2020 Annual Report of Accomplishments and Results

TEXAS
Prairie View A&M University Cooperative Extension Program (CEP)
Prairie View A&M University Cooperative Agricultural Research Center (CARC)

I. Report Overview

The NIFA reviewer will refer to the executive summary submitted in your FY 2020 Plan of Work located in the Institutional Profile. Use this space to provide updates if needed.

1. Executive Summary (Optional)

The Cooperative Extension Program (CEP) staff is to be commended for their exceptional transition to a new outreach and information delivery model to their targeted clientele during the COVID-19 pandemic. They had to re-package Extension products and continue to connect with families and stakeholders while adjusting to a new office: alternative work locations. Empowered to utilize technology like never before, the CEP team developed interactive online sessions, videos, and other educational resources. The Community and Economic Development staff administered Loan Packaging Programs that assisted 70 small business owners, and $151,676 was awarded. The 4-H staff reported 98,035 youth and adult contacts, with 63,640 enrolled in educational events. Other contacts recorded totaled 34,395. Athletes for Computer Science was started to address underserved youth and their access to curriculum enrichment opportunities and increase awareness and build enthusiasm for STEM careers. Other interactive sessions for youth include Junior Master Gardener, Egg to Chick, Water Education, and Jr. Youth Leadership Lab. Special interest 4-H project clubs increased in gardening and robotics, where 4,292 youth learned teamwork, problem-solving, critical thinking, engineering, and design. The 2501 Project offered several information events with producers, farmers, and landowners.

More than 48 applied for Micro Loans valued at $1 million. Limited resource agriculture producers have suffered from financial situations due to low market prices, seasonable droughts, and depleting government assistance programs for many years. The Agriculture and Natural Resources (AgNR) unit conducted over 63 educational workshops, educating more than 800 farmers and ranchers on livestock management, farm financial management, specialty crops, and sustainable agriculture programs. We have assisted farmers and ranchers impacted by COVID-19 apply for more than $100,000, and 48 applied for Micro Loans valued at $1 million. In addition, the AgNR unit organized the Sustainable African American Land Retention Program (SFLR), a half-million-dollar program to assist African American landowners in East Texas. The SFLR is organized through the AgNR Small Farm Outreach Program with assistance from the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NCRS), Farm Service Agency (FSA), community-based and private organizations, Texas A&M University, and the Texas Forest Service. The Texas Rural Workforce Academy was designed to bring skills training services to rural communities. The welding certification program trained

36 adults in 6-week classes, and 12 have accepted job placement. Fifty-one participants enrolled in the construction certification program, and 11 adults received apprentice certification in the electrical certification program. Nineteen completed the 5-week certified nursing assistant program. Sixty-eight new businesses were established through the Business in Development (BID) certification program. Also, 40 veteran-owned and women-owned businesses became HUB-certified and were awarded $2,479,734 in state of Texas contracts. Heroes 4-Health - reached more than 33,000 youth and trained over 800 teen ambassadors across Texas through the 4-H and Youth Development, Family and Community Health, and Expanded Food and Nutrition Education Programs (EFNEP). Family and Community Health county staff presented 500 education workshops to over 3,500 individuals using Diabetes Education Awareness and Prevention (DEAP), Balance Living, and A Taste of African American Heritage curriculums. Informal educational sessions trained 750 adults on mental health, first aid, and healing trauma to destigmatize mental health issues and encourage families to seek available resources if needed.

The Cooperative Agricultural Research Center (CARC) is the organizational unit responsible for coordinating agricultural research within the College of Agriculture and Human Sciences at Prairie View A&M University. CARC's mission is to conduct basic and applied research to produce research-based information and technological developments that improve the socio-economic conditions of the clientele it serves, especially the historically underserved. In that service, CARC coordinates research activities in five major areas: Animal Systems, Food Systems, Natural Resources and Environmental Systems, Plant Systems, and Social and Allied Programs.

The animal systems research unit continued its work in advancing the science and understanding of the physiological mechanisms affecting the grazing ruminants' reproductive performance. The use of this information to improve the livelihoods of Texans, the Gulf Coast region, the nation, and the world through its international mission. Currently, the Animal Systems research group has research projects focused on four areas: animal health and well-being, nutrition, functional genomics, and reproductive biology. The group seeks to expand to a new area in the coming year.

The Food Systems working group focuses significant efforts on issues of the regional and national importance of enhancing nutrition, food safety/quality, food security and insecurity, and the related impacts on the quality of life. Critical issues facing the underserved population locally, nationally, and globally involve the incidences of nutritional-related illnesses and diseases, such as diabetes and obesity, increased foodborne illnesses, and foodborne pathogens. The goals of this group are to advance knowledge in the understanding of nutrients and mechanisms implicated in illnesses and diseases, to increase the body of knowledge in the areas of quality and safety of meat, milk, and value-added products, and a newly added project addresses the issues of food security/insecurity. The Integrated Food Security Center is an outgrowth of the work done in the area of food security/insecurity.

The Plant Systems group works on many projects essential and vital portion to the regional economy. The unit is dedicated to developing a body of knowledge using a multidisciplinary approach to examine the efficacy of producing high-value, low-volume medicinal, and nutritional products. Current projects are focused on three areas: medicinal plants, develop locally grown food crops that have high economic potential, and hemp. In the past year, the group received permission to research industrial hemp, emerging as a significant focal point of the plant systems research. The Natural Resources and Environmental System focused its research under the general area of environmental management with a focus on the following areas:

estimating reference crop evapotranspiration under limited climate data in West Texas; performance of Multi-Radar Multi-Sensor (MRMS) product in monitoring precipitation under extreme events in Harris County, Texas; evaluation of gridded precipitation data for hydrologic modeling in North Central Texas; development of different tools to improve irrigation water management of crops and urban landscapes; an integrated approach to study and disseminate the impact of climate change on agriculture and water quality; soil health status baseline development using soil pH at PVAMU; pasture plots – organic matter study on the 90-acre property; and improvement of the global air quality during the COVID-19 pandemic.
The Social Systems and Allied Program group focuses its research efforts on examining factors impacting the quality of life. An understanding of these factors is vital in setting policies and programs that promote socioeconomic well-being. These factors are multi-dimensional and include some key indicators. Therefore, research scientists in the group have established research projects related explicitly to six key themes: food security/insecurity; health disparities; unemployment and income disparities; education/vocational; rural infrastructure; and emergency management and disaster readiness. The COVID-19 pandemic has added new meaning to the relevancy of this research. The challenges that we face in our communities have never been more apparent than now.

II. Merit and Scientific Peer Review Processes

The NIFA reviewer will refer to your 2020 Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA's attention.

