Postsecondary Education Agriculture Technology Study Commission

Action-to-Date Report

April 23, 2020

I. Legislative Charge

Senate Concurrent Resolution 81 (SCR 81) of the 2019 Regular Legislative Session (see Appendix A) created the Postsecondary Education Agriculture Technology Study Commission. This Commission is charged to study and make recommendations regarding needs and opportunities related to the creation of an Agriculture Technology Training Program for the State. In Louisiana, the agriculture and forestry industries annually contribute an estimated $10 billion to the economy. As this economic sector in Louisiana continues to grow, so do the technology and equipment utilized in it. Given the rapid advancement of high-tech tools, the maintenance and repair of agriculture machinery and equipment increasingly requires specialized training.

II. Overview of Work to Date

The Commission, comprised of representatives from postsecondary education and commodity groups, has met four times since the passage of SCR 81 (see Appendix B). At the first meeting in July, the Commission decided to begin their work by undertaking a thorough inventory of both agriculture and higher education needs. The Commission approached this through three efforts:

1) **Creation and delivery of an Agriculture Producer Survey:** The survey was created by Commission members, Commission Chair Dennis Epps, and Dr. Kristine Strickland, Chancellor of Fletcher Technical Community College, in partnership with Louisiana Community and Technical College System staff members Dr. Rene Cintron and Ms. Adrienne Fontenot. Upon approval by Commission members in October, this survey was distributed through all commodity members of the Commission.
2) **Completion and delivery of an Equipment Dealer Survey:** In addition to an agriculture producer survey, a second survey was created for equipment dealers throughout the State. This survey was designed to gather information about the training needed for the equipment sold in Louisiana.
3) **Higher Education Inventory:** In order to gain knowledge of the current postsecondary landscape, an inventory was developed of courses and programs related to agriculture technology. The inventory was supplemented by presentations from each higher education system in Louisiana: LCTCS, Louisiana State University System (LSU AgCenter), Southern University System (Southern AgCenter), and University of Louisiana System.

The goal of these activities was to provide a foundation to inform the Commission in assessing the need to develop an Agriculture Technology Training Program. The work of this thorough inventory is still underway, and this report serves as an action-to-date account, providing details of current findings as well as a timeline for the Commission's next steps.

III. Higher Education Landscape

The higher education landscape was presented at the October 28, 2019 and January 21, 2020 Commission meetings. During this time each system and/or agricultural center provided an overview of program offerings as they relate to agriculture technology or provided plans for future courses or program offerings.

Southern University Agricultural Research and Extension Centers (SUAREC)
SUAREC, established in 2001, maintains a mission "to conduct basic and applied research to the citizens of Louisiana in a manner that is essential in addressing their scientific, technological, social, economic and cultural needs." SUAREC provided information on both current program and course offerings related to agriculture technology and plans for future development (see Appendix C).

SUAREC's Urban Forestry degree provides courses associated with agriculture technology, including a hydroponics course, which trains students as well as community members to grow their own plants in a limited space. SUAREC also has a mobile technology unit, which helps facilitate four certification courses:

1) Small Ag Business Development
2) Small Ruminant Production
3) Food Safety
4) Sustainable Urban Agriculture

In addition to SUAREC's current program offerings, plans for the future include certificate programs for high school agriculture as well as a sustainable agriculture curriculum. Another future program discussed will incorporate drone technology into the current curricular offerings and focus on improving crop yield as well as farm efficiency. SUAREC also shared information concerning a recent grant application to create an agriculture technology fund, the goals of which are directly relevant to the work of the Commission (see Appendix C).

Louisiana State University AgCenter and College of Agriculture
The LSU AgCenter has greatly expanded its operations since opening in 1908, evolving from focusing almost exclusively on production agriculture to a comprehensive lens encompassing nutrition, economic issues, consulting, and technological advancements as the digital era continues to develop. With the dramatic increase of technology use in agriculture, LSU AgCenter recently developed an Agricultural Technology Initiative to arm future agricultural producers with the skills they need to prosper in their field. LSU recognizes the lack of degrees or certifications surrounding Digital Agriculture (DA) and they have committed to rectify this through education, research, and outreach within the State's agricultural industries and a focus on STEM programs to help train the future workforce.

The objectives of the Agricultural Technology Initiative focus on providing a comprehensive Digital Agricultural (DA) curriculum with an emphasis on a bachelor of science program in

family farm and industry needs. LSU AgCenter also plans to train and educate extension agents and faculty in the program delivery and to expand these modules to associated extension educational centers. A proposal has been submitted for this academic program and curricular materials (concepts and opportunities) have been developed and solidified to initiate training of faculty and staff. The Agricultural Technology Initiative proposes several courses, programs and initiatives to lay the foundation for this academic area in the form of:

- A minor degree in DA with a combination of existing courses and newly created ones;
- Courses focused on DA offered through Science, Technology, Engineering and Mathematics (STEM) disciplines;
- Two newly offered courses focused on Agronomy and Experimental Statistics;
- Graduate student research projects focused on DA; and
- Professional collaborations promoting DA efforts in LSU College of Agriculture.

The AgCenter's current efforts have laid the groundwork for this initiative, establishing a formal partnership with Ag Analytics, which maintains control of an extensive database of farmers with data and current projects. In addition, the faculty and staff have overseen research to promote sustainability and focus on risk management and success of major commodity crops, all through the lens of the DA initiative (see Appendix D).

University of Louisiana System

The University of Louisiana System, composed of nine institutions in Louisiana, provided a snapshot, as seen in Table 1, of relevant academic programs and courses associated with agriculture technology.

Table 1

College	Program(s)
Louisiana Tech University: School of Agricultural Sciences & Forestry	• BS in Agricultural Business • BS in Animal Science • BS in Forestry • BS in Geographic Information Science • BS in Secondary Education and Teaching – Grades 6-12, Agricultural Education Concentration (joint program with College of Education)
Nicholls State University: Department of Applied Science	• BS in Geomatics
McNeese State University	• BS in Agricultural Sciences
University of Louisiana at Monroe	• BS in Agribusiness • UC in Unmanned Aircraft Systems Management • BS in Unmanned Aircraft Systems Management

In addition to academic programs associated with agriculture technology, the System also provided a list of relevant courses which acknowledge or connect to agriculture technology (see Table 2).

Table 2

College	Relevant Courses
Grambling State University	• BIOL 215 Introductory Epidemiology • BIOL 312 Principles of Toxicology • BIOL 315 Water Quality Management Lecture/Lab • BIOL 418 Environmental Issues & Policies
Louisiana Tech University	• Agricultural Science (AGSC) 209: Small Engines • Agricultural Science (AGSC) 211: General Shop • Agricultural Education (AGED) 450: Advanced Agricultural Shop Methods and Safety

The University of Louisiana System added information concerning future programming efforts, which include a proposed Bachelor of Applied Science in Professional Supervision, including a concentration in Agriculture Technology, at Nicholls State University. A second planned program, an undergraduate certificate in Unmanned Aircraft Systems Management at the University of New Orleans, would allow individuals in agriculture or forestry an opportunity to train in the usage of drones (see Appendix E).

LCTCS

Programs offered by LCTCS currently include applied horticulture, forest technology and diesel mechanics technology. Table 3 indicates the colleges which offer each program, as well as the enrollment trends for each (see Appendix F).

