GROWING GREEN:
The Second Green Revolution

Technology Transfer and Federal Marketplace Event

Thursday, October 30, 2008

7:15 AM-5:15 PM

Four Points Sheraton-BWI Airport · Baltimore

Keynote Address

ARS National Research Perspective on Developing Green Technologies

Presented by ARS National Program Leaders

Robert Fireovid and Jeffrey Steiner

Event Hosts

ars

USDA

Maryland TEDCO Technology Development Corporation

TECH Council MD

Reception Sponsor

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Speaker Sponsor

Mintz Levin

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ANNE ARUNDEL COUNTY
MARYLAND

ARUNDEL CENTER
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Phone: 410-222-1821 • Fax: 410-2221-155

JOHN R. LEOPOLD
County Executive

October 30, 2008

Dear Participants,

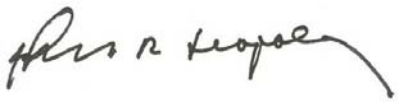
Welcome! I am very pleased that Anne Arundel County was chosen to be the location for ***Growing Green: The Second Green Revolution.*** This important conference will showcase work being done to address global environmental and energy issues and highlight alternative green technologies currently under development.

Last year, I signed the U.S. Conference of Mayors' Climate Protection Agreement. In this agreement, elected officials pledge to reduce carbon dioxide emissions by 7 percent below 1990 levels by 2012. I was the first county executive in the nation to sign this important agreement.

Anne Arundel County will continue to be proactive when it comes to the environment. With 500 miles of Chesapeake Bay shoreline as the county's natural attraction, the environment is of great value to county citizens and part of what makes Anne Arundel County uniquely attractive.

Many thanks to Maryland TEDCO, the Tech Council of Maryland, and the other program supporters for their work in producing this event.

Enjoy the conference and welcome to Anne Arundel County.



John R. Leopold

Agenda

7:15 am **Registration, Morning Networking, and Continental Breakfast**

8:00 am Welcome Remarks

- Renee Winsky, President and Executive Director
  TEDCO
- Julie Coons, President (Invited)
  TCM

Partnership Intermediary Agreement (PIA) Anniversary Recognition

- Richard J. Brenner, Assistant Administrator
  USDA-ARS Office of Technology Transfer
- US Senator Benjamin L. Cardin

8: 30 am Morning General Session Presentations

- Joe Spence, Area Director
  USDA-ARS Henry A. Wallace Beltsville Agricultural Center (BARC)
- Richard J. Brenner, Assistant Administrator
  USDA-ARS Office of Technology Transfer
- James Poulos, Vice President of Tech Transfer
  TEDCO

9:00am Panel Discussion: Biofuels Research Capacity

- Daniel Solaiman- Fats, Oils & Animal Coproducts Research, Pennsylvania
- Robert Mitchell - Grain, Forage, & Bioenergy Research, Nebraska
- Michael Cotta - Fermentation Biotechnology Research Unit (FB), Illinois

9:45 am **Break (Networking, Exhibits, and Posters)**

10:00 am Panel Discussion: Bioproducts Research Capacity

- Terry Isbell- New Crops & Processing Technology Research, Illinois
- Cathleen Hapeman - Environmental Management & Byproduct Utilization Laboratory, Maryland
- William Orts- Bioproduct Chemistry & Engineering Research, California

10:45 am **Break (Networking, Exhibits, and Posters)**

11:00 am Panel Discussion: Sustainable Agriculture Research

- Jerry Hatfield - National Soil Tilth Laboratory, Iowa
- William Kustas - Hydrology & Remote Sensing laboratory, Maryland
- Matias Vanotti - Coastal Plains Soil, Water, & Plant Research Center,South Carolina

11:45 am **Lunch**

12:30 pm Keynote Address--

ARS National Research Perspective on Developing Green Technologies
Presented by ARS National Program Leaders Robert Fireovid and Jeffrey Steiner

1:00 pm **Break (Networking, Exhibits and Posters)**

1:30 pm Break-Out Sessions: Emerging Issues in Green Technologies

- Session I: Biofuels (Moderator Vic Chavez, Tech Transfer Coordinator)
- Session II: Bioproducts (Moderator Renee Wagner, Tech Transfer Coordinator)
- Session III: Sustainable Agriculture (Moderator James Poulos, TEDCO)

3:30 pm **Break**

3:45 pm Closing General Session/Wrap Up
This Session will also include sharing the discussions from each break out session.

- Richard J. Brenner, Assistant Administrator
  USDA-ARS Office of Technology Transfer
- Robbie Melton, Senior Program Manager, Entrepreneurial Development
  TEDCO

4:15 pm Growing Green Networking Reception
(Sponsored by TreMonti Consulting LLC)

5:15 pm Adjourn

General Session Speakers Bios

Dr. Richard Brenner

Dr. Richard Brenner was named the Assistant Administrator in ARS for Technology Transfer in October 2004. In this capacity, he represents the Secretary of Agriculture on issues pertaining to management of intellectual property arising from USDA research, and has the delegated authority for licensing inventions developed through intramural research in any of the USDA agencies. He is a member of AUTM, the Agency Representative to the Federal Laboratory Consortium for Technology Transfer, and the Interagency Working Group for Technology Transfer convened monthly by the Department of Commerce Office of Technology Policy. The Office of Technology Transfer consists of 45 professionals in technology transfer covering patenting, licensing, marketing of ARS technologies and ARS research capacities, and Technology Transfer Coordinators who establish Cooperative Research and Development Agreements (CRADAs) with private sector companies.

Prior to this position, Dr. Brenner served as the Deputy Assistant Administrator for the Office of Technology Transfer (OTT), USDA-ARS, from August 2001, where he managed much of the daily operations on CRADAs, patents, and licensing. From 1984, Dr. Brenner served as a Research Entomologist and later as a Research Leader for ARS in Gainesville, Florida, following a 2-year research assignment in Chiapas, Mexico. Career awards include Outstanding Senior Scientist, USDA Award for Superior Service, ARS Technology Transfer Awards, an FLC Technology Transfer Award, and the “Pollution Prevention Project of the Year,” award in 1999 under the Strategic Environmental Research and Development Program, jointly awarded by the Department of Defense, Department of Energy, and the EPA.

Dr. Brenner has a Ph.D. in medical entomology from Cornell University, and 2 degrees from the University of Illinois. He, his wife Joann, and their two sons, Drew and Joey, live in Severna Park, MD near Annapolis.

Ms. Julie Coons, President

Tech Council of Maryland

Ms. Coons is responsible for developing the strategic direction and managing the operations of the Tech Council’s programming and business operations. Working closely with the Tech Council’s volunteer leadership Coons is responsible for the Council’s advocacy program, membership marketing, product development and event management. She serves as a spokesperson for technology in the State of Maryland and works to promote Maryland as the premier place in the region for technology companies to locate, grow, and do business.

Ms. Coons has extensive experience in Asian markets, has lived in Japan and speaks fluent Japanese. Coons is a member of the Steering Committee of the Women's Wireless Leadership Forum (www.wwlf.org), a member of the American Society of Association Executives (ASAE) and serves on the board of directors of Rehabilitation Opportunities, Incorporated (www.roiworks.org) a Maryland based non-profit organization that supports developmentally and physically disabled adults obtain work experience.

Mr. James A. Poulos, III

Director, Technology Transfer and Commercialization

James A. Poulos, III is a registered patent attorney. His career in patent law began in 1980 as a self-employed patent researcher. Mr. Poulos has written over 150 patent applications and has prosecuted at least a thousand applications. Over 90% of these applications issued into US Patents. From 1991-1998 Mr. Poulos was responsible for the US patent portfolio of the multi-national company Zambon Group S.p.A. (Zambon). Zambon is the largest Italian-owned pharmaceutical company in Italy. Mr. Poulos has prosecuted a patent application of Nobel Laureate, Giulio Natta.

After a national search, Mr. Poulos was named the Executive Director of the Office of Technology Commercialization at the University of Maryland, College Park in June of 2000 through May of 2007. In that office, Mr. Poulos negotiated over 200 license agreements with commercial entities both within and without the state of Maryland. During his tenure over 30 University spin-off companies were created, including Quantum Photonics (College Park, MD), Little Optics (Columbia, MD) and RioRey, Inc. (Bethesda, Maryland). These three companies have received over 85 million dollars in combined venture capital funding.

Mr. Poulos is now Vice President of Technology Transfer and Commercialization at TEDCO and oversees TEDCO's funding programs to the states Federal Labs and Universities.

Dr. Joseph T. Spence

Dr. Joseph T. Spence joined the Agricultural Research Service (ARS), USDA, in 1993 when he was appointed Director of the Beltsville Human Nutrition Research Center, Beltsville, Maryland. This is the oldest, and under his direction, had become the largest of the Federally-funded human nutrition research centers. The center is actively conducting research on nutrition and immunology, phytonutrients, food composition, nutrition monitoring, and the role of individual nutrients in maintaining health.

He received his doctoral degree in nutritional biochemistry from Cornell University in 1977 and was an NIH Postdoctoral Fellow at the McArdle Laboratory for Cancer Research of the University of Wisconsin, Madison. He was a Health Scientist Administrator at the National Heart Lung and Blood Institute of NIH. He was Professor of Biochemistry and Associate Dean for Research and Graduate Studies at the School of Medicine of the State University of New York at Buffalo prior to his arrival at Beltsville. His research interest is in the regulation of gene expression in liver in response to dietary and hormonal influences.

In August, 2004, he was appointed Deputy Administrator for Nutrition, Food Safety and Quality where he oversaw the ARS national programs related to food and nutrition as well as value added products, product quality and bio-based products. In February 2008, he was appointed Director of the ARS Beltsville Area, which includes the Beltsville Agricultural Research Center and the U. S. National Arboretum.

Ms. Renee Winsky

Maryland Technology Development Corporation (TEDCO)

Ms. Winsky is the President and Executive Director of the Maryland Technology Development Corporation (TEDCO), a public instrumentality established by the Maryland General Assembly to promote economic development through the development, transfer and commercialization of technology. In February 2007, the TEDCO Board of Directors appointed Ms. Winsky as President, after a long and thorough national search for a new leader for the organization. She served as TEDCO's Deputy Executive Director since January 2000.

Ms. Winsky serves as a member of the Board of Directors of the Tech Council of Maryland / MdBio, the Chesapeake Innovation Center, the Towson Global Business Globalization Center, and the Mid-Atlantic Institute for Space and Technology Board of Directors. Ms. Winsky was recently a nominee for Corridor Inc. Magazine's "2007 Corridor Person of the Year" award and was named by The Daily Record as one of the "2008 Influential Marylanders." She is a graduate of the University of Maryland and a graduate of the Leadership Maryland Class of 2005.

TEDCO

For detailed program information visit TEDCO's website at: www.marylandtedco.org

Maryland Technology Development Corporation Funding Programs

Programs for Technology Transfer, New Product Development, and Commercialization

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TEDCO provides a variety of funding programs for technology development, transfer and commercialization including:

University Technology Development Fund (UTDF): Provides up to $50,000 for proof of principle studies or patent extension research on Maryland university-owned technologies to demonstrate their ability to meet identified market needs. The objective is to make the technologies more attractive to licensees in Maryland.

TechStart Program (TSP): Provides up to $15,000 for a university to evaluate the feasibility of one of its technologies becoming the basis of a startup company. A team of principal investigator, entrepreneur, and tech transfer manager is required. Funds should be used for tasks critical to determining the viability of a new company.

Maryland Technology Transfer Fund (MTTF): Provides up to $75,000 for initiation of technology transfer projects that involve collaboration between a Maryland company and any federal laboratory or university in Maryland. Funds should be used to defray direct costs of developing early-stage technology.

Working Capital Loan Fund (WCLF): Designed to provide loans to incubator stage companies in Maryland. Loans of between $15,000 and $50,000 are available to early stage technology-oriented companies. The funds are to be used for working capital in order to assist a company with expansion, market entry, or other initiatives.

BRAC Technology Transfer Initiative (BTTI): Provides up to $75,000 for initiation of BRAC related technology transfer projects that involve collaboration between a Maryland company working with any federal laboratory or university in Maryland to meet the needs of the military installations impacted by the BRAC moves. Funds should be used to defray direct costs of developing early-stage technology (Spin-In or Spin-Out).

Ft. Detrick Technology Transfer Initiative (FDTTI): Provides a Maryland company up to $50,000 for transfer of medical technology related to the U.S. Army Medical Research and Materiel Command. Both spin-in and spin-out projects are eligible. Funds should be used to defray direct costs of developing early stage technology.

Maryland Stem Cell Research Fund (MSCRF): provides a variety of grant programs for human stem cell research in the state of Maryland, including: Investigator-Initiated Grants, Exploratory Grants and Post-Doctoral research Grants. All Maryland based organizations of all types are eligible for the Grants. Such organizations include public and private, for profit and nonprofit, universities, colleges, research institutes, companies, medical centers and others. Funding of $55,000 to $500,000 a year is available. For more information please go to www.mscrf.org.

Maryland TEDCO
Technology Development Corporation
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May 2008

ARS

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ARS Mission

The Agricultural Research Service conducts research to develop and transfer solutions to agricultural problems of high national priority and provides information access and dissemination to:

- ensure high-quality, safe food and other agricultural products,
- assess the nutritional needs of Americans,
- sustain a competitive agricultural economy,
- enhance the natural resource base and the environment, and provide economic opportunities for rural citizens, communities, and society as a whole.

Cover photo: *Results of ARS research can be found in many consumer products.*

Slightly revised February 2008

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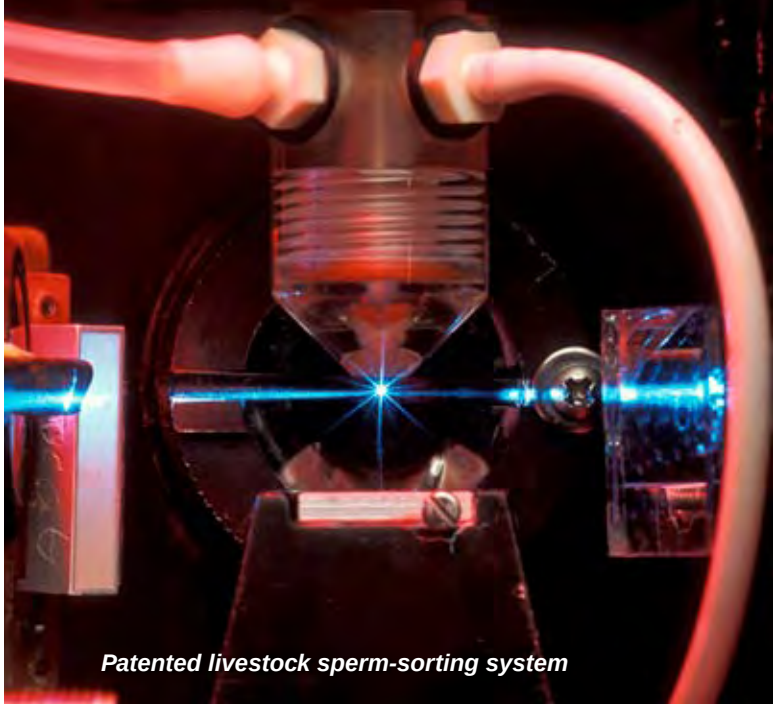
USDA

United States Department of Agriculture
Agricultural Research Service
Office of Technology Transfer
Program Aid 1706

Forming Partnerships With the Agricultural Research Service

Agricultural Research Service (ARS)

ARS has a successful history of partnering with commercial firms to transfer the fruits of agricultural research to U.S. farmers and consumers. The Federal Technology Transfer Act of 1986 dramatically changed how the Federal government does business, allowing Federal laboratories and industry to form commercial partnerships that enhance the development of new technologies and move them into the marketplace. ARS is a leader in the Federal government in transferring and marketing new technologies developed from its research and has formed numerous partnerships using cooperative agreements. The Office of Technology Transfer (OTT) facilitates and coordinates these partnerships.



Patented livestock sperm-sorting system

Cooperative Research and Development Agreements

A Cooperative Research and Development Agreement (CRADA) is appropriate for a commercial firm seeking to further develop and commercialize an ARS invention, merge ARS technology with its own technology, or jointly discover and develop a new technology. CRADAs provide the cooperator the right to negotiate an exclusive license to inventions made under the agreement, providing confidentiality for information generated under the agreement.

The cooperating firm provides the resources needed to develop and commercialize a new product, process, or service. The firm may fund additional costs to ARS for work done under the agreement, and it may contribute personnel, equipment, or materials. ARS provides research staff, laboratory facilities, materials, equipment, supplies, and other in-kind contributions. Both parties bring their expertise to the agreement, and both conduct some portion of the work. As with its other cooperative agreements, ARS enters into a CRADA only when the objective relates to its mission.

