

THERAPEUTIC MARIJUANA

**LOUISIANA STATE UNIVERSITY
AGRICULTURAL CENTER AND SOUTHERN
UNIVERSITY AGRICULTURAL CENTER**

PERFORMANCE AUDIT SERVICES

**Informational Brief
April 16, 2024**

**LOUISIANA LEGISLATIVE AUDITOR
1600 NORTH THIRD STREET
POST OFFICE BOX 94397
BATON ROUGE, LOUISIANA 70804-9397**

LEGISLATIVE AUDITOR
MICHAEL J. "MIKE" WAGUESPACK, CPA

FIRST ASSISTANT LEGISLATIVE AUDITOR
BETH Q. DAVIS, CPA

DIRECTOR OF PERFORMANCE AUDIT SERVICES
KAREN LEBLANC, CIA, CGAP, MSW

PERFORMANCE AUDIT MANAGER
CHRIS MAGEE, CIA, CGAP, CFE, MBA

AUDIT TEAM
COURTNEY STEVENSON, CIA, MS

Under the provisions of state law, this report is a public document. A copy of this report has been submitted to the Governor, to the Attorney General, and to other public officials as required by state law. A copy of this report is available for public inspection at the Baton Rouge office of the Louisiana Legislative Auditor and online at www.la.la.gov. When contacting the office, you may refer to Agency ID No. 9726 or Report ID No. 40230038 for additional information.

This document is produced by the Louisiana Legislative Auditor, State of Louisiana, Post Office Box 94397, Baton Rouge, Louisiana 70804-9397 in accordance with Louisiana Revised Statute 24:513. Four copies of this public document were produced at an approximate cost of \$1.60. This material was produced in accordance with the standards for state agencies established pursuant to R.S. 43:31.

In compliance with the Americans With Disabilities Act, if you need special assistance relative to this document, or any documents of the Legislative Auditor, please contact Jenifer Schaye, General Counsel, at 225-339-3800.

April 16, 2024

The Honorable J. Cameron Henry, Jr.,
President of the Senate
The Honorable Phillip DeVillier,
Speaker of the House of Representatives

Dear Senator Henry and Representative DeVillier:

This informational brief provides the results of our analysis of the therapeutic marijuana programs at the Louisiana State University Agricultural Center (LSU AgCenter) and the Southern University Agricultural Center (SU AgCenter). This informational brief details the roles of the LSU and SU AgCenters in their therapeutic marijuana programs, revenues and expenditures for each, and research projects conducted.

Respectfully submitted,



Michael J. "Mike" Waguespack, CPA
Legislative Auditor

MJW/aa

THERAPEUTICMARIJUANA





Informational Brief

Therapeutic Marijuana

Louisiana State University Agricultural Center and
Southern University Agricultural Center

MICHAEL J. "MIKE"
WAGUESPACK, CPA

Audit Control #40230038
Performance Audit Services – April 2024

Background

Act 261 of the 2015 Regular Legislative Session, also known as the Alison Neustrom Act, established the framework for Louisiana’s therapeutic marijuana program.¹ While the Act delegated rulemaking authority to the Louisiana Department of Agriculture and Forestry, the Louisiana Board of Pharmacy, and the Louisiana State Board of Medical Examiners, it designated the Louisiana State University Agricultural Center (LSU AgCenter) and the Southern University Agricultural Center (SU AgCenter) as the state’s production facilities for therapeutic marijuana, with a right of first refusal. This made the LSU and SU AgCenters the only two authorized producers of therapeutic marijuana in the state.

Both the LSU AgCenter and the SU AgCenter opted into the program, and each selected a vendor through a competitive bidding process in accordance with the state’s procurement code to provide therapeutic marijuana production services for the AgCenters. Through this arrangement, the vendors are responsible for cultivating, extracting, processing, and formulating medical marijuana and medical marijuana-infused products to licensed pharmacies in Louisiana on behalf of the AgCenters, while the LSU and SU AgCenters are responsible for ensuring the terms of the contract are met.

