



June 2007



Red River Valley Agricultural Research Center

RESEARCH NEWS FROM THE VALLEY

Caring for the future



Red River Valley
Agricultural Research Center
Fargo, ND & East Grand Forks, MN

Inside this issue:

From the Director

Pink Eyed Potatoes

Ground Water Contaminant
Converted to Nutrient by Ruminant
Animals

Environmental Management System

USDA and Australian Scientists
Collaborate to Collect Seeds of Wild
Sunflower

Regeneration of Leafy Spurge

Recent Releases of Germplasm and
Genetic Stocks of Durum and Spring
Wheat

DNA Test Identifies Species of Leafy
Spurge Flea Beetles and Rediscovered
a Species Thought to Have
Disappeared

Retirement of Jerry F. Miller

USDA Agricultural Research Service
Geneticist Receives Public Breeder
Award

Jauhar Honored in India

RRVARC Takes Part in Marketplace
for Entrepreneurs

RRVARC Participates in Marketplace
for Kids

RRVARC Judges Sheldon Elementary
School Science Fair

Upcoming Events

From the Director

With the arrival of mid-June here in The Valley, the Red River remains at flood stage, aided by more than four inches of precipitation locally this month, and far more further upstream. Many farmers are facing the challenges of a difficult season of planting, and in many cases re-planting. City-folk this year have been watching and waiting for a dry moment to get to their landscaping or gardens.

- 1 In this issue of the "Research News From The Valley," we highlight activities from the Red
- 2 River Valley Agricultural Research Center's
- 3 six research units. In addition to recent re-
- 4 search accomplishments that you have come
- 5 to expect from these pages, there are exam-
- 6 ples of the worldwide recognition that Center
- 7 staff continue to receive. Of special note also
- 8 are the various outreach efforts of Center
- 9 staff, including participation in the
- 10 "Marketplace for Entrepreneurs," the
- 11 "Marketplace for Kids," and regional programs
- 12 dedicated to improving science awareness in
- 13 youth.



Merle D. Pierson, Ph.D.
USDA Deputy Under Secretary
Research, Education & Economics

- 10 "Transition" continues to be very visible at the
 - 11 Center. Most recently, we were honored by a
 - 12 brief visit in May by USDA Deputy Under Sec-
 - 13 retary for Research, Education, & Economics
- Dr. Merle Pierson who shared with us details of 2007 Farm Bill deliberations and how the Agricultural Research Service will address anticipated challenges to U.S. agriculture.



Bill Kemp, Center Director, presents Tom Anderson, former Chair of the RRVARC Research Partners Group, with a plaque in appreciation for his outstanding leadership contributions to the Red River Valley Agricultural Research Center Partners Group from 2000-2006.

Two other important transitions were those of Tom Anderson, who provided extraordinary leadership in his capacity as Chair of the RRVARC Research Partners Group 2000-2006, and the sunflower research team of Dr. Jerry Miller and Dale Rehder. Although Tom's primary focus has changed in recent months, the impact of his dedicated service will be felt here for quite some time. Likewise with Jerry and Dale, who still, even in "official retirement," continue to make significant contributions to our sunflower research program.

As always, if you have any questions about anything that you see in this research update, please don't hesitate to contact me or any of the Center staff directly. We work very hard to be sure that we produce relevant research of the highest quality.

Thank you for your interest and support of our diversified programs here at the Center and please accept my best wishes for a safe and productive summer season!

Bill Kemp
Center Director

PASS IT ON!!!!

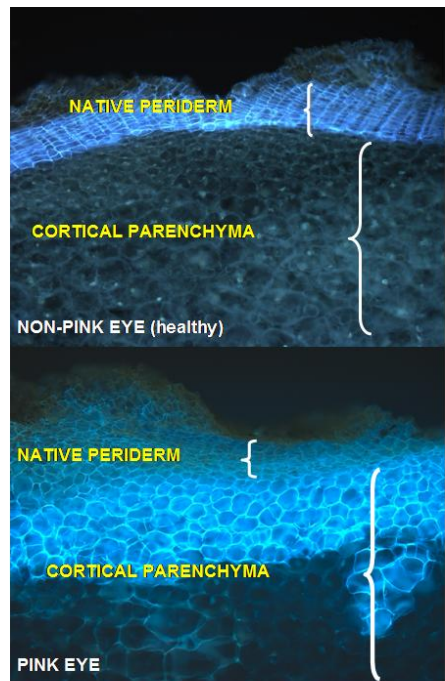
Feel free to pass on this issue of *Research News from the Valley* to others interested in agricultural research in the Northern Plains Area. To be added to our mailing list contact Alicia Thompson by phone (701-239-1370), fax (701-239-1395), or e-mail (alicia.thompson@ars.usda.gov).