ARS developed 100-percent soy ink.

Benefits of CRADAs to Commercial Firms

- The right to negotiate exclusive licenses on patented inventions made under an agreement
- Direct access to ARS scientific expertise
- Potential to commercialize new ARS technologies

Benefits of CRADAs to ARS

- Wider opportunities for developing and transferring technologies
- Feedback from industry on its research needs
- Increased familiarity with problems related to commercializing a product or process

How Commercial Firms Can Initiate a CRADA

- Search ARS's online databases for information about its research programs (see "Additional Information" section in this brochure)
- Contact ARS scientists responsible for research projects of interest
- Develop a brief proposal with the ARS scientist and the technology transfer coordinator (TTC)
- Obtain appropriate preliminary review and clearance for the proposal in your firm
- Work with the ARS scientist and the TTC to develop a statement of work for the agreement
- Obtain approval for the CRADA and its proposed research plan in your firm


Fantesk™ products from ARS-patented technology


Adhesive from cornstarch

Other Types of Agreements

ARS enters into other strategic partnerships with Federal, State, and private organizations to help deliver new technologies to the public. These partnerships are Trust Fund Cooperative Agreements, Reimbursable Cooperative Agreements, Non-funded Cooperative Agreements, Material Transfer Agreements, and Confidentiality Agreements. ARS TTCs can assist with these agreements.

Trust Agreements and Reimbursable Agreements are similar to CRADAs but lack the provision for negotiating an exclusive license and complete assurances of confidentiality. In both agreements, the cooperator provides funds to ARS. In Trust Agreements, ARS receives some or all of the funds when the agreement takes effect. Reimbursable Agreements allow the partner to reimburse ARS as required for the research. Confidentiality provisions apply to the cooperator's proprietary material, but information developed by ARS during either agreement can be withheld from public disclosure to protect intellectual property rights until a patent application is filed.

ARS scientists use Material Transfer Agreements (MTAs) when they want to provide material to someone outside ARS but want to maintain control over the material and avoid public disclosure. MTAs can also be used to bring material into ARS from outside parties for research purposes. Generally, an MTA specifies what the material is and what it can be used for, restricts giving it to a third party without permission, prohibits commercial use, and specifies its disposition.

ARS scientists enter into a Confidentiality Agreement (CA) with cooperators outside the agency when they want to discuss confidential information or data that may have patent potential. CAs are also used when a company needs to discuss confidential information with ARS scientists. A standard CA may be obtained from a TTC or from the ARS Partnering site (www.ars.usda.gov/Business/Business.htm).

Z-Trim, a zero-calorie fat replacer from corn, is now available for consumers to use in cooking.

ARS research is evident in the development or improvement of many products.

These apples have been treated wth an anti-browning coating developed by ARS.

Patent License Program

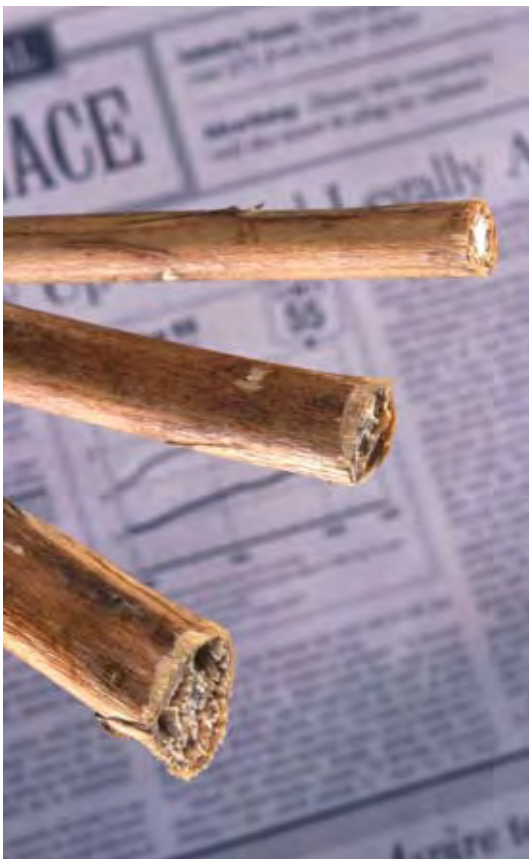
Many important ARS discoveries are transferred directly to the public without intellectual property protection. Some ARS inventions require significant financial investments and resources from the private sector before the public can benefit from a new, improved product or service. To provide an incentive for such investments, ARS may patent new inventions and transfer technologies to the public through patent licenses.

The ARS Office of Technology Transfer (OTT) administers the U.S. Department of Agriculture's technology licensing program. The ARS technology licensing program grants licenses to qualified businesses and individuals who wish to commercialize ARS technologies. Licenses may be exclusive, nonexclusive, or partially exclusive, and foreign patent rights are available in some cases.

ARS developed snack bars containing 100-percent fruit.

ARS is protecting animal production and health through technology.

Lactose-reduced products from ARS technology



ARS is developing new uses for kenaf plants.

How To Apply for a Patent License

Licensing federally owned inventions is done in accordance with Federal regulations (37 CFR 404). A copy of these regulations can be obtained from the technology licensing program coordinator or the ARS Partnering site (www.ars.usda.gov/Business/Business.htm).

Businesses or individuals who want to commercialize an ARS invention must submit a patent license application. Information provided with the application is used to determine whether the applicant has a sufficient plan for developing and marketing the invention. All business plans are kept confidential.

Patent license application forms are available by mail or may be downloaded from the ARS Partnering site. All patent license applications should be mailed to the technology licensing program coordinator.

License Provisions

USDA patent licenses are royalty bearing and include provisions for license execution fees, annual license maintenance fees, and patent cost reimbursements. License fees and royalty rates are negotiable. Information submitted by the applicant—including estimates of potential market size, market share, and profitability—is used to help determine fair and reasonable terms. Other factors are also considered, such as scope of the licensed patent, scope of rights granted, and financial and resource investments required for commercialization.

Licensees are required to submit periodic reports detailing the progress made to commercialize licensed patents. After the first sale of royalty-bearing products, licensees are required to submit royalty reports, including information on the quantity of products made, used, and sold, and the royalties due USDA. This information is confidential and not publicly disclosed.

Lady Liberty's elevator is powered by soy-based fluid developed by ARS.

ARS technology helps bring fresher, safer ready-to-eat produce to the supermarket.

Special Considerations

Exclusive or partially exclusive patent licenses—including licenses that are co-exclusive (limited number of licensees), exclusive territory (limited to a specific country), and exclusive field (limited to a specific use)—may be granted for non-CRADA inventions, but only after public notice has been made.

Successful Commercial Partnerships

ARS continues to foster relationships with many businesses throughout the United States and, in so doing, creates new job and economic opportunities. Several ARS technologies have resulted from fruitful partnerships or have paved the way for new partnerships. Many small businesses have built new industries based on ARS research and products. These companies have helped bolster local, State, and national economies.

One of the most commercially successful inventions that led to a new business endeavor is Super-Slurper, an ARS-patented cornstarch absorbent that can hold 2,000 times its own weight in water. Super-Slurper is used in disposable diapers, body powders, batteries, filters, and wound dressings.

A start-up company made its mark on the egg industry thanks to an ARS-patented method to immunize poultry by injecting safe vaccines directly into eggs. This invention revolutionized vaccination of poultry worldwide.

These are just two examples of the many successful partnerships. Through such partnerships, the ARS Office of Technology Transfer helps deliver innovative technologies to a growing world.

ARS is developing methods to detect foodborne pathogens like Salmonella *(petri dish on left).*

Just a few of the many products made from cornstarch (top) and soybeans (middle)

Improved frozen orange juice through ARS research

Additional Information

You can learn more about ARS research and partnering opportunities from the resources listed below:

Agricultural Research Service Home Page is the electronic gateway to the principal research agency of the USDA. ARS conducts research of national scope that affects the daily lives of consumers.
Internet: ars.usda.gov

ARS Partnering Page contains information on partnering opportunities, patent licensing program, recently issued patents, and newly filed patent applications.
Internet: ars.usda.gov/Business/Business.htm

ARS Research Page describes ARS's national programs and peer review process. The agency's work falls into four major categories: Animal Production, Product Value, and Safety; Natural Resources and Sustainable Agricultural Systems; Crop Production, Product Value, and Safety; and Nutrition, Food Safety / Quality.
Internet: ars.usda.gov/research/programs.htm

OTT Marketing Staff can provide information about technologies available for licensing, partnering opportunities, success stories, information on the ARS Partnering site, and "Technology Alerts" (e-mail notification of available ARS technologies).
E-mail: ottmarketing@ars.usda.gov

Agricultural Research is USDA's science magazine, published monthly by the ARS Information Staff. Articles and photographs are posted monthly on the Web.
Internet: ars.usda.gov/is/ar

Technology Transfer Information Center is part of the National Agricultural Library. The Center assists users in finding information by searching national and international databases and other resources.
Internet: nal.usda.gov/ttic

Improved quality through biotechnology research

Problem solving with biocontrol strategies

Better cheese and other dairy products

Contact Information

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U.S. DEPARTMENT OF AGRICULTURE, AGRICULTURAL RESEARCH SERVICE
OFFICE OF TECHNOLOGY TRANSFER

"INNOVATIVE TECHNOLOGIES FOR A GROWING WORLD"

GET THE LATEST!

Are you interested in receiving the latest information about innovative research developments and partnering opportunities from the U.S. Department of Agriculture's premier scientific research agency—the Agricultural Research Service (ARS)? ARS's Office of Technology Transfer is offering U.S. businesses an opportunity to receive e-mail notifications about available technologies firsthand. The notices are short summaries on recently filed patent applications and issued patents for which we are seeking licensing or cooperative research partners. "USDA Technology Alert" service customers will receive information about new technologies in advance of being published on the U.S. Patent and Trademark Website. You can receive notices from one or more categories, or you can receive them all. You can also change your subscription or unsubscribe at anytime.

The list is divided into these categories (with new categories continually being added to address customer needs):

Animal Production (all animal-related technologies)
- Aquaculture
- Cattle
- Poultry
- Swine
- All Other Animals

Crop Production (all crop-related technologies)
- Soybeans
- Corn
- Cotton
- Wheat
- Other Crops

Biotechnology

Chemicals/Compounds

Food, Safety and Nutrition

Natural Resources

Biobased Products/Bioenergy

To sign-up, contact:

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United States Department of Agriculture

Agricultural Research Service

Program Aid 1502

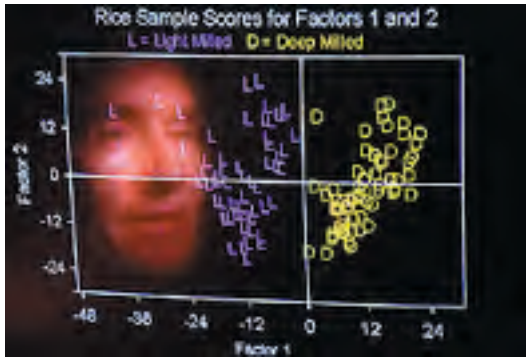
The Agricultural Research Service

Research for the growing world

Research for the growing world

ARS is the U.S. scientific research agency responsible for solving agricultural problems of national importance.

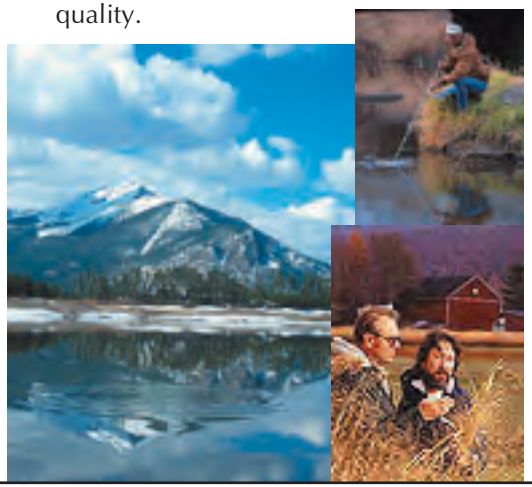
ARS research develops solutions to a wide range of problems related to food and agriculture—problems requiring long-term commitment of resources and problems unlikely to have solutions with the quick commercial payoff that would convince private industry to do the research. These problems range from protecting crops and livestock from costly pests and diseases to improving quality and safety of agricultural commodities and products, determining the best nutrition for humans from infancy to old age, sustaining natural resources, and ensuring profitability for producers and processors while keeping costs down for consumers. In addition to serving this broad range of customers, ARS provides research to support Federal action and regulatory agencies.



The agency's researchers work at about 100 locations nationwide and a few key sites overseas. ARS employs about 7,000 people; 2,000 of them are scientists. The agency's national programs are divided among three major areas:

- **Animal Production, Product Value, and Safety**—improving productivity, value, and safety of meat and dairy products and improving human lives through nutrition.

- **Natural Resources and Sustainable Agricultural Systems**—developing new practices and technologies that conserve natural resources and balance agricultural production with environmental quality.



- **Crop Production, Product Value, and Safety**—improving productivity, value, and safety of crops that are the economic backbone of U.S. agriculture.

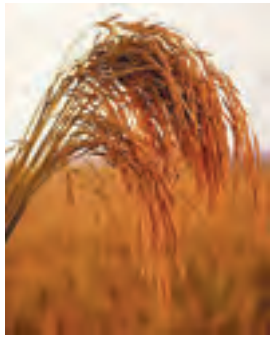
Research Highlights

Using an ARS computer model can greatly reduce the risk of salmonella in poultry products. The model, now used by industry and regulatory agencies, helps make food safety decisions and evaluates the risk of salmonella infection from farm to table.

ARS scientists published the first genetic linkage maps of swine, cattle, and sheep. These maps will lead to development of more productive and disease-resistant livestock. Of direct benefit to consumers will be higher quality food products that are safer, leaner, and more tender.

An easy-to-use ARS-developed test kit detects 185 potyviruses in vegetables and flowers, and it has become the standard in more than 105 countries. Many such viruses cause serious diseases in a wide range of economically important crops. Customs and quarantine officials use this test to detect and prevent introduction of these diseases into the United States.

ARS has developed a series of high-fiber, low-calorie products (Oatrim, Z-Trim, and Nutrim) that are being used by food companies as fat substitutes in prepared foods. These fat replacers have already created new markets for grain products and new jobs in agriculture and could have a huge impact on preventing heart disease by lowering blood cholesterol.



In decades of collaborative research, ARS, State, and industry scientists have developed over 90 percent of the rice grown in the United States. Its high quality explains why 1 out of 5 bushels of rice on the world export market is grown by U.S. farmers.

ARS has developed methods using specially designed biosolids compost to restore sites contaminated by toxic elements. These methods restore vegetation, protect human and animal health, and reduce remediation costs by as much as $1,000 to $3,000 per acre.

Agency researchers have developed conservation tillage systems and crop residue management practices that have increased profitability while preserving our natural resources and minimizing harm to the environment from agricultural production on hundreds of thousands of acres.

ARS developed and released a new cotton germplasm with higher fiber strength that allowed industry to introduce new processes for wrinkle-resistant materials, opening a multibillion-dollar market for U.S. producers and processors.

Technology Transfer

In addition to carrying out its research, ARS transfers the resulting technology to intermediate and end users and otherwise communicates the information gained through its research. This technology transfer and information dissemination is carried out by all ARS employees with the help and guidance of the National Agricultural Library, the Office of Technology Transfer, and the Information Staff.

Planning and Peer-Review

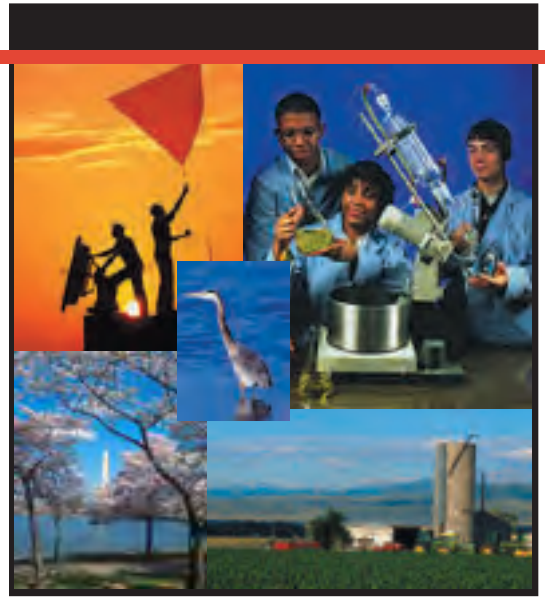
National research programs are planned in consultation with ARS customers to ensure relevance to priority needs.

All research projects are peer-reviewed by panels mainly made up of non-ARS scientists who evaluate each project plan's scientific merit. These reviews ensure the continued excellence and significance of the agency's research.