Process	Updates Only
1. The Merit Review Process	The review panel is comprised of CEP administrative leaders, the Dean of the College of Agriculture and Human Sciences, the CARC director, scientists, faculty, and Texas AgriLife middle managers. These help to determine if appropriate strategies are designated to reach the limited resource clientele mandated by the USDA. The plans are reviewed based on needs assessment, planned programs, outcomes, and evaluation. This collaborative leadership team is responsible for overseeing and managing all programs designed and implemented by Extension staff members. All proposed research projects are funded under either Evans-Allen, Experiment Station (Hatch), or otherwise, undergo a merit review process. Each proposal submitted for support is routed through an internal review committee, and if deemed necessary, each submission is routed through the University Committee on Research. The Research Director selects individuals to serve as members of an internal review panel in consultation with the university's Vice President for Research. At a minimum, three individuals

	review and evaluate each proposed project before approval for external submittal and/or internal fund allocation.
2. The Scientific_Peer Review Process	Scientific peer review is incorporated in that all project reports including, the Current Research Information System, must show evidence of external review. Written comments should be included with final proposals for campus routing. Routing proposals through quality control checkpoints (Research Director, Dean of the College, and Vice President for Research) ensure that proposals meet RFP guidelines as well as meet scientific merit qualifications. All proposals are quality checked by our on-campus Office of Sponsored Programs.

III. Stakeholder Input

The NIFA reviewer will refer to your 2020 Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA's attention.

Stakeholder Input Aspects	Updates Only
1. Actions taken to seek stakeholder input that encouraged their participation with a brief explanation.	CEP used various methods to reach stakeholder groups within the state of Texas. Multiple input sources were gathered from stakeholders, including local clientele, commodity/special interest groups, various county committees, and elected officials. CEP also used media outlets such as public service announcements and online communications. Focused programs were conducted and analyzed, which led to priority setting and development of educational programs addressing the needs and issues raised by various stakeholder groups in the stakeholder input process. Extension used Leadership Advisory Boards (LABs) to validate issues raised in the local stakeholder input process. LABs serve as a conduit to local citizens and their needs. These boards are comprised of community opinion leaders charged with providing visioning and advocacy for the local Extension program. Additional citizens serve on program area committees, task forces, coalitions, and youth boards. These volunteers represent specific areas of the local program and are involved in issues identification, program development and delivery, evaluation and interpretation of programs, and other volunteers' management. These volunteers represent the counties in the state serviced by Cooperative Extension and Research.

2. Methods to identify individuals and groups and brief explanation.	CEP and CARC used open listening sessions in 35 counties as a means of getting grassroots involvement in its program planning and data collection process. These sessions allow local clientele to give their opinion on issues of importance to their communities. Additionally, LABs and other program advisory committees and groups provided input on program direction and implementation. CEP staff also met with various commodity and interest groups that provided insight into the targeted audience's issues.
3. Methods for collecting stakeholder input and brief explanation.	Data was collected via numerous methods from the stakeholders mentioned in the previous section, including meeting with advisory committees, holding open forums with clientele and other groups, and collected needs assessment and/or surveys at educational programs across the state. Likewise, Extension staff members identify needs while conducting research and working with clientele.
4. A Statement of how the input will be considered and brief explanation of what you learned from your stakeholders.	CEP used various methods to reach stakeholder groups within the State of Texas. Extension used multiple sources of input from stakeholders, including local clientele, commodity/special interest groups, emerging issues, various county committees, and elected officials. Extension staff analyzed these issues, which led to the priority setting and development of programs to address the stakeholders' needs and problems. Extension also used LABs to validate issues raised in the local stakeholder input process. LABs serve as a conduit to local citizens and their needs. These boards are comprised of community opinion leaders charged with providing long-term visioning and advocacy for the local Extension program. Additional citizens serve on program area committees, task forces, coalitions, and youth boards. These volunteers represent specific areas of the local program and are involved in issues identification, program development and delivery, evaluation and interpretation of programs, and other volunteer management. These volunteers represent the counties in the state serviced by the CEP and CARC.

IV. Critical Issues Table of Contents

No.	Critical Issues in order of appearance in Table V. Activities and Accomplishments (CTRL Click on the links to view the Individual Summaries)	
1.	Environmental Management	1. Estimating Reference Crop Evapotranspiration under Limited Climate Data in West Texas 2. Performance of Multi-Radar Multi-Sensor (MRMS) product in Monitoring Precipitation under Extreme Events in Harris County, Texas 3. Evaluation of Gridded Precipitation Data for Hydrologic Modeling in North-Central Texas 4. Development of Different Tools to Improve Irrigation Water Management of Crops and Urban Landscape 5. An Integrated Approach to Study and Disseminate the Impact of Climate Change on Agriculture and Water Quality 6. Soil Health Status Baseline Development Using Soil pH Monitoring on Three Hilltop Soil Map Units at PVAMU 7. Pasture Plots – Organic Matter Study on the 90-acre Property 8. Improvement of the Global Air Quality during the COVID-19 Pandemic
2	Healthy Lifestyles	9. Working on Health and Wellness 10. Addressing Childhood Obesity
3	Disaster Management & Outreach	11. Integrating Disaster Management in Farm Management Planning 12. Virtual Workshop - 1890-EDEN Advisory Group Annual Meet 13. Texas Community Resilience Virtual Listening Session
4	Fostering Strong Families	14. Working Together as a Family
5	Food Safety and Education	15. Staying Safe
6	Sustainable Livestock Management	16. Livestock Management Program 17. Comparison of two techniques for fixed-time artificial insemination in goats 18. Analysis of genes involved in sub-normal progesterone secretion by corpora lutea on Day 5 of the estrous cycle
7	Crop Production and Utilization	19. Sustainable Agriculture Program 20. Exploration of specialty and underutilized plant species for food, fiber and medicine and development of agricultural production in Texas to deliver multicultural necessities of society
8	Community and Economic Development	21. Businesses In Development (BID) Program 22. Homeownership and Rehabilitation Assistance 23. The Rural Workforce Academy (TRWA)

		24. Small Business grant and loan assistance in response to the COVID-19 pandemic effect on business
9	Preparing Youth for Life and Work	25. 4-H Garden At Home Series 26. Kids, Kows & More 27. Heroes 4-Health
10	Food Security in Texas Communities	28. Global Food Security, Hunger, and Nutrition Education

V. Activities and Accomplishments

Please provide information for activities that represent the best work of your institution(s). In your outcome or impact statement, please include the following elements (in any order): 1) the issue and its significance (e.g., who cares and why); 2) a brief description of key activities undertaken to achieve the goals and objectives; 3) changes in knowledge, behavior, or condition resulting from the project or program's activities; 4) who benefited and how. Please weave supporting data into the narrative.