The LSU AgCenter selected GB Sciences Louisiana, LLC (GB Sciences Louisiana), which is currently doing business as Good Day Farm. The SU AgCenter selected Advanced Biomedics, LLC, which was subsequently purchased by Ilera Holistic Healthcare (Ilera). The contracts for both AgCenters required the vendors to make payments to the AgCenters based on the proceeds from the sale of therapeutic marijuana products to licensed pharmacies, with clauses setting minimum amounts. Proposed

Why We Compiled This Informational Brief

We conducted this analysis in response to a legislative request for information related to the therapeutic marijuana programs at the Louisiana State University Agricultural Center (LSU AgCenter) and the Southern University Agricultural Center (SU AgCenter). We obtained information related to the roles that the LSU and SU AgCenters fulfill in their therapeutic marijuana programs, as well as program revenues, expenditures, and research projects.

Informational briefs are intended to provide more timely information than standards-based performance audits. While these informational briefs do not follow all *Governmental Auditing Standards*, we conduct quality assurance activities to ensure the information presented is accurate. We met with LSU and SU AgCenter staff and incorporated their feedback throughout this informational brief.

¹ <https://legis.la.gov/legis/ViewDocument.aspx?d=960317>

legislation² could remove the LSU and SU AgCenters from Louisiana’s therapeutic marijuana program and impact future revenues.

What We Found

Role of the LSU and SU AgCenters. State law³ requires the LSU AgCenter and the SU AgCenter to each select and contract with only one vendor, which is then authorized to produce therapeutic marijuana. Because both AgCenters contract out the production of therapeutic marijuana intended for sale in authorized Louisiana pharmacies rather than produce it themselves, neither AgCenter is directly involved in its daily production. Exhibit 1 details the responsibilities of the LSU and SU AgCenters and their respective vendors.

Exhibit 1 LSU AgCenter, SU AgCenter, and Vendor Responsibilities	
Entity	Responsibilities
LSU AgCenter and SU AgCenter	<ul style="list-style-type: none"> • Requesting bids, selecting, and contracting with vendors in accordance with Louisiana Procurement Code • Acting as the contract monitor • May conduct research on marijuana for therapeutic use
Vendor	<ul style="list-style-type: none"> • Cultivating, extracting, processing, producing, and transporting therapeutic marijuana and therapeutic marijuana products • Fulfilling contractual requirements to the LSU and SU AgCenters, including making contracted payments
<p>Source: Prepared by legislative auditor’s staff using information from state law, the LSU AgCenter, and the SU AgCenter.</p>	

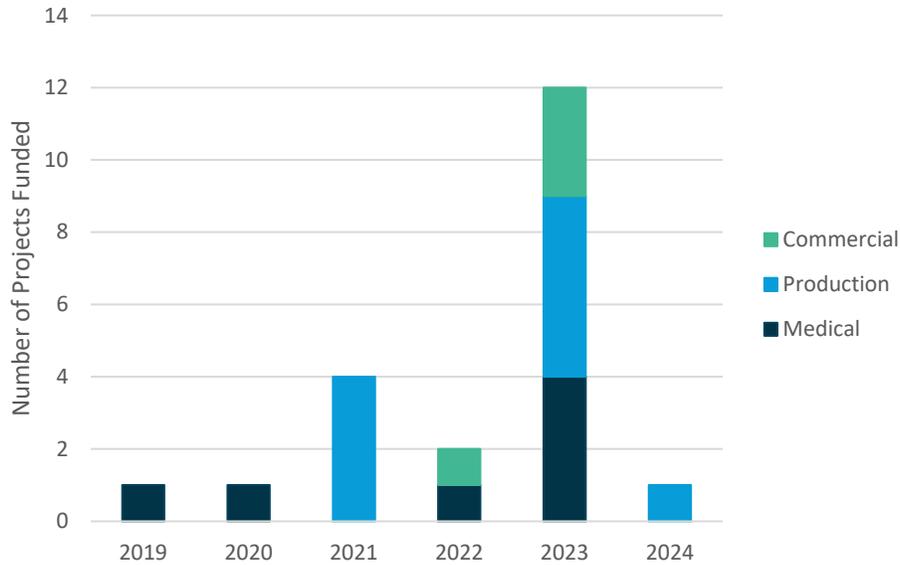
LSU AgCenter Research Projects. Between February 2019 and March 2024, the LSU AgCenter awarded grants of \$1,676,181 for 24 research projects. Because the LSU AgCenter awards grants for its research projects, it knows the budgeted cost for each project. Of these 24 projects, eight are related to medical research about the use of therapeutic marijuana, nine to the production, cultivation, and storage of therapeutic marijuana and industrial hemp⁴, and seven to their commercial use. Exhibit 2 shows the total number of research projects funded by the LSU AgCenter by fiscal year and research type.