Information

For information on the agency's accomplishments, visit the ARS World Wide Web site at http://www.ars.usda.gov and click on one of these links.

News and Information—a wealth of news articles and agency publications describing ARS research, including Agricultural Research magazine, the ARS News Service, Science in Your Shopping Cart, Science for Kids and Ciencia para Niños, the Teachers Desk, a web version of this brochure, and more.



Offices and Programs—for links to area offices and individual labs and locations and for information on employment, civil rights, and doing business with REE agencies.

Research—program and project descriptions and information on publications, people, and places tied to these programs.

USDA National Agricultural Library—for access to a unique and irreplaceable resource for agricultural researchers, policymakers, regulators, and scholars, and a gateway to the library's services and programs, point to http://www.nal.usda.gov.

ARS research locations

Centralized direction, management, and coordination of ARS research programs emanates from headquarters offices in Washington, D.C., and nearby Beltsville, Maryland. Administration, oversight, and support of the research is divided among eight geographical areas and the Office of International Research Programs. Addresses for the area headquarters offices are given below.

Beltsville Area
Beltsville, Maryland, and Washington, D.C.

Bldg. 003, Room 223
10300 Baltimore Ave.
Beltsville, MD 20705

Mid South Area
Alabama, Kentucky, Louisiana, Mississippi, and Tennessee

Jamie Whitten Delta States Research Center
141 Experiment Station Rd.
P.O. Box 225
Stoneville, MS 38776

Midwest Area
Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin

1815 N University St.
Peoria, IL 61604

North Atlantic Area
Connecticut, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia

600 E Mermaid Lane
Wyndmoor, PA 19038

Northern Plains Area
Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, Wyoming

1201 Oakridge Dr., Suite 150
Fort Collins, CO 80525-5562

Pacific West Area
Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon, Washington

800 Buchanan St.
Albany, CA 94710

South Atlantic Area
Florida, Georgia, North Carolina, Puerto Rico, South Carolina, U.S. Virgin Islands, Virginia

950 College Station Rd.
P.O. Box 5677
Athens, GA 30604-5677

Southern Plains Area
Arkansas, New Mexico, Oklahoma, Texas

7607 Eastmark Dr., Suite 230
College Station, TX 77840

International Locations
(focusing on finding natural enemies of insects, weeds, and other pests that have invaded the United States for development of safe-to-use biological control agents)

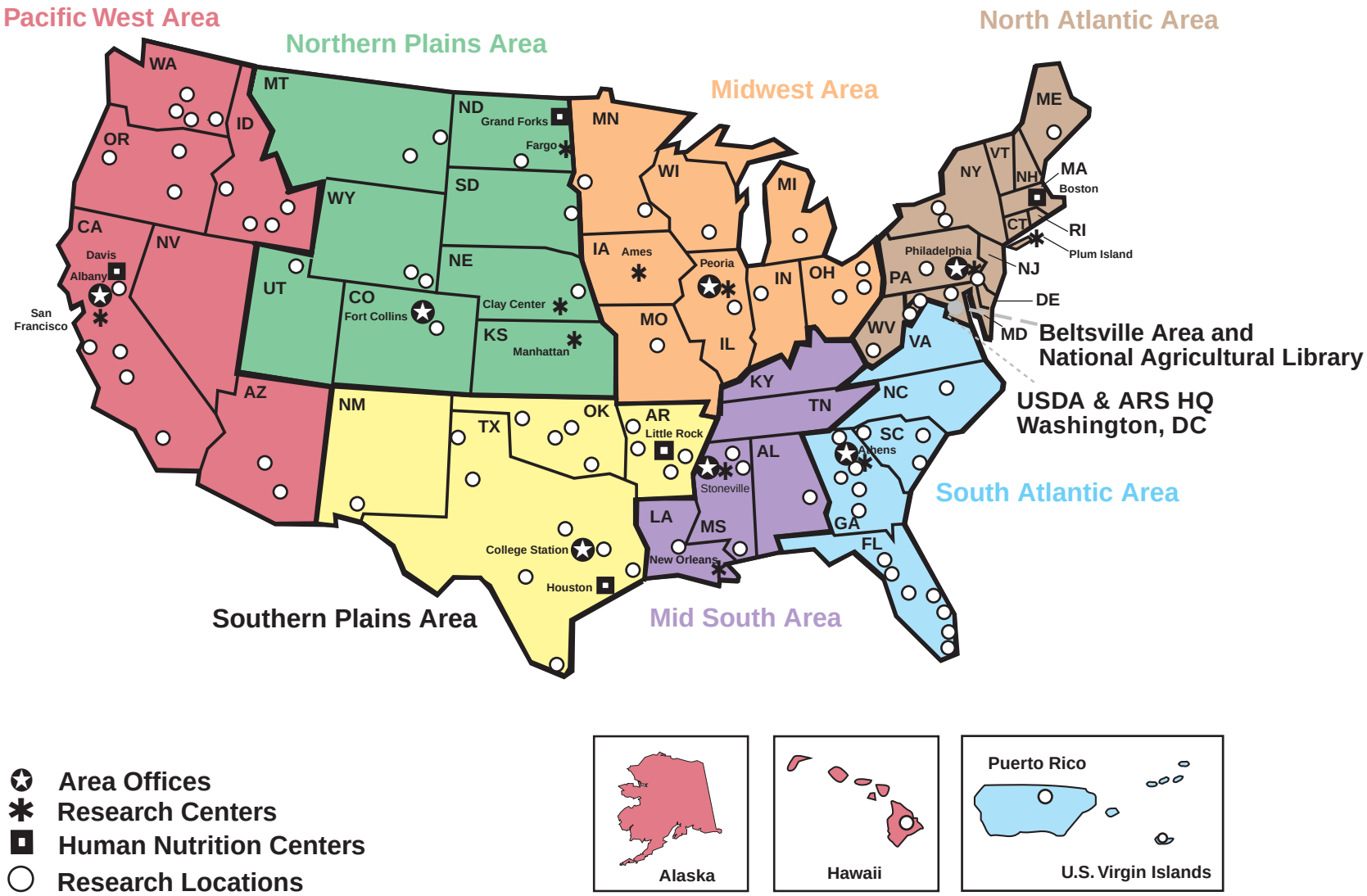
Montpellier, France
Buenos Aires, Argentina
Brisbane, Australia
Beijing, China

Office of International Research Programs
5601 Sunnyside Ave., Room 4-1139
Beltsville, MD 20705-5134

National Agricultural Library
The principal source in the United States for information about food, agriculture, and natural resources, and one of the largest and most accessible collections of agricultural information and databases in the world.

10301 Baltimore Ave.
Beltsville, MD 20705

Agricultural Research Service Area Organization



ARS is part of the U.S. Department of Agriculture's Research, Education, and Economics mission area.

ARS Mission

As the principal in-house research arm of the U.S. Department of Agriculture, ARS conducts research to develop and transfer solutions to agricultural problems of high national priority and provides information access and dissemination to ensure high-quality, safe food and other agricultural products, assess the nutritional needs of Americans, sustain a competitive agricultural economy, enhance the natural resource base and the environment, and provide economic opportunities for rural citizens, communities, and society as a whole.

Revised October 2000, Slightly revised July 2001

ARS Resources

USDA-ARS Partnering Resources
http://www.ars.usda.gov/Business/Business.htm

Research Partnering Opportunities (updated regularly online)
http://www.ars.usda.gov/business/availtechs.htm

Science in Your Shopping Cart
http://www.ars.usda.gov/is/np/shopcart/shopcart.pdf

Keyword Project
http://www.ars.usda.gov/research/projects.htm?slicetype=keyword

Annual Technology Transfer Report
http://www.ars.usda.gov/Business/docs.htm?docid=17236

ARS News and Events
http://www.ars.usda.gov/is/search.htm

Panel Discussions

Problem Solving Enhanced by...

PARTNERING

ARS offers expertise in the research areas listed below. The goal of this offering is to create partnerships with industry, stakeholders and other government agencies to solve problems of mutual interest.

BioFuels

Over view — page 2

CONTACTS:

Robert Fireovid, National Program Leader, Natural Resources and Sustainable Agricultural Systems
301-504-4774, Robert.Fireovid@ars.usda.gov

Eric Rosenquist, Senior International Coordinator, Crop Production and Protection
301-504-4789; Eric.Rosenquist@ars.usda.gov

BioProducts

Over view — page 3

CONTACTS:

Frank Flora, National Program Leader, Nutrition, Food Safety and Quality
301-504-6245; Frank.Flora@ars.usda.gov

Sustainable Agriculture

Over view — page 4

CONTACTS:

Mark Walbridge, National Program Leader, Natural Resources and Sustainable Agricultural Systems
301-504-4731; Mark.Walbridge@ars.usda.gov

Jeffrey Steiner, National Program Leader, Natural Resources and Sustainable Agricultural Systems
301-504-4644; Jeffrey.Steiner@ars.usda.gov

Michael Shannon, National Program Leader, Natural Resources and Sustainable Agricultural Systems
301-504-6246; Mike.Shannon@ars.usda.gov

For additional information on Partnering, visit http://www.ars.usda.gov/Business/Business.htm and contact the Technology Transfer Coordinator for your geographic area listed therein.

For additional information on Research Projects, visit http://www.ars.usda.gov/research/programs.htm

Biofuels Panel

Biofuels Panel Speakers Bios

Dr. Michael A. Cotta

Dr. Michael A. Cotta is a Research Leader at the U.S. Department of Agriculture, Fermentation Biotechnology Research Unit (FB) in Peoria, IL for a broad-based program of microbial, biochemical, genetic, and engineering research to develop bioproducts and bioprocesses for conversion of agricultural commodities into biofuels and chemicals, enzymes and polymers. He is the co/author of several scientific publications. He serves as a Division O, Fermentation and Biotechnology, American Society for Microbiology.

Dr. Cotta holds a B.S. and M.S degree in Animal Science from University of California at Davis, and Ph.D. degree in Dairy Science from University of Illinois.

Dr. Robert B. Mitchell

Dr. Robert B. Mitchell is a Research Agronomist at the U.S. Department of Agriculture, Grain, Forage & Bioenergy Research, University of Nebraska, Lincoln, NE. His research focuses on the establishment, management, harvest, and storage of perennial plants for biomass energy and livestock production. He works as a member of research teams to evaluate grassland establishment economics and stand thresholds, dry matter production, cost of production, carbon sequestration, ethanol production, and seed germination processes.

Dr. Mitchell received his B.S. in Agronomy - Natural Resources/Wildlife and M.S. and Ph.D degrees in Agronomy - Forage and Range Science from University of Nebraska-Lincoln.

Dr. Daniel K.Y. Solaiman

Dr. Daniel K.Y. Solaiman serves as a Research Molecular Biologist at the Eastern Regional Research Center (ERRC), ARS, USDA in Wyndmoor, PA. He is the Lead Scientist of a project team that investigates the fermentation of fats, oils and coproducts to produce biochemicals such as biodegradable polymers and biosurfactants, and develops chemical/physical processes to subsequently modify these biomaterials for property improvement.

Dr. Solaiman is presently serving as an Acting Research Leader for the Fats, Oils and Animal Coproducts Research Unit of ERRC. He is recognized for his work on the development of technologies for genetic characterization and strain improvement of industrial microbes used in the fermentation of dairy products and biobased materials. He is the co/author of 90-plus scientific articles and a patent, and his project team's work has received several awards including the SDA/NBB Glycerine Innovation Research Award. He serves in the Editorial Boards of several journals.

Dr. Solaiman holds a B.A. degree in Chemistry/Biology from Milton College, and M.S. and Ph.D. degrees in Chemistry (biochemistry track) from the University of Wisconsin-Milwaukee.

Expertise in BioFuels Research

Microbiology
- Enzyme and biocatalyst design & purification
- New microbe development
- Development of anaerobic bacteria for batteries

Plant BioCrops
- Development of new crop production methods
- Plant improvement to develop cultivars specific for biofuel

Chemistry
- Development of new pathways for biofuel conversion & purification
- Chemical and physical analysis of biofuel properties

Engineering Technology
- Design & fabrication of new equipment for processing and harvesting feedstocks
- Development of new methods to separate and purify feedstock components

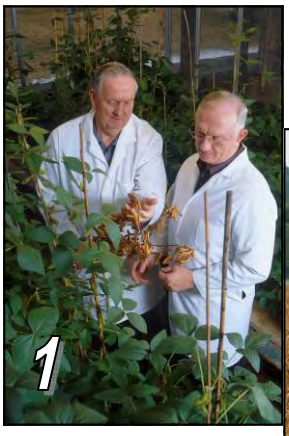


PHOTO CAPTIONS

1. Scientists have pooled their expertise to develop a subirrigation/drainage, crop management system that consistently provides soybean yields of 70 or more bushels per acre and corn yields of 200 or more bushels per acre.
2. ARS National Visitor Center tour bus fueled with soy-based biodiesel passes a soybean field ready for harvesting.
3. Scientists dispense rumen fluid into sample vials containing biomass materials during a test to assess the potential of these materials as feedstocks for biofuels production
4. Scientist evaluates different genetic sources of alfalfa to identify plant traits that would increase growth and enhance the conversion of plant tissues into biofuel.
5. Scientists add yeast to a bioreactor to begin ethanol fermentation. *Bt* and non-*Bt* corn hybrids were compared for ethanol yields

Bioproducts Panel

Bioproducts Panel Speakers Bios

Dr. Cathleen J. Hapeman

Dr. Hapeman is a Research Chemist for USDA-ARS at the Beltsville Agricultural Research Center.

She received her PhD from the University of Maryland, College Park in mechanistic organic photochemistry and has been involved in basic and applied research concerning pollutant fate, blending chemical and environmental process expertise with practical experience of agricultural practices and acquired regulatory knowledge. She served as Research Leader of the Environmental Quality Lab for eight years. Her current research includes examining pollutant fate and transport at the ag-urban interface and as a function of other land-use changes, such as conversation practices and bioenergy production.

Dr. Terry A. Isbell

Dr. Terry A. Isbell is a Research Leader for USDA, New Crops and Processing Technology Research, Peoria, IL. He leads a research unit that has a budget of $3.8 million and manages 13 scientists and 27 support staff. He is also a team leader of researchers that introduced cuphea as a new crop, successfully commercialized licensed patents on estolides for lubricants, and oversight of 6 SCAs with funds of approximately $.5 million per year for development of cuphea, coriander, sicklepod, wheat desease resistance and improved genetics in soybean. He is also co/author more than 60 scientific publications.

Dr. Isbell received his B.S. degree in Chemistry from Bradley University, and his Ph.D. in Organic Chemistry from University of Missouri-Columbia.

Dr. William Orts

Dr. William Orts is a Research Leader at the U.S. Department of Agriculture Western Regional Research Center, Albany California for a group developing biofuels and biobased products from non-corn feedstocks, most notably cellulosics and crops derived in the Western States. New technologies include (1) novel enzymes for biofuels production, (2) separation engineering in support of lignocellulosic biorefineries, (3) commercially-viable bioproducts, and (4) bioenergy production from energy crops, under-utilized ag-biomass and even municipal solids waste.

Dr. Orts received his Masters and PhD from the University of Toronto in fermentation scale-up and biopolymer development.

Expertise in BioProducts Research

Physics and Chemistry
- Development of chemical synthesis and purification technology
- Polymer/composite design and analysis
- Nuclear magnetic resonance (NMR) and mass spectrometry (MS) technology/analysis

Feedstocks
- Conversion of agricultural wastes
- Development of alternate uses for conventional crops

Engineering
- Design and fabrication of new equipment for processing feedstocks
- Extrusion and molding technology

Foods
- Nutrient analysis
- Animal and feeding trials

Recycling
- Procedures and processes for levels of certification

PHOTO CAPTIONS

1. A technician checks the operation of a starch feeder before extrusion processing.
2. While converting vegetable oil into antifungal agents and other value added bioproducts, a chemist and technician monitor the bioconversion reaction by *Pseudomonas aeruginosa* PR3.
3. The displayed items represent ARS research to create new uses for agriculture products.
4. Nutritionist prepares an Alaskan Artic char before nutrient analysis. The fish was harvested in the Point Hope region of Alaska by Alaska natives.
5. Investigating the chemical nature of organic matter in soil, scientists examine a spectrum acquired through NMR spectroscopy. In the background, a scientist loads a sample into the spectrometer.
6. A laboratory technician extracts samples for total lipid and fatty acid composition.
7. In a study of magnesium absorption, a chemist measures magnesium content in water with an atomic absorption spectrophotometer.

Sustainable Agriculture Panel

Sustainable Agriculture Panel Speakers Bios

Dr. Jerry L. Hatfield

Dr. Jerry L. Hatfield is the Laboratory Director of the USDA-ARS National Soil Tilth Laboratory in Ames, Iowa. His research focuses on understanding the interactions among soil-plant-atmosphere processes and the impact of farming systems on environmental quality.