No.	Project or Program Title	Outcome/Impact Statement	Critical Issue Name or No.
1.	**Estimating Reference Crop Evapotranspiration under Limited Climate Data in West Texas**	**Relevance:** Estimating crop reference evapotranspiration (ETo) is essential for many aspects of water resources planning and management, such as irrigation scheduling. Available widely used methods for calculating ETo use complete climate datasets to estimate daily ETo, whereas simple evapotranspiration models based on radiation and temperature use limited climate data. **Response:** In this study, daily crop reference evapotranspiration (ETo) estimated using the temperature-based Hargreaves-Samani (HS) equation was compared and evaluated with those estimated using the standard FAO-ETo at different West Texas Mesonet stations. **Results:** The results showed that the HS equation with original coefficients underestimated daily ETo values compared to FAO-ETo data. New coefficients of the globally, monthly, and regionally calibrated HS equation against FAO-ETo data were derived and proposed for more accurate daily ETo estimates in West Texas. Based on the results of global, monthly, and regional calibration scenarios, ETo estimated by the calibrated and validated HS equation using fitted month-specific coefficients showed better	**Environmental Management**

		agreement with FAO-ETo both within and outside the calibration region. The research findings were published in a peer-reviewed journal and available for the general public and scientific community.	
2.	**Performance of Multi-Radar Multi-Sensor (MRMS) product in Monitoring Precipitation under Extreme Events in Harris County, Texas**	**Relevance:** With an increase in intensity and frequency of extreme precipitations resulting from climate change, it is necessary to develop effective strategies for emergency flood management plans. It is critical to integrate high-resolution hydro-meteorological data (e.g., precipitation) as input for hydrologic modeling to predict and reduce the negative impact of floods accurately. The MRMS data are available at relatively high spatial (1 km) and temporal (2 min) resolutions across the continental United States. MRMS's accuracy in measuring actual precipitation needs to be investigated across some urban areas such as Harris County, Texas. **Response:** A study was conducted to evaluate: the performance of the MRMS system compared to other precipitation products [rain gauge network, Multisensory Precipitation Estimator (MPE)] at different spatial and temporal aggregations during four major flooding events: May 2015 (Memorial Day flood), April 2016 (Tax Day Flood), August 2017 (Hurricane Harvey), and September 2019 (Tropical Storm Imelda) in Harris County, Texas; and the effects of temporal and spatial aggregation scales on the performance of the MRMS system using a suite of statistical parameters. Point-to-grid comparisons were conducted between 142 rain gauges and MRMS system data during four extreme flood events. **Results:** Overall, the MRMS system captured precipitation reasonably well. The results indicate that MRMS product tends to underestimate higher precipitation rates and overestimate light precipitation. Comparing MPE QPE and MRMS products at hourly temporal resolution with gauge observations showed that both products estimate rainfall accurately for the four events. One postdoc was trained in collecting and analyzing precipitation data. The paper related to this research is currently under review.	**Environmental Management**

3.	**Evaluation of Gridded Precipitation Data for Hydrologic Modeling in North-Central Texas**	**Relevance:** High-resolution good quality precipitation data plays a critical role in managing surface and groundwater water resources. Precipitation is the driving component of the water cycle governing surface flows, groundwater recharge, baseflow, ETo, and other hydrologic processes. Precipitation is, therefore, important in many scientific and operational applications such as weather prediction and flood and drought forecasting. Rain gauges provide a relatively accurate and reliable measurement of point-scale precipitation. However, they suffer from many limitations, including poor spatial representation of rainfall distribution due to the sparse gauge network. **Response:** This study investigated to characterize the in situ and remotely sensed precipitation data in the Texas environment. We used ten gauge-based and satellite-based precipitation datasets, including measured gauge data from Global Historical Climate Network (GHCN), to access their applicability for hydrologic modeling at the Bosque River basin (4,300 km2) in North-Central Texas. Gauge-based datasets include Daymet and Parameter-elevation Regression on Independent Slope Model (PRISM) while satellite-based datasets include Integrated Multi-satellite Retrievals for Global Precipitation Measurement, Early, Late, and Final (IMERG), Precipitation Estimation from Remotely Sensed Information Using Artificial Neural Networks (PERSIANN), PERSIANN-Climate Data Record (CDR), PERSIANN-Cloud Classification System (CCS), and Climate Hazards Group Infrared Precipitation with Station (CHIRPS) data. This study used the Soil and Water Assessment Tool (SWAT) for hydrologic simulation. **Results:** Results indicated similar or better model performance statistics from gauge-based (Daymet and PRISM) and satellite-based gauge-corrected products (e.g., CHIRPS) compared to the GHCN data. Gauge-based datasets (PRISM and Daymet) did not show significant differences in prediction accuracies between seasons. Satellite-based-gauge-corrected datasets IMERG-Final, CHIRPS, and PERSIANN-CDR showed slightly better mean performances statistics in November through May season. This project benefits watershed managers and researchers through the presentation. This	**Environmental Management**

		work was presented at the American Water Resources Association (AWRA) annual meeting in October 2020.	
4.	**Development of Different Tools to Improve Irrigation Water Management of Crops and Urban Landscapes**	**Relevance:** Agricultural and urban landscape irrigation, including golf courses, uses a substantial portion of freshwater in Texas. The main goal of this project is to improve irrigation water management of crops through the development, testing, validation, and dissemination of the mobile-web-app irrigation-related tools which use near real-time and historical weather data (rainfall and Evapotranspiration), site-specific soil hydrologic data, and crop-specific crop coefficients under urban and agricultural production environmental conditions across Texas and the United States. **Response:** This project regularly updates web-based irrigation scheduling tools IrrigWise, IrrigWise-PRISM, and the Android app. We improved Irrigation Water Estimator for Texas (IWET), a web-based tool for crop and urban landscape irrigation water requirement calculation, adding a new function in the tool. All these tools are available on the website: http://irrigwise.pvamu.edu/introduction/index.php. **Results:** These tools were introduced to undergraduate students in the Environmental Soil Science course and other students, agricultural professionals, and researchers in the ASA-CSSA-SSSA International Annual Meeting. One postdoc and two students (one graduate and one undergraduate) were trained in developing web applications and collecting required data. The research findings were published in a peer-reviewed journal and proceedings for the general public and scientific community.	**Environmental Management**
5.	**An Integrated Approach to Study and Disseminate the Impact of Climate Change on Agriculture and Water Quality**	**Relevance:** Climate change is a combination of long-term changes to greenhouse gases leading to varying impacts on the earth's elements and sustainability, ranging from warmer oceans, melting glaciers, increasing sea levels; it relates to shifts in weather patterns and elements such as temperature, precipitation. Currently, farmers, growers, and ranchers have limited knowledge and awareness in producers about the impact of climate change on agriculture and water quality from agricultural watersheds.	**Environmental Management**

