

Plant Science Says



Happy
Valentine's Day!

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Crop Pest Management School By Kevin Wanner and Ruth O'Neill

Extension Entomology along with pathology and weeds specialists broke in the New Year with a successful 2009 Crop and Pest Management School. With the CPMS under "new management", we took the opportunity to revamp the agenda with the title and theme "Back to the Basics" (thanks to Bill Grey for the theme idea!). The two and one half day workshop ran from January 6-8, 2009, and featured three half days with "hands on" experience identifying weeds,



insects and diseases. The remainder of the workshop included presentations on a variety of disease, weed and insect pests that damage Montana's agricultural crops, including several speakers from the PSPP department (Luther Talbert, Barry Jacobsen, Bill Grey and Kevin Wanner). Several guest speakers braved the January weather and road conditions to make their valuable contributions. These included Bob Stougaard (NWARC) who gave an excellent update on his orange wheat blossom midge research, Kent McVay (SARC) who discussed the

testing of new crops and Ian Foley (MDA State Entomologist) who introduced a new small grains insect survey planned for 2009. For a full accounting of all the great contributions, the schedule along with supporting material is posted online at <http://ipm.montana.edu/Training/CPMS/2009/>.



Fabian Menalled lecturing during the hands on weed identification portion of the School.

Interest was high and we had a full enrollment of 40 students with an additional 8-10 placed on a waiting list. Thanks to David Baumbauer for hosting us all in Room 214 of the Plant Growth Center! Participation was diverse and included growers, county agents, crop consultants, industry personnel and employees from the Montana Department of Agriculture. Many students will receive pesticide applicator and crop consulting credits for their participation (thanks to Clain Jones and Cecil Tharp for sorting out the accreditation!). Overall the workshop was rated positively with anonymous comments such as: "Useful, very informative, definitely will attend again";

"Buena"; "great organization, materials, top-notch speakers, good food stuffs and good location"; and, "This is the first session I have attended and I felt it was excellent, very valuable information." Thanks to everyone who contributed, and special thanks to Ruth O'Neill for organizing all the details, Irene Decker for her unwavering support and Barry Jacobsen and Fabian Menalled for organizing their half days on diseases and weeds. The 2009 CPMS was a great way for me to continue to learn about agriculture in Montana and I look forward to organizing the next CPMS in 2010.

Dunkel Wins Award

Florence Dunkel was recently awarded the Service Learning, Community Partnership Award. Her partner was the village of Sanambélé Women's Association in Mali.

Sanambélé is a subsistence farming village of about 1,000 people and typical of most Bambara villages in West Africa and of many villages throughout Africa. Millet, sorghum, rain-fed rice, and cowpeas are the main crops in addition to vegetables used for the traditional sauces. Chickens are free-ranging, goats are a once a year holiday feast, and cows are investments saved for daughters' dowries. There is no electricity into the village, but since 2007 several residents have cell phones and one small grain mill run with a gas generator. The village has one health clinic with no basic supplies or equipment. We found childhood mortality is often high (40 to 60%) in rural Malian villages (Williams, Ba, Dunkel, Halvorson 2008).

This collaboration with the village of Sanambélé began in 1998 as a series of on-farm research projects using participatory integrated pest management (in the IPM Collaborative Research Support Program [CRSP]). Once undergraduate students at MSU became involved with the village under the leadership of Dr. Dunkel and, in recent years, Dr. Ada Giusti, the village began to realize some of their more elusive long-term community, not just farm production goals.

President Gamble stated in his award letter, "Engaging MSU students in meaningful work to research and address the unique needs of our global neighbors is an outstanding hands-on experience and is a tremendous vehicle for our students to deepen their understanding of and appreciate for diverse cultures."

Congratulations Florence!

The Post-Harvest Seed Potato Test

On December 29, Nina Zidack and Eileen Carpenter traveled to Oahu, Hawaii to perform inspections and collect leaf samples for the seed potato post-harvest test. The test-plots were planted by Nina and



Nina Zidack planting potatoes with John Venhuizen and the Aloun Farms Crew in November.

