

## Review Report

### Contributing Organizations

Central State University

### Directors

Morakinyo Kuti

Signed

## Executive Summary

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### Overview

#### Executive Summary

Central State University (CSU), the only state assisted Historically Black College and University (HBCU) in Ohio, is a residential, co-educational institution located in Wilberforce, 20 miles east of Dayton, Ohio. Central State was designated as an 1890 Land-Grant Institution on February 7, 2014. Over the past years, CSU has aligned its mission with the mission of the Land-Grant legislation and has transformed the previous College of Science and Engineering into the John W. Garland College of Engineering, Science, Technology and Agriculture (JWG-CESTA). The University provides educational opportunities to the general population, and enhances its teaching, research, and extension activities to solidify its Land-Grant status. Dr. Jack Thomas, CSU's President, is committed to the Land-Grant mission and vision, and is guiding the institutional efforts statewide and beyond to serve the stakeholders in the areas of teaching, research, and extension. The State of Ohio supports CSU's Land-Grant mission by providing a one for one match for the Evans-Allen Research, Cooperative Extension, and the McIntire- Stennis programs. Dr. Morakinyo Kuti serves as the Interim Dean of CESTA and the Director of CSU's 1890 Land-Grant Programs. Dr. Kuti has the oversight of all Land-Grant Programs and the related linkages with The Ohio State University, the other Land-Grant Institution in the State of Ohio. Central State's Land-Grant Program is guided by the CSU Land-Grant Advisory Council (LGAC). The LGAC consists of 12 regular members and 2 Ex-Officio members representing a cross-section of stakeholders from Ohio. Members include representatives from the Ohio Farm Bureau, Ohio Farmers Union, Ohio Agribusiness Association, Natural Resources Conservation Service of USDA, commodity groups, a technology company, farmers, and an agricultural vocational institution from the area. The composition of the LGAC is dynamic to meet CSU's evolving 1890 Land-Grant Mission.

Central State's Land-Grant Programs are managed through Research and Extension directorates. The Agricultural Research Development Program (ARDP), the equivalent of an experimental station at Central State University, is led by Dr. Sakthi Kumaran, the Interim Associate Director of Research and Dr. Alcinda Folck, the Interim Associate Extension Administrator leads the Cooperative Extension Program (CSUE). Central State University (CSU) is currently engaged in the search for a Dean and Director of 1890 Land Grant Programs, Associate Director of Research, and Associate Extension Administrator. Mr. John David Mackie serves as the Director of Operations and Fiscal Matters, providing fiscal management of all the Land Grant Funds (Evans Allen, Extension, McIntire Stennis, EFNEP, RREA and the CBG).

CSU is receiving higher levels of federal support for its Evans-Allen and Cooperative Extension Programs from 2018 Farm Bill compared to the level between 2014 through 2018. The higher funding level has enabled CSU to engage in expanded research and extension activities. CSU intends to increase engagement in farm research and expand extension farming initiatives. CSU is utilizing a systems approach to serve Ohio and the Nation. The systems approach places emphasis on small and under-represented farmers, as well as other stake holders in Ohio.

The research and extension projects and programs focus on six critical issues in the State (i) Developing and Infusing Emergent Technologies in Agricultural Systems (ii) Sustaining Plant and Animal Systems, (iii) Securing Natural Resources and Environmental Systems (iv) Enhancing Food Nutrition and Health Systems (v) Fostering Workforce Development and (vi) Engaging Communities & Transforming Lives.

The knowledge gained by CSU will be shared domestically and globally. CSUE will continue to assist farmers by providing guidance on alternate crops, specialty crops, hydroponics, aquaponics, bee keeping, integrated pest management, small animals, soil health, advanced technology applications in organic and conventional farming, sustainable agriculture, and agricultural eco systems. CSUE delivers programs and technical assistance reaching socially disadvantaged populations across Ohio. Programming is conducted in four program areas: Agriculture and Natural Resources, Family and Consumer Sciences, Community and Economic Development and 4-H Youth Development. Four program leaders oversee 33 educators who work in the five regions established by CSUE to organize outreach efforts: Southwest, Southern, Northwest, Northeast, and Southeast regions. Each region has a Regional Extension Associate and Program Assistant to organize efforts, establish partnerships and promote programming throughout the region.

The Agricultural and Research and Development Program supports twelve full time research faculty focused on projects in Evans Allen and McIntire Stennis. The projects feature applied research that creates goals and objectives within the identified six critical areas.

### **Critical Issue: CSU - Animal Systems**

Deactivated starting FY 2024

### **Critical Issue: CSU - Building new farmers, supporting limited-resource and urban farms**

Deactivated starting FY 2024

### **Critical Issue: CSU - Developing and Infusing Emergent Technologies in Ohio**

Updated

### **Critical Issue: CSU - Engaging Communities and Transforming Lives**

Updated for FY 2024 in manage critical issues section

### **Critical Issue: CSU - Enhancing Food, Nutrition and Health Systems**

Updated for FY 2024 in manage critical issues section

### **Critical Issue: CSU - Preparing our youth for the future**

Deactivated starting in

### **Critical Issue: CSU - Promoting food nutrition and health for socially-disadvantaged communities**

Deactivated for FY

### **Critical Issue: CSU - Securing Natural Resources and Environmental Systems**

Updated for FY 2024 in manage critical issues section

### **Critical Issue: CSU - Supporting small and medium-sized farms**

Deactivated

### **Critical Issue: CSU - Workforce Development**

New critical issue for FY 2024

### **Critical Issue: CSU -Sustaining Plant and Animal Systems**

New critical issue for FY 2024 added in manage critical issues section

### **Critical Issue: OSU - Economic Vitality**

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### **Critical Issue: OSU - Environmental Quality and Sustainability**

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### **Critical Issue: OSU - Food Security and Production**

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### **Critical Issue: OSU - Health and Wellness**

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### **Critical Issue: OSU - Thriving Across the Lifespan**

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## **Merit and Scientific Peer Review Process**

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The Merit Review Processes that will be followed are listed as follows:

#### RESEARCH:

A research advisory council (RAC) will be developed to enable participants to evaluate the relevance of research priorities, the thoroughness of research procedures in individual projects, project outcomes, publications, and direct and indirect impact of the project on the stakeholders for the Evans Allen projects. Internal evaluators will consist of administrators and scientists not directly associated with the planned programs. Expert reviewers and peer review participants will be selected from governmental agencies (state and federal), other universities, and local officials directly related to the commodities or other outputs of the research.

For McIntire Stennis, the Interagency Forestry Team will provide a review of planned projects for the relevance of research priorities, procedures, outcomes, and deliverables. The Interagency Forestry Team was formed in 2008 to bring forestry agencies in Southeast Ohio together for a shared collaborative approach to oak management in state and private woodlands in the region. The team consists of federal, state, and local partners and will provide feedback to help identify direct and indirect impact of planned projects.

#### EXTENSION:

CSUE has four program areas providing outreach, engagement, and education to socially disadvantaged populations in Ohio: Agriculture and Natural Resources, Family and Consumer Sciences, Community and Economic Development and 4-H Youth Development. Program leaders in each area are involved with needs assessments to inform programming focus and direction. Each program area will be developing an advisory council to review the goals, objectives, activities, and impacts of the programs. The advisory council will consist of subject matter experts with experience and expertise to review the proposed programming and establish its alignment with needs assessments and critical area focus to provide guidance for resource allocation.

The advisory councils will consist of at least five members selected for a two-year term to represent expertise in the areas of programming for the individual program area. The members will have experience and expertise in the program area such as specialists, researchers, partnering agencies with similar extension priorities, or representative of a participant cohort. The council will meet twice a year to review goals and objectives of proposed and current programming to provide feedback and input for programming goals and objectives.

