



DONALD DANFORTH
PLANT SCIENCE CENTER

*Our Mission:
Improve the human condition
through plant science*

2007 ANNUAL REPORT

Feed the hungry and improve human health

Preserve and renew our environment

Enhance our region as a world
center for plant science

1998

The year the Donald Danforth Plant Science Center was founded.

186

The total number of Danforth Center employees; 140 are scientists.

2001

The year the Danforth Center facility opened.

2010

The final year of the Danforth Center's *Campaign for a Green Future*.

4

The number of research areas around which our investigations are organized in order to efficiently deliver plant science solutions: controlling plant pests and pathogens; enriching the nutritional value of foods; developing new materials and products in plants; and adapting plants for environmental stresses.



DONALD DANFORTH PLANT SCIENCE CENTER

DISCOVER • ENLIGHTEN • SHARE • NOURISH

18

The number of Principal Investigators leading research teams at the Danforth Center.

3

The number of state-of-the-art core facilities serving the Danforth Center: the Integrated Microscopy Facility; the Proteomics and Mass Spectrometry Facility; and the Plant Cell Culture and Transformation Facility.

21

The number of countries of origin represented by Danforth Center scientists.

83

Cents on the dollar goes directly to research at the Danforth Center.

5

The number of institutions (in addition to the Danforth Center) participating in the Danforth Center Alliance, an association of primary academic partnerships: The Missouri Botanical Garden, Washington University in St. Louis, Purdue University, the University of Illinois at Urbana-Champaign, and the University of Missouri-Columbia.

2007

A very exciting year at the Danforth Center: read on to find out more!

Our Purpose, Our Mission, Our Promise

The Danforth Center celebrates its tenth anniversary in 2008, and as we chart the course for our second decade of achievements – and beyond! – this milestone provides us with a special opportunity to reflect on what has grounded our accomplishments not only in the past year, but since our founding in 1998.



Feed the hungry and improve human health

At the center of all that we do is our mission: *to improve the human condition through plant science*. We believe that plants hold the key to discoveries and products that will make life better for people and for our planet.

- Our scientists are working to reduce the burden of hunger and malnutrition in Africa as well as to improve human health both at home and abroad.
- Research in the new Enterprise Rent-A-Car Institute for Renewable Fuels will build on the Danforth Center's commitment to preserving and renewing our environment.



Preserve and renew our environment



Enhance our region as a world center for plant science

- And, as our investigators continue to secure significant funding and establish ground-breaking scientific collaborations, we are breaking ground of a different sort as well: construction has started on our new greenhouse range and the Bio-Research & Development Growth Park (BRDG) on the Danforth Center campus.

These and other milestones of growth and success are a testament to the quality of our science and the momentum our commitment brings to this community as we strive to enhance the St. Louis region as a world center for plant science.

Letter from the Chairman

Thanks to all of you who have brought the Donald Danforth Plant Science Center through its first decade.

Much has changed in ten years. Agriculture and the environment are now much in the news. The demand for food is outstripping supply. Prices have risen eighty percent since 2005. Demonstrations and riots have taken place from Mexico to Bangladesh. Evidence for global warming continues to mount. The rush to produce more ethanol from corn may have unintended consequences.



And so we learn or re-learn that:

- productive agriculture is basic to human well-being;
- there is no guarantee that our cheap and abundant food will be here always;
- agriculture must produce more on the same amount of land using less water, less fertilizer, and less energy if we are to provide food, fiber and biofuels while preserving a livable world;
- we cannot succeed without many science-based innovations;
- strengthening agricultural research is a national and world priority.

A decade ago our Plant Science Center had no staff, no facilities, no endowment and no annual giving. Today, Dr. Roger Beachy leads a growing team of able scientists in a well-designed, well-equipped building. A new structure is rising on our north eight acres – the Bio-Research & Development Growth (BRDG) Park – that will help build the regional economy of the future.

This year, Danforth Center scientists have secured nearly \$8.5 million in external grants to support their work. We are nearing the end of our first general fundraising campaign. With \$3 million more in gifts, our endowment will reach over \$150 million, enough to sustain our present

operations indefinitely. This year our annual giving exceeded \$1 million. Thus, our Plant Science Center is now strong financially as well as scientifically. It is here to stay, to be a blessing to our world and to our region of the United States.

Thanks to all who have been a part of what I consider a noble effort.

A handwritten signature in black ink that reads "William H. Danforth".

William H. Danforth, M.D.
Chairman of the Board of Trustees

Letter from the President

With each passing month, we read more about the critical need to increase supplies of food and animal feeds, and to replace fossil fuels with biorenewable fuels while protecting the environment. Humankind has asked much of agriculture throughout recent history and farmers have usually met the challenges. Early farmers collected the best seeds of their crops for planting in following years; some made genetic crosses to increase yields or taste of the harvest. As farmers and scientists became increasingly successful in producing food crops during the past century, many people of the world benefitted from abundant and safe foods at relatively low costs. However, due to a lack of natural or financial resources and/or a lack of government support for agriculture, many of the world's poor still have not benefited from modern advances in crop production.



