

INSPIRED DISCOVERIES



RESEARCH REPORT | 2015

University of Idaho

CHANGING THE RESEARCH GAME



For more than a century, the University of Idaho has addressed complex problems through innovative research, creative work and scholarly activity. These endeavors contribute to our collective knowledge, stimulate imagination and inspiration, enrich communities and promote shared prosperity. We are poised to do still more.

As an institution, we do not and cannot do this work on our own. Much of our research supports – and is supported by – industry partners. Helping industry meet the economic development goals of the state benefits Idaho’s citizens with quality-of-life innovations and heightened economic activity that brings opportunity.

New knowledge and practical solutions are at the forefront of our efforts. We continue to explore prospects for groundbreaking work, including a nascent dairy research initiative that will tackle the needs, challenges and aspirations of dairy and related-food producers in the unique climate and terrain of the West.

We also strive to make partnering with UI more accessible for interested companies. As an institution committed to the public dissemination of knowledge, we must maintain the right to publish research findings. However, in 2014, we changed our intellectual property provisions, allowing outside partners to own the results of affiliated research.

Our statewide network of research and extension centers is essential to the university’s service to the state. From north to south and east to west across Idaho in countless communities,

the university’s productivity touches every corner of life and industry in the state. A prime example can be seen in this report’s lead story, which showcases the UI Aquaculture Research Institute (ARI) in Hagerman and Moscow. ARI supports Idaho’s \$35 million farmed-trout industry, providing companies with the tools they need to grow strong, healthy fish to feed the nation.

We’re also working to enhance interdisciplinary research approaches for our faculty and students. Last summer we broke ground on the Integrated Research and Innovation Center, or IRIC, which when completed will give researchers from across disciplines access to common work spaces and increased opportunities for collaboration.

We are confident for the future because of our university’s track record of excellence in research, scholarship and creativity. The projects showcased in this report are just a sample resulting from the creativity and collaboration of Vandal faculty, staff, students and industry partners. Their hard work and enterprise help make a bright future possible for Idaho, for our nation and for our world.

Chuck Staben

CHUCK STABEN
President

John K. McIver

JOHN K. MCIVER
Vice President for Research and Economic Development

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Visit the Research Report online for more coverage, including in-depth stories, links to resources and a video highlighting our researchers and collaborators.

www.uidaho.edu/research2015



GROWING FISH FOR THE FUTURE

Farmed fish feed millions of people in the United States and around the world every day. More than 70 percent of the farm-raised trout that end up on American tables come from one state: Idaho.

At the University of Idaho's Aquaculture Research Institute (ARI), scientists are working to ensure those fish are grown economically, efficiently and in a healthy way.

At ARI's Hagerman station, researchers led by ARI director Ronald Hardy are studying how to feed trout a plant-based diet rather than the traditional diet made from fish protein, or fishmeal, which is a limited resource.

In a long-term partnership with the USDA Agriculture Research Service and Idaho's aquaculture industry, ARI researchers have developed a strain of rainbow trout that can grow fast and healthy on all-plant, soy-based diets. The project has taken 14 years of precise selective breeding over seven generations.

"It's the diet of the future," Hardy said. "By the sixth and seventh generation, the selected trout actually grow faster on the plant-meal diet than on the fishmeal diet."

What's more, the fish grow to harvest size twice as fast as fishmeal-fed trout, and studies show they are more disease-resistant than non-selected trout strains.

These special trout are already benefitting Idaho trout farmers such as Clear Springs Foods Inc., which raises some of the selected trout.

"Feed is our No. 1 cost, so anything we can do to cost-effectively tweak that diet, those are the projects we get excited about," said Scott LaPatra, director of research and development for Clear Springs. "We're a major resource user, so

anything we can do to further reduce environmental impacts is a very positive thing to do, and that comes with better feed utilization, less waste."

Another ARI project, based at the institute's Moscow branch, supports the trout and aquaculture industries by protecting the fish from disease.

ARI associate director Ken Cain has developed a vaccine to protect against coldwater disease, a bacterial infection that afflicts farmed and wild fish worldwide.

"It's a big problem in the trout industry in the U.S., and it's also a major problem in other hatcheries," Cain said. "They lose more fish to that disease than any other disease."

