



November 2004



Red River Valley Agricultural Research Center

RESEARCH NEWS FROM THE VALLEY

USDA-ARS-RRV ARC

Fargo, ND

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

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From the Director

This edition of the "Research News From the Valley" will highlight activities from each of our six research units, as well as providing you with a glimpse of some of the recent activities we've been involved in here at the Center. Since we are at the beginning of a new fiscal year it is also appropriate to discuss some recent changes that will impact our location.

First, however, I want to briefly comment on the 50 Year Anniversary celebration that all ARS employees have participated in over the past 12 months. In the April 2004 issue I mentioned the kickoff activities that occurred in November 2003. That event was an excellent way to begin the year. We followed this up with a day long celebration here in Fargo on July 21, 2004. We not only celebrated the 50th Anniversary of ARS, but we also commemorated the 40th Anniversary of the establishment of the Biosciences Research Lab here on the campus of North Dakota State University. Dr. Ed Knipling, our newly appointed Administrator, and Dr. Will Blackburn, Northern Plains Area Director joined us for the day. Additionally, many of our customers, stakeholders, former employees and friends attended. It was an enjoyable day for all and allowed the Center staff to highlight their

research and say thank you to our many supporters. A copy of the Agenda for the day plus some pictures from the event are included in later sections of this edition of the "Research News from the Valley".

Some of you may have heard about a few changes occurring at our location. To begin, I am in the process of moving to the ARS Northern Plains Area Office in Ft. Collins, CO. This move will occur around the first of December. Dr. Brady Vick, Research Leader of the Sunflower Research Unit, will assume Acting Center Director duties at that time. A national search will occur and hopefully (keep your fingers crossed) a new Director will be in place sometime in the Spring of 2005. Transitions in leadership are always interesting, but I have great confidence in Brady's abilities to continue to lead the Center during the interim period. I am confident that we will also select a new Director who will continue to foster strong ties between our laboratories and our customers, stakeholders, partners, and numerous friends and colleagues.

For those of you who know me you can imagine the numerous feelings I have about leaving Fargo. The past five+ years have gone by very quickly. I came to the Center in August of 1999 which only

seems like yesterday. The Center is a great place to work and I've been pleased to be a part of an outstanding research organization. I've also appreciated having the opportunity to get to know many of you and to work closely with you and your organizations. The Center has grown and expanded its research capacity greatly during the last decade. You folks have been a part of that growth and we appreciate your continued support of our staff and programs. I personally thank you for making my tenure here in Fargo a pleasurable and rewarding experience. Even though I'll be working out of Ft. Collins I will have the chance to occasionally come back to Fargo to work with the Center staff and to hopefully continue some interactions with many of you.

Finally, please give the staff some feedback on the content of this research update. They do appreciate hearing from you and having an opportunity to provide information on their many research activities. The Center appreciates your interest in our numerous programs!!

Best wishes for the remainder of the year!

Larry Chandler
Center Director

PASS IT ON!!!!

Feel free to pass on this issue of *News from the Center* 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 thompsona@fargo.ars.usda.gov.

New Scientist Joins Cereal Crops Research



Dr. Yin-Shan Tai
Research Molecular Biologist
Cereal Crops Research Unit

Dr. Yin-Shan Tai is a new Research Molecular Biologist in the Cereal Crops Research Unit. He came to the Center in August from Dr. Richard Michelmore's laboratory at the University of California/Davis.

Dr. Tai received his B.S. degree in Botany from National Chung-Hsing University, Taiwan, and also received a Master's degree in Plant Physiology from the same university. He then came to the U.S. and obtained another M.S. in Molecular Biology from Utah State University. He subsequently moved to Michelmore's laboratory at UC-Davis where he obtained his PhD working on plant disease resistance mechanisms, specifically the interaction between tomato and *Pseudomonas syringae*. He was also involved in a

study to identify bacterial avirulence effectors and their interactions with components of plant signal transduction pathways.

