PLANT SCIENCE SAYS

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The Western Region IR-4 Project meeting in Davis, CA
By Mary Burrows

In March, I attended the Western Region IR-4 Project meeting in Davis, CA. I'm Montana's IR-4 State Liason Representative. The IR-4 Project is a government project that facilitates pesticide registrations on minor crops. Since the primary crop plant in Montana is wheat, which is not a minor crop, you might wonder why Montana is involved in this program. Well, there are a number of minor crops in Montana, and some are useful rotational crops for wheat. Examples of minor crops in Montana include camelina, mustards, safflower, cherries, seed potatoes, malt barley, mint, nursery and floral crops, etc. This program can also facilitate pesticide registrations for minor uses on major crops. An example is if we needed an insecticide that was not labeled on wheat to control the Haanchan mealy bug, which is a newly identified insect on barley in Montana.

IR-4 receives requests for assistance from growers, commodity groups, and research and extension personnel. In responding to these grass-roots needs, IR-4 leads the coordination and focus of generating data to support the regulatory clearances of crop protection chemical and biological products for food crops through the EPA. IR-4 also coordinates efforts to generate efficacy and crop safety data to support chemical and biological crop protection products for ornamental horticulture crops. To accomplish this, IR-4 has developed a 4-step approach: 1. Research prioritization, 2. Research planning, and 3. Research implementation and 4. Data submission and approval. More details about this process can be found on the IR-4 website, ir4.rutgers.edu.

One way IR-4 has helped Montana is by requesting the registration of Poast (sethoxydim) for weed control in camelina. EPA is currently reviewing this request, and will have a decision by September, 2008 at the latest. The IR-4 Project coordinated with the Montana Department of Agriculture, Montana State University, BASF, commodity groups and the EPA to put the petition together. Estimates of potential economic loss without the use of IR-4 based section 18s in Montana from 1998-2005 is $165,000,000.

Tomato transplants at Masterplant

Another great reason for me to be involved in IR-4 is the great tours and presentations at the western region meeting. This year we toured Ratto Brothers' vegetable farm, and I learned they get 4 harvests of 38-40 vegetable varieties off of 1000 acres of land, using 'only' 4-5 feet acres of water per year! Their compost production was impressive – in fact they have phosphorous toxicity problems from their organic matter. One of their

largest concerns was food safety and all of the new federal regulations. We also visited Masterplant, which provides 80% of the vegetable transplants in CA (mostly canning tomatoes). We also saw almond, avocado, pomegranate, and olive trees on a bus tour along the Delta. The first evening concluded with a Mary-inspired CA wine tasting and some Ratto Bros. vegetables for dinner. The second day we heard about IR-4 activities from Marion Miller and Jerry Baron, Todd Scholz tried to educate us about the farm bill, Joe DeFrancesco talked about the Global Minor Crops Summit in Italy, and Doug Walsh talked about his recent trip to China.

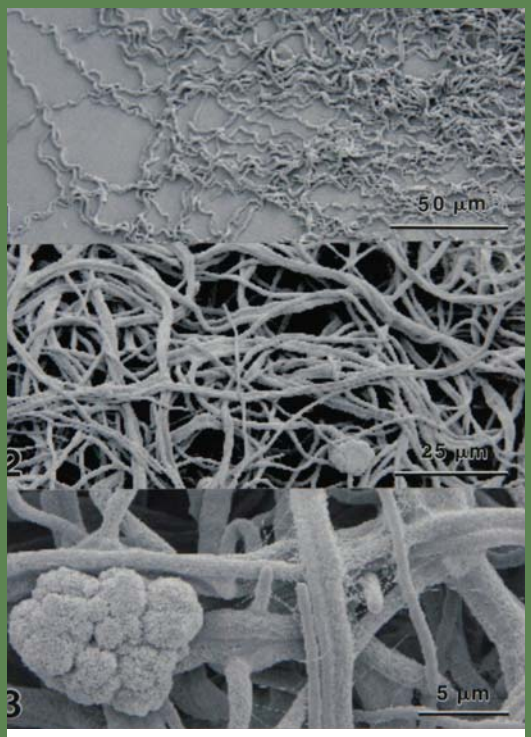
A sample of the vegetables being shipped by Ratto Bros.

Ecuadorian Amazon Expedition in March 2008
By Gary Strobel

The main destination for the Yale University rainforest expedition this year was the Napo river area in the upper Amazon basin of Ecuador. The group was accompanied by 17 Yale undergrads, Gary and Suzan Strobel along with Angie Mitchell. Angie is a USP student majoring in cell biology and neuroscience at MSU and her trip was paid for by a Howard Hughes grant to Gwen Jacobs. Angie has been involved in isolating and characterizing endophytic microbes from rainforest plants for the past 1.5 years in Strobel's lab. This was her opportunity to see first hand how plants are targeted for research and what it takes to find them and acquire samples. One of the main problems encountered is getting a target plant identified. Also accompanying the group was Mr. Percy Nunez Vargas from Cusco, Peru who is probably the most accomplished botanist in South America.

Angie Mitchell with Gary Strobel and Percy Nunez taking a plant sample and discussing its relative merits for endophyte isolation in the area of the Napo river in Ecuador.

Angie's primary concern was to learn how she might match up with an overwhelming majority of Yale students who were on the trip to collect certain targeted plants. At first she felt a bit overwhelmed but after playing several word games, being one of the only ones to make it to the top of an extinct volcano to collect plants, and to be present to administer first aid to a Yale student who almost severed his thumb (getting a plant sample), she began to realize that she was just as accomplished as any of them. In fact at the time she was introduced to the group, she proudly spoke of her recent isolation and characterization of a novel fungal species that she named *Muscodor crispans*. The newly forming fungal hyphae are produced in a "top ramen" like style –thus the designation *–crispans.*



Muscodor crispans isolated and described by Angie Mitchell.