Cain began investigating the potential for a vaccine when he came to UI 15 years ago, and has since developed and refined a vaccine that allows farmers to simply inoculate millions of baby fish by immersion.

Cain recently finalized a licensing agreement with a large pharmaceutical company that produces fish vaccines, and is now moving forward with work to support the final stages of vaccine optimization for USDA approval and commercial sale.

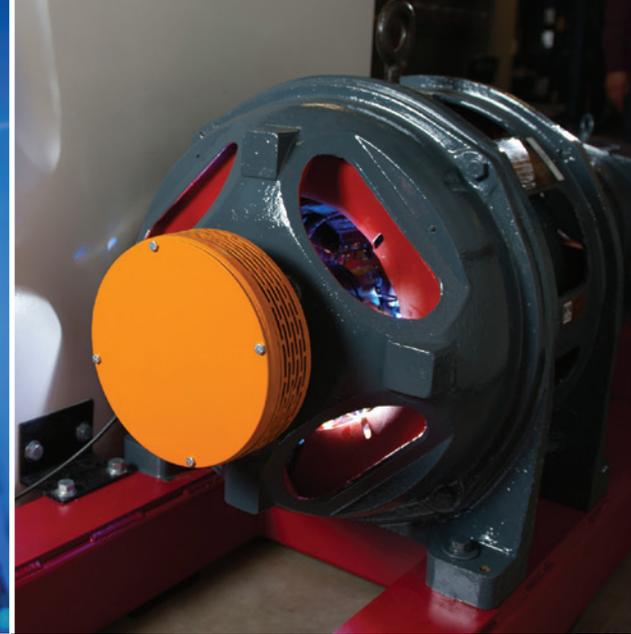
"There's the potential to sell millions and millions of vaccine doses in the U.S., and it could go global as well," Cain said.

These projects, along with the rest of the UI's robust slate of aquaculture research, make ARI a world-class research group that directly serves and supports an industry vital to Idaho and the world.

"If you look globally, there are very few places that have a distinct group of faculty and scientists that are really focused on aquaculture research," Cain said. "UI is one of those few places."



Visit the website to watch a video about aquaculture research at UIdaho.



KEEPING THE POWER ON

In August 1996, a chain reaction caused 4 million people on the West Coast to lose power. Officials spent a year mapping the sequence of events, recording measurements and determining what went wrong. Once they put the pieces together, they discovered the simulation models that could have helped them predict and prevent such events didn't work – the power-generating machines ran differently than expected.

With funding from Pullman, Washington-based Schweitzer Engineering Laboratory (SEL), UI electrical engineering professor Brian K. Johnson is designing a system to help power companies keep their simulations up-to-date.

When the large power generators found in most power plants are built, manufacturers record parameters to describe the way the machines respond to disturbances such as short circuits or changes

in demand, which are then used in models for simulations.

“But over time the parameters drift or change a little bit,” Johnson said. “Once the machine is installed onsite, it's not very easy to do tests and determine new parameters.”

Johnson and graduate student Mike West's goal is to develop a computer-based system that can monitor a machine's normal behavior as it operates and use that data to calculate real-time model parameters. A small generator specially adapted for the project in a UI lab provides them a live platform to test their methods.

The project was made possible in part by a change in UI's intellectual property policy, which opened the door to more projects with SEL. (See below.)

EXPANDING PARTNERSHIP OPPORTUNITIES

Industry partnerships are a key component of UI research – in the 2013 fiscal year alone, more than 50 companies funded more than 80 projects at the university.

At the behest of UI President Chuck Staben, the UI Office of Research and Economic Development introduced an expanded intellectual property policy in September 2014.

The new approach gives industry sponsors the option to obtain ownership of intellectual property discovered during research. The university will retain the right to publish and present the research results, as well as to use inventions for university research and educational purposes.

The change already has generated projects – first among them, electrical engineering professor Brian K. Johnson's research for Schweitzer Engineering Laboratory (SEL).

Bob Morris, SEL's vice president of national operations, says the company likes to partner with university researchers because of their expertise. But it's important for SEL to protect its intellectual property so it can quickly turn discoveries into reality.

“The university's new position on intellectual property makes it possible for my company to engage the university in more meaningful research,” Morris says.

To further aid companies as they seek to sponsor UI research, the university now provides sample research agreements at www.uidaho.edu/corporatepartners.