Table 3

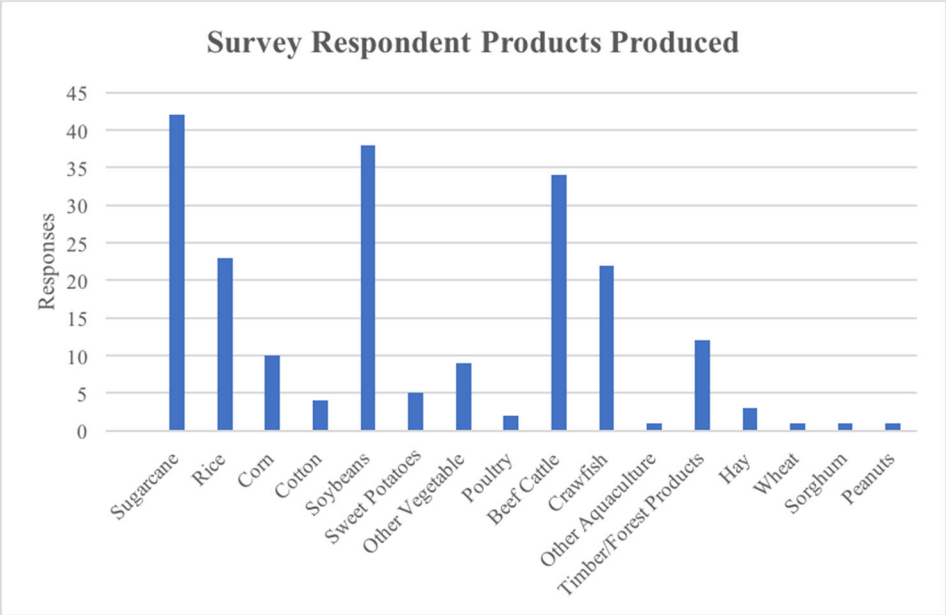
College	Program Name	Total Enrollment 2016-present	Awards Conferred 2016-present
BRCC*	Applied Horticulture	236	90
CLTCC SOWELA	Forest Technology	72	33
BRCC LDCC NTCC NLTCC SLCC**	Diesel Mechanics Technology	714	586
System Total		**1092**	**708**

*BRCC – Diesel Heavy Truck Technology
**SLCC – Industrial/Agriculture Mechanics Technology

IV. Agriculture Producer Survey Results

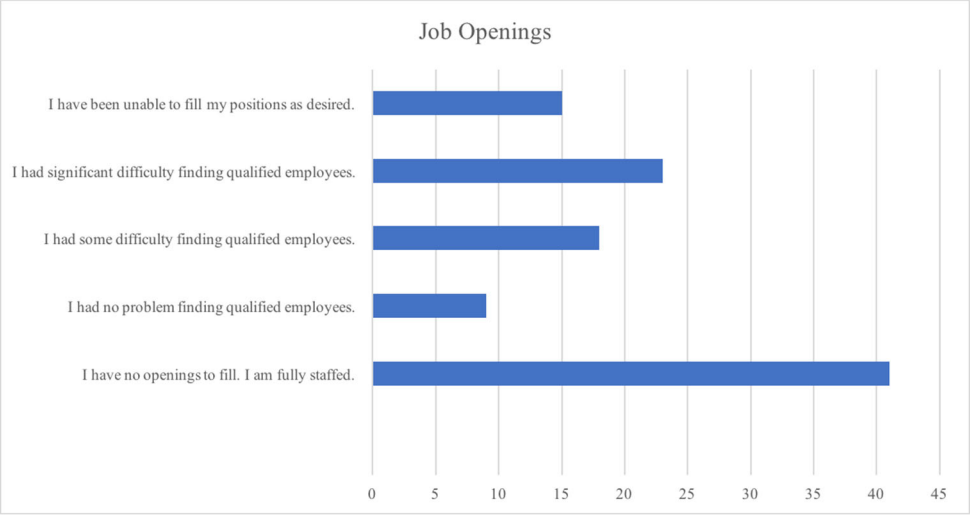
Distributed through Commission commodity group members, the agriculture producer survey obtained 103 responses through an electronic survey format. Appendix G provides all of the questions included in the survey.
Table 4 indicates the products produced by survey respondents. The primary products produced by the respondents included: sugarcane, soybeans, beef cattle, crawfish and timber/forest products.

Table 4



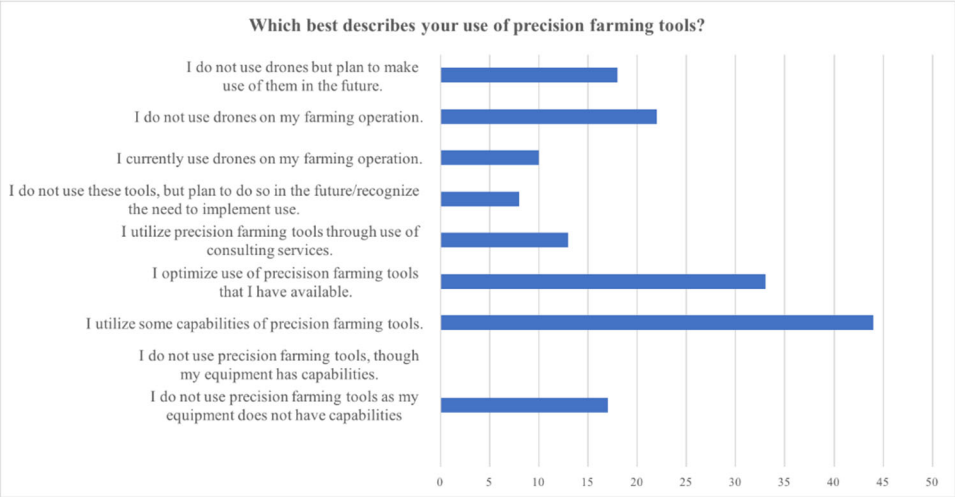
When asked about job openings, 41 percent of respondents stated they have no openings to fill – they are fully staffed – while 23 percent stated the opposite – having difficulty finding qualified employees (see Table 5).

Table 5



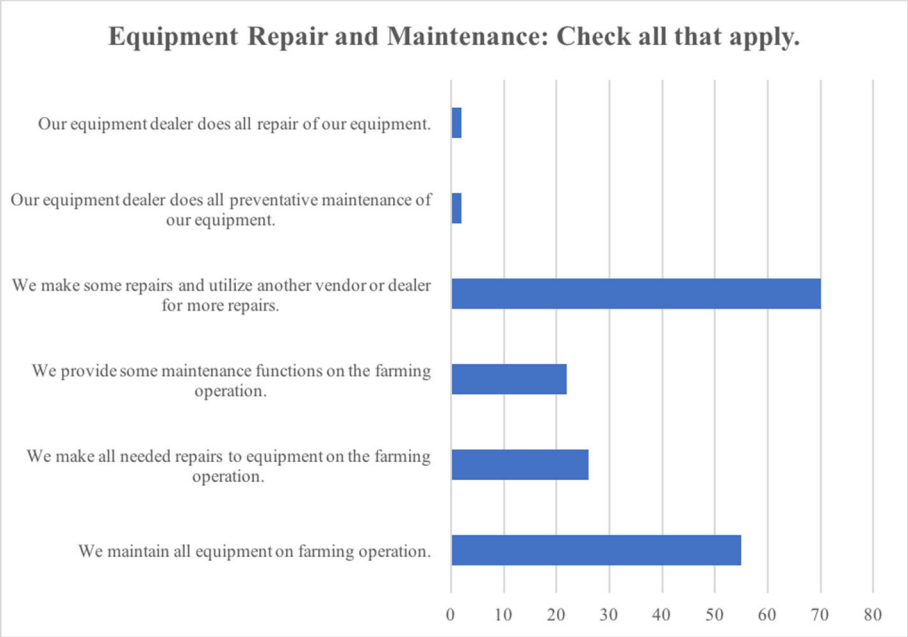
In terms of precision agriculture, when asked "which best describes your use of precision farming tools," 44 percent of respondents stated they utilize some capabilities of precision farming tools, while 33 percent of respondents stated that they optimize the use of precision farming tools (see Table 6).

