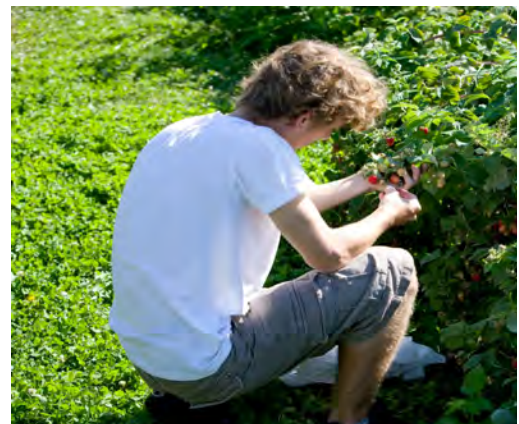
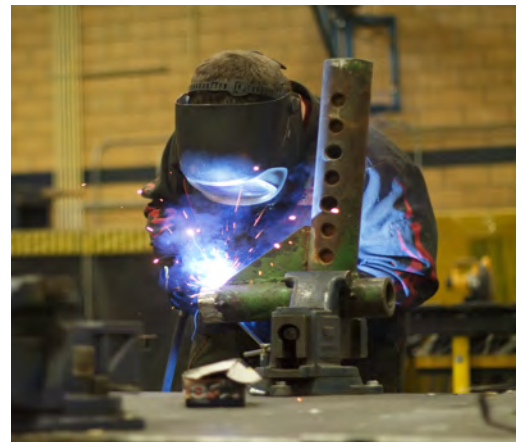




Status of the U.S. Supply and Demand for Teachers of Agricultural Education, 2014 - 2016



Suggested Citation

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Status of the U. S. Supply and Demand for Teachers of Agricultural Education 2014-2016

The “Supply and Demand Study” is an ongoing project of the American Association for Agricultural Education working in partnership with school-based agricultural education stakeholder groups that has been conducted since 1965.

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A special thank you to those who came before us, who established the framework for this study. Their reflective approach and dedication to the advancement of agricultural education was critical in ensuring the future success of the project.

Finally, gratitude is extended to our home institutions, for not only supporting this scholarly line of inquiry for the three of us, but also for investing additional resources in this project.

Researcher Contextual Statement

In approaching the *Supply-and-Demand Study* as a multi-institutional, collaborative project provided for collecting accurate, annual supply-and-demand data relevant to school-based agricultural education, Drs. Foster, Lawver, and Smith leveraged diverse expertise, provided necessary resources, and offered long-term commitment (2014-2020) to this project. The institutional locations of faculty team members allowed for greater networking and collaboration with state and national agricultural education leaders. Specifically, the faculty team represented three NAAE regions (PSU: Region 6; UM: Region 3; USU: Region 1), two AAAE Regions (North-Central and Western), and three FFA Regions (Pennsylvania: Region VI; Minnesota: Region III; and Utah: Region I).

Daniel Foster is an Associate Professor of Agricultural and Extension Education at The Pennsylvania State University. Daniel serves as the student teacher coordinator and actively engages in research on effective agricultural education in secondary and post-secondary settings, specifically teacher mobility and agricultural teacher global competency. Daniel has been active in the professional work of agriculture teacher educators through AAAE, providing leadership as the past chair of the Teacher Education special interest group. In addition, he is a member of the National Teach Ag! Campaign advisory board and was recognized as a Teach Ag! Champion.

Rebecca Lawver is an Associate Professor and Program Leader for Agricultural Education in the School of Applied Science, Technology & Education at Utah State University. Rebecca provides leadership, instruction and advising in the ASTE graduate and undergraduate program. Her research focus includes the professional development of agricultural educators in secondary, post-secondary and non-formal education, specifically, needs assessment, recruitment and retention, agriculture safety, and effective teaching. Rebecca has been active in the professional work of the AAAE as past chair of the Professional Development Committee, past chair of the Teacher Education SIG, and former Vice President of Communications. In addition, she is a member of the National Teach Ag! Campaign advisory board.

Amy Smith is an Assistant Professor and Undergraduate Major Coordinator for Agricultural Education at the University of Minnesota - Twin Cities. Amy teaches orientation/foundation courses for the program, in addition to curriculum and classroom management courses for students pursuing teacher licensure. She assists with the placement and supervision of teacher candidates and works closely with cooperating teachers, MAAE and Minnesota FFA association leaders, and Department of Education staff. Amy's research interests focus on recruitment and retention of agricultural education students and teachers, with related studies addressing advising, effective teaching, and social comparison. Active in the professional work of both AAAE and NC-AAAE, Amy has served on both the Professional Development and Member Services committees, and provided leadership as past chair of the Teacher Education SIG. In addition, she is a member of the National Teach Ag! Campaign advisory board.

This team of project coordinators offers a great deal of energy and commitment to this study. Individually, each brings a history of active involvement in the profession and a variety of national agricultural education initiatives. Such involvement allows for each project coordinator to have a strong professional network within the agricultural education family. Together, as agricultural teacher educators, all three project leaders have significant personal investment in accurate data reflecting opportunity for success in U.S. school-based agricultural education evidencing what is desired to be an appropriate supply of well-prepared school-based agriculture teachers.

Known Limitations

The project coordinators would like to explicitly state known limitations of this ambitious, multi-data source project. Data can only be taken at face value dependent on the identified state/institutional partner providing information. Ideally, increased fiscal resources would allow for the ability to verify data with state/federal data warehouses.

Each state and academic institution has disparate and unique data collection systems and processes; as such, several attempts were made to obtain data. In the spirit of collaborative success, the project team invites colleagues to connect with them to share sources of data collected at scopes smaller than the national level.

The primary purpose of this specific supply and demand effort is to provide a general view of the national landscape surrounding the issue of preparing highly qualified agricultural educators for school-based agricultural education.

Introduction

Determining who is teaching school-based agricultural education and whether there is an appropriate supply to meet demand is important to teacher educators, students, parents, policy makers and other stakeholders in agricultural education. The national study of supply and demand for teachers of agriculture has been a long-standing project supported and facilitated by the American Association for Agricultural Education (AAAE), since 1965. The study has historically provided a great deal of valuable information for those engaged in the profession. The supply and demand study most recently completed was conducted by Adam Kantrovich (2010), in which the author stated:

Leaders of the profession need current, accurate estimates of the numbers of and demand for teachers of Agricultural Education to provide for meaningful policy decisions at all levels. Teacher organizations and teacher educators need current, accurate supply and demand information to use in recruitment activities and in counseling potential teachers of Agricultural Education. Yet, detailed data of that nature, specific to Agricultural Education, are not available outside this study. (p. 8)

The supply of agriculture teachers has been studied for over a century. Bricker (1914) discussed the sources for agriculture teachers. He identified four main sources: (1) nature-study teachers, (2) agricultural college graduates, (3) high school science teachers, and (4) people raised on farms. He was critical of all four sources but was most critical of sourcing agriculture teachers from individuals raised on farms. “They are persons who have been ‘raised on the farm’ and who therefore think themselves amply qualified to teach agriculture” (p. 121). Less criticism was directed towards the agricultural college graduate, but “he does not understand children. Association for a period of four or more years with adults has given him the point of view in education in which only matured minds, bodies, experiences and lives have entered.” (p. 118). The attitude of high school science teachers was the main criticism of Bricker, as agriculture is “more than a science: it is an art and a business” (p. 119). From where then should agriculture teachers be sought? Bricker proposed a then novel idea; agriculture teachers should be graduates of agricultural education departments of normal schools and agricultural colleges – designed to give training in the theory and practice of teaching in agriculture. Interestingly, several such departments existed near to that time. The Smith-Hughes Act of 1917 mandated that training of vocational teachers would be under the supervision of the State board for vocational education and outlined specifications to be followed in the training programs (Swanson, 1942). True (1929) reported 20 agricultural education departments functioning at the time of the passage of Smith-Hughes. Stimson and Lathrop (1942) reported agriculture teacher preparation existed prior to 1917 at Iowa State, Penn State, and Texas A&M.

Since the early days of agricultural education, there have been concerns about producing an adequate supply of school-based agricultural educators. According to True (1929),

The demand varies considerably from year to year. It cannot be closely estimated for any one state. The ideal would be to have production well in advance of the probable annual need, perhaps 10 to 20 percent. This would provide for emergency years and in average years allow for culling. (p. 291)

This holds true today; to strategically and systematically address the existing supply and demand of school-based agriculture teachers, a great deal of programmatic data is needed from numerous agricultural education stakeholders. First, state agricultural education leaders must provide information and insight about teacher turnover, vacancies and potential new programs. Next, agriculture teacher educators must contribute information regarding the pipeline of prospective teachers. Collaboratively, an accurate picture of supply and demand in agricultural education can be achieved. Last, representatives of school-based agriculture programs (current agriculture teachers and/or administrators) must provide key information about local agriculture programs, including program focus, teaching assignments/courses offered, and enrollment. As a profession, conversations have continued regarding the supply and demand of school-based agriculture teachers. Focused conversations have occurred at regional and national AAAE meetings and the topic was a primary focus of the 2013 National Ag Ed Summit. The profession has called for continued research and recommendations to address the persistent recruitment and retention issues faced in school-based agricultural education.