“The university is not only anxious to increase the number of these collaborations, but must do so in order to fulfill its mission,” said Jack McIver, UI vice president for research and economic development.

LEADING DAIRY INNOVATION

The University of Idaho's new Western Initiative on the Dairy Environment (WIDE) aims to support and strengthen the conditions needed for a sustainable dairy industry in Idaho, the American West and beyond.

The U.S. dairy and related food processing industries provide thousands of jobs and billions of dollars in economic output. In Idaho – the nation's third-largest milk producing state – the dairy industry generates \$2.2 billion of the state's GDP. Dairies connect to vital and growing food processing industries, producing cheese, yogurt and more.

But these industries operate in a complex environment with interacting ecological, social-cultural and economic factors.

Through WIDE, UI and its partners can provide unbiased research and education, creating innovative solutions to issues related to water quality, air and soil conditions, appropriate animal health and welfare, an educated and developing workforce, efficient transportation and energy use, and profitability.

UI is convening a diverse coalition of WIDE partners from industry, agencies, universities, investment companies and nonprofit organizations, and has hosted two workshops to begin mapping priorities and potential projects.

WIDE seeks not only to make a difference for decision-makers in Idaho businesses, municipalities and government agencies, but also for decision-makers across the West who face similar conditions and issues. And these regional issues can be translated around the globe to the many arid landscapes that rely on dairy industries for jobs and food security.



BIG DATA FOR BIG BUSINESS

Inside every company, behind-the-scenes processes tie everything together. Operations management students in the UI College of Business and Economics must learn how to understand, assess and improve these processes.

"It's a hard thing to grasp the complexity of that from a book and from case studies," said Scott Metlen, faculty advisor for the UI Business Process Center.

With support from Micron, the college created the Business Process Center in 2008 to help students learn process management by experiencing it. More than 100 student teams have partnered with companies such as Boeing, Glanbia Foods, Potlatch and Frontier Communications to solve real-world problems.

Once teams are paired with a company, they tour the company's facilities, observing the interactions they'll be studying. Students taking the center's simulation-focused class receive data about the process and learn to examine and evaluate it using computer simulation tools. Students in the center's quality-control class use the data to determine how to improve the process, including how to control it.

At the end of the semester, the teams return to the company with their ideas. The companies often put the plans into action – and save money because of it. For example, Metlen said, one student project saved Boeing \$750,000 a year.

Douglas Whitehouse, Boeing's core engineering and industrial engineering manager, said the students who go through Business Process Center courses step into jobs and internships at Boeing and perform in line with people who have years of experience.

"They arrive with critical thinking skills and can assess a production situation," he said. "These are tools they learn through these classes."



TEAMWORK IN THE FOREST

Nearly 25 years ago, Potlatch Corp. began questioning the impacts of contemporary logging practices on streams. As regulations tightened due to external concern and internal desire to do better, the company established a technical team to lead a study of modern forest practices on stream resources.

Potlatch reached out to the University of Idaho to lead research at the Mica Creek Experimental Watershed in northern Idaho to help it better understand – and potentially change – its logging practices.

“Reaching out to a credible third party was a natural course of action and has proven to have a legacy lasting much longer than that original research project,” said Terry Cundy, manager of silviculture, wildlife and environment for Potlatch Corp.

The project is now a \$1.5 million investment from Potlatch and the longest-running research project in the UI College of Natural Resources.

The original study looked at the effects on water and fish as a result of timber harvesting. Researchers continue to gather that data, giving analysts complete records for more than 20 years. Studies since have included optimizing harvest systems, tree growth and even impact on bug quantity in the area.

“Few sites have such long-term data collection covering such a wide range of topics. With that history, Mica Creek is poised to be a relevant research site for years to come,” said Timothy Link, the UI professor of hydrology who oversees activity at Mica Creek. “We also have a lot of trust and a good relationship with Potlatch that has proved to be mutually beneficial to all.”

DEMONSTRATING COLLABORATION

The University of Idaho is a member of the University Industry Demonstration Partnership, or UIDP, a project hosted by the National Academies of Science. Participating in the partnership allows UI research to better connect to state, regional and national industries.

