Plant Science Says

Happy Halloween!

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Second Annual Hop Harvest a Success! And Some Lessons from this Year...

By Vickie Blake

The weather was perfect and the turnout plentiful for the second annual hop harvest at the MSU hopyard at the Hort Farm on September 18. All 38 of the Cascades were harvested, as well as most of the second year bines from the other varieties.

Due to the exceptionally cool summer, most of the first year bines did not reach more than about six feet, and did not produce many cones. These are still growing in the yard, and will remain strung until our first killing frost. We will also propagate potential replacements for these from the 'Mother' plants in the West Greenhouse. Although the Cascade section was uniformly vigorous last year, two of the rhizomes were killed over the winter, indicating that we need to be prepared for this possibility for a few years until the rhizomes are fully mature.

Most of the pickers chose to stay at the yard to harvest their cones, and a lot of children joined to help the effort. Fueled by four dozen Granny's donuts, a festive time was had by all. Several groups took one of each variety, so a lot of home brewing is in store for Bozemanites. Like last year, Lone Peak Brewery in Big Sky gathered several bines of Cascade and is currently brewing 'fresh hop ale' from our hops.

Despite the successful harvest, we learned several lessons this year about how NOT to grow hops, including:

1) Make sure the overhead cables are not as heavy as the supporting cables, or secure the intersections. The section on the south side is sagging and three cables are now side by side in the center. We will either move and secure them (with a person lifter) or just reconfigure the stringing next year to work around this.

2) Use stronger stakes in the ground and stronger bine supporting twine. Many of the six inch staples pulled out this year and the heavy crop load on the second year bines broke some of the supports in windy weather.

3) Prune to just two bines per support and

do NOT let bines grow on the ground. The wet weather in August encouraged quite an impressive population explosion of aphids and spider mites.

4) Stake and string as early as we can get into the yard, and just deal with the cold. Again, an overgrowth of early vigorous bines took over.

On a positive note, we are still trying to grow the rhizomes so perhaps more vegetative growth was a good thing. We'll see next year.

We are expecting nine more varieties from the National Clonal Germplasm Repository (NCGR) any minute so the yard should be nearly full by next year. Rather than 40 plant blocks we are reducing this to 20 plant blocks to fit more varieties.

Another change we will implement next summer is hopyard 'work parties' one evening and one Saturday a month during the growing season. With sweat equity, hop enthusiasts will be able to tag promising bines to harvest at the end of the season. The e-mail list of interested locals has grown to nearly 50, so a force of volunteers should be possible.

There are still a lot of cones out there so if anyone in the department is feeling the urge to brew, or craft relaxing hop pillows, let us know.

Cheers!

'Snowball's Chance' Vineyard is Thriving at the MSU Hort Farm
By Vickie Blake

To accompany the hopyard and Bob Gough's orchard, the Blake lab planted a vineyard at the MSU Hort Farm this spring with 120 vines representing 20 cold-tolerant varieties. These varieties are all American or French-American hybrids that can withstand -30 degrees when dormant. *Vitis vinifera* (i.e. Cab. Sauv., Pinot Noir, Zinfandel, Reisling, Chardonnay) wouldn't stand a chance here and stories of Montanans sinking many thousands of dollars trying to grow these varieties are common.

Vic Blake did her Ph.D. in the Viticulture and Enology Department at UC Davis, and escaped the Academy twice in grad school to work the 'crush' in Napa at Pine Ridge (1993) and Freemark Abbey (1997). Since considering moving to Bozeman five years ago, the challenge of planting a vineyard in Montana has been looming and this year it was finally fulfilled.

We acquired 21 varieties from the cold-hardy grape germplasm collection (Geneva, NY) and all but 'Himrod' survived propagation in the mist bench and cold room.

Vic inspecting a vine after three months of growth in the vineyard.

The vineyard is planted from the most hardy (Beta) near the road to least hardy (Vanessa), so if varieties cannot survive here, the vineyard should remain cohesive. Most of these are jam/jelly or table grapes, with just a few wine grape varieties (St. Pepin (white) and Marechal Foch (blue)). Bozeman does not generally get the heat units to grow proper wine grapes that will need to be ~25% sugar to ferment to a 14% ethanol wine, so a fine red wine is really out of the question here, but we had to include one for good measure. Lower alcohol whites may be achievable, but again, this may be over-optimistic. Table grapes, and jam/jelly grapes do not require the sugar levels, and with the encouragement of Bozemanites that have vines in their home gardens, we are confi-

dent that at least a few varieties will survive.