Pink Eyed Potatoes

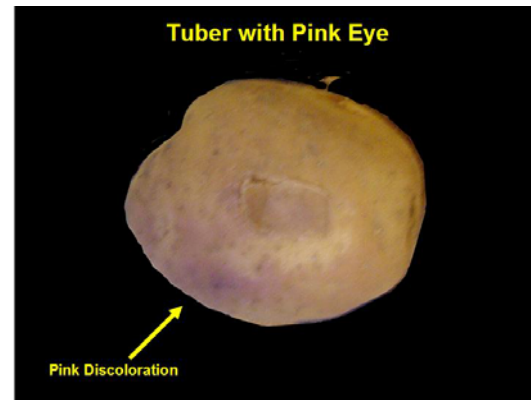
Potato growers and processors sustain tens of millions of dollars in total losses each year from a disorder of unknown origin that has been loosely referred to as pink eye or corky patch (PE). PE is a tuber disorder characterized by an ephemeral pinkish discoloration around the lateral eyes and skin of affected tubers and a persistent strong auto-fluorescence of the underlying tissue. The pink discoloration is observed at harvest but quickly disappears, often replaced by patches of cork-like skin. PE tubers are susceptible to postharvest infections resulting in storage rot. In its mildest form, the thickened skin of afflicted tubers interferes with processing and, in its more serious form, accelerated storage rot can result in significant crop loss.

Historically, the cause(s) of PE has been attributed to an unknown pathogen or combination of pathogens and for years attempts have been made to identify the culprit(s) – but none have been found. The failure to identify a causal pathogen, together with the inability to reproduce PE symptoms under controlled conditions has stymied efforts to minimize its occurrence and mitigate its effects. Recent studies conducted by Dr. Edward Lulai and cooperators at North Dakota State University, University of Wisconsin, and University of Idaho have begun to unravel the uncertainties surrounding this costly tuber defect.

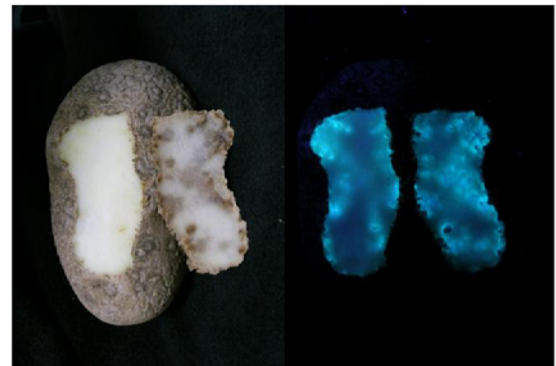
In research conducted over a period of 5 years, the PE syndrome was analyzed in tubers of diverse genotypes from major U.S. potato production areas. These studies determined that, although the tuber periderm (skin) appears intact in PE afflicted potatoes, the surface cells failed to accumulate certain cell wall associated bio-polymers necessary to prevent a wide range of infections. These bio-polymers were previously shown by Drs. Lulai and Dennis Corsini (ARS, Aberdeen, ID) to be essential for the full development of tuber resistance to bacterial and fungal pathogens. In addition, formation of an active region of cell division in the affected areas was disrupted which further compromised the integrity of the tuber skin.



Periderm (skin) of a healthy tuber (upper) and PE affected tuber (lower). Note erratic and excessive accumulation of phenolic bio-polymers resulting in strong blue auto-fluorescence.



Freshly harvested tuber displaying characteristic pink eye discoloration (arrow).



PE tuber under visible light (left) and UV light (right) showing strong blue auto-fluorescence of affected tissues.

This research challenged some long-held assumptions and answered unresolved questions about this important disorder. First, PE was shown to be a physiological (not pathological) disorder and the often-observed association between PE and various pathogens was a result of the disorder not the cause. Second, the previously unknown source of the characteristic fluorescence of PE afflicted tubers was shown to result from the erratic accumulation of cell wall bio-polymers.

Collectively, this research has created a new physiologically based model for PE which emphasizes the importance of cell wall related aberrations in the development and manifestations of this disorder. Future studies can now focus on the underlying biochemical mechanisms that ultimately result in PE and methods to mitigate the deleterious effects of this disorder can now be systematically sought.

For more information, contact
Dr. Jeffrey C. Suttle, Research Leader,
Sugarbeet & Potato Research Unit,
at jeff.suttle@ars.usda.gov

Ground Water Contaminant Converted to Nutrient by Ruminant Animals

Perchlorate is a strong oxidizing agent that occurs at very low concentrations in ground waters throughout the United States. Several locations within the United States, however, are contaminated with high levels of perchlorate from industrial sources. Some in the scientific community have expressed concern that developing infants and children may be sensitive to potential toxic effects of perchlorate. This concern was accentuated with the discovery of perchlorate in commercial milk samples and in health supplements used by pregnant or nursing women.



Drs. Gerald Larsen, Helder Hakk, and David Smith conducted a study to determine how much of a perchlorate dose is excreted in milk of dairy goats. Goats were used to model cows because of the expense associated with the use of the radiolabeled perchlorate. Although most of the perchlorate dosed to goats was converted to chloride (a component of table salt) prior to excretion, some of the perchlorate was absorbed and excreted unchanged into milk (about 4% of the total dose) and urine (about 10% of the dose). The remaining perchlorate was converted to chloride ion. This study demonstrates that ruminants have a large capacity to transform a potential contaminate to natural products.