Manhattan grower, John Venhuizen, in November. For every potato field from 4-40 acres that is registered for certification, 400 tubers are submitted. Smaller certified fields are sampled at a rate of 10 tubers/0.1 acre. Post-harvest testing is a critical element for potato certification, and a fortunate benefit is that the same climate that allows us to grow a potato crop in the dead of winter also allows for a reprieve from Bozeman weather. All seed potato certification agencies in the United States are required to perform a post-harvest test to confirm the results of summer field inspections, and detect late season virus infections. MSU originally conducted the winter test in Ocean Side, California. Due to high lease costs and unreliable winter growth conditions, the test was moved to Hawaii in 2000. We contract

with Aloun farms to lease the land and secure labor for planting and leaf picking. Colorado, Minnesota and Canada also perform their test in Hawaii. North Dakota and the majority of the Great Lakes producing areas do post-harvest testing in Florida. Oahu provides a perfect climate for potato growth and expression of virus diseases. It also allows for evaluations after about 40 days of growth so we can complete all inspections and testing in time for the growers to supply their buyers with winter test results at the winter seed seminars, and before shipping and delivery of seed potatoes. One leaf is picked from every plant in the Hawaii plot. From the 507 plots that were planted in an 11 acre field, a total of 373,790 leaves were picked and sent back



Eileen Carpenter inspecting potatoes in the Hawaii post-harvest test

to the lab at MSU. Susie Siemsen performs all of the laboratory analysis and coordinates a crew of 10 to crush all of the leaves and prepare them for ELISA testing. The leaves were pooled into 10-leaf samples for a total of 37,379 tests on three potato viruses. Combining all three tests, there were 760 ELISA plates used in the analysis. This was all performed in 8 working days by the potato lab. If you would like to see high-throughput virus testing in action this summer, give us a call and you can visit the lab. If you are ever in Hawaii in late

December or early January, come see Montana's potatoes at their tropical best.

MSU offers new degree program in sustainable food and bioenergy systems

By Anne Pettinger, 406-994-4902 or annep@montana.edu

Beginning this spring Montana State University will offer a new degree program designed to contribute to the development of bioenergy and a stronger, more secure food system in Montana.

"It's an exciting opportunity for both faculty and students to be on the front end of what we at MSU hope will be a transformational program in food systems," said Jeff Jacobsen, dean of MSU's College of Agriculture. The new major is a partnership between the College of Agriculture and the College of Education, Health and Human Development.

The Board of Regents approved the new undergraduate Bachelor of Science program in sustainable food and bioenergy systems (SFBS) at its regular meeting in November, and students enrolled in the program will be able to take their first courses in the spring semester.

Three degree options, housed within three different departments at MSU, will be available to students working toward the degree. Those options and departments are agroecology (Department of Land Resources and Environmental Sciences); sustainable crop production (Department of Plant Science and Plant Pathology); and sustainable food systems (Department of Health and Human Development). Together, the options will focus on ecologically sound, socially just, and economically viable farming methods, food and people's health, and other issues related to food and bioenergy systems.

Jacobsen said it is the program's combined coursework that distinguishes it from other programs across the country.

"The partnership between agriculture and health and human development is what

makes this program unique," Jacobsen said. "It brings together coursework in plant sciences, agriculture, food and nutrition and ecology, while simultaneously promoting the student experience through internships." Some experiential learning experiences will take place at Towne's Harvest Garden, a 2 ½-acre diversified vegetable farm located at MSU's Bozeman Agricultural Research and Teaching (BART) Farm. Other opportunities for students will be arranged through internships with Montana producers, small farmers and other industries.

The program's dual focus on sustainable agriculture and bioenergy systems is important because agriculture in Montana is more than food, said Alison Harmon, an assistant professor in MSU's Department of Health and Human Development and one of the people that designed the program.

