

*Plant Science
Says*



*Happy
Easter!*

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Dr. Cindy Morris Recognized as Lyman Briggs College Distinguished Alumni Award Winner



Dr. Morris graduated from Lyman Briggs College (the honor's college at Michigan State University) in 1979 with a major in Biology. She has since received her Ph.D. from the Department of Plant Pathology, University of

Wisconsin, Madison, and a HDR (qualification to direct research) in life sciences from the University of Biology/Montpellier II, France. Throughout her entire academic and professional career she has been known for her commitment to combining her knowledge of science with making a difference in society. In the 1980's, after a visit from Chinese scholars at the University of Wisconsin, Dr. Morris was impressed with the potential for enhancing scientific training in China. The Chinese had in effect lost a generation of scholars, and the need for training new scientists was urgent. She viewed this as an ideal opportunity to contribute her education and experience to a greater cause. She and her husband both obtained funding from the U.S. National Academy of Sciences to travel to China where they spent 4 years at Beijing Agricultural University (BAU) teaching plant pathology, scientific method, research techniques, statistics, and English. Her contributions at BAU made a significant impact on a large population of young scientists, including many who continued their careers both in China and in the West.

Dr. Morris and her husband (a French citizen) were flown out of China by the French government during the Tiananmen Square incident in 1989. They settled near Avignon, France, where they both obtained research positions with the French Government Agricultural Research Agency (INRA). Shortly after arriving in France, Dr. Morris gave birth to her first child, Simon, who has Down's Syndrome. This motivated her to immerse herself in the *Working Group for Social Insertion of People with Down's Syndrome*, a group that supports Down's Syndrome children's full integration into French society. Dr. Morris wrote a story book concerning the biology of this syndrome that helps young children to understand the disease. This book has been used to help train teachers in primary schools on how to explain the biological basis of Down's syndrome. She has also been a volunteer



Dr. Morris assisting at Eagle Mount with the Eagle Mount organization in Montana where she was trained on the use of a special walker that helps physically handicapped people ski.

Dr. Morris' research spans a broad range of issues from highly applied work addressing the needs of cantaloupe growers in southern France, to studies of the fundamental evolutionary ecology of plant-associated bacteria in the environment. Whether it is ongoing interactions with local farmers in southern France, or research partnerships with the wider international community, she has established a diverse array of collaborative relationships. Dr. Morris became director of the Plant Pathology Research Unit at INRA's research center in Avignon in 2008. Their mission concerns diseases of fruits and vegetable crops typical of the Mediterranean basin, as well as diseases of the plane tree, an important regional shade tree, and viral diseases of ornamentals. The long term research goal is to contribute to the development of effective and environmentally friendly disease control that supports production of high quality fruits and vegetables.

Dr. David Sands, Professor of Plant Pathology at Montana State University says of her, "If I could follow the career of one scientist in my field, it would be that of Dr. Morris. She is qualified to ask the unasked question and very qualified to find answers. She has laboratory and staff and scientific collaborators from all over the world. She is easily the most outstanding scientist in her field. In a real sense, she has answers to the questions: Where do these bacteria generate their ferocious disease causing characteristics, and what can be done to predict their behavior, and prevent them from doing what they do so well? In this world of new diseases 'coming out of the wild' she has found out where and what that wild place is."

Western Region IR-4 State Liason Representative meeting, March 17-18, 2009

By Mary Burrows

The acronyms were flying fast and furious during the IR-4 SLR meeting in BZN. Twenty administrators, IR-4 state representatives, and CLC (Commodity Liason Committee) members met here on campus and down at Chico Hot Springs. IR-4 is a group which facilitates pesticide registrations for minor

crops, and for minor uses on major crops. A recent success of Montana's involvement in IR-4 is the registration of Poast (pendimethalin) for use in camelina. There are additional requests on the table for herbicides in camelina but scientists at several universities need to provide crop safety, yield, and efficacy data before we go forward on those requests. These requests also need to be supported by the chemical manufacturers. Priorities for residue testing are set at the Food Use Workshop (FUW) each September. This meeting was the first step in setting western region priorities. The western region has historically been very successful at the FUW, due in part to our cohesiveness in bringing our requests to the table. Part of our cohesiveness is maintained by annual wine tastings, an event I am proud to have initiated in 2007.