*For more information, contact
Dr. Gerald L. Larsen, Research Leader,
Animal Metabolism & Agricultural Chemicals Research Unit,
at gerald.larsen@ars.usda.gov*

Environmental Management System

One of the points of emphasis of the Center's Environmental Management System (EMS) is recycling. Through the efforts of a very cooperative workforce the Center recycled a total of 24,262 lb of various materials in CY 2006.

Some of the larger contributors to the total are:

office paper	6285 lb
glossy paper/magazines	4855 lb
glass	6000 lb
steel & tin	2900 lb
electronics	1530 lb
and newsprint	1055lb



*For more information, contact
Dr. William P. Kemp,
Center Director at
william.kemp@ars.usda.gov*

USDA and Australian Scientists Collaborate to Collect Seeds of Wild Sunflower



Wild annual sunflower in a municipal "rubbish tip" at Esperance, Western Australia, illustrated a "typical" habitat for this species in Australia.



Australian plant pathologist, Gary Kong, collecting seeds from *Helianthus annuus* roadside populations near Port Augusta, South Australia.



A retired Australian farmer proudly displaying a wild sunflower plant from a population that has been on his farm near Laura, South Australia for more than fifty years.



Gerald Seiler, USDA botanist, collecting seeds of wild *Helianthus annuus* in a town dump in Queensland.



Tom Gulya, USDA pathologist, with robust wild *Helianthus annuus* near Ceduna, South Australia.

Tom Gulya, ARS-Plant Pathologist, and Gerald Seiler, ARS-Botanist, recently spent 17 days in Australia with a group of Australian sunflower researchers in an attempt to collect seeds of naturalized wild *Helianthus* species. Dr. Gary Kong, plant pathologist with the Queensland Dept. Primary Industries, and his two technicians helped to organize the trip. The five individuals covered over 10,000 km while exploring areas of Western Australia, South Australia, New South Wales, Victoria and Queensland. Despite the extreme drought, they found and were able to collect seeds from 37 populations of *H. annuus*, the common annual sunflower, and *H. debilis*, the dune sunflower. Dr. Kong and Gulya hope to collaborate more in the future as they jointly investigate the races of sunflower rust evolving on wild sunflowers in Australia and the United States. Once seeds of the Australian sunflowers clear customs, they will be evaluated by the USDA Sunflower Unit for possible new sources of disease and insect resistance, with special emphasis on Sclerotinia and rust resistance. The seeds will be deposited in the USDA-NCR Plant Introduction Station's (Ames, IA) *Helianthus* germplasm collection. This trip is the first exploration trip outside of North American for *Helianthus*, and was funded by a competitive grant from the USDA Plant Exploration Office, within the USDA National Plant Germplasm System.

For more information, contact
Dr. Brady A. Vick, Research Leader,
Sunflower Research Unit,
at brady.vick@ars.usda.gov

Regeneration of Leafy Spurge



Dr. Wun Chao (USDA-ARS) and Bin Xu (NDSU) observing regenerated plantlets.

Plant Science researchers are studying dormancy and growth of vegetative propagules because vegetative reproduction from crown and root buds is key to the persistence and spread of leafy spurge and other perennial weeds. Scientists in the unit have developed genomics resources for leafy spurge such as microarrays for examining the global expression of genes that regulate growth and development. Despite these new tools, a major limitation for using them to their fullest extent is the lack of a genetic transformation system for leafy spurge. Dr. Wun Chao, a Research Molecular Geneticist in the Plant Science Research Unit and collaborators at North Dakota State University are developing a transformation system for leafy spurge to test the function of cloned genes *in planta*. Individual cells from various plant tissues or groups of cells called 'callus' are generally transformed using *Agrobacterium* or 'gene gun' methods to overexpress or silence the target gene of interest. However, the transformed cells must be regenerated into a whole plant before gene expression can be rigorously examined. Scientists have found that regeneration of Euphorbiaceae family members from callus or other tissue is inconsistent, difficult, and sometimes not possible. Dr. Chao's group has determined that regenerated shoots of leafy spurge are primarily developed from preexisting meristematic cells in the stem and hypocotyl. Meristematic cells are those that are capable of cell division to generate new tissues. Currently, a few highly regenerable lines of leafy spurge have been obtained after exhaustive screening of 160 seedlings. New shoots can now be regenerated from callus or from the outer cells of the stem, which are actually non-meristematic tissue, and shoot regeneration is highly homogeneous. The regeneration potential is further enhanced by optimizing tissue culture conditions such as hormone content, basal medium formulation, pH, and light. Transformation is now within reach given the breakthrough in regeneration of whole plants from non-meristematic and callus tissues.

