

**New Program Proposal
 Doctorate of Philosophy in Agriculture,
 with concentrations in Agricultural Systems Management and Agricultural Education
 Clemson University**

Summary

Clemson University requests approval to offer a program leading to the Doctorate of Philosophy in Agriculture, with concentrations in Agricultural Systems Management and Agricultural Education, to be implemented in Spring 2020 through traditional delivery. The following chart outlines the stages of approval for the proposal. The Advisory Committee on Academic Programs (ACAP) voted to recommend approval of the proposal. The full program proposal and documents are attached.

Stages of Consideration	Date	Comments
Program Proposal Received	2/1/19	Not Applicable
Staff comments to the institution	3/19/19	Staff requested revisions to the proposal to address the following inquires: <ul style="list-style-type: none"> ▪ Rationale for institutional approval delays; ▪ Incorporation of feedback from interested students and prospective employers; ▪ Inclusion of more data sources for employment opportunities and narrative to address employment connections; ▪ Elaboration on projected enrollment; ▪ Clarity on use of physical resources and facilities; ▪ Further elaboration on use of funds (facilities, equipment, annual growth); ▪ Frequency of assessments; and ▪ Potential stackable credentials that students may earn.
ACAP Consideration	3/28/19	Representatives from Clemson University (CU) introduced the proposal along with the new program proposal for the MS in Agriculture, citing the huge role of agriculture in the state. CU representatives explained that the current MA in Agricultural education program is not approved to convey any initial licensure or certification, nor will the proposed program, and that students in the current MA in Agricultural Education would transfer to the Agricultural Education concentration in the proposed program. <p>Representatives also cited the interest of working professionals such as extension agents who would want to attain a MS in Agricultural Systems Management, and that feedback from employers indicated a desire for students with greater depth of knowledge which the concentrations will deliver. Representatives also noted that despite the impact of agriculture in the state economy, there currently is no MA or PhD program in agriculture.</p>

		<p>Members of the Advisory Committee on Academic Programs (ACAP) discussed the proposal, citing staff questions about electives and coursework and the lengthy internal approval process. Clemson representatives stated that most courses are already taught so there will be no significant faculty or other resources required as faculty are already in place. Regarding the approval process, CU explained that, as noted in the Background section of the proposal, after initial informal approval there were a variety of changes to the agricultural program (organizational changes, leadership turnover), but the current curriculum committee has reviewed the proposed program and determined it is still relevant and has integrity. Moreover, the Clemson Office of the Provost is supportive of the programs.</p> <p>After remaining discussion, ACAP voted to unanimously recommend approval of the program proposal. Staff transmitted remaining questions for additional clarity.</p>
Staff comments to the institution	4/5/19	<p>Staff requested the proposal be revised to include:</p> <ul style="list-style-type: none"> ▪ Information on the selection of the external reviewer; ▪ The explanations provided at ACAP regarding intuitional approval; ▪ Primary source student and prospective employer needs; ▪ More data sources for employment opportunities and narrative to address employment connections; ▪ Elaboration on coursework; ▪ The physical resources and facilities already existent that will be used to support the program; ▪ Further elaboration on use of funds (facilities, equipment, annual growth); ▪ Frequency of assessments; and ▪ Potential stackable credentials students may earn.
Revised Program Proposal Received	8/1/19 10/3/19	The revised proposal satisfactorily addressed the requests.

Recommendation

The staff recommends the Committee on Academic Affairs and Licensing favorably commend to the Commission the program leading to the Doctorate of Philosophy in Agriculture, with concentrations in Agricultural Systems Management and Agricultural Education to be implemented in Spring 2020.

Clemson University Student and Program Data

Graduate In-/Out-of-State Enrollment Fall 2018	2,195 (41.56%)/3,087(54.44%)
Number of Approved Programs in 10 Yrs. (FY 2009- 2018)	37
Number of Terminated Programs in 10 Yrs. (FY 2009- 2018)	18

Industry Related Occupational Wages and Projections in South Carolina, 2016 – 2026*

Occupational Field¹	2016 Median Income²	2016 Estimated Employment³	2026 Projected Employment	Total 2016-2026 Employment Change	2016-2026 Annual Avg. Percent Change	Total Percent Change
Farming, Fishing, and Forestry	\$31,710	23,738	20,899	-2,839	-1.27%	-11.96%

¹ "Occupational Field" represents the closest related occupation category that includes the occupations aligned with the program proposal.

² SC Department of Employment & Workforce (DEW), Labor Market Information. (2019). Occupational Employment and Wage Rates (OES) for All Major Groups in South Carolina in 2016 [Data file]. Retrieved from <https://jobs.scworks.org/vosnet/lmi/default.aspx?pu=1>

³ SC Department of Employment & Workforce (DEW), Labor Market Information. (2019). Occupational Projections (Long-term) for Multiple Occupations in South Carolina in 2016-2026 [Data file]. Retrieved from <https://jobs.scworks.org/vosnet/lmi/default.aspx?pu=1>

* Data downloaded September 16, 2019; Most recent data available.