As responsible citizens of the world, how are we to respond to the challenges of a growing demand for products of agriculture? In the previous years of abundant grain supplies, our government purchased excess yields

to provide to countries that fell short of their needs. Times have changed and pressures from growing populations, droughts, changing food preferences, trade restrictions and the rapid expansion of interest in particular kinds of biofuels are squeezing agricultural supplies. While the current situation may be temporary, economists project that it is unlikely that food prices will return to the levels of three years ago any time soon.

At the Danforth Center we do not try to address all of the challenges that face agricultural productivity, sustainability, or uses of agricultural products. Scientists at the Danforth Center conduct plant science research "to improve the human condition," and we are serious about doing so for the benefit of humankind. Some of our research is targeted toward increasing crop yields, reducing the need for water and fertilizers, and increasing resistance to diseases.

Other projects seek to increase the amounts of vitamins, minerals, and proteins in crops. Still other projects seek to increase production of biodiesel, a biofuel that we hope can be increasingly produced by non-food crop plants. Progress in each of the Center's research areas has been very good, but patience is still in order since the payoff of such research for farmers and consumers will continue to develop for many years into the future.

In the meantime, a caring world needs to find ways to meet the shortfalls in agriculture. Some help will come from food aid, while other help will come from working to provide farmers with best practices that allow them to be more successful. Plant science will play a key role in meeting the needs for food, feed, fiber and fuel. And, it will be most successful if policies are in place to support Research & Development, fair trade, and collaborations that reach developing economies in the north as well as the south. Scientists at the Danforth Center will be a key part of that success.

A handwritten signature in black ink that reads "Roger N. Beachy". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Roger N. Beachy, Ph.D.
President

Developing Our Discoveries

The Danforth Center is committed to improving the human condition through plant science, and in large part we are able to do so because of the generosity and commitment of organizations and individuals whose confidence sustains our science and whose support allows our Center to keep growing, expanding, and improving. This continuing commitment generates ideas, develops products, and brings discoveries from the lab to the field.



Howard G. Buffett Foundation Grant to Danforth Center Strengthens Africa's Food Future

On May 20, 2007, the Danforth Center announced that the Howard G. Buffett Foundation would contribute more than \$3 million to fund research to enhance resistance to virus infection and increase the nutritional content of sweet potato for Africa.

"This new and truly unique partnership between the Danforth Center and the Howard G. Buffett Foundation will address hunger in Africa – sweet potato is an important staple crop in many regions of Africa and has the potential to produce high yields," said Danforth Center President Dr. Roger N. Beachy.

Sweet potato virus disease can severely reduce sweet potato production in eastern Africa, as can severe infestations by pests such as the sweet potato weevil. In addition, although sweet potato is an important food crop, it is deficient in several vital nutrients. Danforth Center scientists will work to increase resistance to the viruses that cause disease as well as to increase the amount of folic acid, zinc, and iron in the tubers. Concurrently, collaborators at the International Potato Center in Lima, Peru and the National Agricultural Research Organisation in Uganda, Africa will work to enhance resistance to weevil infestation. If the research is successful, improved varieties will be distributed without charge to farmers in Africa.



Howard G. Buffett is a noted writer, photographer, philanthropist, humanitarian, and conservationist.

He has written articles and opinion pieces for *The Wall Street Journal* and *The Washington Post*, as well as published more than half a dozen books, including *The Partnership of Biodiversity and High-Yield Agricultural Production* and *On the Edge: Balancing Earth's Resources*. His most recent volume, *Tapestry of Life*, consists of a compilation of portraits taken in Bangladesh, Ethiopia, Ghana, India, and other countries with deep poverty and human need.

Buffett operates an 840 acre farm in central Illinois and has been recognized by the Inter-American Institute for Cooperation in Agriculture as one of the most distinguished individuals in agriculture.

Photo above:

Image courtesy of Howard G. Buffett

Photo left:

Howard G. Buffett on his travels.

Taylor Family Gift Establishes Enterprise Rent-A-Car Institute for Renewable Fuels

In the spring of 2007, the Danforth Center announced a \$25 million gift from the Jack C. Taylor family to create the new Enterprise Rent-A-Car Institute for Renewable Fuels at the Donald Danforth Plant Science Center.

Named for the company Jack C. Taylor founded in 1957 and that is still owned and operated by members of the Taylor family, the Enterprise Rent-A-Car Institute leverages the Danforth Center's existing strengths in plant-based oils and fuels and its mission to preserve and renew the environment. It also builds on the commitment of Enterprise Rent-A-Car, a recognized leader in corporate initiatives for responsible environmental stewardship, to address challenges such as climate change and reducing our dependency on petroleum.

Andrew C. Taylor, chairman and CEO of Enterprise Rent-A-Car noted, "For 50 years, this company that my father built from the ground up has relied on the availability of vehicles and fuel. Today, more than ever, it is essential that we pursue new energy sources that will sustain not only our business, but also the environment around us for future generations."

The Enterprise Rent-A-Car Institute and its scientists will work on the development of economically viable, environmentally safe plant-based biofuels that will reduce the current dependency on petroleum and decrease future levels of greenhouse gases in the atmosphere. Not all plant-based biofuels are the same and Danforth Center scientists are concentrating their energies on exploring options that will address our energy needs – without creating problems of their own.