"When we talk about crop production, we're talking about both food and energy," Harmon said. "We are also very geared toward improving Montana's food system. There is public interest in knowing what's in our food and where it is coming from."

The program also will address issues associated with market garden systems and community supported agriculture, a rapidly growing part of food systems in the U.S. and Europe.

"We are bringing science to the market garden production systems, an aspect of agriculture not previously addressed by land-grant universities," said Bruce Maxwell, a professor in the Department of Land Resources and Environmental Sciences who also worked to develop the program.

The program could help Montana producers who are looking for ways to improve their profitability, added William Dyer, another member of the program's development team and a professor of plant sciences and plant pathology.

"We hope that our students can help Montana producers identify sustainable ways of producing food and bioenergy crops that

can reach new markets," Dyer said.

Meeting the challenges of food and bioenergy production in Montana and the region is one of the goals of the degree program, which is due, in part, to consumer demands, Jacobsen said.

"Consumers in the food system have increased their expectations more than ever before, both in knowing more about their food and the impact its production has on the environment," Jacobsen said. "The system is more dynamic and complex, so the challenges and problems we face are broader than historical agricultural systems."

Jacobsen noted that agriculture has changed not only because of consumers' increased expectations, but also because of production practices.

"From an efficiency standpoint, production practices have changed due to time, energy, and fossil fuel requirements. They've also changed because of harvesting and storing methods," Jacobsen said.

Faculty involved with the SFBS degree hope the program will appeal to students who otherwise might not have chosen agriculture, particularly those from rural Montana and the state's Native American communities.

Students who enroll in the program should develop well-rounded knowledge of food and bioenergy systems, as well as practical skills to help them land a variety of jobs, Harmon said. Those careers include jobs in food safety, agricultural biosecurity, rural economic decline and poverty, obesity, loss of indigenous foods, and bioenergy production and improvement.

Indeed, students who graduate from the program should be well-positioned in the field, predicted Kate Malone, a graduate student in health and human development who helped develop the program and is designing its introductory class as her master's project.

"The success of the program relies on

interdisciplinary collaboration, hands-on experiences, and a way of thinking and addressing issues that takes into account not just isolated parts of food, agriculture, and energy industries, but the whole system," Malone said. "It is a truly unique program that will give students an edge in this increasingly important, popular and vital discipline."

Grants from the Western Sustainable Agriculture Research and Education Program and the US Department of Agriculture Higher Education Challenge Grant Program will initially help fund the program.

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Ms. Sonya Victoria Iverson, Visiting Scientist to BIGMP!

Ms. Sonya Victoria Iverson (former Biotech major and participate in Biotech Frontiers) recently spent two months as a visiting scientist to ICARDA to investigate the potential for introducing, or possibly re-introducing, *Camelina sativa* in the dryland areas. *Camelina* is an oilseed crop, of the Brassicaceae family, which is suited to dryland farming and provides a healthy alternative food source to complement cereal grains.

During her stay there, from 20 November – 19 January 2009, Ms Iverson assisted in another project which focused on the isolation and characterization of ice nucleation activating (INA) bacteria, in short, bacteria that help cause rain. She also gave intensive training to graduate students on bacteria research at ICARDA.

Name Change for Hort Curriculum

The Board of Regents has approved a name change for the horticulture curriculum. The degree offered will now be called a Bachelor of Science in Environmental Horticulture with a concentration in Horticulture Science or a concentration in Landscape Design. The requirements for the degree will remain the same. For those students graduating this Spring, the degree will still read Bachelor of Science in Horticulture with a concentration in Horticulture Science or Landscape Design.

The name change is effective this summer and subsequent semesters.

The name change does not affect Landscape Design students. That degree will still read Bachelor of Science in Horticulture with a concentration in Landscape Design.