NEW PROGRAM PROPOSAL FORM

Name of Institution: **Clemson University**

Name of Program (include degree designation and all concentrations, options, or tracks):
PhD Agriculture (two concentrations: 1) Agricultural Systems Management and 2) Agricultural Education)

Program Designation:

- | | |
|---|---|
| <input type="checkbox"/> Associate's Degree | <input type="checkbox"/> Master's Degree |
| <input type="checkbox"/> Bachelor's Degree: 4 Year | <input type="checkbox"/> Specialist |
| <input type="checkbox"/> Bachelor's Degree: 5 Year | <input checked="" type="checkbox"/> Doctoral Degree: Research/Scholarship (e.g., Ph.D. and DMA) |
| <input type="checkbox"/> Doctoral Degree: Professional Practice (e.g., Ed.D., D.N.P., J.D., Pharm.D., and M.D.) | |

Consider the program for supplemental Palmetto Fellows and LIFE Scholarship awards?

- Yes
 No

Proposed Date of Implementation: **January 2020**

CIP Code: **01.9999**

Delivery Site(s): **Clemson Main Campus**

Delivery Mode:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Traditional/face-to-face
*select if less than 25% online | <input type="checkbox"/> Distance Education |
| | <input type="checkbox"/> 100% online |
| | <input type="checkbox"/> Blended/hybrid (50% or more online) |
| | <input type="checkbox"/> Blended/hybrid (25-49% online) |
| | <input type="checkbox"/> Other distance education (explain if selected) |

Program Contact Information (name, title, telephone number, and email address):

Dale Layfield, Associate Professor of Agricultural Education; 864.656.5676; dlayfie@clemson.edu

Jeremy King, Assoc Provost Instl Effectiveness; 864.934.3554; jking2@clemson.edu

Institutional Approvals and Dates of Approval (include department through Provost/Chief Academic Officer, President, and Board of Trustees approval):

- Provost: February 4, 2015
- President: February 5, 2015
- Board of Trustees: February 6, 2015
- Departmental Faculty Final Approval: September 28, 2016
- University Graduate Curriculum Committee: December 2, 2016

Background Information

State the nature and purpose of the proposed program, including target audience, centrality to institutional mission, and relation to the strategic plan.

The purpose of the Doctor of Philosophy (Ph.D.) in Agriculture is to develop leaders of professions in agricultural systems and agricultural education. This will be accomplished by preparing graduates for academic and technically-demanding agricultural positions in academic, government and the private sectors of the economy. Specifically, this degree is designed to add significant depth to an individual's understanding of pedagogy and scholarship in agricultural and natural resources, as well as technological and policy-based issues.

The target audience of the doctoral program will include, but will not be limited to, secondary agricultural educators and cooperative extension agents seeking to pursue post-secondary academic education. Professionals from agricultural industries and governmental agencies are also expected to be potential candidates in the agricultural systems management or the agricultural education concentrations for the Ph.D. program.

The proposed doctoral program strongly aligns with Clemson University's mission, which is to "establish a 'high seminary of learning' through its historical land-grant responsibilities in teaching, research and extended public service." Both the agricultural education and agricultural systems management concentrations are engaged in outreach and programmatic efforts throughout South Carolina and students will be highly engaged in agricultural research. Furthermore, the Agriculture Ph.D. program coincides with Clemson University's strategic plan, ClemsonForward, by supporting the academic core's priority of increasing the number of high-quality, nationally-prominent graduate programs

The proposed program also is integrated with the corresponding department's strategic plan. The establishment of the Ph.D. graduate degree is one of the primary core strategies in the strategic priority of "excellence in teaching and education of students" while supporting the additional core strategy of strengthening linkages with agribusiness and natural resource industries, educational institutions, governmental and non-governmental organizations. This is fed through the use of class-based student research projects conducted for stakeholders, student internships, and graduate student research.

The only stackable credentials in this program will be in the agriculture teachers when they take additional graduate coursework and they earn add-on credentials for the teaching certificate.

Assessment of Need

Provide an assessment of the need for the program for the institution, the state, the region, and beyond, if applicable.

A 2015 report by Palmetto Agribusiness Council titled "The Economic Impact of the Agribusiness Industry in South Carolina," reported agribusiness as South Carolina's leading economic cluster and has a total economic impact of \$41.7 billion, making agriculture the largest aggregate sector of the state economy. The report also noted that agribusiness has continued to grow in the 21st Century and now provides jobs for nearly 212,000 South Carolinians. At the national level, the *US Agribusiness Human Resource Review* (2016) surveyed 135 companies and reported that the agricultural sector is booming with employment opportunities for young people coming out of college with ag-related degrees and experience. A 2016 Georgetown University study found that agricultural and natural resource majors had the highest employment rate of any college major in the U.S. The study concluded, "those studying natural resources and agriculture enjoy excellent job prospects." With growing technology demands and regulatory requirements confronting agriculture, a highly educated and technically trained workforce is needed to facilitate the ability of South Carolina to compete in an increasingly global market that rewards technologically sophisticated low-cost producers. With this in mind, the importance of producing leaders with doctoral-degree credentials in many of these fields is evident.

With the unique pairing between agricultural systems and agricultural education concentrations, doctoral graduates will be poised to address STEM-related aspects in South Carolina agriculture. Currently, there are no doctoral programs in the U.S. with this combination and with a state and national emphasis on STEM demands could drive the demand for these unique graduates.

No similar integrated program exists at any other public or private university in South Carolina. The Agricultural Systems Management (ASM) graduate concentration is distinct from, but complementary to, Clemson's existing agricultural science curricula taught within the Plant and Environmental Sciences graduate program (such as plant pathology, horticulture, crop science, entomology, and soil science), and the Animal and Veterinary Science program. Qualification requirements for student and prospective employer in each of the proposed concentrations are included below.