"This generous commitment from the Taylor family will advance efforts to unlock the scientific secrets in plant biology that will ultimately make renewable biofuels that are plentiful and cost effective," said Danforth Center President Dr. Roger N. Beachy. "Our knowledge will grow over the coming decades and we look forward to announcing the founding director of the Enterprise Rent-A-Car Institute, as well as additional scientific staff, by the end of 2008."

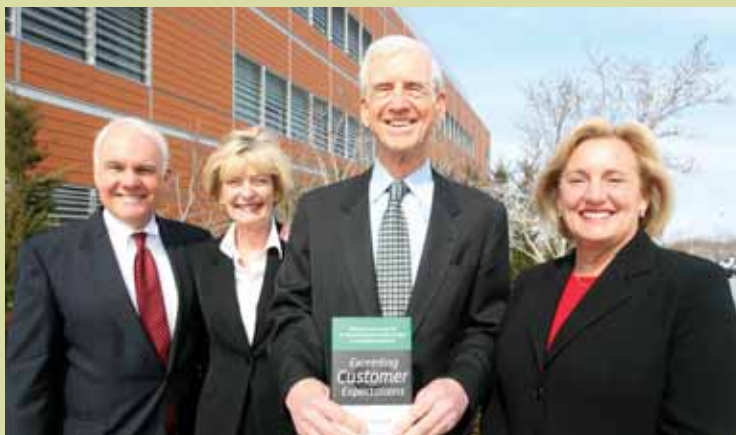


Photo:

Dr. William H. Danforth with Andy and Barbara Taylor and JoAnn Taylor Kindle

New Greenhouse Groundbreaking

On August 28, 2007, the Donald Danforth Plant Science Center broke ground on a new \$5.25 million, 15,300 square foot greenhouse that will more than double the Center's greenhouse capacity. The Missouri Development Finance Board provided the initial funding for the project and authorized \$1.75 million in Missouri tax credits. The Jack C. Taylor family and the Danforth Foundation then provided a combined \$3.5 million in additional funding for the project. The Monsanto Company purchased the tax credits.



Greenhouse Groundbreaking: Kevin Buchanan, Charlie Dooley, Roger N. Beachy, William H. Danforth, Pat Farrell, and Peter Kinder.

"We are grateful for the extraordinary support of the Jack C. Taylor family, and it is exciting to see the Taylor family come together with the Danforth Foundation, the Monsanto Fund, the State of Missouri, and the city of Creve Coeur in support of growing the Center," explained Danforth Center President Dr. Roger N. Beachy.

Danforth Center Chairman Dr. William H. Danforth thanked all for coming and the ceremony featured remarks from Missouri's Lieutenant Governor, Peter Kinder; St. Louis County Executive, Charlie Dooley; Pat Farrell of Enterprise Rent-A-Car; and Kevin Buchanan of Monsanto.

Designed by William Tao & Associates, Inc., the new greenhouse is expected to be completed in the fall of 2008. Construction project management is provided by The Benham Companies through Landmark Contract Management, Inc.

New Bio-Research & Development Growth Park Under Construction at the Danforth Center

Construction is underway on a new 120,000 square foot laboratory and office building that will assist fledgling plant science companies in the critical post-incubation stages, where ideas become tangible technologies. The building, slated to open in 2009, is the first of three planned for the new Bio-Research & Development Growth (BRDG) Park at the Danforth Center. The BRDG Park was announced in January 2008 by the Danforth Center and Wexford Science + Technology, LLC of Hanover, Maryland. A groundbreaking ceremony was held in March.

"Having the BRDG Park on our property will allow Danforth scientists and facilities to directly support the needs of entrepreneurs and their start-up companies," said Danforth Center Chief Operating Officer Sam J. Fiorello. "As the acronym implies, the BRDG Park will provide a bridge to help turn innovative ideas in plant science into commercial successes by capitalizing on the synergy created by these interactions."



Photo: The BRDG Park buildings will complement the science and the architectural style of the Danforth Center.



Photo: Senator Kit Bond receives a commemorative glass bowl as the Plant Growth Facility was dedicated in his honor.

Danforth Center Integrated Plant Growth Facility Named in Honor of Senator Christopher S. “Kit” Bond

Bond Recognized for Leadership in Establishing and Shaping Missouri’s Plant Sciences

On June 4, 2007, the Donald Danforth Plant Science Center hosted a ribbon-cutting and dedication ceremony recognizing United States Senator Christopher S. “Kit” Bond for his dedication to Missouri’s plant sciences.

“In a world where plant science will be increasingly important for shaping a sustainable global future, Senator Bond accepted the challenge of developing the infrastructure and funding for research. He has been a champion of the plant sciences in St. Louis and throughout the region,” said Dr. Roger N. Beachy.

Danforth Center Chairman Dr. William H. Danforth thanked Senator Bond for being an active and ardent supporter of the Danforth Center since its inception, highlighting his

tireless efforts during the construction period, which resulted in funds for the creation of a unique plant growth facility at the Danforth Center.

Naming the Danforth Center’s plant growth facility in Senator Bond’s honor recognizes his pivotal role in the Center’s success, and attaches his name to one of the most exceptional features of the Danforth Center.

The Senator Christopher S. “Kit” Bond Integrated Plant Growth Facility is one of the most technically advanced growth facilities in the nation. Designed to support the development of important staple crops from around the country – and the world – it can simulate and maintain a variety of environmental conditions using computer-based control systems.