Dr. Hatfield currently serves as the Technical Leader for the Air Quality Projects within USDA-ARS and responsible for fostering interactions among research locations and is co-leader of the Air Quality Working Group of the USDA-EPA AFO Research Task Force. He is the lead author on the Agriculture section of the Synthesis and Assessment Product 4.3 on "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity" and part of the IPCC process that received the 2007 Nobel Peace Prize.

He is a Fellow of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America and Past-President of the American Society of Agronomy. He is the author or co-author of 358 publications and the editor of 10 monographs including *Nitrogen in the Environment: Sources, Problems and Management.*

Dr. William P. Kustas

Dr. William P. Kustas is a Research Leader at USDA, Hydrology and Remote Sensing Laboratory, Animal and Natural Resources Institute in Beltsville, MD. He has been engaged in research with ARS for 22 years.

Dr. Kustas has conducted pioneering research in both the theory and application of remote sensing and boundary later meteorology to hydrologic and climate problems. The current's investigation into radiative exchange and turbulent transport of energy and moisture across the land surface-atmosphere interface addresses the fundamental processes that govern the coupling between terrestrial ecosystems and climate. He also has over 200 scientific publications of which 145 appear in peer-reviewed journals and book chapters.

Dr. Kustas holds his B.S. degree in Forest Engineering from College of Environmental Science and Forestry, State University of New York, his M.S. degree in Hydrology and Hydraulics and Ph.D. degree in Hydrology and Water Resource Systems and Atmospheric Science from School of Civil and Environmental Engineering, Cornell University.

USDA ARS

Expertise in
Sustainable Agriculture

Precision Agriculture
- Develop crop models
- Devise and implement strategies that increase crop efficiencies

Organic Systems
- Create strategies that reduce chemical inputs
- Explore farming practices that raise food and environment quality

Environmental Management
- Analyze effects of global climate change
- Develop and design improved waste management technology

Remote Sensing
- Utilize aerial and satellite imaging for soil mapping
- Create crop prediction and assessment tools

PHOTO CAPTIONS

1. Compost research facility.
2. Computer models are being used to assess the performance of alternative dryland crop rotations in Colorado and extend the results to soils and climates of other locations.
3. This greenhouse-like chamber is receiving injections of CO2 to simulate anticipated global concentrations.
4. Scientist record data on weed seedling growth at USDA's 17 acre certified organic research site in Salinas, CA.
5. Scientist inspects flowering of hairy vetch, a cover crop that increases soil nitrogen.
6. A permanent grass cover resulted in sequestration of large amounts of carbon in this soil. The dark area is rich in carbon.
7. Technicians collect samples from watermelon varieties to determine the influence of organic production systems on fruit quality.
8. On a Salinas Valley, CA, organic farm, a scientist harvests a bundle of late-summer rye crop to analyze biomass production.
9. A stretch of rangeland in Wyoming's Red Desert is typical of the vast expanse that aerial remote sensing is well adapted to.
10. SPOT satellite data helps remote sensing specialist map preferred screwworm habitats for trap placement in the Panama Canal area.
11. Scientists view output from the RZWQM2 model and use the model to simulate crop sequencing effects at Akron, Colorado.
12. "Farm Suite" computer program offers peanut farmers a way to manage most farm operations.

Contacts:

Keynote Address Speakers Bios

Dr. Robert Fireovid

Dr. Robert Fireovid is a National Program Leader, Bioenergy. He first joined the National Program Staff at the USDA's Agricultural Research Service (ARS) in November, 2004, to help lead the ARS research program in quality and utilization (i.e. bioproducts). Previously, he spent 10 years at the Dept. of Commerce's National Institute of Standards and Technology (NIST) where he was a program manager in the Advanced Technology Program (ATP). While at ATP, Dr. Fireovid worked with companies such as Cargill-Dow, Genencor, Metabolix, Seminis, Cognis, Metabolix, Maxygen/Verdia, Maxygen/Codexis and CropTech for high-risk/high-payback R&D within the chemical, materials, agricultural and industrial biotechnology industries. In August, 2007, Dr. Fireovid became the ARS National Program Leader for bioenergy research.

Dr. Fireovid has been involved in bioenergy and biobased research for over 30 years, starting with his Ph.D. work on ethanol fermentation of cellulosic acid-hydrolyzate. He led "bioproducts" research programs on pencillin fermentation and enzymatic production 6-APA (Wyeth Labs), the conversion of lactic acid to acrylics (Corn Products), and fermentation-derived food additives (Hercules). In addition to a Ph.D. in Chemical Engineering, Dr. Fireovid has an MBA from Northwestern University and was a business manager at both Black & Decker and General Electric.

Dr. Jeffrey Steiner

Dr. Jeffrey Steiner is National Program Leader for Agricultural System Competitiveness and Sustainability with the USDA, Agricultural Research Service, Office of National Programs in Beltsville, Maryland.

He leads eighteen research projects around the country that are producing new kinds of technology and systems to help producers respond to changing environmental and market conditions, enhance natural resources quality, and increase American food, fiber, and energy security. Dr. Steiner represents his agency on the USDA Council for Sustainable Development and in other matters related to sustainability, particularly in the emerging area of agricultural based bioenergy production. J

Dr. Steiner received his B.S. and M.S. degrees from California State University-Fresno, and the Ph.D. from Oregon State University. He is a Fellow of the American Society of Agronomy and Crop Science Society of America.

Biofuels Break-out Session

CONTENT WILL BE POSTED AFTER THE SHOWCASE.

Bioproducts Break-out Session

CONTENT WILL BE POSTED AFTER THE SHOWCASE.

Sustainable Agriculture Break-out Session

CONTENT WILL BE POSTED AFTER THE SHOWCASE.

Closing General Session Speaker Bio

Ms. Robbie Melton

Senior Program Manager, Entrepreneurial Development
TEDCO

Robbie Melton is the Senior Program Manager, Entrepreneurial Development for the Maryland Technology Development Corp. (TEDCO). Her primary responsibility is assisting early stage companies to secure financial and business resources to facilitate the commercialization of technology developed at university and Federal Laboratories. Prior to her appointment, she served as Assistant Director of the Investment Financing Group of the Maryland Department of Business and Economic Development, where she was involved in funding early stage technology start up companies.

Ms. Melton is also one of the co-founders and President of Women In Bio, a non-profit organization dedicated to helping women entrepreneurs in life sciences build successful companies. Ms. Melton holds a master's degree in Science, Technology and Public Policy from The George Washington University; and a bachelor's degree from Drake University in economics.

Exhibits

Exhibits List

Exhibits and Displays	
Role	**Organization**
Supporter	Anne Arundel Economic Development Corporation
Supporter	Charles County Tech Council
Supporter	Chesapeake Regional Technology Center
Corporate Sponsor	Deltek
Supporter	Federal Laboratory Consortium
Supporter	Green Building Institute
Supporter	Horticultural Research Institute
Supporter	Howard Economic Development Authority
Host	Maryland Technology Development Corporation (TEDCO)
Corporate Sponsor	PNC Bank
Reception Sponsor	TreMonti Consulting, LLC
Host	USDA-ARS Pilot Plant Exhibit
Host	USDA-ARS Office of Technology Transfer
Host	USDA-ARS "Green" Technologies Exhibit

Products for Green Technologies Showcase

Biofuels Products

SWITHCGRASS

BIODIESEL FUEL

BIOBASED LUBRICANT

BIODEGRADABLE FLUIDS

ETHANOL

ALTERNATIVE BIODIESEL SOURCES

Biobased Products

BIODEGRADABLE PRODUCTS

EARTHSHELL PACKAGING

GUAYULE RUBBER

SOY GLUE

SOY INK

SOY CONSUMER PRODUCTS

GREEN LIGHT PRODUCTS

FEATHER FIBER PRODUCTS

HYDROMULCH

WOOL PROUDCTS

Sustainable Agriculture Products

WATER QUALITY

HONEYBEE RESEARCH

HAIRY VETCH
WIRELESS IRRIGATION

POTATO SYSTEMS PLANNER

CAFTETERIA WASTE

PLANT GENETIC RESOURCES

PRESERVING THE BAY

Pilot Plant Exhibits Products

NATURESEAL®

FRUIT BARS

SUSHI WRAPS

FROZEN FOOD INNOVATIONS

SUNBUTTER®

NEW RICE PRODUCTS

INFANT FORMULA

COTTON INNOVATIONS

NEW CROPS, NEW PRODUCTS

SOY CONSUMER PRODUCTS

FANTESK PRODUCTS

TRIM PRODUCTS

MUSCLE PUFFS™

LEATHER PRODUCTS

LACTAID

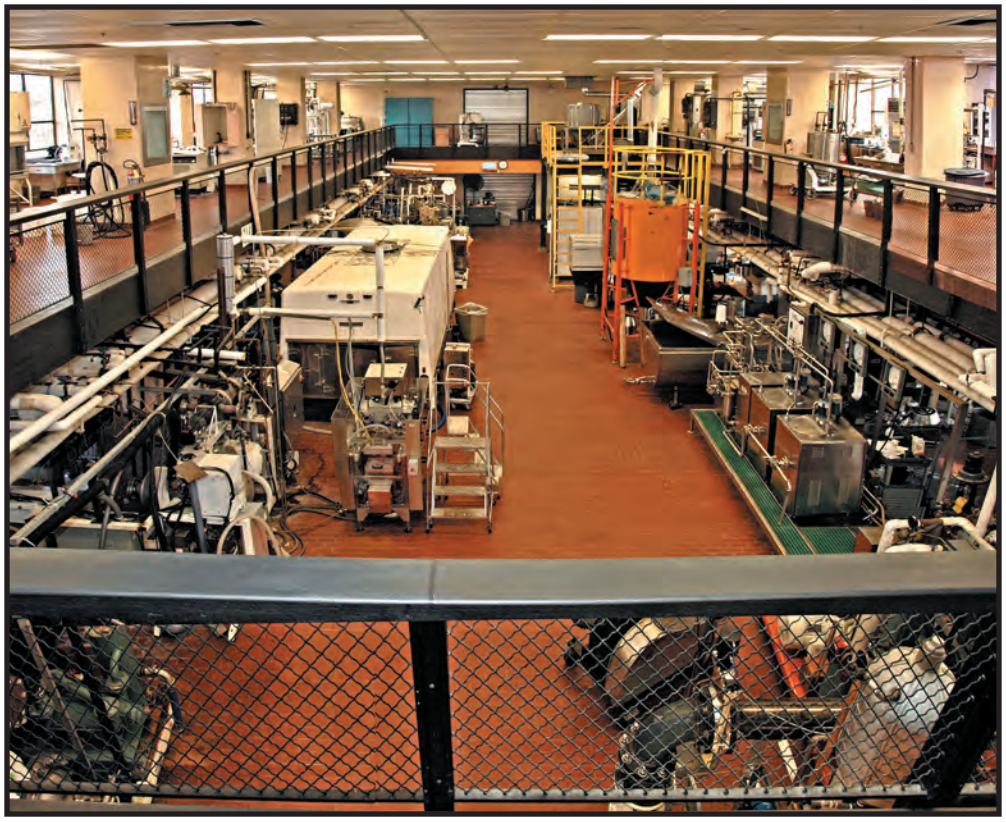
DEHYDRATION INNOVATIONS

EASTERN REGIONAL RESEARCH CENTER

Where people and facilities are in place to conduct research programs of national importance.
We welcome opportunities to collaborate with sister agencies, academia, and industrial partners.

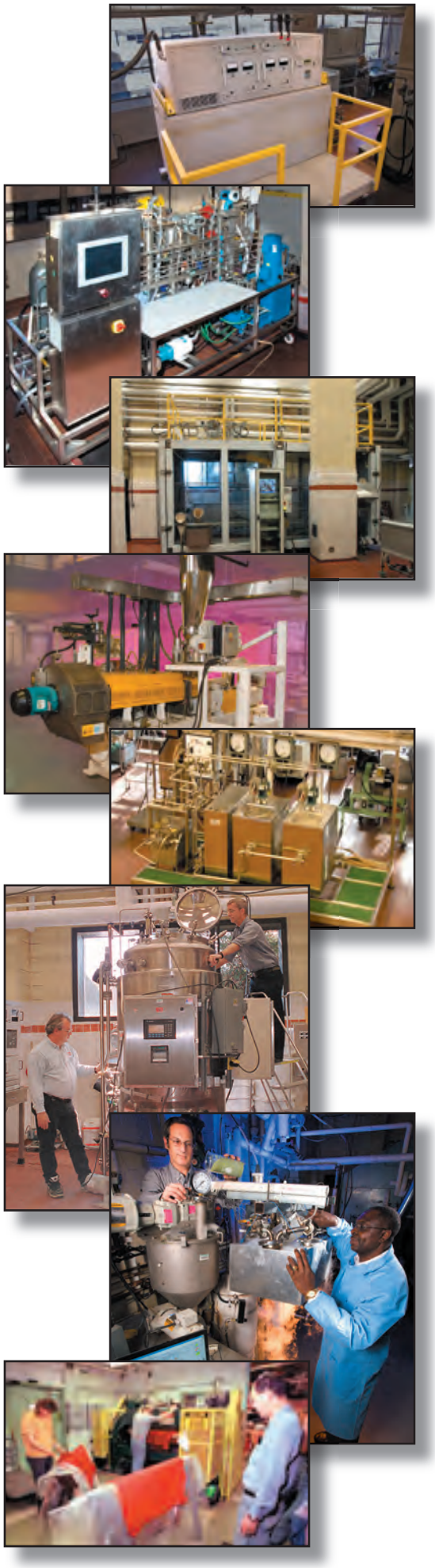
Shu-I Tu, Acting Center Director, 215-233-6595, shui.tu@ars.usda.gov
Vic Chavez, Technology Transfer Coordinator, 215-233-6610, vic.chavez@ars.usda.gov
USDA, ARS, ERRC, 600 East Mermaid Lane, Wyndmoor, PA 19038

ERRC Pilot Plants and Facilities



More than 20,000 sq. ft. of space with utilities and equipment for research at pilot and near commercial scales.

Food and bio-based processing pilot plant (10,000 sq. ft.); Dairy processing pilot plant (2,000 sq. ft.), Center of Excellence in Extrusion and Polymer Rheology (CEEPR); Grains pilot plant (2,000 sq. ft.); BSL-2 containment pilot plant (2,000 sq. ft.); BSL-2 challenge facility (2,000 sq. ft.); Bio-Fuels pilot plant (1,000 sq. ft.); Tannery (3,000 sq. ft.)



ERRC Pilot Plant Equipment

Bio-Based Products

Size reduction and mixing devices
Batch and continuous chemical reactors, 1 to 1000 L
Evaporators
Dryers: shelf, freeze, tray, drum, and belt types
Dry and wet milling systems
Oil extraction and purification

Bio-Fuels

70 L Continuous Dry Grind Ethanol Processing Facility
60 L and 300 L Fermentation Systems
3" Pilot Scale Pyrolysis and Gasification Reactor
Pilot Scale Bio-Fuel Centrifuges and DDGS Dryers
Numerous Pilot Scale Mills for Feedstock Reduction and Fractionation
Ethanol Co-Product Extraction and Purification Systems

Dairy Processing Technologies

Fluid milk and food processing
- HTST-UHT pasteurizer
- Microfiltration systems
- Universal pilot plant system for milk processing
- Microfluidizer
- Spray dryers
- Ultra-high pressure (UHP) system (QFP-6,2 L vessel)
- Parr vessels for super critical CO_2 extraction and reaction

Cheese plant
- Kusel vats

Extrusion and molding (CEEPR)
- Twin screw extruders (APV MPF-50, W&P ZSK-30)
- Injection molder (Demag)

Mathis laboratory film coater

Food Safety Technologies

Produce safety
- BSL-2 containment pilot plant
- Dump-tank hot water surface pasteurizer
- Produce washers: brush, rod/reel, and vibration types

Juice and beverage safety
- Integrated process and packaging line, 200 L/h
- Pulsed electric field system
- Radio frequency electric field system
- Dense-phase carbon dioxide system
- Aseptic bag filler

Meat & ready-to-eat product safety
- Vacuum-steam-vacuum flash pasteurizers
- UV belt-tunnel

Tannery

Tanning drums
- 10 10-L (Dosemats: 4-in-1 and 6-in-1)
- 4 pilot-scale drums (max. capacity 2 to 4 sides)

Side production equipment for fleshing, wringing, splitting, drying, staking, and milling
- Molissa staker, dryers (toggle, paste, Cartigliano vacuum)

Finishing spray booth
Constant temperature/humidity room
Mechanical property testing equipment

USDA•ARS

NATIONAL CENTER FOR AGRICULTURAL UTILIZATION RESEARCH

PILOT PLANT

From its beginning, NCAUR has worked directly with industry to achieve results of global significance, first and most notably to develop the method for the mass production of penicillin. The commitment to commercializing new technology continues today.