Table 6



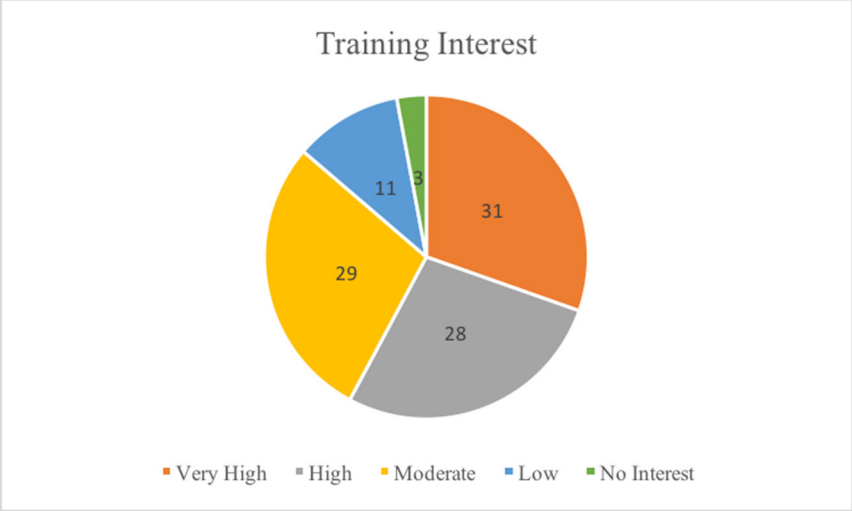
As seen in Table 7, for equipment repair and maintenance, 71.4 percent of respondents replied that "we make some repairs and utilize another vendor or dealer for more repairs."

Table 7



The majority of respondents stated they have a very high to moderate interest in training, showing preference for a combination training approach of both in-person and online training. The primary interest is training in the topic of repair diagnosis and troubleshooting, while the secondary interest is in preventative/predictive maintenance. The top three equipment makes used by survey respondents are John Deere, Case/IH, and Kubota.

Table 8



Overall, the survey of agricultural producers across the State indicates interest in a training program specific to the needs of repair diagnosis and preventative maintenance. In the comment section of the survey several themes emerged, including difficulty in obtaining needed personnel as well as the identification of precision agriculture farming needs. Respondents also expressed the need to expand educational opportunities related to agricultural practices, which continue to advance with time.

V. Equipment Dealer Survey

In addition to the agriculture producer survey, the Commission created a survey for distribution for equipment dealers across the state. As seen by the questions in Appendix H, this survey was designed to collect information concerning dealership needs and interests relevant to developing a skilled workforce specific to training opportunities. The survey has not yet been circulated by various equipment dealers throughout the state.

VI. Research of Agriculture Technology Training Programs

A survey of the programs across Louisiana's neighboring states and beyond shows that several large agricultural technology vendors partner with postsecondary institutions to train and educate students in agricultural technology innovations. The majority of offerings are provided through the John Deere Ag Tech program, which partners with 24 institutions across the U.S. & Canada; a detailed comparison of programs in Mississippi and Arkansas is below. Other programs have been established through transnational companies such as Case IH (Case IH Agriculture, 2011), Case New Holland, Caterpillar (ThinkBig, 2020) and Mack Trucks (Mack, 2018). These

programs are more limited than John Deere's and some, like Case IH, operate through third-party dealerships/companies (Parkland, 2020).

The John Deere programs in Mississippi and Arkansas service institutions, industry and demographics comparable to those in Louisiana. The program in Mississippi, offered through the Northwest Mississippi Community College, offers a five-semester, two-year program to train and educate future John Deere service technicians (Northwest MSCC, 2020) with a combination of classroom theory and hands-on experience, leading to an Associate of Applied Science degree. A program at Arkansas State University-Beebe offers similar instruction; students earn an Associate of Applied Science in Agriculture Equipment Technology with a mandatory 60 credit hours taken (Central Arkansas Now, 2019). The John Deere Ag Tech program includes a mandatory internship and a guaranteed job offer upon completion.

Based on research conducted, John Deere seems to have a substantial presence in agricultural technology training systems within the neighboring states of Texas, Mississippi, Arkansas and Georgia, with active programs at community and technical colleges. In considering whether Louisiana campuses should participate in the John Deere initiative, communication with the corporate office is necessary to gather information on how these programs are established and whether this should be sought through the direct vendor or a verified dealership (John Deere, 2020).

VII. Commission Next Steps

Due to the COVID-19 pandemic the Commission's anticipated timeline is being adjusted as needed while still ensuring the work continues forward in 2020.

Next Steps	Owner	Timeline
Continue discussion and development of postsecondary and equipment dealer partnerships	Postsecondary institutions & equipment dealers	**March 2020:** John Deere Tour at Nicholls **Spring 2020:** Develop program plan, including program needs, curricula, and implementation timeline
Louisiana stakeholders tour Case training facilities to gain insight to various opportunities	Trip logistics organized by Board of Regents and Case	**February 2020:** Task Force approves attending members **Spring 2020:** Louisiana Team training trip
Development of working sub-groups of the Commission	Commission Members	**July 2020:** At this meeting, Commission members will be able to identify the working groups they will participate in.

Appendix A:

2019 Regular Session **ENROLLED**

SENATE CONCURRENT RESOLUTION NO. 81

BY SENATORS ALLAIN, ALARIO, BARROW, BISHOP, CHABERT, COLOMB, ERDEY, FANNIN, GATTI, HENSGENS, JOHNS, LONG, MARTINY, MILLS, RISER, THOMPSON, WALSWORTH, WARD AND WHITE AND REPRESENTATIVE JAMES

A CONCURRENT RESOLUTION

To urge and request the Board of Regents to create the Postsecondary Education Agriculture Technology Study Commission.

WHEREAS, the agriculture and forestry industry contributes an estimated ten billion dollars annually to the economy of the state of Louisiana; and

WHEREAS, the agricultural industry is dependent upon highly specialized training and certifications to ensure the safe and reliable performance of agricultural machinery and equipment needed to harvest and prepare agricultural products for market and thus drive the state's economy; and

WHEREAS, the maintenance and repair of agricultural machinery and equipment requires specialized training and certifications to ensure the safe and reliable performance of the equipment and to comply with manufacturer warranty repair requirements; and

WHEREAS, technological improvements in precision agriculture and land grading require additional training for producers as a means to improve production and the ability to

compete at the national level; and

WHEREAS, our postsecondary education institutions are key partners in the training of citizens to fill equipment maintenance and repair jobs and to create innovations and opportunities for growth within this industry sector; and

WHEREAS, our postsecondary education institutions have industry partnerships that should be leveraged to ensure that training opportunities are aligned with industry needs, technical specifications, and emerging technologies.

THEREFORE, BE IT RESOLVED that the Legislature of Louisiana does hereby urge and request the Board of Regents to create the "Postsecondary Education Agriculture Technology Study Commission" to be composed of fifteen members as follows:

(1) The president of the University of Louisiana System or his designee.

(2) The Louisiana State University vice president for agriculture or his designee.

(3) The chancellor of the Southern University Agricultural Research and Extension Center or his designee.

(4) The president of the Louisiana Community and Technical College System or his designee.

(5) The president of Nicholls State University or his designee.