Dr. Tai will be responsible for investigations of the molecular basis of host-pathogen interactions, particularly for economically significant foliar and head diseases of wheat. The goal is to provide basic knowledge that will facilitate our understanding of the molecular mechanisms underlying resistance and pathogenicity, and ultimately to use this knowledge to improve disease resistance in wheat and other cereals. Specific lines of research may include characterization of defense response pathways, identification and characterization of interactions between host and pathogen

gene products, and/or biochemical characterization of pathogenicity/virulence factors (eg. toxins) and their mode of action.

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

News from Plant Science Research



Dr. Tracey Slotta
Postdoctoral Associate
Plant Science Research Unit

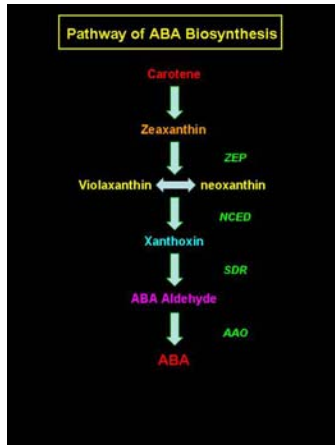
Dr. Tracey Slotta joined the Plant Science Research unit in August 2004 as a Postdoctoral Associate to implement research on the population genetics of Canada thistle. This is a new project that began with stakeholder input and action to address the dramatic expansion of Canada thistle, particularly in natural areas. Canada thistle is a noxious weed in about 30 states and much of Canada. Our objectives are to understand the genetic structure of Canada thistle and its relationship to other thistles in the U.S., some of which are native and endangered. This research is the first step in determining if biological control is an option for management of Canada thistle, without harming the native and endangered thistles.

Tracey completed her Ph.D. at Virginia Polytechnic Institute and State University in Blacksburg, VA in August 2004. For her dissertation, Tracey examined the phylogenetic history and population genetics of several rare and endangered mallow plants. The switch to weeds has gone smoothly for Tracey. With the help of her husband, she collected Canada thistle plants from populations along the highways and byways from Virginia to North Dakota. One of her first comments was "it's much easier to find populations of Canada thistle than mallow plants." After settling into a new residence in Fargo, Tracey made several collection trips crisscrossing North Dakota and parts of Minnesota. With the onset of cooler weather, Tracey has moved into the lab to extract DNA from several thousand

plant samples. This winter Tracey intends to examine the usefulness of several different types of DNA markers in order to examine the genetic diversity within Canada thistle populations gathered throughout the region. Tracey and other unit members will give an update on their research in Bismarck at the North Dakota Invasive Species Workshop in April 2005.

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

Genetic Dissection of Plant Hormone Synthesis and Destruction in Potato



The pathway of ABA biosynthesis from carotenoids illustrating the positions of critical genes controlling each step: ZEP, NCED, SDR, and AAO.

In most seed plants, abscisic acid (ABA) is the major hormone controlling plant dormancy, plant disease resistance, and wound-healing. ABA is synthesized from a carotenoid precursor in a series of highly coordinated steps involving at least four separate enzymes (see figure). In collaborative studies between the laboratories of Drs. Edward Lulai and Jeffrey Suttle, a total of eight genes controlling all steps of ABA biosynthesis and degradation have been

isolated, cloned, and characterized from potato tubers. Using the newly developed techniques of real-time polymerase chain reaction (RT-PCR), the effects of tuber dormancy and wounding on the expression of all eight genes is being determined. In further studies with Dr. James Lorenzen (Idaho State University), each of these genes is being mapped to specific locations in the potato genome. Once completed, the genetic mechanisms controlling the

synthesis and accumulation of this critical hormone will be identified. This information can then be used to identify superior potato breeding lines with enhanced storage and processing potential and to develop molecular probes for potato germplasm improvement using marker assisted selection.

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

Sclerotinia Initiative FY-2005 Pre-Plan of Work

Visit: www.whitemoldresearch.com/HTML/research.cfm or contact Dr. Laurence D. Chandler at 701-239-1370. Proposal should be postmarked no later than 12/10/04.