While agricultural education has identified and monitored the supply of agricultural teacher candidates since the 1960s, as a profession we are not unique in concern regarding supply and demand of qualified teachers. Shortages are occurring in many areas for a multitude of reasons including, but not limited to, a decrease in teachers entering the profession, an increase in student enrollment, and new positions and courses being added to better prepare students for life beyond graduation (Berry & Shields, 2017).

The National Center for Education Statistics (NCES) predicts the school-going population will increase by 3 million students in the next decade and estimate hiring 300,000 teachers per year (USDE, 2015). When considered alongside Yaffee's (2016) assertion that enrollment in all teacher education programs has fallen by double digit percentages in recent years, the dire nature of the issue of teacher supply is compounded. The supply of highly qualified teachers is further impacted by factors like public perception of the teaching profession, federal and state legislation, the teacher evaluation process (Goldhaber, 2015), increased workload, paperwork, and the amount of classroom time lost to standardized testing (Thibodeaux, Labat, Lee, & Labat, 2015). As such, the need to explore policy interventions to address the desirability of the teaching profession becomes acute.

In 2016, the U.S. Department of Education (USDE) released the Notice of Final Rulemaking for the Teacher Preparation Regulations in effort to ensure that novice teachers are ready to succeed in the classroom and that every student is taught by a great educator (USDE, 2018).

The rules focus on promoting stronger outcomes for all teacher preparation programs, including traditional, those providing alternative routes to certification, and those provided through distance education, while giving states significant flexibility in how they measure program performance to reflect local needs and priorities. More specifically, the rules require new reporting by states beyond the basic measures they are required to report annually under the Higher Education Act about program effectiveness to drive continuous improvement by facilitating ongoing feedback amongst programs, prospective teachers, schools and districts, states and the public. The regulations also aim to provide better information to address the mismatch between the available teaching jobs and fields in which programs are preparing educators, and to enable districts and schools to deploy their best teachers where they are needed the most (USDE, 2018).

These regulations have created challenges for teacher preparation programs. Fletcher and Gordon (2017) found the greatest challenges facing teacher preparation in Career and Technical Education include lack of student interest, changing certification requirements at the state and federal levels, the increasing number and changing nature of preservice and inservice certification/licensure assessments, a need to offer online and hybrid courses to accommodate nontraditional students, and the changing demographics of students. Further, the American Association of Colleges for Teacher Education (2010) expressed serious concerns about the impact of state and federal regulations on teacher shortages, declining enrollment in educator preparation programs, persistent lack of diversity, and a low retention rate; none of these issues will be solved by forcing those involved in the profession to comply with a costly and burdensome unfunded mandate.

While teacher supply and demand is an issue facing the entire nation, it is also an issue that does not impact all with the same magnitude. In fact, access to highly qualified instructors (agricultural education or otherwise) could be presented as a fundamental social justice issue. Repeatedly, it has been shown that dearth of qualified teachers is felt more acutely in schools serving more low-income and minority students (Darling-Hammond & Shields, 2016) or is significant in highly urban and rural areas and in Title 1 schools (Martin & Mulvihill, 2016) as well as in certain geographic areas the American West appears to suffer extra due to geographic isolation (Martin & Mulvihill, 2016).

By describing the status of supply and demand within school-based agricultural education, the conversation around interventions and policy can be nuanced. While there have been five main strategies advocated to help fill teacher vacancies including strengthening teacher preparation, improving hiring practices, increasing compensation, providing support for new teachers, and improving working conditions (Podolsky, Kini, Bishop, & Darling-Hammond, 2016), it is the responsibility of the leaders of the agricultural education profession (with help from vested partners and stakeholders of school-based agricultural education) to identify contextually relevant and appropriate applications of strategies.

Conceptual Framework

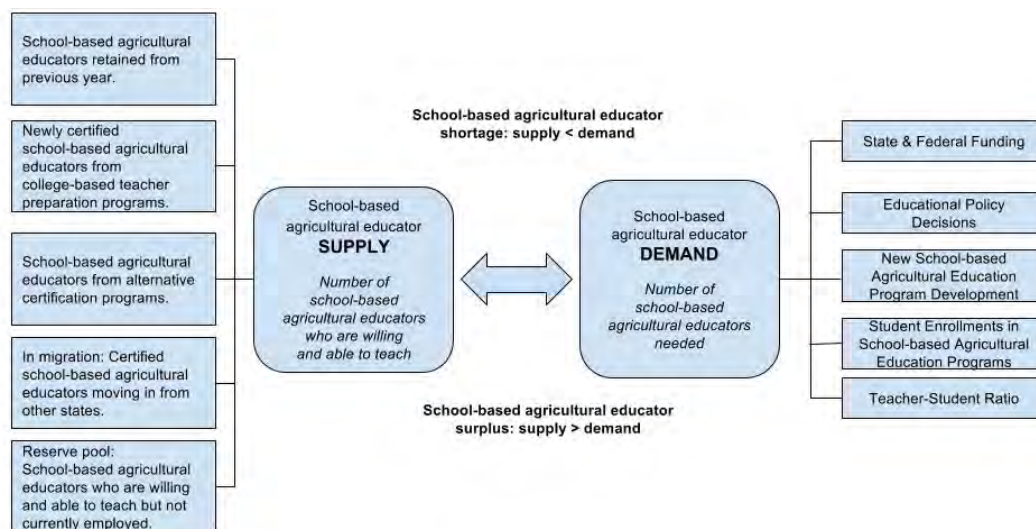


Figure 1. Conceptual Framework of Agriscience Teacher National Supply and Demand Study. Adapted From Lindsay, Wan, & Gossin-Wilson (2009).

Purpose

The purpose of the Supply and Demand for Teachers of Agricultural Education project is to provide stakeholders in agricultural education current, accurate estimates of the supply and demand for school-based teachers of Agricultural Education in order to provide for meaningful policy decisions at all levels (Kantrovich, 2010). Further, data may be used by agriculture teacher educators, agricultural education organizations, and state agricultural education staff to support ongoing recruitment and retention efforts within school-based agricultural education.

Objectives

The overarching objective of the Supply and Demand for Teachers of Agricultural Education project is to determine the availability of and need for school-based agricultural educators. Working with “Team Ag Ed” partners including national leaders for the American Association for Agricultural Education (AAAE), National Association of Agricultural Educators (NAAE), National Association of Supervisors Agricultural Education (NASAE), the National FFA, and the National Teach Ag Campaign, the following objectives provided guidance for the development summary of data collected annually from 2014-2016.

1. Describe historical trends of agricultural education in the United States (capacity of agriculture teacher education programs, number of licensed program completers, and number of completers who pursued careers in school-based agricultural education).
2. Describe agricultural teacher education programs in the United States.
3. Describe characteristics of licensed program completers (gender, ethnicity, type of licensure program, anticipated post-graduation plans, etc.)
4. Describe the scope of school-based agriculture programs in the United States.

Methods

This study built upon existing processes and protocols in place for the *Agricultural Education Supply and Demand* research developed over the last 50 years. Project coordinators worked to strengthen and streamline data collection methods for both supply and demand aspects of the study. The parameters for the study were submitted (#4564) to the Institutional Review Board for Human Subjects Research at the Pennsylvania State University and approved.

Supply

The population for the supply of school-based agricultural educators included university agricultural teacher educators from every institution that offered a school-based agriculture teacher preparation program leading to licensure. Data collected from the Supply survey included: university teacher education program data, number of licensure program completers, and employment plans of program completers. The institutions offering agriculture teacher preparation varies from year to year as new programs are added or defunct programs are closed.

Supply frame. An accurate and up-to-date frame of institutions was scrutinized annually prior to data collection. The original frame was developed from membership in AAAE. A snowball method was used in asking key stakeholders (including, but not limited to AAAE membership), who should be contacted on an annual basis regarding certifying school-based agricultural education teachers. The project team reviewed and updated the frame for accuracy on an annual basis. During data collection, the last item on the instrument requested the name and contact information for the institution's best contact for the following year. To assist in trustworthiness of data collection, on an annual basis an informational email was sent with a state snapshot from the previous year of data collected and an indication of who would be contacted in the upcoming year.

Supply instrumentation. As this is a legacy study, the starting point for each instrument was the questions asked in previous iterations of the instrument. Questions were added and revised based on current literature and feedback from a panel of agricultural teacher educator experts who reviewed the instrument for face, content, and construct validity. Reliability was checked annually and found to be appropriate for a descriptive study.