*For more information, contact
Dr. Michael E. Foley, Research Leader
Plant Science Research Unit,
at michael.foley@ars.usda.gov*

Recent Releases of Germplasm and Genetic Stocks of Durum and Spring Wheat

Modern agriculture heavily relies on the development and utilization of commercial cultivars or varieties that are usually developed through hybridization between adapted elite germplasm followed by selection processes. Although intensive utilization of commercial cultivars has remarkably increased productivity, it has resulted in a reduction of genetic variability in the major crops. The narrow genetic base of cultivated wheats, including hexaploid bread wheat and tetraploid durum wheat, has received attention from wheat geneticists and breeders since the 1970s. In the Cereal Crops Research Unit, efforts to widen the wheat gene pool have been made continuously through development of new germplasm and genetic stocks using old landraces and related species, and a number of germplasm and genetic stocks in durum and spring wheat have been recently released to the public.

These releases include four durum wheat germplasms (PI 636498, PI 636499, PI 636500, and PI 636501) carrying the gene *Glu-D1d*, one scab-resistant durum germplasm (PI 645483), three spring synthetic hexaploid wheat (SHW) germplasms (PI 639730, PI 639731, and PI 639732) resistant to Hessian fly, and a durum genetic stock 'Rusty' (PI 639869). The scab-resistant durum germplasm was released from Dr. Prem Jauhar's program, while the others arose from the research program of Dr. Steven Xu.

The four durum germplasms carrying the gene *Glu-D1d*, which was transferred from bread wheat, were produced in an effort to develop dual-purpose durum wheats that might be good for bread-baking as well as pasta. The gene *Glu-D1d* encodes high-molecular-weight (HMW) glutenin subunits 1Dx5 and 1Dy10 (5+10); these subunits are highly desirable for superior bread-baking quality. Breeders may find these lines useful as parents in crosses combining a durum germplasm carrying *Glu-D1d* with glutenin or gliadin genes from a second source that may complement *Glu-D1d*.

The three SHW germplasms carry Hessian fly resistance genes transferred from goat-grass (*Aegilops tauschii*), the D genome donor of bread wheat. They are useful in developing adapted bread wheat germplasm and commercial cultivars resistant to Hessian fly (Fig. 1). 'Rusty' durum is a genetic stock that is near-universally susceptible to all the stem rust races that have been tested. It will be useful to researchers studying the genetics of stem rust resistance in tetraploid wheats, or in crosses designed to select monogenic progeny from a parent containing multiple genes for stem rust resistance. The most recent release is a scab-resistant durum germplasm (PI 645483). It is an alien disomic addition line carrying a pair of chromosomes from a diploid wheatgrass (*Lophopyrum elongatum*) in a durum background (Fig. 2). It took ten years to develop this stable addition line that may be a useful germplasm for incorporating the alien gene for scab resistance into the durum wheat genome.

Public releases of these germplasms and genetic stocks may speed the deployment of desirable genes into commercial cultivars and also may facilitate genetic study of the genes by the wheat research community. Since their release, some of these lines have been requested by wheat breeders, geneticists, pathologists, and entomologists at Louisiana State University, Oklahoma State University, Washington State University, University of Minnesota, North Dakota State University, Arizona Plant Breeders, Inc., University of Saskatchewan, Argentina, Canada, France, and the International Maize and Wheat Improvement Center (CIMMYT).

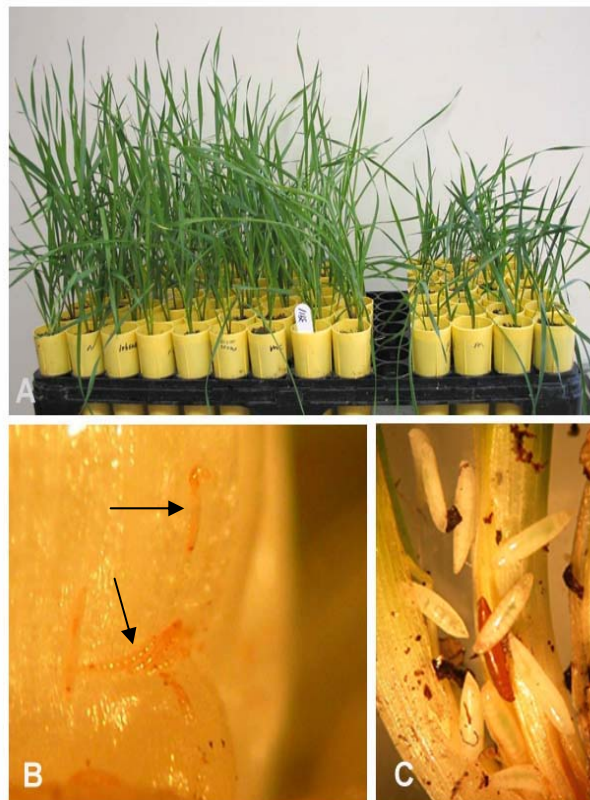


Figure 1. Reaction of synthetic hexaploid wheat lines to Hessian fly at 15 days post infestation. A) Resistant lines (left) showed normal growth and susceptible lines (right) were stunted; B) dead first-instar larvae found at the base of leaf sheath in the resistant plants; and C) live larvae or pupae found at the base of the leaf sheath in the susceptible plants.