New Chromosome Doubling Gene Identified in Wild Sunflower



Helianthus californicus

Wild sunflower species hold great promise as a genetic resource to improve cultivated sunflower. Many of the genes for disease resistance which have been introduced into cultivated sunflower were derived from wild sunflower species.

However, transferring genes between sunflower species is technically very difficult in some cases, especially when

the transfer is attempted between annual and perennial species. After pollination, the embryos typically abort after a few days, resulting in little or no seed production. The few seeds that are produced often grow into plants whose seeds are nonfertile.

Dr. Chao-Chien Jan, a cytogeneticist in the Sunflower Research Unit, specializes in gene transfer between difficult-to-cross sunflower species. The technique usually involves rescuing the fertile seeds of a cross before they abort, and growing them first in culture, and later in pots, until they are mature plants called "interspecific hybrids."

The interspecific hybrids are treated with a chemical called

colchicine, which doubles the number of chromosomes and allows the interspecific hybrids to produce fertile seeds. These seeds have twice the usual number of chromosomes, and contain a complete set of chromosomes from each of the parents. This type of plant, called an amphiploid, can be readily crossed with cultivated sunflower to introduce desired genes from the wild sunflower parent. Unfortunately, the colchicine used to double the chromosomes is a highly toxic and carcinogenic chemical. An alternative method to double the chromosome number of an interspecific hybrid would be desirable.

Recently, Dr. Jan discovered a gene from *Helianthus*

californicus, a wild perennial sunflower indigenous to central and southern California, that causes natural chromosome doubling in crosses with cultivated sunflower.

Dr. Jan plans to further characterize this gene and assess its utility in producing amphiploid sunflower plants that can be used to facilitate gene transfer. If successful, and we think there is a good chance for success, the new method will revolutionize and significantly accelerate the transfer of useful genes from wild sunflowers into the cultivated crop.

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

Activities of the Insect Genetics & Biochemistry Research Unit



Dr. Roger Leopold transferring screwworm to Ft. Collins, CO.

Roger Leopold, Entomologist, of the Insect Genetics and Biochemistry Research Unit recently led efforts to cryopreserve and transfer 10 strains of screwworm embryos from Lincoln, NE to the USDA-ARS National Center for Genetic Resources Preservation in Fort Collins, CO. Dr. Leopold's efforts were coordinated with Dennis Berkebile, Entomologist of the Midwest Livestock Insects Research Unit, Lincoln, NE and Harvey Blackburn, Coordinator of the ARS National Animal Germplasm Program in Fort Collins.

On October 1-2, Dr. James Buckner, Research Leader and Dr. George Yocum, Physiologist, attended the 2004 Conference of the Association of Natural Bio-Control Producers in Colorado Springs, CO and interacted with stakeholders in the commercial biocontrol industry.

On October 19-22, Dr. Leopold attended the International Conference on "Conservation of Genetic Resources" held at the Institute of Cytology in St. Petersburg, Russia. Dr. Leopold, as co-chairman of the plenary session on "Achievements of fundamental cryobiology, and new approaches to cryotechnologies for reproductive medicine, conservation of genetic materials of plants, animals and cell cultures", gave the opening presentation entitled: "Cryopreservation of dipteran insects: development and evaluation". During the Conference he also gave another presentation on "Establishing a national insect germplasm storage program for the U.S.A."

In November, all four Unit Scientists will attend and present research findings at the Annual Meeting of the Entomological Society of America in Salt Lake City, UT. Poster presentations include: Dr. Roehrdanz -- "Multiple Wolbachia Strains in Northern Corn Rootworms (*Diabrotica barberi*)"; Dr. Yocum -- "Nitrogenomics of the Predatory Pentatomid, *Perillus bioculatus*"; Dr. Buckner -- "Comparisons of Adult Cuticular Lipids from the Pollinator Bees, *Megachile rotundata* (F.) and *Osmia lignaria* Say (Hymenoptera: Megachilidae)".