		Response: This project focused on investigating the effect of projected climate or climate change on major crops grown in Texas through field experiments and modeling. This study used the Soil and Water Assessment Tool (SWAT) for hydrologic simulation. This study used future (2020-2099) temperature and precipitation projections for the Bosque River basin (4,300 km2) in North Central Texas to evaluate climate change effects on agriculture and water quality. We used an ensemble of future climate projections generated from three GCMs (MIROC5, MPI-ESM-LR, CCSM4), three Representative Concentration Pathways (RCPs) (2.6, 4.5, and 8.5), three downscaling methods (delta-change method, Equidistant Quantile Mapping and Piecewise Asynchronous Regression Model) and three input climate datasets (Daymet, PRISM, and Livneh) to account for the future uncertainty. **Results:** Preliminary results indicated slight declines in precipitation (0-15%) and streamflow (0-25%) in the basin, along with increased irrigation demands due to increased temperatures and reduced precipitation in the future. This study should help decision-makers and other stakeholders to understand the potential impact of climate change on streamflow and crop water requirements. Graduate and undergraduate students, researchers, and growers benefit through gained knowledge and awareness from the project activities.	
6.	**Soil Health Status Baseline Development Using Soil pH Monitoring on Three Hilltop Soil Map Units at PVAMU**	**Relevance:** The soil pH results can provide some indication of the potential availability of nutrients to plants if the soil nutrient level is adequate for plant growth. Soil pH is a primary indicator for soil health as well as soil quality since it reflects growth potential for beneficial plants such as row crops (annual), pasture (grazing or hay), shrubs, and trees (permaculture). **Response:** Soil pH and water pH were measured following standard procedures. The soil samples were collected from seven locations in the Hockley, Kenney, Mentz, and Moakley soil units at 0-4 inches in soil pits with water and at 72 inches in dry soil pits to access the pH conditions in the topsoil and subsoil. Triplicate (three) samples of soil and water from each soil pit were used to produce the mean and standard deviation values for the	**Environmental Management**

		statistical analyses. Soil pH data from the six soil pits and one pond dam sample within the individual soil units provided spatial variability information that assists the overall project goals of baseline assessment to provide higher quality land management in future agricultural operations. Water pH data from three soil pits and one pond adjacent to the property were monitored to compare with the soil pH values surrounding the same sites. Also, data from a previous study was used as an additional comparison to determine spatial variability by landscape position, soil type, and elevation on the property. **Results:** The results showed soil pH values at soil pits 1, 3, and 5 were significantly lower ($p<0.05$) than the water pH values, as well as at the pond dam compared to the pond adjacent to the 90-acre property. This observation indicated the soil's acidity is not significantly lowering the pH of the water in the ponds either on or adjacent to the property. The highest water pH value (9.34) and the highest soil pH value (7.96) occurred at soil pit 5 at the highest elevation (289). The study will continue in the spring of 2021 with an additional sampling of the soil pits, the surrounding surface soils, and ephemeral surface water that may be present during the winter and early spring periods. The additional data will be analyzed statistically and compared to the previously collected and analyzed dataset. This project provided an opportunity for agriculture students to gain practical, technical, and "hands-on" knowledge about an important chemical indicator (pH) of soil and water conditions that can be used to infer knowledge about soil health status and the growth potential for beneficial plant and weed species.	
7.	**Pasture Plots – Organic Matter Study on the 90-acre Property**	**Relevance:** This study aims to determine the amount, type, and size of organic matter stored at the soil surface and in the upper surface soil (0-4 inches) after traditional pasture mowing techniques. The pastures in the study area have been maintained on an irregular mowing schedule during the last 10 years. As a result, a wide range of weedy species (including wooly croton, goldenrod, dewberries, rattle bean bush, yaupon holly, senna or septic weed, annual and perennial flowering species), native grasses (including broom sedge and bushy bluestem, and King Ranch bluestem), and improved grasses (including Coastal and Jiggs bermudagrass) have	**Environmental Management**

		grown in an uncontrolled manner. Noticing the amount of biomass that remains on the surface of the soil when mowed on an irregular basis, we are interested in the amount, type, and size of organic matter that is maintained at the soil surface and in the upper surface soil after mowing (shredding) is resumed regularly. **Response:** Eighteen plots that are approximately 75 feet by 150 feet are split into nine lower and nine upper slope zones with triplicate treatments of control (non-mowed), shredded, and scalped areas. The treatment areas are randomly assigned within each of the two slope zones that will be compared to the one year post shredded area that borders the lower slope zone. The research project area surrounds the 10 cover crops plot used in another portion of the soil health project. The plant species within each plot will be surveyed before shredding (mowing) and scalping (double shredding). The amount, type, and size of organic matter at the soil surface and within the upper surface soil will be recorded before mowing and one month, three months, and six months after mowing. **Results:** Expected results include data related to organic matter (biomass) accumulation and loss at the soil surface and in the upper surface soil as impacted by pasture management techniques. The results shared from this study benefits ranch and landowners who manage properties at varying levels based on productivity, accessibility, and capital resources available as impacted by environmental conditions on pasturelands.	
8.	**Improvement of the Global Air Quality during the COVID-19 Pandemic**	**Relevance:** Dramatic improvement in the global air quality occurred and was documented by several studies that reported improved air quality worldwide. Most of these recent studies are city- or country-specific using satellite-based data. While satellite-based measurements give a good view of pollution over a region, ground-based air quality data provide site-specific information on pollution levels people are experiencing daily. **Response:** This investigation studied the impacts of the global response to COVID-19 on air pollution and air quality changes in major cities across the globe over the past few months. Air quality data (NO2, CO, PM 2.5, and	**Environmental Management**

		O3) were downloaded from the World Air Quality Index project for the January 2019–April 2020 period. **Results**: Results show a significant reduction in the levels of 2020 NO2, CO, and PM 2.5 compared to their levels in 2019. These reductions were as high as 63% (Wuhan, China), 61% (Lima, Peru), and 61% (Berlin, Germany), in NO2, CO, and PM2.5 levels, respectively. In contrast, 2020 O3 levels increased as high as 86% (Milan, Italy) in an apparent response to the decrease in titration by nitrogen monoxide and its derivatives. Significant differences in the weather conditions across the globe do not seem to impact this air quality improvement trend. Some of the research findings were published in a peer-reviewed journal. Preliminary results were disseminated to the public, the scientific community, and eXtension Foundation Climate Fellows through presentations at conferences and the ECOP (Extension Committee on Organization and Policy) program.	
9.	**Working on Health and Wellness**	**Relevance:** The definition of balance is stability, equality, and harmony. Balanced living is achieved by taking appropriate care of all areas of life. Individuals achieve greater life balance when they do not let one area of life take over all their time at the expense of other priorities. Overdoing or underdoing even good things like physical activity can lead to imbalance. Ultimately, living an unbalanced life can lead to stress, health problems, poor relationships, and lost productivity. Although many things are a part of balanced living, time management, stress management, mindful eating, physical activity, and sleep are the major components addressed in this curriculum because these areas tend to be overlooked when life gets hectic or out of control. The goal of this series is for participants to gain knowledge and skills to live a more balanced life. Balanced Living is a five-part series: "Balance Your Time," "Manage Your Stress," "Feed Your Body," "Move Your Body," and "Rest Your Body." Each session is designed to run for one hour. **Response:** Work, school, family time, social life, work commitments, and mobility affected our daily lives while navigating through COVID-19.	**Healthy Lifestyle**