Demand

The population for the demand of school-based agricultural educators included state agricultural education leaders from all 50 states, Puerto Rico, and the Virgin Islands. Data collected from the Demand survey included: existing programs, potential for new programs, number of teachers, types of programs, anticipated retirements, and other demand issues.

Demand frame. An accurate and up-to-date frame of state agricultural education leaders was generated each year. The original frame was developed from membership in NASAE. The National FFA Local Program Success Specialists reviewed the frame for accuracy on an annual basis and assisted with identifying necessary changes. During data collection, the last item asked who would be the best contact for that state the following year. To assist in trustworthiness of data collection, on an annual basis an informational email was sent with a state snapshot from the previous year of data collected and an indication of who would be contacted in the upcoming year.

Demand instrumentation. As this is a legacy study, the starting point for the instrument was questions previously asked in historical Supply and Demand studies. Questions were added and revised based on current literature and feedback from a panel of state and national agricultural educator leaders who served to check face, content, and construct validity. Reliability was checked annually and found to be appropriate for a descriptive study.

Supply and Demand Data Collection

Preliminary data for both supply and demand were collected using an online Qualtrics survey. The data collection procedures utilized Dillman's guiding principles for internet and mixed-mode data collection (Dillman, Smyth, & Christian, 2014). Following dissemination of unique individual emails and reminders, the project team followed up with individual phone calls to non-respondents. Data were treated confidentially.

For successful data collection, timing is essential. The inaugural year of data collection by the current project team was 2014. It was hypothesized that successful data collection for the supply of school-based agriculture teachers would occur beginning in April as institutions completed the academic year and recommended students for licensure. The final data collection for supply was received in May allowing for the project team to check validity at the annual AAAE meeting. Initial 2015 demand of school-based agriculture teachers' data collection was attempted in September with validity check desired at the October annual meeting of NASAE. This created a scenario of year-long data collection with limited improved and costs outweighing benefits. Feedback received from agriculture teacher educators also supported an adjusted timeline, as often employment plans of license-eligible program completers were unknown until late spring/early summer. As such, data collection in 2015 and 2016 was adjusted and aligned so that the bulk of collection for both supply and demand began in August and was completed by November. This allowed the project team an opportunity to check validity on an individual basis as needed, through telephone calls and email.

Handling of Potential Survey Error

There are four generally accepted sources of survey error: sampling error, measurement error, coverage error, and nonresponse error (Dillman et al., 2014). The following methods were utilized by the project team to minimize and control potential sources of error. As a census of respondents was desired, the possibility of sampling error was not applicable to this study. Measurement error was mitigated using a panel of experts to review and evaluate validity of the study. This included a review for face, content, and construct validity. The panel of experts included teacher educators, National FFA LPS Specialists, and the NAAE Teach Ag Campaign coordinator. Like sampling error, a census approach controlled for coverage error. In addition, the project team utilized trusted source approaches to ensure no stone was left unturned. Recognizing that 7 states and 17 institutions failed to respond to Kantrovich (2010), additional efforts were planned to reduce, or eliminate, non-response. Institutions who failed to respond were contacted via telephone. Due to familiarity with the population as well as the manageable frame size, the project team was aggressive in reaching out via multiple communication modes to obtain representative data. Table 1 reports nonrespondents to the supply of school-based agriculture teachers; Table 2 reports the nonrespondents for demand of school-based agriculture teachers.

Table 1
Supply of School-Based Agriculture Teachers Nonrespondents 2014-2016

2014 Nonrespondents	2015 Nonrespondents	2016 Nonrespondents
Univ. of Arkansas – Pine Bluff Fort Hays State University Univ. of Maryland – College Park Univ. of Massachusetts College of the Ozarks Missouri State Univ. University of New Hampshire Delaware Valley College Middle Tennessee State Univ. Angelo State Univ. Prairie View A&M University of Wisconsin – Platteville	Delaware State University Univ. of Arkansas – Pine Bluff Univ. of Georgia – Tifton	<i>100% response rate was achieved</i>

Table 2

Demand of School-Based Agriculture Teachers Nonrespondents 2014-2016

2014 Nonrespondents	2015 Nonrespondents	2016 Nonrespondents
Massachusetts Puerto Rico Virginia Washington	Puerto Rico Massachusetts	Puerto Rico Washington

Data Analysis

Data were analyzed primarily using excel database features for simple descriptive statistics. Specifically, data analyzed for each objective is described below.

Objective one: Describe historical trends of agricultural education in the United States. A longitudinal analysis of historical data was analyzed, with frequencies and percentages used to describe historical trends. This included secondary data analysis and utilization of historical research methods.

Objective two: Describe agricultural teacher education programs in the United States. Descriptive statistics, which included frequencies and percentages were used to describe agricultural teacher education programs including full time equivalent faculty/instructors, college affiliation, etc.

Objective three: Describe characteristics of license-eligible program completers. License-eligible program completers are those students who complete an agriculture teacher preparation program and are eligible for licensure upon completion. Descriptive statistics were used to analyze the characteristics of license-eligible program completers. Specifically, frequencies and percentages were used to describe ethnicity and gender.

Objective four: Describe the scope of school-based agriculture programs in the United States. The scope of school-based agriculture programs was described using descriptive statistics including frequencies and percentages. Further, the project team was interested in looking closer at demand versus supply, therefore, a “Demand Metric” was developed which allowed for a Total Demand Score to be calculated and when compared to candidate production, resulted in a Shortfall Score. In order for this to be calculated, a state had to have both supply and demand numbers reported for 3 years.

Presentation of Data

Decisions regarding presentation of data were made with consideration of preserving the integrity for longitudinal analysis and building from previous reports.

Findings

The findings below represent the data collected on an annual basis from 2014-2016 with reference to historically reported studies.

Objective 1: Describe Historical Trends of Agricultural Education in the United States.

The importance of a well-prepared individual teacher and the role that teacher training played in that process to the success of school-based agricultural education is evidenced in the provisions of the Smith-Hughes Vocational Education Act of 1917, a significant piece of legislation impacting agricultural education. For example, states participating were mandated to use the minimum amount appropriated for the training of teachers in order to secure other benefits of the act (Swanson, 1942). Evidence of agricultural teacher education programs exists starting as soon as 1907 (Bailey, 1908) with reports of number of newly qualified candidates existing as of 1920 (Federal Board for Vocational Education, 1921; Jarvis, 1921).

Table 3 shows reporting institutions from 1907 to 2016. These numbers are pulled from historical reports (Jarvis, 1921; Swanson, 1942; etc.), past supply studies (Camp, 2000; Camp, 1998, Camp, Broyles & Skelton, 2002; Kantrovich, 2007, 2010), and the current study collected data from 2014-2016.

While the profession has experienced approximately a 20% decrease ($n = 48.95$) in total position dedicated to agricultural teacher education from 2001 to 2014, Figure 2 presents the percentage of those position as tenure track faculty has been fairly consistent as 2/3rds of all positions (range of 60.84% to 72.23%).

Table 3

Historical Perspective of Reported U.S. Agriculture teacher preparation Programs

Year	Number of U.S. institutions	Year	Number of U.S. institutions
1907	1	1922	69
1908	1	1923	78
1909	3	1924	68
1910	6	1925	70
1911	7	1941	72
1912	9	1989	88
1913	13	1995	84
1914	17	1998	78
1915	18	2001	79
1916	19	2006	92
1917	30	2009	92
1918	47	2014	103
1919	60	2015	99
1920	64	2016	101
1921	69		