#### LAND GRANT ADVISORY COUNCIL

The Land Grant Advisory Council may be asked to provide merit review of proposed Joint Extension/Research Plan of Work as the council consists of non-university panel members from various partnering agencies with similar types of research and extension priorities in the state, stakeholders with subject matter expertise, and representatives of a participant cohort. Members will be selected every two years to provide input from a variety of representatives for feedback and evaluation. A comprehensive and detailed merit review will be conducted at least every other year. The review will provide feedback to better address stakeholder needs and provide guidance for resource allocation and programming decisions.

The Peer Review Processes that will be followed are listed as follows:

Peer review processes will consist of assessments by internal and external extension and research professionals from both land-grant universities of the state. The research program will be reviewed prior to implementation by scientific peers. Stakeholder groups will evaluate the relevance of research priorities, the thoroughness of research procedures in individual projects, project outcomes, publications, and direct and indirect impact of the project. Internal evaluators will consist of administrators and scientists not directly associated with the planned programs. Expert reviewers and peer review participants will be selected from governmental agencies (state and federal), other universities, and local officials directly related to the commodities or other outputs of the research. Publications by CSUE and ARDP are peer reviewed before publications in print or electronic media.

## Stakeholder Input

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### Actions to seek stakeholder input that encourage their participation

#### Stakeholder input: Actions to seek stakeholder input that encourages their participation.

Extension will utilize continual stakeholder input for programming feedback and direction. The five Extension regions have an advisory council that meets twice a year to discuss community dynamics, needs, and opportunities. These advisory councils are in addition to the advisory councils described above that will be providing merit and peer review for Extension programming.

In addition to the advisory councils, Extension program utilizes participant evaluations after classes, workshops, and field days to capture information for program planning. A needs assessment will also be conducted by Extension in at least one target community in each region. The community chosen in each region will be identified as a socially disadvantaged community as indicated by demographics, accessibility to healthy food, and socio-economic conditions.

Stakeholder groups will evaluate the relevance of research priorities, the thoroughness of research procedures in individual projects, project outcomes, publications, and direct and indirect impact of the project on the stakeholders. Internal evaluators will consist of administrators and scientists not directly associated with the planned programs. Expert reviewers and peer review participants will be selected from governmental agencies (state and federal), other universities, and local officials directly related to the commodities or other outputs of the research.

## Methods to identify individuals and groups

### Stakeholder input: Methods to identify individuals and groups.

The Extension advisory councils in each region will have representatives from various communities in the region that have socially disadvantaged populations. The representatives will be identified by key partners in the communities as individuals who can provide insight on the needs in the communities and opportunities for Extension to meet those needs. The advisory councils will also provide input on identifying the communities in which assessments will be conducted to provide additional information for Extension programming.

The Research Advisory committee will include researchers from USDA and State agencies, business representation and commodity groups. CSU staff will conduct town hall meetings to identify issues or needs of citizens in cities. Research and Extension personnel will jointly conduct listening sessions and needs assessments. Staff will conduct a series of focus group sessions to prioritize issues identified in public hearings (e.g., town hall meetings).

## Methods for collecting stakeholder input

### Stakeholder input: Methods for collecting stakeholder input.

The regional Extension advisory councils will meet twice a year for the representatives to provide feedback and information about the communities in each region. Agendas that include questions to ask the advisory councils will be created by the Extension Leadership Team that includes program leaders and regional Extension associates to ensure comparable results from each region's advisory meeting. Minutes will be taken to capture the information to be shared with program leaders for the upcoming Plan of Work.

The needs assessment in the communities will be conducted with a variety of strategies. Town Hall Meetings, surveys, face-to-face, focus groups, one-on-one interactions, and listening sessions will be used to collect data. Staff will ensure that the stakeholders include representatives of the limited resources households in terms of geographic location, family status, income level, age, gender, disability status, and users or non-users of existing educational programs. Guideline manuals will be designed for collecting data from stakeholders and to ensure reliability and validity of the assessment results.

## A statement of how the input will be considered

### Stakeholder input: A statement of how the input will be considered.

The minutes from the advisory councils will be used when writing the upcoming Plan of Work to incorporate stakeholder input. The needs assessment data will be analyzed to identify trends and themes relevant to Extension programming. Clarification of these trends and themes found in the Plan of Work will be shared with the advisory councils to provide a feedback loop to increase validity of the results.

Stakeholders' input is crucial in building relevant research and extension programs. The stakeholder input process is essential to refocusing and reaffirming priorities on an on-going basis. The stakeholders' input will help CSU's research and extension activities remain current to society's needs. The process is also critical in identifying emerging issues. The stakeholder input will inform and guide research and extension operations. Consequently, resources will be allocated according to the population's greatest need.

## Critical Issues

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Closing out in FY 2024

### CSU - Animal Systems

Initiated on: 11/26/2019

Last Updated: 2022

**Term Length:** Long-term (>5 years)

Avian Systems: Ohio is one of the largest egg farming states in the Nation. The poultry industry in Ohio identifies 4 major areas as critical -Animal Care and Bio Security; Food Safety; Environment and Sustainability and Innovation and Technology. The Agricultural Research Development Program (ARDP) and CSU Extension (CSUE) are planning to collaboratively work on issues affecting the poultry farmers in the State of Ohio. The State of Ohio produces 10 billion eggs and 526 million pounds of chicken annually and is the second most leading State in the US for egg production. A critical need is for an avian veterinarian who can serve the poultry producers through performing appropriate

examinations, interpreting health history and conducting laboratory tests. The veterinarian is expected to visit farms, hatcheries, processing plants and other avian enterprises to diagnose, report and formulate prevention and control plans for spontaneously occurring diseases of poultry and a variety of other avian species. Small Animal/Fish Systems Research Program: One of the CSU's long-term goals is to establish an animal science program. CSU has already invested in aquaponics research and extension programs that involves training and technical assistance of limited-resource and small farms in rural and urban areas. Additionally, CSUE is seeking farmer-partners and partners from other 1890 and 1862 Land Grants to develop an Extension-based comprehensive educational program for forage-based ruminant production systems (e.g., grass-fed beef/goat production). CSUE will start an apiculture (beekeeping) apprenticeship program. Of particular focus will be clients who are military veterans because beekeeping has shown to have salubrious effects on those that have suffered various form of trauma. CSUE educators are being trained by CSU apiculture scientist Dr. Hongmei Li-Byarlay, on various aspects of managing beehives. This apprenticeship will include hands-on trainings, workshops, as well as technical assistance to beekeepers. To support this mission, CSUE will be purchasing hive management and honey harvesting tools that will be kept in trailers for our clients to borrow. The beekeeping apprenticeship program should increase bee populations across the state, causing an increase in its associated benefits, and diversify farm income for beekeepers. The descriptions of CSU Bee research programs are given under the Critical Issue Section on Natural Resources and Environmental Systems. The food safety aspects are covered under the Critical Issue Section on Food, Nutrition and Health.

**Science Emphasis Areas:** Bioeconomy, Bioenergy, and Bioproducts, Food Safety, Sustainable Agricultural Production Systems

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Research Projects: 0

Extension Programs: 0

Closing out in FY 2024

## CSU - Building new farmers, supporting limited-resource and urban farms

Last Updated: 2022

Initiated on: 05/21/2020

**Term Length:** Long-term (>5 years)

Central State University is dedicated to educating and assisting limited-resource farms and urban farms and increasing the number of successful socially disadvantaged and military veteran owned farms. Part of this effort will include the training of prospective/beginning farmers recruited among traditionally underserved communities, including urban communities. To support this effort, CSU intends to hire research and extension staff in soil less production systems as well as specialists in specialty crop market assessments and experts in ruminant grazing.

