

Plant Science Says



*Happy St.
Patrick's
Day!*

Volume 15, No. 2

March, 2012

ASHS Collegiate Scholars Award

The MSU Horticulture Faculty has named their American Society of Horticultural Sciences (ASHS) Collegiate Scholars and Outstanding Undergraduate Student Award for 2011-2012.

The prestigious ASHS Collegiate Scholars Award honors the top juniors and seniors in horticulture from all over the United States. This year's MSU nominees are:

Heather Begger
Elisa Boyd
Luke Bromley
William Chandler
Erin Gunnink
Laurie Neuman
Cassandra Peters
Jamie Raznoff
Kris Champeny

Congratulations to all of you!

Outstanding Undergraduate Horticulture Student Award



The ASHS Outstanding Undergraduate Horticulture Student Award recognizes an elite group of students from across the US for their academic, leadership, and service achievements. This year's MSU recipient is Erin Gunnink.

Erin is an MSU Presidential Scholar, is in the University Honors Program, and has completed several undergraduate research projects. Erin is incredibly involved in the Bozeman community. Her involvement with the Cunningham's ATA Martial Arts School engages her in many ways with the community. Erin is a recent state champion

in taekwondo and has shared her passion for the martial art. Since 2004 she has volunteered as an instructor for kids and adults alike, spending 3-4 times (at a couple hours each) a week teaching. The martial arts program also involves Erin in many community service projects. Erin has participated in projects ranging from collecting toy donations for Toys for Tots to money raising activities for a girls' school in Pakistan through the Central Asia Institute. To round out her busy schedule, Erin worked with the MSU Grounds department and completed her internship at Cashman's Nursery, learning the ins and outs of horticulture in the public eye. Erin openly shares her experience with other students in and out of her courses, adding tremendously to the students' learning. She also was an outstanding Teaching Assistant in the Woody Ornamentals course, where her technical skills and infectious passion for plants clearly enriched the student's experience.

Congratulations Erin!

Recipients of both these awards will receive a certificate from ASHS and their names appear in the April issue of the *ASHS newsletter*.

SAVE THE DATE **By Martha Peters**



Montana EPSCoR and the National Science Foundation invite you to attend:
"Science: Becoming the Messenger"
Communicating Science to a Non-Technical Audience

The workshop will be held on Wednesday, May 16, 2012, from 7:30am - 6 p.m. It is open to all participants.

This interactive workshop developed by the National Science Foundation provides science communication tools to help researchers communicate more broadly with the public.

Participants: This workshop is open to researchers, scientists, engineers, graduate students, early career scientists, and public information officers. The focus will be on science communication basics, defining the audience, developing messages, explaining science, working with reporters, public outreach and using multimedia.

Registration: There is no registration fee, however pre-registration is required.
Registration coming soon.

Where: The University of Montana, University Center, Missoula, Montana

A block of rooms has been reserved at the Doubletree Hotel Missoula Edgewater at the rate of \$87/night for May 15-18 under the Group name "Becoming the Messenger". Call 1-406-542-4611 or 1-800-222-TREE to make reservations.

For more information, contact Martha Peters at mpeters@montana.edu

Web Accessible Plant Specimens By Matt Lavin

Images of plant specimens in the MSU Herbarium are now web accessible. The MSU Herbarium, which is administered by the Department of Plant Sciences and Plant Pathology, houses a collection of over 80,000 preserved vascular plant specimens. These specimens serve to document the diversity and distribution of over 2500 vascular plant species known to be native and introduced in Montana. This sort of information is used to foster plant conservation efforts, such as those conducted by the Montana Natural Heritage Program. For a screen shot of the website, see the last page of the newsletter.

A recently funded project by the National Science Foundation, entitled "Consortium of Pacific Northwest Herbaria Online Portal" has resulted in a web portal www.pnwherbaria.org where images and

associated information of over 50,000 plant specimens housed in the MSU Herbarium are now accessible to the general public via the internet. This web site provides access to a total of about 300,000 specimen images housed in 13 plant collections (herbaria) from the Pacific Northwest region, including those at the University of Idaho, Oregon State University, and the University of Washington. Along with Idaho, Oregon, and Washington, the entire state of Montana is included in the Pacific Northwest Flora Online Portal. This is because these are the four states that were originally encompassed by the volumes of the *Flora of the Pacific Northwest*, published in 1973 by C. Leo Hitchcock and Arthur Cronquist.