Center Library Dedicated to Honor Elizabeth Gray Danforth

On April 10, 2007, members of the Danforth family gathered at the Donald Danforth Plant Science Center to dedicate the Elizabeth Gray Danforth Library. Elizabeth, known as "Ibby" to friends and family, was a tireless champion and ambassador for both St. Louis and Washington University in St. Louis. The dedication was a moving tribute to a remarkable woman and an unforgettable member of our community. Danforth Center President Dr. Roger Beachy noted that the library is a fitting place to honor her memory. "She was always a supporter of youth and the educational needs of the young. The Elizabeth Gray Danforth Library is a key resource for scientists and scientists-in-training at the Danforth Center, and all who benefit from its resources will celebrate her investment in learning."



Photo: Dr. William H. Danforth with his children: Beth Danforth Sankey, Cynthia Danforth Prather, Maebelle Danforth Reed, and David G. Danforth

AT&T Auditorium Honors Critical, Continuing Support for Communications

On Wednesday, April 18, 2007, Danforth Center scientists, staff, and Center Friends gathered in the Center's lower atrium to celebrate the re-dedication of the AT&T Auditorium (previously the SBC Auditorium) with a ribbon-cutting and champagne toast prior to the evening's *Conversations* program. Following remarks by Dr. Danforth and Dr. Beachy, Cindy Brinkley, president of AT&T Missouri, cut the ribbon on the newly re-named facility.



Photo: Drs. Danforth and Beachy, joined by Center Friend Clarence "Cedge" Barksdale and Cindy Brinkley of AT&T Missouri.

In their remarks, both Dr. Danforth and Dr. Beachy thanked AT&T for its generosity and highlighted the significance of their commitment. Dr. Danforth spoke of the impact of the AT&T Foundation's gift, crediting their early support with setting an example for other corporations and foundations to follow, while Dr. Beachy explained the critical role the AT&T Auditorium plays in the life of the Center.

With more than 300 stadium-style seats, the 3,700 square foot AT&T Auditorium serves as the Center's communications hub and is host to a variety of programs including the Center's weekly scientific talks, Boeing-sponsored *Conversations* programs, and special speakers presented by the Donald Danforth Society. Its state-of-the-art audio, video, webcasting and teleconferencing abilities make it an ideal location for the Danforth Center's Fall Symposium and other scientific conferences, as well as for corporate and organizational meetings.

Whitmire Annuity Gift Endows Center Lab

Dedication of Whitmire Laboratory builds on legacy of generosity and environmental awareness

On July 13, 2007, the Danforth Center celebrated the dedication of the Margaret S. and Blanton J. Whitmire Laboratory in recognition of the Whitmire's support and shared commitment to using plant science to improve the human condition.

Blanton Whitmire revolutionized the pest control industry with his pioneering "crack and crevice" method of pesticide application that used 100 times less chemicals to achieve superior results. He and his brother founded the Whitmire Institute of Technology, known for training seminars that are considered the gold standard in the pest control industry.

The lab is home to Dr. Edgar Cahoon and his research team, who are studying naturally-

occurring plant compounds with an array of pesticidal properties, with the goal of figuring how to help plants 'self-protect' against attacks by insects and disease.

Having travelled widely in many of the developing countries where Danforth scientists have established collaborative research endeavors, the Whitmires witnessed first-hand the problems posed by high rates of pest-related food loss in developing countries (30% compared to less than 5% in countries such as the United States) and appreciated the work that Danforth Center scientists like Dr. Cahoon were doing to produce safer, more nutritious pest and disease resistant crops – as well as the resonance of these advances with those of the Whitmire legacy.

Photo right:

Dr. Cahoon and his research team seek to understand and modify a variety of biochemical compounds in plants, including vegetable oils, lipid-soluble vitamins, and antioxidants. One area of their research involves naturally-occurring plant compounds known as polyacetylenes, which have an array of pesticidal properties, with the goal of figuring how to help plants 'self-protect' against attacks by insects and disease.



Photo left:

Margaret and Blanton Whitmire join Drs. Danforth and Beachy in cutting the ribbon for the Whitmire Laboratory.

Danforth Center Building, Grounds, and Research Recognized for “Going Green”

Smart Design Supports Serious Science

The June 2007 issue of the scientific journal *The Scientist* featured the Danforth Plant Science Center in the article “Can Labs Go Green?” Danforth Center Director of Facilities Howard Beittenmiller is quoted extensively in the piece, which profiles the unique design and operation of the Danforth Center, as well as several other scientific spaces in the St. Louis area, including Sigma-Aldrich’s Life Science and High Technology Building, and the Nidus Center for Scientific Enterprise.

Citing the Center as being “on the leading edge of a movement toward environmentally conscious design and operation,” the article’s author Bob Grant points out that due to the specialized energy needs of laboratory spaces and equipment, even labs engaged in research contributing to “green” advances are often not able to operate in a particularly energy-efficient manner.

Designers at the St. Louis architectural firm of Hellmuth, Obata and Kassabaum (HOK) worked with the Danforth Center to include as many “green” features as possible in plans for the 150,000 square foot building, located near Olive and Warson Roads in Creve Coeur, Missouri.



