

“Importance of Agricultural Research: Non-Land-Grant Colleges of Agriculture”

Hearing Before The

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Agriculture Committee

Testimony

Of

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Good morning Chairman Conaway, Ranking Member Peterson and the members of the Committee. Thank you for convening this hearing addressing the continued importance and needs of agricultural research, education and infrastructure. It is an honor to address this committee on this important subject matter. My name is Robert Duncan, and I am the fourth chancellor of the Texas Tech University System, which includes: Texas Tech University, Texas Tech University Health Sciences Center, Angelo State University and Texas Tech University Health Sciences Center El Paso. Our system includes two Non-Land-Grant Colleges of Agriculture: Texas Tech University and Angelo State University, both of which contribute valuable agricultural research to the industries in our region.

Texas Tech University achieved Tier One designation and was listed in the Highest Research Activity category by the Carnegie Classification of Institutions of Higher Education in 2016. Texas Tech is one of only 81 public institutions listed in this top tier. In 2015, Texas Tech University was ranked No. 41 on the National Science Foundation's rankings for higher education agricultural research and development, which is the highest ranking of any Non-Land-Grant College of Agriculture. Texas Tech University has a total enrollment of nearly 37,000 students and the College of Agricultural Sciences and Natural Resources has 1,754 and 420 undergraduate and graduate students, respectively. The college prides itself on having one of the highest student retention rates at the university. We believe this is due to a combination of factors, including faculty advising of students and student involvement in extracurricular activities.

Every year since 2010, Angelo State University has been recognized by The Princeton Review as one of the nation's "Best Colleges." The university is a Hispanic-Serving Institution and offers more than 100 majors and concentrations, and provides opportunities for both

undergraduate and graduate research. Angelo State University is able to provide students with an economical education due to strong financial aid programs, including the \$130 million endowment for the Carr Scholarship Program. Specific to the Department of Agriculture at ASU, most of the labs are taught at the Management, Instruction and Research (MIR) Center, a facility that consists of 6,000 acres of range and farm land. The department's mission is to work directly with regional commercial producers through development of seed stock in Angus Cattle, Rambouillet Sheep, Suffolk Sheep, Meat Goats and Dorper Sheep through breeding programs on the University Ranch. In 2015, ASU's graduate agricultural education program was recognized as one of the top 25 in the United States and recently received the Mirabeau B. Lamar Award. Angelo State University's Department of Agriculture has a 100 percent pass rate on the Secondary Teacher Education Exam for Agricultural Education.

Executive Summary

Agricultural research will be required to address the complex issue of producing more food with fewer resources while maintaining the stewardship of the land and natural resources. Further, food security, both under- and over-nutrition, will require a trans-disciplinary approach and agricultural sciences will be a nexus for addressing this complex subject. Unfortunately, research funds allocated for agricultural research are disproportionately less when compared with other federal research programs and are not keeping pace with other emerging countries. Investing in both foundational and innovative research will be essential to keep the American farmer competitive in this global economy.

The Non-Land-Grant Colleges of Agriculture educate approximately 50 percent of the future workforce in states where they are located. Further, these public institutions provide excellent translational research and outreach programs through their graduate studies and

associated research efforts. The funding model of the USDA allocates a large portion of its annual budget to capacity building for the Land-Grant Universities. Though they also fund competitive programs, many of the Non-Land-Grant Colleges of Agriculture are less competitive because they do not have the same capacity as their Land-Grant counterparts. The 2008 farm bill authorized a competitive capacity-building program for Non-Land-Grant Colleges of Agriculture, and that program has funded projects since 2012 to purchase new research equipment, address relevant and emerging research areas, and educate students that will be the future workforce. The funding of this program at approximately \$5 million per year is small in comparison, but it has had significant impacts on improving research and education capacity in the agricultural sciences and natural resources management. Increasing capacity at the Non-Land-Grant Colleges of Agriculture will increase output of trained workforce and support new and innovative research. Increasing the funding of the competitive capacity-building program for Non-Land-Grant Colleges of Agriculture and creating new funding programs to incentivize the expansion of these institutions will be important strategies to expand our agricultural education and research efforts.

Importance of Agricultural Research and Education

Competitiveness and Sustainability of U.S. Agriculture

Previous investments into agriculture research have paid off more than what was expected. Innovation increased agricultural outputs and efficiencies beyond any other country and has allowed the American farmer to be competitive in an ever more global economy. Population growth is expected to increase, and agricultural outputs are going to need to increase to keep pace. However, it is now well-accepted that the increased outputs cannot come at the expense of natural resources or the environment. Natural resources are limited, so the American

farmer is going to have to do more with less. The American farmer and Agri-business sector produces more food and fiber now with no more land than they did a century ago. Continued investments into innovation are required to meet and exceed the targeted needs for agricultural products.