		Family and Community Health agents reached out to the Program Area Committee members to address the new issues individuals and families were confronted with abruptly. The "Balanced Living" curriculum is designed as a five-week series that addresses areas of concern for the underserved and underrepresented clientele. Family and Community Health agents enrolled over 400 adults within these workshops throughout Texas over seven months to implement this curriculum. **Results:** Education programs were conducted using technology, and of the 303 participants surveyed, 65% stated they would determine priorities regularly, 45% said they ate mindfully, and 75% increased physical activity. Unfortunately, there was a reduction from 78%, stating they recognized and responded to stress levels to 36% of participants' ability to recognize and respond to stress.	
10.	**Addressing Childhood Obesity**	**Relevance:** According to The State of Childhood Obesity (https://stateofchildhoodobesity.org/states/tx/), 17.3% of Texas youth ages 10 to 17 are obese, giving our state a ranking of 12 among the 50 states and District of Columbia. The obesity rate in Texas for adults was 34%, for high school students 16.9%, and for WIC participants ages 2-4 14.6%, placing the state18th out of 51 states in the obesity rate in the nation in 2018-2019. The obesity rate in 2018 by race was: 31.5% White, 40% Black, and 37.9% Latino. Obesity is linked to diet-related diseases, including coronary heart disease, hypertension and stroke, Type 2 diabetes, and certain types of cancer. Poor health and diet-related illness have a devastating impact on households. The annual cost associated with excess weight in Texas is $15.6 billion in 2010 and could increase to $39 billion by 2040. Also, aside from obesity putting people at risk for the previously mentioned diseases, it increases the risk of severe illness from COVID-19, according to the Center for Disease Control. **Response:** Although 2020 was quite different and more challenging than prior years, the CEP's Family and Community Health unit relied on trusted volunteers' strength and dedication. The assistance and support allowed agents to implement programs using their volunteers and committee	**Healthy Lifestyle**

		members. Education workshops were conducted through social media, Zoom, and Microsoft Teams to implement the "Choose Health Food Fun and Fitness," "Eat Smart Being Active," "A Taste of African Heritage," and "A Taste of Latin Heritage" curriculums. **Results:** Of the 334 youth who completed the education workshops conducted by Extension agents, 242 (72%) participants reported they drink less soda or pop and substitute with water or other unsweetened beverages, 182 of 334 (54%) increased physical activity to 30 minutes per day, and 218 of 334 (65%) try new healthy foods. A total of 197 of 199 adult participants increased their consumption of fruits, vegetables, red, and orange vegetables and drank less sweetened beverages. Additionally, 92% (184 of 199) of participants engaged in 30 minutes of physical activity by doing workouts to build and strengthen muscles or making small changes to be more active.	
11.	**Integrating Disaster Management in Farm Management Planning**	**Relevance:** These efforts aim to strengthen the Agricultural producers' capacity and commitment to understand and address disaster issues that impact them; and to maintain close ties with USDA and related agency personnel while using ongoing work relations with local interest groups. Pertinent issues include risk management, refining strategies, training, and nurturing collaborative partnerships. **Response:** Agricultural producers in Walker County participated in a workshop. Sessions included information on Emergency Support Function (ESF 11), USDA risk management programs, local government resources, and components of farm management disaster plans. **Results:** All participants (100) gained valuable knowledge about the Emergency Support Function (ESF 11), USDA risk management programs, local government resources, and components of farm management disaster plans. Most (85%) agreed their behaviors would change based on the activities of the workshop. Since the topics can be presented virtually, we	**Disaster Management & Outreach**

		agreed to host future sessions on individual topics. We will explore the idea of training local experts to conduct future presentations.	
12.	**Virtual Workshop - 1890-EDEN Advisory Group Annual Meet**	**Relevance:** This workshop delivered activities for 1890 Land-Grant Universities (LGUs) to collaborate on disaster programming and responses to Request for Applications (RFAs). There will be training that targets disaster victims (individuals and families), agencies, universities, and political leaders. The purpose is to encourage a culture of pre-planning and collaboration with limited resource agricultural producers from Texas, Tennessee, Florida, Arkansas, Alabama, and North Carolina. The workshop will embrace the ambitious goals of identifying disaster-related challenges faced by agricultural producers, strategy development, COVID-19 response programming, and PhotoVoice training for 1890 personnel participating in research grants. **Response:** Participants from fifteen LGUs participated in a two-day virtual workshop. Activities included a business session to plan 2020 activities for LGUs to collaborate on disaster programming and responses to RFAs and a training session; a special session engaged limited resource agricultural producers from Texas, Tennessee, Florida, Arkansas, Alabama, and North Carolina in a session to identify disaster-related challenges they faced by agricultural producers, strategy development; and COVID-19 response programming and PhotoVoice training for 1890 personnel participating in research grants. **Results:** Participants in the business session to plan 2020 activities for LGUs to collaborate on disaster programming indicated they gained valuable knowledge. All participants had an affirmative response (90% strongly agreed, and 10% agreed), stating the training session was helpful. As a result, they would change their behavior according to the knowledge gained. Data about disaster-related challenges was collected from limited	**Disaster Management & Outreach**

		resource agricultural producers from Texas, Tennessee, Florida, Arkansas, Alabama, and North Carolina.	
13.	**Texas Community Resilience Virtual Listening Session**	**Relevance:** This program's purpose was to strengthen the capacity and commitment to understand and address disaster issues that impact the entire community. Participants must be knowledgeable of a comprehensive emergency management approach to disaster preparedness. One of the aims is to encourage a culture of pre-planning before a disaster. **Response:** A cross-section of participants (emergency manager, mayor, police chief, first responders, Extension staff, persons from grassroots organizations, and community members) participated in a two-hour virtual listening session that focused on issues and topics related to disaster preparedness in your community. **Results:** All participants were actively engaged in the critical issues of disaster preparedness in the community. Everyone (100%) indicated that they learned something new or gained valuable knowledge for preparing the community for disasters and local emergencies. One of the comments was to have more sessions similar to this and not wait until after a disaster to communicate. Although we cannot predict disasters, we can undoubtedly make adequate preparations before they occur.	**Disaster Management & Outreach**
14.	**Working Together as a Family**	**Relevance:** One in five Americans has a mental illness or substance use disorder, yet many are reluctant to seek help or simply don't know where to turn for care. Recognizing mental health and substance use challenges can be difficult, which is why it's crucial for everyone to understand the warning signs and risk factors. Even when friends and family of someone who may be developing a mental illness recognize that something is amiss, they may not know how to intervene or direct the person to proper treatment. All too often, those in need of mental health services do not get them until it is too late. Mental Health First Aid encourages early detection and intervention by teaching participants about the signs and symptoms of specific illnesses like	**Fostering Strong Families**

		anxiety, depression, schizophrenia, bipolar disorder, eating disorders, and addictions. The program offers concrete tools and answers key questions like "What can I do?" and "Where can someone find help?" Participants are introduced to local mental health resources, national organizations, support groups, and online mental health and addiction treatment tools and support. **Response:** Due to the stress many were feeling with the COVID-19 pandemic, a CEP program specialist conducted virtual training for nine county agents on "Healing Trauma" and "Mind Matters" within their counties. Within six CEP counties, agents are teaching the "Healing Trauma" curriculum for adults. "Healing Trauma" is an evidence-based, gender-responsive, six-session (90-minute sessions) curriculum for women, specifically designed for settings in which a short-term intervention is needed. Examples where agents teach this curriculum include a domestic violence shelter, a homeless shelter, and with individuals experiencing traumatic life events. The curriculum uses psychoeducational and cognitive-behavioral therapy (CBT) techniques, expressive arts, body-focused exercises, mindfulness, and relational therapy. Youth participated in the "Mind Matters – Overcoming Adversity and Building Resilience" curriculum. Individuals experiencing trauma and toxic stress often have difficulty regulating their emotional responses when facing challenges in school, life, and relationships. The "Mind Matters" lessons teach people ages 12 and older to heal from adverse childhood experiences (ACEs) and other negative experiences with innovative methods based on current research. These skills give individuals a way to take charge of their emotions and improve their states of mind. Additionally, one of the agents has used yoga to expose these individuals to exercise and relaxation. CEP agents incorporated "Healing Trauma" for about 175 participants for six sessions and 12 lessons on Mind Matters for about 100 Youth. Participants have stated that they have overcome fears, let go of the past, and feel happier. **Results:** Adults who participated in the "Healing Trauma" curriculum, 98% of participants state that they can recognize the signs that someone may be dealing with a mental health problem or crisis as a result of this course. 96% of participants stated that they can reach out to someone who may be dealing	