“The UIDP is a program to bring universities and industry together to talk about common interests and frequent problems and to work together more effectively,” said Gene Merrell, UI associate vice president for economic development.

The UIDP’s membership includes more than 100 research universities and industries, including major national companies such as GE, DuPont and IBM.

UIDP members work together to address topics relevant to both sides, such as intellectual property, conflicts of interest and start-up companies. UIDP also produces resources to help researchers and universities do business with industry.

Merrell said participating in the UIDP helps build UI’s research portfolio and provides recruiting and research opportunities for companies.

“It allows our researchers, faculty and students to really get engaged with real-time research topics of interest to the private sector,” Merrell said. “We can work on problems that solve needs for the public and industry at this point in time.”

GROWING A PARTNERSHIP

A five-year, \$1.5 million University of Idaho-J.R. Simplot Co. agreement saved the Parma Research and Extension Center from closure in 2009. The pact proved beneficial to both sides – in November, the agreement was renewed for an additional three years.

The Parma center provides an important testing ground for new potato varieties and research on ways to grow potatoes more efficiently.

Terry Tindall, Simplot's senior agronomist, said the company is "exceedingly happy" with the cooperative agreement.

"We certainly appreciate the faculty and staff of the Parma research station that puts our interest out at the forefront and allows our advanced understanding of nutrient efficiency, plant genetics and irrigation management issues to be evaluated in a totally professional manner," he said.

"Without this cooperative effort, we would not be where we are today in the technical advances that are becoming more and more important to an agribusiness company like Simplot."

Although the agreement allows the company to use up to 50 irrigated acres, roughly half the station's total, Simplot research has taken place on 10 to 15 acres annually. The work has not interfered with other research at the station and has typically benefited the center's overall work, said UI Extension crop physiologist Mike Thornton, who serves as the university's liaison for the agreement.

In addition, Thornton said, the close collaboration at Parma has boosted work by UI researchers by giving them access to a nearby Simplot-owned research site.

"It does come back to the entire potato industry as a benefit in adding extra knowledge," he said.



EXPERIMENTS ON THE GO

The fleet of buses that carry Idaho National Laboratory (INL) employees from Idaho Falls to INL's desert site travel 2.7 million miles every year.

To help INL study bus-related issues such as efficiency, safety and communication systems, manufacturer Motor Coach Industries supplied the lab with a 6,000-pound bus chassis to build an immersive simulator.

And to help build a top-of-the-line simulator, INL turned to UI graduate student interns trained in the UI Department of Psychology's human factors program.

Zach Spielman and Jordan Holmberg began setting up the simulator in June at the Center for Advanced Energy Students, or CAES – a collaborative partnership among UI, INL, Boise State University, University of Wyoming and Idaho State University. The students studied the best ways to design the simulated bus to give drivers a realistic experience, record accurate data and answer the questions INL and Motor Coach Industries needed to answer.

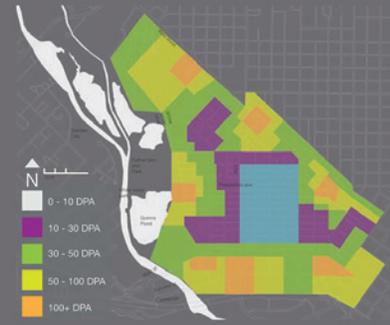
Spielman, who will continue his internship at INL through May, is now working with INL researchers to expand the project to serve companies that make other heavy vehicles such as snowplows, as well as to help design studies that will determine the best ways to present vehicle-to-vehicle and vehicle-to-infrastructure information to drivers.

Dave Gertman, the lead investigator for the INL transportation research simulator and mentor to UI students, says having UI students involved in the project has benefitted all parties.

"The students that we've had from UI in particular are highly motivated and skilled in research, so from a laboratory perspective, it's a way to get access to people whose training and research skills are valuable and very current."



Density



DESIGNING FOR THE REAL WORLD

The University of Idaho Urban Design Center (UDC) in Boise is the ideal think tank for next-generation architects and landscape architects. The program allows students to work with clients from private practice or public agencies to tackle real-world planning and design problems.

In 2013, the UDC began a contract with the city of Boise's Planning and Development Department to reimagine existing spaces to better serve the population.