New Initiatives Generate Interest

The announcement of the Enterprise Rent-A-Car Institute for Renewable Fuels at the Danforth Center has raised awareness of the work Center scientists are doing on the potential uses of plant products as an alternative to petroleum-based fuels. A profile of the Danforth Center and its research on renewable fuels was one of the cover stories of the August issue of *Inform* magazine, a publication of the American Oil Chemists’ Society.



Award Recognizes Center for Putting Down Attractive Roots

The Danforth Center building and grounds won the 2007 City of Creve Coeur Beautification Contest. The motto for the contest is “To plant a garden is to believe in tomorrow.” In her letter announcing the award, Susan Baseley, Chair of Creve Coeur’s Recycling, Environment, and Beautification Committee, thanked the Center for helping to create more beautiful tomorrows.



Advancing Our Science, Honoring Our Achievements

At the Danforth Center, plant science is the heart of our people-oriented mission, and we are proud that our scientists are not only leaders in their academic fields, but that their research leads to actual advances in the field. From the heart of the country to the rest of the world, our investigators are establishing new international collaborations, sharing their advances with the countries that need them most, and welcoming foreign investigators to train here so that together we can truly make and sustain change.

2007 Grant Highlights

Support from Center Friends helps keep the Danforth Center running, but Center scientists must support their research and their laboratories with scientific grants. The following list of recent grants highlights their success in securing funds from a variety of public and private sources in a competitive intellectual and financial environment.

The USDA approved the following funding for:

- **Dr. Brad Barbazuk** to develop a computer program that will identify potential gene targets in the tomato gene sequence.
- **Dr. Claude Fauquet** to develop a microarray-based diagnostic system for identifying plant viruses.
- **Dr. Christopher Taylor** to work with researchers at Washington State University on the control of plant parasitic nematodes. He received a second grant to collaborate with colleagues at Virginia Tech on soybean pathogen interactions with plant roots.

The Monsanto Company is supporting work by:

- **Dr. Mark Running** to investigate an important plant hormone response system that modulates seed germination, plant growth, and stress responses.

- **Dr. Liming Xiong** on the regulation of nitrate uptake and nitrogen assimilation in plant development.

Additional Grants

- **Dr. Ed Cahoon** received funding from **Abbott Labs** for a project investigating the expression of poly-unsaturated fatty acid-related enzymes in plants. Poly-unsaturated fatty acids are involved in multiple aspects of human health, development, and nutrition, and targeting enzyme expression in plants could provide a source of improved nutrition for humans.
- **Dr. Jan Jaworski** received an award from **Bayer Crop Science** to study the accumulation of chemical targets derived from plant oils that may have industrial applications.
- **Dr. Joe Jez** secured funds from the **American Society of Plant Biology** for its Summer Undergraduate Research Fellowship program to support a summer intern.
- **Dr. Daniel Schachtman** secured funding from the **National Science Foundation** for a project using genetic and physiological approaches to investigate the impact of fungal infections on root metabolism and nutrient acquisition.
- **Dr. Chris Taylor** received funding from the **United Soybean Board** for a project investigating biotechnology applications for controlling the soybean cyst nematode, as well as money from the **Illinois-Missouri Biotechnology Alliance** to support the generation of soybean plants resistant to soybean cyst nematodes.

In the Field: New Collaborations Deepen and Extend Danforth Center's International Mission

New Partnership with China Charts Course for Future Activity

In March 2007, a group of scientists from the Danforth Center traveled to Huazhong Agricultural University in Wuhan, China for the first joint symposium between the two institutions. Co-chaired by Danforth Center President Dr. Roger Beachy and Dr. Qifa Zhang of Huazhong Agricultural University, and sponsored by the National Natural Science Foundation of China, participants exchanged information on research and development in plant genomics, biochemistry, and metabolism, including molecular signaling and developing stress tolerance and nutrient enhancement in crops. The two institutions recently agreed to establish a joint lab on plant functional genomics, so the meeting also provided an opportunity to discuss and plan for future collaborative activities between Huazhong Agricultural University and the Danforth Center.

Photo below:

Dr. Zhang and Dr. Beachy shake hands after signing copies of their agreement.



Danforth Center Establishes Historic Agreement with India

On October 3, 2007, Dr. Roger Beachy signed an historic Memorandum of Understanding with Dr. Asis Datta, the Director of the National Institute for Plant Genome Research (NIPGR) in New Delhi, India. This agreement formalizes a groundbreaking collaboration, marking the first time that the Indian government has agreed to pay for scientists from NIPGR to come to the Danforth Center to study. The Memorandum of Understanding, signed at the home of Danforth Center Chairman Dr. William H. Danforth, is intended to further the research objectives of each institution and promote better understanding between scientists and students at the two research centers. The agreement will also serve as a catalyst for the creation of interdisciplinary programs that will provide opportunities for scientists at both institutions to work together to establish new strategies for excellence.

Photo above:

Dr. Asis Datta and Dr. Beachy establish an historic collaboration.