Ultimately, the group visited several rainforests in Ecuador while gathering tens and tens of plant samples. While many encounters were made with biting ants, mosquitos, and nasty flies, there were many episodes of pure delight and wonder and nature was being observed in action. For instance, a variety of hummingbirds were encountered in the Bellavista cloud forest near Quito.

Several notable events occurred on the trip besides the thumb severing episode. One student nearly stepped on a huge coiled *fer de lance* which turns out to be one the most poisonous snakes in South America.

Mudslides on the road from Quito to Cuenca caused great delays in travel, but it was surely interesting to see why the problems with slides have developed. The entire Andean forest has been cut and crops and cattle do not occupy these slopes. The newly created man related activities have reduced ground cover and root /soil relations to a point that the water saturated soils simply give way and take down entire hillsides.

Imagine yourself trying to drive on this scary road between Cuenca and Guayaquil Ecuador.

The Buff -Tailed Coronet hummingbird of Ecuador

The Masked Flower Piercer of the Ecuadorian cloud forest

Overall the trip was productive in that many photos and plant samples were acquired. New friends were made and the sights, sounds and wonders of a new place were experienced. Such opportunities should be available to all MSU students.

New Employees
Tamara Parnell – Accountant

Hi Everyone; I'm the new accountant in the Plant Sciences and Plant Pathology Department. Thank you to everyone for making me feel so welcome. I'm looking forward to meeting new friends and being able to work with old friends once again. My degrees are in accounting and wildlife biology. I know. It's a weird combination; but, I am perpetually curious and always looking to learn something new. The majority of my work experience is in accounting. Those positions are in various types of companies including manufacturing, guest services, retail, and public accounting to name a few. I'm looking forward to broadening my horizons once again by learning to work in a university setting.

Outside of work, I enjoy hiking, skiing, reading, movies and exploring new places. Though I love music, I just listen these days. See you on the trails.

Publications

Tercek, M.T., T.S. Al-Niemi and R.G. Stout. (2008) "Plants Exposed to High Levels of Carbon Dioxide in Yellowstone National Park. A Glimpse into the Future?" *Yellowstone Science* vol. 16(1), pp. 12-19.

Jukanti, A.K. and A.M. Fischer (2008) "A high-grain protein content locus on barley (Hordeum vulgare) chromosome 6 is associated with increased flag leaf proteolysis and nitrogen remobilization." Physiol. Plant. 132:426-439. doi: 10.1111/j.1399-3054.2007.01044.x

How can I increase germination of my garden seeds?
By Cheryl Moore-Gough

About this time of year, gardeners are wondering how to get better germination in their vegetable and flower seeds. Of course, start with good seeds and in most cases you'll have good germination, but some seeds are notoriously tough with hard seed coats. Well, researchers in Georgia have found a common household substance that increases germination in watermelon seeds.

The new seedless watermelon cultivars on the market are, for the most part, triploids. That means that they form fruit that have no developed seeds. While they are no good for seed-spitting contests, the melons do make great eating. The triploid cultivars are expensive to produce and, unfortunately, the seeds have thick coats that interfere with germination. These researchers have found that soaking the seeds in 1 percent solution of hydrogen peroxide at room temperature and in the dark greatly improves their germination. After just a day or two in the solution, the seeds germinated readily in petri dishes and would no doubt do so in the garden soil.

The 1 percent solution of hydrogen peroxide does not damage the emerging radicle, but solutions 2 percent or higher do severe damage to the young seedling. The hydrogen peroxide solution generally available in the drug store is a 3 percent solution, so you'll have to dilute it with water. You can do that by adding 2 parts water to 1 part hydrogen peroxide. So far, researchers have only tested the solution on watermelon seeds, but they suggest that it might also improve germination in a wide range of "hard-coated" seeds, such as those of cabbage and broccoli. If you decide to try it, let me know the results.

Insert a predefined symbol by using AutoCorrect
Bob Johnston (Irene Decker filling in)

Type a predefined AutoCorrect entry that is in the following list, and watch Microsoft Office Word automatically replace it with the appropriate symbol. For example, type **-->** to insert →.

Type	To insert
(c)	©
(r)	®
(tm)	™
...	…
:) or :-)	☺
:| or :-|	😐
:(or :-(	☹
-->	→
<--	←
<==	⇐
<=>	⇔
==>	⇒

Recipe of the Month

Carrot Cake by Linda Sherwood

1 1/2 cups sugar
4 eggs
1 tsp vanilla
1 1/2 cups cooking oil
2 cups flour
2 tsp baking soda
1 tsp salt
3 tsp cinnamon
1/2 tsp allspice
3 1/2 cups grated carrots
1 cup chopped nuts
cream cheese frosting

1. Preheat oven to 350F. Grease and flour 13x9x2 inch pan.

2. In large mixing bowl, beat sugar and eggs. Add vanilla and oil. Beat well.

3. Sift four, soda, salt, cinnamon, and allspice together.

4. Gradually add dry ingredients to egg mixture, mixing thoroughly after each addition. Fold in carrots and nuts.

5. Pour into prepared pan.

6. Bake about 45 minutes, or until cake center springs back when pressed with fingertip. Cool.

7. Frost with cream cheese frosting

April Birthdays

Matt Lavin	10
Bill Pond	11
John Sherwood	12
Mike Giroux	12
Andreas Fischer	25
Nina Zidack	26
Martha Peters	30