Drawings by Landscape Graphics Students

By Page Huyette

PSPP225 Landscape Graphics students completed hand rendered drawings of a photographic image as part of the course offerings, learning value, shadowing and appropriate pencil techniques. They finished the semester with individual designs for the lower entrance to Leon Johnson Hall where most students access the studio and computer lab. Each student chose the best way to enhance the entry in ways that would reflect the prestige and creativity of the Landscape Design Program.



Photo rendering by Chelsey Gilman

Plans for Camelina Hit Some Obstacles Acreage Devoted to Oilseed Falls in Favor of More Lucrative Crops

By Matthew Brown Associated Press

Ambitious plans to convert millions of acres of Northern Plains farmland to grow a biodiesel crop have stalled, as competition with traditional crops and other factors constrain a promising new agricultural industry.

In Montana - the center of the fledgling camelina industry - the number of acres devoted to the oilseed crop fell by more than half this year from the 22,500 acres planted

in 2007, according to preliminary federal figures.

That's far short of what companies had anticipated, and it marks a significant setback for a crop widely touted as an ideal



Bill Hoch's graduate student, Brekke Peterson, working in the greenhouse with camelina plants

source of plant oils needed to make alternative fuels.

Acreage for other states was not available, but agriculture industry representatives said the problems with the crop seen in Montana apply across the region.

"There were some big numbers being thrown around, but it just hasn't come to fruition," said John Hilton, deputy director of the National Agricultural Statistics Service field office in Helena.

Once prolific in Europe, where it was used for lamp oil, camelina was relatively unknown in the United States until a recent revival. It needs minimal water to grow and tolerates extreme cold weather, making it ideal for the arid Northern Plains.

Just a year ago, several companies announced plans to collectively produce more than 200 million gallons of biodiesel from camelina within two to three years. Reaching that goal would require several million acres devoted to the crop, industry representatives said.

However, with prices for wheat hitting record highs over the past year, many farmers balked at converting to the oilseed crop.

About 5 million acres of wheat are planted each year in Montana.

Camelina supporters hope for a turnaround in 2009, as wheat prices drop and make the alternative crop more attractive. Yet with prices for diesel also falling, interest in the crop as a fuel source could suffer.

Politicians including U.S. Sen. John Tester and Gov. Brian Schweitzer - both Democrats from Montana - have promoted camelina as a way to reduce the country's dependence on foreign oil.

Tester included a provision in the 2008 Farm Bill that made camelina eligible for the first time for federal crop insurance. The USDA has yet to implement such a program, but Tester said when it does that will reassure farmers wary of changing their practices.

"We'll have crop insurance for 2009," the senator said in an interview. "Camelina is a new crop, and farmers are traditionally pretty conservative folks. They don't like to take a lot of risk."

"Fundamentally, I think the industry is moving along at a pace that's sustainable," he added.

Don Panter is president of Sustainable Oils, a Seattle company that last year announced it planned to produce up to 100 million gallons of biodiesel annually by 2010. Those plans have now been pushed back by at least a year, but Panter said the goal remains unchanged.

"We could have spent a lot of time losing money or we could be smart with our money," he said of the delay.

Compounding camelina's woes have been difficulties in finding a use for the millions of pounds of crushed seeds that are a byproduct of biodiesel. Also, a lack of seed-crushing facilities in Montana means the crop must be shipped out-of-state - raising production costs.

In a move that could ease at least one of

those problems, the Montana Agriculture Development Council recently awarded a \$50,000 grant to a company that wants to build an oilseed crushing plant in the state.

The company, Great Plains-The Camelina Co., had announced in February that it planned to invest \$20 million this year in the crushing facility and a biodiesel refinery. Neither project has advanced beyond planning.

"We learned our lesson in speaking before turn. We were a bit overzealous about the prospects," said Great Plains' chief executive, Sam Huttenbauer. "This last year, we were up against probably the worst potential conditions you can have for a new crop."

He said the company expects to more than triple its acreage for 2009.

Ron Zellar with the Montana Department of Agriculture said his agency and the Schweitzer administration remain confident the state can support one or two processing plants for camelina.

