



**Institute of Agriculture and Natural Resources
University of Nebraska – Lincoln**

**Year in Review
2019**

Distributed January 15, 2020

Nebraska College of Technical Agriculture (NCTA)

“Discover Your Way at NCTA”

NCTA continues to fill the need for contributing to agricultural workforce development in the state. New programs were developed under the last administration to address emerging needs. Stakeholders assisted in developing a new strategic five-year plan in 2019, and faculty and staff are aggressively working to meet these objectives.



Enrollment

- NCTA's enrollment was down for 2019/2020 after hitting a 23-year high. Competiveness in the job field has contributed to students choosing to enter the work place rather than attend school.
- High school students enrolled in NCTA Dual Credit courses doubled this past year.



Opportunities:

- Provide intensive hands-on learning courses, which can lead to attainment of certificates.
- Continued Link to Lincoln programs through CASNR, particularly in Ag Education and sciences.
- Collaborations with in-state institutions which desire agricultural programming.
 - Wayne State College
 - University of Nebraska – Kearney
 - Mid-Plains Community College

Challenges:

- Developing an updated recruitment strategy and team that meets needs for today's students and parents.
- Engaging our Aggie alumni in assisting with recruitment.

Academics

- NCTA is recognized for the ability to offer affordable education resulting in high placement rates and competitive salaries.
- NCTA is accredited by the Higher Learning Commission. A five-year site visit and review is February of 2020.
- NCTA students continue to demonstrate their skills at competitive learning events.
 - Crops Team** – Ranks in the top placings at National American Colleges and Teachers of Agriculture.
 - Ranch Horse Team** – Place students among top 10 at collegiate contests.
 - Stock Dog Team** – Students set the example for collegiate programs at trials.



Opportunities:

- Hands on learning is a primary objective of our curriculum.
- Development of more intensive experiences for students.
- Insuring our students understand new technologies.
- Creating partnerships with producers and industry leaders beyond the classroom.



Deans Search

A national search for the NCTA Dean is under way

The position closes January 17; Interviews are late February-early March

<https://ncta.unl.edu/search-dean-nebraska-college-technical-agriculture>

Contact NCTA

For campus visits, information and news updates, see <https://ncta.unl.edu/>

Or, call us at 1-800-3-CURTIS



Agricultural Research Division (<https://ard.unl.edu>)

Supporting the Science to Ensure Resilient Food Systems and a Healthy Global Future

The Agricultural Research Division is dedicated to the support of Teams and Centers executing the innovative science that propels the University of Nebraska to a global leadership position in food security and resilient natural/agro-ecosystems, and partnerships with the private-sector to create translational value and meet workforce needs, thereby fueling the economy of Nebraska. Towards those aims, ARD Faculty Teams continue to leverage the critical state and institutional support that they receive to achieve research success, develop new technologies, and train the next generation workforce, in an extremely competitive environment. Expenditures from externally-funded IANR research continues to be at all-time high in FY19 at \$54.6M, a >20% increase since FY14. Externally-sponsored research expenditure per faculty FTE has again reached an all-time high of >\$181,000.

Translational Agricultural Sciences – ARD faculty in plant sciences and biosystems engineering continue to conduct fundamental and applied research to make new discoveries, and develop new technologies (e.g., gene editing, robotics, digital agriculture, and artificial intelligence) that can be translated into new breeding and management strategies to increase yield; enhance plant resistance to weather variability and extremes, insects and diseases; optimize the use of natural resources (e.g., water and nutrients); improve agricultural system adaptation and resilience to changing climate; develop new biofuel and bioproducts; improve diversity, and enhance water quality and soil health. For example, 2 of the 7 nationally awarded Foundation for Food and Agriculture Research (FFAR) Irrigation Innovation Consortium grants were received by ARD faculty to use real time data to automate and optimize irrigation management in NE and the region. Funds received from the Breakthrough Technologies competitive federal grant program of the National Science Foundation (NSF) helped develop wearable plant sensors to measure water use in real time, which is important for improving irrigation management and selecting crops better suited for local conditions. ARD faculty were part of an international team that sequenced the genome of ancient crop-proso millet – a feat essential to raising yields of the drought-resistant crop in the Nebraska Panhandle and semiarid regions where population booms foreshadow food shortages. Dr. D. Holding's team, after 8 years of research using state of the art technologies, such as gene editing CRISPR-Cas9, successfully improved the protein content of sorghum and its digestibility by humans and animals, an important step for addressing food security at the national and global scales.