In December, Drs. Buckner and Leopold will attend the 2004 Pierce's Disease Research Symposium in Coronado, CA, and in collaboration with Dr. Thomas Freeman, Director of the North Dakota State University Electron

Microscope Center, present their findings -- "Ultrastructural Contributions to the Study of the Glassy-Winged Sharpshooter and Pierce's Disease". Dr. Leopold will also present his research "Functional responses and super-parasitism of egg parasitoid, *Gonatocerus ashmeadi* to the glassy-winged sharpshooter, *Homalodisca coagulata* (Say) and "Effects of using constant and cyclical stepwise-increasing temperatures on parasitized and unparasitized eggs of the glassy-winged sharpshooter, *Homalodisca coagulata*, during cold storage".

December 13-15, Dr. Roehrdanz and Dr. Yocum will attend the 2004 International Conference on *Diabrotica* Genetics in Kansas City, KS and Dr. Roehrdanz will present a symposium talk -- "Genetic diversity and Wolbachia in northern corn rootworm".

In July 2004, the Unit welcomed a new employee, Marnie Aasheim, a Biological Laboratory Technician working with Dr. Yocum.

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

Animal Metabolism-Ag. Chemicals Research Unit On-Site Review

An On-site Expert Review of the Animal Metabolism – Agricultural Chemicals Unit was conducted October 13-15, 2004 at the Biosciences Research Laboratory. The purpose of the review was to engage a panel of experts to provide an assessment of Unit research programs in regard to: a) relevance to Agency Mission (National Programs); b) scientific merit; c) the Unit's capacity to perform its mission; and d) benchmark the Unit's leadership nationally and internationally. The Expert Review Panel consisted of Dr. Nate Bauer (Chair), Food Safety and Inspection Service, USDA; Dr. Gregory D. Sayles, US EPA; Dr. Liz Wagstrom, National Pork Board; Dr. Michelle Rossman, National Cattleman's Beef Association; and Dr. Sarah Wagner, Dept. Animal & Range Sciences at North Dakota State

University. Background presentations were given by Center Director Dr. Laurence Chandler, Northern Plains Area Director Dr. Will Blackburn, and ARS National Program Staff Leaders Drs. Jane Robens and James Lindsay. Unit Scientists presented information on their research projects, research goals and vision. The Review Panel interviewed Unit Scientists, Technical Support and Administrative Staff, Customers and Stockholders. Tours of the facilities were also provided. On Friday, October 15 the Review Panel presented their preliminary findings and recommendations on the status and future of the Unit research, personnel and facilities to Unit staff. A Review Team is working on a formal report which will be submitted to the Northern Plains Area Office within the next 30 days. The Unit will then

develop an Action Plan to address the recommendations made. The preliminary report from the Panel was positive and complimented the staff on their current efforts and past research activities.

*For more information, contact
Dr. Gerald L. Larsen, Research Leader,
Animal Metabolism-Ag. Chemicals Research
Unit, at larseng@fargo.ars.usda.gov*



**Animal Metabolism-Agricultural Chemicals Research Unit
Red River Valley Agricultural Research Center
Fargo, North Dakota**

Sunflower Research Unit Hosts International Sunflower Conference

The Sunflower Research Unit, along with colleagues from North Dakota State University and the National Sunflower Association, recently hosted the 16th International Sunflower Conference at the Holiday Inn in Fargo. Held August 29 through September 2, 2004, the meeting attracted about 250 researchers, processors, seed producers, and agricultural chemical distributors from 25 sunflower-growing countries.

The conference is held every four years, most recently in Toulouse, France, in 2000, Beijing in 1996, and Pisa, Italy, in 1992. The last time the conference was held in the U.S. was in Minneapolis in 1978.