To facilitate technology transfer, NCAUR offers pilot plant scale-up for industrial products, biobased products / biofuels and food processing, along with the on-site expertise of more than 100 Ph.D. researchers from nearly a dozen different scientific disciplines. The result is product development and production capacity with the additional benefit of business incubator functionality.

These assets are combined with legislative authority allowing materials produced in the pilot plant to be sold by the collaborator in order to prove market concept. The result is a unique and powerful capacity for partnership and success at NCAUR.

The Power of Partnering

Agreements between NCAUR and its industry, university, and agency partners lead to successful development of commercial production and formulation technologies. Examples include:

- A new metalworking fluid derived from soybean oil rather than petroleum, providing performance benefits and lower cost
- Conductive polymers made from plant polysaccharides, such as starch and cellulose, that work as well as the petroleum based materials in the developmental pipeline
- Microbial agents that control a variety of pests, including Formosan subterranean termites; the aquatic weed hydrilla; Fusarium head blight of wheat and potato dry rot, late blight and sprouting
- New types of skin care additives attached to soybean oil and other natural oil molecules with anticipated uses in skin-, hair- and related personal-care products for health-onscious consumers
- A series of oat- and barley-based fat substitutes that are good for the heart, the most recent providing a "double-whammy" of reducing fat calories while at the same time working to reduce cholesterol

Food Processing Resources

Food processing research focuses on enhancing the performance of agricultural materials in existing applications and on developing new products to promote health using crops such as corn, soybeans, oats, barley and wheat. Equipment includes:

- Jet cooking lab featuring excess steam jet cookers capable of producing 30 gallons of liquid per batch at one gallon per minute
- Electric boiler producing clean steam generated from distilled water with no additives
- Vertical cutter mixer capable of blending liquids in batches up to 4 gallons each
- Steam-heated drum dryers capable of drying suitable materials at approximately .5 liter per minute
- Fully equipped test kitchen including a convection oven with capacity for 30 dozen cookies per batch or 12 1-lb. loaves of bread per batch or 4 20-lb. turkeys
- Sensory evaluation lab and test kitchen with odor and light-controlled booths for members of trained sensory panels

Chemical Processing Resources

Chemical processing research focuses on modifying the chemical and physical properties of soybean and other vegetable oils to develop improved quality and functionality; and on modifying bio-based materials such as polysaccharides and proteins from corn. Equipment includes:

- Werner & Pfleiderer ZSK-30 and Leistritz 18 mm co-rotating twin screw extruders with multi-port injection, feeding or venting capability; Brabender single screw extruder capable of producing pellets and ¼" ribbons; Randcastle co-extrusion system for extruding 3 or 5 layer films
- Brabender and Haake torque rheometers
- Cincinnati Milacron injection molding machine with 78 ton clamping force
- Ultrafiltration device capable of accepting any suitably sized cartridge membrane
- 5 and 50-gallon reactors, filtering apparatus, reverse osmosis concentrators, chiller, membrane separation apparatus, dewatering screens and more
- Myers-15 distillation apparatus, high vacuum distillations and high pressure reactors
- Supercritical fluid extraction pilot plant
- Technochem 800 lb/day pilot scale oil refiner RBD
- Small production scale equipment for de-hulling, cleaning, screening, aspirating, grading and milling seeds, including Rototex cleaner, seed conditioner and 400 lb/hr. French press

Biological Processing Resources

Biological processing research focuses on metabolic engineering technologies to convert agricultural commodities such as corn & crop residues into biofuels and chemicals, enzymes and polymers and to develop natural biological pest control agents. Equipment includes:

- Benchtop and pilot plant fermenters (1-100 L scale fermenters)
- Ancillary equipment for recovering and drying microbial products such as batch and continuous centrifuges, fluidized bed, spray, tray and vacuum freeze dryers and a rotary drum vacuum filter
- Controlled environment and plant growth chambers
- Turnkey integrated robotic workcell laboratory automation for high throughput molecular screening

NCAUR
Where the future is Created

www.ncaur.usda.gov

For more information about partnering opportunities at NCAUR contact:

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Partnerships

The Center is eager to explore new partnerships that would expand the use of the SRRC Pilot-Plant facilities. Current areas of research interest include food processing, oilseed extraction, fiber processing and finishing, pyrolysis processes, bio-fuels development, and environmental testing, but most areas of value-added agricultural product and process development can be accommodated.

A number of industry-government interactions have been undertaken within the pilot -plants from short-term specific research projects, with SRRC personnel performing most of the work, to extended interactive collaborations, with external personnel located on-site over sustained periods.

Equipment/operations supported within the facilities:

- Milling equipment (knife, hammer, attrition, pin mills, etc.)
- Reactors (glass and stainless steel jacketed reactors)
- Fiber carding, drawing, spinning, knitting and weaving operations
- Non-woven fiber processing
- Fabric wet processing, dyeing and chemical treatments
- Solvent extraction and processing
- Extrusion (single and twin barrel screw extruders)
- Ultrafiltration
- Ultrasonic treatment
- Evaporation
- Pelleting
- Pyrolysis
- Heat treatment (ovens, furnaces)
- Freeze-drying (barrel, shelf, manifold)
- Fermentation
- Particle separations (screening, air classification, gravity table separations)
- Dehulling
- Blending and mixing

USDA ARS SRRC
Southern Regional Research Center

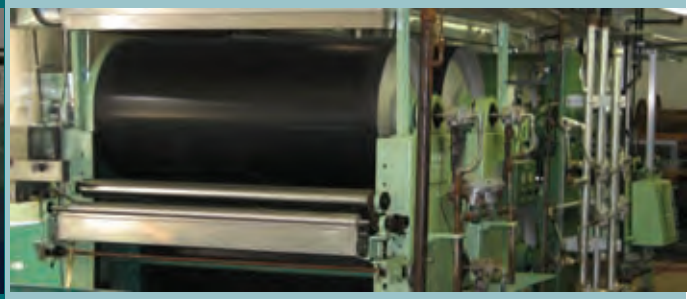
the PILOT PLANTS of the

Southern Regional Research Center

Overview of the Facilities

The Southern Regional Research Center has three pilot-plant facilities as part of its operations. Included are the Industrial Pilot-Plant, historically used for milling and oilseed extraction, the Food Pilot-Plant, used for many food processing operations, and the Textile Mill, used to support cotton fiber and textile production and finishing work. These facilities form core components of four Research Management Units and have been essential components of the Center's research programs over the past 65 years. Both the industrial and food facilities have one- and two-story sections; the Textile Mill is housed on two single-story floors in a separate dedicated building. The Industrial Pilot-Plant has non-hazardous and explosion-proof bays. Combined, the facilities occupy 21,500 ft2 of space and all are supported by common industrial utilities.

The pilot-plant operations have largely recovered from the effects of Hurricane Katrina, and new capacity has been added. Two new one-meter-width non-woven fabrication lines (one needlepunch and one hydroentanglement) have recently been purchased for the textile area. Fiber processing, mini-spinning, warping, weaving, dyeing, and finishing units have also been added to the Textile Mill. A new cabinet oven, barrel freeze-dryer and gravity table separator have been installed in the Industrial Pilot Plant. Additional units will be made operational as projects evolve.



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USDA ARS SRRC Southern Regional Research Center

USDA

Western Regional Research Center

ARS

THE PILOT PLANTS

Industrial Products

Biobased Products/Biofuels

Food Processing

The Pilot plants at the Western Regional Research Center in Albany, California encompass an acre of specialized facilities that have nurtured the success of many research projects during the Center's 65 year history. These are some examples:

Criteria for optimized conditions for frozen foods Time-Temperature Tolerance (T-TT) studies;

Technology for individual quick blanch (IQB) and vibratory spiral blanching;

Technologies for food dehydration and concentration (foam-mat dehydration, dehydrofreezing, Wurling evaporator, and belt-trough drier);

Chemical and mechanical peeling and cleaning of grains (bulgur), potatoes, tomatoes;

Bulk chemical and mechanical fractionation of alfalfa leaf protein and carotene concentrate;

Fermentation technologies to utilize waste crops and crop components for fuels and novel products;

Fermentor designs for biofuel conversion of field wastes on mobile platforms,

Extrusion and advanced processing technologies for healthy fruit-and vegetable-based convenience foods;

Physical and solvent refining of citrus byproduct phytonutrient chemicals to combat diseases;

Formulation and application of edible coatings to preserve lightly-processed fruits and vegetables;

Physical and solvent fractionation of cereals and cereal brans and other cholesterol-lowering foods to increase utilization in the diet; develop biobased products;

Unique biorefinery prefermentation concepts for conversion of crops and residues to biofuels; and

X-ray based recognition of pest-contaminated contraband in luggage, sorting methods for aflatoxin and other toxins and insects in almonds, pistachios, and other products.

Resources:

Specifically defined areas are available for safe and confidential processing of agricultural crops and marine products leading to edible food products and non-food biobased products and fuels. The space is flexible allowing use of modular equipment as well as the assembly of coordinated process sequences. The pilot labs are equipped with process equipment representing most important unit operations needed for foods and crop conversion and component separation.

Partnerships:

We are eager to explore new partnerships that would make use of the WRRC Pilot Plants in such areas as development of new biobased products, biofuels and bioenergy from agricultural products/byproducts; new healthy food forms utilizing fruits, vegetables, and cereal grains; and water and energy-efficient new methods for food processing and preservation. Partnerships may take the form of Cooperative Research and Development Agreements, Trusts, and Reimbusables.

Future:

In order to improve the R&D Facility to meet present and future needs, a multiphase modernization was initiated by ARS in 1997. Phases 1 and 2, which addressed major parts of the area used primarily for biobased product and biofuel research, were completed in 2005. Phase 3a modernization, which will include additional biofuel research capability as well as upgrades to the Food Processing laboratory and its extrusion facilities, is expected to be completed in 2008. The modernized facility will be home to research involving 70 or more Agricultural Research Service scientists and scientific support staff, as well as industry Cooperative Research and Develelpment Agreement partners and University collaborators, many of whom are already using the facility as modernization proceeds.

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Process Equipment Supported Capabilities for Food and Industrial Applications

Ambient and Heated Mixing
Atmospheric and Vaccuum Canning
Batch and Continuous Centrifugation
Blanching
Coating
Comminuting
Compression molding
Culinary Steam
Cutting
Emulsifying
Extrusion (single and double screw)
Fermentation
Fiber Spinning
Filtration: (physical, ultrafiltration, reverse osmosis)
Freeze Drying
Freezing
Heat Transfer
Homogenizing / Emulsification
Milling
Pasteurizing
Peeling
Plastics molding and extrusion
Puffing
Reverse Osmosis
Screen Separation
Size Reduction
Solvent Extraction
Solvent Processing space.
Spray Drying
Spray Drying
Ultra Filtration
Ultrasonic Treatment
Vacuum Evaporation

Solvent Processing Space

Full Range of Materials Testing Instrumentation

Working space physical overhead varies from one to four stories.
Research bays may be compartmentalized for confidentiality.
An acre (45,000 ft^2) of total floor space.

United States Department of Agriculture

Agricultural Research Service

30 YEARS OF THE NATION'S NETWORK OF ARS Human Nutrition Research Centers

USDA's chief scientific research agency, the Agricultural Research Service (ARS), develops science-based evidence to support better public health through nutrition.

Thirty years ago, The Food and Agriculture Act of 1977 required USDA to establish and support human nutrition research as a separate and distinct mission. That legislation led to establishment of new regional ARS Human Nutrition Research Centers, or HNRCs.

The ARS Human Nutrition National Program's portfolio of projects answers a wide spectrum of human nutrition questions by providing authoritative, peer-reviewed, science-based evidence. To accomplish their mission, ARS scientists study the role of food and dietary components in human health from conception to advanced old age.

The ARS Human Nutrition National Program now includes six HNRCs and several smaller locations throughout the United States. Projects at these HNRCs range from studying single cells to controlled human clinical trials to the population at large. The work of these six centers is necessarily interrelated and falls within four overarching research components—**Nutrition Monitoring and the Food Supply, Science-Based Evidence for Dietary Guidance, Preventing Obesity and Related Diseases,** and **Life-Stage Nutrition and**

Beltsville Human Nutrition Research Center Beltsville, Maryland

Highlights

Researchers here—

Provide *the* authoritative source of food composition information in the United States, the USDA-ARS National Nutrient Databank. The center is also responsible for the dietary data-collection component of the nationally representative food consumption survey, "What We Eat in America/NHANES."

Reported that people with just slightly elevated cholesterol who consumed barley containing the same amount of beta-glucan as found in oats lowered their cholesterol levels. The research led to FDA approval of a health claim for barley, based on its soluble fiber content.

Reported on the health benefits of limiting intakes of trans fats and not replacing them with saturated fats. Those findings contributed to the FDA-required listing of trans fats on nutrition facts labels and to the current reformulation of many products to versions with less trans fat content.

Grand Forks Human Nutrition Research Center Grand Forks, North Dakota

Highlights

Findings here on nutrient requirements related to physical activity and performance are being used by the Institute of Medicine's Committee on Military Nutrition to determine the adequacy of rations to support military personnel during combat operations.

Researchers here have been major contributors in linking selenium to cancer prevention. Investigations of selenium bioavailability and the potential health effects of high-selenium foods have prompted the South Dakota Wheat Commission to study the feasibility of segregating high-selenium wheat for sale to specialty markets.

ARS is now celebrating 30 years of a network of national HNRCs that support better public health through science-based nutrition.

Metabolism. In support of the first research component, **Nutrition Monitoring and the Food Supply,** ARS scientists measure and document the nutrient composition of thousands of foods commonly eaten in the United States. This information feeds into *the* authoritative source of U.S. food composition—the National Nutrient Databank. Consumers, health care professionals, and researchers enjoy multiple online and downloadable resources made possible by this versatile bank of nutrient data.

Another important aspect of nutrition monitoring is keeping abreast of the Nation's dietary habits through a systemized nationwide food consumption survey. This survey, called "What We Eat in America/NHANES," provides the only nationally representative information on the population's dietary habits. Nutritionists, both public and private, use these and other data sets as their tools to explore links between dietary intakes and health outcomes.

While nature provides a cornucopia of food sources from which to choose, there are thousands of nutrients and other bioactive components within those foods to be studied. ARS scientists develop and improve methods for food composition analysis to accurately determine the abundance and role of emerging classes of bioactive components in foods that have beneficial health properties.

Science-Based Evidence for Dietary Guidance for promoting health and preventing disease is the second research component. ARS scientists investigate nutrient require-

Arkansas Children's Nutrition Center Little Rock, Arkansas

Highlights

Researchers here have launched a large, longitudinal study that aims to define best feeding practices for neurological, or brain, development among infants and children. Called "New Beginnings," this soon-to-be-definitive study compares development of infants who are either breast fed, fed soy formula, or fed cow's milk formula during their first 6 months.

Scientists here developed an automated version of the oxygen radical absorbance capacity (ORAC) assay, which is now widely used to measure the antioxidant capacity of a variety of foods. A modified form of the assay is used to assess the antioxidant capacity of plasma.

Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University Boston, Massachusetts

Highlights

At the Nutrition, Exercise Physiology and Sarcopenia Laboratory, researchers have shown the safety and effectiveness of progressive resistance, or strength training, exercise in reversing sarcopenia—which is loss of muscle mass that comes with aging. The condition actually starts around age 45, when muscle mass begins to decline at a rate of about 1 percent per year.

At the Nutrition and Genomics Laboratory, researchers have identified several genes that influence body weight and/or obesity. Identifying genetic variations that relate to weight loss and maintenance will help in the design of future individualized interventions for preventing obesity and diabetes.

At the Laboratory for Nutrition and Vision Research, scientists have identified modifiable dietary risk factors for developing two major eye diseases that impair sight: age-related macular degeneration (AMD) and cataracts. AMD is the most common cause of blindness in people over 65.

ments across the life cycle—from before conception to gestation and for pregnant and lactating women, infants, children, adolescents, adults, and the elderly. Their findings provide key data that are used to establish the national nutrition standards known as the Dietary Reference Intakes (DRIs) and the national food and nutrition guidance known as the "Dietary Guidelines for Americans." These standards and guidelines are also used in establishing effective food assistance and nutrition education programs.

ARS scientists working within this research component are also studying genes and gene expression in relation to diet. Another aspect is identifying the roles of known nutrients, bioactive food components, and physical activity in promoting health and preventing disease. This ongoing research uncovers nutritional needs that differ, based on age, gender, race, genetics, environment, behavior, and lifestyle.