(6) The chancellor of Fletcher Technical Community College or his designee.

(7) Four persons appointed by the Louisiana Farm Bureau Federation, representing the major agriculture commodity groups.

(8) The president of Louisiana Farm Bureau Federation or his designee.

(9) Two persons appointed by the Deep Southern Equipment Dealers Association.

(10) The state director of United States Department of Agriculture Rural

Development in Louisiana or his designee.

(11) The commissioner of higher education or his designee.

BE IT FURTHER RESOLVED that the commissioner of higher education shall convene the commission for an organizational meeting not later than August 15, 2019. The commission shall elect a chairman and other officers as deemed necessary.

BE IT FURTHER RESOLVED that a majority of the membership shall constitute a quorum and any official action taken by the commission shall require an affirmative vote of a majority of the quorum present and voting.

BE IT FURTHER RESOLVED that the members of the study commission shall serve without compensation, but may be reimbursed for expenses by the respective appointing organization.

BE IT FURTHER RESOLVED that the Board of Regents shall provide staff support to the commission.

BE IT FURTHER RESOLVED that the commission shall study and make recommendations regarding the needs and opportunities related to the creation of an Agriculture Technology Training Program, including program budgetary needs, curricula, implementation timeline, cross-system collaboration, and any other items the study commission deems necessary for the successful implementation of an Agriculture Technology Program.

BE IT FURTHER RESOLVED that the Board of Regents shall submit a written report of the commission's findings and recommendations to the Senate Committee on Agriculture, Forestry, Aquaculture, and Rural Development, the Senate Committee on Education, the House Committee on Agriculture, Forestry, Aquaculture, and Rural

Development, and the House Committee on Education no later than March 1, 2020.

BE IT FURTHER RESOLVED that a copy of this Resolution be transmitted tothe chairman of the Board of Regents and the commissioner of higher education.

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PRESIDENT OF THE SENATE

Appendix B:

Postsecondary Education Agriculture Technology Study Commission Agenda, July 22, 2019 meeting

BOARD OF REGENTS
P. O. Box 3677
Baton Rouge, LA 70821-3677
Phone (225) 342-4253, FAX (225) 342-9318
www.regents.la.gov

Postsecondary Education Agriculture Technology Study Commission Agenda
July 22, 2019
9:30 a.m.
Iowa Room, 1st Floor of the Claiborne Building
1201 North 3rd St.
Baton Rouge, Louisiana

Objective:

- Study and make recommendations regarding the needs and opportunities related to the creation of an Agriculture Technology Training Program.
- In the study include program budgetary needs, curricula, implementation timeline, cross-system collaboration, and any other items the study commission deems necessary for the successful implementation of an Agriculture Technology Program.

Agenda Items:

1. Presentation from Senator Bret Allain
2. Roll Call
3. Election of Chair
4. Discussion:
    - Needs and Opportunities for an Agriculture Technology Training Program
    - Program Budgetary Needs
    - Curricula
    - Cross-System Collaboration
    - Implementation Timeline
5. Identify and prioritize next steps

BOARD OF REGENTS
P. O. Box 3677
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Postsecondary Education Agriculture Technology Study Commission Agenda
October 28, 2019
9 a.m. – 11 a.m.
Iowa Room, 1st Floor of the Claiborne Building
1201 North 3rd St.
Baton Rouge, Louisiana

Agenda Items:

1. 9:00 a.m. – 9:05 a.m.: **Call to Order, Roll Call & Approval of July 22, 2019 Minutes**
2. 9:05 a.m. – 9:30 a.m.: **Higher Education Inventory**
    - Dr. René Cintrón, *Chief Academic Affairs Officer, LCTCS*
    - Dr. Adrienne Fontenot, *Director of Adult Learning and Educational Programs, LCTCS*
3. 9:30 a.m.- 9:40 a.m.: **Components of Commission Report**
    - Mellynn Baker, *Institutional Research Associate, Louisiana Board of Regents*
4. 9:40 a.m. – 10:05 a.m.: **Agricultural Producer & Equipment Dealer Survey Update**
    - Chancellor Dennis Epps, *Louisiana Delta Community College & Commission Chair*
5. **Updates:**
    - 10:05 a.m.- 10:30 a.m.: USDA Grants
        - Elizabeth Doster, *Rural Development United States Department of Agriculture*
    - 10: 30 a.m.- 10:55 a.m.: Manufacturer Training
        - Shane Soileau, *Progressive Tractor & Implement Co.*
6. 10:55 a.m.- 11:00 a.m.: **Next Steps & Adjournment**

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P. O. Box 3677
Baton Rouge, LA 70821-3677
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Postsecondary Education Agriculture Technology Study Commission Agenda
Tuesday, January 21, 2020 10:30 a.m. – 12:30 p.m.
Efferson Hall (Rm. 212)
LSU AgCenter
Baton Rouge, Louisiana

Agenda Items:

1. 10:30 a.m. – 10:35 a.m.: **Call to Order, Roll Call & Approval of October 28, 2019 Minutes**

2. 10:35 a.m. – 12:00 p.m.: **Higher Education Inventory**

   - 10:35 a.m. – 11:05 a.m.: Louisiana State University AgCenter
     - Dr. Bill Richardson, *LSU Vice President for Agriculture and Dean of the College of Agriculture*
     - Dr. Thanos Gentimis, *Assistant Professor, Experimental Statistics*
   - 11:05 a.m. -11:35 a.m.: Southern University Ag Center
     - Dr. Renita W. Marshall, *Vice Chancellor for Academic and Student Services & Associate Dean, Southern Ag Center*
     - Dr. C. Reuben Walker, *Executive Vice Chancellor & Director of Special Programs/Projects, Southern Ag Center*
   - 11:35 a.m. – 11:50 a.m.: University of Louisiana System
     - Dr. Jeannine Kahn, *Provost and Vice President for Academic Affairs, UL System*
     - Dr. Quenton Fontenot, *Professor and Head of Biological Sciences, Nicholls State University*
   - 11:50 a.m. – 12:00 p.m.: Louisiana Community and Technical Colleges Update
     - Missy LaCour, *Director of New Markets, LCTCS*

3. 12:00 p.m. – 12:20 p.m.: **Agricultural Producer & Equipment Dealer Survey Update**

4. 12:20 p.m. - 12:30 p.m.: **Next Steps & Adjournment**

Postsecondary Education Agriculture Technology Study Commission Agenda, February 28, 2020 meeting

BOARD OF REGENTS
P. O. Box 3677
Baton Rouge, LA 70821-3677
Phone (225) 342-4253, FAX (225) 342-9318
www.regents.la.gov