		with a mental health problem or crisis as a result of taking this course. 93% of participants stated they can now assist a person dealing with a mental health problem or crisis to connect with community, peer, and personal supports as a result of taking this course. Youth provided testimonials of how the education classes benefited their ability to process negative information on social media, boost self-esteem, and the process of overcoming traumatic experiences.	
15.	**Staying Safe**	**Relevance:** Having good hand hygiene is one of the keys to preventing food poisoning. Washing your hands helps keep pathogens from spreading and protects from food contamination. Due to Texas' hot temperatures, it is recommended that food is kept at the proper temperatures because bacteria typically need heat to grow, and leaving foods out too long can be dangerous. Each year, an estimated one in six people become ill from the food they eat. Common symptoms of the foodborne disease include nausea, vomiting, diarrhea, abdominal cramping, fever, and headache. While some people may view this as a mere case of "food poisoning," foodborne illness has serious health and economic consequences. In fact, foodborne illnesses from five pathogens alone (campylobacter, salmonella, listeria monocytogenes, E. coli O157:H7, and E. coli non-O157:H7 STEC) cost more than $6.9 billion in medical expenses, lost productivity, and even death. All clientele are at risk for foodborne illness, but older adults, pregnant women, young children, individuals with chronic disease, and those with a compromised immune system are at an increased risk. Because nearly half of our food dollars are spent on foods eaten away from home, it is imperative that employees who work in retail foodservice handle food safely. **Response:** To meet the need for quality food safety education in Texas retail food establishments, the Food Protection Management (FPM) program was developed. The two-day certified food manager program prepares food service workers to sit for the state Certified Food Manager exam. The two-hour food handler program, accredited by the Department of State Health Services, trains front-line food service workers on the basic principles of food safety. Both programs are conducted at the county level by Extension	**Food Safety and Education**

		agents. Extension agents led education programs to limited resource clientele on proper washing fruits and vegetables, placing cold foods back in the refrigerator, washing hands under hot running water, and eliminating cross-contamination. **Results:** In 2020, 13 adult participants completed the virtual Spanish Food Handler class. All 13 participants completed the pre-and post-test. Change in knowledge (pre- vs. post-) was used to evaluate the food handler program. In addition, client (customer) satisfaction surveys were collected from participants. There were six males and seven females in the class. All reported being Hispanic and of adult age. All participants requested that the instructional and testing material in Spanish. After completing classes, 86% of 122 participants now wash their hands before eating, 64% of 122 participants wash their fruit and vegetables before eating, which is an increase from 14% who washed their fruit and vegetables on the pre-survey, and 64% now put food in the refrigerator within 2 hours.	
16.	**Livestock Management Program**	**Relevance:** Limited-resource agriculture producers have suffered from financial situations due to low market prices, seasonable droughts, and depleting government assistance programs for many years. In addition, some lack agricultural resources. **Response:** To address this issue, 19 livestock management educational programs were conducted through the CEP Agriculture and Natural Resources (AgNR) unit. The workshops focused on beef cattle production and management, increasing small ruminant production, nutrition management, pasture and heyland management, and external and internal parasite control. The education programs increased knowledge about practices, changed techniques perceptions to improve livestock production, and had the potential to improve savings. **Results:** The CEP AgNR unit utilized an electronic retrospective post-evaluation education program survey evaluation, and some participants revealed 75% gain knowledge about the program. All of the participants (100%) felt like their management and operation decision regarding farm	**Sustainable Livestock Management**

		operations will be different, and some participants believe that the information through our education programs will have potential individual estimated cost savings between $100-$5,000.	
17.	**Comparison of two techniques for fixed-time artificial insemination in goats**	**Relevance:** The profitability of livestock production is linked to reproductive success. The largest proportion of pregnancy failures occurs during the first 30 days of pregnancy and are magnified when artificial insemination is used to improve genetic merit. **Response:** The efficacy of transcervical (TC) and intracervical (IC) semen deposition was evaluated for pregnancy per artificial insemination (P/AI) in a fixed-time artificial insemination (FTAI) program in the goat. Three breeds (Alpine, n=50, Boer, n=17, and Spanish n=20) were synchronized by a co-synch program and then inseminated by traditional TC (n=52) or a new commercial (RamGo, TecnoGen) IC technique (n=35) which requires less technical skills. No difference in P/AI was noted between the TC or IC technique (45.7 and 30.8 %, respectively). A significant difference in the P/AI among the breeds was apparent. Spanish does record a lower P/AI than the Boer, and Alpine does (10 vs. 41.2 and 46 %, respectively). **Results:** This study demonstrated that ICAI requires less technical proficiency and is a practical technique for FTAI in the goat. This technique will increase the breadth of people that can utilize FTAI as a management tool to increase genetic merit in goats. The P/AI results further revealed a need for continued evaluation of the optimal timing of insemination between different goat breeds that will further increase efficiency.	**Sustainable Livestock Management**
18.	**Analysis of genes involved in sub-normal progesterone secretion by corpora lutea on Day 5 of the estrous cycle**	**Relevance:** Progesterone secretion by the caprine corpus luteum (CL) is essential for the establishment and maintenance of pregnancy and required throughout gestation in goats. Estrus synchronization programs for artificial insemination (AI) is a widely used practice. When estrus synchronization schemes are utilized, between 20-60 % of does short-cycle because the CL abnormally regresses at day five. This decreases the efficiency of AI programs where fertilization occurs but loss of progesterone secretion results in early embryonic loss.	**Sustainable Livestock Management**