² <https://legis.la.gov/legis/BillInfo.aspx?s=24RS&b=SB228&sbi=y>, as of April 15, 2024.

³ Louisiana Revised Statute (L. R.S.) 40:1046

⁴ Industrial hemp is defined in La. R.S. 3:1462(10) as marijuana with tetrahydrocannabinol (THC) levels below a certain threshold.

Exhibit 2
LSU AgCenter Research Projects by Fiscal Year and Research Type
February 2019 through March 2024



Source: Prepared by legislative auditor’s staff using information from the LSU AgCenter.

These projects examine various aspects of marijuana including tetrahydrocannabinol (THC) and cannabidiol (CBD) traits, uses for neurodegenerative disorders, plant growth management, anti-inflammatory effects, use of fiber, use as an opioid alternative, and opportunities for cardioprotective traits after a heart attack. For example, one grant totaling \$22,674 evaluated the ideal container size for promoting hemp growth, identifying the optimal planting density, comparing growth media types, comparing the effect of container color on soil temperature and related effects, and identifying effective herbicide treatments on hemp. Appendix A lists each project and details grant funding and a summary of the project.

SU AgCenter Research Projects. The SU AgCenter began conducting therapeutic use research projects in 2022 and is currently conducting five research projects at an estimated cost of \$287,000. The SU AgCenter groups its research projects together and does not track the budget and costs for each project individually. All of these projects are related to medical uses of therapeutic marijuana. For example, one research project is evaluating the potential use of cannabinoids in improving wound healing outcomes, while another is looking at its neuroprotective qualities for use in treatments for Parkinson’s Disease. According to SU AgCenter staff, the AgCenter also conducts agricultural research related to the cultivation of marijuana, but that research is conducted under its industrial hemp program and is not directly funded through the therapeutic marijuana program. Appendix A lists each project and details estimated costs and a summary of the project.

LSU AgCenter Revenues and Expenditures. The LSU AgCenter entered into an initial five-year contract with GB Sciences Louisiana in September 2017. According to documents provided by the LSU AgCenter, it received \$7,569,028 from its vendor between April 2018 and January 2024. The contract required GB Sciences Louisiana to make several payments to the LSU AgCenter in exchange for producing therapeutic marijuana on their behalf. These payments included an annual research investment of \$500,000 and either 10.0% of gross receipts earned from the sale of therapeutic marijuana or a guaranteed minimum financial payment, whichever was greater.⁵

According to LSU AgCenter staff, the contract was amended in December 2020 in order to clarify and update the payment terms in the initial contract. The contract amendment, which also renews the agreement between GB Sciences Louisiana and the LSU AgCenter for another five years, requires settlement payments totaling \$2,668,500 during fiscal years 2022 through 2025 in exchange for amending and renewing the contract. The contract amendment changes annual payments during fiscal years 2022 through 2028 to a percentage of post-tax net proceeds, ranging from 3.0% to 7.0%, or minimum payments of between \$500,000 and \$2,000,000, whichever is greater. The LSU AgCenter should receive at least an additional \$6.3 million through the end of fiscal year 2028 between settlement and annual payments based on the terms of the amended contract. Exhibit 3 shows the LSU AgCenter's actual and projected minimum revenues for fiscal years 2018 through 2028.

Exhibit 3	
LSU AgCenter Actual and Projected Revenues	
April 2018 through December 2027	
Fiscal Year	Amount
2018	\$1,000,000
2019	600,000
2020	1,000,528
2021	1,300,000
2022	1,000,000
2023	1,368,500
2024	1,300,000
2025*	1,300,000
2026*	1,500,000
2027*	1,500,000
2028*	2,000,000
Total**	\$13,869,028
* Projected based on contract between the LSU AgCenter and GB Sciences Louisiana.	
** Total includes actuals for fiscal years 2018 through 2024 and minimum projected amounts for fiscal years 2025 through 2028.	
Source: Prepared by legislative auditor's staff using information from the LSU AgCenter.	