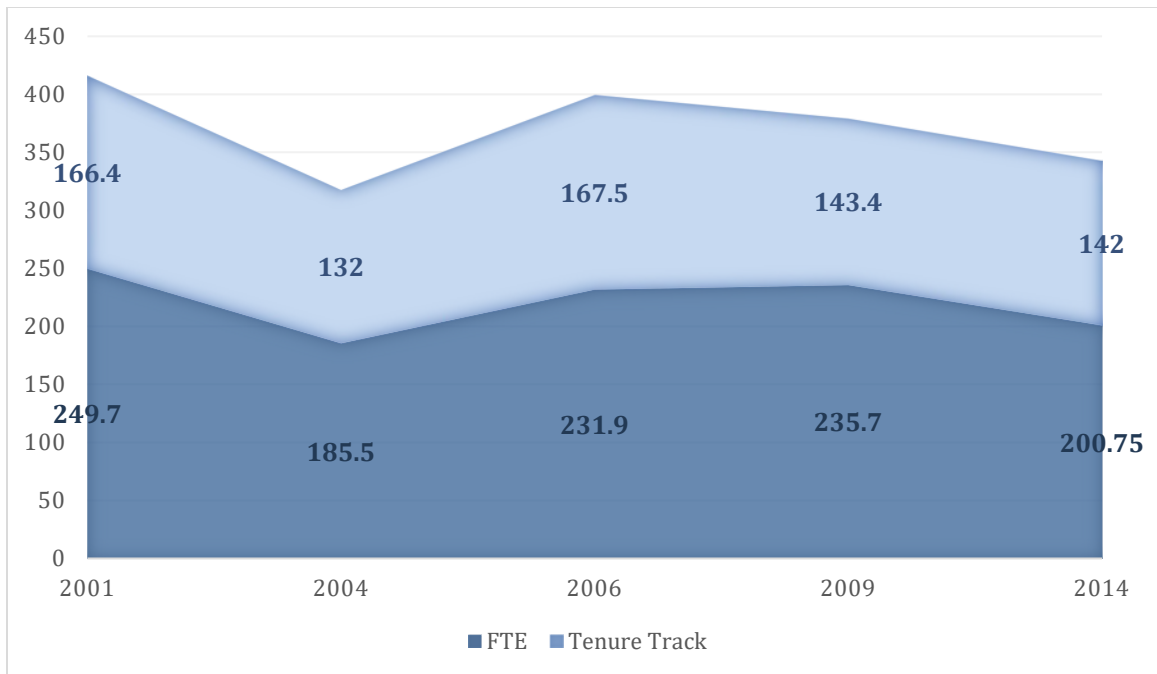
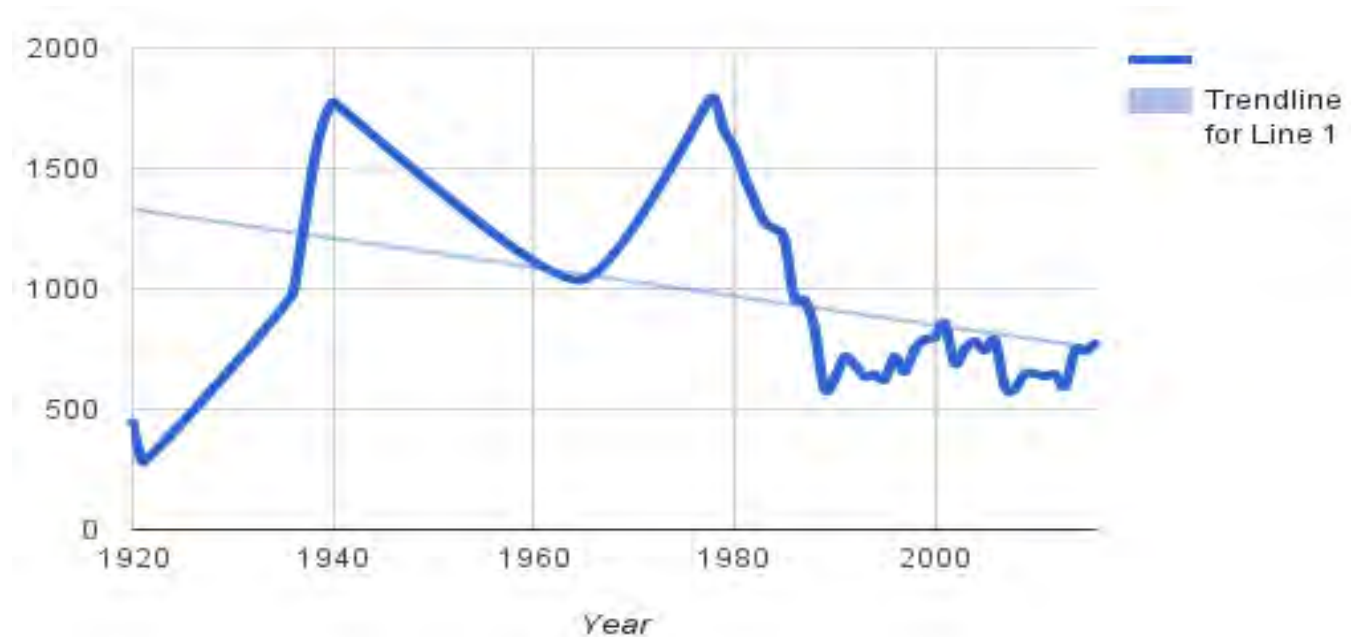


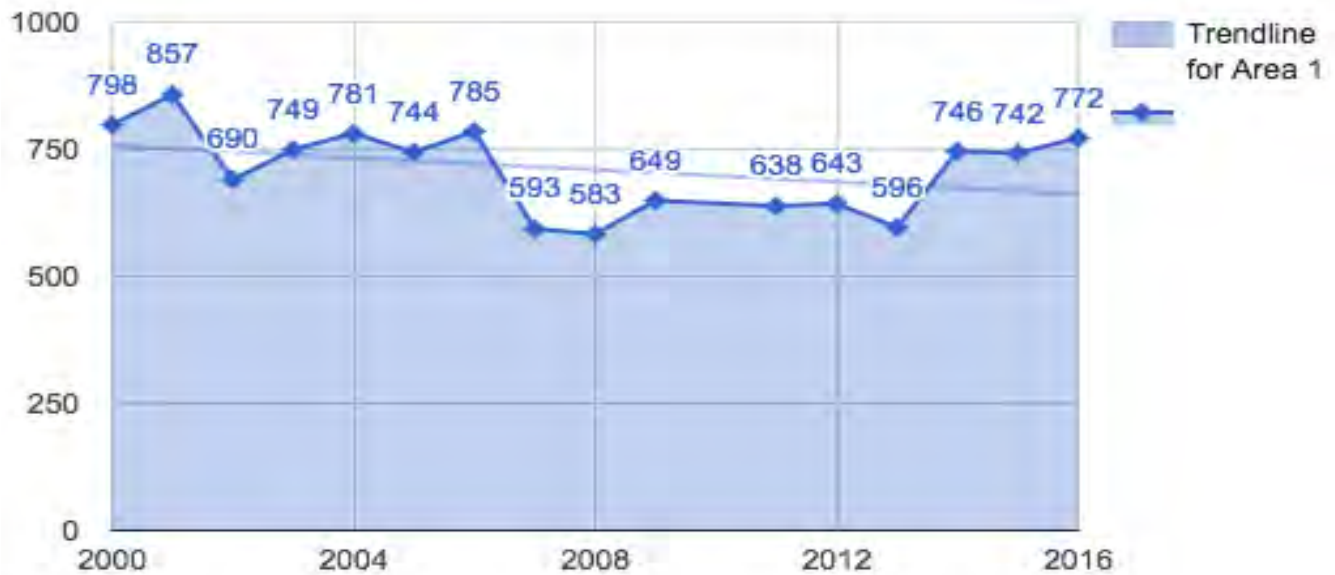
Figure 2. Full-Time Position Equivalents Dedicated to Agriculture Teacher Preparation in the 21st Century

In 2014, there were 746 agricultural education teacher licensure completers reported by 87 institutions. This followed by 96 institutions reporting 742 completers in 2015 and 101 institutions reporting 772 completers in 2016. Figures 3 and 4 show the context of license-eligible program completer production with historical views from 1920 and from 2000.



Note. No data were available for 1922-1935, 1941-1965, 1966-1976, 2010.

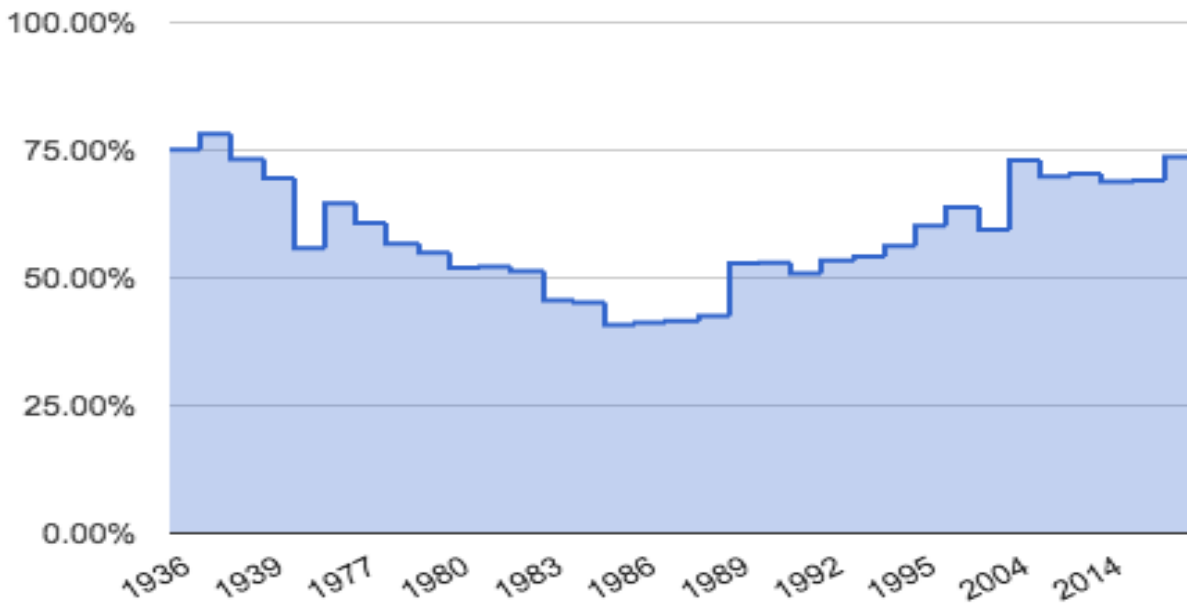
Figure 3. Historical Perspectives of Agriculture Teacher Preparation Program Completers, 1920-Present.