CSU will continue to develop research objectives related to beekeeping, hydroponics, aquaponics, and specialty crop production that are congruous with the limitations of land, capital, and labor that typify these farms. Their findings will guide extension demonstrations and farmer training. Extension programs in Community and Economic Development will provide training in entrepreneurship and business development, while Family and Consumer Sciences will educate farm families about the judicious selection of food for good nutrition, improving relations within a farm family and stress management, and on personal family finances.

CSU Extension will continue to provide limited-resource farms and urban farms with interactive classes that include in-depth training along with hands-on experience through the on-site demonstration farm. The classes focus on organic and conventional, intensive vegetable production and beginning farmers will learn about crop management, pest management, post-harvest handling and food safety, use of farming equipment/farm safety, business planning and development, marketing, land access and engagement with USDA programs. The limited-resource farms and urban farms programs will target socially disadvantaged populations and military veterans. CSU Extension will develop farm demonstration and training sites in collaboration with governmental and nongovernmental and community organizations.

Impacts:

- Increase number of new farmers in region
- Create mentor relationship for new farmers
- Improve access to resources to help farmers establish crops
- Develop marketing opportunities

Term: Long

Science Emphasis Areas

Bioeconomy, Bioenergy, and Bioproducts

Sustainable Agricultural Production Systems

**Science Emphasis Areas:** Bioeconomy, Bioenergy, and Bioproducts, Sustainable Agricultural Production Systems

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Research Projects: 0

Extension Programs: 2

Active

## CSU - Developing and Infusing Emergent Technologies in Ohio

Last Updated: 2023

Initiated on: 06/01/2020

**Term Length:** Long-term (>5 years)

### DEVELOPING AND INFUSING EMERGENT TECHNOLOGIES IN AGRICULTURAL SYSTEMS

Description:

Agriculture has become highly mechanized in the last few decades. This transformation was led by advancements in precision agriculture (PA) technologies like GNSS, auto-steering, crop and soil sensors, rate control technologies of crop inputs, and yield mapping. PA technologies have proven their worth in many ways by (a) making farm operations more efficient and sustainable, (b) enhancing agriculture profitability and productivity, and (c) by providing environmental benefits with reduced use of chemicals and natural resources. However, PA has not always been an economically viable option for small or medium farm operations. Small-scale and specialty crop growers may not benefit very much from this wave of technological advancements as large-scale production growers. Very little work has been done to uplift small-scale farming to make PA a profitable and desirable choice for beginner farmers. This issue needs to be addressed for the betterment of the small scale, beginning, socially disadvantaged, and specialty crop growers. Small-scale farmers who farm less than 5 acres are very important for world food security as they are responsible for producing 35% of the world's food. Therefore, the development of effective precision agriculture solutions for small-scale farming is imperative for sustainable agriculture and world food security. Agriculture 4.0, another wave of technological advancements in agriculture, is bringing robotics, artificial intelligence (AI), drones, and Internet of Things (IoT) to mainstream. There is a need to develop solutions specifically focused on small scale farming based on these Agriculture 4.0 technologies. Cross disciplinary approaches are needed to address this challenge. Applications of mechatronics that integrate expertise in mechanical engineering, electrical engineering, computer control, machine vision and information technology in a seamless manner is gaining traction in precision agriculture. Research in mechanical design of new or modifying and adapting existing agricultural machinery for precision delivery of novel integrated agricultural nutrient and pest management strategies, coordinated machine control in response to sensory feedback, sensor technology and high-level programming are needed to improve efficiency of farming systems. The John W. Garland College of Engineering, Science, Technology and Agriculture (JWGCESTA) at CSU is uniquely qualified to bring this integration into fruition by

working with various sub disciplines such as manufacturing engineering, industrial engineering, environmental engineering, water resources, and agriculture and life sciences that are near one another both physically and organizationally.

CSU Extension will be developing programming to help farmers with climate-smart practices to encourage carbon sequestration and lower energy inputs. Programming will also focus on managing climate change through technology tools to manage changing weather and provide crop protection. Soil health is also an integral part of climate smart farms and resources will be developed to address cover crops, increasing soil biology, and no-till options for small-scale and specialty crop farmers. Programs for climate smart farms will target socially disadvantaged populations.

Research Projects: Advanced Agriculture Technologies for Small Scale Farms

Extension Programs: Adopting Climate Smart Technologies for Small-Scale and Urban Farms

**Science Emphasis Areas:** Bioeconomy, Bioenergy, and Bioproducts, Environmental Systems, Sustainable Agricultural Production Systems

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[Research Projects: 1](#)

[Extension Programs: 1](#)

Active

## CSU - Engaging Communities and Transforming Lives

Last Updated: 2023

Initiated on: 11/26/2019

**Term Length:** Long-term (>5 years)

### ENGAGING COMMUNITIES AND TRANSFORMING LIVES

Description:

The target audience for CSU Extension programming is underserved, underrepresented populations in rural and urban areas. Improving the overall conditions facing individuals and families in Ohio's communities is key to needs assessment to influence programming, as well as addressing agricultural issues in rural, urban, and Appalachia locations. CSU Extension creates pathways to success by empowering communities, organizations and individuals through education and technical assistance. With a focus on both urban and rural areas, programs focus on community development and revitalization, small business development and personal achievement.

#### a. Current Programs and Projects

Building resilient communities is a focus for CSUE Community and Economic Development to develop coordination and collaboration within communities to provide opportunities for growing businesses, community organizations, individuals, and others. The 4-H Youth Development program currently addresses societal needs by providing strong and resilient individuals, families, and communities in Ohio. Children, Youth, and Families at Risk is a program the develops programming for addressing barriers for vulnerable populations. The CSUE FCS program focuses on issues such as childhood obesity, family resilience, financial readiness, health, hunger, and environmental degradation. Addressing these through research and programming focused on human nutrition, food and non- food products, food safety, hospitality/recreation, health, and financial education are planned.

#### b. Planned Programs and Projects

CSU Extension programming is still expanding in the five regions that have been identified in Ohio. With only three years of full-time staff in the regions, audiences will be identified that would benefit from programs. The audiences will be identified with needs assessments and meeting with community leaders.

Research Projects:

Extension Programs:

Developing Better Socio-Economic and Sustainable Communities (CED)

Navigating Life's Journey and Family Dynamics (FCS)

Evolving Individuals to Impact Youth (4-H)

**Science Emphasis Areas:** Education and Multicultural Alliances, Family & Consumer Sciences, Human Nutrition, Youth Development

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Research Projects: 0

Extension Programs: 2

Active

## CSU - Enhancing Food, Nutrition and Health Systems

Last Updated: 2023

Initiated on: 11/26/2019

**Term Length:** Long-term (>5 years)

### ENHANCING FOOD, NUTRITION AND HEALTH SYSTEMS

Description:

Health of individuals and overall populations encompass many factors: behavioral, economic, environmental, cultural, educational, and genetic. Diet and nutrition are important to overall health. Diseases related to obesity, sedentary lifestyles, nutrient deficiencies and food insecurity, are major dietary health concerns in the U.S and in Ohio. Methods are needed to positively impact community health, by working with individuals and systems to determine the best practices in health promotion. Studies on factors related to the health of the African American population are essentially needed to find pathways to improve wellness of the affected communities. Preventative mechanisms for reducing angina will have to be researched. Determining the effects gasotransmitters such as nitric oxide (NO) and hydrogen sulfide (H<sub>2</sub>S) in diabetes and cardiovascular disease models including tissue culture, will guide in the possible intervention mechanisms using nutritional approaches. Studies in these disease models will provide valuable information for improving human health and associated science.