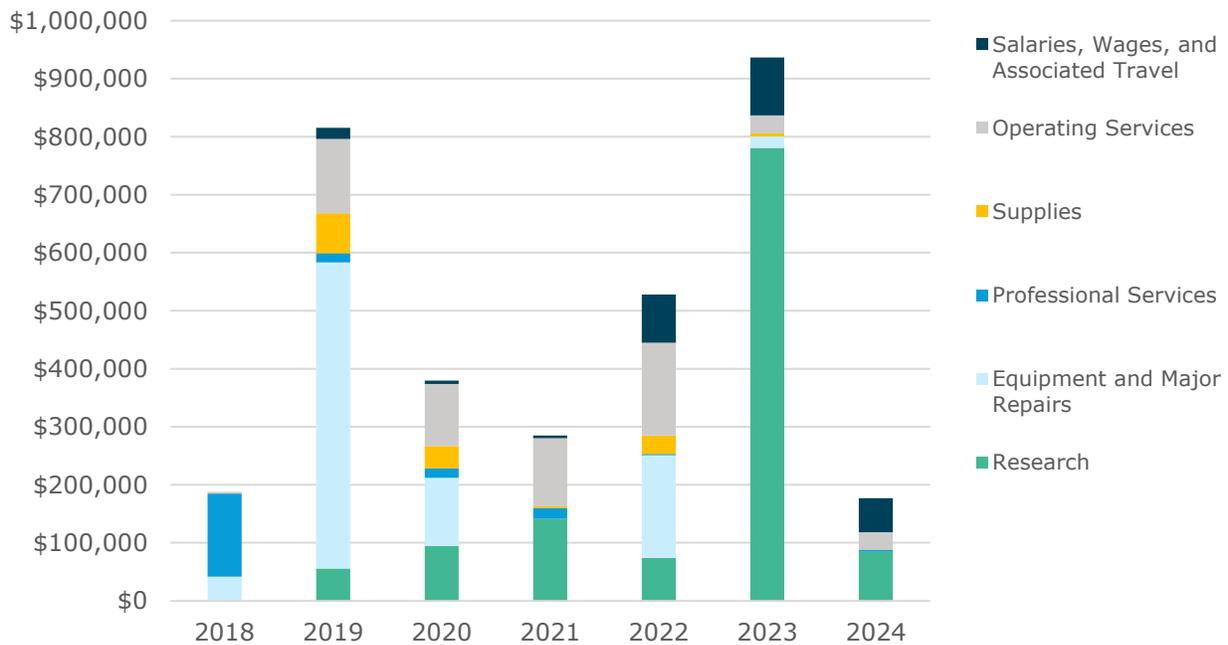
⁵ It ranged from \$1,000,000 to \$600,000 over the course of the initial five-year contract.

From June 2018 through January 2024, the LSU AgCenter spent \$3,754,207 on its therapeutic marijuana program for research, equipment and supplies, operating services, and personnel.⁶ LSU AgCenter staff stated that while neither the law nor the contract requires that they use the revenues from the vendor for marijuana research specifically, that is how they have chosen to use the revenues. Exhibit 4 describes expenditures and grant awards by category, while Exhibit 5 shows the type of expenditure by year.

Exhibit 4		
LSU AgCenter Expenditures and Grant Awards		
Fiscal Year 2018 through January 2024		
Category	Expenditures	Description
Research-related	\$1,676,181*	Direct funding for peer reviewed research projects from collaborating faculty and staff within the LSU AgCenter and the LSU System.
Equipment/Major Repairs	883,499	Purchase, acquisition, and installation of research-related equipment.
Operating Services	575,498	Banking fees, computer services, annual scientific research equipment maintenance contracts, expenses for licensing of production facility and staff (reimbursed by vendor), and maintenance of research equipment.
Personnel, Salary, Wages, and Associated Travel	270,986	Salaries and associated costs of faculty and professional staff working with the therapeutic marijuana program.
Professional Services	199,865	Project consulting, legal consulting, and other professional services agreements associated with implementation, development, and operation of the therapeutic marijuana program.
Supplies	148,178	Scientific research supplies and materials, general office supplies, and research software subscriptions.
Total	\$3,754,207	
* Includes grants awarded but not yet funded through March 2024.		
Source: Prepared by legislative auditor's staff using information from the LSU AgCenter.		

⁶ This includes expenditures made through January 2024 and grants awarded but not yet funded through March 2024.

**Exhibit 5
LSU AgCenter Expenditures by Type*
Fiscal Year 2018 through January 2024**



* Total research expenditures do not include amounts for projects that have been approved but not yet disbursed.

Source: Prepared by legislative auditor’s staff using information from the LSU AgCenter.