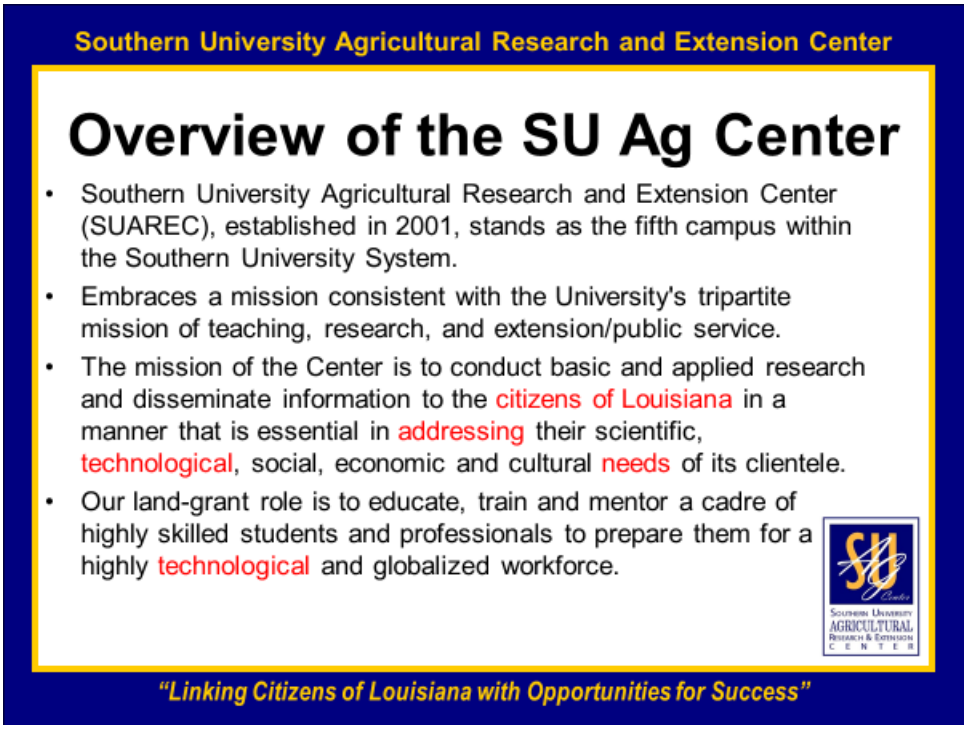
Postsecondary Education Agriculture Technology Study Commission Agenda
February 27, 2020
10:30 a.m. – 12:05 p.m.
Iowa Room, 1st Floor of the Claiborne Building
1201 North 3rd St.
Baton Rouge, Louisiana

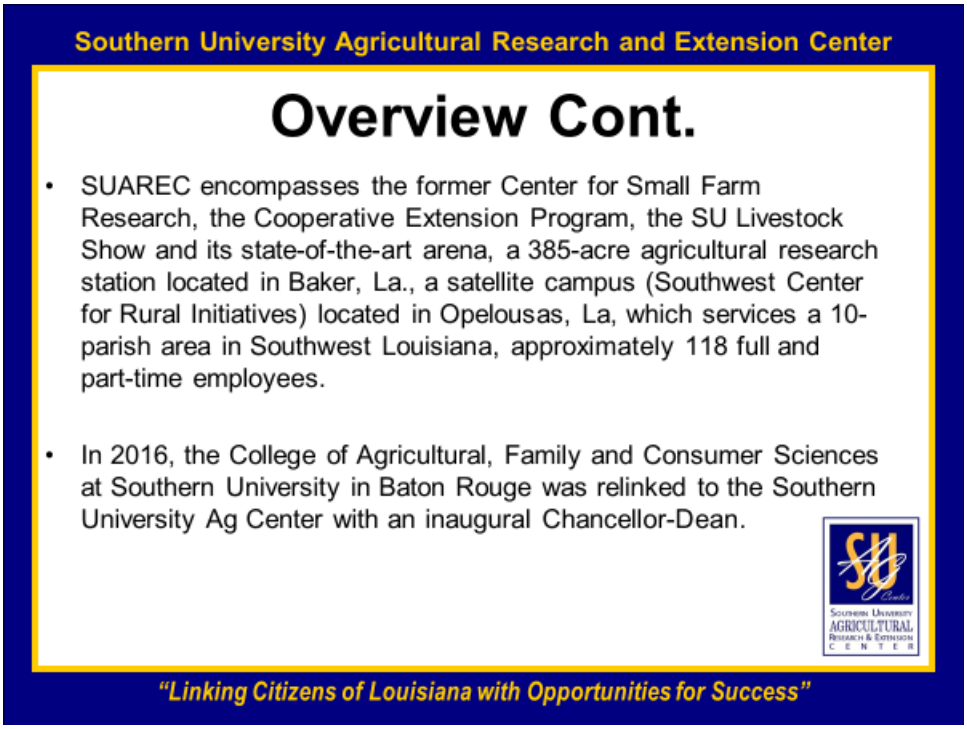
Agenda Items:

1. 10:30 a.m. – 10:35 a.m.: **Call to Order, Roll Call & Approval of January 28, 2019 Minutes**
2. 10:35 a.m. – 11:05 a.m.: **Agricultural Producer Survey Analysis & Discussion**
3. 11:05 a.m. – 11:35 a.m.: **Commission Action to Date Report**
    - Mellynn Baker, *Institutional Research Associate, Board of Regents*
4. 11: 35 a.m. – 12:00 p.m.: **Discussion of Commission Next Steps**
5. 12:00 p.m. - 12:05 p.m.: **Next Steps & Adjournment**

Appendix C:

Agriculture Technology at the Southern University Ag Center, Presented January 21, 2020.





Southern University Agricultural Research and Extension Center

Academic Program Areas

- The College of Agricultural, Family and Consumer Sciences consists of three departments:
  - Agricultural Sciences (183)
    - Animal Sciences, Plant and Soil Sciences, Ag Economics, Ag Business and Pre-Veterinary Medicine
  - Family and Consumer Sciences (116)
    - Apparel, Merchandising and Textiles, Child Development, and Human Nutrition and Food
  - Urban Forestry and Natural Resources (58)
    - B.S., M.S. and PhD

"Linking Citizens of Louisiana with Opportunities for Success"

Southern University Agricultural Research and Extension Center

Research Program Areas

- Community and Economic Development
- Food and Food Safety
- Nutrition and Health
- Sustainable Agriculture
- Urban Forestry Management
- Youth Development
- Southern Institute for Medicinal Plants
- Southern Institute for One Health, One Medicine
- Southern Institute for Food, Nutrition and Wellness
- ANSWERS Institute (Air, Nutrients, Soil, Water, Ecosystems and Remote Sensing)

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Southern University Agricultural Research and Extension Center

Extension Program Areas

- Agriculture and Natural Resources
- Livestock Program
- Communities of Color Network
- Family and Human Development
- SNAP-ED
- Youth Development
- Center for Rural and Small Business Development
- Mobile Technology Lab

Southern University Agricultural Research and Extension Center

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Southern University Agricultural Research and Extension Center

Urban Forestry

- LI-6400XT Portable Photosynthesis System
- Global Climate Model (EdGCM) and I-Tree Model
- E Fuel Micro Fueler Technology for producing Bioethanol and liquid transportation fuel
- Soil Respiration and Soil CO2 Flux Analysis System (Li-Cor) for assessing soil biological productivity and carbon flux
- Portable Leaf Chlorophyll Florescence System (SPAD Meter) for fast, on site and non destructive analysis of Chlorophyll concentration and assisting vitality and health of plants
- GIS/RS technology (Geographic Information System and Remote Sensing)
- Tree Radar System for mapping out tree root systems

Southern University Agricultural Research and Extension Center

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Southern University Agricultural Research and Extension Center

Urban Forestry

- Resistograph for assessing tree decay
- HPLC/MS for organic compounds quantification and qualification
- DNA/RNA extraction system for plants
- UV and Visible Shadow band spectroradiometer UVB, UVA monitoring System
- Bioenergy and BioChar research facility
- Soil Moisture Sensoring

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Southern University Agricultural Research and Extension Center

Faculty - students simulating global climate change using EdGCM Model

Portable Leaf Chlorophyll Florescence System (SPAD Meter)

E Fuel Micro Fueler

Soil Respiration and Soil CO2 Flux Analysis System (Li-Cor)

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Southern University Agricultural Research and Extension Center

Hydroponics

- Creating wealth in urban areas
- Utilization of limited space to grow healthy crops
- SU is researching various systems to determine the most economically feasible system for growing various produce.
- Training students and the community to grow their own.