One such project was the 2014 design for redevelopment of the Main-Fairview District of downtown Boise's West End. Students investigated opportunities for attracting future investment in the district by exploring different mixes of new housing; commercial, office and light industrial space; and entertainment and recreation, including a new multi-use stadium complex.

Alongside city planners, students applied design and planning tools focused on a sustainable urban future.

"The Urban Design Center requires our students to step outside of their disciplines and truly collaborate with diverse communities from different areas of specialization," said Kasama Polakit, a UI architecture professor.

Kathleen Lacey, comprehensive planner with the city of Boise and liaison for the city/university project, said the partnership is a positive exchange. "Students thrive in producing work for a client and the city garners varied perspectives applicable to our evolving urban environment with the goal of making Boise the most livable city in the country."

LAUNCHING A STARTUP



Two years ago, Marshall Piatt and Nick Lodato were UI juniors looking for a good idea to enter in a College of Business competition.

Now, they're vice presidents of a company the contest helped them launch.

Piatt and Lodato co-founded BioCement Technologies, Inc., based on their winning project for the Vandal Innovation and Enterprise

Works – or VIEW – Business Plan Competition.

BioCement is a soil-engineering technology that uses naturally occurring microbes to create calcium carbonate networks that have many uses, including preventing erosion, protecting foundations in the event of natural disasters and sequestering hazardous materials.

BioCement was developed by UI researchers, and Piatt and Lodato connected with the project after looking through the UI Office of Technology Transfer's database of licensable technologies.

After graduating in 2014, Piatt and Lodato incorporated the company, hired a CEO and are now looking to launch BioCement's first commercial uses in 2015.

Northwest energy giant Avista is among the company's many supporters.

"We like to partner and support the university on these real-world applications. BioCement was a great example of proposing a solution to some of the challenges that we face as a utility," says Paul Kimmel, Avista's regional business manager for the Palouse.

Alongside running their company, Lodato and Piatt volunteer with the VIEW program and encourage other students to take the same path they have.

"There are a lot of cool things that happen at this university," Piatt says. "There's a lot of cool science, and there are a lot of talented students who want to help the scientists."



A BETTER PROSTHETIC

People who use leg prostheses often deal with pain caused by the very devices that help them move.

Craig McGowan, an assistant professor of biological sciences and a member of UI's WWAMI Medical Education faculty, is studying the mechanics of movement so companies that design prostheses can create devices that work with the body's neuromuscular system.

With funding from a one-year Murdock Foundation Exceptional Opportunity Grant, McGowan and his students are developing a computer simulation that models how prostheses designed for running interact with the body.

Engineers have been able to design these running-specific devices – which are often called blades but work more like springs – yet it's unknown exactly how an amputee runner's remaining muscles adapt to controlling the device, or how the runner's limb interacts with the device's rigid socket.

The simulation's first phase models a non-amputee using data gathered from real-life runners. The next step is building a simulation of an amputee using a prosthesis.



McGowan's team first modified a general model to remove lost muscle and bone, then added a model of a prosthetic running device. They're now testing this model against data from amputee runners, the majority of whom are current or former Paralympic athletes.

"While our research has direct implications for otherwise healthy individuals who have suffered limb loss due to injury, our hope is to ultimately be able to help the millions of people who have been affected by diseases such as diabetes as well," McGowan said. "Daily exercise can be a powerful tool in mitigating the impact of disease, but you're not going to exercise if your prosthesis causes you pain."

INVESTING IN FUTURES

UI Extension educators have led efforts to help more than 40,000 young people learn about personal finances and credit – without learning the lessons the hard way by running up debt.

Northwest Farm Credit Services recently committed \$280,000 to a four-year project through the UI Extension 4-H Youth Development Program to help expand those efforts to improve youth financial literacy and economic prospects for rural communities.

The program now will expand its presence in Idaho and develop training programs for Washington, Oregon, Montana and Alaska.