Ecological, geographical, and taxonomic information for an additional 1,400,000+ specimens is also available through the Consortium of Pacific Northwest Herbaria Online Portal. By the end of 2012, the approximately 70,000 specimens housed at the University of Montana Herbarium (<http://herbarium.dbs.umt.edu/database/>) should also be integrated into this database.

What does this internet resource offer to the general citizen who is interested in native and exotic plant diversity in Montana? From the home page (www.pnwherbaria.org), the "Specimen Data" tab can be selected (<http://www.pnwherbaria.org/data>) and from there you can do one of three general operations: 1) download the specimen data from any or all of the collections of the 13 herbaria currently participating (<http://www.pnwherbaria.org/data/datasets>), 2) obtain checklists of plant species for any of the counties within the states of Idaho, Montana, Oregon, and Washington (<http://www.pnwherbaria.org/data/countylists>), and 3) search the entire data base for a particular species from a particular geographical region (<http://www.pnwherbaria.org/data/search>). Many of these operations cater to those who know how to manage and manipulate large amounts of information. However,

the third option provides the opportunity for a general user to search for images of species of interest.

Let's say you are interested whether anyone has ever collected alpine lewisia (*Lewisia pygmaea*) from southwestern Montana (Beaverhead and Madison Counties). You could go to the page that generates county checklists and select these two counties on the map, and then inspect the resulting species list for the occurrence of *Lewisia pygmaea*. You could also go the search page and enter "Lewisia pygmaea" into the "Genus" and "Species" fields and select that the specimens be returned to you sorted by state and then by County. You could then inspect the Beaverhead and Madison County, Montana, sets of specimens for images and collection localities.

You may also be interested in where you can find the nearest population of, say, softstem or giant bulrush, *Scirpus validus* (or *Schoenoplectus tabernaemontani*). You could type in the scientific name (including synonyms; this could be facilitated by searching for scientific names via the common name on USDA Plants database, <http://plants.usda.gov>). Then sort the returned specimens by State and then by County. Because the Consortium of Pacific Northwest Herbaria Online Portal features a Google map (for a screen shot of the website, see the last page of the newsletter), you could click on one of the orange dots on the map (which represent collection localities for the species that is being investigated). You could choose the orange dot representing the locality nearest where you live to discover the most accessible locality of the species of interest. You could also draw a polygon on the Google map to return specimens of this species within that perimeter (but this would return only specimens that have been georeferenced, which yet doesn't include all imaged specimens).

Another interesting set of searches could include sorting in chronological order the occurrences of state-listed noxious weeds

or other invasive plants. You could type in one such species, for example, *Bromus tectorum* (cheatgrass), and have the results sorted by "State" and then by "Collection Year" (see Figure). If this was done for each of Montana's state-listed noxious weed species, you would be surprised to find out that most of our now-invasive plant species were common in the Pacific Northwest (and Montana) during the late 1800's and early 1900's.

Although the Consortium of Pacific Northwest Herbaria Online Portal is up and running with many useful search features, many enhancements and corrections still need to be made. Regardless, ready public access to information on Montana's plant diversity and distributions will only greatly improve with time through the www.pnwherbaria.org web site.

Copenhagen, Beetles, History and Hamlet

By Mike Ivie

Michael and Donna Ivie traveled to Copenhagen in January to study specimens and documents related to some of the oldest scientific names of beetles, described by J. C. Fabricius from material collected in the Danish West Indies by, among others, a previously unrecognized woman entomologist from the eighteenth century.



MSU grad Ken Puliatico shows the last remaining box of Fabrician specimens still in their original arraignment.