Agricultural Education Concentration: Employers of the graduate students earning a Ph.D. in Agriculture include Career and Technology Educator (CTE) positions and agricultural education faculty at Land Grant and other 4-year agricultural universities. Others seeking the agricultural education concentration would include cooperative extension agents seeking advancement into administrative positions in the South Carolina system (Clemson). The National Research Agenda report (2016) for the American Association for Agricultural Education highlights the need for change agent development in the Research Priority 2, titled *New Technologies, Practices, and Products Adoption Decisions*. One of the roles of a cooperative extension agent is to link Change Agents and Opinion Leaders to the farmers. Part of the program in the agricultural education concentration will engage students in coursework and applied activities to strengthen this concept (AGED 8010).

Agricultural Systems Management Concentration: Agricultural Systems Management undergraduate degrees across the country (or similar named programs such as the Agricultural Mechanization and Business Program at Clemson University) are very diverse programs that cover a wide range of subject matter. Subject matter consists of courses such as electrical system design, building structures, land surveying, irrigation design, hydraulic system design, computer controls, material handling and processing, soil and water conservation, ventilation design, waste management, business/marketing/finance, etc. Programs that teach these skills are expanding in many programs across the U.S. (based on university Websites of those programs). These programs are now seeking faculty with a Ph.D. in the area of Agricultural Systems Management.

Transfer and Articulation

Identify any special articulation agreements for the proposed program. Provide the articulation agreement or Memorandum of Agreement/Understanding.

None

Employment Opportunities

Occupation	State		National		Data Type and Source
	Expected Number of Jobs	Employment Projection	Expected Number of Jobs	Employment Projection	
Agricultural Sciences Teachers, Postsecondary	Not available	Not available	12,600 (current)	7.9% (by 2026)	http://www.projectionscentral.com/Projections/LongTerm
Conservation Scientists	270	8.7% (by 2026)	22,300	6.3% (by 2026)	http://www.projectionscentral.com/Projections/LongTerm
Instructional Coordinators	2,110	10.9% (by 2026)	163,200	10.5% (by 2026)	http://www.projectionscentral.com/Projections/LongTerm
Soil & Plant Scientists	Not available	Not available	19,900	9.0% (by 2026)	http://www.projectionscentral.com/Projections/LongTerm
Education Administrators, All Other	290	8.6% (by 2026)	38,400	10.7% (by 2026)	http://www.projectionscentral.com/Projections/LongTerm
Education Administrators, Postsecondary	2,490	11.8% (by 2026)	180,100	10.1% (by 2026)	http://www.projectionscentral.com/Projections/LongTerm

Unfortunately, data on employment in our fields is very limited. We've looked for resources in other areas and due to the nature of our specialized professions, we could not find additional information.

Supporting Evidence of Anticipated Employment Opportunities

Provide supporting evidence of anticipated employment opportunities for graduates.

Ph.D. — Concentration in Agricultural Education

The primary focus of agricultural education programs in universities across the U.S. is to prepare agriculture teachers for secondary school programs. A continued shortage of secondary agriculture teachers results in additional pressure on these teacher education programs. At the beginning of the school year in 2016 (September), the National Agricultural Education Supply & Demand Study (2016) stated that 66 positions were unfilled nationally. During the economic crisis of 2008-2009, many teacher educator positions vacated by retirement or advancements to administration, went unfilled for several years. In recent years, unfilled positions have decreased and national demand for teacher educators with Ph.D. credentials have steadily grown each year. As of 2016 (American Association for Agricultural Education 2015-2016 Faculty Salary Report), there were 86 university programs across the U.S. that employed agricultural teacher educators. Realizing this, a steady demand for graduates with a Ph.D. in agricultural education will continue to grow as retirements continue. These 86 programs across the country are not all Ph.D. granting (for Ag Ed) programs. They teach agricultural education (developing high school agriculture teachers), but the majority of them do NOT have a Ph.D. Currently, there are 18 programs in the U.S. that offer either Ph.D. or Ed.D. degrees in agricultural education (<http://aaaeonline.org/resources/Documents/AAAE%20Degree%20Resource%20Final.pdf>)

One joint doctoral program between Texas Tech and Texas A&M (Program Brochure) cites employment areas to include: 4-H youth specialists, community college faculty, extension county and district directors, historical center directors, non-profit organization directors and university instructors and faculty.

Ph.D. — Concentration in Agricultural Systems Management

Traditionally, university programs with faculty teaching in undergraduate agricultural systems management were found in every state at Land-Grant Universities. These programs had varying names, including agricultural mechanization, agricultural operations management, agricultural systems management and other related names. The majority of these programs were consolidated with agricultural/biological engineering programs in the past 20 years. However, Clemson maintained a separate undergraduate program in agricultural mechanization as the placement rate has sustained 100% for more than ten years and student enrollment has consistently maintained more than 150. Other universities maintained this applied program within the agricultural/biological engineering departments, including Ohio State, Purdue, Texas A&M, and the University of Missouri. Some of these programs also provide a master's in agricultural systems management. Growth in any of these programs will result in hiring new faculty holding a Ph.D. In a position listing for an assistant professor of digital agriculture at Purdue this past year, applicants holding a Ph.D. in "agricultural engineering, agricultural systems management, computer engineering, computer science or a related discipline," were sought. Through our research, we have not located a program that provides a Ph.D. in Agricultural Systems Management. Realizing this, it is our opinion that this proposed doctoral concentration will have a steady demand of graduates.