Another economic boost could come from a pending proposal to sell crushed camelina seeds as animal feed.

Sustainable Oils submitted that proposal last month to the Food and Drug Administration. Panter said he expects a decision early next year.

Publications

Feiz L., Martin J.M., Giroux M.J. (2009) Creation and functional analysis of new Puroindoline alleles in *Triticum aestivum*. *Theor Appl Genet.* 11(2): 247-57.

Rainmaking Bacteria

An article entitled "Rainmaking Bacteria Ride Clouds to 'Colonize' Earth" was published in the January 12, 2009, issue of *National Geographic News*. Brent Christner who was a post doc here was referenced in the article and he works with Dave Sands, Cindy Morris and several other labs on the idea observed 25 years ago in Montana that ice nucleating

bacteria seemed to move from plants to clouds and back down to the ground in the form of rain. This was termed the bio-precipitation cycle, but there was a 25 year hiatus before enough evidence was found to substantiate it. There are now approximately 25 labs all over the world trying to find out which plants produce the most of these bacteria and which of these bacteria are the most effective in nucleating rainfall. Darfur, here we come!

Why do the leaves on my houseplants turn yellow and drop?

By Cheryl Moore-Gough



This is common in our houseplants in winter. Understanding the cause will lead to the remedy.

Dropping its leaves is one way a plant shows its stress. Too much or too little water causes the leaves to dry and drop. If the soil in your pot feels cool, the plant probably has enough water. If algae or moss is growing on the sides of the pot, you're keeping it too wet. Some plants, particularly those that produce flowers, need plenty of light. Insufficient light can cause leaf drop. And of course, a plant will drop its leaves during the natural aging process. If none of these conditions seem to fit and you burn propane gas, call the gas company. Houseplants can be very sensitive to gas leaks and warn you by dropping their leaves.

Bob's Byte

By Bob Johnston (Irene Decker filling in)

How To Forward E-Mail Appropriately And Other Useful Information

A friend who is a computer expert received the following directly from a system administrator for a corporate system. It is an excellent message that ABSOLUTELY applies to ANYONE who forward e-mails.



Please read the short letter below, even if you're sure you already follow proper procedures.

Do you really know how to forward e-mails? 50% of us do; 50% DO NOT. Do you wonder why you get viruses or junk mail? Do you hate it?

Every time you forward an e-mail there is information left over from the people who got the message before you, namely their e-mail addresses & names. As the messages get forwarded along, the list of addresses builds, and builds, and builds, and all it takes is for some poor sap to get a virus, and his or her computer can send that virus to every e-mail address that has come across his computer. Or, someone can take all of those addresses and sell them, or send junk mail to them, in the hopes that you will go to the site and he will make five cents for each hit.

That's right, all of that inconvenience over a nickel!

How do you stop it? Well, there are several easy steps:
When you forward an e-mail, DELETE all of the other addresses that appear in the body of the message (at the top). That's right, DELETE them. Highlight them and delete them; backspace them; cut them; whatever it is you know how to do. It only takes a second. You must click the 'Forward' button first and then you will have full editing capabilities against the body and headers of the message. (If you don't click on 'Forward' first, you won't be able to edit the message at all.)

Whenever you send an e-mail to more than one person, do NOT use the To: or Cc: fields for ADDING e-mail addresses. Always use the BCC: (blind carbon copy) field for listing e-mail addresses. This way the people you send to will only see their own e-mail address. (If you don't see your BCC: option click on where it says 'To:' and your address list will appear. Highlight the address and choose BCC: and that's it, it's that easy.)
When you send to BCC: your message will

automatically say 'Undisclosed Recipients' in the 'TO:' field of the people who receive it.

Remove any 'FW:' in the subject line. You can re-name the subject if you wish or even correct the spelling.

ALWAYS hit your Forward button from the ACTUAL e-mail you are reading!!!!!!! Ever get those e-mails that you have to open 10 pages to read the one page with the information on it?