The visit was hosted by University of Copenhagen Museum of Zoology entomologist Alexey Solodovnikov. It was also an opportunity to catch up with MSU Entomology grads Katie Marske and Ken Puliatico. Katie is doing a Post-Doc at the University, and Ken is Alexey's

assistant in the museum. It is a small world! Ken was able to help us with the very-old but well-preserved eighteenth century Fabrician collections, making the time much more productive.

Special permission was also obtained to work in the Special Collections at the Danish National Library, housed in the architecturally stunning Black Diamond. Within that fantastic collection, we located the actual 1789 newspaper notice of the death of one of the early beetle collectors in the Danish West Indies, Johann Paul Gottfried Pflug, whose widow continued to collect and send specimens back to Europe. While we don't recommend you time your Copenhagen vacation in January, we did enjoy a Sunday touring the old city with Katie and Ken. There, we were able to see many sites important to the colonial history of our previous home in the Virgin Islands, and of course the Little Mermaid statue. Plus, Alexey did pry us out of the Museum for an afternoon to visit the castle that was the setting for Shakespeare's Hamlet.



Michael Ivie and Alexey Solodovnikov in the courtyard of Hamlet's Castle (Kronborg) at Helsingør or "Elsinore."

Come Attend the 2012 Diagnostics Webinar Series Linnea Skoglund

Just a reminder about the diagnostic webinars in Room 134 of the Animal BioScience Building. Webinars take place at 9:00 a.m. and run about 50 minutes.

Everyone is welcome. On March 28th our very own Barry Jacobsen will present a retrospective of IPM. Don't miss it.

MARCH SCHEDULE

- | | |
|----------|---|
| March 7 | Zebra Chip
<i>Phil Nolte</i>
Extension Seed Potato
Specialist – University of Idaho |
| March 14 | New Pests: bagrada bug,
pear rust and others
<i>Richard Hoenisch, Margery
Daughtrey</i>
U CA Davis, Cornell University |
| March 21 | First Detector Training
<i>Amanda Hodges</i>
Extension Specialist and
Entomologist – University of
Florida |
| March 28 | IPM Retrospective
<i>Barry Jacobsen</i>
Professor, Plant Pathology
Montana State University |

Bugwood IPM Center Working Group Meeting, Tifton, GA

By Mary Burrows

It's always nice to go somewhere warm in the middle of winter and learn something new. For example, among the many things I learned in Tifton was that if there are a lot of turtles on a pond, you don't need to worry about alligators. Useful information. I also learned you can buy powdered peanut butter, a local ingredient. Not as useful, but definitely interesting.

I was among a group of people who had been invited to meet to discuss our IPM programs, how they related to Bugwood, and how we could all work together to advance our programs using the tools developed by the Center for Invasive Species and Ecosystem Health (the long name for Bugwood). I finally met the 'wood' part of 'Bugwood,' David Moorhead. That was nice since I'm from Moorhead, MN and his name has always been easy for me to remember. I also travelled all the way to GA to finally meet Liz Galli-Noble, who runs the Center for Invasive Plant Management, a regional

group, out of Montana State. We found we have a lot in common outside of work including a love of wine. That is also useful information.

The 'bug' part of Bugwood, Keith Douce, facilitated the meeting. We discussed a variety of topics including our individual programs, how changes in federal funding have, and will continue to affect, IPM programming, how we can work together, what the future of IPM holds and how we can improve evaluation of our program impact. One of the main features we discussed was the development of 'apps' for implementation of IPM. We also discussed how we need a spokesperson for IPM to really raise public awareness. I suggested Daniel Craig (the 'new' James Bond). Other suggestions were forwarded



Howard Schwartz collecting a sample of IYSV from onions



Closeup of typical IYSV symptoms on onion

from the female contingent. We'll work on that. I took a lovely walk at lunch with my fellow pathologist, Howard Schwartz, from CSU. We scouted onions and on the first try found *Iris yellow spot*

virus (IYSV) symptoms and its vector, thrips. The virus makes a truly lovely ringspot, for those of you who are in to that. If you find any in your garden, be sure to bring us a sample in the clinic and we'll send it along to Howard.