We did not trellis the vines this year, and allowed them to grow and spread with the idea of growing as much vegetative tissue as possible to strengthen the root system. Next year, like this one, fruit clusters will be removed while we shape and strengthen the vine. Grape clusters are formed in the buds of the previous year's growth, and generally there are as many as three shoot/cluster buds in each compound bud.

We will allow these vines to stay unpruned near the ground until next spring. They will then be pruned to two major arms (cordons) and will be trellised only two feet from the ground, with support wires at four feet for fruit-bearing shoots. This trellising method attempts to take advantage of a snow cover that will protect the buds during the occasional warming trend in the winter/early spring. With the advice of a local grower, they will not be pruned until early spring next year, to 'sacrifice' the terminal buds that may break first, only to then be killed by frost.

Like the hopyard, the intention of the vineyard is to demonstrate to local gardeners what could survive in this climate, and eventually provide a fruit harvest to accompany the hop harvest. We are working with the crew at Towne's Harvest to eventually transition both to that project, and hope to include a community effort to maintain the vineyard.

On the last page of this newsletter is a vineyard map. We'll update the map next spring once we learn what will survive. We named the vineyard 'Snowball's Chance' for a good reason.

In the Garden of Linfield
By Jennifer Britton

A common irony among design professionals stems from the brutal, windowless, or temporary buildings, in which we typically receive our education. As if part of appropriate design school curriculum is firsthand knowledge of "what not to design." Luckily for PSPP Landscape Design student's this unpleasant right-of-passage is not their fate. A new design studio graces Linfield Hall basement.

After a summer of sweat, some tears, and very little blood, facilities tore down walls, added operable windows, painted, hung white boards and installed new carpet. A week before classes began PSPP folk gathered as if raising a barn. We moved the whole of the Leon Johnson Hall studio. Mightier arms than mine (thankfully!) lifted drafting tables, lockers, and chairs. The empty spaces filled and the rooms took shape. We have in essence three

Dillon Graham, Senior Design Class, critiquing figure – ground studies

Tim Obstar, Senior Design Class, critiquing figure–ground studies

spaces: the main studio, a lecture area, and the "breakout" room which houses additional computers and student activity space.

Since we recently moved we still have some polishing touches to finish—fine tuning furniture placement, functional enhancements such as pin boards and posters for bare walls. Yet beyond refinements, students and faculty have a fresh space with plentiful natural light. The exposed piping has a hip industrial look like a major city design firm filled with creative minds. From the Landscape Studio, designers can see seasons, weather, and plants. Best of all, we can become visually a part of the world we help to create.

A Journey to Bitterroot
By Jennifer Britton

An Indian story tells of the origin of the Bitterroot plant. The sun heard a mother crying because she couldn't find food for her family. In sympathy she changed the woman's tears into the Bitterroot so she would always have food for her children. Like most lore, the Bitterroot story has grounding in truth, a lesson taught. Survival. Food. The small purplish-pink succulent flower *Lewisia rediviva* provided sustenance to the Salish (Flathead) Indian Nation, Lewis and Clark, and later settlers. From the Bitterroot's life sustaining significance comes the naming of the Bitterroot Valley and the honor of being Montana's state flower. For myself, a recent transplant, it is a fitting plant to discover and the so-named Bitteroot Valley became my first exploration. For this year's fall Montana Nursery & Landscape Association tour I travelled south of Missoula in the company of Tracy Dougher, David Baumbauer, Toby Day, and recent graduate Bill Szasz. We joined 70 other participants on a grand tour of six Nurseries and Landscape businesses. Each stop in our chartered yellow school bus offered up stores of baked goods. We began at Great Bear Restoration where flocks of Salix cuttings pushed new growth. Next we stopped at Empire Landscaping to admire their solar panels. Earth & Wood Craftsman, Nature's Enhancement, Bitterroot Nursery and finally Canyonview Nursery. We grazed through raspberries, strawberries, apples...all akin with best fruit adjectives- sweet, plump, crisp, juicy. We tromped through manicured rows, as if Peter rabbits with permission from farmer to nibble. Roger Joy, with his sun kissed skin and black suspenders, stood near at hand describing his methods, culture, and philosophy. An antithesis to my recent days in Seattle grey our tour day had glorious, steady sun.
As dusk settled in and the BBQ buffet with Bluegrass Band lulled us into relaxation,

