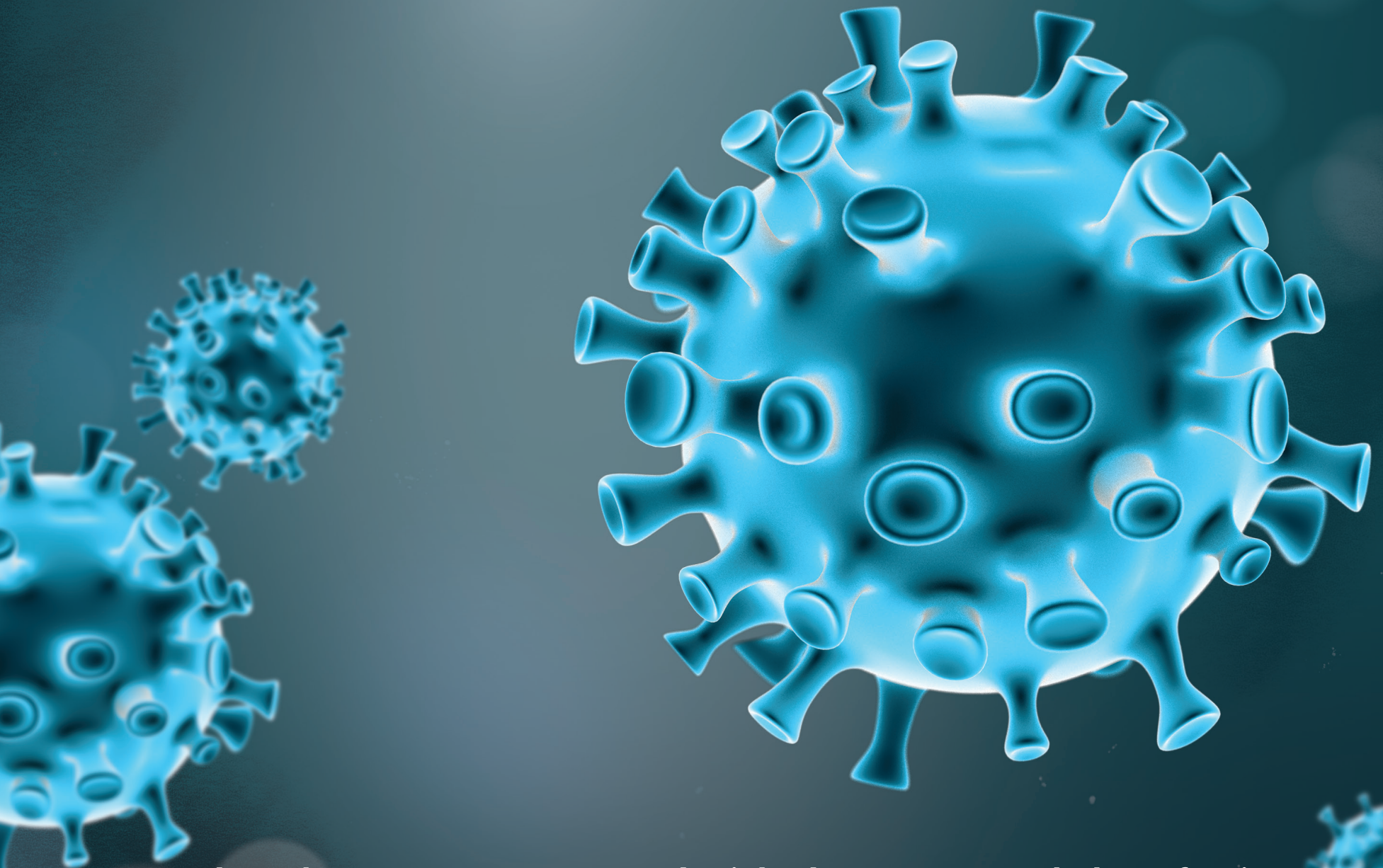


See *k*

RESEARCH MAGAZINE FOR KANSAS STATE UNIVERSITY

2020



Welcome home

Architecture students tackle housing crisis

A pandemic battle

Scientists take the lead on COVID-19

The hemp frontier

Research pioneers study a new crop

A different vein

This close-up view of an industrial hemp leaf comes from a *Cannabis sativa* L. variety that is growing at the John C. Pair Horticultural Center, which is a K-State Research and Extension research center near Wichita.

Hemp is a broadleaf plant often grown and harvested for its fiber and grain. This makes it useful for a variety of potential products, such as food ingredients, biofuels and cattle feed.

While industrial hemp is related to marijuana, hemp is legal to grow because it contains low to no tetrahydrocannabinol, or THC. See page 36 to learn how Kansas State University industrial hemp research is helping farmers across Kansas learn how to grow this new crop.



Features



14 | Welcome home
Architecture students use research to design affordable, sustainable housing



20 | A decade of research
Looking back at 10 years of K-State milestones



26 | A pandemic battle
In the time of COVID-19, K-State scientists take the lead



36 | The hemp frontier
Building a statewide network of research pioneers on a new crop



42 | Fighting the fever
As African swine fever spreads worldwide, scientists protect U.S. industry

3 | Letter

49 | Undergraduate Scholar

4 | Shorts

50 | Graduate Scholar

46 | Engagement

52 | Explain It

47 | UDP Focus

53 | The Past

48 | Faculty Focus

➤ Seek more

Find Seek online at k-state.edu/seek
or at Kansas State University
New Prairie Press, newprairiepress.org.