Class Focus

Bob Sharrock—BIOB 375 – General Genetics



BIOB375 "General Genetics" is taught by Luther Talbert, Li Huang, Adam Richman and me. It is offered in Spring and Fall but not in the summer. Class sizes are in the 100-200 students/semester range and the

course is entirely lecture in format. It is either a required class or an elective in a wide range of undergraduate majors, although an alternative course, BIOB377 "Practical Genetics", is also taught in Spring by Luther or Norm Weeden. Unfortunately, there has never been an undergraduate genetics lab at MSU. Every instructor has their own take on the course but we all cover the same material and use the same or similar texts. I first taught the course in (oh , my...) 1990. It was a one quarter course then (MSU was on the quarter system) called BIOL324 "Principles of Genetics". Some of us were still in the MSU Biology Department, and, for those who might remember, I traded off teaching with a wonderful former faculty member and mentor Ernie Vyse.

All areas of science are advancing in interesting new directions these days and these innovations will have enormous effects on our lives and those of generations to come. One could argue that, in the last 100 years or so, the science of genetics has changed how we think of ourselves as humans and how we deal with challenges such as feeding ourselves, keeping ourselves reasonably healthy, and understanding our environment as much as any field of endeavor. So, I think of BIOB375 as an important cornerstone class for any major

related to biology and for anyone who would like to understand how living things work on a “biological information processing” level. Students come in to this class with the background of having seen some of the concepts and material in high school and in popular writing (in many cases this isn’t very much) and having taken a one semester course of 100-level or 200-level introductory cell and molecular biology. We cover a standard set of topics in basic genetics and, with each concept or structure or mechanism, I try to make connections to other ideas we’ve covered or will cover and to the big picture in biology. Cell division – you can’t understand biology unless you know where it comes from. Sex – Yea! Mendelian genetics – such a simple model to start from. Chromosomes and genes and how genetic information becomes our 3-D biological world. The origins of new gene alleles and the flow of alleles over generations in populations. Breeding, genetic engineering, and new things like RNA-mediated gene control and epigenetics.

There are many higher-level undergraduate courses at MSU that build on the background provided by BIOB375, BIOB377, or BIOH320 “Biomedical Genetics”. The field will continue to change rapidly over the coming years and expand increasingly into everyone’s lives, and I look forward to explaining and discussing these changes in BIOB375 along the way.

Montana Ag Live!

March 25

Dr. Robert Keene, Technical Development Veterinarian, Boehringer-Ingelheim Corporation, “Spring animal vaccinations and new developments in the vaccine industry”.

April 1

George Haynes, MSU agricultural economist, “Montana's Rural Poverty Issues”.

April 15

Cecil Tharp, Montana State University’s pesticide education specialist, “Herbicide contamination issues in manure, a potential

hidden problem” or “Know Your Manure”.

April 22

Tim Fitzgerald, MSU agricultural economist, “Leasing your farm or ranch for energy exploration”

April 29

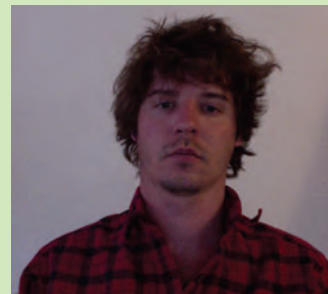
Professor Geoff Poole, MSU's Land Resources and Environmental Science Department, “Stream Habitat Restoration from a fish eye's view and how it positively impacts agriculture”.

Invited Talks

Gary Strobel was invited in early February to give a lecture on *Muscodor* spp to the Citrus Board of California. A few days earlier he lectured at the Marrone Bio Innovations Company in Davis, Calif. Also, for a part of the same trip, he visited the DoE Emeryville lab and gave an invited lecture on fungi making fuel related compounds.