SU AgCenter Revenues and Expenditures. The SU AgCenter entered into a five-year contract with Advanced Biomedics in May 2018. According to documents provided by the SU AgCenter, it received \$7,000,000 from its vendor between fiscal years 2019 through 2024.⁷ The contract between the SU AgCenter and Advanced Biomedics required Advanced Biomedics to pay the SU AgCenter an initial payment of \$1,000,000 on the effective date of the contract, with annual payments of either 5.0% of gross proceeds or \$1,000,000, whichever was greater, through 2024. The SU AgCenter is currently in discussions for a subsequent contract with its vendor. Exhibit 6 shows the SU AgCenter’s revenues through the end of the initial contract in 2024.

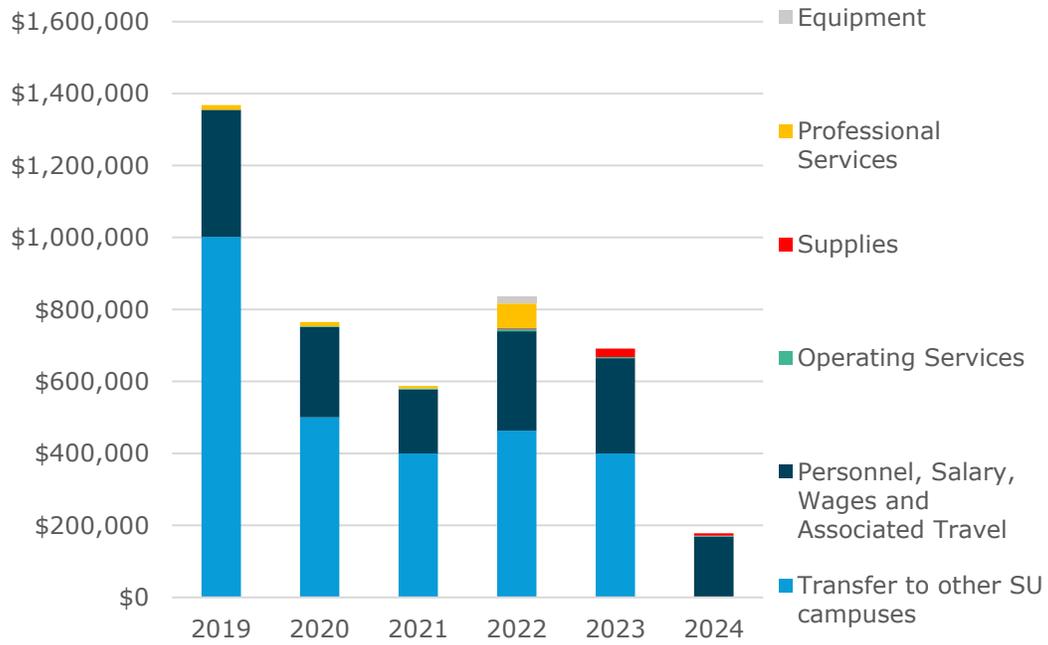
⁷ Further, the contract between the SU AgCenter and Advanced Biomedics require Advanced Biomedics to make community contributions of \$150,000 to the Medicinal Plant Institute (Institute) within the first 72 hours of the effective date of the initial contract and 2.5% of pre-tax net operating profit thereafter. These community contributions are determined at the sole discretion of Advanced Biomedics and include items such as contributions to the Institute and funding of academic scholarships for high school students attending the Institute.

Exhibit 6 SU AgCenter Revenues May 2019 through Fiscal Year 2024	
Fiscal Year	Amount
2019	\$2,000,000
2020	1,000,000
2021	1,000,000
2022	1,000,000
2023	1,000,000
2024	1,000,000
Total	\$7,000,000
Source: Prepared by legislative auditor staff using information from the SU AgCenter.	

During fiscal years 2019 through 2024, the SU AgCenter spent \$1,652,665 on employee salaries and associated expenses, equipment, and other costs for its therapeutic marijuana program, which includes the costs for its research projects. In addition, the SU AgCenter transferred \$2,764,653 to other campuses in the Southern University System for general expenditures. Neither the law nor the contract requires the AgCenters to spend revenues exclusively on marijuana research. Exhibit 7 describes the total amount of expenditures for the SU AgCenter by category, while Exhibit 8 shows the type of expenditure by year.