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Southern University Agricultural Research and Extension Center

Air Monitoring

- SU is using air monitors to assist citizens in being proactive in regards to environmental threats.
- Systems are being placed strategically around campus and other areas around the state for the purpose of providing our stakeholders with access to air quality data in their areas.
- Systems will also allow our researchers to conduct studies to determine the impact of air pollution and examine ways to mitigate these pollutants.

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Southern University Agricultural Research and Extension Center

Mobile Technology Unit

- Our newly designed Mobile Technology Education Center (M-TEC) will help to facilitate four certification courses in the areas of:
  - Small Ag Business Development
  - Small Ruminant Production
  - Food Safety
  - Sustainable Urban Agriculture

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Southern University Agricultural Research and Extension Center

FUTURE AG TECHNOLOGY PROGRAMS

"Linking Citizens of Louisiana with Opportunities for Success"

Southern University Agricultural Research and Extension Center

Teaching

- Agricultural Sciences and Technology Department
- Sustainable Agriculture Curriculum
- Certificate Programs
  - – High school agriculture programs
    - Summer programs
  - – Community Colleges
  - – On-Line

"Linking Citizens of Louisiana with Opportunities for Success"

Southern University Agricultural Research and Extension Center

Drone Technology

- Assist Farmers With Disabilities
- Monitor Herd Movement
- Create Up-to-Date Property Maps
- Ensure Global Food Security
- Observe Crop & Soil Health
- Improve Crop Yield And Farm Efficiency

"Linking Citizens of Louisiana with Opportunities for Success"

Southern University Agricultural Research and Extension Center

Extension

- Conferences/Meetings
- Website Updates
  - Podcasts/Blogs
  - Webinars
- Certifications
- Short Courses/Workshops
  - Ag technology on-farm trainings
  - Industry partners
    - Preventive Maintenance Workshop for Farm Equipment on Saturday, February 15th in MerRouge, Louisiana.



"Linking Citizens of Louisiana with Opportunities for Success"

Southern University Agricultural Research and Extension Center

Grant Development

- Louisiana Rural Prosperity: Agricultural Farm Technology and Training Programs
- USDA 1890 Capacity Building Grant Program
- Funding Limit: $350,000
- Objectives:
  - To conduct preventive maintenance trainings in farm machinery and equipment,
  - To establish an agricultural technology instructional fund,
  - To utilize computer and drone technology to aid in diagnostics and repairs, and
  - To provide for high school agriculture technology training programs in the summer

"Linking Citizens of Louisiana with Opportunities for Success"

Southern University Agricultural Research and Extension Center

Charge to Fulfill

- Help small-scale and limited resource farmers and ranchers to develop and maintain viable farming operations that are in harmony with the environment.
- Help communities build capacity to enhance the growth and development of the business and industrial sectors.
- Improve the quality of life for families and youth throughout Louisiana.

"Linking Citizens of Louisiana with Opportunities for Success"

Appendix D:

LSU AgCenter and LSU College of Agriculture, Presentation on January 21, 2020.

LSU AgCenter and LSU College of Agriculture

Agricultural Technology Initiative

Objectives

- Develop a multi-disciplinary curriculum on Digital Agriculture (DA) and offer a BS degree addressing family farm and industry needs;
- Concentrate and focus internal efforts for training LSU AgCenter Ag agents and faculty for stakeholder program delivery;
- Expand extension programming efforts to include DA training modules during ongoing training events for producers;
- Identify knowledge gaps in DA and cultivate research opportunities in targeted areas defined as priorities within local, regional, and Federal funding agencies.

LSU College of Agriculture

LSU AgCenter

LSUAgCenter.com

LSU AgCenter and LSU College of Agriculture

Agricultural Technology Initiative

Current Status

- The LSU AgCenter has successfully introduced DA concepts and opportunities to Louisiana's agricultural industries as well as the AgCenter's faculty and staff.

Teaching:

- A minor degree (18hrs.) in DA has been proposed with a curriculum of existing courses and new ones to be developed.
- Courses were surveyed across STEM disciplines to support the DA minor.
- 2 new courses have been developed in Agronomy and Exp. Statistics
- Graduate students have research projects focusing on DA projects.
- Professional presentations and articles have demonstrated the DA efforts in the LSU College of Agriculture.

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Research (Current Highlights)

- The LSU AgCenter has established a formal partnership with national ag resource industry (Ag Analytics) which allows access to a large database of farmers (and their data) participating in the company's projects.
- Faculty have established a relationship with USDA's Risk Management Agency (RMA) to apply machine-learning algorithms to their agricultural database for estimating crop losses from natural disasters.
- Research in DA-linked projects have been supported by major commodity organizations (Rice, Sugar, Cotton, Soybean, Corn, and Wheat).
- Faculty have development remote sensing systems using UAS (drones) as platforms and continue to modify UAS for agriculture.
- To support the agricultural pesticide application industries, faculty have improved equipment and protocols for pattern testing sprays from aircraft and tractor-mounted applicators.
- Faculty have partnered with selected farmers (early adopters) to create analyses of archived datasets as pilot studies to establish various DA priorities.

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Extension (Current Highlights)

- The LSU AgCenter established a Digital Agriculture (DA) team to guide the Extension advisory process, coordinate efforts across a range of faculty and staff, establish educational priorities and share information delivery.
- Extension specialists offer expertise and service to individual producers for analysis of yield maps to identify profit-limiting field properties.
- On-farm trials and demonstrations are being used to educate growers and consultants on spatial variation in crop response to field properties and production inputs.
- The LSU AgCenter developed campus-wide UAS(drone) policies (used as a model for the LSU A&M BR campus and other land grant universities).
- Regional agents continue to offer DA educational programs for schools, 4-H clubs, and career days.
- An annual outreach event promoting on-farm use of DA technologies was developed and delivered in early 2019. The second event will be in January 2020. The goal is to create a multi-state Southern Region event involving multiple states and land grant universities.

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Youth Education and Outreach

- Our youth programs through Science Environment and Technology (SET) experiences reach 75,790 4-H'ers and 10,000 FFA members.
- 4-H University's annually builds knowledge through competitions such as; Computer Simulation, Ag Products Demonstration, Diesel Operations, Environmental Conservation Talk, Insect Identification and Louisiana Agronomic Illustrated Talk.
- LA 4-H Outdoor Science and Technology (LOST) Camp features technology-based workshops with an agriculture focus. Camp Lagniappe has a science focus that reaches military youth with hands-on science programming.
- *"Code Your World,"* was the theme of the National 4-H Youth Science Day (October 2019), a 4-part challenge that teaches kids to apply computer science to the world around them.
- A $7500 grant was awarded by Capital One to implement a robotics project to expose youth to STEM experiences as well as develop skills in such areas as teamwork.
- Five FFA contests have equipment and diagnostic practicums with components of digital agriculture.

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Professional Development

- Members of the DA team continue to attend Digital Agriculture (DA) conferences for training, CEU's, and new skill development.
- Train other AgCenter employees in areas of DA (drones, safety, etc.)
- AgCenter personnel participate/audit "GIS" classes at LSU to understand and use 'big data" in agriculture.
- Multiple commercial entities are partnering with LSU AgCenter personnel to provide/access data and technologies.

Resources Needed

- 3 faculty positions and one instructor addressing research knowledge gaps, extension programming and teaching.
- Classroom upgrades for workstations, technology access and data storage servers.
- Research support for "big data" collection from multiple platforms (satellite to micro- devices).
- Funding for graduate students (research and extension outreach) to support faculty programs.
- Extension outreach and program development resources for classes, formal conferences, digital delivery, and training materials.