New Graduate Student

David May (Phil Bruckner)



David May is a Master’s Student of Plant Sciences and Plant Pathology at Montana State University. Born and raised in Tallahassee, Florida, he graduated from the University of

Virginia in 2008 with a degree in English Language & Literature. After two years of restless wandering, which included work in olive oil and wine production in Italy and Greece, and as a schoolteacher at his former high school, David finally saw the light and realized that his true calling all along was in the biological sciences. For the past two years he has aided in research efforts in soil and water sciences at the Center for Water and Air Quality in Tallahassee, Florida, and worked for the University of Florida’s Small Grain and Forage Breeding Programs at the North Florida Research and Education Center in Quincy, Florida. Here in Bozeman, David’s research will help to improve a high-yielding variety of hard red winter wheat,

by breeding in resistance to nematodes. These little-understood and underappreciated pests are responsible for tens of millions of dollars of annual losses for Montana wheat farmers. When not hard at work on his research, David can typically be found on the slopes, hiking into the beautiful Montana wilderness, or curled up in bed, reading and re-reading his favorite novels and poems.

Grants

PIs: John McCutcheon (UM, genomics), Diana Six (UM, entomology), Cathy Cripps (MSU, mycology). "The Genomics of a Beetle-fungal Symbiosis with Massive Implications for Forest Disturbance Ecology". Institute of the Environment Incubation Grant.

Publications



Al-Niemi, T., N.F. Weeden, B.H. McCown and W.A. Hoch. 2012. Genetic analysis of an interspecific cross in ornamental viburnum (*Viburnum*). *J. Hered.* 103:2-12



The following article was written about the work David Sands and Cindy Morris have done regarding microbes in snowflakes. Fox, Douglas, "Do high flying microbes control Earth's weather?" *Discover Magazine* April:

40-45. For the most current information regarding this topic, please go to this website by Cindy Morris: bioice.wordpress.com/

Northwest Flower and Garden Show By Toby Day, Extension Horticulture Associate Specialist

I recently had the privilege to take 46 Master Gardeners, Master Gardener Coordinators and their guests to the Northwest Flower and Garden Show February 9-12. The theme for this year's Northwest Flower and Garden Show was "A Floral Symphony." The Northwest Flower and Garden Show is one of the largest and most impressive garden shows in the world. The display gardens and the number of exhibitors were overwhelming, educational and very interesting. Many of the Master Gardeners left with ideas that they could bring back to their gardens and their communities.



One of the displays at the Northwest Flower and Garden Show

During the show the Master Gardeners attended seminars from national gardening celebrities such as: Stephen Orr, Editorial director from Gardening for Martha Stewart living; Jennifer Bartley, Landscape architect and author of "The Kitchen Gardener's Handbook;" Dan Hinkley, plant explorer and author of "The Explorer's Garden;" Graham Kerr, author and former TV star "the Galloping Gourmet;" Cisco Morris, Radio and TV Host, columnist and author of "Ask Cisco;" and many, many more. The Northwest Flower and Garden Show is one that the Master Gardeners will be

talking about for months to come. Mostly because they got to see a chicken coop repurposed from a VW Camper Van (O.K., maybe not because of that *one* exhibit, but it was *my* favorite. See picture below.) Many thanks go out to Dara Palmer, Assistant Master Gardener Coordinator for her organizational skills in putting this program together!



Adding space between table cells in Word to add visual interest

By Susan Harkins - techrepublic.com

Takeaway: Learn two easy ways to add visual interest to your Word tables by adding space between cells.

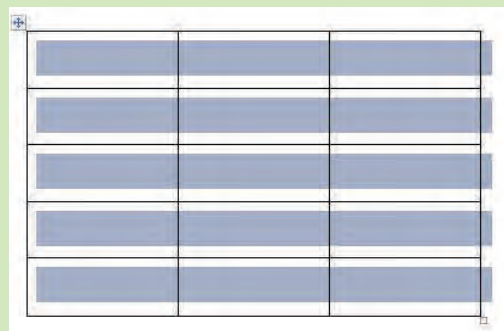
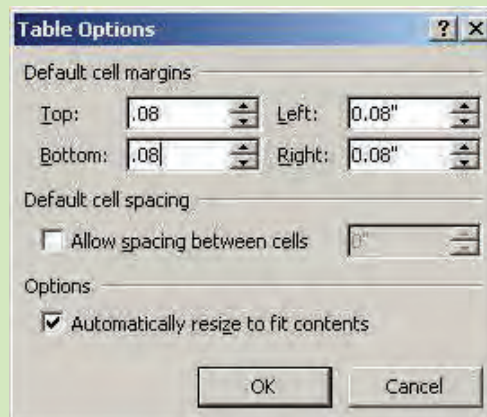
Most Word tables are relatively boring, but then, you probably don't want a lot of table noise in most of your documents. On the other hand, you can add some interesting visual elements by simply adding space between cells. You might be surprised to learn how easy it is!