Description of the Program

Projected Enrollment			
Year	Fall Headcount	Spring Headcount	Summer Headcount
2019– 20	4	4	4
2020– 21	4	4	4
2021– 22	8	8	8
2021– 22	12	12	12
2022– 23	12	12	12

The numbers above are based on the calculation that each faculty member (9 total) would begin the Ph.D. program with approximately 0.5 grad students each.

Besides the general institutional admission requirements, are there any separate or additional admission requirements for the proposed program? If yes, explain.

Yes

No

1. A master's degree in an appropriate field from a regionally accredited university;
2. A grade point average in undergraduate and graduate studies (undergraduate GPA of 3.0; graduate GPA of 3.0 in 24 or more hours);
3. Recommendations from three people knowledgeable of the applicant's professional qualifications;
4. A curriculum vitae and statement of goals.

Curriculum

New Courses

List and provide course descriptions for new courses.

Course Name	Description
AGED 8300 — Effective Teaching in Post-secondary Agriculture	Addresses theories and practices of effective teaching in post-secondary agricultural sciences. A focus will be placed on developing curriculum, course planning, teaching and learning styles, instructional techniques, laboratory instruction, assessment and student evaluation, instructional technology, and faculty roles and responsibilities in planning and delivering a successful course.
AGED 9910 — Doctoral Dissertation Research	This course is designed to assist students that are conducting doctoral research and/or writing their dissertation. The research topic will be directly related to the student's dissertation, which will be agreed upon by the major professor and the student prior to the beginning of the semester.
AGM 9910 — Doctoral Dissertation Research	This course is designed to assist students that are conducting doctoral research and/or writing their dissertation. The research topic will be directly related to the student's dissertation, which will be agreed upon by the major professor and the student prior to the beginning of the semester.

Total Credit Hours Required: 36

Curriculum by Year: Agricultural Education Concentration only					
Course Name	Credit Hours	Course Name	Credit Hours	Course Name	Credit Hours
Year 1					
Fall		Spring		Summer	
STAT 8020 - Statistical Methods II	3	AGED 8300 - Effective Teaching Methods in Postsecondary Agriculture	3	EDF 8770 - Experimental and Nonexperimental Research Methods in Education I	3
EDF 9790 - Qualitative Research in Education	3	AGED 9910 - Doctoral Dissertation Research	3	AGED 8690 – Seminar	1
Total Semester Hours	6	Total Semester Hours	6	Total Semester Hours	4
Year 2					
Fall		Spring		Summer	
AGED 9910 - Doctoral Dissertation Research	3	AGED 9910 - Doctoral Dissertation Research	3	AGED 9910 - Doctoral Dissertation Research	3
STAT 8040 OR STAT 8050 - Sampling OR Design and Analysis of Experiments	3			AGED 8690 – Seminar	1
Total Semester Hours	6	Total Semester Hours	3	Total Semester Hours	4
Year 3					
Fall		Spring		Summer	
AGED 9910 - Doctoral Dissertation Research	3	AGED 9910 - Doctoral Dissertation Research	3	AGED 8690 – Seminar	1
Total Semester Hours	3	Total Semester Hours	3	Total Semester Hours	1

Total Credit Hours Required: 36

Curriculum by Year: Agricultural Systems Management Concentration only					
Course Name	Credit Hours	Course Name	Credit Hours	Course Name	Credit Hours
Year 1					
Fall		Spring		Summer	
STAT 8020 - Statistical Methods II	3	AGM 9910 - Doctoral Dissertation Research	3	AGM 9910 - Doctoral Dissertation Research	3
Coursework to be determined by Graduate Committee	3	Coursework to be determined by Graduate Committee	3		
Total Semester Hours	6	Total Semester Hours	6	Total Semester Hours	3
Year 2					
Fall		Spring		Summer	
AGM 9910 - Doctoral Dissertation Research	3	AGM 9910 - Doctoral Dissertation Research	3	AGM 9910 - Doctoral Dissertation Research	3
Coursework to be determined by Graduate Committee	3	Coursework to be determined by Graduate Committee	3		
Total Semester Hours	6	Total Semester Hours	6	Total Semester Hours	3
Year 3					
Fall		Spring		Summer	
AGM 9910 - Doctoral Dissertation Research	3	Coursework to be determined by Graduate Committee	3		
Total Semester Hours	3	Total Semester Hours	3	Total Semester Hours	

The course requirements for the PhD in Agricultural Systems Management concentration covers a diverse subject matter with respect to expertise. Subject matter covered under this Program range from natural resources, power and machinery, instrumentation and controls, to precision agriculture. With this diverse subject matter, the faculty prefer that flexibility be in the curriculum so that students can take courses in their subject area. The basic statistics and methodology courses meet the fundamentals we wish all these students have and then based on dissertation focus, tailor the courses to meet those needs.

Similar Programs in South Carolina offered by Public and Independent Institutions

Identify the similar programs offered and describe the similarities and differences for each program.