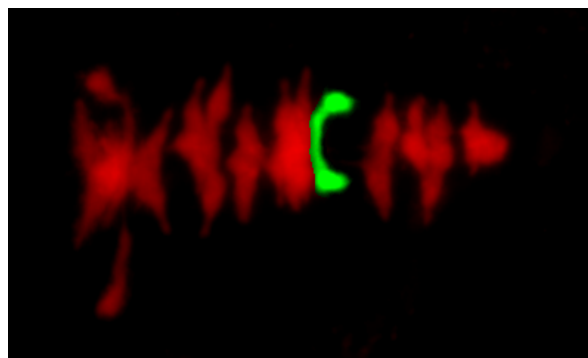
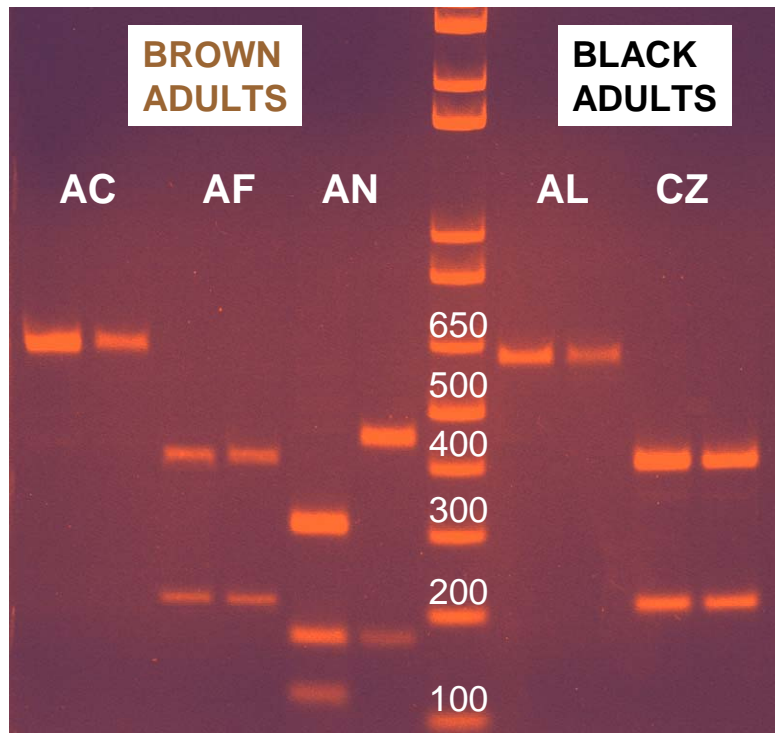


Figure 2. A cell showing chromosomes of durum wheat (red) and an added pair from diploid wheatgrass (green).

For more information, contact
Dr. Michael C. Edwards, Research Leader,
Cereal Crops Research Unit,
at michael.edwards@ars.usda.gov

DNA Test Identifies Species of Leafy Spurge Flea Beetles and Rediscovered a Species Thought to Have Disappeared



Chrysomelid flea beetles from the genus *Aphthona* were introduced into North America in the late 1980s in an effort to control the invasive weed, leafy spurge. Both the weed and insects are native to Eurasia. Five *Aphthona* species have been successfully released during the course of this biological control program. They are *A. flava* (AF), *A. cyparissiae* (AC), *A. nigriscutis* (AN), *A. czwalinae* (CZ), and *A. lacertosa* (AL). The first 3 species are various shades of brown to gold in color, while the latter two are predominantly black. During the course of the redistribution efforts to expand the range of the beetles there has been a change in the relative species mix.

AL and AN are currently the most prevalent, and recent evidence suggests that AL may be supplanting AN. AF and AC have become so scarce in ND and MN that collections of brown beetles are usually assumed to be all AN. This is partly a matter of convenience because these three species are not easily distinguishable via external morphology and color. CZ was thought to have been a major component in the early years of the release program until it was discovered that most of what was being called CZ was in fact AL. There have not been verifiable sightings of CZ in ND and MN for several years. We have developed a relatively simple DNA based assay that can identify the five *Aphthona* species that have been part of the biocontrol effort. DNA from the insects is cleaved with a restriction enzyme that results in distinctive size pieces of DNA for each of the brown and each of the black species (see figure). With an additional step, larvae of all 5 species can be identified. In the process of testing beetles from different collection sites, we discovered a location in eastern North Dakota that supports substantial numbers of 3 species (CZ, AF, and AC) that have not been observed there in recent years. These 3 species would be candidates for redistribution to sites that do not have AL nor AN. This work has been done by Dr. Richard Roehrdanz, Geneticist, Insect Genetics & Biochemistry Research Unit, Fargo in collaboration with S. Sears (USDA Fargo), D. Olson (ND Dept. of Agriculture), G Fauske (ND State Univ.). R. Bouchier (Agriculture & Ag-Foods Canada), and T Cortilet (MN Dept. of Agriculture).

For more information, contact
Dr. James S. Buckner, Research Leader,
Insect Genetics & Biochemistry Research Unit,
at james.buckner@ars.usda.gov

Retirement of Jerry F. Miller



Jerry F. Miller and Dale A. Rehder (technician) both retired in January 2007.