The first day we heard Jeff Jacobsen speak about Montana and the College of Ag in between giving Rocky Lundy from the Mint Research Council a hard time. For those of you who remember Rocky, I'm sure you will understand. He gave as good as he got. We also heard from Amy Bamber from the Department of Ag about the importance of IR-4 to our minor crop commodities, Nina Zidack on potato pests and their future pesticide needs, and Jack Riesselman on wheat production in Montana. Amy's presentation generated much discussion on MRLs – Maximum Residue Levels. These are acceptable levels of pesticides in a product, and IR-4 is very active at setting international MRLs. A grower could use pesticides properly according to the U.S. label then get his grain rejected at an overseas port because their MRL is different than the US MRL. The Montana Wheat and Barley Committee is very concerned about MRLs because the majority of our overseas grain goes to Japan, which has lower residue tolerances than the US for many commonly applied pesticides.

After the morning session we got a tour of the Potato Lab, and then headed to Wheat Montana for lunch. After an introduction to the facility and some of the history by Jack, we toured the bakery. The first thing we learned is that bread is shipped to several markets in the US including Denver and Portland, and the bread is shipped frozen.

Bread is not frozen for shipment to local markets such as Bozeman. We saw the flour mill and the small, slow mill for the spelt (the best spelt bread I've ever had – it actually has the texture of bread), and where they assemble the oat and 7-grain cereal. After Wheat Montana we visited the cheese factory for Amaltheia Organic Dairy and got a tour from Sue Brown. They make cheese twice a week from goat milk.

One of their biggest waste products is the whey, and they recently acquired pigs to take care of that problem. When we were there, their first shipment of pigs to slaughter was in process. Unfortunately the truck broke down after the pigs were loaded. However, once all the issues are resolved, organic local pig will be available at the Co-op April 1st. Although warned about the vast quantity of mud at the farm, most of the participants still wanted to see the baby goats. And, I have to say they were the hit



Baby goats at Amaltheia Organic Dairy

of the meeting. Mel gave us a tour of the adult and baby goats, and the milking facility. He said one of the worst pests isn't coyotes or mountain lions, it's the dogs people abandon in the country. Another pest is flies, and he was very excited about a new fly trap he had built and was going to bait with whey. One of the entomologists in the group said it would make him feel better, but probably not do too much more. Mel said fly parasites do the best job.

After getting our feet muddy we headed to Chico Hot Springs for some relaxation in the pool, shuffleboard, and oh yeah, the

business meeting. Matt Flikkema and Gordon Stoner came in from Belgrade and Outlook, respectively, to represent the Montana Grain Growers and learn about the IR-4 process. Todd Scholz from the US Dry Pea and Lentil Council, apparently no good at shuffleboard, represented the pulse industry. Marion Miller, the Western Region IR-4 Director and Van Starner, Assistant Director of Research Planning from headquarters in Rutgers gave presentations on their role in IR-4, seeking feedback from SLRs and CLCs. Then, we essentially went through the lists of nominated projects, prioritized those of interest to the western region, talked a bit about IR-4 in each state, and adjourned after lunch.