Surrounding each cell with a bit of a cushion (space) is a simple way to liven up a boring table or to add a bit of a break between elements in a busy table. It seems odd to use the space to achieve such different results, but it works in either case. First, let's examine a default table. By selecting the entire table, we can clearly see the default margins (.08) on the left and right. When you insert a table, Word adds those margins for you. (To insert this simple table, click the Insert menu, click Table in the Tables group, select three columns and five rows, and click!)

To add a bit of space to the top and bottom

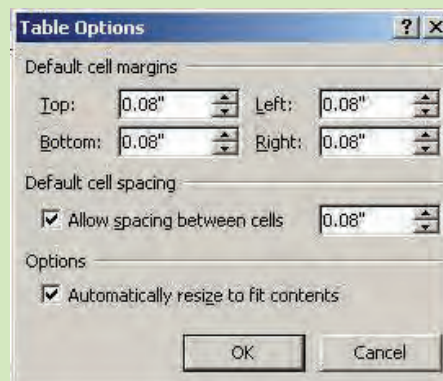
margins, do the following:

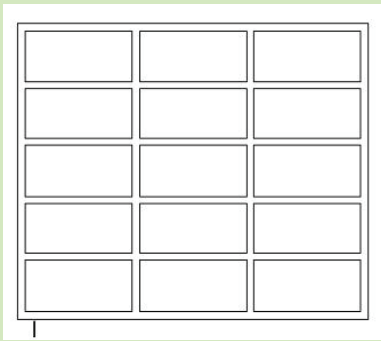
1. Select the entire table (click the Move handle at the top-left corner of the table).
2. Click the contextual Layout tab. In the Alignment group, click the Cell Margins option. In Word 2003, right-click the table and choose Table Properties. Then, in the Table, click Options.
3. In the resulting dialog, change the top and bottom settings to .08 and click OK.



Now, let's add some space *between* the cells as follows:

1. Repeat steps 1 and 2 above.
2. In the resulting dialog, check the Allow Spacing Between Cells option and specify .08.
3. Click OK.

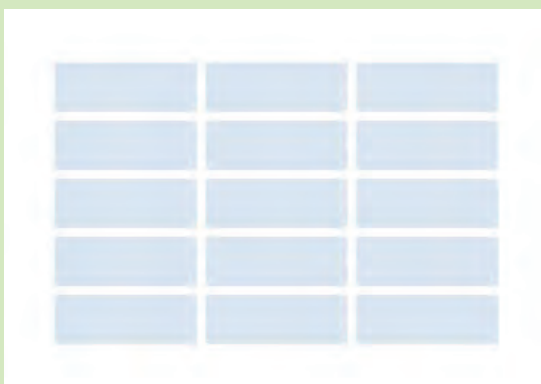
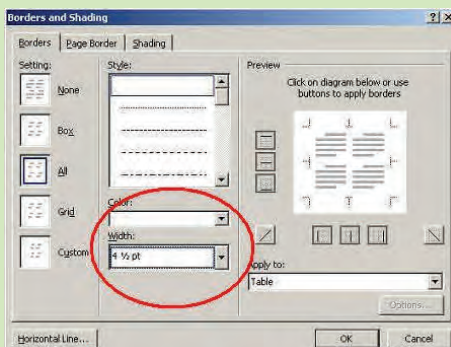




The results are interesting and easy to implement. All we did was add a little space.

Now, let's take another approach: let's add space by making the cell borders disappear. Starting with another simple table like the first table shown above, do the following:

1. Select the table.
2. Click the contextual Design tab. Then, Click the Borders dropdown in the Table Styles group and choose Borders and Shading. In Word 2003, right-click the table and choose Table Properties. In the Table tab, click Borders and Shading.
3. In the resulting dialog box, select white from the Color dropdown and choose a large point size from the Width control. Choose white if the document's background is white; choose a color that matches the document's background so the cell borders will disappear.
4. Click the Shading tab, choose a color for the cell background, and click OK.