Note. No data available for 2010.

Figure 4. Agricultural Teacher Education Program Completers, 2000-2016

Figure 5 presents the historical view of the percentage yield of program completers accepting school-based agricultural education positions. Historically, the average over time is 58.5%. Table 12 presents the reported number of program completers and the reported number of graduates who accepted positions in school-based agricultural education either in-state or out-of-state as reported by the teacher education institution from 2014-2016.



Note. Missing/nonreported data from 1941-1964, 1966-1976, 1996-1997, 1999-2000, 2002-2003, 2005, 2007-2008, 2010-2013.

Figure 5. Percentage of License-Eligible Program Completers Who Acquired Teaching Positions in School-Based Agricultural Education.

Objective 2: Describe Agricultural Teacher Education Programs in the United States.

While supply of agricultural teacher education candidates is collected on an annual basis, a more comprehensive data collection occurs in the first year of each triennial data collection period. The data presented in Table 4 illustrates the faculty dedicated to agriculture teacher preparation by region and national total in the fall of 2014. A historical perspective is also provided.

Table 4
Agricultural Education Faculty Region & U.S. Totals

Region/Historical Trends	Full-time Equivalent (FTE) positions					
	Total FTE	Asst./Assoc./ Full Professor	Instructor	Graduate Assistant	Clinical Faculty/ Professor of Practice	Other
North Central 2014	48.0	29.8	10.3	5.5	2.2	0.3
Southern 2014	106.3	81.6	11.0	11.5	1.3	1.0
Western 2014	46.4	30.7	7.3	7.5	1.0	0
Total 2014	200.7	142.0	28.6	24.5	4.5	1.3
Total 2009	235.7	143.4	29.8	61.5	Not collected	1.0
Total 2006	231.9	167.5	21.5	39.0	Not collected	4.0
Total 2004	185.5	132.0	12.5	35.0	Not collected	6.0
Total 2001	249.7	166.4	18.0	60.8	Not collected	4.5

Figure 6 indicates the college affiliations for agriculture teacher education programs. The majority of faculty within agricultural education programs are housed in colleges of agriculture ($f=72$) with nine residing in colleges of education. Those programs not affiliated with a college of agriculture or a college of education ($f=10$) reported the following department or collegiate homes:

- College of Applied Arts
- College of Applied Science and Technology
- College of Arts and Sciences
- College of Business
- College of Business and Technology
- College of Natural Sciences and Mathematics
- College of Sciences
- College of Science and Engineering
- Department of Agriculture

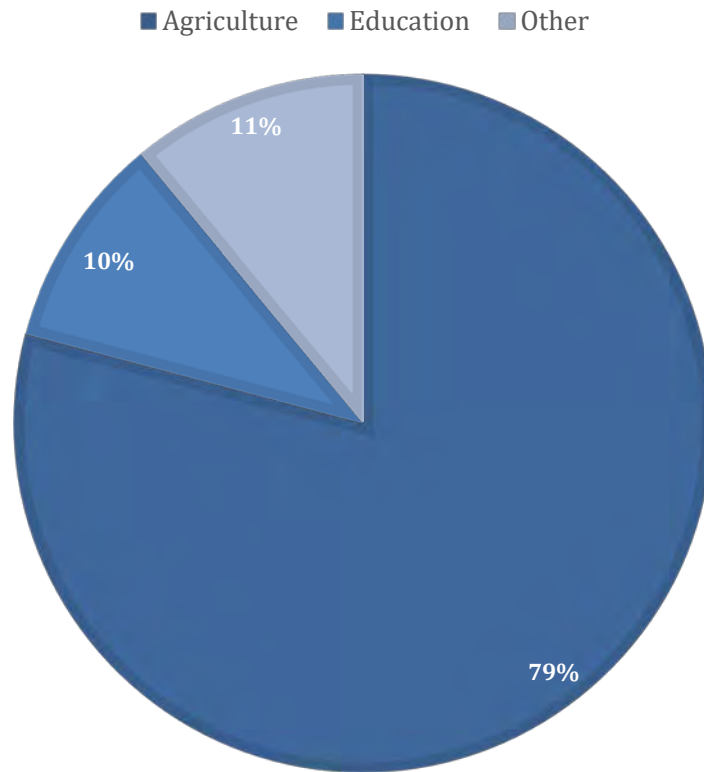


Figure 6. College Affiliation of Agriculture Teacher Preparation Faculty in 2014 ($N = 91$).

Figure 7 indicates the college affiliations for agriculture teacher preparation undergraduate degrees. The majority of undergraduate students ($n = 61$) receive degrees in colleges of agriculture, only 14 receive degrees in the college of education, and fewer than 1% ($n = 4$) are at institutions where a degree is only offered at the graduate level. Those not affiliated with the college of agriculture or the college of education ($n = 12$) at the respective institution provided an open response item, which included:

- College of Applied Arts
- College of Applied Science and Technology
- College of Arts and Sciences
- College of Business
- College of Business and Technology
- College of Natural Sciences and Mathematics
- College of Sciences
- College of Science and Engineering

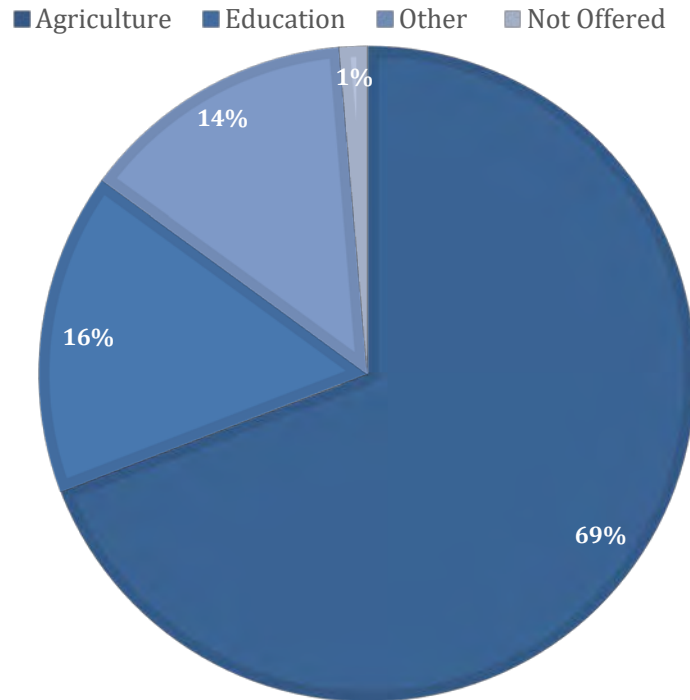


Figure 7. College Affiliation of Undergraduate Agriculture Teacher Preparation Programs in 2014 (N = 91).

Figure 8 indicates the college affiliations for agriculture teacher preparation graduate degrees. The majority of graduate programs are offered in colleges of agriculture ($n = 46$), followed by no graduate programs offered ($n = 26$), and 8% ($n = 12$) of graduate degrees are offered in the colleges of education. Those not affiliated with the college of agriculture or the college of education ($n = 7$) at the respective institution provided an open response item, which included:

- College of Applied Arts
- College of Applied Science and Technology
- Collaborative agreement with local institutions College of Education
- College of Business
- College of Graduate Education
- College of Science and Engineering

■ Agriculture ■ Education ■ Other ■ Not Offered

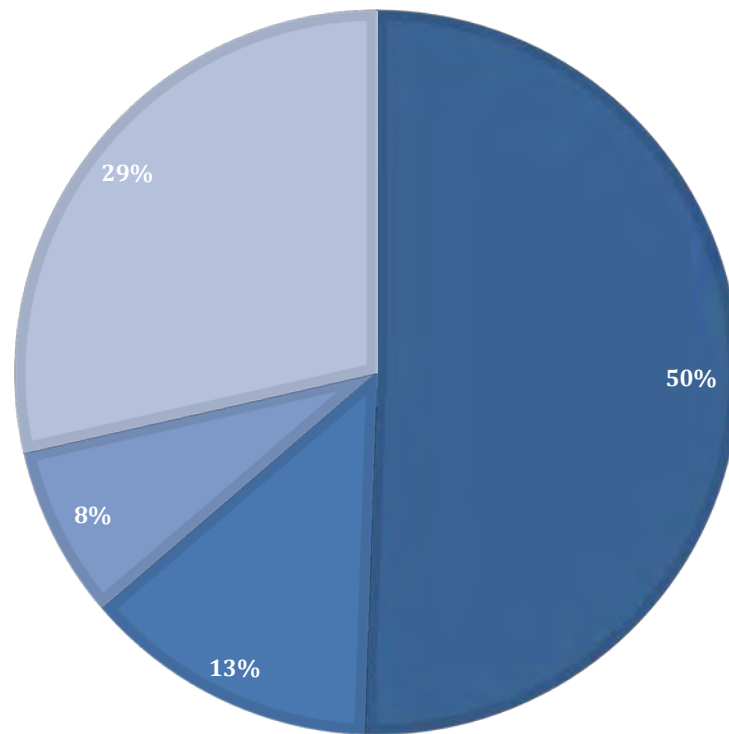


Figure 8. College Affiliation of Graduate Agriculture Teacher Preparation Programs (N = 91).