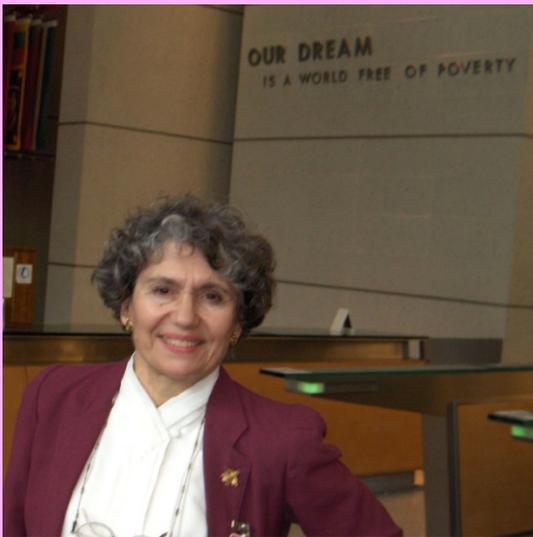
If anyone is interested in the IR-4 process, please let me know. Minor crops in Montana include safflower, potatoes, sugarbeets, malt barley, peas, lentils, chickpeas, mustard crops including *Brassica juncea* and camelina, cherries, and mint, among others.



Rebecca Sisco, Western Region IR-4 Center Regional Field Coordinator stands by one of the mixers at Wheat Montana

Dunkel Invited to Speak at World Bank By Florence Dunkel

Via a web search, the World Bank, Department of Agriculture and Rural Development found Dunkel and her work with Mali agriculture incubators combined with a U.S. educational component. She was asked to present what World Bank termed her "marriage model" at a new seminar series entitled Agriculture Innovation Systems. On March 11, 2009, Florence presented her model in Washington D.C. in a lecture entitled "Mali Agriculture Incubator: The marriage between post-graduate education and an agribusiness incubator."



Dunkel gives seminar at World Bank, Washington D.C. March 11.

According to the Bank, the goal of the presentation was "...to bring together World Bank Human Development Sector colleagues (Education) and World Bank Agriculture Sector colleagues to identify the way forward, specifically to determine if the Mali Agriculture Incubator model should be included as one of the Agricultural Innovation Systems of World Bank. Experiences in agricultural incubators and inter-sectoral work between mainstream agriculture and education sectors are both of great interest to us." Typically, these sectors do not interact with each other at the Bank.

Dunkel explored facts about Agricultural Incubators for Africa, specifically francophone West Africa and particularly Mali. She learned what works and does not work in these specific cultures. U.S. and

European business models often provide dead-end ideas for these environments.

Five incubators are in various stages of development, each with mutualistic collaboration between farmers, the Center, and U.S. university students and faculty. How was this "arranged marriage" negotiated between the parent organizations, the national agricultural university of Mali (IPR/IFRA) and the national agricultural research organization (IER) of Mali? Dr. Dunkel, originator of the think tank from which the marriage idea was generated, addressed these questions and shared pitfalls, successes, and lessons learned.

Following presentations/discussions at the World Bank, Dunkel continued to Mali to work with five incubator leaders of the Agri-Business Center (ABC) all trained at MSU, including Plant Sciences and Plant Pathology graduate students, Keriba Coulibaly, Aissata



Keriba Coulibaly, former PSPP student and member of Agri-Business Incubator Center working with leader of small enterprise incubating in village of Sanambele in Mali.

Producers of oats find interest in alternative to other grains By Tom Lutey Of The Gazette Staff

It's 14 degrees in the Montana Gluten-Free Processors warehouse. The morning cups of coffee resting on the counter are quickly losing steam as everyone's attention turns toward a hopper spitting oats into brown 50-

pound bags.

This is where the real heat is, say Dean Miller and Bruce Wright, gesturing at an ever-growing stack of bagged PrOatina. The gluten-free-food market is hot, and PrOatina could be southwest Montana's inroad.

The crop is closely monitored from field to mill to make sure it never takes on gluten through contact with wheat or barley. A slight trace of gluten, as little as 10 parts per million, kills the crop's gluten-free marketability.

"All oats are gluten-free," Miller said. "But these oats have twice as much protein as regular oats."

Wright, who likes a hot bowl of PrOatina for breakfast, said the more common Quaker Oats taste like cardboard by comparison.

Montana is earning a reputation for creating gluten-free flours sought by people with disorders like celiac disease, which is associated with intolerance to gluten and untreated can result in permanent intestinal damage and severe malnutrition.