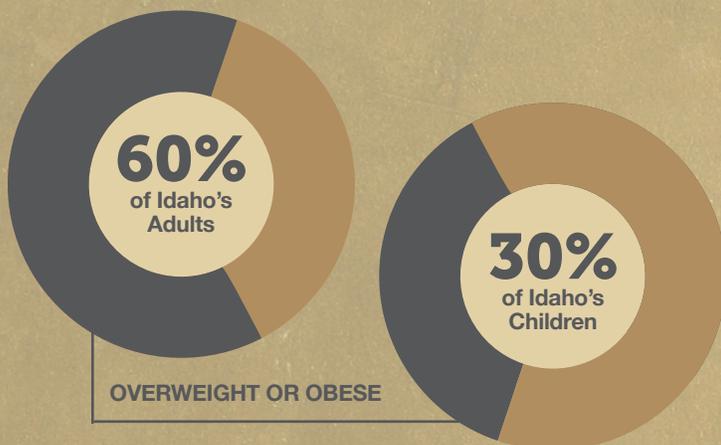
The expanded Northwest Farm Credit Services Youth Financial Literacy program will focus on developing peer-reviewed financial literacy materials trainers can use with youth. Additional funding from CoBank, a major agricultural lender, is funding the development of a space-themed video game to teach financial information.

The program guides teachers as they help young people to become financially literate through practical, hands-on exercises that are fun, yet focus on serious messages. For example, program participants learn the consequences of buying "must-have" accessories like consumer electronics and others on credit.

"We hope to be able to take those conclusions and determine a return on investment," said Extension educator Luke Erickson. "We want to be able to prove that what we are doing makes a difference, and it is being done in a cost-effective manner."



PREVENTING OBESITY WITH INFORMATION



More than 60 percent of Idaho's adults and nearly 30 percent of its children are overweight or obese, and obesity contributes to the state's leading causes of death, such as heart disease.

But health care and community leaders need detailed information on the problem in order to develop effective ways to reduce obesity rates and give all Idaho's residents better access to healthy choices.

With funding from the Blue Cross of Idaho Foundation for Health Inc., Helen Brown and her colleagues in the UI Department of Movement Sciences created a comprehensive analysis of all the data available on obesity and related issues in Idaho.

Their report, "Measuring What Matters," is designed to help people understand what data exist about obesity in Idaho and what information is still needed to fill in the big picture.

Blue Cross of Idaho Foundation manager Kendra Witt-Doyle said the foundation, which supports an initiative to prevent childhood obesity, knew data was scarce about Idaho's children in particular.

"Obesity among adults has reached epidemic proportions, and we realize that to reverse the trend and make a difference we need to focus on our children, and focus on prevention and teaching children healthy behaviors at a young age."

Obesity is complicated and the report can't address every issue, Brown said, but it's a strong start.

"A public health strategy is to adopt policy and environmental changes that make the healthy choice the easy choice," she said. "I think we have done something that will be useful for Idaho and help us move forward to prevent obesity and improve health."

SUPPORTING DEVELOPMENT WITH RESEARCH

Idaho needs innovative solutions for expanding its economy, and research conducted by the UI College of Law's Economic Development Clinic has built a foundation for new opportunities in the state.



A group of students led by Stephen R. Miller, associate law professor and director of the Boise-based clinic, studied New Markets Tax Credits in 2011. They were surprised to discover that areas all over Idaho were eligible for the credit, but almost no one was using it.

The New Markets Tax Credit program, created by Congress in 2000, is designed to help low-income communities attract

investors, who can then receive a federal tax credit for their investments in economic development projects.

Based on the clinic students' research, Miller wrote an editorial piece arguing for more cities to use the credit, and inquiries started rolling in.

The largest success came when Dave Glaser, president of the Montana Community Development Corporation, read the editorial and called Miller.

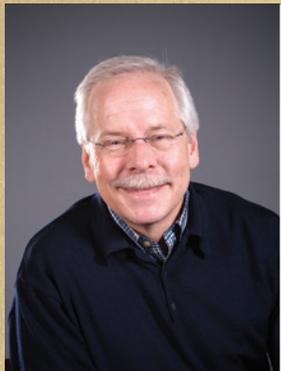
The Montana CDC has now expanded its efforts into Idaho, helping secure tax-credit based financing for three Idaho projects – Kootenai Medical Center in Coeur d'Alene, Targhee Professional Offices in Rexburg and Golden Valley Natural in Shelley – totaling \$40 million.

Glaser said the projects have created or retained 325 jobs, plus 630 construction jobs, and he estimated a 10-year economic impact of more than \$135 million.

Miller said the New Markets Tax Credit project demonstrates how the Economic Development Clinic's work can help the whole state.