Fresh produce consumption has increased in the US because of increasing health consciousness of consumers, improved year-round availability, creative marketing, and improved varieties. Fresh produce consumption increase however, has coincided with several foodborne pathogenic cases outbreaks and diseases linked to produce which are major threats to food industry. For the past few years, most foodborne contamination and outbreaks have been associated with fresh produce (fruit and vegetables). Human pathogenic bacteria, Salmonella, Listeria, and Escherichia coli O157:H7, Staphylococcus aureus, and Shigella, and Norovirus, Hepatitis A virus, and Protozoa are the leading contaminants in produce industry. Currently, there is limited literature in understanding the human pathogen sources, survival behavior in produce and environment, and mode of transmission and contamination during production.

Effects of climate change and changes in global trade and consumption patterns are expected to influence the quality of fresh produce and impacts food safety. Climate change effects including extreme weather events and natural disasters, such as floods and drought have increased the frequency of heavy rains, frequent and longer drought periods, acidification of water, CO<sub>2</sub> enriched atmosphere, and extreme precipitations with altered patterns and potential rising in sea levels. All these effects of climate change are expected to impact the agricultural production methods and potentially



support the growth, survival, antibiotic resistance, and emergent of new strains of pathogenic microorganisms associate with food and water sources. Also, the insect pests, microbial vectors, population is expected to grow due to altered weather patterns. Increment in temperatures is expected to increase the rise of sea level that may influence human pathogens survival and proliferation in agricultural production systems.

The welfare of adults, youth, and children in low-income, underserved, and disadvantaged communities in Ohio is a critical priority for CSU Extension. Parents, pregnant women, and youth in these communities are often at a greater risk of poor nutrition and subsequent illnesses with long term consequences. For adults these include chronic diseases including diabetes, hypertension, and high cholesterol. For youth risk such as impaired or poor brain and physical development, learning disabilities, decreased immunity, increased infections and obesity are, among others.

The United States spends \$200 billion in healthcare related to obesity, and more than 81 million Americans are completely inactive and lack physical activity. Ohio has the 11th highest adult obesity rate in the nation, and the sixth highest obesity rate for youth ages 10 to 17. Obesity in children is a growing epidemic in the United States, and the minority populations are especially at risk for obesity. Health of individuals and overall populations encompass many factors: behavioral, economic, environmental, cultural, educational, and genetic. Diet and nutrition are important to overall health. Diseases related to obesity, sedentary lifestyles, nutrient deficiencies, and food insecurity, are major dietary health concerns in the U.S. Nicotine/tobacco use, and secondhand smoke exposure contribute to many health issues affecting Ohio families and communities (SHIP 2020-2022). The health challenges related to Nicotine/tobacco use include increased risks for cancers, infant mortality, heart disease and asthma. 21.15% of adults ages 18 and older are current smokers in Ohio (BRFSS). E-cigarettes and other vaping product use among youth has been surging in Ohio, which is a concern for future addiction to tobacco/nicotine and other drugs. There is a 135% increase in vaping related products use among Ohio's youth between 2017 and 2019.

CSU Extension uses researched, evidence-based curriculums and strategies to teach participants in underserved communities how to mitigate these circumstances by learning food selection, budgeting, meal preparation, food storage and physical activity to help they and their families become healthier. Family health also includes programming for youth and adults in smoking cessation, resolving conflict in relationships, and providing programs focused on improving mental health.

#### a. Current Programs and Projects

Central State focuses on prevention and/or reduction of chronic diseases in vulnerable and underserved populations. CSU Extension programs in Family and Consumer Sciences (FCS) cover human nutrition, disease abatement through nutrition and exercise, cooking methods, and individual/family mental health. CSU Extension also participates in the Expanded Food and Nutrition Education Program (EFNEP) to reach underserved audiences with nutritional information and cooking demonstrations.

CSU Extension's FCS and EFNEP programs will continue to partner with CSU's Food and Nutrition and Health Systems researchers to provide up to date research-based information to our stakeholders. CSU Extension provides classes for the Diabetes Empowerment Education Program (DEEP) for minority, socially disadvantaged, and economically depressed populations. Program participants also learn about exercise options that can be done at home with no specialized equipment. Two mobile kitchen units are used throughout the state by CSU Extension Educators for cooking demonstrations and nutrition education. Nutrition education and healthy eating is also available through the 4-H Youth Development Program to increase healthy decisions among children.

#### b. Planned Programs and Projects

Additional health education will include programs to improve immune health including discussions about diets and lifestyles that boost immunity, how to maintain optimum health and develop a more intentional plan of action towards lifestyle modification for increasing health and immunity to fight back viral infections. To help deliver these programs, a Health Education Mobile Unit (HEMU) has been purchased for CSU Extension educators to offer health education to high poverty, urban and rural communities where populations are isolated from accessible health care facilities. CSU Extension will coordinate with local health departments for programming with the HEMU so trained medical staff can

perform health checks and other medical procedures and bring additional vaccination resources to communities of poverty. The HEMU will also help in providing screening and education for vulnerable populations to address chronic health issues such as diabetes and heart disease.

CSU Extension will also develop programs with evidence-based youth and adult smoking cessation curricula to promote smoking cessation and addiction prevention. Other programming that is being developed includes mental health, stress reduction and healthy family relationships.

CSU seeks to expand knowledge of the factors affecting health-particularly those that can be addressed through nutrition and exercise intervention – through genetic testing, nutrition/exercise education and programming, and the creation or enhancement of food production and delivery systems to underserved populations. The University also aims to understand the mechanisms of action of nutrients in disease development and progression, with the goal of recommending nutrients as potential preventative or adjuvant treatment modalities.

Appropriate data will be collected, analyzed, and published in peer reviewed literature, extension bulletins and curriculum, and incorporated into undergraduate course work ensuring that all stakeholders benefit from our research results. For example, because underserved populations often lack access to nutrient-dense foods, CSU aims to develop novel or enhance existing methods of food production to ensure a sustainable and accessible supply of affordable, safe food and have direct impacts on sustainability efforts, agricultural economy, and human health.

#### c. Critical issue (Science Emphasis Area)

Research Projects:

Extension Programs:

Empowering Individuals and Families to be Healthy and Resilient (FCS)

**Science Emphasis Areas:** Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Family & Consumer Sciences, Food Safety, Human Nutrition, Youth Development

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[Research Projects: 1](#)

[Extension Programs: 1](#)

Closing out in FY 2024

### CSU - Preparing our youth for the future

Last Updated: 2022

Initiated on: 05/21/2020

**Term Length:** Long-term (>5 years)

Preparing youth, for STEM careers, leadership, resiliency and finances

Description:

Creating Youth Pathways to Success: CSU's 4-H Youth Development program currently addresses societal needs by providing strong and resilient individuals, families, and communities in Ohio. Specifically, youth are receiving hands-on education on STEM topics, natural resource management, and on agriculture. Youth will learn water science-based careers through collaborations with International Center for Water Resources Management. This programming will continue in future, with emphasis on schools with a significant population of at-risk youth. In addition to STEM topics, youth will learn leadership, business skills, environmental knowledge, agriculture, human nutrition, and exercise science. Developing Better Socio-Economic and Sustainable Communities. CSU is focused on providing a holistic approach to improve the overall conditions facing individuals and families in Ohio's communities, as well as addressing agricultural issues in rural, urban, and Appalachia locations. Building Families and Communities: CSU's Family Consumer Sciences program will provide training to families and communities on specific issues like childhood obesity, family resilience, risk management, financial readiness, health, hunger, and environmental degradation. Addressing these

issues through scientific research and programming focused on human nutrition, food and non- food products, food safety, hospitality/recreation, health, and financial education are essential plans of action: CSUE's Community and Economic Development program seeks to empower communities to achieve their goals through education and technical assistance. The aims of this program are community development and revitalization, leadership development, local economic development, entrepreneurship and small business development, and government programs and disaster preparedness and assistance.