More than 3 million Americans are thought to suffer from the disease, which makes products containing even minimal amounts of wheat, barley and rye off limits. And wheat is in practically everything, added to french fries to give them a crispier coat, folded into candy, blended into soup as an easy thickener. Even beer, derived from barley, can give someone with celiac disease severe intestinal troubles.

An even larger segment of the population self-identifies as being wheat-sensitive, which has farmers willing to experiment with gluten-free crops excited. They've made flour out of timothy and native Indian rice grass, which like PrOatina are alternative crops spawned by Montana State University. What they haven't done yet is find a big market success.

But their timing with PrOatina seems to be good. The gluten-free-food market of late is sizzling, said Liz Sloan, whose Sloan Trends and Solutions consulting firm is a leading

tracker of national and global food trends. She has seen sales of gluten-free products soar from \$396 million in 2005 to a projected \$1.7 billion in 2010. Anheuser-Busch now markets a gluten-free beer, Redbridge, made from an African cereal grass, sorghum. General Mills has retooled its production of Rice Chex cereal, making sure naturally gluten-free rice isn't picking up gluten through incidental contact with wheat products during manufacturing. There's also a gluten-free labeling craze, sparked by a federal Food and Drug Administration recognition in mid-decade that wheat is something to which people might be allergic.

The FDA now requires food companies to list wheat on product ingredient labels. Consequently, some products that were always wheat-free now sport gluten-free labeling.

A rise in the recognition of celiac disease is part of the gluten-free trend, Sloan said. In general, households with one person on a restricted diet are likely to impose that diet on everyone, which amplifies the market affects of a disease like celiac, found in one in 133 people.

But the bigger factor driving sales of gluten-free products is the gluten-sensitive demographic, that is, people who because of self-diagnosis or a physician's recommendation identify gluten as something to avoid. That segment of the population has soared in recent years as the social media implicate gluten with ailments from autism to malnutrition. Avoiding gluten has become trendy, but trends don't last forever, Sloan said.

"If you have celiac disease, you're pretty sick, let's face it," Sloan said. "But the real broad group is gluten sensitivity, which has become a huge trend. This whole idea of sensitivities has gone through the roof. We've got sensitive hair, sensitive teeth."

Consumers, particularly those between ages 18 and 24, tend to treat their perceived sensitivities with food. It's the same group that reaches for caffeine shots at the convenience store counter, or energy

vitamins or immunity beverages. Eventually, those consumers move on, Sloan said.

Celiac-disease organizations see undiagnosed victims of their condition within the gluten-sensitive population. When Jean Powell was diagnosed with celiac disease in 1990, the condition was thought to be extremely rare, a one-in-10,000 occurrence in North America. She was one of only seven known cases in Montana. Powell, of Bozeman, said doctors were reluctant to make a celiac diagnosis; she was initially diagnosed with multiple sclerosis. Severe malnutrition had cost her feeling in her limbs.

Now, there's a blood test for celiac disease, and a new generation of doctors is open to the diagnosis, she said, though the disease still gets missed.

"The younger doctors are very open," said Powell, 73. "The older guys are stubborn. I know a number of people whose doctors tell them they have irritable bowel syndrome (or IBS). IBS means there's something wrong with you, but we don't know what it is."

The surge in gluten-free products is noticeable, Powell said. She finds products easily at health food stores, but she's also seeing more gluten-free merchandise at her local Safeway.

The gold standard for gluten-free certification is a GF printed in a circle. The logo is issued by the Gluten Intolerance Group of North America. The group includes people with celiac disease and also dermatitis herpetiformis, a hereditary autoimmune gluten intolerance disease that produces watery, pimplelike blisters.

GIG has already certified PrOatina oat products, as well as Timtana flour, a Great Northern product made from timothy. It has also certified Montana Monster Munchies gluten-free cookies. The cookies are made in Four Corners with PrOatina oats.