The ARS Human Nutrition National Program is also focusing on U.S. obesity. The third research component, **Preventing Obesity and Related Diseases,** addresses the problem that an estimated two-thirds of adults in the United States are overweight or obese. Unfortunately, that problem doesn't stop with adults. In just the 5 years from 1999 through 2004, the prevalence of overweight children and adolescents aged 2 to 19 increased from about 14 percent to over 17 percent.

Western Human Nutrition Research Center Davis, California

Highlights

- Women who go on and off diets, called yo-yo dieters, inadvertently adjust their metabolism to use less fat after meals.
- Decreased ability to concentrate, or to remember words, may signal a developing iron or zinc deficiency in young adults.
- Chronic self-imposed, restrained eating among women age 20-45 significantly lowered their bone mineral content and may increase their risk for osteoporosis later in life.
- Discoveries about molecules called "zinc transporters" help explain how the body ferries zinc from foods to cells that depend on this element.
- Natural compounds in sweet, fresh Bing cherries may help fight the inflammation of arthritis, heart disease, and cancer, but apparently they work selectively—suppressing some indicators of inflammation but not others.

These unprecedented U.S. trends are important underlying causes of many related disorders, including heart

Children's Nutrition Research Center at Baylor College of Medicine Houston, Texas

Highlights

CNRC scientists—

- Reported results from the first long-term study of food choices in schools. When middle-school students gained access to foods not in USDA-approved lunch programs (think school snack bars and à la carte menus), not surprisingly, the quality of their diets declined. The finding contributed to revamping the Texas State school foods policy. That change in policy became a model for many other States that have now modified their policies on the sale of foods and soft drinks in schools.
- Showed that bone deposition and calcium absorption peak during early puberty, a finding that influenced recent increases in calcium recommendations for children 9 to 18 years of age.
- Developed an early feeding strategy using human milk that reduced postdelivery hospitalization of premature infants by an average of 3 days.

CNRC is the largest federally funded children's nutrition research center in the country. It is operated in cooperation with Baylor College of Medicine and Texas Children's Hospital.

disease, diabetes, and several cancers. Developing strategies to prevent obesity and related diseases is part of this research component. New directions include the nutrition national program's Obesity Prevention Research Initiative, which focuses on testing the ability of the Dietary Guidelines for Americans to prevent unhealthy weight gain and to decrease risk factors for chronic diseases. This initiative also focuses on determining barriers—as well as facilitators—to following the Dietary Guidelines.

Another initiative is working to prevent obesity and promote health in the lower Mississippi Delta region. Obesity, heart disease, stroke, and cancer rates are significantly higher among people living in the Arkansas, Mississippi, and Louisiana Delta region than among other U.S. residents. To address these health problems, Congress created the Lower Mississippi Delta Nutrition Intervention Research Initiative in 1994.

The fourth research component, **Life Stage Nutrition and Metabolism,** covers the study of nutritional needs during development and aging. It involves research on the concept of "nutritional programming" that occurs during gestation—where genes are turned on or off in response to various factors, including maternal diet and nutrition. Such nutritional programming can affect susceptibility to health risks later in life. This component also includes research on basic biological mechanisms involved in growth and aging that affect nutrition requirements.

For over 30 years, ARS human nutrition research scientists have been providing nutrition information for health. Many of them are pioneers in the areas of nutrition, health, aging, and age-related diseases. They have reported thousands of studies that reveal important findings on the body's ability—through diet and exercise—to stay healthy and lower the risk of developing chronic disorders that occur with aging.

April 2007

USDA-ARS Human Nutrition National Program Leaders

Molly Kretsch, Ph.D., human interventions and population studies

David Klurfeld, Ph.D., basic and mechanistic studies

USDA-ARS Human Nutrition Research Centers

Arkansas Children's Nutrition Center
Little Rock, Arkansas
www.acnc.uams.edu
Director: Thomas M. Badger, Ph.D.

Beltsville Human Nutrition Research Center
Beltsville, Maryland
www.ars.usda.gov/ba/bhnrc
Director: Allison A. Yates, Ph.D., R.D.

Children's Nutrition Research Center at Baylor College of Medicine
Houston, Texas
www.kidsnutrition.org
Director: Dennis M. Bier, M.D.

Grand Forks Human Nutrition Research Center
Grand Forks, North Dakota
www.gfhnrc.ars.usda.gov
Director: Gerald F. Combs, Jr., Ph.D.

Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University
Boston, Massachusetts
www.hnrc.tufts.edu
Director: Robert M. Russell, M.D.

Western Human Nutrition Research Center
Davis, California
www.ars.usda.gov/pwa/Davis/whnrc
Director: Lindsay Allen, Ph.D.

Other, smaller ARS human nutrition research locations include: the Lower Mississippi Delta Nutrition Intervention Research Initiative (Delta NIRI), Little Rock, Arkansas, and its cooperating partners in three States; the Plant Soil and Nutrition Laboratory, Ithaca, New York; and the Pennington Biomedical Research Center, Baton Rouge, Louisiana.

Additional Resources

USDA Sustainable Operations Council
www.greening.usda.gov

BioPreferred
www.biopreferred.gov

USDA-Funding Opportunities (Main page)
http://www.csrees.usda.gov/fo/funding.cfm

USDA-SBIR Program
http://www.csrees.usda.gov/funding/sbir/sbir.html

Greater Baltimore Technology

The Greater Baltimore Technology Council is devoted to one goal: building and growing the region's tech community. We ask tech companies what they need to grow and provide it through innovative programs. We create forums where organizations can meet, learn and do business. And we celebrate the community's successes, spreading the word that technology businesses thrive in the Greater Baltimore region.

Upcoming Events – Fall 2008:
Registration for all events can be found at www.gbtechcouncil.org

Voices of Bio: Navigating the Government Grant/Application Process
Navigating the murky waters of government contracts and grant applications can be a daunting process. Come to this program and listen to our experts tell you, first-hand, what's available, your options, and most importantly, what you need to do to successfully land a contract/grant. Come prepared for a detailed conversation and be ready to take home a wealth of knowledge....knowledge that will improve your bottom line.
11/13/08
8:00 a.m. – 10:30 a.m.
GBTC Bio Members and Bio Non-Members invited

Meet the Members: Lessons Learned
Join us to hear 3 seasoned executives share their experiences...the good, the bad, the challenges and the triumphs. Find out how they think, the lessons they have learned, the things they would do differently. Be on hand to listen, learn and ask questions. This is an event you won't want to miss
11/18/08
7:30 a.m. – 9:30 a.m.
Open to GBTC Members and Non-Members

Winter Wine Tasting
Just think – tech companies, regional executives, vino and of course lots of low pressure networking. Come out and meet some of our favorite technology firms from around the region while enjoying wine, beer and food in a fun atmosphere.
12/11/08
5:30 p.m. – 7:30 p.m.
GBTC Member-Only Event

Greater Baltimore Technology Council
2400 Boston Street, Suite 322 | Baltimore, MD 21224
410-327-9148 | info@gbtechcouncil.org | www.gbtechcouncil.org

The SBIR Resource Center(R)

On the World Wide Web at http://sbir.us/

Absolutely the fastest, easiest, and most economical pathway to SBIR/STTR funds.

The SBIR Resource Center(R) has pioneered the use of special, non-traditional software to apply for, and win, SBIR & STTR funding for hundreds of clients and is currently promoting custom-crafted time and $$$ saving application support packages for ALL open procurements. Since beginning support of SBIR/STTR, the Center has developed the world's only *complete, integrated & comprehensive set of resources* to support the SBIR/STTR applicant.

Proposal Development Tools will dramatically cut the time, cost & effort of developing compliant SBIR/STTR proposals and grant requests. Composed of 18 different software packages, **each custom-crafted and updated to meet the specific requirements of the target agency** (so complete that *compliance success is guaranteed* when the full set is used to develop your proposal). Customer satisfaction is guaranteed for all ToolKits.

+ **SBIR-ToolKit**™ – time and work-saving guidance, professional advice and proposal tools integrated into every paragraph of compliant proposal templates. Includes special tools for project planning, cost estimates, developing indirect cost ratios & publishing cost proposals. Each title saves at least 24 to 40 hours of effort.
+ **SBIR-Forms**™ - easy to use tools for rapid "on screen" completion and local printout of the required forms.
+ **IRCalc**™ - low cost spreadsheet tool for properly calculating *indirect cost rates* (no consultants required).
+ **Cost_Est**™ - time saving tool set for making good cost estimates and pricing decisions on R&D projects.

Tutorial Packages -- software-based, self-study tools covering most important aspects of SBIR/STTR.

+ **SBIR-Guide**™ - SBIR/STTR basics, a program information database, current news (annual updates $50).
+ **SBIR-Legal**™ - how to protect intellectual property in SBIR/STTR and other government contracting.
+ **SBIR-Accountant**™ - government contracting requirements & financial issues under SBIR/STTR.

SBIR Support Services offer cost effective, fixed-price access to leading experts in SBIR & STTR.

+ **SBIR-Eval**SM - evaluation of project as SBIR/STTR application & strategic advice for its best potential.
+ **SBIR-BidData**SM - supports proposal development through well-informed technology assessment and accurate commercialization planning data (certified librarians using the world's most important databases).
+ **SBIR-Review**SM - a critical proposal review (includes 30 minutes of telephone consulting while writing).
+ **SBIR-Leader**SM - provides professional leadership, tactical planning & hands-on management of your proposal with you as the subject matter expert; includes edit & construction of the final submission document.
+ **SBIR-BidMatch**SM - annual subscription to full text procurement searches finds the opportunities for you.
+ **How to Win SBIR Awards**SM – a highly acclaimed, full day, SBIR/STTR business-development workshop.
+ **SBIR Workshops –** *Maximizing Value of A Phase I, Project Planning & Management, Competitive Checklist*.

Outreach Program Support - The Center provides a wide range of support tools and services to states and non-profit outreach programs. These include a turnkey **SBIR Outreach Center**™ equipped with software tools, self-paced tutorials and SBIR/STTR publications; bulk-priced products and services; **SBIR-Counselor**™ training; outreach Web site development & maintenance; state-based newsletters & information outreach campaigns and the ***SBIR Practitioner***™, the "best-practices" newsletter for Outreach Center operators & local small business counselors.

** The SBIR Resource Center(R) is a division of JADE Research Corporation, and has been the leading provider of commercial business development resources to the SBIR/STTR community since 1994.*

Please consult the Web at* http://sbir.us/ *for more details and an exposition of our credentials.

"SBIR Resources" lead to "SBIR Success"

SBIR Resource Center(R) • 5 Linda Lane • Severna Park, MD 21146
TEL: (410) 315-8101 • FAX: (410) 315-9560 • E-MAIL: SBIR@sbir.us

Credentials & Qualifications to Provide SBIR & STTR Support

- The SBIR Resource Center® has completed its 14th year of continuous, dedicated service to the SBIR Community.
- Center personnel **attend ALL three of the National SBIR Conferences every year** (since 1993).
  * Often provide National SBIR Conference speakers on *Preparing Competitive Proposals, Doing The Pre Proposal Homework* and *Small R&D Project Planning, Cost Estimating and Control.*
  * Official (invited participation) in the National SBIR Conference's one-on-one sessions since 1997.
  * Recently (since 2003) the Center has organized and conducted special tracks on *Best Practices in SBIR Outreach*
- Center personnel attend, and often make presentations or chair sessions at, many other SBIR conferences and workshops put on by agencies, states and institutions of higher learning all across the country.
- The Center's associates have over 300 man-years of successful proposal management experience, and stay up-to-date through active membership in the Association of Proposal Management Professionals (APMP), along with numerous other professional/industry associations. The Center invests in and works hard to maintain true "professional" status.
- Center personnel have "hands on" experience in conducting and managing research projects and are well qualified to advise on research design as well as R&D project planning management and control -- both critical to SBIR success.
- Center personnel have extensive executive (COO/CEO) and business development experience in government contract R&D firms (large and small) and are thus well qualified to advise on the strategic and business planning aspects of SBIR projects -- this is becoming more critical as SBIR/STTR evaluators focus more heavily on long term commercialization potential.
- Center personnel actually study each, and work with every SBIR & STTR procurement package from every agency each year -- true experts with every SBIR agency, not just one. **Actually spend 8 hours weekly just to stay abreast of changes.**
- The Center creates proposal templates (*SBIR-ToolKit*™), electronic forms (*SBIR-Forms*™) and detailed, powerful proposal guidance (*SBIR-Advisor*™) products custom-crafted for each and every one of the ~21 procurements each year -- the Center is **the ONLY available source** for such products.
- The Center publishes an electronic, e-mail distributed newsletter, *SBIR News You Can Use*™, to more than 8000 subscribers.
- The Center also publishes *The SBIR Practitioner*™ to keep SBIR support personnel abreast of "best practices in outreach."
- The Center developed, and since 1997, has continuously provided, the highly acclaimed ***How To Win SBIR Awards***℠ workshop in public forums across the country at least 10 times a year for various technical groups, agencies, small business development centers (SBDCs) and institutions of higher learning.
- SBIR Resource Center® created and maintains the single most useful SBIR/STTR program tutorial, database, and conference newsletter, the *SBIR-Guide*™, product available in the SBIR community.
- The **ONLY available source** of professionally developed, self-paced tutorial products covering SBIR/ STTR's intellectual property (SBIR-Legal™) and Government contracting (SBIR-Accountant™) issues.
- The **ONLY available source** of opportunity-matching services covering every SBIR/STTR solicitation.
- The **ONLY available source** of custom, low fixed-price, *SBIR-BidData*℠ search services of the world's most important databases by professional, graduate database librarians to enhance SBIR/STTR applications.
- The SBIR Resource Center® contracts with a number of States to provide SBIR/STTR Outreach Centers™, workshops, tutorials, software and direct consulting services to locally qualified firms.
- The Center operates and maintains one of the most useful & popular SBIR sites on the World Wide Web. It serves the community as a **primary source** of current, up-to-date SBIR/STTR news covering all 11 SBIR agencies. Links to this site are carried on the SBIR pages of many government SBIR agencies and virtually all non-government sites that include any mention at all of SBIR/STTR.
- SBIR Resource Center® has been written up/profiled/quoted/published in *Washington Technology, Technology Transfer* Magazine, *Technology Initiatives, Unmanned Systems* Magazine, National Small Business Council's *Impact, Contract Management* Magazine, *Baltimore Business Journal*, various daily newspapers and many other publications.
- Since 1994 the SBIR Resource Center®, an operating division of JADE Research Corporation, has been widely recognized as **the nation's leading provider of business development resources to the SBIR/STTR community.**

"SBIR Resources" lead to "SBIR Success"

SBIR Resource Center® * 5 Linda Lane, Severna Park, MD 21146 * TEL: 410-315-8101 * WEB: http://sbir.us/

Make It Grow.

MINTZ LEVIN

Venture Capital and Emerging Companies Practice Group

Achieving Success for Companies and Investors. Mintz Levin has represented hundreds of companies and investors in financial transactions. The total value of recent transactions alone is in excess of $60 billion — a number that continues to grow. We have deep domain expertise in these growth sectors.

Maximize Our Connections.

In the world of venture capital and emerging companies, it really is who you know. Thanks to our extensive network across diverse industries, Mintz Levin can make the introductions you need. It's about transforming good ideas into great businesses, and requires rigorous attention to market realities. That's how you achieve the best returns—and how start-ups position themselves for long-term success.

Your legal needs evolve over time, depending on where you are in the life-cycle of your enterprise. Our Venture Capital and Emerging Companies practice group will carry you through the full spectrum of legal services—from formation to exit. We'll be there at the launch, and we'll stay involved as your company matures.

Because we understand your business, we'll help examine your corporate requirements, intellectual property protection, employment issues, regulatory and compliance needs, and assess how these impact your bottom line. That's what we've already done for many important investors and companies in the information technology, digital media, life science, healthcare, and energy and clean technology sectors.

From early or seed stage investments through subsequent later stage, we're experienced representing investors and companies in all types of financings. We counsel companies, investors, and financial advisors in sophisticated transactions including IPOs, private placements, and follow-on equity and debt financings, and we structure and negotiate complex mergers, acquisitions, joint ventures, strategic alliances, and venture financings.