Dr. Jerry F. Miller, Research Geneticist, with the USDA-ARS, Northern Crop Science Laboratory in Fargo, ND, retired on January 3, 2007, after working nearly 31 years in the field of plant breeding and genetics.

Jerry was raised on a wheat farm near Sidney, NE. He received his B.S. and M.S. degrees from the University of Nebraska-Lincoln and his Ph.D. from North Dakota State University and did his research on hybrid wheat. He worked for two years with Funk Brothers Seed Co. in Bloomington, IL, before being hired as an instructor-research associate with North Dakota State University to work on hybrid wheat seed production and breeding. He joined the USDA-ARS Oilseed Research Unit in 1976 as a flax and sunflower geneticist. He released two varieties of flax, Linton and Omega, with multiple gene rust resistance. Omega is still the leading golden flax cultivar grown in the United States utilized for its Omega-3 rich fatty acid composition. He was the curator of the World Flax Collection until 1995 when it was transferred to the North Central Plant Introduction Station in Ames, IA. In 1995 the name of the research unit was changed to the Sunflower Research Unit and Jerry's research program became 100% sunflower research.

Jerry is recognized worldwide for his germplasm releases and genetic investigations of sunflower. During his career he released 225 germplasm lines and genetic stocks and authored 216 scientific publications. His international stature was evidenced by his election to the Presidency of the International Sunflower Association, headquartered in Paris, France, and the visiting scientists from 17 countries who have worked under his direction. Jerry is a Fellow of the American Society of Agronomy and the Crop Science Society of America, received the ARS Award for Superior Technology Transfer Achievement in 2003, and was recently given the National Council of Commercial Plant Breeders Genetics and Plant Breeding Award. He also served as Chair of Division C-1 of the Crop Science Society of America as well as on several other CSSA committees. Jerry was an Adjunct Professor with the Plant Sciences Department of North Dakota State University and in this capacity guided 14 students through their M.S. or Ph.D. degrees, and served on 38 graduate student committees.

Jerry's research career is noted with numerous achievements that made significant impact on the sunflower industry. He was first to elucidate the inheritance of oleic acid in sunflower, and made the genetic combinations to first create NuSun™ (mid-oleic) hybrids that began the movement that now accounts for 90% of U.S. sunflower production. The transformation of the hybrid sunflower production from traditional to NuSun oil quality is the most significant development in the U.S. sunflower industry since the introduction of hybrid sunflower. Jerry was also the early leader in investigating and utilizing herbicide resistance in sunflower with imidazolinone and sulfonyleurea herbicides. Most recently he released Sclerotinia head and stalk rot tolerant germplasm lines, and downy mildew, rust, and Phomopsis disease resistant germplasm lines from interspecific crosses, and confection sunflower germplasm lines with Sclerotinia and imidazolinone herbicide resistance.

Jerry and his wife, Sharon, plan to spend winters in Mesa, AZ, being near to Sharon's parents, but will remain in Fargo, ND, to be active with their three children and grandchildren.

We wish Jerry the very best in the future.

USDA Agricultural Research Service Geneticist Receives Public Breeder Award



Dr. Jerry F. Miller, Research Geneticist
Sunflower Research Unit (Retired)

Dr. Jerry Miller received the Genetics and Plant Breeding Award at the American Seed Trade Association meeting held in Chicago, IL, December 6-8, 2006. Dr. Miller is a Research Geneticist in the Sunflower Research Unit, USDA Agricultural Research Service, in Fargo, ND. Miller was cited for his many contributions to sunflower improvement during his 31-year career with the USDA. His achievements include a key role in the successful conversion by the U.S. sunflower industry from a highly polyunsaturated sunflower oil to a highly monounsaturated oil called NuSun™. Miller was also recognized for his development and release of the first herbicide-resistant sunflower germplasm, and for numerous sunflower lines with enhanced disease resistance. The award, sponsored by the National Council of Commercial Plant Breeders, honors a plant breeder who has made outstanding basic contributions to the advancement of plant breeding and genetics in the public sector.

*For more information, contact
Dr. Brady A. Vick, Research Leader,
Sunflower Research Unit,
at brady.vick@ars.usda.gov*

Jauhar Honored in India



Dr. Prem P. Jauhar, Research Geneticist
Cereal Crops Research Unit

Azad University, Kanpur, and also Governor of the state of Uttar Pradesh, India. He was also named an Honorary Fellow of the Indian Society of Biotechnology. Jauhar was in India last November to attend the International Conference on Biotechnology and served on the International Advisory Committee for the conference. While there, Dr. Jauhar gave a plenary lecture on "Biotechnology as an Important Tool for Incorporating Value-Added Traits in Cereal Crops." Following the conference, Jauhar gave invited lectures at several universities and institutes, including Delhi University, Delhi; Indian Agricultural Research Institute, New Delhi; Banaras Hindu University, Varanasi; National Botanical Research Institute, Lucknow; Punjab University, Chandigarh; and Rajasthan University, Jaipur.