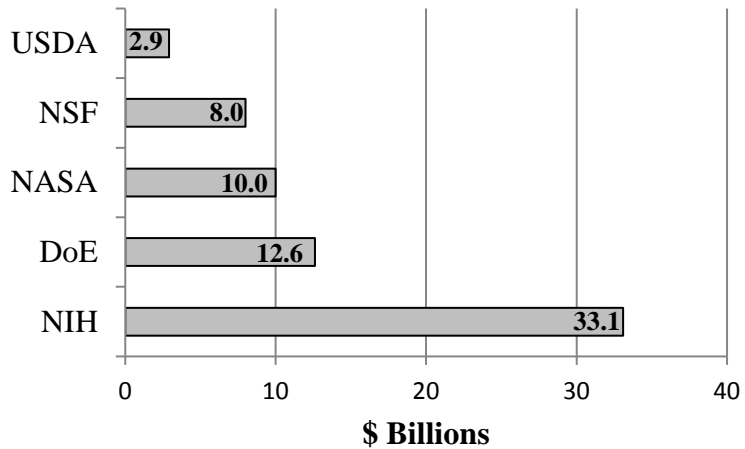
The importance of U.S. Agriculture is a nexus of our economic viability, national security and human health. Recent USDA Economic Research Service data indicate agriculture contributed \$992 billion to the U.S. GDP or about a 5.5 percent share. Additionally, agriculture and its related industries provided 11 percent of the US employment. Food security in the U.S. is unprecedented, and food only accounts for approximately 12 percent of household incomes. However, despite the overall access to food, there continues to be food insecurity in every county in the U.S. Further, one of the greatest security threats to the US is availability of nutritious food. High food prices and restricted access to food are known to destabilize regions, which was apparent in the Arab Spring of 2011. Food security is a complex issue and associated with it is also the increasing amount of over-nutrition. Over-weight and obesity rates in North America are reaching epidemic proportions, and the estimated annual costs associated with this is between \$1 and 2 trillion. It is well-accepted that one of the greatest risk factors for many non-communicable diseases is over-nutrition. Food science, behavior economics, nutritional education programs and arguably every aspect of Agri-business sector are going to be important in combating these complex issues.

Agriculture is Under Funded Relative to Other Programs

As you will undoubtedly hear today, the annual USDA research budget of \$2.9 billion (2017 requested budget) is disproportionately less when compared with other federal research programs. Figure 1 shows a comparison of the USDA's intramural and extramural research

programs with other leading federal research funding agencies. The importance of agricultural sciences is overlooked and often taken for granted. The contributions of agricultural sciences research to the advancements of the life sciences

Figure 1 : Annual Research Budgets



is meaningful and transects other disciplines like human health, energy, and basic science. Most agricultural research programs are trans-disciplinary in nature, and many of the most important issues facing humankind such as human health, food insecurity, environmental stewardship and economic viability arguably will be best addressed by trans-disciplinary approaches such as agricultural sciences research.

Non-Land-Grant Colleges of Agriculture

Institutions, Education, Training and Research

Seventy institutions in 27 states have Non-Land-Grant Colleges of Agriculture with long histories of successful programs educating and preparing professionals in agricultural sciences and natural resources. It was estimated in these 27 states that approximately half the baccalaureate degrees awarded each year in agricultural sciences and natural resources are from one of these institutions. In fact, more than 50,000 students on an annual basis are educated through one of these Non-Land-Grant Colleges of Agriculture. Another important characteristic of a large number of these institutions is they accommodate many under-represented student groups including: first generation students, minorities and rural students. Further, these public

institutions provide excellent translational research and outreach programs through their graduate studies and associated research efforts.

A 2015 report from Purdue University indicated that from 2015 to 2020 there will be a deficiency in the baccalaureate or higher degrees needed to fill new agricultural-related positions [<http://purdue.edu/usda/employment>]. They reported an expected annual need of 57,900 graduates and a growing workforce of only 35,400 new graduates with expertise in food, agriculture, renewable natural resources or the environment. Therefore, there is an expected 39 percent annual shortage of graduates to fill these positions, and the difference must be made up from other non-agricultural degree-based programs. Importantly, the report also notes employers prefer to hire students from agricultural-based degree programs.