Research Grant Builds Bridges with Israel, New Opportunities for Institutions

A novel collaboration involving scientists at the Danforth Center and the Weizmann Institute in Rehovot, Israel is being funded by a grant arranged by Sara Lee Schupf (the namesake of the Sara Lee Corporation) through her family's Lubin Family Foundation. Research for the project investigating how drought-tolerance may be improved by engineering the waxes in roots is already underway at both institutions. The study's key investigators, Dr. Daniel Schachtman of the Danforth Center and Dr. Asaph Aharoni of the Weizmann Institute, are hopeful about the outcomes for crop plants grown in dry climates. The project will also produce a new "crop" of drought researchers as well: both scientists have used the Lubin grant money to create new opportunities for young scientists, especially women, to join their labs and gain valuable training and experience.

Another International Collaboration:

Dr. Schachtman also received a grant from the National Academy of Sciences (through funds from USAID – an office of the U.S. State Department) for work on drought-related genes in wheat in collaboration with a research group in Pakistan.

Photo above:

Dr. Daniel Schachtman with plants in a growth chamber at the Kit Bond Integrated Plant Growth Facility.

Danforth Investigator Dr. Claude Fauquet Knighted by French Government



Photo above:

Dr. Claude Fauquet receives his honor at a ceremony during the Danforth Center Fall Symposium.

On the final day of the Danforth Center Fall Symposium, Dr. Claude Fauquet was made a *Chevalier dans l'Order des Palmes Academiques*. Created by Napoleon in 1808, this recognition is one of the highest honors given by the French government. Dr. Fauquet's honor was conferred by Dr. Jules Hoffman, president of the French Academy of Science. Dr. Hoffman highlighted Dr. Fauquet's outstanding contributions to scientific research and education and the excellence of his work on transgenic plants applied to agriculture and health. Dr. Fauquet is a recognized leader in cassava biology and biotechnology. He is the co-founder and current head of the International Laboratory for Tropical Agricultural Biology (ILTAB) as well as the co-chair of the Global Cassava Partnership.

Plant Scientist Dr. Joe Jez Receives Young Investigator Award

Dr. Joe Jez received the Arthur Neish Young Investigator Award at a special awards banquet for the Phytochemical Society of North America (PSNA) 2007 annual meeting, held at the Danforth Center in July. Each year, the Neish Young Investigator Award is given to a select group of promising young investigators pursuing research on plant chemicals. Plants generate an impressive arsenal of chemicals with an equally impressive range of biological activities. Dr. Jez studies how plant compounds are made with an eye to their potential commercial, industrial, and pharmaceutical applications. He joined the



Photo above:

Dr. Jez's research promises wide-ranging benefits for improving crops, such as developing plant-based heavy-metal detoxification of soils.

Danforth Center as a Principal Investigator in 2002. In 2006, he received the Presidential Early Career Award for Scientists and Engineers in a ceremony held at the White House.

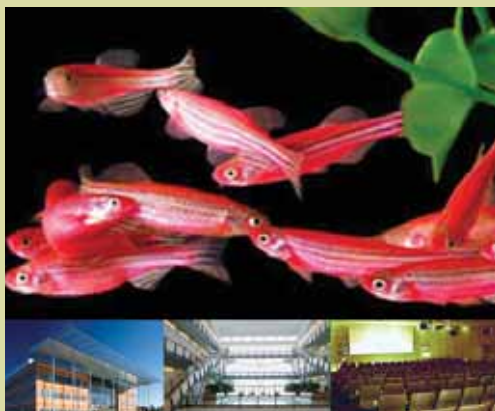
Danforth Center Fall Symposium

The Danforth Center International Fall Symposium, *Frontiers in Transgenesis: A Vision for New and Safer Sources of Food, Pharmaceuticals and Energy*, was held at the Danforth Center on September 26-28, 2007.

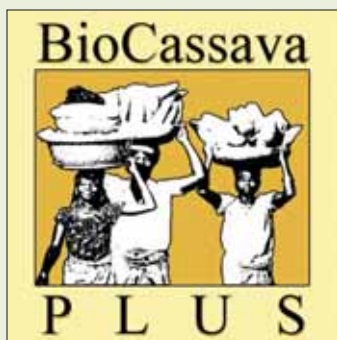
More than 200 scientists attended the international scientific symposium which featured presentations by five keynote speakers, twelve session chairs, and thirty-six session speakers. Topics included developmental biology, innate

and acquired immunity, novel materials and methods for transgenesis, and safety concerns about transgenic organisms. Two roundtable discussions provided an opportunity for conference participants to actively consider timely topics such as the challenge of using crops for food vs. renewable energy. The second dealt with biosafety issues surrounding transgenic organisms.

Symposium co-organizers, Dr. Claude Fauquet of the Danforth Center and Dr. Jean-Pierre Toutant of the Midwest Office of the Consulate General of France, secured generous funding from the Organisation of Economic and Co-Operation and Development (a unique forum based in France that supports opportunities to address economic, social, and governance issues related to globalization), as well as support from Monsanto, Syngenta, the Consulate General of France, and the Danforth Center.



BioCassava Plus Holds Second Annual Meeting at Danforth Center



On May 7-9, 2007, over 35 scientists gathered at the Danforth Center for the BioCassava Plus Second Annual Meeting. Organized by Danforth scientist Dr. Nigel Taylor, this is an important meeting for the program which is funded by the Bill and Melinda Gates Foundation and seeks to reduce malnutrition by developing varieties of cassava that provide complete and balanced nutrition with a readily marketable and higher yielding plant. The meeting brought together all the lead scientists and researchers involved in the project, including delegates from Europe, Latin America, west and east Africa, and the United States.