Program Name and Designation	Total Credit Hours	Institution	Similarities	Differences
NONE				

Faculty

Rank and Full- or Part-time	Courses Taught for the Program	Academic Degrees and Coursework Relevant to Courses Taught, Including Institution and Major	Other Qualifications and Relevant Professional Experience (e.g., licensures, certifications, years in industry, etc.)
Professor #1 (Full-time)	F15, AGM 4050/4051 Env Cont in Anim Str, 3 (UT) S18, AGM 4720/4721 Capstone, 3 (UT) F18/S18, AGM 4730 Heat Transfer Apps in Ag, Var (UT)	BS, Agricultural Engineering, University of Georgia 1982. MS, Agricultural Engineering, University of Kentucky 1987. PhD, Agricultural Engineering, University of Kentucky 1991.	
Professor #2 (Full-time)	F18/S18, AGM 2210 Land Measurements, 3 (UT) S18, AGM 4020/4021 Landscape Drainage and Irrig, 3 (UT) F18/S18, AGM 4730 Special Topics, Var (UT) S18, AGM 6020/6021 Land Drain and Irrig, 3 (G) S18, PES 9910 Doctoral Dissertation Research, Var (G)	BS, Agricultural Engineering, Clemson University 1997. MS, Biosystems Engineering, Clemson University 1998. PhD, Civil Engineering, University of South Carolina 2005.	
Professor #3 (Full-time)	S18, AGED 1000 Orientation & Field Experience, 1 (UT) F18, AGED 2010/2011 Intro to Agric Educ, 3 (UT) F18, AGED 2040 App Ag Calculations, 3 (UT) F18, AGED 4000 Supervised Field Experience II, 1 (UT) S18, AGED 4060 Directed Teaching, 12 (UT) S18, AGED 4250/4251 Teaching Ag Mechs, 2 (UT) S18, AGED 6250/6251 Teaching Ag Mechs, 2 (G)	BS, Agricultural Education, Virginia Tech 1981. MS, Vocational and Technical Education, Virginia Tech 1997. PhD, Vocational and Technical Education, Virginia Tech 2004.	
Associate Professor #1 (Full-time)	F15, AGM 3010 Soil Water Conserv, 3 (UT) S16, FNR 4700 Succession in Restored Wetland, Var (UT)	BA, History, Wake Forest University 1987. MS, Marine Resource Management, Oregon State University 1995. PhD, Forest Resources, Clemson University 2009.	
Associate Professor #2 (Full-time)	F15, BE 8710 Coastal Eco Design & Restoration, Var (G) F15, PES 8900 Coastal Ecological Design, Var (G)	BS, Zoology, University of Tennessee 1993. MS, Environmental Health, University of Georgia 1996. PhD, Biology and Agricultural Engineering, University of Georgia 2001	

Rank and Full- or Part-time	Courses Taught for the Program	Academic Degrees and Coursework Relevant to Courses Taught, Including Institution and Major	Other Qualifications and Relevant Professional Experience (e.g., licensures, certifications, years in industry, etc.)
Associate Professor #3 (Full-time)	S18, AGED 4060 Directed Teaching, 12 (UT) S18, AGED 4070 Int in Ext/Ldr Edu, Var (UT) S18, AGED 4150 Leadership of Vol, 3 (UT) F18, AGED 8120 Dev of Superv Agric Exp, 3 (G) S18, AGED 6150 Leadership of Vol, 3 (G) F18/Su18, AGED 8040/8041 Special Problems, 3 (G) F18/S18, AGED 8100 Clin Ag Ed Research, Var (G) F18, AGED 2000	BS, Agricultural Education, University of Florida 1989. MAg, Agricultural Education, University of Florida 1994. PhD, Agricultural Education, Pennsylvania State University 1998.	
Assistant Professor #1 (Full-time)	F18, AGM 4060/4061 Mech & Hydraulic Sys, 3 (UT) S18, AGM 4520/4521 Mobile Power, 3 (UT) F18/S18, AGM 4730 Special Topics, Var (UT) S18, AGM 6520/6521 Mobile Power, 3 (G) F18, AGM 8710 Adv Precision Ag Sci & Tech, Var (G) F18/S18, PES 8910 Master's Thesis Research, Var (G)	BS, Agricultural Machinery Engineering, Ankara University (Turkey) 1992. MSc, Agricultural and Biological Engineering, The Pennsylvania State University 1997. PhD, Agricultural and Biological Engineering, The Pennsylvania State University 2000.	
Assistant Professor #2 (Full-time)	F18, AGED 4030 Prin Adult/Ext Ed, 3 (UT) F18, AGED 3020 Junior Seminar, 1 (UT) F18, AGED 3030/3031 Ag Ed Mech Tech, 3 (UT) S18, AGED 4060 Directed Teaching, 12 (UT) F18, AGED 4280 Special Studies, Var (UT) F18, AGED 7500 Special Institute Courses, Var (G) F18, AGED 8040/8041 Special Problems, 3 (G) S18, AGED 8100 Clin Ag Ed Research, Var (G) F18, AGED 8150/8151 Agric Power Mech, 3 (G) S18, AGED 8890 Intro to Res in Ed, 3 (G)	BS, Agricultural Education, Virginia Tech University 2004. MS, Agricultural and Life Sciences, Virginia Tech University 2011. PhD, Agricultural Education, Iowa State University 2014.	