Table 5 presents the college affiliation of faculty, undergraduate program and graduate programs. For those institutions that selected “Other,” their open-ended responses are captured in Table 6.

Table 5

College Affiliation of Faculty, Undergraduate Degree, and Graduate Degree in 2014 (N=91)

Region	Faculty			Undergraduate Degrees				Graduate Degrees			
	Ag	Ed	Other	Ag	Ed	Other	Not Offered	Ag	Ed	Other	Not Offered
North Central	23	3	3	17	6	4	2	14	5	2	8
Southern	36	2	7	32	4	8	1	23	4	4	13
Western	13	4	0	12	4	0	1	9	2	1	5
Total	72	9	10	61	14	12	4	46	12	7	26

Table 6

Other College Affiliations of Faculty, Undergraduate Degree, Graduate Degree in 2014 (N = 91)

Faculty	Undergraduate Degree	Graduate Degree
<ul style="list-style-type: none"> • Arts and Sciences • Business • Collaborative Agreement • College of Applied Arts • College of Applied Sciences • College of Business and Technology • College of Natural Sciences • College of Sciences • College of Science and Engineering • Department of Agriculture 	<ul style="list-style-type: none"> • Arts and Science • Business • College of Applied Arts • College of Applied Sciences and Technology • College of Business • College of Natural Science and Mathematics • College of Sciences • College of Science and Engineering • Different University Campus • Either BA of Education or BS of Agriculture • Science and Engineering 	<ul style="list-style-type: none"> • Arts and Science • Business • College of Applied Arts • College of Applied Sciences and Technology • College of Business • College of Education • College of Graduate Education • College of Science and Engineering

The majority of agriculture teacher preparation programs are in the Southern Region of AAAE (45.5%) with only 16.8% of agriculture teacher preparation programs located in the Western Region of AAAE. Table 7 describes the total number of agriculture teacher preparation institutions identified in 2016 by region.

Table 7

Agriculture Teacher Preparation Programs in the U.S. as of 2016 (N=101)

Region	Number of reporting institutions	% of total
North Central	38	37.6
Southern	46	45.5
Western	17	16.8
Total	101	100

Note. Appendix B provides an institutional list per AAAE Region.

Description of academic opportunities in agricultural teacher education programs. Table 8 presents, by region, programmatic opportunities available for individuals interested in becoming licensed school-based agriculture teachers. Ninety percent ($n = 82$) of responding institutions offer a Bachelor of Science degree in agriculture teacher preparation with 2.1% offering a Bachelor of Arts, and 7.6% ($n = 7$) not offering a bachelor level degree in agriculture teacher preparation. The majority 48.3% of institutions offer a Master of Science in agriculture teacher preparation, 5.4% offer Master of Arts, and 14.3% offer Master of Agriculture degrees. Additional Masters programs were listed in open-ended responses and included Masters of Agricultural Leadership (2), Masters of Arts and Teaching and Masters in General Agriculture. Sixteen (17.5%) of responding institutions offer a Ph.D. in agriculture teacher preparation, with 5.5% offering Ed.D. and 1.1% offering Ed.S.

Table 8

Type of U.S. Post-Secondary Degrees Offered in Agriculture Teacher Preparation (N = 91)

Region	B.S.	B.A.	M.S.	M.A.	M.Ag.	M.Ed.	Other Masters	Ed.S.	Ed.D.	Ph.D.
North Central	25	2	13	3	0	6	1	0	0	7
Southern	42	0	24	1	5	6	3	1	5	8
Western	15	0	7	1	3	3	0	0	0	1
Total	82	2	44	5	8	15	4	1	5	16

Note. This data was not previously collected in historical Supply and Demand projects.

In reviewing undergraduate program offerings reported by the 91 agriculture teacher preparation programs in 2014, 65.6% ($n = 59$) require all agricultural education majors to complete teacher licensure requirements while 34.4% ($n = 31$) offer a nonteaching option. The project team provided an opportunity for institutions to describe their nonteaching/licensure degree options and/or specializations for agricultural education majors.

The following list describes the variety of nonteaching options.

- Leadership, Communications and Education
- Agricultural Technology Management (Emphasis Areas Include: Controlled Environment Agriculture, Crop Production and Management, Ornamental Landscape/Horticulture, Turf grass Management, Animal Industry)
- Agricultural Communications
- Agricultural Systems & Technology Management
- Communication
- Agricultural Literacy
- Curriculum & Instruction
- Agriculture Education, nonteaching option
- Ag Leadership Education (Nonteacher cert)
- General Agriculture
- Agricultural Leadership
- Agricultural Education-Relations option
- Outreach & Development Education
- Professional services
- Agronomy - with specialization in Education
- Extension
- Students receive an emphasis in one of the following: Animal and Veterinary Science, Agroecology, Rangeland Ecology and Watershed Management, Soil Science, Agricultural Communication/Leadership, or Agricultural Business.
- Agriculture and Environmental Technology
- Specializations - animal science, plant science, environmental sciences

Description of student teaching internships. A critical element of teacher preparation programs is the capstone student teaching internship. In 2014, data was collected to indicate when internships were conducted. The majority of student teaching internships occur in the spring semester only (52.7%). Thirty-five (38.5%) institutions offer student teaching in both spring and fall semesters. Fall only and quarter system internships are less frequently utilized in agriculture teacher preparation (see Tables 9 and 10).

Table 9
Student Teaching Internships by Semester (N = 91)

Region	Fall 2014		Spring 2014		Both 2014	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
North Central	1	1.0	18	19.7	10	1.1
Southern	1	1.0	24	26.4	20	21.9
Western	2	2.1	6	6.7	5	5.5
Total	4	4.4	48	52.7	35	38.5

Table 10
Student Teaching Internships by Quarter (N = 91)

Region	Fall 2014		Winter 2014		Spring 2014		All 2014	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
North Central	NA	-	NA	-	NA	-	NA	-
Southern	NA	-	NA	-	NA	-	NA	-
Western	0	0	2	2.2	1	1.1	2	2.2
Total	0	0	2	2.2	1	1.1	2	2.2

Table 11 describes the student teaching internship length, which varies from 10 weeks to 36 weeks, with a mean of 15 weeks total.

Table 11
Student Teaching Internship Length in Weeks (N = 91)

Region	Internship in weeks 2014			
	Mean	Min	Max	Mode
North Central	14.9	10	34	16
Southern	14.3	10	24	12
Western	17.2	10	36	14
Total	15.0	10	36	16

Description of license-eligible program completers. Table 12 reports the number of license-eligible programs completers from 2014-2016. A total of 101 institutions reported data with 92 institutions reporting at least one license-eligible program completer in the 3-year period. The total number of license-eligible program completers ranged from 0 to 128. The average 3-year total of license-eligible program completers certified per institution was approximately 22 with an annual average of 8 candidates per institution. During the 2014-2016 data collection cycle, an average of 72.2% license-eligible program completers accepted teaching positions in school-based agricultural education.

Table 12

Yield of Program Completers Accepting Positions in School-Based Agricultural Education

Year	License-eligible program completers	License-eligible program completers accepting positions	Percentage
2014	713	514.0	72.1
2015	724	512.5	70.2
2016	772	569.0	73.7
Total	2,209	1,595.5	72.2

Table 13 provides a list of the agriculture teacher preparation institutions who provided data about license-eligible program completers from 2014-2016. The project team divided the institutions are into the lower producing 1/3, middle producing 1/3 and upper producing 1/3 of institutions and listed them alphabetically by category. This information is provided to provide a snapshot of supply for stakeholders in agricultural education, it is not intended to be a “ranking” system.