Celebrating Our Supporters

So much of what we do at the Danforth Center is for the benefit of future generations, the planet, and people we will likely never meet and who may live half a world away. And yet, none of it can happen without the people who give so generously of their time and their resources, and who make room in their lives to invest in improving the lot and lives of generations to come. We cannot celebrate your vision nor say thank you for your commitment often enough.

PLANTASIA

On September 24, 2007, over 200 members of The Donald Danforth Society and their guests gathered to celebrate the Danforth Center's achievements and the contributions of those who made them possible.

The event began with a reception around the Kemper Reflecting Pool as guests enjoyed the sunset and cassava appetizers until the Plantasia Fairies led them to dinner in the Center atrium. The evening featured remarks from Dr. Roger Beachy, Dr. William H. Danforth, and Friends Committee Chair, Jim Knight. Two key awards were presented. Mr. Oliver Langenberg was honored with the Danforth Distinguished Service Award for his role in supporting the development of St. Louis as an international center for plant science. Dr. Robb T. Fraley was recognized with the Danforth Award for Plant Science for his outstanding achievement and service in plant science.

Mr. Oliver Langenberg, Senior Vice President at A.G. Edwards & Sons, has a distinguished record of professional accomplishment and service to St. Louis. Mr. Langenberg was one of the Danforth Center's earliest supporters and has remained committed to the Center's growth personally and as Chairman of the Board of the Edward Mallinckrodt Foundation. Danforth

Principal Investigator, Dr. Toni Kutchan, was recently named the Oliver M. Langenberg Distinguished Investigator in his honor.

Dr. Robb Fraley is the Executive Vice President and Chief Technology Officer at Monsanto Company. Sometimes referred to as the "Father of Agricultural Technology," Dr. Fraley is the author of numerous publications and patent applications relating to technical advances in agricultural biotechnology. In addition to serving as an advisor to government and public agencies, he has received multiple honors and awards for his work to advance basic research in plant biology.

Mark your calendar for 2008: Our tenth anniversary gala will be October 4, 2008!



Top photo:

Dr. Danforth with the Plantasia Fairies.

Bottom photo:

Dr. Danforth and Dr. Beachy with Danforth Science Awardee Dr. Robb Fraley and Danforth Service Awardee Mr. Oliver Langenberg.



Presents...

Members of the Donald Danforth Society generously support the annual fund of the Donald Danforth Plant Science Center. Their gifts are among the Center's most valuable resources, for they provide the Center with flexible, unrestricted resources necessary to set its own priorities and respond to opportunities uncovered by its scientists. The valued members are in the tradition and philanthropic spirit of Donald Danforth, Sr., and Donald Danforth, Jr.



Award-Winning Director Davis Guggenheim Generates Discussion on Climate Change

On Friday, May 11, 2007, a capacity crowd welcomed Academy Award®-winning director Davis Guggenheim to the Danforth Center. A native of St. Louis, Mr. Guggenheim visited the Donald Danforth Plant Science Center to talk about the role

he played in bringing the message of his film, *An Inconvenient Truth*, to a global audience. Under his direction, a PowerPoint™ slideshow created by former Vice President Al Gore became the feature-length documentary providing a compelling view of the challenges facing our planet. *An Inconvenient Truth* won two Oscar® awards, including Best Documentary, and has sparked a global dialogue on the important topic of our planet's environmental viability.

Howard Buffett Visits Center, Presents Striking Images and Compelling Message

On September 18, 2007 noted photographer and writer Howard G. Buffett shared remarkable photos and fascinating stories from his extensive travels through the world's developing countries. This thought-provoking evening opened with an arresting video presentation of his images set to "Where the Streets Have No Name" by the band U2. Mr. Buffett then shared personal reflections on a select group of images from the presentation and devoted a generous amount of time to answering questions from the audience.

Although Mr. Buffett's presentation illustrated the conditions of poverty and exploitation that



he encounters, his continued commitment to discovering, communicating, and to whatever degree possible, easing the suffering of the world's poorest citizens can serve as both education and inspiration to those who learn of his work and that of the foundation he created.

D² in 3D: A 3-Dimensional View of the Science of the Donald Danforth Plant Science Center

The mission of the Danforth Center – to improve the human condition through plant science – is advanced each day by its scientific employees who are engaged in basic research. Center scientists and supporters alike share the conviction that plant science research provides a deeper understanding of plants as living systems. In pursuit of this new under-

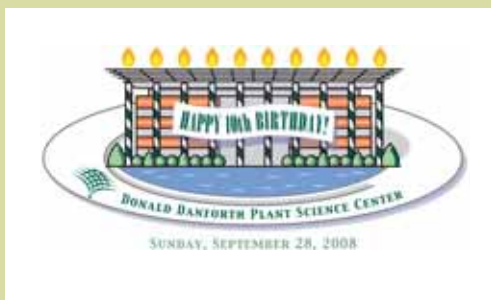


standing, scientists at the Danforth Center rely on its world-class facilities, including the sophisticated microscopic equipment of the Integrated Microscopy Facility (IMF). This core facility allows Center scientists to study minute details of plant cells and tissues at great magnification, as well as conduct studies requiring three-dimensional imaging.