Exhibit 7 SU AgCenter Expenditures Fiscal Year 2019 through March 2024		
Category	Expenditures*	Description
Transfers to System Campuses	\$2,764,653	Includes transfers to support other SU System Campuses, including the Board and System, Southern University - Baton Rouge, the SU Law Center, Southern University - New Orleans, and Southern University - Shreveport.
Equipment/Major Repairs	18,999	Purchase and acquisition of research related equipment and installation of equipment for research.
Operating Services	17,847	Banking fees, computer services, annual scientific research equipment maintenance contracts, expenses for licensing of production facility and staff (reimbursed by vendor), and maintenance of research equipment.
Personnel, Salary, Wages, and Associated Travel	1,484,583	Salaries and associated costs of faculty and professional staff.
Professional Services	99,400	Project consulting, legal consulting, and other professional services agreements associated with implementation, development, and operation of the therapeutic marijuana program.
Supplies	31,836	Scientific research supplies and materials, general office supplies, and research software subscriptions.
Total	\$4,417,318	
* The SU AgCenter does not track individual research project actual expenditures but instead provided the LLA with estimated costs by project. Research project expenditures are included in the other categories in this exhibit.		
Source: Prepared by legislative auditor’s staff using information from the SU AgCenter.		

Exhibit 8 SU AgCenter Expenditures by Type and Year Fiscal Year 2019 through March 2024



Source: Prepared by legislative auditor’s staff using information from the SU AgCenter.

APPENDIX A: RESEARCH PROJECTS

LSU AgCenter Research Projects			
Entity	Project Title	Grant Funding	Summary
LSU	Development of single nucleotide polymorphism (SNP) panels for THC and CBD traits in Cannabis species	\$47,694	Development of molecular markers using SNP panels for future use in Cannabis breeding aiming for the differentiation between high CBD plants and high THC plants to make it easier to develop those varieties. Markers for sexing of plants have been developed using these panels. Further cannabinoid profiling and development of markers looking at disease and pest resistance, stress, and terpene profiling is also planned.
LSU	Use of zebrafish models to investigate the neuroprotective/ neurorestorative potential of target cannabinoid extracts and mixtures on select neurodegenerative disorders	55,750	Using zebrafish as a model organism to study the effects of Cannabis extracts on neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease. Cannabinoids are known to have neuroprotective benefits because of anti-inflammatory and antioxidant activity. Zebrafish adults, embryos, and larvae are being treated with cannabinoid mixtures to study their neurological effects.
LSU	Developing arthropod models for studying interactions of the cannabinoid receptor and neurodegenerative diseases	94,477	Human cannabinoid receptors have been knocked into arthropod species using a genetic modification technique. These insects are being used as a model organism to study cannabinoid effects on slowing or halting the progression of diseases like Alzheimer's, Parkinson's, spastic paraplegia, and schizophrenia. Mobility and electrophysical assays are investigating the effects on neurodegeneration and improving organism longevity.
LSU	Evaluation of container grown hemp and herbicide evaluation	22,674	Master's project investigated the feasibility of using containers for hemp production in Louisiana. Some objectives of the research were to identify the ideal container size for promoting hemp growth, identifying the optimal planting density, comparison of growth media types, compare the effect of container color on soil temperature and the effect on the hemp plants, and identification of effective herbicide treatments.
LSU	Initial steps in identifying the components of a hemp Integrated Pest Management (IPM) program	39,960	Initial study of insect pest populations that are prevalent in hemp production of Louisiana to determine the pests with the biggest economic impact. Insect monitoring methods are also being evaluated in greenhouse and field settings. The effect of key hemp insect damage on cannabinoid production is another research focus, as it is important to maintain hemp compliance and avoid crop destruction due to high THC levels.

