DONALD DANFORTH
PLANT SCIENCE CENTER
DISCOVERY | COMMUNITY | IMPACT

Facts at a Glance

Our Mission

Improve the human condition through plant science

- Feed the hungry and improve human health
- Preserve and renew our environment
- Enhance our region as a world center for plant science

Background

Founded in 1998, the Donald Danforth Plant Science Center is a St. Louis-based non-profit organization that focuses scientific research and innovation at the nexus of food security and the environment to increase agricultural productivity while preserving precious natural resources. The Center and its partners aim to improve both the yield and quality of food, provide sustainable sources of energy and fuel economic growth for this and future generations.

- Nearly 250 employees, 19 scientific teams with staff from 24 countries
- Collaborative research projects across the globe

Major Research Focus Areas

Basic plant science discovery and technology; food security crop improvement and sustainability; next-generation/sustainable bioenergy. Translation and application of discoveries is facilitated by two Danforth Center institutes.

The Enterprise Rent-A-Car Institute for Renewable Fuels

The Enterprise Rent-a-Car Institute for Renewable Fuels develops technology for next generation feedstock for transportation fuels that are more sustainable AND higher in energy content than our current feedstocks.

- Explore fundamental science about genes and systems that underlie solar energy capture and conversion into oils, sugars and biomass
- Develop new technology to understand constraints to algal growth and productivity of bioenergy grasses to enhance yield and quality and lower environmental impact
- Take basic discoveries in areas such as photosynthesis and facilitate commercialization uptake in the private sector

The Institute for International Crop Improvement (IICI)

The Institute for International Crop Improvement focuses on increasing the productivity and nutritional value of staple food crops in developing regions of the world.

- Research is focused on improving the nutrient content, resistance to virus diseases and productivity of staple crops that are underserved by commercial agriculture but are extremely important to the livelihood of subsistence farmers, such as sweet potato, banana, cassava, sorghum, maize, rice, groundnuts, millet and cowpea
- Twenty-two collaborations underway with research institutions, NGOs, funding and regulatory agencies in Africa, Asia, Europe and Latin America
- The IICI's Biosafety Resource Network provides advice and oversight to assist other institutions that are working through the process of field trials and safety testing necessary to bring products to the farmer's field

Core Technologies
The Danforth Center's Core Facilities accelerate discovery by providing scientists with access to state-of-the-art instrumentation and technology with which to expand and attain their research endeavors. Facilities include Bioinformatics, Integrated Microscopy, Plant Phenotyping, Plant Growth, Proteomics and Mass Spectrometry and Tissue Culture and Transformation. High-quality services are offered to both internal and external clients, and training/access is available to scientists interested in developing knowledge and skills in the specific areas of expertise available in the facilities.

Funding for Research
Danforth Center scientists secure $14 million in average annual grant and contract revenue, twice the plant science average, from federal, private and industry sources. Two-thirds of the Center's grant funding is for multi-institutional collaborative projects.

Economic Development
The St. Louis region, as home to a rapidly growing plant and agricultural innovation community, has become a leading hub for the commercialization of plant science and related technologies. The Danforth Center places an unusually high emphasis on formation and attraction of innovative plant science-based companies at the Bio Research & Development Growth (BRDG) Park, a part of our campus designated for commercial development. Today BRDG Park is home to 15 enterprises that employ 250 people and an on-site workforce training program.

The Center seeks scientific leaders who are also entrepreneurs, and we encourage and incentivize them to both form spin-out companies, like Benson Hill Biosystems, and to engage with regional companies to commercialize their technologies.

The Danforth Center and BRDG Park partner with the Larta Institute to host the Ag Innovation Showcase, an annual event that brings together an international audience of influential Ag industry executives, investors, innovators and policy makers in an effort to unearth solutions to global issues in food safety and security. The Showcase encourages the convergence of diverse technology solutions around platforms that help bring the industry to the next level of productivity and sustainability.

Education and Outreach
Training infuses all the Danforth Center's research programs and students come from around the world. Since inception, the Center has trained more than 530 people from 52 countries. Generous funding from the National Science Foundation supports the Center's highly sought after Research Experience for Undergraduates Summer Internship Program. Ninety percent of these interns have gone on to pursue advanced degrees in science or work full-time in the field of science.

Danforth Center outreach and education programs bring cutting-edge science to K-12 classrooms across the region. Established with grant funding with Boeing, the Center's "Technology Trunk" program brings scientific equipment and lab materials into science classrooms in underserved areas. To date, these programs have reached 1,968 students. The Center also hosts weekly seminars, an annual fall symposium and other presentations that are open to the public.

Expansion Facts at a Glance
On April 15, 2016, Danforth Center leadership and supporters dedicated the new William H. Danforth Wing, named in honor of the Founding Chairman whose vision catalyzed the formation of the Donald Danforth Plant Science Center in 1998.

The new wing will strengthen and expand priority research areas, provide the capacity and technology to accelerate outcomes and advance the Danforth Center as a collaborative hub that connects regional, national and international partners to improve the human condition through plant science.

William H. Danforth Research Wing ($50M) - A 79,000 square foot, four-story facility with research, education and community spaces.

- Three floors of flexible research laboratories to accommodate advances in robotics, bioinformatics and group approaches to research, state-of-the-art equipment, open fume hood space and equipment rooms
- Expanded bioinformatics and genomics capabilities; building capacity for projects that could not otherwise be tackled, further accelerating the pace of scientific discovery
- Lecture-style theater of 2,191 sq. ft. with 95 seats, state-of-the-art audio, video, internet and teleconferencing capabilities for seminars and training of next-generation of scientists
- A significant redesign of the Danforth Center's landscape through reconstruction of a native Missouri tall grass prairie, including many varieties of flowering plants. The six-acre prairie will showcase the vital connections between native landscapes, biodiversity and agriculture, and provide an enhanced ecosystem 12 colonies of managed honey bees whose 500,000 foragers will help pollinate thousands of acres surrounding the Danforth Center
- Renovation of the Kemper Water Garden featuring aquatic grasses and a boardwalk

New Technology Facilities ($10M)

- Advanced, controlled plant growth facility for plant-environment interaction studies; 34 controlled-environment chambers to study effects of changing CO_2 levels on crop growth, (100 percent increase)
- One-of-a-kind Bellwether Plant Phenotyping Facility that will transform the scale and precision with which Center scientists can measure effects of drought, extreme temperatures and other environmental factors that affect crop productivity. Since opening in January 2014, labs have run a total of 22 experiments. The facility is nearly booked through March of 2020, with a total of 44 experiments funded
- Maker Shop for new instrument development. More than 60 percent of Danforth Center labs participate in the Center's Maker Group
- Computational crop improvement lab

New Science and Scientists

- 100 scientists to strengthen of programs in digital/computational plant science, plant-environment interactions, food security and next-generation bioenergy crops
- Four principal investigators that will be hired jointly with University of Missouri (MU)

Financing and Design

- The William H. Danforth Wing was funded entirely by private donations. The Center received $4.5 million in Contribution Tax Credits from the Missouri Development Finance Board
- The design of the new research facility was a collaboration between two architectural firms, Christner Inc. and Flad Architects
- McCarthy Construction Company provided construction services
- Landmark Contract Management Inc. served as project manager

For more information please visit www.danforthcenter.org