Nebraska's David Holding (right) and Leandra Marshall (left) with lines of popcorn featuring higher levels of lysine, an amino acid essential to the diets of humans and some livestock. <https://news.unl.edu/newsrooms/today/article/genome-to-protein-efforts-enriching-nutrition-of-popcorn-sorghum/>

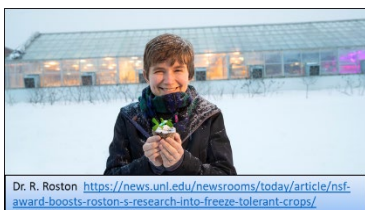
The Nebraska Integrated Beef Systems Initiative (NIBSI) – NIBSI aims to create innovative, integrated, systems approaches that leverage Nebraska's position as the epicenter of Beef, and that help ensure a robust future for beef production in Nebraska and beyond. Achievement of this vision requires new and broad transdisciplinary connections across genetics, environment, management and new innovative private-sector partnerships – meetings have been held across the state in the past year to facilitate these connects of faculty, stakeholders and potential partners, including a NIBSI summit in October. In 2020, a one-of-a-kind genomics and genetic evaluation platform will be developed through collaborations with US MARC and strategic private-sector partners. From this platform and leveraging IANR statewide infrastructure and industry partnerships, future transdisciplinary studies of efficient production, product value to consumers, animal health and well-being, and resilient integrated systems, can have transformational and sustained value for the Nebraska beef community.

Nebraska Food for Health Center (NFHC) - ARD faculty at NFHC study unique plant-based components that can be used to promote human health through dietary modulation of the gut microbiome, and inform new-age breeding programs to add value to Nebraska crops. Working with NUtech Ventures, the university's technology commercialization affiliate. A faculty-led startup company "Synbiotic Health" has emerged to develop a combination of beneficial gut bacteria and the fuel that feeds them. The start-up has licensed its first Synbiotic strains and plans to begin human clinical trials soon.



Bob Hunkins, member of the start-up Synbiotic Health

Honors and Awards - ARD faculty continue to receive professional recognition for their innovative and breakthrough science discoveries and contributions. Notably, Dr. A. Pannier received the Presidential Early Career Award, the highest honor presented by the US government, for her research on developing biomaterials and gene delivery systems, including DNA vaccines. Four junior ARD faculty received the highly competitive federal Early Career Award from NSF: Dr. Joe Louis for research on improving natural resistance in sorghum to sugarcane aphids, the most damaging pest in the US; Dr. L. Zhang for her research on shifting shapes of proteins and how they might contribute to disease infection; Dr. T. Obata for his research on understanding metabolism and role in health; and Dr. R. Roston for her research on developing hardy plants to address extreme weather events and chilling temperatures. Dr. E. Cahoon and Dr. T. Clemente became fellows of the prestigious American Association for the Advancement of Science (AAAS).



Dr. R. Roston <https://news.unl.edu/newsrooms/today/article/nsf-award-boosts-roston-s-research-into-freeze-tolerant-crops/>

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WE ARE CASNR

College of Agricultural Sciences and Natural Resources

Largest Enrollment in College History

3,222

Overall CASNR
Enrollment

**Includes 2% increase
in undergraduate
enrollment**

462

New Nebraska
Freshman

**10% increase
over last year**

7%

Increase in
Out-of-State
Enrollment

Student Success is our Top Priority

#1

CASNR maintains the
highest retention rates
for 1st and 2nd year
students at UNL.

90%

CASNR students start
their careers within
6 months of graduation.

\$1.5M

CASNR scholarships
support 40% of
students to reach
academic goals.

Focusing on the Future

HOLISTIC STUDENT DEVELOPMENT

In CASNR, students
are immersed
in innovative,
experiential
curriculum that allows
students to co-create
their experience.