LSU AgCenter Research Projects			
Entity	Project Title	Grant Funding	Summary
LSU	Evaluation of commercial cultural practices for Louisiana grown industrial hemp	\$31,001	Project evaluating germination and transplant production practices, in-field plant spacing with the goal of producing best management practices guide for industrial hemp in Louisiana.
LSU	A novel goat model to characterize the male fertility following paternal cannabidiol exposure	134,638	Study looking at the effect of CBD exposure on the effect on goat semen attributes and sperm RNA code as an animal model. As Cannabis gains social acceptance, the applicability of an animal model could reveal details on CBD safety for humans.
LSU	Identification and quantitation of bioactive compounds in hemp used as a salad green	49,500	Investigating the nutraceutical value of hemp microgreens as a salad green or other value-added food products. Cannabinoid testing will determine the amount of cannabinoids present in the leaves including THC, THCA, CBD, CBDA, CBG, and CBGA. Antioxidant and vitamin content will also be quantified. A taste test will also evaluate the marketability as a food product compared to other leafy green vegetables.
LSU	Assessing interactions in the capacity of terpenes to produce anti-inflammatory and antinociceptive effects as well as reduce the abuse-related effects of opioids	77,964	Evaluate the effect of terpenes and their ability to reduce inflammation, produce analgesic effects, and reduce opioid use. Three prevalent terpenes will be used to evaluate effects on inflammatory signaling pathway and antinociception. Fentanyl-induced place conditioning will be utilized in a mouse model to evaluate the effects on opioid abuse.
LSU	The impact of endocannabinoids on oviduct and uterine fluid composition regulation and early embryo development in vitro	89,132	Utilize cutting edge cell culture modeling approaches to elucidate the influence of cannabis metabolites on oviduct and uterine fluid composition in vitro. THC and CBD will be combined at different levels as factors in the experimental design to determine their influence during the early stages of pregnancy.
LSU	Container grown Cannabis sativa subspecies for essential oil production in Louisiana	25,516	Continued research to evaluate the efficacy of high-tunnel production of Cannabis grown in containers for oil production. Experiments designed to optimize production methods to assess the impact of different factors like container size, container color, planting density, and media types.

LSU AgCenter Research Projects			
Entity	Project Title	Grant Funding	Summary
LSU	Establishment of a centralized Cannabis plant material propagation system for continued hemp research	\$22,501	Funding provided to establish a room dedicated to Cannabis propagation and the production of clones as a source of plant material for various LSU research projects. The establishment of this project will also be used to generate funding to maintain the room and cover costs of supplies and plant material moving forward. The room is fully functional and has been used to produce nearly 12,000 plants used in nine different research trials.
LSU	In vitro and in vivo screening of native plant crude extracts against major plant pathogens affecting Cannabis and specialty food crops of Louisiana	6,135	Exploratory study to evaluate the effects of extracts sourced from selected Louisiana native plants on fungal and bacterial pathogens of Cannabis using in vitro bioassays. Extracts from two different native plants are currently undergoing testing on 4 common pathogens at different concentrations to evaluate the extract's efficacy of inhibition of pathogen growth.
LSU	Evaluation of greenhouse grown Cannabis sativa for essential oil production in Louisiana	84,659	Evaluation of eight different varieties of Cannabis produced in greenhouses for essential oil production. Varieties will be sourced based on performance from past trials as well as from the USDA germplasm bank. Two trials are currently nearing completion with different varieties being evaluated for plant morphology, leaf nutrients, floral imaging, yield, and cannabinoid content.
LSU	Soil fertility and nutrient management research for hemp production in Louisiana	130,760	Multi-year project to establish optimal fertilizer application rates for hemp production in Louisiana growing conditions. Multiple soil types and cultivars will be tested across multiple fertilization treatments and compared to untreated controls. Investigation into the relationships between nutrient levels, pest infestations, growth parameters, and the cannabinoid profile of hemp plants are currently in ongoing trials.
LSU	Consumer acceptance of industrial hemp textile products: education and outreach	71,900	Existing consumer sentiments regarding hemp textile products will be determined using a consumer survey to gauge the willingness of individuals to purchase hemp textile products compared to other alternatives. Promotion of awareness of the potential of hemp textiles through a wearable art exhibition will also help educate consumers.
LSU	Assessing the impact of cannabis on executive function and susceptibility to stimulant addiction	183,626	Individuals with methamphetamine use disorder and cannabis use disorder will be recruited for evaluation to understand the effects of cannabis on susceptibility to methamphetamine addiction using neuropsychological assessment tools by measuring the effect on executive function. Animal models will also be used to measure the impact of cannabinoids and terpenes related to methamphetamine exposure and if they positively or negatively affect susceptibility to relapse.