Rank and Full- or Part-time	Courses Taught for the Program	Academic Degrees and Coursework Relevant to Courses Taught, Including Institution and Major	Other Qualifications and Relevant Professional Experience (e.g., licensures, certifications, years in industry, etc.)
Assistant Professor #3 (Full-time)	F18, AGED 1020 Freshman Seminar, 1 (UT) S18, AGED 2030/2031 Teaching Agriscience, 3 (UT) F18, AGED 4010/4011 Instr Methods Ag Ed, 3 (UT) S18, AGED 4060 Directed Teaching, 12 (UT) F18, AGED 6010/6011 Instr Methods Ag Ed, 3 (G) S18, AGED 8040/8041 Special Problems, 3 (G)	BS, Plant and Soil Science, University of Delaware 1992. MAgEd, Agriscience Education, University of Delaware 2009. PhD, Agricultural Education, University of Florida 2015.	

Total FTE needed to support the proposed program: .45
 Faculty: **5% of time, overall**
 Staff: **0.075 of time**
 Administration: None

Faculty, Staff, and Administrative Personnel

Each of the 9 faculty in the program will re-allocate 5% of their time to the newly proposed graduate program.

Resources

Library and Learning Resources

Explain how current library/learning collections, databases, resources, and services specific to the discipline, including those provided by PASCAL, can support the proposed program. Identify additional library resources needed.

The Clemson University Libraries hold more than 1.8 million items including books, periodicals, electronic resources, digital media collections, government publications and patents, musical recordings, maps and microforms. Resources include 3,593 print journal subscriptions, approximately 48,000 e-journals, more than 22,800 e-books, and more than 400 online databases. The Library holdings and electronic access are adequate to support the program. All major journals in our files are available online or through open access. The Library already maintains access to databases such as the National Agricultural Statistics Service (NASS), Agricola, and AGRIS. The Library also maintains in-person and online research resources specific to the Agriculture field. Likewise, extensive additional resources for the proposed program are available through Interlibrary Loan and Pascal, which are available to students and faculty without cost. No additional library resources are anticipated.

Student Support Services

Explain how current academic support services will support the proposed program. Identify new services needed and provide any estimated costs associated with these services.

In addition to library and learning resources, a number of academic and student support services are available to all graduate students—including online students—at Clemson University:

- **Clemson Computing and Information Technology (CCIT)** provides a leading-edge integrated information environment integral to learning and research. Graduate students may (but are not limited to) take advantage of services such as Clemson email account, emergency text messages, mobile guidebooks, video conferencing, web development, and data storage. Help services are available via phone, email, or online chat.
- **Student Accessibility Services** – Graduate Students may register with Student Accessibility Services to use services such as academic access letters, assistive technology, communication services, test proctoring center and electronic textbooks.
- **Center for Career and Professional Development** – Clemson University is dedicated to engaging students in career development that will empower them to successfully pursue their educational and professional goals. Services provided by the career center include career workshops, resume writing, career development, job search assistance, and networking.
- **Legal Assistance** - All Clemson students are eligible to receive one legal aid voucher per semester. Each voucher entitles the student to one-half hour consultation with a lawyer off campus.
- **Counseling and Psychological Services (CAPS)** - Counseling and Psychological Services (CAPS), the mental health department of Student Health Services, offers a wide array of services along a continuum of intensity for various psychological issues.
- **Graduate Student Life** – Operating under the Division of Student Affairs, this is a central body that collaborates with the Graduate School and Graduate Student Government to enhance the overall graduate student life experience.
- **Clemson University Writing Center** – The goal of the writing center is to help all members of the Clemson community become more confident and effective writers.
- **The Harvey and Lucinda Gantt Multicultural Center** - The Harvey and Lucinda Gantt Multicultural Center is committed to creating diverse learning environments that enhance the intercultural competence of our students. The center supports and advocates for the needs of all students, challenges students to think critically about themselves and their communities, provides engaging experiential learning opportunities and empowers students to be positive change agents.
- **Clemson Online** - Clemson Online staff are here to ensure that all online students have access to the resources and support that comprise a first-class Clemson education. Clemson University is devoted to ensuring an innovative and substantive educational experience for all students.

Personalized student support and file management will be provided by the student services coordinator in the Department of Agricultural Sciences. Each student will be provided with a temporary advisor in the department upon acceptance until a permanent advisor is selected by the end of the first semester. No additional estimated costs for student support will be incurred by the addition of the new graduate program students.

Physical Resources/Facilities

Identify the physical facilities needed to support the program and the institution's plan for meeting the requirements.

The Agricultural Sciences Department is a multifaceted department with several programs and focus areas. The labs and lab equipment cover a range of research areas from water and natural resources to instrumentation and machinery design to teaching labs for agricultural education. In addition to these individual lab areas, we also oversee a research fabrication lab that is used by all of the program areas.

With respect to the water and natural resources portion of the department, we have a suite of labs that focus on topics such as soil/erosion/sediment, water quality, and animal waste management. These labs provide students with the analytical equipment required for measuring and monitoring such properties associated with these topics. In addition to wet and dry labs, this suite also includes computational lab space for water quality/quantity modeling. Labs devoted to instrumentation and machinery consist of several labs whereby are currently working with precision agriculture and development of unmanned ground and air vehicles used with remote sensing. These labs are also being used for development of crop harvesting and processing equipment and techniques in order to increase production. The agricultural education teaching labs are used by this program to educate students on various teaching techniques and strategies to promote learning in the classroom. The main research fabrication lab is used by all research programs to design and construct various pieces of equipment required for the various research needs. This lab contains both metal and wood fabrication equipment ranging from new metal and wood lathes to milling and cutting equipment.