SERVICE OFFERINGS

Financings
M&As, IPOs, Alternative Public Offerings, Private Placements, Exit Strategies, Debt and Equity Structures, Venture Financings, Cross-Border Financings

Corporate Transactions
Joint Ventures, Governance, Incorporations, Contracts, Licensing, Outsourcing Agreements, International Transactions, Strategic Alliances

Fund Formation
Private Placement Memorandums, Limited Partnership Agreements, Limited Liability Company Agreements and Investment Advisory Agreements

Intellectual Property
Patent and Trademark, Technology Transfer, Privacy and Security, Copyright, Licensing

Employee, Labor and Benefits Counseling
Compensation Agreements, Non-Compete Protection, Employee Handbooks, Immigration

Government Relations
Lobbying and Federal Relations

Tax Structuring and Advice


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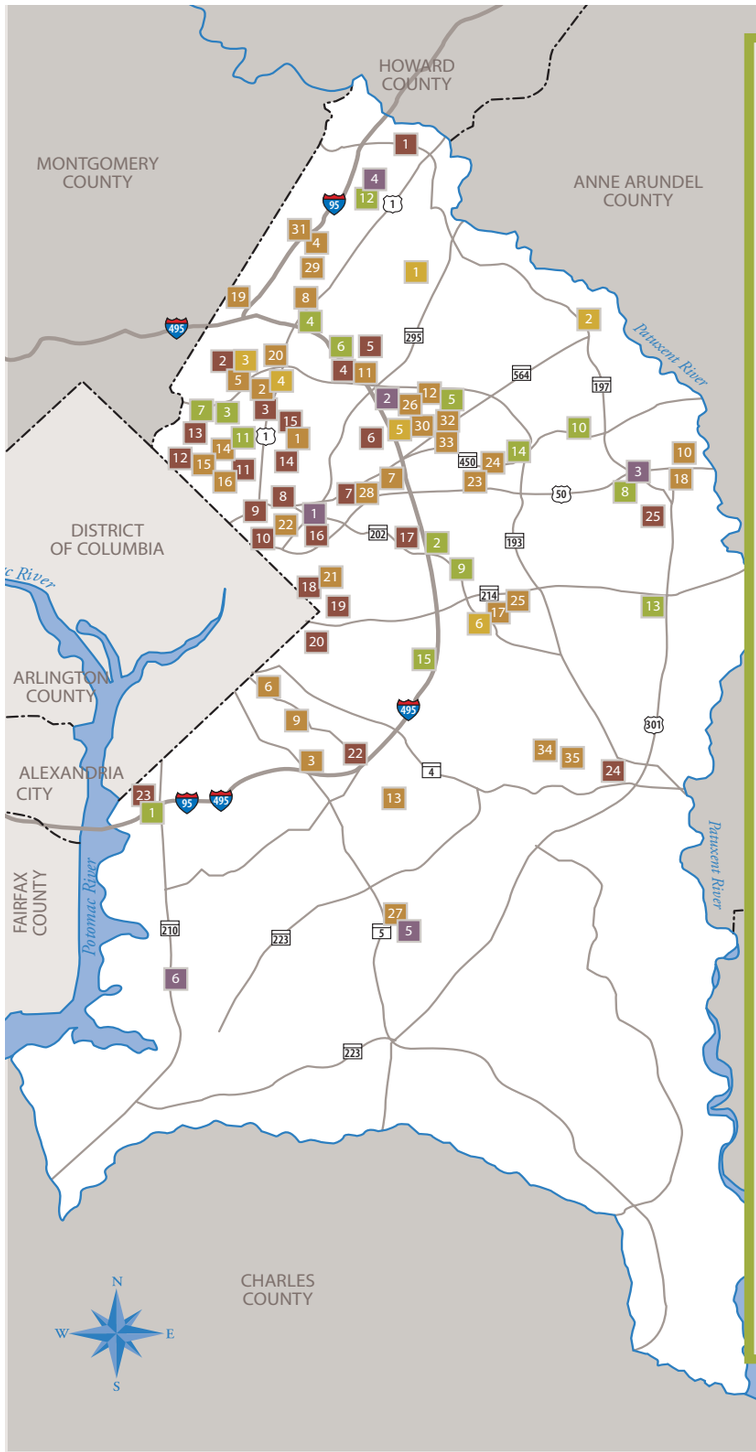


Prince George's County

Major Residential Communities

1 Laurel
2 College Park
3 University Park
4 Berwyn Heights
5 Greenbelt
6 New Carrollton
7 Landover Hills
8 Bladensburg
9 Cottage City
10 Colmar Manor
11 Brentwood
12 Mount Rainier
13 Hyattsville
14 Edmonston
15 Riverdale
16 Cheverly
17 Glenarden
18 Fairmount Heights
19 Seat Pleasant
20 Capitol Heights
21 District Heights
22 Morningside
23 Forest Heights
24 Upper Marlboro
25 Bowie

Major Employers

1 U.S. Food and Drug Administration (FDA) - Center for Food Safety and Applied Nutrition (CFSAN)
2 Joint Institute for Food Safety and Applied Nutrition (JIFSAN)
3 National Oceanic Atmospheric Administration (NOAA) Science Center
4 Bureau of Alcohol, Tobacco and Firearms (ATF) National Laboratories and the Fire Research Center
5 National Archives at College Park, National Archives and Records Administration (NARA)
6 The Washington National Records Center (WNRC)
7 Internal Revenue Service (IRS)
8 U.S. Department of Agriculture (USDA) - Beltsville Agriculture Research Center (BARC)
9 U.S. Department of the Census
10 U.S. Department of Census Super Computer Facility
11 U.S. Department of Justice Baltimore/ Washington High Intensity Drug Trafficking Program (W/B HIDTA)
12 National Aeronautic and Space Administration (NASA) - Goddard Space Flight Center (GSFC)
13 Andrews Air Force Base
14 National Processing Service Center (NPSC) Federal Emergency Management Agency (FEMA)
15 U.S. Department of Health and Human Services (DHHS) - National Center for Health Statistics (NCHS)
16 U.S. Department of Treasury - Financial Management Systems
17 U.S. Drug Enforcement Administration (DEA)
18 Supercomputing Research Center (SRC), Institute for Defense Analyses (IDA)
19 Army Research Lab (ARL)
20 University System of Maryland
21 Giant Food
22 Dimensions Health
23 Safeway
24 Shoppers Food Warehouse
25 Prince George's Community College
26 Raytheon Systems
27 Southern Maryland Hospital
28 Computer Science Corporation
29 District Photo
30 Honeywell Technology Solutions
31 Swales Aerospace
32 Doctor's Community Hospital
33 Northrop Grumman
34 Prince George's County Government
35 Prince George's County Public Schools

Major Retailers/ Mixed-Use Developments

1 National Harbor
2 Woodmore Towne Centre
3 University Town Center
4 IKEA
5 Greenway Center
6 Greenbelt Station
7 The Mall at Prince George's
8 Bowie Town Center
9 Boulevard at Cap Center
10 Fairwood Greens
11 Belcrest Center
12 Konterra
13 Karington
14 Vista Gardens Marketplace
15 Ritchie Station Marketplace

Hospitals

1 Prince George's Hospital Center
2 Doctor's Community Hospital
3 Bowie Health Center
4 Laurel Regional Hospital
5 Southern Maryland Hospital Center
6 Fort Washington Medical Center

Higher Education

1 Capitol College
2 Bowie State University
3 University of Maryland University College
4 University of Maryland at College Park
5 Washington Bible College & Capitol Bible Seminary
6 Prince George's Community College

Business Incentives

- Enterprise Zone Program
- High Tech Incentive Package
- Foreign Trade Zone
- HUB Zone
- Revitalization Tax Credits
- Small Tech Business Revolving Loan Fund
- Workforce Training matching grants (Maryland Business Works)

Key Contacts

President & CEO: Kwasi Holman

Senior Vice President: Kevin Malachi

Business Development: Wanda Plumer

Business Incentives: Bill Gardiner

International Business Development/ Foreign Trade Zone: Patricia Parker

Marketing: Patricia Thornton

Maryland Minority Research and Development Initiative: mmrdi@gsecurity.com

Small Business Initiative: Charlotte Ducksworth

Technology Assistance Center Incubator: TBA

Workforce Services: Patricia White & Jeffrey Swilley

Prince George's County Economic Development Corporation

Overview of Programs and Services

1100 Mercantile Lane,
Suite 115A
Largo, MD 20774
Phone: (301) 583-4650
Fax: (301) 772-8540
www.pgcedc.com

Prince George's County Maryland

Gorgeous Prince George's A Growing Renaissance

Business Development

- Working closely with other county agencies and major public and private entities, the EDC assists existing companies identify possible sites for expansion or re-location;
- Facilitates access to various state and county incentives, financing and workforce programs;
- Implements business recruitment programs to attract new businesses to the county;
- Actively pursues federal, state and foundation grants, as well as private contributions, to help support economic development activities in the County;
- Creates an important communication link between local business owners and government officials and resources, providing policy input to strengthen the business climate in the County;
- ISO 9001 Training

Small Business Initiative

- One-stop-shop for consolidated small business services with a cadre of alliance partners;
- Efficient access to SBA loans, commercial loans, equity, bonding, and insurance;
- Increased access to contracting opportunities and procurement databases;
- Fosters joint ventures and alliances;
- Comprehensive training seminars and workshops featuring one-on-one and group counseling;
- Mentor / Protégé Program;
- Priority consideration for Permits, Loan approvals, Contract opportunities and/or awards;
- Monthly Procurement Days and ongoing assistance with MDOT, 8(a) certifications.

International Business Development

Foreign Trade Zone (FTZ) 63

- A Foreign-Trade Zone is a specially designated area, in or adjacent to a U.S. Customs Port of Entry, which is considered to be outside the Customs Territory of the United States.
- FTZ benefits include deferred duty for products admitted to the FTZ; eliminated duty on products imported to and exported from FTZ outside the US and on products admitted and subsequently destroyed within the zone; reduced duty on imported products admitted to the FTZ due to inverted tariffs and reduced adiministrative reporting.
- FTZ 63 is located at the Capitol Beltway (I-495) and the new Ritchie-Marlboro Road interchange (Exit 13).

Other Activities

- EDC has helped the County develop an International Business Strategy that will position the County as a “Portal for International Investment.”
- EDC has partnered with the U. S. Department of Commerce to assist small and minority firms learn how to export their products and services.
- The EDC also helps the County attract foreign business investment and take advantage of business opportunities that may exist as part of relationships between Prince George’s County and cities or regions abroad.

Technology Initiatives

The Prince George’s County Technology Assistance Center (TAC) Incubator

- Flexible commercial offices in a first-class building;
- Competitively priced rental rates;
- Expansion options;
- Twenty-four hour access;
- High-tech workforce training services available;
- Flexible lease terms;
- Significant building and site amenities.

Maryland Minority Research & Developmen Initiative

- Periodic workshops and seminars for the business community;
- Pre-scheduled business counseling services;
- Proposal assessment services (SBIR and STTR);
- Priority participation and reduced rates for Prince George’s County Minority and women-owned businesses;
- Partnership between EDC, Maryland Technology Development Corporation (TEDCO) and the University of Maryland.

Workforce Services

Business Services

- Recruitment, pre-screening & hiring assistance;
- Statewide online job exchange/Maryland Workforce Exchange System;
- Pre-employment skills assessments;
- Targeted and customized job fairs;
- Labor market information;
- On-site career consultation and outplacement;
- Assistance to dislocated workers.

On-Site Center Resources

- Access to computer workstations;
- EmployOn system;
- Free access to copiers and fax machines, Internet job llistings;
- Computer software tutorials;
- Library of career information and books.

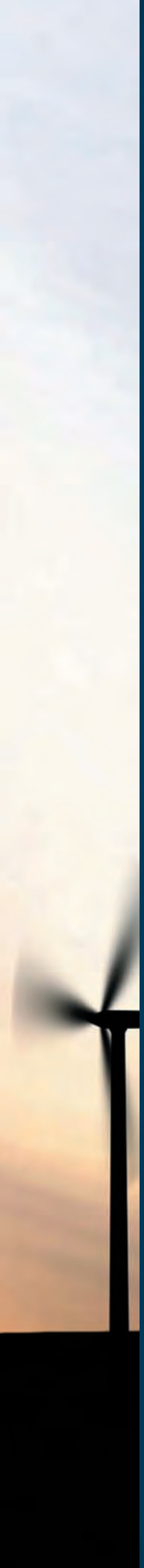
Job Seeker Services

- Career assessment & planning, resume development;
- Referral and placement assistance;
- Employment consultation, counseling & referral services;
- Training information, workshops & GED assistance;
- Veterans & youth services.

Make Tomorrow's Energy Today.

MINTZ LEVIN

Energy and Clean Technologies



See the Big Picture.

As the appetite for energy continues to grow globally, so does the demand for change in the way it is delivered and consumed. That's a large and important opportunity in many ways. Whether your company is pioneering new energy sources—photovoltaics, solar thermal, fuel cells, biofuels and clean coal—or finding ways to make more efficient use of existing resources, you need legal counsel that know your industry, know your business and know the issues and opportunities that mean the most to your success. These often involve the interplay of politics, policymaking, public and private financing, intellectual property and high-stakes disputes—among other things. Mintz Levin has the resources to see the big picture.

Our lawyers and government relations specialists offer the critical experience needed to help investors, traditional energy providers and clean tech entrepreneurs create and implement their plans. And our experience at the crossroads of these sectors offers you a view into the best practices and lessons learned by those on all sides of the changing energy landscape.

MINTZ AT A GLANCE

- 500 Lawyers across 8 offices
- Industry-identified leading attorneys
- Attorneys have supported the successful development, construction and financing of more than 4000 MWs (approx. $3 billion) of energy generating facilities
- Mintz Levin attorneys have closed more than 75 clean tech transactions since January 2006

Representative Clients

Bridging the gap between the pioneers of yesterday and today with the same goal in mind. Generating a thriving economy and sustaining a cleaner world.

ENVIRONMENTAL

Expertise in regulatory strategy, advocacy and litigation with a strong focus on environmental policy and enforcement

Industry-identified leading attorneys

CORPORATE

Closed more than 75 transactions since January 2006, including more than 40 venture capital transactions, numerous M&A deals and public offerings

25 years of experience in taking emerging technology companies public

PROJECT DEVELOPMENT AND FINANCE

Expertise in managing all facets of project development including site control, compliance (state and federal laws), permitting, and drafting, review and negotiation of complex documents

Attorneys experienced in development, acquisition and sale of energy facilities in transactions totaling billions of dollars

INTELLECTUAL PROPERTY AND LICENSING

More than 100 IP professionals in our IP practice section

Experienced attorneys in strategic counseling, patent infringement, patent prosecution and trademark applications

Long history of licensing IP out of universities

GOVERNMENT RELATIONS

Experienced political strategists and policy advisors at the federal, state and local levels

Focused experience on federal legislative and regulatory representation of Fortune 500 energy companies

REGULATORY

Experienced counsel in local, state and federal regulatory matters

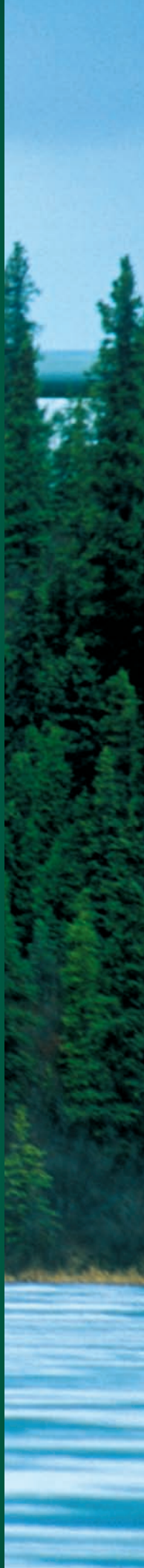
Attorneys actively participate to create value for clients in wholesale and retail markets

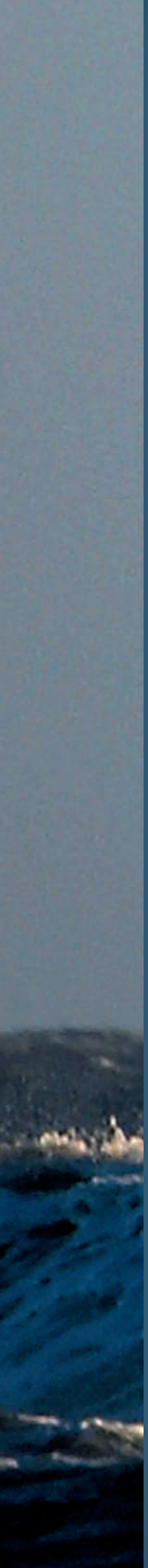
Tap Deep Resources.

Until new energy sources come online in significant volume, pressure will intensify to find more efficient and responsible ways to produce, distribute and consume existing energy resources. As you adapt to this changing environment, your business is faced with problems that are multidimensional by nature: they touch many areas of the law and require a coordinated, interdisciplinary approach. At Mintz Levin, our energy clients turn to us for deep subject matter experience in our environmental, land use, real estate, business, project finance, litigation and regulatory practices. But they also rely on a team-based service model that connects you with the right resource in the right place at the right time.