Term: Long

Science Emphasis Areas

Education and Multicultural Alliance

Sustainable Agricultural Production Systems

Youth Development

**Science Emphasis Areas:** Education and Multicultural Alliances, Sustainable Agricultural Production Systems, Youth Development

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Research Projects: 0

Extension Programs: 3

Closing out in FY 2024

## CSU - Promoting food nutrition and health for socially-disadvantaged communities

Last Updated: 2022

Initiated on: 05/21/2020

**Term Length:** Long-term (>5 years)

Critical Issue – Promoting food nutrition and health for socially disadvantaged communities

Description: The welfare of socially disadvantaged communities is a critical priority for 1890 Land-Grant programs, including CSU. Socially disadvantaged people are at a greater risk of poor nutrition and illness, including diabetes, than more affluent populations. The United States spends \$200 billion in healthcare related to obesity, and more than 81 million Americans are completely inactive and lack physical activity. Ohio has the 11th highest adult obesity rate in the nation, and the sixth highest obesity rate for youth ages 10 to 17.

CSU will engage in research and extension activities related to human nutrition and exercise education, as well as food delivery systems to underserved populations to target treatments are necessary. Research results will help determine the best practices in health promotion. These endeavors will be based on nutrigenomics knowledge, which could lead to personalized nutrition plans. Research into relaxation techniques using Yoga and integrate the nutrigenomics with the use of herbs can also benefit our target audience. Obesity in children is a growing epidemic in the United States, and the minority populations are especially at risk for obesity. As part of the research program, physiologic parameters including resting heart rate, blood pressure and body composition will need to be assessed before and after the intervention.

CSUE will play a critical role in the dissemination of research results pertaining to human nutrition and health. CSU has acquired a Health Education Mobile Unit (HEMU) to assist Family and Consumer Science staff bring programs over all 60 service counties. The HEMU will also accommodate county health department medical staff who will augment CSUE health programs with additional education, health screenings, and other medical services.

Term: Long

Science Emphasis Areas

Bioeconomy, Bioenergy, and Bioproducts

Family & Consumer Sciences

Food Safety

Human Nutrition

Youth Development

**Science Emphasis Areas:** Bioeconomy, Bioenergy, and Bioproducts, Family & Consumer Sciences, Food Safety, Human Nutrition, Youth Development

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Research Projects: 0

Extension Programs: 1

Active

## CSU - Securing Natural Resources and Environmental Systems

Last Updated: 2023

Initiated on: 11/26/2019

**Term Length:** Long-term (>5 years)

### SECURING NATURAL RESOURCES AND ENVIRONMENTAL SYSTEMS

Description:

A critical component of plant productivity and environmental quality in agricultural systems is the concept of "soil security." To effectively manage natural resources, informed management of soil resources is imperative. An assessment of soil information and health at local, regional, and global scales will provide a holistic system-based approach to address the issues at the nexus of plant, animal, natural resources, and environmental systems. This approach will include the use of advanced techniques and instrumentation that harnesses the recent developments in agricultural sciences such as isotope geochemistry, proximal sensing, satellite sensing, drone-based sensing, soil microbiology, and pesticide chemistry to solve broad societal needs such as climate change mitigation, carbon markets, renewable energy systems, non-point source pollution abatement, enhanced crop productivity, diversified cropping systems and pollinator behavior and health. We expect to utilize advanced machine learning and geospatial techniques to carry out this assessment at varying spatial scales.

Water issues in the US are related to 1) variability in availability of the resource for agriculture, domestic industrial and commercial uses, firefighting, and recreation; 2) floods and droughts; 3) water quality in agricultural and urban areas; 4) economics of water resources and 5) ways for energy generation. The major phenomenon of change in climate impacts all aspects of water, which requires planning structural and non-structural measures. A major water issue in Ohio is related to water quality. Nitrogen and Phosphorus in agricultural runoff and leaching continues to be a non-point source pollution affecting water quality in Ohio watersheds by causing harmful algal blooms. So far, little research has been done in cropped acres of southwestern Ohio to quantify the impact of nutrient pollution on water quality. A water quality issue affecting municipal stakeholders is managing the water and wastewater systems under their respective jurisdictions. The wastewater from these systems, though treated and released, still carry considerable loads of Nitrogen and Phosphorus. Major work elements involve developing guidelines for watershed level decision making on water quality restoration and improvements by the municipalities and counties; enhance environmental sustainability Expansion of modeling as a decision-making tool to include socioeconomic factors; Enhancing the smart models to include other and emerging "contaminants of concern" and Augmenting wastewater smart sensors with biosensors to detect viruses leading to county-wide public health crisis.

Biodiversity and saving endangered species are important for improving the ecosystems in farming areas. Organic farming has numerous benefits in improving the ecosystems.

Honeybees are the most important managed pollinators contributing \$15 billion for the U.S. economy, but the honeybee colonies are in a 40-50% decline in the country. Managed bee colonies are in a 60% annual decline in Ohio. Promoting mite resistant bees is one of the most effective ways to mitigate the bee decline. It is imperative that we develop new methods for increasing genetic diversity and to improve queen bee quality. The limiting factors affecting local honeybee resources include fewer queens and the nuclei available to fulfill the demand of beekeepers in the region.

Engaging with woodland owners in Appalachian Ohio to encourage oak regeneration and stewardship is an ongoing program for CSU Extension through involvement with the Forestry Team comprised of representatives from USDA Agencies: Forest Service and NRCS; Ohio Department of Natural Resources Divisions: Forestry and Wildlife; and Extension: Ohio State and Central State. These programs are ongoing and focus on a 17-Appalachian County area in Southeast Ohio. The Forest Outreach Coordinator is co-located with the U.S. Forest Service to help with the efforts for oak regeneration and stewardship while enhancing economic viability in this region with the highest poverty rate in Ohio.

The environmental impact of pollinators is key for agricultural production. CSU Extension educators provide beginning beekeeping programs to help increase the number of successful apiaries in Ohio. Videos will also be developed to help beginners become successful in the beekeeping experience.

We intend to assess the effectiveness of several agricultural best management practices in reducing nutrient loads in the Great and Little Miami watersheds that drain into the Ohio River and subsequently into the Mississippi river and Gulf of Mexico. Central State expects to achieve this by utilizing advanced geospatial technologies, modeling and other innovative lab and field techniques coupled with on-farm research.

Agroforestry is an emerging sustainable model for small-scale farms. CSU Extension will be engaged in programs, workshops, and resources for farmers interested in agroforestry and seeking information for their farm operation. Agroforestry outreach will include rural and urban opportunities and engage with practices such as permaculture, mushroom production, riparian buffers, and silvopasturing. CSU Extension will also be focusing on legacy planning for woodland owners with an emphasis on heirs' property, minority landowners and underserved audiences.