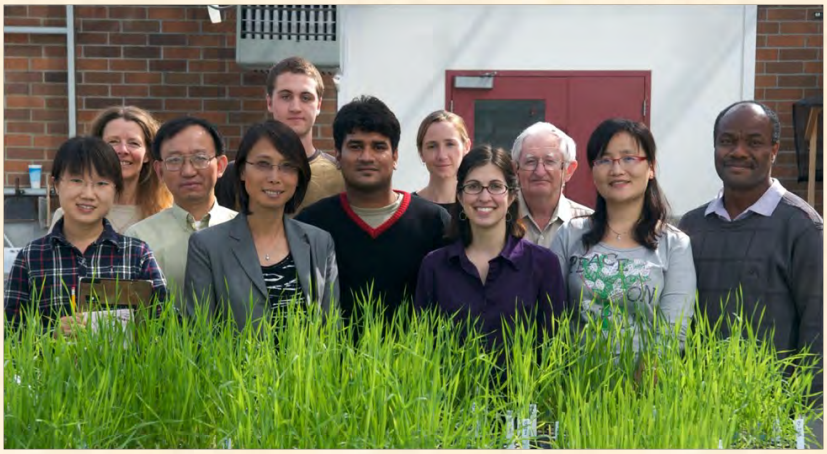
Drawing by Jennifer Britton

we said our departing goodbyes. With a wide smile Roger gave us a parting gift of braided sweetgrass; and being the new comer David bestowed the gift onto me. "Lovely, thank you...it smells so good." I said. Yet it wasn't until later I came to understand sweetgrass. I have a personal lore not unlike the bitterroot tale.
In the morning I learned my Aunt was in surgery. They had discovered a malignant tumor. Yet as I talked to anxious family separated by 900 miles my eye paused on the braid. There on our dining room table lay the grass, a slender whip form, a Montana native. In Indian culture the braided grass stems provides incense for smudging, for purification and to carry prayers to the Great Spirit. It's life force self-evident for when cut, it retains its fragrance. The botanical name, Hierochloë, literally trans-

lates from Greek as sacred (hieros) and grass (chloë). My sacred grass felt like a chalice of tarnished gold. I knew myself a temporary guardian and instinctively thought it needs to be with another. Now my bit of Montana, my sunny day of abundance, is travelling post haste to California in hopes that the grass as legend says, "never dies" will restore spirit to my Aunt. My trip to Bitterroot began like many journeys. I saw a place and a people. I gained functional and aesthetic knowledge. But somewhere my course skewed and I ended my journey somewhere not anticipated. I entered into the unique connection only harbored between a person and a plant. It seemed fitting, as a new faculty member of PSPP, I share my experience. In my journey to Bitterroot I found life, and that life was a plant.

The First BREAD Project Meeting at Montana State University (September 2nd-September 8th 2010)
By Jackie Campbell

During the first week in September the Huang lab hosted a project meeting in support of an international research project led by Dr. Li Huang. Dr. Huang was awarded a BREAD (Basic Research to Enable Agricultural Development) grant funded by the National Science Foundation and the Bill and Melinda Gates Foundation. The BREAD program supports basic research that has a direct impact on agriculture in the developing world. Dr. Huang's research on wheat rust disease resistance was chosen by BREAD as an important contribution to disease management through genetic resistance. The focus of the project is inactivating rust resistance suppressors to unlock multiple defense responses in wheat. Dr. Huang is leading the project with key collaborators in Australia, China, and Kenya. A major tenet of the program is training young scientists; accordingly each participating lab will have a PhD student working on the project. An exchange program will allow these students to train in the key laboratories for a short period of time. There are three key contributing labs led by Dr. Evans Lagudah and Dr. Linda Tabe at CSIRO in Australia, Dr. Junhua Peng from the Chinese Academy of Sciences/Wuhan Botanical Garden in China, and Dr. Sridhar Bhavani from CIMMYT in Kenya. In addition to the lead scientists three graduate students and a post-doctorial researcher from the key labs attended the project meeting. The meeting began the exchange program for Yan Liang, a PhD student from Dr. Peng's lab who will be in the Huang lab for the next three months. The meeting also began Dr. Hongtao Zhang's tenure as a BREAD post-doc in the Huang lab.



BREAD Project Meeting Participants, MSU Plant Growth Center. Left to Right: Back row, Dr. Linda Tabe (CSIRO), Cameron Clevidence (Huang lab), Jackie Campbell (Huang lab), Dr. Bob McIntosh (BPI). Middle row, Dr. Junhua Peng (CAS), Dr. Sridhar Bhavani (CIMMYT), Dr. Evans Lagudah (CSIRO). Front row, Yan Liang (Peng lab), Dr. Li Huang (MSU), Mina Talajoor (Huang lab), and Dr. Hongtao Zhang (Huang lab) (photo by Ian Johnson).