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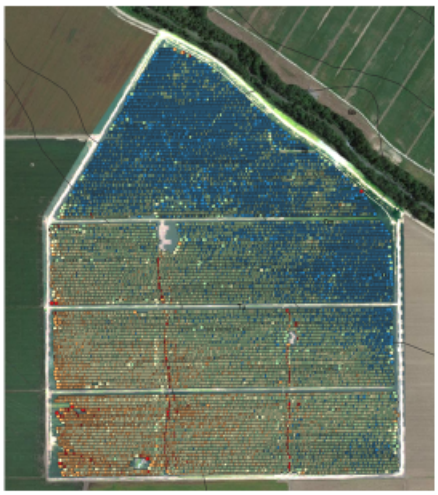
Agricultural Technology Initiative



Remote sensing is used to show plant vigor differences

"BIG DATA" Concept in Production Agriculture

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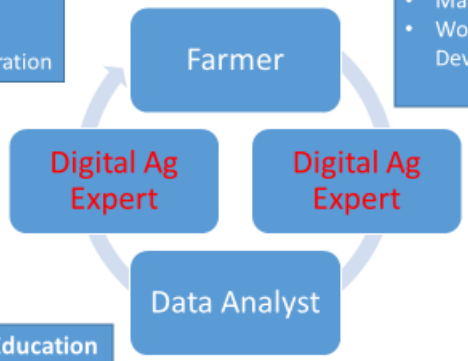
Agricultural Technology Initiative

Farmers
- Awareness
- Value
- New Generation

College Students
- Main focus
- Workforce Development



Continuing Education
- Extension Agents
- Translators
- Non traditional Ag

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Agricultural Technology Initiative

- **Digital Ag Class**
  - Enrollment tripled in 3 semesters (10-30)
  - Attracts people from AgCenter but also CS, Math, Stats, Engineering
  - Class projects have been submitted as refereed papers.
  - From student evaluations these descriptors appeared multiple times: "Critical", "Needed", "Expansive"
- **Related fields**
  - Computer Scientists
  - Mathematicians
  - Engineers
  - Statisticians
  - Economists
  - Technicians

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Appendix E:

A Snapshot of Relevant Academic Programs

Louisiana Tech University: School of Agricultural Sciences & Forestry

- BS in Agricultural Business
- BS in Animal Science
- BS in Forestry
- BS in Geographic Information Science
- BS in Secondary Education and Teaching – Grades 6-12, Agricultural Education Concentration (joint program with College of Education)

Nicholls State University: Department of Applied Science

- BS in Geomatics

McNeese State University

- BS in Agricultural Sciences

University of Louisiana Monroe

- BS in Agribusiness
- UC in Unmanned Aircraft Systems Management
- BS In Unmanned Aircraft Systems Management

A Snapshot of Relevant Courses

Grambling State University

- BIOL 215 Introductory Epidemiology
- BIOL 312 Principles of Toxicology
- BIOL 315 Water Quality Management Lec/Lab
- BIOL 418 Environmental Issues & Policies

Louisiana Tech University

- Agricultural Science (AGSC) 209: Small Engines
- Agricultural Science (AGSC 211): General Shop
- Agricultural Education (AGED) 450: Advanced Agricultural Shop Methods and Safety

On the Horizon

Nicholls State University

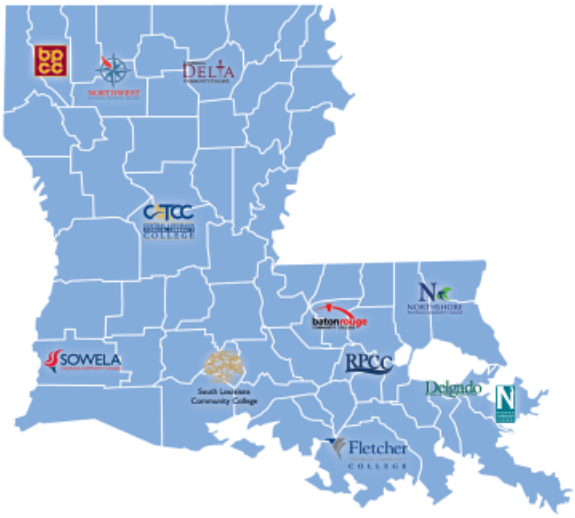
- Proposed Bachelor of Applied Science in Professional Supervision
  - Concentration in Ag Tech

University of New Orleans

- UC in Unmanned Aircraft Systems Management

Appendix F:

LOUISIANA'S COMMUNITY & TECHNICAL COLLEGES



Louisiana's Community & Technical Colleges

Changing Lives, Creating Futures
www.lctcs.edu

AGRICULTURE PROGRAMS

College	Program Name	Total Enrollments 2016 - present	Awards Conferred 2016 - present
BRCC	Applied Horticulture	236	90
CLTCC SOWELA	Forest Technology	72	33
BRCC* LDCC NTCC NLTCC SLCC**	Diesel Mechanics Technology	714	586
System Total		1022	709

*BRCC – Diesel Heavy Truck Technology
**SLCC – Industrial/Agriculture Mechanics Technology

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Appendix G:

Agricultural Producer Survey

The survey below is designed to collect information on agricultural equipment and precision farming training needs. Please feel free to attach additional information detailing any interests or needs that you see as critical to your operation that were not explored in the content of this survey.

Respondent Information *(Not Required):* Name of Producer/Operation:
Phone: Email: Address:

Commodities/Products Produced *(Check all that apply):*

- ☐ Sugarcane
- ☐ Rice
- ☐ Corn
- ☐ Cotton
- ☐ Soybeans
- ☐ Timber/Forest Products
- ☐ Sweet Potatoes
- ☐ Other Vegetables
- ☐ Hay/Forage Crops
- ☐ Beef Cattle
- ☐ Poultry
- ☐ Beef Cattle
- ☐ Crawfish
- ☐ Other Aquaculture
- ☐ Other (Please specify): _____

Acreage Farmed *(Check the acreage that applies):*

- ☐ 250 or less
- ☐ 251 to 1000
- ☐ 1001 to 1750
- ☐ 1751 to 2500
- ☐ 2501 and above, please list your number of acres _____

Number of Employees
(Full time, Non-Seasonal): ___

Number of Employees
(Part-time or Seasonal): ___

Job Openings
Check the statement that describes your situation over the past year:

- ☐ I have no openings to fill. I am fully staffed.

- I had no problem finding qualified employees.
- I had some difficulty finding qualified employees.
- I had significant difficulty finding qualified employees.
- I have been unable to fill my positions as desired.

Hiring Intentions *(Check the statement that applies):*

- I expect to have fewer employees next year.
- I expect to maintain consistent numbers during the coming year.
- I expect to hire new personnel during the coming year.

Precision Farming

Which best describes your use of precision farming tools?

- I do not use precision farming tools as my equipment does not have capabilities.
- I do not use precision farming tools, though my equipment has capabilities.
- I utilize some capabilities of precision farming tools.
- I optimize use of precision farming tools that I have available.
- I utilize precision farming tools through use of consulting services.
- I do not use these tools, but plan to do so in the future/recognize the need to implement use.
- I currently use drones on my farming operation.
- I do not use drones on my farming operation.
- I do not use drones but plan to make use of them in the future.

Equipment Repair and Maintenance (*Mark all areas that are applicable):*

- We maintain all equipment on the farming operation.
- We make all needed repairs to equipment on the farming operation.
- We provide some maintenance functions on the farming operation.
- We make some repairs and utilize another vendor or dealer for more advanced repairs.
- Our equipment dealer does all preventative maintenance of our equipment.
- Our equipment dealer does all repair of our equipment.