In June, 2007, the Danforth Center partnered with Plaza Frontenac to showcase a new collection of beautiful scientific images created using the microscopic equipment of the IMF. The D² in 3D exhibit featured a dozen large scale 3D images of compartments found in plant cells such as chloroplasts, cell walls, and vacuoles. The opening night event, chaired by Dee Dee Kohn, also featured an animated 3D film of the inside of a cell. A special “Kids Close Up” event the following day gave young scientists-in-training a hands-on chance to learn more about plants. This well-attended exhibit provided engaging and educational insight into the work undertaken by our scientific team and proved to be a popular introduction to the Center’s science.

Looking forward!

In 2008, the Danforth Center is celebrating its tenth anniversary. The Center is currently gearing up for its “10th Birthday Party,” to be held on Sunday, September 28, 2008. This community event, chaired by Dan and Connie Burkhardt, will open the Danforth Center doors to celebrate science in our region and commemorate a decade of success and growth. Family, friends, and neighbors are invited to the Center to learn about our mission, tour our labs and greenhouses, meet scientists from around the world, participate in scientific activities, and enjoy international food and entertainment. For more details, visit the “10th Birthday Party” Web site at: www.danforthcenter.org/birthdayparty



Selected Financial Data

2007 Revenues and Expenditures

(Dollars in Thousands)

Donald Danforth Plant Science Center

Fiscal Year Ended December 31, 2007

Unrestricted Revenues⁽¹⁾

	REVENUE	SOURCE %
Corporate/Foundation Gifts	\$ 161	1.51%
Individual Gifts	1,421	13.3%
Grants & Contracts — Research	8,498	79.6%
Program and Service Income	360	3.4%
Other Income	238	2.2%
Total Revenues	\$10,678	100.0%

Operating Expenditures⁽²⁾

	EXPENDITURES	EXPENDITURE %
Total Research/Science	\$15,689	79.2%
Administration	3,054	15.4%
Development and Public Relations	1,072	5.4%
Total Expenses from Continuing Operations	\$19,815	100.0%

Capital Expenditures

Laboratory Equipment Purchases	\$ 226
Greenhouse Expansion Project	\$ 1,320
Other Capital Expenditures	\$ 450

Depreciation Expense

Depreciation of Fixed Assets	\$ 3,242
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Notes:

(1) Cash basis and excludes income from investments and reimbursement for subcontracted research from Grants and Contracts.

(2) Excludes subcontracted research on Grants and Contracts.

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Special thanks to Bethlehem Valley Vineyards, Cardwell's at the Plaza, Mount Pleasant Winery, and Plaza Frontenac for their support of this event.

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2007 Conversations Series

Renewable Energy: New Fuels from Plants

Today, bio-based fuels account for less than 5% of all transportation energy in the U.S. By 2030, the goal is for this figure to grow to 30%. Our panelists explored the reasons for the dramatic upswing in these goals, the necessary steps to achieve success, and the role St. Louis – and the Danforth Center – may play in leading the charge.

Date: 02.26.07 **Featured Speakers:**

Dr. Jan Jaworski

Vice President for Research, Member and Principal Investigator at the Donald Danforth Plant Science Center

Dr. Ganesh M. Kishore

Vice President, Science and Technology & Chief Biotechnology Officer at DuPont

Dr. James McLaren

C.M.C., Founder and President of StrathKirn, Inc.

The Role of Plants in Enhancing Human Health

It has long been recognized that plants are a source of powerful drugs. Plant-based medical care plays an important role in both the developed and developing worlds. Our panelists explored the evolving role of plants in medical and health care, and the promising new research being pursued in St. Louis – and at the Danforth Center.

Date: 04.18.07 **Featured Speakers:**

Dr. Tom Smith

Principal Investigator at the Donald Danforth Plant Science Center

Dr. Ming You

Professor of Surgery and Director of the Chemoprevention Program at the Siteman Cancer Center

Dr. Wendy Applequist

Postdoctoral Researcher in the Applied Research Department at the Missouri Botanical Garden

Increasing the Nutritional Content of Food

In the fight against famine and malnutrition in developing countries, scientists have encountered both challenges and promises for the world's future food supply and its nutritional quality. Our panelists discussed ongoing research to improve the nutritional content of cassava, a staple root crop of sub-Saharan Africa, and other promising research being pursued in St. Louis – and at the Danforth Center.

Date: 08.28.07 **Featured Speakers:**

Dr. Daniel Schachtman

Principal Investigator at the Donald Danforth Plant Science Center and Adjunct Professor at Washington University in St. Louis

Dr. Mark Manary

Professor of Pediatrics and Emergency Medicine at Washington University School of Medicine

Special Conversations “Close Up” with Richard and Susan Kiphart

This intimate event featured the Kipharts speaking about their commitment to constructing wells in Ghana, one of the best investments in Africa's future. Once wells are built, schools usually follow since children – girls, in particular – no longer need to spend their days hauling water from distant sites. Susan has worked with members of her Kenilworth Union Church to raise money for 34 wells, and Richard serves on the board of DATA (Debt AIDS Trade Africa), an advocacy organization started by Bono and others.

Date: 10.05.07 **Featured Speakers:**

Richard and Susan Kiphart



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