CASE IN POINT

The Northeast Gateway LNG Project is a safe and reliable means of satisfying New England's growing demand for natural gas. Now under construction outside of Boston Harbor, Excelerate Energy's LNG port will deliver gas to New England markets from offshore buoys through a new subsea pipeline. Mintz Levin's lawyers led the successful effort to obtain all approvals for the pipeline required from regulators in Massachusetts and in federal regional offices.





Move Ideas to Market.

When you're starting a clean technology company, you generally have one direction you want to go: up. To do so you need to protect and optimize IP, raise capital, manage operations, build and expand facilities, recruit and retain talent, resolve disputes and enter into joint ventures. Often, all at the same time. To work through these and other related challenges, clients turn to high-performing, interdisciplinary Mintz Levin teams. From the word 'go,' to the words 'go public' and beyond, Mintz Levin professionals provide the business-building counsel you need to quickly move your ideas to market.

Example: EnerNOC, Inc. helps utilities and grid operators reduce the risk of blackouts by controlling the usage of major electric customers, thus substantially lowering peak demand. Users voluntarily curtail consumption when the grid is stressed, thus avoiding escalating electricity costs and uncertain grid reliability. Mintz Levin has assisted EnerNOC from idea to financing to development and marketing — bringing it to market in May 2007 with its $97 million IPO and again six months later with a $108 million follow-on public offering. Going public has brought additional responsibilities, and Mintz Levin helps EnerNOC navigate the challenges of public company reporting and compliance.

QUICK FACTS

- In excess of $1.25 billion of energy and clean tech deals completed from 2007 through Q3 2008
- More than 75 transactions since January 2006
- The most successful clean tech IPO in 2007
- Represent more than 150 energy and clean tech clients

Chart information is from Ernst & Young Q2 2008 Venture Insights™, Global Cleantech trends and investment

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TreMonti

Intellectual Property Commercialization Services

GSA Schedule

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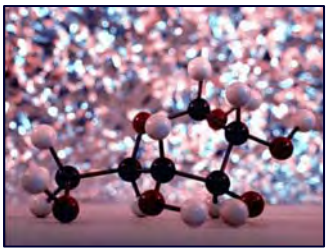
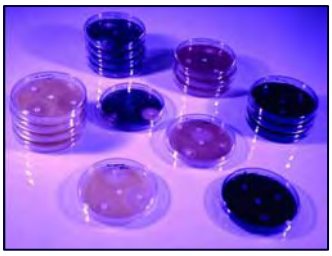
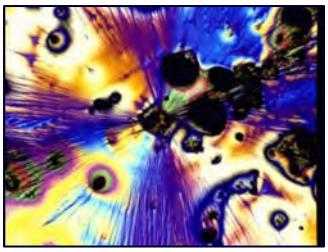
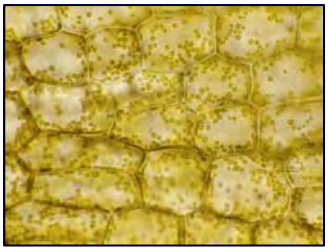
(703) 865-5211 • www.tremonticonsulting.com









TreMonti Consulting, LLC (TreMonti) has extensive experience in providing advice and assistance to universities, governments and companies, regarding **intellectual asset management** issues. We have fully dedicated professionals with broad experience and in-depth knowledge in all sectors and disciplines relating to intellectual asset management. We utilize state-of-the-art tools and methods in the management and commercialization of a wide spectrum of intellectual property.

We have rendered advice on best practices in **technology transfer management and implementation**. We advise clients regarding software tools, organization structure, methodologies, IP management processes, spin-offs, joint ventures, licensing structure and practice, sale of intellectual property, and other issues relating to the management of technology transfer. We have assisted numerous clients in the management and implementation of their technology transfer processes.

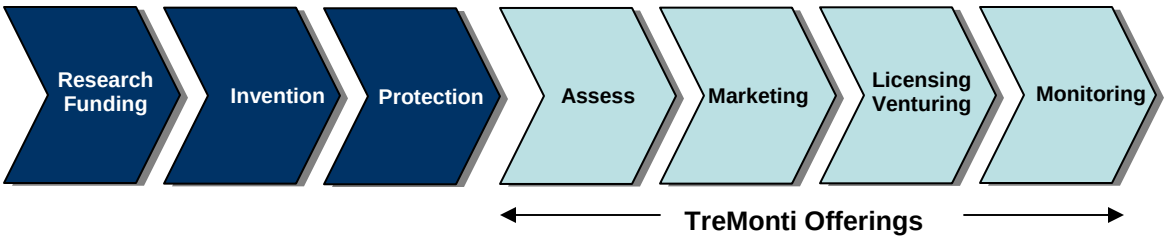
Technology Transfer includes a range of formal and informal cooperative actions between agencies, federal laboratories, and the public and private sectors. TreMonti works with the public and private sectors to ensure transfer efforts result in product improvement, service efficiencies, improved manufacturing processes, joint development to address government and private sector needs, and the development of major new products for the international marketplace.

We have developed strong working relationships with select clients across several industries. A common theme for these relationships is the use of management and business improvement-based strategies to deliver discernible benefits based on customer insight and execution. Our services often involve teaming with scientists, technicians, engineers and other scientific trained people and small firms as sub-contractors to TreMonti.

A privately held company, TreMonti's team of business and technology professionals has hands-on experience in managing intellectual property portfolios and a long track record of technology commercialization. Our team stems from organizations such as Deloitte & Touche, KPMG, and various industrial sectors. They are recognized as noted authorities and industry leaders in technology transfer, commercialization, and licensing of intellectual property.

Headquartered in Fairfax, Virginia, TreMonti's consultants operate in a continuous discovery mode, deploying the best practices in business improvement, technology transfer, and intellectual asset management. TreMonti's leadership is knowledge based and fundamental to the success of our strategic consulting and technology solutions offerings.

Technology Transfer Stages



Service	Purpose	Key Tasks
Assessment	Provide assistance in determining whether or not to protect and commercialize a new technology.	• Evaluate technologies and markets • Provide ranking of technologies in IP portfolio • Provide opportunity assessment
Technology Marketing	Develop industry contacts who are good targets as potential licensees/partners	• Identify potential partner/licensees • Contact potential licensees • Evaluate interest in the technology • Introduce companies with interest and resources
License Negotiation Assistance	Assist in developing license options in order to negotiate stronger license agreements.	• Determine licensing strategy considering the desires of all parties • Identify licensing comparables • Facilitate negotiations/partnership formation • Qualify individual companies • Determine comparable transactions
License Monitoring	Audit licensees to help ensure accurate royalty accounting.	• Perform onsite audit of licensee records • Increase understanding of reliability of reporting systems in place at licensee
Best Practices Assessment	Using best practices will improve licensing programs to focus on generating the maximum economic benefit for the institution.	• Benchmark TTO with similar TTOs • Improve productivity to reduce cost per license • Design processes to make marketing efforts more successful • Provide greater assurance of the completeness, accuracy timeliness, and predictability of licensing streams
Backlog Services	Quickly and effectively manage costly backlog of aging technologies.	• Review of patent portfolio using a proprietary survey methodology. • Results of the survey will: - provide the TTO with an action plan regarding the disposition of its existing intellectual property - provide an overview of research activities related to the intellectual property - provide an opportunity to reach out to faculty researchers.

Do You Need Answers?

- **How well are we managing our technology portfolio?**
- **How well are we commercializing our technologies?**
- **How well is our organization positioned in the industry?**
- **How well do we protect our intellectual property?**
- **How can we address the problem of older non-revenue producing technologies, that may be commercially viable?**
- **How have we leveraged the latest technologies to enhance the productivity of our department, without increasing the budget?**
- **How have we positioned our department for the future?**
- **How well have we been complying with government regulations?**

The Basis of Our Success

- **An approach focused on revenue enhancement**
- **Employing best practices culled from numerous Technology Transfer Offices (TTO's)**
- **High-level contacts in industry translate into potential licensees**
- **Approach technology and market assessment intelligently**
- **Is there a unique and valuable solution to a real problem offered by the invention?**
- **Is the methodology offered by my invention significantly different from others?**
- **Does my invention provide a real and tangible improvement over previous solutions?**
- **How readily can my invention reach the marketplace?**
- **Where is the marketplace going?**
- **Will my invention withstand new market demands?**
- **What is the fair market value of this product?**
- **What is the value that my product brings to the consumer?**
- **How can we support the mission of the TTO?**

TreMonti Can Help:

- **Develop a comprehensive list of strategic markets**
- **Build a go to market strategy for each technology solution or technology grouping**
- **Create strategies for securing research funding**
- **Present your solutions and technologies to the appropriate buyers in industry**
- **Negotiate strong license agreements with ongoing terms that maintain the licensor and licensee relationship**
- **Develop a comprehensive business plan and strategies for technology spinoffs**

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GSA Schedule

The Howard County Economic Development Authority is a public-private partnership that promotes growth and stability by supporting existing businesses, targeting new businesses, and attracting corporate/regional headquarters. The Authority also maintains several programs aimed at the special needs of small, minority-owned, and agricultural business communities. Additionally, the Authority strives to preserve the distinctive quality of life in Howard County. To learn more about the Howard County Economic Development Authority, please visit www.hceda.org.

Howard County Goes Green

Investing in "Green" leads to an environmentally progressive and economically stable future

Howard County has recognized its role in encouraging businesses to change their environmental practices for the better. Addressing these current and future issues have moved to the forefront of the minds of the citizens, government, and business leaders in Howard County.

In July 2007, the County Executive introduced **"The Howard County Green Buildings Law"** that the County Council approved. This legislation established green building standards for public and private buildings in the county. Effective July 1, 2008, most new publicly funded buildings larger than 10,000 square feet must attain a LEED Silver rating. Also, most new private buildings larger than 50,000 square feet must attain a LEED Certified rating.

Green buildings are designed to be more efficient in their use of energy, water, and building materials. As the costs of natural resources and product inputs rise, so will the desire and the need for green buildings. They promote the use of renewable resources, reduce waste and pollution, improve air quality, and thus lessen their impact on the environment. For more information on Green Buildings, LEED Certification and benefits, please visit the Howard County Government's website for Planning and Zoning at **www.howardcountymd.gov/dpz/environment/green_building.htm.**

The Howard Technology Council is the premier resource for business growth. It provides vision, awareness, forum and focus for informative programs and business networking opportunities that promote technology businesses in Howard County.

To enhance opportunities for growth, collaboration and success within the Howard County technology business community, the Howard Technology Council hosts a variety of educational programs and activities. These forums are designed to complement and provide value to this nationally recognized community of excellence.

For more information about the Howard Technology Council, please visit contact Larry O. Collins, Executive Director, Howard Technology Council, 410-313-6550, e-mail lcollins@howardtechcouncil.org or visit www.howardtechcouncil.org.

You're invited to attend . . .

The 2008 Technology Awards

Recognizing Innovations and Bright Ideas

November 11, 2008 . 5:30 - 8:00 PM

JHU APL Kossiakoff Center . 11100 Johns Hopkins Road . Laurel, Maryland

Visit www.howardtechcouncil.org for more information and to register.

Chesapeake Regional Tech Council

Membership Details and Opportunities

www.chesapeaketech.org

* Visibility * Education * Knowledge * * Connections * Resources * Promotion *

Annapolis-Washington-Baltimore

Chesapeake Regional Tech Council

Membership Benefits

Everything a growing tech company needs is available through the reaches of the Chesapeake Regional Tech Council. With more than 230 members and growing, the tech council is the link to the region's fastest growing, most dynamic tech companies. The Chesapeake Regional Tech Council was designed to enable growth and success among its members and for the technology community throughout the entire region. We cover the Annapolis-Washington-Baltimore area, although our members come from throughout the state and beyond. Originally founded as the Anne Arundel Tech Council in 1992, the tech council changed its name in January, 2008 to reflect its growing stature and reach.

Events
Our events are designed to link members to each other, inform members about top-of-mind tech topics and provide valuable insights, connections and info you can't get anywhere else. From our signature **President's Reception, BBQ on the Bay** and **TechAwards** programs that draw hundreds, to our monthly **InfoMixers** and **Tech Focus Seminars**, the Chesapeake Regional Tech Council provides regular opportunities to mix it up with top executives and emerging tech talent.

Visibility
Tap into our knowledge. The Tech Council has garnered recent press attention, and the coverage is only growing. Our monthly **newslette**r reaches more than a thousand of tech-specific executives in the county and beyond. Our **website** links tech companies with each other. TheTechJobs board lists available tech-specific workers and lists open jobs from the region. We regularly send out notices on business opportunities and press leads to members, as well, increasing their business development capabilities.

Resources
Connecting with the Chesapeake Regional Tech Council is connecting with the organizations that move and shake the tech industry. When companies join the council, they gain immediate access to a network of resources providing invaluable assistance, all with a technology company focus.

Business Promotion Ops
The tech council provides a high level of interaction with companies that already share a common denominator: technology. Our news page acts as a portal for top tech news from leading companies, a great chance to enhance your visibility in the region. Many of our events feature small-business-affordable booths. And the Chesapeake Regional Tech Council can assist companies with name recognition through program **sponsorship** opportunities and linking members for **strategic partnerships**.

Chesapeake Regional Tech Council

Fact Sheet

WHO WE ARE

Founded in 1992 as the Anne Arundel Tech Council, the Chesapeake Regional Tech Council changed its name in January 2008 to better reflect the council's true coverage area and regional focus. The CRTC is a stand-alone, non-profit corporation supported by a grant from the Anne Arundel Economic Development Corporation, our year-round sponsorships, membership dues and event income.

BOARD MEMBERS & OFFICERS

Michael Ryan, President	South River Technologies
Kevin Lancaster, Vice President	The Winvale Group
Chris Johnson, Treasurer	AmDyne
Owen Meeks, Secretary	Anne Arundel Economic Development Corp
Mark Powell, President Emeritus	Sidus Group
Dan Buan	Buan Consulting
Rob Collins	Collins Technology Law
John Elstner	VentureShack
Gregory Stone	Whiteford, Taylor & Preston
Tim Lorello	TeleCommunication Systems
Richard Perrin	AdvanTech
Dave Troy	Roundhouse Technologies
Tiernan Wallace	Convergence Technology Consulting
Laura Weidner	Anne Arundel Community College
Lee White	Technology Specialists Inc.

OUR MEMBERSHIP

The Chesapeake Regional Tech Council is the membership organization for the technology community in the Annapolis-Baltimore-Washington region. Our members include companies focusing on Information Technology, Telecommunications, Internet, Biotechnology, Information Security, Computer Applications and Software and more. Other members include business support firms, agencies and educational institutions that provide a wide variety of essential resources for area technology companies.

Chesapeake Regional Tech Council

Company: _____

Name: _____ Title: _____

Phone: _____ Fax: _____

Email: _____ Website: _____

Address: _____

City, State, Zip: _____

Company Description (2-3 sentences used on our website and in company listing in our e-newsletter):

_____

_____

_____

_____

Number of employees: _____

Please check appropriate boxes:

☐ 8a Certified ☐ Minority-owned business ☐ Woman-owned

☐ Veteran owned business ☐ Service disabled veteran owned business

Type of technology organization: IT, internet provider, telecom, computer software/integration, homeland security, defense, etc. You may choose up to five identifiers. This information helps us sort and identify potential business opportunities from inquiries we regularly receive from the business community.

_____

_____

If you are not a direct technology company (for instance, you are a marketing company), please describe for us your current role in the technology industry in Anne Arundel County and/or surrounding areas

_____

_____

Month, day, year of application: _____

Annual Membership Dues:

☐ Entrepreneur Rate (1 person-Tech Companies Only): $150/year

☐ 1 to 10 employees: $250/year

☐ 11 to 25 employees: $550/year

☐ 26 to 99 employees: $750/year

☐ 100 to 400 employees: $1250/year

☐ 400-plus employees: $2000/year

Please remit payment with application to:
Chesapeake Regional Tech Council
2660 Riva Road, Suite 200
Annapolis MD 21401
410-222-7410x124

You can also join and pay online at
www.chesapeaketech.org

Special Thanks To Our
Showcase Supporting Organizations

Anne Arundel County Maryland Economic Development Corporation

Baltimore County Maryland

CCTC Charles County Technology Council

Chesapeake Regional Tech Council

Economic Alliance of Greater Baltimore | Economic Development

Federal Laboratory Consortium for Technology Transfer

Fort Detrick Business Development Office

GBTC

Greenbuilding Institute

Howard County Maryland Economic Development Authority

Howard Technology Council

mbia Maryland Business Incubation Association

University of Maryland SBDC Network Maryland Small Business Development Center

The Patuxent Partnership

Prince George's County Maryland

RMI of Maryland The Regional Manufacturing Institute of Maryland

Rockville Economic Development, Inc. Known for the Companies We Keep

SBIR Resource Center®

University of Maryland Robert H. Smith School of Business Dingman Center for Entrepreneurship

SMART