LEVERAGING PARTNERSHIPS

CASNR is working
with private and
public partners to
enrich the experiences
of our students
preparing them for a
changing world.

SMART ENROLLMENT GROWTH

It is not enough for
us to just increase
enrollment. In CASNR
we are focusing our
enrollment goals to
allow for the greatest
student success in the
careers of tomorrow.

GRADUATE EDUCATION

We have an enormous
opportunity to grow
our graduate student
population allowing
for more students
to seek professional
growth past their
undergraduate
degree.

Interested in mentoring a current CASNR student? Contact Meg Kester at meg.kester@unl.edu

#ThisIsCASNR

NEBRASKA EXTENSION HIGHLIGHTS - 2019

INNOVATIVELY EMPOWERING NEBRASKANS TO BE SUCCESSFUL TODAY AND TOMORROW

Through innovative learner engagement methods, Nebraska Extension strives to empower Nebraskans to make informed decisions to help them achieve their goals for their lives, businesses and communities. These programs demonstrate the meaningful impact Nebraska Extension is having in local communities and statewide. To learn more, visit: extension.unl.edu/impact.

FLOOD RECOVERY SERVICESHIPS

After the devastating floods in March, it was not only University staff that responded, but its students. Through the Flood Recovery Serviship program, Nebraska Extension hosted and supervised 27 college students in 13 counties. These students worked directly with local leaders on recovery efforts, identified service projects, and gained public service experience while learning how communities deal with natural disasters. Student projects included documenting damage to roads and bridges, organizing events, developing multilingual disaster recovery materials, and assisting with landscape design and GPS mapping. The flood serviship program has proven a genuine opportunity for students to gain real-world experience in meeting the needs of our communities.



RURAL WELLNESS

The floods this year increased concerns about the mental health and well-being of farmers and ranchers who were already facing economic uncertainty. To help families and producers cope, Nebraska Extension started “Wellness in Tough Times” to provide mental health and well-being resources and guidance to farmers, their families, and agricultural professionals working with farmers. From webinars to trainings to exhibits, Nebraska Extension is on the front-line, providing resources to help people understand how farmer stress develops and to encourage people to access local mental health resources. This year, the team has secured over \$100,000 to enhance programming in the mental health arena. Future efforts include expanding our Neighbor-to-Neighbor program that focuses on connecting local residents to curb social isolation and expand the dialogue around mental health.

LATINO BUSINESSES

Much of Nebraska’s demographic growth over the past two decades is due to immigration. Core to this immigration are persons with Latino heritage. Nebraska Extension provides a key resource to Latino entrepreneurs in the central Platte River Valley region and other communities with Latino populations. This past year, over 50 businesses participated in the Latino Entrepreneur program, which provided start-up assistance to create 15 business plans; additionally, and 22 businesses received micro-loans. In total, 436 participants gained valuable experience, business counseling, networking opportunities, and discovered new collaborations. This resulted in the creation of 155 new start-ups and 64 new jobs over the past five years.



READ FOR RESILIENCE

Experiencing a natural disaster can be very stressful for young children. By using children’s literature in an interactive way, caregivers can help children heal. The Read for Resilience program identified nine children’s books to support children’s coping and understanding of their feelings after experiencing a disaster, loss, and/or grief. To accompany each book, the team created story guides for the books, which include questions for the caregiver to ask the child and activities to help children personally connect with the experiences of the characters in the books. Supported through donations, this program engages both the child and the caregiver in a meaningful way and requires little training or expertise for the caregiver to implement.

HIGH PLAINS PRACTICUM

The farm and ranch economy continues to struggle financially. Input costs continue to rise and commodity prices swing widely. Through the High Plains Practicum, ranchers develop skills and apply management tools needed in today’s complex ranching industry. Each year of the program, 50 participants responsible for a total of 45,000 head of cattle and a million acres of land complete the program with the intent to make changes to their operation based on the knowledge gained in range and forage resources; integrating nutrition and reproduction; cost-of-production analysis; and family working relationships.