The conference began with a reception on Sunday evening, followed by an opening ceremony on Monday morning. Registrants were greeted by Roger Johnson, North Dakota Agriculture Commissioner, by Pat Jensen, NDSU Vice President for Agriculture, by Dr. Jerry Miller, USDA-ARS Research Geneticist and President of the International Sunflower Association, and by André Pouzet, Executive Secretary of the International Sunflower Association. A welcome was also given by Alan Demaray of the Three Affiliated Tribes from the Fort Berthold Indian Reservation, reminding the attendees of the contributions of Native Americans to world agriculture.

The opening ceremony also included the presentation of the Pustovoit Award, which is the highest recognition that a person can receive in the sunflower industry. At this conference, the award went to four researchers—Dr. José Fernández-Martínez (Spain), Dr. Gian Paolo Vannozzi (Italy), Dr. Felicity Vear (France), and Dr. Florin Stoenescu (USA).

The program consisted of three days of technical presentations, with a social event at Bonanzaville on Monday evening and a banquet on Tuesday evening. On Thursday, the group traveled by bus to the Carrington Research and Extension Center for a day-long field tour of sunflower demonstration plots.

By all accounts, the conference was an unqualified success, with many highly complimentary remarks from a broad spectrum of the participants. The success was due in large part to the planning, execution, and enthusiasm of the members of the Sunflower Research Unit, who assisted the organizing committee and did most of the work for the conference.

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



Native American dancers from Sisseton entertained the participants at Bonanzaville.



The Sunflower Research Unit was host to the 16th International Sunflower Conference in Fargo.



Tom Gulya (above) and Gerald Seiler presented a plenary lecture on wild sunflower explorations.



Participants from Uganda inspect the sunflower hybrid trials at the Carrington Research and Extension Center.



Participants from the Ukraine (left) and Australia (center) discuss sunflower production with Mike Clemens, President of the National Sunflower Association.

ARS 50th & BRL 40th Anniversary Celebration - July 21, 2004

ARS 50th & BRL 40th Anniversary Celebration Invitation July 21, 2004



We invite you to celebrate with us this summer in recognition of the 50th Anniversary of the Agricultural Research Service (ARS) and the 40th Anniversary of the Biosciences Research Laboratory on **Wednesday, July 21, 2004**.

The ARS can trace its heritage back to the early 19th Century seed collection efforts of the U.S. Patent Office. In 1953, during a major reorganization, the Department of Agriculture consolidated most of its research activities into the newly named Agricultural Research Service. As an agency, the ARS is now 50 years old, and we are celebrating this milestone anniversary at more than 100 ARS locations across the country this year.

In 1964, the Metabolism and Radiation Research Laboratory (since renamed the Biosciences Research Laboratory) was constructed on the campus of the North Dakota Agriculture College. The mission of the laboratory, as stated in *The Forum*, was to obtain information leading to "safe, cheap methods for the control of plant and animal pests and the safe use by livestock growers of feed additives or alternatives." Over the years, the mission and facilities have expanded to include the Northern Crop Science Laboratory, the Wheat Quality Laboratory and the Red River Valley Potato Research Work Site in East Grand Forks, MN. Collectively they form the Red River Valley Agricultural Research Center (RRVARC).

As a Partner with our Center, your input and promotion of our facility and scientists has been integral to our current success. Our work together has helped to define our research priorities and has positioned us well for the future.

Schedule of Events:

9:30-10:00 am - Registration at the Biosciences Research Lab

10:00-11:00 am - Program at the Biosciences Research Lab

Brief comments from ARS Director, D. Edward Knippling; Northern Plains Area Director, Dr. Will Blackburn; ND Agriculture Commissioner, Roger Johnson; and others, and a presentation entitled "Celebrating the History."

