake

Try to lean your cameraphone/hand against a solid object (like a tree, wall, ledge, etc.) when taking your shots. This is particularly true in low light conditions when the camera is prone to using longer shutter speeds. That means it's a longer exposure and it demands that you stay put for at least a few seconds after pressing the shutter down.

### 4.) Store All Pictures

It's best to keep all the photos you have taken from your cameraphone for awhile and revisit them when you have more time to spare. What you initially thought to be bad photos, because they were blurry or out of focus, could be quite useable in an abstract kind of way. Even more, they could be used to create a painting kind of effect in Photoshop later on. Also, remember that the photo might appear bad on someone's computer, but not yours. So, if possible, hang on to your shots until you can get them on your PC.

### 5.) Feel Free to Experiment

Because they are mobile and tiny, cameraphones are quite handy in allowing you to not only take as many shots as you want (cell phones usually have 8 GB memory cards), but they also help in experimenting with different angles. For example, you could shoot from down low, up high, close up, etc. and you'll end up with interesting and cool shots. You can always discard what you don't like later and you don't have to pay a

penny for your indulgence, which is one of the many benefits of being digital, I might add!

## 6.) Break the Rules of the Game



Before you do that though, you need to know the rules of composition. For example, the Rule of Thirds mandates that you

place your subject a third of the way into the frame and not bang in the middle. But, who stops you if you fill up your frame with your subject, leaving no room on either side or placing your subject right at the corner of the frame? Or, better still, take only half of the subject's face to show off your creativity. Once you know the rules, the new rule should be: anything goes!

## 7.) Clean Your Lens



Finger-prints are a common problem on camera lenses, especially if your phone doesn't have a lens cover.

Treat the lens of your cameraphone the way you would treat your sunglasses. In fact, use the very same cloth to wipe the lens every time you use it for shoots. Since cell phones are usually outside and some don't even have dust covers, it's important to clean the lens before starting to take shots.

## 8.) Set the Resolution Every Time

Make sure you set the resolution of your cameraphone every time you are using it. If it's just shooting pictures that you don't

really feel the use for, set it to a low resolution. But, if it's an important shoot where you'll want to keep your pictures for posterity, make sure you have it set to the highest resolution. Also, remember that the higher the resolution, the larger amount of memory it will use. So, it's advisable to use at least a 2 GB memory card. That should allow you to take at least 800 pictures at the highest resolution.

Happy cameraphoning!

## Recipes of the Month

### Pickles Chinese Style

By Li Huang

Clean cucumbers and let them air dry (no surface water is the key) and rub salt all over them until the



color changes and they look like they have been soaked in water – a few minutes.

Put two big pieces of ginger roots and two big splashes of white cooking wine into a big clean container, mix well and stack as many cucumbers as you can into a bottle, seal it tight. Leave the bottle at room temperature for one day, then refrigerate for one week. It should be ready to eat. The less salt you use, the more sour they will be.

This recipe is also suitable for hot peppers, long Chinese beans, etc.

### Butternut Squash Soup

6 T chopped onion  
4 T butter  
6 c peeled and cubed butternut squash  
2 c water  
1 c apple cider  
4 c chicken bouillon  
½ t dried marjoram  
¼ t ground black pepper  
1/8 t ground cayenne pepper  
1 8 oz cream cheese



Roast the squash along with some smashed garlic cloves (brush olive oil on them) at 375 for 30-45 minutes. In a large saucepan, sauté onions in butter until tender. Add pureed squash and cream cheese along with

water, apple juice, bouillon, marjoram, black pepper and cayenne pepper. Heat through, but don't boil.

### November Birthdays

Jim Berg	4
Carli Lofing	4
Jack Martin	8
Kathi Trujillo	8
Emby Davich	15
Harvey TeSlaa	15
Leila Feiz	17
Cathy Cripps	18
Adam Richman	22



## Disease Pathogens

Pathogens are agents that cause disease. Like insects, pathogens can overwinter in debris and infested stems. In autumn rake the fallen leaves and fruit from infected plants and remove them from the property. Likewise, prune out diseased shoots and branches and get them off location. Turn under uninfected and uninfested garden debris in your fall plowing and otherwise tidy up the yard and garden.

A pathogen cannot cause a disease on its own. It needs help. To cause a disease the pathogen must have a favorable environment *and* a susceptible host. The three components of a disease are the pathogen, the host, and the environment. Often called the "disease triangle," all three components must be present for the disease to occur.

Following are a half-dozen diseases that you will likely encounter in your Montana landscape.

## Disease-Resistant Plants

"Gardeners in Montana must be aware of various plant diseases that can cause real problems for them," says Don Mathre, MSU plant pathology professor emeritus. "Purchase seed that has been treated with a fungicide to control seedling damping-off diseases. If you must use nontreated seed, be sure to wait until the soil has warmed enough to minimize damping-off."

"For other diseases that occur as the plant is growing, it is best to use disease-resistant varieties, especially tomatoes that are resistant to verticillium and fusarium wilt diseases," he advises. "Also, rotate your crops to minimize the buildup of pathogens in the soil. Because of our dry summer climate, we don't have much trouble with diseases that attack the foliage, with the exception of powdery mildew."