Across 7 program areas and 18 issue teams, Nebraska Extension continues to build on sound accomplishments and innovate for the future.

From youth, to communities, to agriculture and food, Nebraska Extension looks forward; facing the grand challenges and improving the lives of Nebraskans.

The impacts here give a glimpse into the accomplishments of 2019 that will compound into the achievements of tomorrow.

To learn more, visit: extension.unl.edu/impact



4-H YOUTH DEVELOPMENT

The **Think, Make, Create Mobile Lab** reached 2,100 youth engaged in a variety of program activities focused on STEM, nutrition, health and physical activity.



BEEF SYSTEMS

Through the **Nebraska Grazing Conference** conference, over 170 producers learned new strategies for grazing livestock systems, leading to a \$21 per head increase in profitability with average herd size of 1,050 cows.



COMMUNITY ENVIRONMENT

Over 191,000 viewers tune in weekly to watch **Backyard Farmer**; with 45,000 more direct contacts and subscribers to landscape and entomology social media.



COMMUNITY VITALITY

The **University of Nebraska Resource Navigator** launched with over 50 resources providing relevant information related to business development to over 500 businesses in the first 6 months.



CROPS AND WATER

Farmers estimate a \$66.4 million value of knowledge and practice changes reported by 8,800 **Water and Soil Protection** program participants.



FOOD, NUTRITION & HEALTH

More than 91,000 Nebraskans were reached in nutrition, health and well-being programs with a focus on reducing food insecurity, reducing youth obesity and improving well-being.



THE LEARNING CHILD

The ripple effect of adult education opportunities for childcare professionals and families has reached 70,351 children indirectly, and an additional 4,265 children through direct contacts.



COLLEGE OF EDUCATION AND HUMAN SCIENCES

2019 marked a turning of the page for the College of Education and Human Sciences. Sherri Jones, professor and chair in the Department of Special Education and Communication Disorders was named dean of the college and assumed the position on July 1. Jones is an experienced, well-respected scholar and a Nebraskan dedicated to the delivery of the university's land-grant mission.

Jones spent the fall leading the college through a strategic planning process to identify and/or reaffirm collective goals. The discussions have centered around how CEHS can help people reach optimum health and well-being, achieve maximum potential and enhance communities. The new strategic plan will be further developed during the year ahead.

Looking ahead

- With the support of stakeholders across Nebraska, construction will begin on a new **Mabel Lee Hall**, which will feature modern learning spaces designed to inspire collaboration and innovative ideas.
- In **partnership** with the Department of Food Science and Technology, the Department of Nutrition and Health Sciences will host the joint meeting of the Association of Nutrition Departments and Council of Food Science Administrators in October 2020.

→ Teaching

- **2,687** undergraduate students (Fall '19)
- **1,048** graduate students (Fall '19)
- **1,153** degrees awarded
- The **Teacher Scholars Academy** launched with an inaugural class of 40 high school graduates. The academy was created to grow the teacher workforce in Nebraska and address teacher shortages.
- The Indigenous Roots Teacher Education Program (**ROOTS**) celebrated 20 years of helping Native American students interested in working with children in area schools, with opportunities to earn teaching degrees.

→ Research

- The Nebraska Center for Research on Children, Youth, Families and Schools celebrated 15 years of conducting, supporting and sharing research in the social, behavioral and educational sciences. During that time, CYFS has partnered with more than **970 rural schools** in Nebraska.
- The Nebraska Center for the Prevention of Obesity Diseases has made important progress in **understanding obesity** and obesity related-diseases at the molecular level. With support from a second \$11 mil. grant from the National Institutes of Health, the team is looking for "consumer-friendly" ways to prevent obesity-related threats to human health.

→ Outreach

- The Barkley Speech Language and Hearing Clinic became the first Nebraska clinic specializing in **cochlear implant services** to be located outside of the Omaha metro area.
- Led by Nebraska Extension, **Read for Resilience** offered free storybooks with the themes of coping with trauma, loss, grief and stress to children across the state to help young flood survivors heal through reading.
- **NebraskaSTEM** is helping 14 rural Nebraska high-needs schools develop educational leadership in sciences, technology, engineering and mathematics.