11:00-12:00 noon - Tours of the Biosciences Research Lab

Animal Metabolism-Agricultural Chemicals, Insect Genetics and Biochemistry, and Plant Science Research Units

12:15-1:15 pm - Lunch at the Northern Crop Science Lab

1:15-2:15 pm - Tours of the Northern Crop Science Lab

Sugarbeet and Potato, Cereal Crops, and Sunflower Research Units and the NDSU Electron Microscopy Lab

In order to accurately plan the day's events we respectfully request that you RSVP to us using the enclosed card by **Friday, June 25, 2004**. In the event that you are unable to attend, please feel free to pass this invitation to someone else in your organization. We request that you complete the RSVP card with the name of the person who will be attending to represent you or your organization.

For those of you who are "old" friends, we thank you for all your support of the Center over the years. For our "new" friends, we would like to say "Hello," and we look forward to working with you in the future.

Sincerely,

Dr. Laurence Chandler & RRVARC Anniversary
RRVARC Center Director Committee

ARS 50th & BRL 40th Anniversary Celebration Handout July 21, 2004

Schedule of Events:

9:30-10:00 am - Registration

Refreshments served outside Large Conference Room

10:00-11:00 am - Program - Large Conference Room

Dr. Larry Chandler - RRVARC Director

Mike Williams - Fargo City Commission

Dr. Edward Knippling - ARS Administrator

Dr. Will Blackburn - ARS-NPA Area Director

Roger Johnson - ND Agriculture Commissioner

Pat Jensen - NDSU Vice President and Dean of College of Agriculture, Food Systems, and Natural Resources

"Celebrating the History" Video Presentation

Dr. Don Zimmerman - RRVARC Director (Retired)

11:00 am-12:00 noon - Tours of the Biosciences Research Lab

At the conclusion of the program, interested guests will be divided into three groups and each group will tour all three units.

Animal Metabolism-Agricultural Chemicals - Provide safe, healthful, and economical use of animal products as food.

Insect Genetics and Biochemistry - Develop environmentally safe and organism specific methods of pest insect and weed control.

Plant Science - Develop and expand knowledge on the physiology, genetics, and the molecular biology of weeds to improve existing and discover new environmentally sustainable weed management strategies.

12:15-1:15 pm - Lunch at the Northern Crop Science Lab

Once inside the building, follow the signs to the Courtyard.

1:15-2:15 pm - Tours of the Northern Crop Science Lab

After lunch, those wishing to go on the MCSL tours, please meet in the Large Conference Room. Everyone will get to tour all four sections.

Sugarbeet and Potato - Improve the quality and profitability of sugarbeet and potato production through fundamental research on germplasm enhancement, crop protection, and postharvest physiology.

Cereal Crops - Provide basic knowledge and improved germplasm for developing, maintaining, and improving hard red spring wheat, durum wheat, barley, and oat.

Sunflower - Develop (1) a diverse germplasm base that leads to enhanced yield potential and quality characteristics, (2) methods to transfer useful traits from wild species and other sources into cultivated sunflower, and (3) management strategies for insects and diseases with reduced pesticide use to increase profitability and protect the environment.

NDSU Electron Microscopy Lab - The University Electron Microscope Facility provides technical assistance and service to North Dakota State University teaching and research scientists and to USDA scientists on the NDSU campus.

On behalf of the RRVARC employees, we would like to thank you for sharing this special day with us. We hope you have had the opportunity to relive a memory or two and maybe learned something new. We look forward to working with all of you in the future and we can't wait to show you what we can achieve in the next 50 years for the agricultural community and society as a whole.

Sincerely,

Dr. Laurence Chandler & RRVARC Anniversary
RRVARC Center Director Committee

Speakers



Dr. Edward Knipling
ARS Director



Dr. Will Blackburn
Northern Plains Area Director



Dr. Laurence Chandler
RRVARC Center Director



Dr. Don Zimmerman
Former RRVARC Center Director



Roger Johnson
ND Ag. Commissioner



Pat Jensen
NDSU Vice President of Ag. Affairs



Mike Williams, Fargo City Commissioner, presented the proclamation "Agricultural Research Service Appreciation Day" from the Mayor of Fargo, ND, Bruce W. Furness.