The researchers met for several days to discuss the BREAD program details, research strategies, and to begin the collaborative effort. The group also participated in training by the renowned rust researcher Dr. Bob McIntosh of the Plant Breeding Institute, Australia. Dr. McIntosh led the group through a leaf and stem rust disease evaluation session in the PGC (see picture on next page).

The training offered a dual opportunity; for the students to learn from the incredible experience and knowledge of the senior scientists and to establish a consensus on disease assessment among the participating labs. In addition to the greenhouse disease assessment the group scouted for

Rust Disease Assessment Training, MSU Plant Growth Center. (photo by Ian Johnson).

Fort Ellis Research Plots, MT. Left to Right: Dr. Evans Lagudah, Dr. Amor Yahyaoui, Dr. Junhua Peng, Dr. Bob McIntosh, and Dr. Linda Tabe (photo by Li Huang).

rust in and around the wheat research fields at Fort Ellis and the Post Farm. In addition, Dr. McIntosh recounted some of the rust research highlights in a seminar he presented to the PSPP department.

When the project meeting business and training was complete the visiting researchers had time to enjoy a bit of the Montana landscape. The group accomplished drive-by tours of Glacier National Park and Yellowstone National Park. Even though time was limited on the tour of Glacier the group enjoyed fantastic weather, sweet Flathead cherries, and a taste of snow on top of Logan pass.

In Yellowstone everyone appreciated the hydrothermal features and the elk, bison, deer, and chipmunk sightings.

The conclusion of the meeting marked the beginning of an exciting research endeavor for all of the participants!

Montana Ag Live! Fall Schedule

10/3 Kim Falcon, Executive Vice President of the Montana Wheat and Barley Committee, "Influence of Montana's Wheat and Barley Committee on Montana's Agriculture"

10/10 John Dudley, School Safety specialist from Lincoln, NE, "School Safety Issues in Rural Montana".

10/17 Rick Mulder, Water Quality Specialist with the Montana Department of Agriculture, "Water Quality in Montana".

10/24 Myles Watts, MSU Professor of Economics, "The impact of the lingering credit crunch on Montana's agriculture".

New Employees

Hongtao Zhang (Li Huang)

Hello, I am Hongtao Zhang and I will be conducting research in Dr. Li Huang's lab as a post-doc. In June, I received my PhD in Agricultural Science from the China Agriculture University in Beijing after five years in wheat genetics and genomics lab. The focus of my PhD

research was comparative fine mapping and candidate gene cloning of a powdery mildew resistance gene in wheat. The results of my work were published in TAG.

My primary professional interest is genetics, especially wheat genetics. I chose to seek a research position abroad because I knew it would offer me many exciting challenges and opportunities. Fortunately, I was chosen for this valuable opportunity in the PSPP Department. I like the fresh air, the blue sky, and the green plants here in Bozeman. I have lots of new friends here in Bozeman who have been very friendly and helpful.

I am originally from the HeBei province of China. I am an outgoing person and I am looking forward to getting to know all of you. My hobbies include singing, reading, running, and mountain climbing. My motto is: "Let perfection be the rule and not the exception." Happy life, happy work!

Publications

Developing Native Multispecies Sod: An Alternative Rehabilitation Method for Disturbed Lands. Stott, Lance V.; Dougher, Tracy A. O.; Rew, Lisa J.. Restoration Ecology, Sep2010, Vol. 18 Issue 5, p742-752

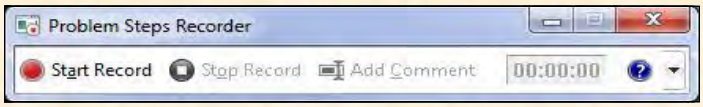
A Few Hidden Features in Windows 7
By Matt Rognlie (Irene Decker filling in)

Enhanced Calculator

Windows' built-in calculator hasn't really changed much over the years, but Windows 7's calculator has a few extra tricks up its sleeve, which you'll find under the View menu. It can do myriad kinds of unit conversion (temperature, weight, area, and eight others), interesting date calculations, and even has worksheets to calculate a mortgage payment or a car's fuel mileage. It maintains a history of your previous calculations as long as the program is open.

Problem Steps Recorder

When you need outside PC help, it's much better to let them see for themselves what's happening on your system. But if remote access isn't an option, the Problem Steps Recorder may be the next best thing.



Search for and run "psr" from the Start menu. Click Start Record, and the utility will record your activities through a series of screen shots, automatically including captions that show exactly where you clicked. You can also use the Add Comment button to highlight specific areas of the screen and insert custom annotations. When you stop recording, everything will be stitched together and saved as a Web browser-compatible MHTML (MIME HTML) file, conveniently pre-ZIPped and ready for e-mailing to your geek of choice.
These tips are courtesy of PCMagazine.