#### c. Critical issue (Science Emphasis Area)

Research Projects:

Extension Programs: Promoting sustainability for woodland and agroforestry endeavors

**Science Emphasis Areas:** Agroclimate Science, Bioeconomy, Bioenergy, and Bioproducts, Environmental Systems, Sustainable Agricultural Production Systems

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Research Projects: 4

Extension Programs: 1

Closing out in FY 2024

## CSU - Supporting small and medium-sized farms

Last Updated: 2022

Initiated on: 05/21/2020

**Term Length:** Long-term (>5 years)

Critical Issues: CSU - Supporting small and medium-sized farms

Ohio small and medium-sized farms are afflicted with production risk, fluctuating prices, and shrinking access to labor. These include limited resource farms that are often owned by farmers of color. These farms face challenges, not only of production, but also of marketing, management, and overall viability. To facilitate their survival, CSUE will create a Small Farm Program that will conduct research and extension activities suitable for limited resource and small farms. These activities will involve production research and outreach, and incorporate land access trainings, specialty crops market assessments, production technology economic assessments, postharvest food handling/food safety, value added

product development and regulations, farm business management, use of farming equipment/farm safety, USDA programs for limited resource and small farms, and trainings in farmer organizations including farmer cooperatives. Farming demonstrations will be conducted on CSU's main campus and at collaboration sites with external partners. These demonstrations will host field days and workshops. CSUE will invite successful minority and military veteran farmers and other agents (e.g., crop buyers, agribusinesses, input suppliers, USDA staff, etc.) to share information and inspiration to trainee farmers. ARDP's will contribute to the Small Farm Program by sharing information about alternative crops including hemp, Cannabis sativa with a THC content less than 0.3%, amaranth, sweet potato, high-amylose corn, tree fruit and nut crops, medicinal plants, and hops. High-amylose corn is of interest to consumers who want to lower the starch-based calories in their diet due to its lower glycemic index than other starches. Emphasis will also be placed on small and medium-scale hydroponic/soilless culture systems and other fertigated fruit and vegetable production systems using soils that can grow plants intensively, requiring no tillage and harvesting equipment, and needing reduced labor applications.

CSU Extension will provide sustainable resources for small-scale and organic farmers that focus on three elements of sustainability: profitability, stewardship, and quality of life. The resources will provide local workshops, trainings, and farm demonstrations for improving soil health, composting, integrated pest management (IPM), small-scale livestock, regenerative practices, land access, land transfer, local and direct food marketing. Programming will target socially disadvantaged populations.

ANR Educators currently engage with small-scale farmers through a state-wide "Growing Small Farms Webinar Series". The webinars are held monthly on third Thursdays during the summer and weekly on Thursdays during the winter. Topics include organic production, beekeeping, specialty crops, integrated pest management, small-scale poultry and livestock, pasture management, soil health, and agroforestry. The webinars are recorded and available on YouTube for farmers who missed the session. A podcast will also be developed from the recordings to increase access by busy farmers.

CSU Extension will provide focused programming, workshops, and resources on hydroponics and aquaponics for beginning and small-scale farmers. Programming will focus on managing these systems and low-cost, low-input systems to reduce the need for large amount of capital to begin a system. Demonstration sites for aquaponics has been implemented on CSU campus and sites will be developed in other areas of the state or provided through mobile, educational options.

The environmental impact of pollinators is key for agricultural production. CSU ANR educators will be providing beginning beekeeping programs to help increase the number of successful apiaries in Ohio. Videos will also be developed to help beginners become successful in the beekeeping experience.

#### Protecting agricultural environment

Pollinator Issues: Promoting mite resistant bees is one of the most effective ways to mitigate the bee decline. It is imperative that we develop new methods for increasing genetic diversity and to improve queen bee quality. The limiting factors affecting local honeybee resources include fewer queens and the nuclei available to fulfill the demand of beekeepers in the region. Climate Change: Small and medium size farmers are critically impacted by global climate change variations. Assisting farmers to meet conditions due to weather and climate changes is seen as a priority issue. Climate change in Ohio is resulting in incidences of drought and higher levels of spring precipitation. The difficulties for farmers and other stake holders arise due to 10% increase in spring precipitation and increase in drought in Ohio. Adding drainage systems to reduce the impacts is increasing the cost of inputs for farming. Research is needed to design and implement structural and non-structural measures to meet climate challenge issues in Ohio. Water Resources and Water Quality: Water issues in the US are related to floods and droughts, water quality; hydro energy. The major phenomenon of change in climate impacts all aspects of water, which requires planning structural and non-structural measures. Soil Health: An assessment of soil information and health at local, regional and global scales will provide a holistic system-based approach to address the issues at the nexus of plant, animal, natural resources and environmental systems. Agricultural Ecology: Biodiversity and saving endangered species are important for improving the ecosystems in farming areas. CSU's forestry program in southeastern Ohio will educate stakeholders in forest management and conservation of oaks and other valuable forest-based natural resources. CSU's ANR program will invest in educating farmers about organic production systems for horticulture and row crops.

Climate smart farms are key to helping farmers manage climate change. Programming will be offered by ANR educators to help farmers with climate-smart practices to encourage carbon sequestration and lower energy inputs. Programming will also focus on managing climate change through technology tools to manage changing weather and provide crop protection. Soil health is also an integral part of climate smart farms and resources will be developed to address cover crops, increasing soil biology, and no-till options for small-scale and specialty crop farmers. Programs for climate smart farms will target socially disadvantaged populations.

CSU ANR Extension will provide focused programming, workshops, and resources on new and emerging technologies used by beginning and small-scale farmers. These technologies include smart irrigation and hydroponics. Programming will focus on managing these systems and low-cost, low-input systems to reduce the carbon footprint. Demonstration sites for smart irrigation has been implemented on CSU campus and sites will be developed in other areas of the state.

These items of critical issues to assist small and medium farmers include developing demonstration sites for smart irrigation, hydroponics, and aquaponics; Create programs to highlight low-cost, low-input systems for new technologies; Create resources to encourage climate-smart farms; and Identify soil health practices for small-scale and specialty crop farmers.

Organic Farming: Organic farming is a pathway to improved health and nutrition while enhancing? sustainable agriculture. ARDP and CEP will work together in developing methods to enhance organic farming in Ohio with a focus on small and medium farmers. We propose to use advance technology tools to enhance the production of organic produce in Ohio and improve the levels of farm income for farmers. A major impact is also improved health and nutrition of Ohioans.

Term: Long

Science Emphasis Areas

Agroclimate Science

Bioeconomy, Bioenergy, and Bioproducts

Environmental Systems

Sustainable Agricultural Production Systems

**Science Emphasis Areas:** Bioeconomy, Bioenergy, and Bioproducts, Sustainable Agricultural Production Systems

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Research Projects: 0

Extension Programs: 1

Active

## CSU - Workforce Development

Last Updated: 2023

Initiated on: 10/01/2023

**Term Length:** Long-term (>5 years)

### FOSTERING WORKFORCE DEVELOPMENT

Description:

The number one industry in Ohio is agriculture with nearly one in seven jobs in the state coming from agriculture and food production. Members of socially disadvantaged populations often have no or limited experience in agriculture and food production which limits access to a large number of job opportunities. Other barriers to job success include education, opportunities, and capital can be limited conditions.

CSU Extension focuses on programming to help provide education, opportunity, and access to capital for youth and adults seeking experience in and access to agricultural and food production careers.

#### a. Current Programs and Projects

CSU Extension 4-H Educators provide summer camps and after-school learning programs to introduce youth to agriculture and career opportunities. The summer camps include a residential camp on CSU campus and day camps at locations in all five CSU Extension regions. In addition, in-school and after-school programs utilize a tower garden for agricultural education. The tower garden is a hydroponic, vertical growing system that can be used in a classroom or community center without need for light or soil. The curriculum includes hands-on activities as the youth grow the plants and learn how to prepare the harvest into healthy, tasty meals.