"A project that started out for one specific city morphed into this multi-year, larger project about the entire state," Miller said. "This is something that wasn't going on in Idaho, and we played a part in making that happen here."

MENOPAUSE AND MICROBIOMES



Tens of millions of bacteria live in women's reproductive tracts. But until recently, scientists knew little about which bacteria make up these communities and how they influence women's health.

Larry Forney, a Distinguished Professor of biological sciences and director of UI's Institute for Bioinformatics and Evolutionary Biology (IBEST), is among the world's leading experts on the vaginal microbiome. His work on the subject began in 1997, when he formed a research partnership with a multinational consumer products and services company.

That partnership continues to thrive and produce results that help enhance women's health.

Forney is dedicated to research that not only ensures products don't harm women, but also investigates how the vaginal microbiome has

evolved, how it differs among populations and individual women, how it prevents infection and how changes in it can cause pain and illness.

Forney's most recent project was a study of menopausal women's microbiomes – about which almost nothing was known, though a large percentage of women in this age group struggle with vaginal symptoms and infections.

Forney says he's been impressed with his partner company's desire to base its product development efforts on scientific data, as well as its dedication to women's health – a mission he shares.

Cultural dismissiveness often dissuades women from seeking medical help for vaginal symptoms, which can cause pain, quality-of-life issues and self-esteem issues, Forney said.

"I like to speak out about those issues while trying to do some work to understand what causes these things, which could lead to therapies or steps to take to prevent them."

PLANTING A NATIVE LANDSCAPE

UI Extension horticulturist Stephen Love spent years traveling across the West in search of native plants to improve home and commercial landscapes.

Now, Kimberly, Idaho-based Conservation Seeding and Restoration is marketing seeds from Love's discoveries through Native Roots. The company licenses the right to propagate the plants from the Idaho Research Foundation.

Love's search was motivated by his belief that plants native to Idaho and the West provided the most sustainable options for the region's gardeners and landscapers. And there's an attractive bonus: "People are surprised that native plants can be so pretty," Love said.

Love, who is trained as a plant breeder, takes the small samples of native seeds he gathers and selects the best plants through several generations, removing the plants that do not display the qualities he seeks.

The results are brilliant mounds of purple penstemons, colorful columbines, surprising mints and intriguing buckwheats, among scores of others.

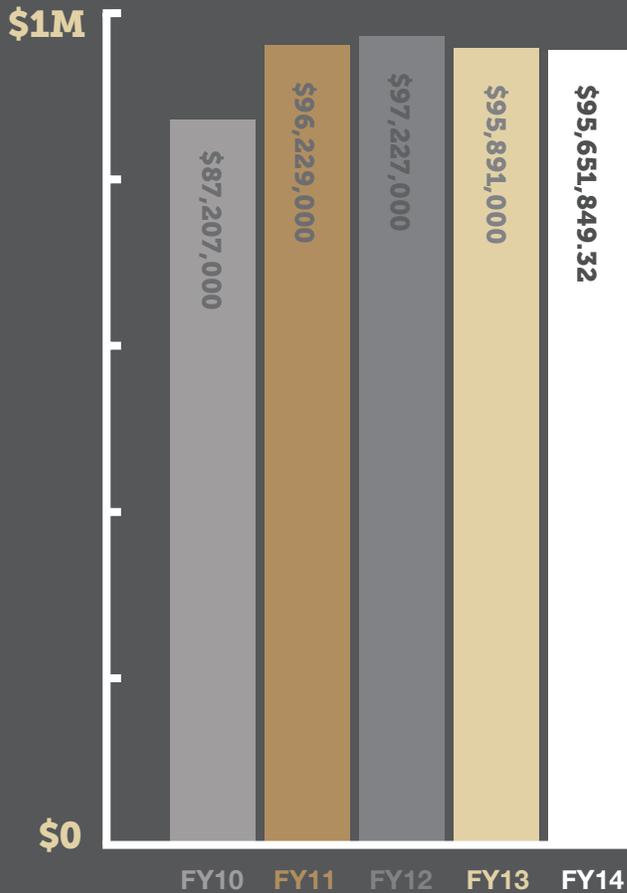
Native plants, Love believes, could offer beauty and require less fertilizer, water and pesticides than plants now in the trade that had been collected worldwide. In addition, native plants could offer better habitat for other native species, from butterflies to songbirds.