In this case, we didn't increase the spacing between each cell. Instead, we increased the cell border width and then made them disappear to give the illusion of added space. Doing very little, we just created two interesting tables. Knowing your options is the key.

Recipe of the Month Irish Beef Stew

- 2 tablespoons olive oil
- 3 tablespoons all-purpose flour
- 2 pounds beef chuck, cut into 1 1/2-inch cubes
- 1 pound carrots, peeled and cut into 1-inch chunks
- 6 large potatoes, peeled and cut into large chunks
- Salt and pepper to taste
- 1 white onion, cut into large chunks
- 2 cloves garlic, minced
- 2 cups beef broth
- 1 (6 ounce) can tomato paste
- 1 (12 fluid ounce) can or bottle Irish stout beer (e.g. Guinness®)
- 1 tablespoon cold water
- 1 tablespoon cornstarch



Heat the oil in a large skillet over medium heat. Toss beef cubes with flour to coat, then fry in the hot oil until browned. Place the carrots, potatoes, onion and garlic in a large slow cooker. Place the meat on top of the vegetables. Mix together the beef broth and tomato paste and pour into the slow cooker along with the beer. Cover and cook on High for 6 hours or Low for 8 hours. During the last hour before serving, dissolve the cornstarch in cold water and then stir into the broth. Simmer on the High setting for a few minutes to thicken.

March Birthdays

Courtney Speegle	3
Yousef Zadegan	17
Elaine Nichols	31



CPNWH Database Search - Mozilla Firefox

File Edit View History Bookmarks Tools Help

CPNWH Database Search

www.pnwherbaria.org/data/search.php

Consortium of Pacific Northwest Herbaria

Providing access to specimen data and digital resources from herbaria throughout Pacific Northwest North America

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« Browse Search: Accessing 1,743,120 specimen records from 13 participating herbaria. Use of the data requires agreement to the terms and conditions in our [Data Usage Policy](#)

Search Label Data:

Enter any combination of search terms. Partial terms are accepted in most fields. See below for search operators and hints

+ Add Query - Clear Queries Query List (1)

Family Tax. Group

Genus Species Intraspecies

Scientific Name

Include synonyms of this name in search results

Country State/Prov. County/Munic.

Region

Locality

Min. Max. Unit

Elevation to

Collector Collector's #

Day (1-31) Month (1-12) Year (4-digit)

Collection Date

Accession # (or catalog number or barcode)

Search by Location:

Zoom in, click "Create Polygon", then click your mouse to draw a polygon around the area you want to search

Create Polygon Remove Polygons

Search »

Search Options:

Group By

Then Sort By

Show only specimens with images

Show only type specimens

Exclude cultivated specimens

Retrieve Results as:

Web page (specimen list and map)

Text file with label data

Tab-delimited CSV

Google Earth file (KML)

PDF with label data

Include thumbnail images

Checklist of species names

HTML PDF Text (tab)

Select Herbaria to Search:

Search all herbaria

BABY (B. A. Bennett Herbarium, Yukon Government)

HJAEF (H.J. Andrews Experimental Forest)

ID (University of Idaho, Stillinger Herbarium)

MONT (Montana State University)

NY (The New York Botanical Garden)

OSC (Oregon State University)

RM (University of Wyoming, Rocky Mountain Herbarium)

UAM (University of Alaska, Fairbanks - Museum of the North)

UBC (University of British Columbia)

V (Royal British Columbia Museum)

WS (Washington State University, Marion Ownbey Herbarium)

WTU (University of Washington)

Search Operators:

Operator	Usage
%	Partial text match (e.g., Poly%) (text fields)
>	Greater than (numeric fields)
>=	Greater than or equal (numeric fields)
<	Less than (numeric fields)
<=	Less than or equal (numeric fields)
...	Range of values (numeric fields)