LSU AgCenter Research Projects			
Entity	Project Title	Grant Funding	Summary
LSU	Exploring the markets for hemp fiber textiles and clothing	\$67,420	Using internet data mining approaches, identification of marketing determinants for the promotion of hemp fiber textiles and clothing will also be supplemented with large-scale surveys. The research will be used to develop hemp textiles and clothing products and to educate crafters on the use of industrial hemp textiles.
LSU	The effect of cannabidiol on the heart after myocardial infarction	100,000	Translational animal models will evaluate the effectiveness of CBD post myocardial infarction (heart attack) and its potential cardioprotective effect. The mechanisms underlying the cardioprotective effect will be explored using a comparative gene expression analysis approach on an animal model.
LSU	Optimizing Louisiana planting and harvest dates for field grown day-neutral hemp crops in the fall and early spring seasons	20,209	Off-season planting dates using an auto-flowering variety aim to determine the best cool season planting timeframe during the spring and fall. Off-season hemp planting could potentially avoid common pests, diseases, and environmental conditions present during the warm summer months.
LSU	Accelerated stability testing and an evaluation of shelf life, cannabinoid degradation, and floral degradation	84,375	Post-harvest study examining how storage of Cannabis flower affects the chemical and physical attributes like cannabinoid degradation. Samples will be evaluated at multiple timepoints to document the changes in inflorescence morphology using multiple different cultivars with varying chemical and physical attributes.
LSU	Lignin-based nanoparticles to improve oral delivery of cannabidiol	84,920	Exploring lignin nanoparticles as new delivery methods which have the potential to increase bioavailability and absorption to improve their efficiency. The initial study will focus on the synthesis and characterization of the particles loaded with cannabidiol and will be evaluated for gastrointestinal bioavailability and uptake.
LSU	Testing phytocannabinoids on cancer cell physiology in a microfluidic chip	100,000	3D-printed microfluidic chips are a new technology that can be seeded with live patient cells as a more accurate way to mimic tumor progression. The microfluidic chips will be used as a platform to test phytocannabinoids like CBD that could act as novel cancer treatments, adjuvants, sensitizers, or chemoprotectives.
LSU	Comparing the wearing comfort of hemp and cotton sustainable apparel	51,370	Sustainably designed zero-waste hemp medical scrubs will be developed and evaluated against cotton medical scrubs. The scrubs will be compared for different comfort factors in wear trials during clinical immersions to potentially provide support for manufacturers to adopt the use of hemp fabrics and zero-waste production methods.
Total	24	\$1,676,181	

SU AgCenter Research Projects			
Entity	Project Title	Estimated Costs	Summary
SU	Evaluation of cell viability of rat liver cells following independent and combined cannabinoid and terpene extract applications.	\$35,000	The aim of this study is to assess cell viability and evaluate the anti-inflammatory effects of cannabinoids and terpenes, two classes of compounds derived from the cannabis plant, on rat liver cells. Cannabinoids are molecules that interact with the endocannabinoid system (ECS), a modulatory system that regulates various physiological processes, including inflammation, metabolism, and liver function.
SU	Preclinical evaluation of cannabinoid-infused products for wound healing in swine	53,000	Cannabinoids have shown promise in promoting anti-inflammatory, analgesic, and tissue-regenerating effects. Incorporating these compounds into various product formulations could offer a unique and novel therapeutic approach for enhancing wound healing outcomes.
SU	Preclinical evaluation of therapeutic interventions for Parkinson's Disease using rat model	94,000	Parkinson's Disease (PD) is a progressive neurodegenerative disorder characterized by dopaminergic neuron loss. This study aims to assess the neuroprotective effects of cannabinoids as potential therapeutic interventions for PD using the rat model. The rat model replicates key aspects of PD pathology, providing insights into motor deficits, neurochemical changes, and potential interventions.
SU	Preclinical trial to evaluate the neuroprotective efficacy of cannabinoids and terpenes in a rat model of cerebral ischemia	75,000	Cerebral ischemia is a leading cause of stroke, and neuroprotective strategies are crucial for mitigating its devastating effects. This preclinical trial aims to assess the potential neuroprotective effects of cannabinoids and terpenes using a rat model of middle cerebral artery occlusion (MCAO), simulating the ischemia-reperfusion injury observed in human stroke.
SU	Preclinical evaluation of cannabinoids and terpenes for diabetes management: investigating triage effects	30,000	The aim of this study is to determine the effectiveness of identified cannabinoids and terpenes in managing diabetes, and to investigate the potential triage effect among these compounds using a suitable rat model which closely mimics human diabetes.
Total	5	\$287,000	
Source: Prepared by legislative auditor's staff using information from the LSU AgCenter and the SU AgCenter.			