Table 14 presents metrics of the supply of license-eligible program completers by states. It displays the number of license-eligible program completers reported from 2014-2016, the number of institutions in each state reporting and the number of full-time equivalent (FTE) faculty dedicated to agriculture teacher preparation. Additionally, Table 14 provides a ratio of license-eligible program completers reported in the 3-year period of time to FTE, license-eligible program completers to the number of current school-based agriculture teachers in each state and the number of license-eligible program completers to school-based agricultural education programs in the state.

Table 13

License-Eligible Program Completers Produced Institutional 2014-2016 Presented Alphabetically

Lower 33% producing institutions (0-9 candidates in 3 years)	Middle 33% producing institutions (10-28 candidates in 3 years)	Top 33% producing institutions (29-128 candidates in 3 years)
Alcorn State University	Angelo State University	Auburn University
Arkansas State University	Arkansas Tech University	California State Polytechnic
California State Polytechnic University - Pomona	Eastern Kentucky University	University - San Luis Obispo
College of Ozarks	Louisiana State University	California State University -
Cornell University	McNeese State University	Chico
Delaware State	Mississippi State University	California State University -
Delaware Valley	Missouri State University	Fresno
Dordt College	Montana State University	Clemson University
Eastern New Mexico University	Morehead State University	Colorado State University
Ferrum College	Murray State University	Iowa State University
Fitchburg State	North Dakota State University	Kansas State University
Fort Hayes State University	Northwest Missouri State University	New Mexico State University
Fort Valley State University	Northwestern Oklahoma State University	North Carolina A&T University
Illinois State University	Oregon State University	North Carolina State University
Louisiana Tech University	South Dakota State University	Oklahoma State University
Michigan State University	Southern Arkansas University	Pennsylvania State University
Middle Tennessee State	Stephen F. Austin State University	Purdue
Panhandle State University	Texas A&M - Kingsville	Sam Houston State University
Rutgers University	Texas State University	Tarleton State University
Southeastern Missouri State University	University of Arizona	Texas A&M University
Southern Illinois University -	University of California - Davis	Texas A&M University -
Carbondale	University of Connecticut	Commerce
Southwest Minnesota State University	University of Idaho	Texas Tech University
State University of New York, Oswego	University of Illinois - Urbana- Champaign	The Ohio State University
Sul Ross State University	University of Mount Olive	University of Arkansas
Tennessee State University	University of Nebraska Lincoln	University of Florida
Tennessee Technological University	University of Tennessee	University of Georgia - Athens & Tifton Campus
University of Alaska - Fairbanks	University of Wisconsin - Platteville	University of Kentucky
University of Arkansas-Pine Bluff	University of Wyoming	University of Minnesota- Twin Cities
University of Maryland - College Park	University of Delaware	University of Missouri
University of Maryland- Eastern Shore	Utah State University	University of Puerto Rico
University of Minnesota - Crookston	Virginia Tech	University of Wisconsin-River Falls
University of Nevada - Reno	Washington State University	West Texas A&M University
University of New Hampshire	Western Illinois University	West Virginia University
University of Tennessee- Martin		
Virginia State University		
Western Kentucky University		
Wilmington College		

Table 14

State Production Metrics Ranked by Number of Certified Agricultural Education Candidates from 2014-2016

State	Number of license-eligible program completers	Number of institutions reporting from 2014-2016	FTEs in Ag Ed teacher education reported in 2014	3-year license- eligible program completers to FTE Ratio	3-year license- eligible program completers to agriculture teachers in the state ratio	3-year license-eligible program completers to agriculture programs in the state ratio
Texas	485	11	26.5	18.3	0.2	0.5
Oklahoma	112	3	13	8.6	0.3	0.3
Missouri	107	5	4	26.8	0.2	0.3
North Carolina	107	3	13.3	7.8	0.3	0.3
California	105	5	15.5	6.8	0.3	0.3
Kentucky	79	5	4.5	17.6	0.3	0.5
Georgia	71	2	6.8	10.5	0.3	0.2
Arkansas	70	5	6.5	10.8	0.3	0.3
Iowa	58	2	4	14.5	0.2	0.3
Wisconsin	58	2	2	29.0	0.2	0.2
Illinois	50	4	11.0	4.6	0.1	0.2
Indiana	49	1	3.3	15.1	0.2	0.2
Pennsylvania	49	2	2.5	19.6	0.2	0.3
Tennessee	45	5	3.5	12.9	0.1	0.2
Kansas	43	2	3	14.3	0.2	0.2
Minnesota	42	3	1.8	24.0	0.8	0.2
Alabama	41	1	2	20.5	0.1	0.2
New Mexico	40	2	12	3.3	0.4	0.5
Florida	37	1	2.4	15.7	0.1	0.1
Ohio	37	2	5	7.4	0.1	0.1
Puerto Rico	37	1	2	18.5	-	-
West Virginia	33	1	4	8.3	0.1	0.4
South Carolina	32	1	6	5.3	0.3	0.3
Colorado	29	1	1.8	16.1	0.2	0.2
Louisiana	29	3	7	4.1	0.1	0.2
South Dakota	28	1	1	28.0	0.3	0.3
Utah	28	1	1.5	18.7	0.2	0.3
Oregon	25	1	3.5	7.1	0.2	0.3
Idaho	24	1	2.7	9.1	0.8	0.3
Nebraska	22	1	2.2	10.0	0.1	0.1
Virginia	22	3	5.5	4.0	0.1	0.1
Washington	21	1	1.5	14.0	0.1	0.1
North Dakota	18	1	1	18.0	0.2	0.2
Montana	17	1	2	8.5	0.2	0.2
Wyoming	17	1	1	17.0	0.3	0.3
New York	16	2	2	8.0	0.1	0.1
Mississippi	15	2	5.2	2.9	0.1	0.1
Arizona	13	1	5.5	2.4	0.1	0.1

continues

State	Number of license-eligible program completers	Number of institutions reporting from 2014-2016	FTEs in Ag Ed teacher education reported in 2014	3-year license- eligible program completers to FTE Ratio	3-year license- eligible program completers to agriculture teachers in the state ratio	3-year license-eligible program completers to agriculture programs in the state ratio
Connecticut	12	1	0.3	48.0	0.1	0.6
Delaware	11	2	1.5	7.3	0.2	0.3
Michigan	8	1	1.5	5.3	0.1	0.1
Nevada	5	1	-	-	0.1	0.2
Massachusetts	3	1	-	-	-	-
Maryland	1	2	0.8	1.3	0.0	0.0
Alaska	0	1	1.3	0.0	0.0	0.0
Hawaii	0	0	0	-	0.0	0.0
Maine	0	0	0	-	0.0	0.0
New Hampshire	0	1	-	-	0.0	0.0
New Jersey	0	1	0.3	0.0	0.0	0.0
Rhode Island	0	0	0	-	0.0	0.0
Vermont	0	0	0	-	0.0	0.0
Virgin Islands	0	0	0	-	-	-
Total	2151	101	203.7	10.6	0.2	0.3

Unique challenges facing agricultural teacher educators in 2014. During this 3-year collection of data, a more comprehensive instrument was utilized in 2014 with open-ended responses to allow agricultural teacher educators to report unique challenges their institution is facing and concerns they have for the profession. A comprehensive listing of all responses is provided in Appendix E, but eight thematic areas were identified. Table 15 presents each theme and an example quote which aligns to each.

Table 15

Unique Challenges of Agricultural Teacher Education as Reported in 2014

Identified Theme	Example Quote
Boards/Departments of Education/Educational Policy	<ul style="list-style-type: none"> • State Accreditation, Continuing Portfolio Assessments, Recently Added PRAXIS II Pedagogy and Content, State Legislature and Institution are considering additional changes from institution-based portfolio to EdTPA or other system. Many changes are occurring simultaneously. Increased GPA, ACT scores for admission • Preparation of provisionally endorsed teachers (e.g., formalized program to do so)
Administrative/Institutions Decisions & Factors	<ul style="list-style-type: none"> • University enrollment requirements are increasing, making it more difficult for admission at the undergraduate level for many students • Lack of scholarships
Teacher Education Program Specific Factors	<ul style="list-style-type: none"> • We still operate under a 4-week block before student teachers spend 12 weeks in the schools. • The 5th year requirement and student teaching can be a negative to some students.
External Partners	<ul style="list-style-type: none"> • <State> Team AgEd has recruitment and retention as one of its priorities for 2013-2016 • Ag industry - competitive salary
Lack of Human Resources/Faculty	<ul style="list-style-type: none"> • Reduced number of FTEs dedicated to teacher preparation
Candidates Challenges	<ul style="list-style-type: none"> • Potential teacher candidates are arriving with much less technical agricultural experience • Need more teacher candidates • Need a gender balance between males and female • Less young men attending college
Current School-Based Agricultural Education Program Challenges	<ul style="list-style-type: none"> • SBAE emphasis and core shifting from agriculture to leadership/human development emphasis (i.e. excess FFA influence on curricular decisions both within the classroom and SAE)
Broad Program Mission	<ul style="list-style-type: none"> • We prepare all vocational education (CTE) area teachers, including Agriculture, FACS (family consumer science), Business and all trade areas offered in NYS BOCES (trade type HS programs) including electrical trades, construction trades, culinary arts, cosmetology, and many more

Objective 3: Describe Characteristics of Licensed Program Completers.