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CSU Extension 4-H Youth Development also conducts the planned program, “Creating Youth Pathways to Success” targets ‘vulnerable populations’ including minorities in inner-cities and underserved rural communities. Program focus will provide positive youth development and experiential learning activities that create pathways for Ohioan youth to grow and bloom into responsible citizens and caring adults. Overall, programming will provide afterschool and in-school 4-H experience in positive youth development (PYD) to underserved and at-risk youth in urban (inner-cities) and rural communities through experiential learning activities in S.T.E.A.M. education, healthy living, community and civic engagement, and career preparedness to become functional and responsible individuals. CSUE will (1) create and develop a strong community partnership that fosters positive youth development based on the needs and strengths of youth, their families, and communities; (2) encourage youth to improve their dietary habits, nutrition, health and wellness, and physical activities; (3) gain access to healthier foods through hands-on activities in gardening and healthy food preparation; (4) introduce activities in science and agriculture, nutrition and food preservation (5) provide opportunities for youth to develop life and workforce preparation skills (to include teen leadership, mastery, self-esteem, and self-determination skills).

CSU Extension provides beginning farmer programs with interactive classes that include in-depth training along with hands-on experience through on-site demonstration farms. These farms are in four of the five regions of CSU Extension in Ohio and are made possible with partnering organizing who provide the land and management support. These cooperative partnerships help teach a new generation of farmers and help expand current non-profit, learning farms. The classes focus on organic, intensive vegetable production and farmers learn about crop management, pest management, post-harvest handling and food safety, farm safety, business planning and development, marketing, land access and engagement with USDA programs. The beginning farmer programs target socially disadvantaged populations. Currently, programming is focused in urban areas with African American and veteran audiences.

CSU Extension Community and Economic Development (CED) provides workforce development through programming that encourages entrepreneurship and small-business planning and development. These programs help individuals grow a local business that not only helps their career but provides jobs and opportunities for job training in communities. The CED Educators co-partners with local businesses and organizations to provide job-training skills, including necessary certifications, to prepare participants for employment. The program offers supportive classroom and hands-on training in the trades, soft skills, agriculture, and other opportunities.

#### b. Planned Programs and Projects

Urban Farm Manager Certification is being developed to provide a pathway for aspiring farmers who are looking to become involved in urban agriculture. The program will be piloted with incarcerated adults who are looking for educational opportunities to develop skills to find work when they are released. The program includes instruction and apprenticeship with a vegetable production farm at the correctional facility.

#### c. Critical issue (Science Emphasis Area)

Research Projects:

Extension Programs:

Empowering Individuals for Socio-Economic Advancement (CED)



**Science Emphasis Areas:** Education and Multicultural Alliances, Sustainable Agricultural Production Systems, Youth Development

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Research Projects: 0

Extension Programs: 1

Active

## CSU -Sustaining Plant and Animal Systems

Last Updated: 2023

Initiated on: 11/26/2019

**Term Length:** Long-term (>5 years)

### SUSTAINING PLANT AND ANIMAL SYSTEMS

Description:

Growers in Ohio and across the country face low crop prices and struggle to keep their farms solvent. The overproduction of major grain crops (corn, soybeans, and wheat) by US farmers suppresses commodity prices. Alternative crops are needed to provide growers with new revenue streams. Moreover, large-scale adoption of alternative crops can reduce overproduction of major crops, thereby increasing commodity prices. It is relevant to explore and develop crop plants to provide knowledge and help establish valuable niche markets for alternative and specialty crops.

Interesting candidates for Ohio include hemp, high-amylose corn, perennial crops, medicinal plants, biomass crops. Hemp can be utilized as a food, fiber, feed, bioenergy, and medicine. Given the desire for increasing Ohio hemp production will diversity the state agriculture, give growers alternative revenue streams, reduce dependence on two crop systems (corn-soybeans), and provide ecological sustainable benefits and can result in products in enhancing human health.

Hemp, *Cannabis sativa* with a  $\Delta^9$ -tetrahydrocannabinol (THC) content less than 0.3%, can be utilized as a food, fiber, feed, bioenergy, and medicine. New hemp varieties bred and adapted to Ohio will provide growers across the region superior genetics to maximize crop yields and reduce chances of crop failure. These traits will enhance the success of hemp crops within the region and maximize farmer returns. Developing techniques to make use of hemp fiber for composite materials and medicinal products appears to be a valuable effort.

Recent surveys have revealed a more than 20% drop in public plant breeding programs with activities in designing, planning, managing, and conducting plant breeding activities. Many of these projects have historically been located at land-grant institutions but, overtime has been dropped with changes in policy and funding eliminations citing rapid advancement in the private sector. Despite years of concern and growing public distrust of dominating multinational companies, the trend continues. A program for the improvement of specialty corn that works with Ohio producers toward identifying new market opportunities by the development and commercialization of hybrid varieties with useful novel starches as determined by the needs of the end-users appears necessary. In this regard high-amylose corn is of interest, which has elevated levels of amylose content in the starch. Recent developments indicate potentials for use of it in bioplastics and by food companies for a starch type that resists digestion. Diversification of cropping systems including perennials, agroforestry and soilless cultivation for alternative and sustainable agricultural systems will allow producers more opportunities to for risk-aversion and access to niche markets. Besides conventional farming, research emphasis appears critically needed on organic management strategies. The development of novel natural products from horticultural production that have potential to provide enhanced economic value to agricultural systems is likewise foreseen to bring potential economic benefits to Ohio producers. In addition, plant the promotion of soilless cropping systems like hydroponics, organic production, and strategies for extending the production season merit attention for additional solutions. The potential for natural products to remediate some of the most current public concerns such as human health and nutrition, pests, and pathogens, as well as other societal problems merits exploration. Developing

natural products from plants to establish valuable niche markets for alternative and specialty crops. Investigations of plant species will study naturally producing compounds that have the potential for applications in food, medicine and industry appear as a critical need.

#### a. Current Programs and Projects

Issues to be addressed under plant systems include advancement of alternate crops, increase development of natural products, improvement of crop quality and investigation of alternative production systems.

CSU Extension provides sustainable resources for small-scale and organic farmers that will focus on the three elements of sustainability: profitability, stewardship, and quality of life. Educators provide local workshops, training, and farm demonstrations for improving soil health, composting, integrated pest management (IPM), small-scale livestock, regenerative practices, land access, land transfer, local and direct food marketing.

#### b. Planned Programs and Projects

Ohio is one of the largest egg farming states in the Nation. The poultry industry in Ohio identifies 4 major areas as critical -Animal Care and Bio Security; Food Safety; Environment and Sustainability and Innovation and Technology. The Agricultural Research Development Program (ARDP) and CSU Extension (CSUE) are planning to collaboratively work on issues affecting the poultry farmers in the State of Ohio. The State of Ohio produces 10 billion eggs and 526 million pounds of chicken annually and is the second most leading State in the US for egg production. A critical need is for an avian veterinarian who can serve the poultry producers through performing appropriate examinations, interpreting health history, and conducting laboratory tests. The veterinarian is expected to visit farms, hatcheries, processing plants and other avian enterprises to diagnose, report and formulate prevention and control plans for spontaneously occurring diseases of poultry and a variety of other avian species.

Small Animal/Fish Systems Research Program: One of the CSU's long-term goals is to establish an animal science program. CSU has already invested in aquaponics research and extension programs that involve training and technical assistance of limited-resource and small farms in rural and urban areas.

CSU Extension provides focused programming, workshops, and resources on hydroponics and aquaponics for beginning and small-scale farmers. Future programming will be developing demonstration sites for aquaponics and hydroponics in the regions outside of the campus location or provided through mobile, educational options.