		Response: This study was conducted to characterize gene profiles (RNA-seq) in abnormal regressing and normal cycling day five CL in the goat. A total of 33,433 differentially expressed genes were detected. When abnormally regressed and normal cycling CL were compared, 932 genes were upregulated, and 584 genes were downregulated (log fold change > 1 and Padj < 0.05). Gene overrepresentation analysis revealed 374 significantly enriched factors (Padj < 0.05) in the biological process category, including DEGs involved in response to altered oxygen levels. KEGG enrichment analysis indicated two pathways, steroid biosynthesis and terpenoid backbone biosynthesis were altered (Padj < 0.1) in abnormal CL. **Results:** This study provides initial insights into the genomic attributes of abnormally regressing CL that results in inadequate progesterone secretion and early pregnancy losses.	
19.	**Sustainable Agriculture Program**	**Relevance:** Through the AgNR sustainable agriculture programs, we educate small and limited resource farmers and ranchers as a result of their lack of knowledge of the crops, marketing, and USDA programs and services for sustainable farming practices within an integrated system of plant and animal production practices. **Response:** The AgNR Unit identified issues related to production needs. Twenty-one virtual educational programs were conducted to increase agriculture producers' knowledge and attitude through workshops that could help them compete in today's agriculture industry. The Sustainable Agriculture Program educated limited-resource producers through workshops on the benefits of cover crop, apiculture and beekeeping, integrated pest management (IPM), and improving soil health. In addition, we conducted "Controlling Feral Hog" workshops. With the rise of feral swine infestation competing for territory due to rural and urban development in Texas, CEP workshops educated landowners on how to trap, prevent, and eliminate feral swine issues. More than 1,400 feral hogs were trapped in	**Crop Production & Utilization**

		three years, and the Feral Hog Coalition built 27 traps at multiple sites. corrals, box, boar, and jaeger traps built. **Results:** Evaluation results from one workshop indicated that 100% of participants gained helpful and valuable knowledge of USDA cost-share programs and services. 100% will increase participation in more federal, state, and local programs. The Feral Swine program has helped capture thousands of feral hogs. In the Fort Bend County trapping demonstration alone, 100% of the participants stated they would change their current environment to prevent feral swine damage. 100% increased their knowledge gained, skill level in feral swine prevention, and interest in the subject matter. 96% of participants gained a new opinion about feral swine trapping, and 93% adopted new practices presented. 100% indicated they would make better-informed decisions, participate in more feral Swine programs, believe their economic conditions would change.	
20.	**Exploration of specialty and underutilized plant species for food, fiber and medicine and development of agricultural production in Texas to deliver multicultural necessities of society.**	**Relevance:** Texas, particularly the Greater Houston area, has a diverse ethnic representation where there is a rich food culture that includes many edible plant species with high nutritional and medicinal properties. Most of these plant species can be grown successfully in subtropical climate settings in Texas, allowing the community to grow these species as cash crops, develop new products, and blend these species into the American food culture. **Response:** Germplasm development of various medicinal species, under-utilized species, and novel crops such as industrial hemp is made, allowing our researchers to conduct comprehensive studies on their genetic characterization, agronomy, and biochemical evaluation and enhance public awareness of these species with credible scientific research data. **Results:** The study of medicinal plants for potential bioactive molecules, industrial hemp genetic characterization, Agronomic studies of selected green vegetables and superfruits, and developing new sweet potato breeds are successfully progressing. Workshops, public awareness programs, and webinars (due to the COVID-19 pandemic) were held. We also developed	**Crop Production & Utilization**

		public and private partnerships aligning further research and development needs.	
21.	**Businesses In Development (BID) Program**	**Relevance:** Higher than acceptable unemployment among majority and minority population groups continues to threaten family and community health and prosperity. Non-traditional skill sets and education are needed to allow a paradigm shift that improves economic outcomes. Minority agricultural producers, agri-businesses, and startup micro-businesses, the majority of whom are first-generation entrepreneurs, continue to suffer from a lack of qualified technical assistance, financial record-keeping, and access to capital. The unemployment rate for minorities continues to be significantly higher than unemployment in the majority population (exceeding 20% in some communities). Pervasive layoffs and continuing high unemployment numbers have forced a new wave of aspiring entrepreneurs ill-equipped to survive in an already tough marketplace flooded with displaced public and private sector individuals attempting to earn a living as business owners. Lack of training and network is one reason why minority-owned businesses generate minimal income and fail at a much higher rate than those owned by non-minority entrepreneurs. **Response:** In 2020, staff in Waller, El Paso, Liberty, Willacy, and Zavala counties conducted the Businesses in Development (BID) program, a nine-week state contracting training course. Because of the COVID-19 pandemic, the program was modified to be online, which affected participation. The workshops focused on training new and existing businesses on getting and successfully executing state contracts for business. Community and Economic Development (CED) staff also provided one-on-one counseling to individuals to start a business, maintain their business, develop business plans, and apply for small business loans. **Results:** • 18 participants trained • 26 new HUBs certified • 11 of 22 contracts approved	**Community and Resource Development**

		• Amount of State Contracts Approved: $5,359,234.	
22.	**Homeownership and Rehabilitation Assistance**	**Relevance:** Minorities and limited-resource clientele are disproportionally lacking in homeownership. Home buying has always been a means of building wealth and increasing assets. As a result of limited home purchasing knowledge, more people are hesitant to purchase a home. Specifically, limited-resource clientele finds it difficult to apply and buy a home and find it easier to purchase a depreciating asset like a new expensive vehicle. The Homeownership and Rehabilitation Assistance Program provide technical assistance and loan packaging for potential applicants interested in homeownership programs available through USDA Rural Development. The program aims to assist potential applicants with the application process by gathering the necessary documents, assisting with completing the application, reviewing documentation to determine if the potential applicant may qualify, and providing counseling to those who may not yet be ready for homeownership. **Response:** • Promote and market USDA RD 502 Direct Program to very low- and low-income application, especially in counties not covered by USDA RD Field Office • Provide homeownership education outreach and awareness on homeownership/repair programs offered by USDA Rural Development (502, 504 & 523 Self-Help Program) • Meet with potential applicants and discuss income/credit/program requirements • Support USDA RD mission, vision, and new business model for providing affordable homeownership **Results:** • 10 first-time homeowners assisted • $761,007 total home loans approved • $16,260 total down payment assistance received • 1 IDA enrollment	**Community and Economic Development**

		• $3,800: IDA amounts received	
23.	**The Rural Workforce Academy (TRWA)**	**Relevance:** Many rural communities lack access to skills training programs compared to urban areas and often trail behind in four-year college graduation rates. Skills trade training programs build up communities by providing additional options to community members who find college less desirable and prefer a hands-on career. **Response:** The Rural Workforce Academy (TRWA) is a pilot program funded by a grant from the U.S. Economic Development Administration Department of Commerce and PVAMU. In 2020, CEP provided skilled trades training certification and job placement to rural counties impacted by disasters. The certifications offered continue to provide value-added impact, addressing the much-needed rebuilding and recovery efforts in rural Texas. Program participants could choose one of four training areas: welding, core construction, certified nursing assistant, or electrical technician. **Results:** 82 participants 71 participants receiving certifications 53 participants placed with a job Economic Impact (Salary.com): 25 Welder I jobs: averaging $34,000-$54,000 ($850,000 - $1,350,000) 20 Certified Nursing Assistants averaging $27,000-$38,000 ($540,000 - $760,000) 8 Electrician I- averaging $42,000-$55,000 ($336,000 - $440,000) Construction (0/Started in 2021) Total annual economic/employment impact: $1,726,000 - $2,550,000	**Community and Economic Development**
24.	**Small Business grant and loan assistance in response to the COVID-19 pandemic effect on business**	**Relevance:** The COVID-19 pandemic caused historic job loss and business closures. **Response:** In 2020, the CED unit was very active in getting information out to limited resource clientele and businesses affected by the COVID-19 pandemic. Business closures and unemployment were at an all-time high,	**Community and Economic Development**