 [@KState](https://www.facebook.com/KState)

 [@kansasstateuniversity](https://www.instagram.com/kansasstateuniversity)

 [@KState](https://twitter.com/KState)

 [linkedin.com/school/kansas-state-university](https://www.linkedin.com/school/kansas-state-university)

Editor's note:

Many of the photos in this issue were taken before the COVID-19 global pandemic and before face coverings and physical distancing became common practices. In the photos that have been taken during the pandemic, people are wearing face coverings and practicing physical distancing and other safety measures.



About Seek

Seek is Kansas State University's flagship research magazine and invites readers to "See" "K"-State's research, scholarly and creative activities, and discoveries. Seek is produced by the Office of the Vice President for Research and the Division of Communications and Marketing.

Seek contributors

Creative director

Benjamin Cleveland

Graphic designers

Ryan Barten

Photography editor

Tommy Theis

Photographers

Dan Donnert

Jeff Moore

Editor

Jennifer Tidball

Writers

Beth Bohn

Michelle Geering

Jason Hackett

Stephanie Jacques

Pat Melgares

Taylor Provine

Patrice Scott

Production manager

Erin Pennington

Other contributor

Cindy Hollingsworth

ISSN 2574-1764

ISSN 2475-7683

KANSAS STATE
UNIVERSITY



In a hotel ballroom in Washington, D.C., on February 25, 2020, I gave the following opening remarks to a meeting of university and government leaders and discussed CERES, the Coalition for Epi Response Engagement and Science, which is a collaborative group of scientists dedicated to bio- and agro-defense.

Two weeks later, Kansas State University, like so many other colleges and universities worldwide, began shutting down operations because of a zoonotic disease that started a global pandemic.

From my remarks:

“This gathering is intended to share and learn about the current and future challenges associated with keeping American and global food supplies safe, reliable and plentiful. Although the economies of the world are intricately tied through global trade and supply, global peace and stability are connected to the most fundamental of all human needs: to be fed and to be healthy. Governmental policies are enacted to strengthen the binds that tie our investments and strategies to peace and stability, and it is through government and private sector investments in new discoveries and inventions that we, the scientists in the room, will provide new methodologies, reliable technologies and advanced countermeasures to achieve those ends.

“Before CERES was a coalition, she was the Roman goddess of grain. If you studied Roman or Greek mythology, you know that the gods were servant gods charged to ensure humans would survive and thrive. To accomplish this, Ceres realized that she needed to cooperate with the other gods and goddesses — sun, rain, seasons and so forth — to deliver her charge to provide ample grains for a growing and thriving population.

“Our CERES today recognizes the same: To deliver on agricultural biosecurity, we must be explorers, and we must collaborate and connect our talents in science and innovation that lead to action. Today, we are here to share our progress on our mission and to express the continued need to muster our forces, maybe even collaborate with the Greek god, Ares, to not only prepare for but to wage war on the unknowns: on plant, animal and zoonotic infectious diseases that threaten our very existence.

“We are at a critical crossroads today as we chart our course. With more than three times the population on earth today than were alive when I was born six decades ago, peace and prosperity across the human species are menaced

by food, animal and human diseases, and losses. Rapidly evolving viruses and other zoonotic pathogens threaten our production plants and animals and now our own species. Uncoordinated responses that are reactive and not proactive confirm the philosophers’ rule that history shows again and again how nature points out the folly of man.”

As the last seven months have shown, we were not prepared. A new variation on a known severe acute respiratory syndrome virus, SARS, emerged and moved rapidly through an unprepared world. The existential threat of a zoonotic disease that impacts our lives has been demonstrated — again. Nevertheless, with some interruption in research while we worked to develop safe protocols for our researchers and secure adequate protective equipment, SARS-CoV-2 virus and COVID-19 disease research began apace at K-State by early April in our Biosecurity Research Institute. By the end of summer, more than \$29 million in grant proposals were written, more than \$3 million in contracts for COVID-19 research had been secured and a number of new technologies had been licensed to corporate partners to combat the disease. K-State research pivoted quickly, and we’ve dedicated a large portion of this Seek issue to those efforts.

K-State research isn’t only about SARS and COVID-19, but so much of what we do is about improving people’s lives and adapting to changing environments, changing landscapes and changing health. This issue shares some ways in which we improve people’s lives. Change is inevitable, and we’ve had to adapt our Seek magazine publishing timeline to change as well — thank you for being patient.

This will be my final Seek magazine as the vice president for research at K-State. Life changes are also sometimes inevitable. As the year changes to 2021, I will have enjoyed serving five years as the VPR and four years as dean at K-State. It has been an honor and a pleasure to know the K-State family. The next chapter of our journey takes Carolyn and me to Ames, Iowa, where I will serve as the next VPR at Iowa State University. It will be a homecoming for us — I had my first job after my doctorate in Ames at the U. S. Department of Energy Ames Laboratory.

“We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.”

— T.S. Eliot, “Little Gidding” from “Four Quartets”

Peter K. Dorhout, Vice President for Research