Capacity Funding

The USDA has a unique but effective funding system with an annual budget of approximately \$850 million that is allocated to the Land-Grant Institutions as capacity-building funds and an annual budget for competitive grants of approximately \$700 million. A recent report funded by USDA evaluated the effectiveness of these two primary funding streams and found that both were effective and offered distinct benefits [<http://nifa.usda.gov>]. Importantly, it was noted in the report that although Non-Land-Grant Universities can submit grants to the competitive funding programs, they are likely at a disadvantage because many of these institutions do not have the capacity to compete with the Land-Grant Institutions because they do not have access to those capacity-building funds.

To help support such a capacity, the 2008 Farm Bill authorized a program to provide competitive grants to the Non-Land-Grant Colleges of Agriculture. The program was re-authorized in the 2014 Farm Bill. The first awards were allocated in FY12, and these grants have

been instrumental in developing academic, research and outreach capabilities at the Non-Land-Grant institutions. Here are just a few examples to give you an idea of the types of projects that were funded through this program:

- Fresno State, CA – “Expanding the research capacity in agricultural sciences through modernization of instrumentation”
- Chico State, CA – “Integrating agricultural education and outreach to increase profitability through local food marketing channels”
- Missouri State, MO – “Agriculture and food literacy initiative at Northwest Missouri State”
- Montclair State College, NJ – “Bridging the gap between New Jersey farmers and consumers through research, education, and outreach”
- Texas Tech University, TX – “Developing a generation of agricultural change agents in the battle for food security”
- University of Tennessee, Martin – “Building capacity for climate change education & expanding research opportunities in rural communities in TN & KY”
- Fort Hays State, KS – “Unmanned aerial systems and precision agriculture: building capacity in emerging technology”
- University of Wisconsin, Platteville – “Incorporating dairy livestock into agroecosystem research: grazing responsibly for a sustainable tomorrow”

As you can see from this non-exhaustive list, these competitive funds for Non-Land-Grant Colleges of Agriculture are used to purchase new research equipment, address relevant and emerging research areas, and educate students that will be the future workforce. Another important point is the regional diversity of the institutions that received funds through this

capacity-building program. As a result, these funds are supporting increased research and educational capacity in all regions of the U.S.

This competitive program has received approximately \$5 million in annual funding since 2012, which is comparatively small; but these funds are going a long way at improving research and education in agricultural sciences and natural resources management. Like the American farmer, we know that Non-Land-Grant Colleges of Agriculture have to do more with less. These capacity-building funds do not require state or private matching, which given the infancy of this program is important. However, we also recognize the importance of leveraging federal dollars with both state and private funding. An example from my time in the Texas State Legislature is a program our team of legislators developed and funded known as TRIP the Texas Research Incentive Program [<http://theeb.state.tx.us>]. It is a program where emerging research universities are awarded matching funds from the state based on how much an institution raises in private gifts and endowments to enhance research activities. Since 2010, Texas Tech University has received \$103.4 million dollars in matching funds through this program and the program has awarded a total \$291.3 million. These funds were used to increase research capacity at Texas Tech University, like in the case of a research gift from Bayer Crop Science that was matched by the State of Texas. The gift was used in support of the construction of a \$15 million state-of-the-art teaching and research Bayer Plant Science Building on the Texas Tech University campus. Undergraduate and graduate enrollment increased by approximately 25 percent in plant and soil sciences following construction. This is just one example of many of how this type of program is able to leverage resources to build research capacity at a Non-Land-Grant College of Agriculture. Further, this is an example of leveraging dollars to invest in much needed infrastructure in our Colleges of Agriculture at public universities.

In closing, I appreciate the opportunity to share the Texas Tech University System's perspective of our two Non-Land-Grant Colleges of Agriculture: Texas Tech University and Angelo State University. Investments in agricultural research and infrastructure build over time and are long-term investments in the future well-being of our nation. Research serves as the foundation of applied sciences to assist the industry in solving problems that have a direct impact on all aspects of our economy. As you continue your important work, we hope you will continue supporting and increasing the funding for the Non-Land-Grant Colleges of Agriculture competitive capacity-building program. The Texas Tech University System would like to work with the Committee to explore additional research partnerships to increase agricultural research investment opportunities for Non-Land-Grant Institutions with a proven research track record. We appreciate the Committee's continued support of agricultural research and look forward to working with the Committee as you reauthorize the Farm Bill.