		with many businesses having to close due to state and federal mandates and meet social distancing requirements. With many people staying home, businesses were forced to close or modify their businesses to online and delivery options. Many mom-and-pop businesses couldn't transition quickly enough and were from to reduce staff or shut down. The CED team conducted many online and in-person consults to businesses to make them aware of the federally supported grants and loans available to help save their business, such as the Paycheck Protection Plan and the Economic Injury Disaster Loan. **Results:** • 16 webinar trainings • 2,773 participants reached (combination of YouTube views, Facebook engagements, LinkedIn and misc.) • 106 small businesses assisted • 1,789 CED contacts • 19 PPP applications packaged • 58 EIDL application packaged • $163,623 total PPP loan amounts submitted • $78,023 PPP loan amounts awarded • $316,000 total EIDL loan amounts submitted • $398,000 EIDL loan/advance amounts awarded • $578,000 business grants pending/applied for • $5,000 small business grants awarded • $115,000 CRF amount awarded for small businesses	
25.	**4-H Garden At Home Series**	**Relevance:** With Science, Technology, Engineering, Agriculture, and Mathematics (STEAM) careers increasing every day in the nation, minorities are largely underrepresented in this occupation area. According to American College Testing (ACT), minorities are 16 times less likely to be ready for credit-bearing STEAM coursework in college than the group of students who are not considered underserved (ACT, 2017). The lack of access and exposure in STEAM subjects can significantly impact minority students gaining interest in pursuing a career in the area.	**Preparing Youth for Life and Work**

		Response: Of the 2,768 youth reached with at least six hours of STEAM education, 230 participants from historically underrepresented communities in these fields were involved in the 4-H Garden at Home Series to increase their interest in STEM careers. Half the youth received a garden kit and lessons in person at a military base and an elementary school before March 2020. After that time, the other half completed a self-paced course online. **Results:** Of the 144 evaluated, 87% stated they agree or strongly agree they want a career in horticulture or other STEAM-related careers after participating. This is a 60% increase from the level of interest indicated in the pre-test.	
26.	**Kids, Kows & More**	**Relevance:** According to Data USA, the total number of agricultural degrees awarded in 2017 were 36,893. Recipients of the awarded degrees did not reflect America's diverse demographics. Whites accounted for approximately 76% of agricultural degrees compared to 8% for Hispanics or Latinos and 3% for African Americans (https://datausa.io/profile/cip/agriculture) **Response:** There were 17,160 participants engaged in Science, Technology, Engineering, Agriculture, and Math (STEAM) outreach programming from communities historically underrepresented in these fields. Nearly 20% of them (3,321 youth and teachers) attended a Kids, Kows & More event to increase their agricultural literacy and awareness of STEAM careers. **Results:** Of the 108 evaluated, 92% stated that students' knowledge increased about where their food and clothing come from by attending this expo. In addition, 98% said they feel students and teachers will have a higher respect for agriculture after visiting the expo.	**Preparing Youth for Life and Work**
27.	**Heroes 4-Health**	**Relevance:** In Texas, 17.3% of youth ages 10 to 17 are obese, giving Texas a ranking of 12 among the 50 states and the District of Columbia, according to The State of Obesity, a project of Trust for America's Health and the Robert Wood Johnson Foundation.	**Preparing Youth for Life and Work**

		Response: To address childhood obesity, Extension agents from 11 Texas counties collaborated with 34 faith-based and community partners to implement Heroes 4-Health. Of the 21,900-youth reached with healthy living programming, 1,646 participated in at least six hours of nutrition education, and 57 served as health ambassadors. An additional 1,632 youth and 1,685 of their family members engaged in health outreach activities. **Results:** One teen ambassador reports, "This Heroes 4-Health program is about helping the community in a variety of ways. This program, as well as 4-H in general, has always positively impacted my life by giving me something positive to do and learn. It teaches me leadership skills and teaches me ways to do things right. 4-H is like family, and I really like being in it. It also helps me in meal preparation and cooking and teaches me how to do a presentation. We also learn how to eat healthy and stay active. These are some of the things I have learned since I joined 4-H. One impact I was able to observe was that the students truly enjoyed the healthy recipes and went as far as to get the recipe, prepare them at home, and was able to share their family's response casually during class. This was the result of an adoption of positive behavior change in favor of good health." A school administrator said, "It was a great experience. We are still cooking together as a family. We just made smoothie popsicles this weekend! Thank you for supporting our community in this way!" An adult volunteer reported, "I just have to say that my kids are always so excited when the 4-H staff comes to our site…even virtually. They really don't get to learn these things at school, and I think learning something new like this always gets them excited. I wish they were able to do the fun activities like last year, like the food challenge. But we are hopeful that we can do that next year!"	
28.	**Global Food Security, Hunger, and Nutrition Education**	**Relevance:** Food security is an issue that affects people on a national and international scale. Worldwide, it has been estimated that one out of nine people are food insecure. In the United States, it has been estimated that 12% of the population is food insecure. In Texas, nearly 15% of households live at or below the federal poverty level. More than 3.5 million Texans	**Food Security in Texas Communities**

		receive SNAP benefits. Low-income individuals are less likely to consume diets that meet current guidelines and are more likely to suffer from food insecurity and diet-related chronic diseases than those with moderate or higher incomes. The burden of chronic disease is great from both a financial and societal perspective. **Response:** The Better Living for Texans (BLT) program provided food and nutrition education to individuals and families who are receiving or who are eligible for benefits from the Supplemental Nutrition Assistance Program (SNAP). Programs focused on increasing fruit and vegetable intake, increasing physical activity, increasing home gardening skills to improve access to fresh produce, food safety, and food resource management. **Results:** During the program year, BLT educators across the state reached more than 423,000 individual adults and youth through direct and indirect educational outreach. The total number of individuals who graduated from a program series was 22,721. An additional 189,762 individuals participated in a single education event. Program impacts include: 1. Adult participants completing the Fresh Start to a Healthier You! series reported pre-and post-surveys increasing their fruit and vegetable intakes by more than 15 percent. 1. Adult participants completing the Growing and Nourishing, Healthy Communities series reported increasing availability of vegetables in their household by 20%. More than 30% reported the ability to grow vegetables. Participants reported harvesting more than 8,149.3 pounds of vegetables, fruit, and herbs with an additional estimated of 6,876.3 pounds harvested, thus increasing accessibility and availability to fresh produce. 2. Youth participants enrolled in the Balancing Food and Play program reported drinking one or more less sugar-sweetened beverages as a result of what they learned.	

		3. Participants enrolled in the Walk Across Texas physical activity program reported an increase in the number of miles walked each week by one.	

OPTIONAL **Youth Development Expenditures (dollars)**	
State and/or Institution:	FY 2020 Expenditures ($)
1862 Smith-Lever	XXX
1890 Extension	**$ 503,500**