By forwarding from the actual page you wish someone to view, you stop them from having to open many e-mails just to see what you sent. (If there are more than 2 forwards, I usually delete the email unless it is from a very good friend or relative who is untrainable....).

Have you ever gotten an email that is a petition? It states a position and asks you to add your name and address and to forward it to 10 or 15 people or your entire address book. The email can be forwarded on and on and can collect thousands of names and email addresses.

A FACT: The completed petition is actually worth a couple of bucks to a professional spammer because of the wealth of valid names and email addresses contained therein. If you want to support the petition, send it as your own personal letter to the intended recipient. Your position may carry more weight as a personal letter than a laundry list of names and email address on a petition. (Actually, if you think about it, who's supposed to send the petition in to whatever cause it supports? And don't believe the ones that say that the email is being traced, it just ain't so!)

One of the main ones I hate is the ones that say that something like, 'Send this email to 10 people and you'll see something great run across your screen.' Or, sometimes they'll just tease you by saying something really cute will happen. IT AINT GONNA HAPPEN!!!!!!

Before you forward an Amber Alert, or a Virus Alert, or some of the other ones floating around nowadays, check them out before you forward them. Most of them are junk mail that's been circling the net for YEARS! Just about everything you receive in an email that is in question can be checked out at Snopes. Just go to <http://www.snopes.com/>. It is really easy to find out if it's real or not. If it's not, please don't pass it on.

So please, in the future, let's all help stop the junk mail and the viruses.

Recipe of the Month

The two recipes below were recently served at a Friday Coffee.

Mushroom Spread (or hot Mushroom dip)
(from Hope Miller's Mushroom Cookbook) –
contributed by Cathy Cripps

1 lb fresh mushrooms chopped fine
6 T butter/margarine
1 T lemon juice
2 T minced onion
1 lb carton sour cream
2 t chicken/mushroom bouillon
Salt & pepper
2 T soft butter
2 T flour

Chop mushrooms fine (brown cremini mushrooms, white button mushrooms, oyster mushrooms, or almost any type of wild edible mushrooms), sauté with butter and lemon juice 5-10 minutes. Add onions, sour cream, bouillon, salt, pepper and simmer 5-10 minutes. If mixture is too thin (it will thicken somewhat on cooling), add paste of remaining butter and flour to thicken. Simmer a few minutes.

Serve on mushroom bread, crackers, with chips, or over vegetables.

Mushroom Bread

(adapted from Betty Crocker Breads,
Western Publishing Company, Inc. 1974)

Contributed by Kathi Trujillo

1 cup milk, scalded
¼ cup molasses
2 teaspoons salt
1 tablespoon oil



1 cup 7-grain cereal (may substitute cracked wheat)
2 packages yeast
½ cup warm water (105-115 °F)
1 cup whole wheat flour
2 ¾ - 3 cups bread flour
½ lb. fresh mushrooms

Slice mushrooms and allow to partially dry (2 hrs-overnight)

Combine milk, molasses, salt, oil, and 7-grain cereal in large mixer bowl. Cool to lukewarm. Dissolve yeast in warm water (I add ½ teaspoon white sugar to test yeast activity; it should form a froth on the surface within 15 minutes.) Add yeast, whole wheat flour and 1 cup bread flour to the cooled cracked wheat mixture. Beat 2 minutes on medium speed, scraping bowl frequently. Stir in the dried mushroom flakes. Stir in enough remaining bread flour to form sticky mass of dough that pulls away from the side of the mixing bowl.

Turn dough onto lightly floured surface. Knead until smooth and elastic, about 10 minutes. (Dough should rebound slightly when poked with a finger.) Place in greased bowl; turn greased side up. Cover and let raise in warm place (~85 °F) until volume has doubled. (About 1 hour; dough should retain imprint of finger when touched.)

February Birthdays

Jeffrey Johnston	2
Norm Weeden	12
Alan Dyer	15
Phil Bruckner	17
Pam Border	23