Native Roots markets 35 plants developed by Love, which includes multiple varieties of some species, and has hundreds more in the pipeline being evaluated for release to buyers.

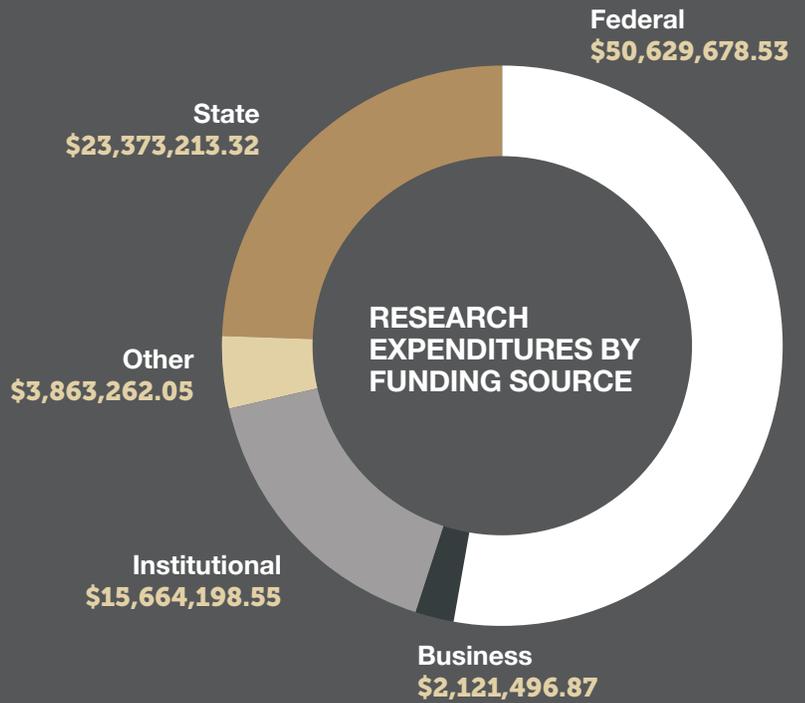
2014

FISCAL YEAR SUMMARY

RESEARCH EXPENDITURES



Research Expenditures as reported to the National Science Foundation HERD



SPONSORED PROJECT EXPENDITURES BY COLLEGE

SPONSORED PROJECTS	NUMBER	TOTAL
COLLEGE OF AGRICULTURAL AND LIFE SCIENCES	522	\$15,647,292
COLLEGE OF LETTERS, ARTS AND SOCIAL SCIENCES	19	\$251,958
COLLEGE OF ART AND ARCHITECTURE	51	\$1,140,637
COLLEGE OF BUSINESS AND ECONOMICS	13	\$17,573
COLLEGE OF EDUCATION	74	\$11,743,224
COLLEGE OF ENGINEERING	146	\$8,414,648
COLLEGE OF GRADUATE STUDIES	2	\$151,238
COLLEGE OF LAW	8	\$255,332
COLLEGE OF NATURAL RESOURCES	308	\$13,742,044
COLLEGE OF SCIENCE	141	\$8,248,534
DIVERSITY AND HUMAN RIGHTS	2	\$406,137
GENERAL LIBRARY	3	\$21,549
PROVOST/EXECUTIVE VP AREA	7	\$145,174
STUDENT AFFAIRS	8	\$431,630
UNIVERSITY OUTREACH - IDAHO FALLS	36	\$2,954,333
UNIVERSITY OUTREACH - NORTHERN IDAHO	4	\$494,120
UNIVERSITY RESEARCH	153	\$10,472,650
UWP - ENVIRONMENTAL SCIENCE WATER RESOURCES	11	\$785,241
VICE PROVOST FOR ACDMIC AFFAIRS	4	\$71,688
WI-REGIONAL PROGRAM IN VETERINARY MEDICINE	5	\$121,131
WWAMI MEDICAL EDUCATION PROGRAM	3	\$2,128
TOTAL	1520	\$75,518,261

Expenditures represent externally funded grants and contracts only. Additional activity is funded through other mechanisms.

TECHNOLOGY COMMERCIALIZATION:

17 Disclosures

16 Applications

6 Issued Patents

7 Licenses