These diverse labs encompass the research areas in which this new degree program focuses and will provide students with the resources they need to be successful in their degree goals. These labs have been updated over the past four to five years with the assistance of the college and resources provided by individual faculty from their respected research programs. Over the coming years, with the implementation of this degree program, additional resources and equipment will be added as we grow these programs in order to meet the needs of the state. In addition to these campus resources, these programs will also have access to the various Clemson Research and Experiment Stations across the state. These research centers provide students with experience in the field working with their research projects.

Equipment

Identify new instructional equipment needed for the proposed program.

NONE

Impact on Existing Programs

Will the proposed program impact existing degree programs or services at the institution (e.g., course offerings or enrollment)? If yes, explain.

Yes

No

Financial Support
Sources of Financing for the Program by Year

PhD in Agriculture	1st		2nd		3rd		4th		5th		Grand Total	
	2019-2020		2020-2021		2021-2022		2022-2023		2023-2024			
	New	Total	New	Total	New	Total	New	Total	New	Total	New	Total
Tuition Funding	\$ 45,936	\$ 45,936	\$ 47,314	\$ 47,314	\$ 97,467	\$ 97,467	\$150,587	\$150,587	\$155,104	\$155,104	\$ 496,408	\$ 496,408
Program-Specific Fees												
Special State Appropriation												
Reallocation of Exising Funds	\$ 0	\$160,440	\$0	\$165,683	\$0	\$ 171,110	\$0	\$ 176,729	\$0	\$182,545	\$ 0	\$ 856,508
Feder, Grant or Other Funding												
TOTAL	\$45,936	\$206,376	\$47,314	\$212,997	\$97,467	\$268,577	\$150,587	\$327,315	\$155,104	\$337,650	\$496,408	\$1,352,916

Estimated Costs Associated with implementing the Program by Year

Category	1st		2nd		3rd		4th		5th		Grand Total	
	New	Total	New	Total	New	Total	New	Total	New	Total	New	Total
	Program Administration, and Faculty and Staff Salaries	\$0	\$160,440	\$0	\$165,683	\$0	\$171,110	\$0	\$176,729	\$ 0	\$ 182,545	\$ 0
Facilities, Equipment, Supplies and Materials	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 45,000	\$ 45,000
Library Resources												
Other (Admin Overhead)	\$19,382	\$19,382	\$19,971	\$19,971	\$32,154	\$32,154	\$ 45,051	\$ 45,051	\$ 46,415	\$ 46,415	\$162,972	\$162,972
TOTAL	\$ 28,382	\$188,822	\$28,971	\$194,654	\$41,154	\$212,264	\$54,051	\$230,779	\$55,415	\$237,960	\$ 207,972	\$ 1,064,480
Net Total (Sources of Financing Minus Estimated Costs)	\$ 17,554	\$17,554	\$18,343	\$ 18,343	\$ 56,313	\$ 56,313	\$ 96,536	\$ 96,536	\$ 99,690	\$ 99,690	\$ 288,436	\$ 288,436

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11/06/2019

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Note: New costs - costs incurred solely as a result of implementing this program. Total costs - new costs; program's share of costs of existing resources used to support the program; and any other costs redirected to the program.

Budget Justification

Revenue Highlights:

- **Tuition and Fees:** Academic Tuition and Fees of \$638 per credit hour for in-state is proposed. As enrollment grows from 4 initial students to 12 students in year five, the program will eventually generate approximately \$155K in additional tuition revenue each year. Program degree length is a minimum of three years. The current enrollment projection includes one cohort for year 1-3, then additional cohorts beginning each year in years 4 & 5. The financial plan assumes that tuition and fees grow at 3% annually.
 - No graduate assistantships or fellowships will be offered for students in this degree program.
- **Reallocation of Existing Funds:** The department will utilize 12 existing courses to administer the new PhD program. The estimate per course is \$10K with fringe of 36.2%.

Expense Highlights:

- **Program Administration, Faculty and Staff Salaries:**
 - No new personnel costs are required to administer this program. All courses are existing, with the exception of 3 newly created courses (AGED 8300, AGED 9910, & AGM 9910). Newly created courses are independent study and require no additional faculty workload, students will be assigned to an existing faculty member for directed research.
 - All courses listed in the program have additional capacity, for which the program will leverage to teach the newly proposed PhD programs.
- **Facilities, Equipment, Supplies and Materials:**
 - A marketing budget of \$4K will be used to communicate the new program across the state of South Carolina.
 - A budget for \$5K is for lab improvements for courses utilized across the curriculum.
- **Other Costs:**
 - Administrative overhead represents departmental support costs pro-rated across academic programs.