Training Interest

If short-term training were to be provided to me and/or my personnel regarding maintenance and repair by community colleges and equipment manufacturers, my level of interest in participating in these opportunities would be:

- Very high
- High
- Moderate
- Low
- No interest

Format of Training

- In person
- Online
- Combination of online and in person

Training Subject Matter *(Indicate all areas in which you think training opportunities would be beneficial):*

- Preventative/Predictive Maintenance
- Repair Diagnosis/Troubleshooting
- On-Farm Repair Techniques Allowable Under Equipment Warranties
- Understanding Issues that Impact My Equipment Warranty
- Precision Farming Capabilities of My Equipment
- Utilization of Drones in Precision Farming
- Utilization of GPS for leveling of fiends
- Variable rate pesticide application
- Fertilizer Application (vary to the needs of the plant)

My Equipment Makes

I utilize the following makes of equipment on my farming operation (Check all that apply):

- Case/IH
- Caterpillar
- Challenger
- Deutz-Fahr
- Fendt
- Freightliner Trucks
- Gehl
- Gleanor
- John Deere
- Kenworth Trucks
- Kubota
- Mack Trucks
- Mahindra
- Massey-Ferguson
- New Holland
- Peterbilt Trucks
- Rogator
- Terragator
- Tigercat
- Valtra
- Western Star Trucks
- Trimble Agriculture (GPS)
- Other *(Be specific and include any equipment makes that should be important for training initiatives as well):* _____

Training Availability

Given the demanding nature of farming and the diversity of operations, indicate the months that would be best for you and/or your personnel to take advantage of training opportunities (Check any and all that may work):

- January
- February
- March
- April
- May

- June
- July
- August
- September
- October
- November
- December

How frequently would you like the training to be offered:

Credentials for Employees

In looking at the training needs of your existing and future employees, what level of training is most needed? Check all that might apply across your workforce:

- I am not concerned with certifications; I just want practical training that meets our needs.
- I would like my employees to earn short-term industry-based credentials to show they have mastered knowledge and competencies.
- I would like my employees to work toward and complete a two-year (Associate) degree.
- I would like my employees to have a four-year (Bachelor's) degree.
- I would like to have employees who have a Master's or higher degree.

Appendix H:

Equipment Dealer Survey

The survey below is designed to collect information on your dealership's needs and interests relevant to developing a skilled workforce and in terms of offering training opportunities and experiences to your client base. Please feel free to attach additional pages detailing any needs critical to the success of your dealership.

I. Respondent Information *(Not Required):*
Name of Producer/Operation: _____ Phone: _____
Email: _____ Address: _____

II. Number of Employees
(Full time, Non-Seasonal): ____

III. Number of Employees
(Part-time or Seasonal): ____

IV. Job Openings
Check the statement that describes your situation over the past year:

- ☐ I have no openings to fill. I am fully staffed.
- ☐ I had no problem finding qualified employees.
- ☐ I had some difficulty finding qualified employees.
- ☐ I had significant difficulty finding qualified employees.
- ☐ I have been unable to fill my positions as desired.

V. Hiring Intentions *(Check the statement that applies):*

- ☐ I expect to have fewer employees next year.
- ☐ I expect to maintain consistent numbers during the coming year.
- ☐ I expect to hire new personnel during the coming year.

VI. Positions Needed *(Mark all that apply and indicate numbers needed over the 24 months):*

- ☐ Service Technicians _____
- ☐ Precision Agriculture Technicians _____
- ☐ Precision Agriculture Consultants_____
- ☐ Parts Clerk_____
- ☐ Parts Manager_____
- ☐ Service Manager_____

VII. Producer Training Interest
My interest in extending short-term training opportunities to my customers would be:

- ☐ Very high
- ☐ High
- ☐ Moderate
- ☐ Low
- ☐ No interest

VIII. Training Subject Matter for Producer Training

Please indicate all areas in which you think training opportunities would be beneficial:

- ☐ Preventative/Predictive Maintenance
- ☐ Repair Diagnosis/Troubleshooting
- ☐ On-Farm Repair Techniques Allowable Under Equipment Warranties
- ☐ Understanding Issues that Impact Equipment Warranty
- ☐ Precision Farming Capabilities of Equipment
- ☐ Utilization of Drones in Precision Farming

IX. My Equipment Makes

I sell the following makes of equipment at my dealership (New equipment/Check all that apply):

- ☐ Case/IH
- ☐ Caterpillar
- ☐ Challenger
- ☐ Deutz-Fahr
- ☐ Fendt
- ☐ Freightliner Trucks
- ☐ Gehl
- ☐ Gleanor
- ☐ John Deere
- ☐ Kenworth Trucks
- ☐ Kubota
- ☐ Mack Trucks
- ☐ Mahindra
- ☐ Massey-Ferguson
- ☐ New Holland
- ☐ Peterbilt Trucks
- ☐ Rogator
- ☐ Terragator
- ☐ Tigercat
- ☐ Valtra
- ☐ Western Star Trucks
- ☐ Other *(Be specific and include any equipment makes that should be important for training initiatives as well):*

  _____

X. Equipment Sold or Serviced

During a typical year, my dealership will typically sell used equipment or service the following makes (Check all that apply):

- ☐ Case/IH
- ☐ Caterpillar
- ☐ Challenger
- ☐ Deutz-Fahr
- ☐ Fendt
- ☐ Freightliner Trucks
- ☐ Gehl
- ☐ Gleanor
- ☐ John Deere
- ☐ Kenworth Trucks
- ☐ Kubota
- ☐ Mack Trucks
- ☐ Mahindra
- ☐ Massey-Ferguson
- ☐ New Holland
- ☐ Peterbilt Trucks
- ☐ Rogator
- ☐ Terragator
- ☐ Tigercat
- ☐ Valtra
- ☐ Western Star Trucks
- ☐ Other *(Be specific and include any equipment makes that should be important for training initiatives as well):*

  _____

XI. Credentials for Employees

In looking at the training needs of your existing and future employees, what level of training is most needed? Check all that might apply across your workforce:

- ☐ I am not concerned with certifications; I just want practical training that meets our needs.
- ☐ I would like my employees to earn short-term industry-based credentials to show they have mastered knowledge and competencies.

- ☐ I would like my employees to work toward and complete a two-year (Associate) degree.
- ☐ I would like my employees to have a four-year (Bachelor's) degree.
- ☐ I would like to have employees who have a Master's or higher degree.

XII. Course Content

In preparing a training curriculum to develop new personnel, the following subjects are essential (Check all that apply):

- ☐ Overview of Dealer Operations
- ☐ Microcomputer Skills (general)
- ☐ Controls and Instrumentation
- ☐ Electrical Systems
- ☐ Hydraulics and Pneumatics
- ☐ Technical Mathematics
- ☐ English
- ☐ Technical Writing/Business Communications
- ☐ Customer Service
- ☐ Air Conditioning Systems
- ☐ Diesel Power Trains
- ☐ Gasoline Engine Basics
- ☐ Tractor Diagnostics
- ☐ Precision Agriculture Systems and Tools
- ☐ Harvesting Systems
- ☐ Drone Technology
- ☐ Drone Flight Training/FAA Licensure
- ☐ Global Positioning Systems
- ☐ Irrigation Systems
- ☐ Small Engines/ATV Maintenance and Repair
- ☐ Marketing/Sales Skills
- ☐ Other *(Please Specify):* _____

XIII. Past Training

Have you and/or your company offered any continuing education training to customers or producers in the past? If so, what was offered? When and where?

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