Tours



Cereal Crops Research Unit



Insect Genetics & Biochemistry Research Unit



Sugarbeet & Potato Research Unit



Sunflower Research Unit



NDSU - Electron Microscope Lab

Lunch



Lunch was served under tents at the NCSL.



NDSU Carnivore Catering catered the Bar-B-Q lunch at the NCSL.



The anniversary cake was a reproduction of the original cake served at the dedication of the Metabolism & Radiation Research Lab (since renamed Biosciences Research Laboratory) in 1964.



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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.

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Upcoming Events:

EVENTS AT THE CENTER

NOVEMBER 2004

- 18: Prof. Joe Sowokinos, Univ. of MN, Dept of Horticulture Seminar, USDA-ARS-NCSL, 10 am.

DECEMBER 2004

- 1: RRVARC Annual Research Partners Mtg., Fargo, ND, USDA-ARS-BRL.
16: Dr. Mike Foley Seminar, USDA-ARS-RRVARC, NCSL, 10 am.

JANUARY 2005

- 20: Dr. Tim Friesen Seminar, USDA-ARS-RRVARC, NCSL, 10 am.

FEBRUARY 2005

- 17: Dr. Jinguo Hu Seminar, USDA-ARS-RRVARC, NCSL, 10 am

MARCH 2005

- 17: Dr. Luis Destefano Seminar, USDA-ARS-RRVARC, NCSL, 10 am

EVENTS ELSEWHERE

OCTOBER 2004

- 2-3: Assn. of Natural Bio-Control Producers Annual Mtg., Colorado Springs, CO

- 15-18: Entomological Society of Canada Annual Mtg., Charlottetown, Prince Edward Island, Canada

- 18-23: Conf. on Conservation of Genetic Resources, St. Petersburg, Russia

- 31-Nov. 4: ASA-CSSA-SSSA, Seattle, WA

NOVEMBER 2004

- TBD: MN Area II Potato Research Mtg., Alexandria, MN

- 11-12: NPPGA Annual Mtg, Fargo, ND

- 12-15: Barley Coordinated Agricultural Project (CAP) Conf., Mpls, MN

- 14-17: Entomology Society of America Annual Mtg., Salt Lake City, UT

- 14-18: SETAC 4th World Congress, Portland, OR

- 16-17: NP302 Planning Workshop, San Francisco, CA

- 29: Sugarbeet R&E Needs Mtg, Fargo, ND

DECEMBER 2004

- 7-10: Pierce's Disease Symp., San Diego, CA

- 11-15: 2nd Intl Fusarium Head Blight (FHB) Symposium, Orlando, FL

JANUARY 2005

- 11: RRV Sugarbeet R&E Board Reporting Session, Fargo, ND

- 11-13: Barley Improvement Conference, Charleston, SC

- 11-13: North Dakota Weed Control Assn. (NDWCA), Mandan, ND

- 12-13: National Sunflower Assn. Research Forum, Fargo, ND

- 12-13: MarketPlace for Entrepreneurs, Bismarck, ND

- 14-19: Plant & Animal Genome XIII Program, San Diego, CA

- 18-20: 3rd Annual Sclerotinia Initiative Mtg, Mpls, MN

- 30-Feb. 3: Intl. Symposium Ecology & Management of Lygus Plant Bugs, Ottawa, Canada

FEBRUARY 2005

- TBD: MN Area II Research Reporting Mtg., Monticello, MN

- 7-10: Weed Science Society of America Annual Mtg., Honolulu, HI

MARCH 2005

- 2-4: ARS-IR-4 Assess Mtg., Greenbelt, MD

- 2-5: American Society Sugarbeet Technologists Mtg., Palm Springs, CA

- 7-9: 8th Annual Exotic Annual Exotic Fruit Fly Symposium, Riverside, CA

- 20-23: Entomological Society of America, North Central Branch Mtg., West Lafayette, IN

APRIL 2005

- TBD: Quad State Regional Potato Research Mtg., Lansing, MI