PrOatina isn't the first gluten-free oat flour to hit the market, said Cynthia Kupper, GIG's executive director. Her group has certified a few oat flours, as well as flour made from

garbanzo beans, tapioca and rice, to name a few. Gluten is what gives wheat flour its binding quality, so alternative flours without gluten need an additive like xanthan gum or carrageenan.

Her advice to the PrOatina producers is to broaden their market. Producers who don't, she says, usually don't last.

"What happens is they restrict their market to the celiac community, and I keep telling them they have to go beyond that," Kupper said.

Student Wins Green Section Internship



Bryce Fischer

Horticulture major, Bryce Fischer, was selected by the United States Golf Association for the 2009 USGA Green Section

Internship Program. Only

15 students nationwide are selected for the program. The week long internship aims to provide turfgrass students with a broad view of the golf course industry and the opportunity to learn about golf course management through the perspective of the Green Section agronomists.

Montana Tennis Team Wins at USTA Sectional Championships

The Montana Men's 7.0 Super Senior Team won this weekend in Las Vegas, Nevada and will represent the Intermountain Section at the USTA National Championships in Surprise, AZ on April 24-26. The team captained by Rick Berreth, Superior, live across the state and included these team members: Eric Braun, Missoula, Tom Bohnsack, Kalispell and Steve Buckner, Whitehall. Other members are all from Bozeman: Brown McKai, Rich Vinton, Earl Hanson and **David Sands**. Although tied with Colorado with three team wins the Montana team had one more individual match win to give them the championship.

Congratulations David!

Grants

Burrows, Tisserat, Cranshaw, Koski, and Hammon. "Creation of online urban IPM resources for the High Plains and Intermountain region". Western Region IPM Center.

Dougher, T. and Delphia, C. "Backyard conservation: evaluation of Montana native perennials for water savings and pollinator attraction". Montana Native Plant Society.

Publications

Leisso, R., P. Miller, and M. Burrows. June, 2008. Integrated management of chickpea pre-emergence damping off. Can. J. Plant Pathol. 31(1).

Inside the Plant in April

By Cheryl Moore-Gough



Many of our "winter damage" occurs in late winter and early spring. By this time, woody plants have completed their rest period, having

accumulated sufficient number of hours below 45°F to satisfy their chilling requirement. Most, however, are still in dormancy. Not in rest as they were in midwinter, but in quiescence. Unlike rest, which is dormancy induced by internal conditions within the plant, quiescence is induced by external conditions. For example, the plant CAN grow but won't because the temperature is too low. In summer, cool season grasses go quiescent due to high temperatures and drought conditions. They CAN grow, but won't because of inclement conditions.

Quiescent plants are not as hardy as plants in rest. Furthermore, they can respond to good growing conditions and become even less hardy to cold. For example, peach flower buds can begin to swell and start to grow when exposed to just a couple days of temperatures above 45°F. Apple buds are less responsive and need a couple weeks of warm weather to start swelling. Red raspberries can begin to deharden when exposed to temperatures as low as 27°F.

Each plant has its own response curve. Here's where the problem comes in. Say the first week of April the temperature rises into the 60s. Most plants will respond by dehardening and actually beginning to grow, even if this growth is internal to the bud. Then, the temperature plummets to 0°F or 10°F and the dehardened tissues die. The longer the plants are exposed to high temperatures, the less able it is to withstand low temperatures. Since most plants satisfy their rest requirements by the first of the year, quiescence controls dormancy from then on and this sort of damage can occur at any time after early January.

It's best to keep plants cool until danger of severe cold has passed. Planting them on a north exposure and/or keeping them mulched with organic material will help. Otherwise, there's not much you can do to prevent this sort of damage.

Bob's Byte

By Bob Johnston

Netbook computers – are they for you?