Dr. Jauhar has previously received several prestigious honors, including being elected Fellow of the Crop Science Society of America in 1995, Fellow of the American Society of Agronomy in 1996, and Fellow of the American Association for the Advancement of Science in 2003.

Prem P. Jauhar, Research Geneticist in the Cereal Crops Research Unit, was recently given the Robe of Honour and the University Memento for his outstanding research contributions by T.V. Rajeswar, Chancellor of Chandra Shekhar

*For more information, contact
Dr. Michael C. Edwards, Research Leader,
Cereal Crops Research Unit,
at michael.edwards@ars.usda.gov*

Community Involvement


RRVARC Takes Part in Marketplace for Entrepreneurs

Marketplace for Entrepreneurs is co-sponsored annually by U.S. Senator Kent Conrad and ND Agricultural Commissioner Roger Johnson and was held for the second time in Fargo at the Fargo Dome January 16-17, 2007. The ARS team consisted of Theresa Gross (Sunflower Unit), Cheryl Kimberlin (Plant Science Unit), Joe Rinehart, Rich Roehrdanz and George Yocum (Insect Biochemistry and Genetics Unit). Attendance on the day of our exhibit was 5,992 so our team was kept busy.

With Marketplace being in Fargo it made for a very short and convenient drive which was really nice. The two things that stood out this year were the large number of high school students and interest in biofuels. Although ARS is not working on biofuels in Fargo, we still were able to answer some questions and talk about biofuel projects within ARS. Prairie Public TV filmed Theresa talking about our potato chip display and aired a short clip of it the following week. As always we had fun interacting with the general public and were encouraged by the level of interest people showed in our research.



For more information, contact Dr. William P. Kemp, Center Director at william.kemp@ars.usda.gov



Marketplace
for entrepreneurs

Growing North Dakota from Within

411 Main Street West
Mandan, ND 58554-3164
701.663.0150 or 1.888.384.8410
Fax: 701.663.1032
marketplace@bimel.net

Marketing: Mary E. Kipp, Executive Director
411 Main Street West
Mandan, ND 58554-3164
701.663.0150 or 1.888.384.8410
Fax: 701.663.1032
marketplace@bimel.net

ORGANIZING SPONSORS:

Kent Conrad
United States Senator
Room 228, Federal Building
220 East Roosevelt Avenue
Bismarck, ND 58501
701.256.4440

Roger Johnson
Agriculture Commissioner
ND Department of Agriculture
503 East Boulevard Avenue
Department 602
Bismarck, ND 58505
701.328.2231

BOARD OF DIRECTORS:

Roger Johnson, President
Shirley Johnson, Vice President
Sarah Vogel, Secretary
Elwood "Woody" Bath, Treasurer
Wayne G. Sandstead

Marketplace of/for:
Marketplace for Kids, Inc.
5501(c)(3), Nonprofit Organization
and an Equal Opportunity
Provider and Employer.

Supported and Assisted
by more than 1,000 Private
and Public Organizations
throughout North Dakota.

February 12, 2007

Dr. William P. Kemp
Red River Valley Ag Research Service, ARS/USDA
PO Box 5677
Fargo, ND 58105-5677

Dear William:

Thank you for your role in making Marketplace for Entrepreneurs 2007 a resounding success. We are pleased to hear about the many valuable and memorable experiences participants have recounted about this year's event in Fargo.


The seminars, workshops, exhibits, inventions, featured speakers, and the talent search competition combined to demonstrate how truly vibrant and promising our life in North Dakota is. We were particularly encouraged by the participation of a large number of young people and impressed by the depth of information provided by presenters, exhibitors, and keynotes.

Awards were presented to the Marketplace Entrepreneur of the Year, the Entrepreneurial Community of the Year, the best business plans presented by college students, the most outstanding inventions of the Northern Plains Inventors Congress, and to a talented vocalist. Marketplace attendees also participated in the Nature Based Tourism Conference, the Opening the Doors of Opportunity Conference, the Summit on Entrepreneurship and a number of other events held in conjunction with Marketplace.


Please let us know if you would like a copy of the 2007 Resource Directory CD for your use throughout the year ahead. You can also access the 2007 Resource Directory online at www.MarketplaceForEntrepreneurs.org.

Again, thank you for helping us "Grow North Dakota from Within"!

Sincerely,



KENT CONRAD
U.S. Senate



ROGER JOHNSON
Agriculture Commissioner

www.MarketplaceForEntrepreneurs.org

Community Involvement

RRVARC Participates in Marketplace for Kids



On May 4th, staff of the Red River Valley Area Research Center in Fargo, ND participated in the 2007 Marketplace for Kids held at Concordia College, Moorhead, MN. Marketplace for Kids is a yearly event co-sponsored by U. S. Senator Kent Conrad, North Dakota Agriculture Commissioner Roger Johnson, and North Dakota State Superintendent of Public Instruction Wayne Sanstead. The event encourages children to invent and market a product or an idea. Approximately 2,500 elementary school children from schools throughout the Red River Valley participated in this year's event.