Evaluation and Assessment

Program Objectives	Student Learning Outcomes Aligned to Program Objectives	Methods of Assessment
1. Develop a foundation for one's personal philosophy of the research process by synthesizing and evaluating appropriate philosophical models.	Doctoral students will be able to apply knowledge of philosophical and historical foundations of agricultural education and agricultural systems to develop personal philosophy statements.	As part of the mid-program qualifying exam, doctoral students will develop a complete written philosophy as guided by their graduate committee.
2. Organize, conduct, and evaluate activities that further the profession's missions, provide growth opportunities for its practitioners, and foster development of a vision.	Doctoral students will be able to demonstrate advanced knowledge/expertise in agricultural education or agricultural systems management.	Student seminar presentations and/or student-led workshops will be assessed to determine levels of student knowledge in agricultural education or agricultural systems management. This will be conducted each year on a regular basis.
3. Monitor the development of trends and administration of policies in and outside of the related disciplines and explain their impact or potential impact.	Doctoral students will demonstrate and participate in intellectual/organizational aspects of their respective professions.	Artifacts developed in the graduate comprehensive exam will be used as artifacts for this outcome.
4. Develop graduate's skills in scholarly research and writing for their respective professions.	Doctoral students will conduct independent research resulting in an original contribution to knowledge in agricultural education and agricultural systems management professions.	Chapter three of the doctoral student's dissertation, "Research Methodology."

Explain how the proposed program, including all program objectives, will be evaluated, along with plans to track employment. Describe how assessment data will be used.

The student learning outcomes are of particular importance and relate directly to the curriculum plan of study. Accomplishment of learning objectives will be assessed through course artifacts, a qualifying examination upon completion of at least 80% of core coursework, a preliminary oral defense of a detailed dissertation proposal that addresses both the topic and proposed methodology, and a final oral defense of the dissertation for Ph.D. students and a preliminary oral defense of a detailed thesis or project proposal that addresses both the topic and proposed methodology.

To maintain employment tracking of Ph.D. students, each doctoral advisor will contribute to a database that will be maintained by the department's student service's coordinator. Annual correspondence with those in the database will provide a continued update of those transitioning in their careers.

Program evaluation will be consistent with existing university program evaluation and assessment metrics that focus on program outcomes as well as student learning outcomes. While assessment of students is essential, program assessment is also an important to monitor and document program quality. The faculty will use a number of factors related to program quality and effectiveness including, but not limited to, enrollment and graduate rates, publications and presentations of faculty and students, student assessment of instructors, and exit interviews. The university provides annual data for department chairs to use in conducting program reviews. These data assist faculty in evaluating and improving program implementation. The evaluation program will also monitor graduate student publications and the database of postgraduate employment/addresses will allow for additional aspects in program evaluation.

Accreditation and Licensure/Certification

Will the institution seek program-specific accreditation (e.g., CAEP, ABET, NASM, etc.)? If yes, describe the institution's plans to seek accreditation, including the expected timeline.

Yes

No

Will the proposed program lead to licensure or certification? If yes, identify the licensure or certification.

Yes

No

If the program is an Educator Preparation Program, does the proposed certification area require national recognition from a Specialized Professional Association (SPA)? If yes, describe the institution's plans to seek national recognition, including the expected timeline.

Yes

No

January 15, 2019

Dr. Dale Layfield, Associate Professor
Department of Agricultural Sciences
256 McAdams Hall
Clemson University
Clemson, SC 29634-0303

Dear Dr. Layfield:

Thank you for the opportunity to review and provide my assessment of the proposal for the establishment of a Ph.D. in Agriculture program with emphasis areas in both Agricultural Education and Agricultural Systems Management. After reviewing the proposal documenting the need for such a program and the intellectual and financial resources available to support the program, I am pleased to offer my support.

My first observation upon receiving the proposal and scanning the proposal form was that this proposal has undergone an extended internal review, with the initial request submitted in July 2013. Based on this lengthy review process and subsequent approvals to proceed at each level, I am confident the proposal has strong internal support. I note this simply because a high level of internal support is vital to the initiation and success of a new Ph.D. program.

The proposal does an adequate job of documenting the need for Ph.D. graduates in Agricultural Education and in Agricultural Systems Management on a state and national basis. While not all of the positions listed in the "Employment Opportunities" table will require either a Ph.D. or a specialization in Agricultural Education or Agricultural Systems Management, a significant proportion will. My recent experiences chairing search committees seeking faculty members with these exact credentials indicate a shortage of well-qualified candidates, especially in Agricultural Systems Management. I am confident the potential to concentrate in one of the specializations and potentially minor in the other will prepare in-demand graduates for leadership positions in academic, government, non-profit, and industrial careers.

A second factor supporting the proposed degree program is the quality and qualifications of the nine full-time faculty members staffing the Ph.D. program. Each faculty member holds an appropriate terminal degree, and, as a group, they present an excellent mix of early-, mid-, and late-career faculty and an appropriate mix of expertise in Agricultural Education and Agricultural Systems Management. I have no doubt these individuals will be able to provide students with rigorous and challenging educational and research experiences, while, at the same time, offering excellent mentoring and career guidance.

I do note the proposed coursework for the Agricultural Systems Management option is not as specific as is the one for Agricultural Education. However, this could be a potential strength of this option, given the varied professional goals of the likely students. Regardless, this flexibility, although positive in some respects, must be carefully monitored to ensure each graduate has the depth of knowledge expected of Ph.D. holders.

Finally, I am satisfied that Clemson University intends to devote adequate funding to support the Ph.D. program. While I would like to see additional institutional support in the first few years, I believe the proposed support is, as I said, adequate. Developing a cadre of Ph.D. students should enhance faculty research programs and competitiveness for the external funding that will be necessary as the program grows and develops.

Dr. Layfield, again, thank you for the opportunity to review this proposal. I support your request for a Ph.D. in Agriculture with specializations in Agricultural Education and in Agricultural Systems Management.

Best Regards,

Donald M. Johnson, Professor