Seems like everywhere you turn these days—newspapers, magazines, TV shows, even your friends—netbooks are a hot topic for discussion. What has pushed netbooks into the spotlight

is the fact that they are capable yet inexpensive, with prices ranging from \$300 to \$600. Early on, they were considered second computers, best for e-mail and Web surfing—thus the netbook moniker. But as manufacturers compete vigorously for market share—slashing prices and tacking on extras—consumers are reconsidering the roles that netbooks could play. Inexpensive and portable netbooks appeal to a wide audience, from businesspeople who travel frequently, to kids and home users looking for a small laptop to carry from room to room, to book-laden students who spend long hours on campus.

What Makes Netbooks Different?

It's easy enough to tell a netbook from other laptops, but the differences between one netbook and the next are getting fewer and fewer. They generally have 8-to-10-inch widescreens and lack built-in optical drives.

None have full-size keyboards—they usually range from 89 percent to 93 percent of full size—so expect a more cramped typing experience than with a mainstream laptop. (If at all possible, try out the keyboard before you buy.) You will find an abundance of USB ports, a webcam, a card reader, and built-in Wi-Fi. Some even have bonus features like ExpressCard slots, Bluetooth, and options for cellular modems. Most every netbook has adopted the Intel Atom platform, made up of the Atom processor, integrated graphics, and 512MB to 1GB of RAM.

What Can (and Can't) Netbooks Do?

Don't underestimate the capabilities of these machines. They're not just limited to Web surfing, compiling spreadsheets, or word processing. You can offload your photos from a digital camera and edit them using a program like Adobe Photoshop Elements 7. With some patience, you can transcode video to another format using Windows Media Encoder 9 or edit video footage using Adobe Premiere Elements 7, or run your entire music library off of a program like Apple iTunes. A netbook can play video from sites like YouTube or a movie from an external USB drive, unmarred by distortions and lag. Businesses are considering these pint-size laptops because you can run various e-mail clients on them, put them on a network, install a VPN client, and secure them with antivirus and antispymware suites.

Configuring Your Netbook

To get a netbook that does all that you want it to do, you have to follow some basic configuration guidelines. Start with the operating system. Linux is cheap and very user-friendly, but average users tend to be more familiar and comfortable with Windows. What it comes down to is the support, functionality, and compatibility that Windows offers with an enormous range of hardware and software applications—whereas with Linux, users may not want to take the time to learn a new interface, install a program, or figure out how to get a device to work with a particular driver. And when Windows 7 rolls out, it will be even tougher for Linux to get a foothold in the netbook market. You'll find two types of hard drives: solid-state drives (SSDs) and spinning hard

drives. While SSDs have faster transfer speeds, are more durable, and have longer life spans than their traditional counterparts, you pay a premium for these advantages. Most netbooks are available with spinning hard drives that can store up to 160GB worth of data. Shoot for a hard drive that has a capacity of at least 60GB and a rotational speed of 5,400 rpm.

The Intel Atom processor is the fastest and most energy-efficient netbook processor you can get. You may find an Intel Celeron M or a VIA processor in first-generation models like the ASUS EeePC 4G and the HP 2133 Mini-Note, but you're better off skipping these. Many netbooks will run fine on 1GB of memory, and most can be upgraded to 2GB, provided you can make this simple addition yourself. (Microsoft has limited manufacturers to including 1GB of memory on systems with Windows XP Home Edition, and a lot of today's netbooks run XP Home.) Standard netbook batteries are typically three-cell (less than 30 Wh) units, although netbooks like the ASUS EeePC 1000HE, the Acer Aspire One (10-inch), and the Samsung NC10-14GB have upped their standard batteries to six-cell units. Our testing has shown that the smaller batteries will get you anywhere from 2 to 3 hours on a single charge, while the bigger ones range from 6 to 8 hours. If your activities include trips abroad or all-day classes, you'll want to look for a netbook with a six-cell option. Specialty features aren't exclusive to larger laptops, either. Already, the HP Mini 1000 is bundling mobile broadband, a modem that makes use of cellular networks to acquire a broadband signal.

Thanks to PC Magazine for this article.

April Birthdays

John Sherwood	12
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Andreas Fischer	25
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