Research Projects:

Extension Programs: Promoting sustainability for limited resources and small-scale farms

**Science Emphasis Areas:** Agroclimate Science, Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Environmental Systems, Sustainable Agricultural Production Systems

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Research Projects: 1

Extension Programs: 2

Active

## OSU - Economic Vitality

Initiated on: 11/26/2019

Last Updated: 2019

**Term Length:** Long-term (>5 years)

It is important that all Ohioans have the capacity to pursue and sustain economic well-being. Ohioans should be able to enjoy financial security today, save enough resources for the future, and successfully navigate fiscal challenges and opportunities as they arise. Through money management education, individuals, families, business managers, and community leaders will improve their financial literacy, decision making, and ability to manage resources. Research in

this area focuses on understanding how complex economic factors may impact our stakeholders and developing tools that stakeholders can use to improve their operations. This critical issue also includes research and outreach related to local, national, and international policy impacts.

**Science Emphasis Areas:** Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Environmental Systems, Family & Consumer Sciences, Sustainable Agricultural Production Systems, Youth Development

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Research Projects: 0

Extension Programs: 0

Active

## OSU - Environmental Quality and Sustainability

Last Updated: 2019

Initiated on: 11/26/2019

**Term Length:** Long-term (>5 years)

Ohio State environmental experts educate Ohioans about their individual impact in a global community, while teaching them to be good stewards of the planet. Ohio State research-based programs help people make more informed choices about how they can promote and sustain environmental quality. Programs focused on nutrient management, air quality, forestry, farming practices, water quality, and landscapes engage and encourage both urban and rural audiences to preserve natural resources for future generations. Our researchers are also constantly looking for new ways to reduce waste and improve the efficiency of sustainably developed products.

**Science Emphasis Areas:** Agroclimate Science, Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Environmental Systems, Sustainable Agricultural Production Systems, Youth Development

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Research Projects: 0

Extension Programs: 0

Active

## OSU - Food Security and Production

Last Updated: 2019

Initiated on: 11/26/2019

**Term Length:** Long-term (>5 years)

A sustainable food system not only benefits producers and protects consumers, but also ensures a safe food supply while feeding a growing population. Ohio State conducts research and educates producers about best practices that increase yield and profitability. In addition, changing consumer preferences continually influence production practices and the types of products that producers are expected to bring to market. Using science-based information, Ohio State helps consumers, producers, and policy makers become more informed about decisions related to food and the way it is produced, processed, distributed, stored, prepared, and consumed. Engaging citizens in conversations about their food creates a holistic approach to solving food security issues. Additionally, teaching citizens to grow some of their own food can help improve food quality, eliminate food deserts, and increase community food security.

**Science Emphasis Areas:** Education and Multicultural Alliances, Food Safety, Sustainable Agricultural Production Systems, Youth Development

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Research Projects: 0

Extension Programs: 0

Active

## OSU - Health and Wellness

Last Updated: 2019

Initiated on: 11/26/2019

**Term Length:** Long-term (>5 years)

Ohioans should have a positive state of mental and physical health, which includes the prevention of disease, by creating and supporting healthy environments in homes, schools, workplaces, and communities. Ohio State will achieve this goal through a focus on topics that include disease prevention, safety research and education, social and emotional health, and stress reduction. Research and Extension efforts are anticipated to lead to positive behavior change, enabling people to achieve and manage positive personal and community health and wellness outcomes.

**Science Emphasis Areas:** Education and Multicultural Alliances, Family & Consumer Sciences, Food Safety, Human Nutrition, Sustainable Agricultural Production Systems, Youth Development

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Research Projects: 0

Extension Programs: 0

Active

## OSU - Thriving Across the Lifespan

Last Updated: 2021

Initiated on: 11/26/2019

**Term Length:** Long-term (>5 years)

From infancy into later life, Ohio State is committed to helping Ohioans thrive. We develop and strengthen the skills of current and future leaders to address today's most pressing issues. Our Research and Extension mission areas partner to leverage research-based knowledge and best practices to strengthen individuals and the various social structures in which they live. As our society and family structures change, the ways in which we reach and empower clientele will evolve, so it is important that we are finding new ways to reach these audiences—from court-mandated programming to online learning communities. Person-centered engagement also advances the body of research knowledge and individualized instruction practices. Another key focus of our efforts is positive youth development, delivered primarily through 4-H. Our goals are to empower youth, families, and communities to develop and expand characteristics, knowledge, and skills that create a strong foundation for a positive adulthood, including career and college readiness.

**Science Emphasis Areas:** Education and Multicultural Alliances, Family & Consumer Sciences, Youth Development

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Research Projects: 0

Extension Programs: 0

## Report Status

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Approved as of 07/19/2023

### Comments

Executive Summary

Central State University (CSU), the only state assisted Historically Black College and University (HBCU) in Ohio, is also the newest of the 1890 Land Grant Institutions in the country. The State of Ohio supports CSU's Land-Grant mission by providing a one for one match for the Evans-Allen Research, Cooperative Extension, and the McIntire- Stennis programs. Central State's Land-Grant Programs are guided by the CSU Land-Grant Advisory Council (LGAC), 12-member body with representation from across the farming spectrum of Ohio, and managed through Research and Extension directorates.

CSU is receiving higher levels of federal support for its Evans-Allen and Cooperative Extension Programs from 2018 Farm Bill compared to the level between 2014 through 2018. The research and extension projects and programs focus on six critical issues in the State.

CSU Extension will continue to assist farmers by providing guidance on multiple plant and animal production systems. CSU Extension programming is delivered through four program areas across five regions. Each region has two extension personnel to organize and coordinate outreach activities. Twelve full time research faculty conduct applied research through Evans-Allen and McIntire-Stennis projects within the identified six critical areas.

In summary, the overall plan of research and extension activities proposed by CSU is well positioned to address the critical areas identified.

#### Merit and Scientific Peer Review Process

A research advisory council (RAC), internal evaluators not associated with programs, and external expert/peer reviewers form a robust review process for evaluation of CSU's Evans-Allen projects. The Interagency Forestry Team will provide a review of all aspects of planned McIntire-Stennis projects. Each one of CSU Extension's four program areas will have respective advisory councils consisting of subject matter experts to review the programs. The LGAC may be asked to provide merit review of proposed Joint Extension/Research Plan of Work.

CSU's Merit and Scientific Review Process involves a thorough process of program evaluation.

#### Stakeholder Input

CSU Extension's five regions have an advisory council that meets twice a year to discuss community dynamics, needs, and opportunities. In addition, participant evaluation of Extension programs will be conducted. A needs assessment will also be conducted by Extension in at least one target community in each region. Internal and external evaluators described in the Scientific and Merit Review Process section will be used here as well. Processes for collecting, analyzing, and implementing input from stakeholders are quite adequate.

#### Critical Issues

The CSU 2024 Plan of Work describes 6 critical issues, Developing and Infusing Emergent Technologies in Agricultural Systems, Sustaining Plant and Animal Systems, Securing Natural Resources and Environmental Systems, Enhancing Food Nutrition and Health Systems, Fostering Workforce Development, and Engaging Communities & Transforming Lives in the following Science Emphasis areas: Bioeconomy, Bioenergy, and Bioproducts, Food Safety, Environmental Systems, and Sustainable Agricultural Production Systems. All the critical issues and science areas will be addressed with definitive and planned integrated research and extension activities. Overall, the outcomes from the approaches to the critical issues should benefit all Ohioans, especially, minority/underserved/small farm operations.

#### General Recommendations

In summary, the 2024 appraisal of Central State University's 2024 Plan of Work, addressing 6 Critical Issues, is well planned and outlines clearly defined activities to meet their goals and objectives. CSU's merit, peer, and program review processes are balanced and quite robust. Stakeholder input is obtained through various vehicles and is incorporated into multiple aspects of their overall program plan. CSU is commended for drafting this well-defined Plan of Work.