Several organizations, including the RRVARC, had display booths highlighting their services. At the RRVARC booth children learned about some of the research activities at the Center. Our exhibit included Jacob, the lab rat, hissing cockroaches, hands-on pH measurements, a game to match food products with the crop from which they were derived, and a high-performance liquid chromatograph to measure the amount of caffeine in soda pop. Students who visited the booth and participated in the demonstrations were rewarded with a bag of potato chips or a packet of sunflower seeds. Pencils provided by the USDA-ARS Information Staff, Beltsville, MD, were also distributed to the children. Thank you to Jeff Suttle and the Northern Plains Potato Growers Association and to Brady Vick and the National Sunflower Association for providing the snacks. In addition to our display booth, Sheila Sears presented a class on "How Did They Do That?" Thanks also to volunteers Lloyd Billey, Leonard Cook, Theresa Gross, Grant Harrington, Joseph Rinehart, Gerald Seiler, Nancy Shappell, and Jamie Wadzink for representing the RRVARC this year.



Building Blocks of Entrepreneurship

2007

Marketplace for Kids

Growing Young Entrepreneurs!

HONORS

2007 EDUCATION DAYS

March 12th ~ Devils Lake
 March 13th ~ Bottineau
 March 14th ~ Dickinson
 April 3rd ~ Minot
 April 13th ~ Jamestown
 April 24th ~ Williston
 April 26th ~ Grand Forks
 April 30th ~ Bismarck
 May 4th ~ Moorhead
 July 11th ~ Cooperstown

USDA-ARS Red River Valley Agricultural Research Center
 Fargo, ND

Thank you for exploring new ideas and sharing your enthusiasm!

We think you're GREAT!

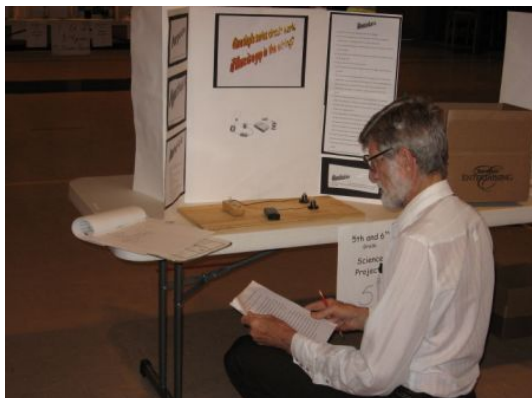
Kent Conrad
 United States Senator

Roger Johnson
 Agriculture Commissioner

Dr. Wayne G. Sanstead
 Superintendent of Public Instruction

Community Involvement

RRVARC Judges Sheldon Elementary School Science Fair



Tom Gulya, Plant Pathologist, from the Sunflower Research Unit and Dave Davis (retired Plant Physiologist) made their last appearance at the Sheldon Elementary School (ND) to judge the school's annual science fair. The school, with enrollment declining to the present 21 students, will close this year, and students will attend either Lisbon or Enderlin schools next year. Visiting the Sheldon school was a rewarding experience for both Tom and Dave, and they hoped that there are a few budding scientists who reside in Sheldon... maybe even a future ARS person!

This year's projects included the inevitable volcano display, plus some interesting projects on electricity, gas laws, centripetal force (did you ever measure how far a marble goes into a cup of jello if you swing it over your head?), plus lovely dioramas done by the younger children on the life cycle of butterflies.



For more information, contact
Dr. William P. Kemp,
Center Director at
william.kemp@ars.usda.gov





USDA-ARS-RRV ARC
Fargo, ND

1307 North 18th Street
P.O. Box 5677, State University Station
Fargo, ND 58105-5677

Phone: 701-239-1370
Fax: 701-239-1395
Email: alicia.thompson@ars.usda.gov

Job Opportunities:

www.ars.usda.gov

WE'RE ON THE WEB!

[HTTP://WWW.ARS.USDA.GOV/NPA/RRVARC](http://WWW.ARS.USDA.GOV/NPA/RRVARC)

Commercial Endorsement Disclaimer

The use of trade, firm, or corporation names in this publication (or page) is for the information and convenience of the reader. Such use does not constitute an official endorsement or approval by the United States Department of Agriculture or the Agricultural Research Service of any product or service to the exclusion of others that may be suitable.

RED RIVER VALLEY AGRICULTURAL RESEARCH CENTER

Vision Statement

An internationally recognized center of excellence for integrated agricultural research on high priority problems to ensure a safe and abundant food supply.

USDA Nondiscrimination Statement

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Upcoming Events:

EVENTS AT THE CENTER

JULY 2007

4: RRVARC Closed - Independence Day

SEPTEMBER 2007

3: RRVARC Closed - Labor Day

OCTOBER 2007

8: RRVARC Closed - Columbus Day

EVENTS ELSEWHERE

JUNE 2007

26-27: National Sunflower Association
2007 Summer Seminar, Medora
Community Center, Medora, ND.

JULY 2007

7-11: American Society of Plant Biology
Meeting, Chicago, IL.

AUGUST 2007

12-16: 91st Potato Association of America
Annual Meeting, Idaho Falls, ID.