The History of the Jack O'Lantern
By Toby Day

O.K., I didn't write the following article about the history of the jack o'lantern – I stole it from www. History.com. However, it explains the story of how the jack o'lantern came about much better than I ever could. While we prepare for Halloween, I thought that it would be beneficial to see why most pumpkins (rather than turnips?) are hacked to pieces and where in the world we got that tradition. It is also why I think that Irish myths are the simply the best…

"People have been making jack o'lanterns at Halloween for centuries. The practice originated from an Irish myth about a man nicknamed "Stingy Jack." According to the story, Stingy Jack invited the Devil to have a drink with him. True to his name, Stingy Jack didn't want to pay for his drink, so he convinced the Devil to turn himself into a coin that Jack could use to buy their drinks. Once the Devil did so, Jack decided to keep the money and put it into his pocket next to a silver cross, which prevented the Devil from changing back into his original form. Jack eventually freed the Devil, under the condition that he would not bother Jack for one year and that, should Jack die, he would not claim his soul. The next year, Jack again tricked the Devil into climbing into a tree to pick a piece of fruit. While he was up in the tree, Jack carved a sign of the cross into the tree's bark so that the Devil could not come down until the Devil promised Jack not to bother him for ten more years. Soon after, Jack died. As the legend goes, God would not allow such an unsavory figure into heaven. The Devil, upset by the trick Jack had played on him and keeping his word not to claim his soul, would not allow Jack into hell. He sent Jack off into the dark night with only a burning coal to light his way. Jack put the coal into a carved-out turnip and has been roaming the Earth with ever since. The Irish began to refer to this ghostly figure as "Jack of the Lantern," and then, simply "Jack O'Lantern."

In Ireland and Scotland, people began to make their own versions of Jack's lanterns by carving scary faces into turnips or potatoes and placing them into windows or near doors to frighten away Stingy Jack and other wandering evil spirits. In England, large beets are used. Immigrants from these countries brought the jack o'lantern tradition with them when they came to the United States. They soon found that pumpkins, a fruit native to America, make perfect jack o'lanterns."
If you are trying to get your pumpkins to turn from green to orange, it all has to do with light. If they are still on the vine (amazing huh? What a fall!), remove some of the leaves around the pumpkin so that it will get increased sunlight. If it is off the vine, simply turn the green portion toward the light. Finally, to keep your pumpkins lasting longer after you carve them, rub petroleum jelly on the cut parts...a tip I learned from Martha Stewart.

Recipe of the Month

Pumpkin Roll

3 eggs
1 cup white sugar
2/3 cup canned pumpkin
3/4 cup all-purpose flour
1/2 teaspoon ground cinnamon
1 teaspoon baking soda
1/2 cup chopped walnuts
confectioners' sugar for dusting

1 cup confectioners' sugar
3/4 teaspoon vanilla extract
2 tablespoons butter, softened
8 ounces cream cheese

Preheat oven to 375 degrees F (190 degrees C). Grease a 15x10x1 inch baking pan and line with parchment paper. Grease and flour the paper.

In a large bowl, beat eggs on high for five minutes. Gradually add white sugar and pumpkin. Add flour, cinnamon, and baking soda. Spread batter evenly in pan. Sprinkle walnuts evenly on top.

Bake at 375 degrees F (190 degrees C) for 15 minutes or until cake springs back when lightly touched. Immediately turn out onto a linen towel dusted with confectioners sugar. Peel off paper and roll cake up in the towel, starting with the short end. Cool.

To Make Filling: Mix confectioners sugar, vanilla, butter or margarine, and cream cheese together till smooth. Carefully unroll the cake. Spread filling over cake to within 1 inch of edges. Roll up again. Cover and chill until serving. Dust with additional confectioners' sugar, if desired.

October Birthdays

Hope Talbert	5
Florence Dunkel	10
Bob Sharrock	11
Joanna Gress	13
Jamie Sherman	20
David Parrot	27
Peng Liu	31

Vineyard Map

Vennessa								Tender
Seyval			**Vignoles**					
De Chau-nac							**Canadice**	
Van Buren				**Aurore**				Tender to Mod
Swenson Red								
St. Pepin								
Fredonia								
Foch								
Edelweiss								
Concord								
Elvira					**Wordon**			Mod Hardy
Bluebell								
Valiant								Hardy
St Croix								
Kay Grey								
Beta								V.Hardy

	Red berries
	Blue berries
	White berries