Objective 3 allowed for the deeper exploration of the 2,165 candidates who were reported as successful completed the teacher licensure process for agricultural education from 2014-2016. The research team defined “program completers” as graduates of an agriculture teacher preparation program who fulfilled licensure requirements. While Table 12 on page 24 reports the actual number of reported program completers from 2014-2016, Figure 9 reports the annual number of graduates for each year from 2014-2016 by undergraduate bachelor's degree, post-baccalaureate degree, graduate degree, and licensure only program.

Undergraduate teacher preparation is the most common form of agriculture teacher preparation (see Figure 9), and includes 80.9% ($n = 1,731$) of all license-eligible program completers from 2014-2016; 19% ($n = 408$) are prepared post baccalaureate ($n = 159$), graduate ($n = 185$), and in licensure only ($n = 90$) programs for a total of 2,165 graduates.

Note, the total number of program completers from 2013-2014, as reported by teacher educators, is different from the reported actual number of license-eligible program completers. This discrepancy led to creation of a system of checks and balances in subsequent data collection cycles.

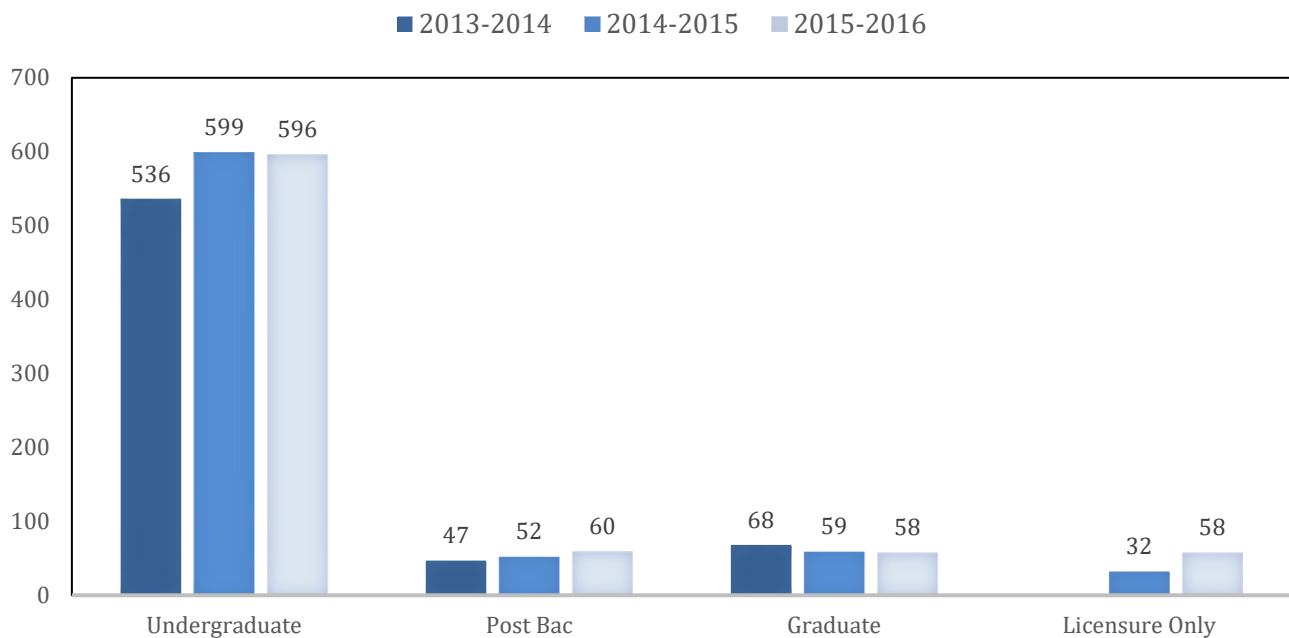


Figure 9. License-Eligible Program Completers by Degree/License Earned.

Employment plans of program completers. Figure 10 represents the intended employment plans for all license-eligible program completers from the 2014-2016 data collection period. A total of 2,226 students graduated, with a teaching license in agriculture in this time period. The majority of the graduates (71.6%; $n = 1,595.5$) sought employment teaching school-based agriculture compared to 25.4% who sought careers in other areas.

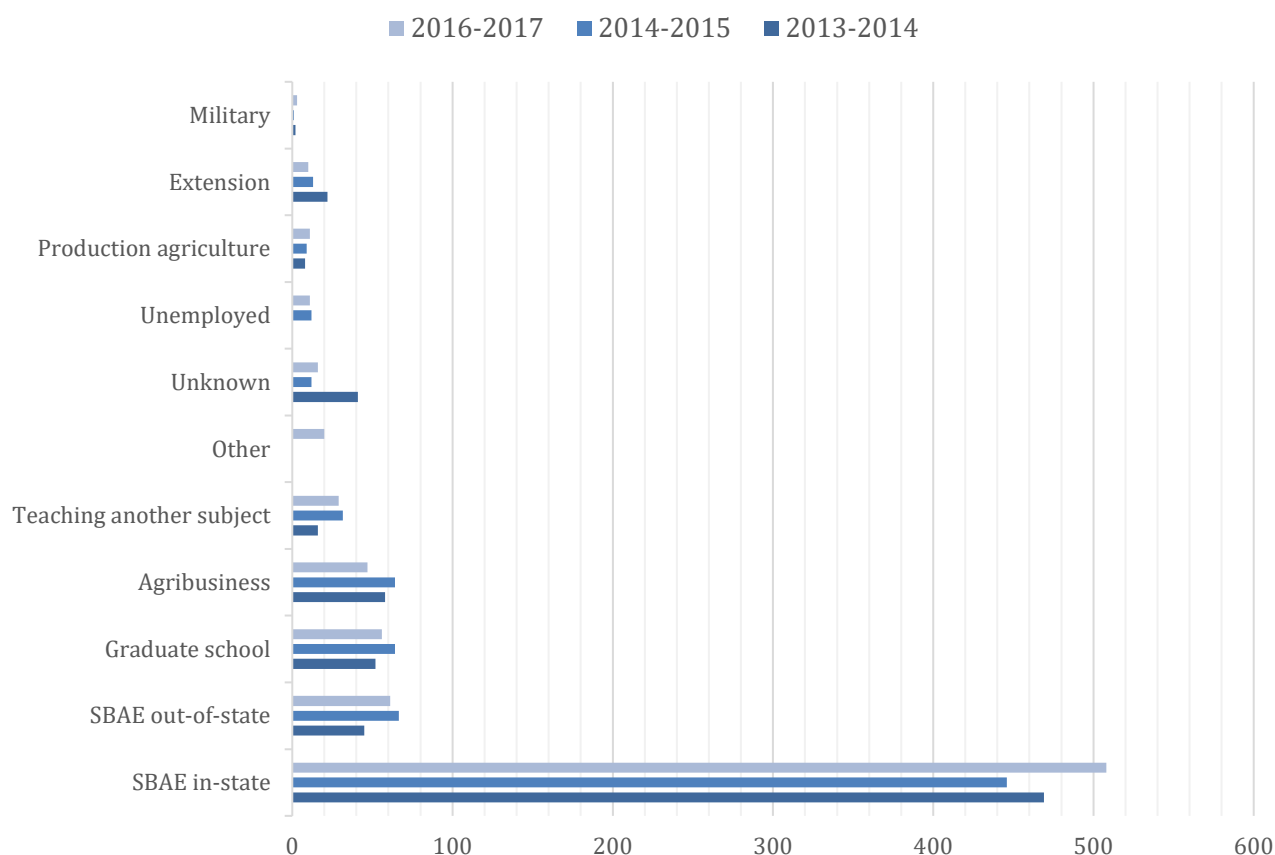


Figure 10. Employment Plans for License-Eligible Program Completers.

While the majority (71.6%; $f = 1595.5$) of graduates choose a career in school-based agricultural education, 25.4% ($f = 565.5$) pursue other career opportunities. Of graduates ($f = 1,717$) who choose careers in education, the majority (92.9%; $f = 1,595.5$) chose school-based agricultural education, 4.5% ($f = 76.5$) pursued teaching another subject, and 2.6% ($f = 45$) chose to enter extension (see Table 16).

Other graduates chose careers unrelated to agriculture or education, including internships, speaking, technology, insurance, U.S. Congress, or auto mechanic. Some are self-employed or employed in other careers in industry. Finally, a small number of graduates reported wanting to begin a family and stay at home.

Demographics of program completers. The study examined demographics of candidates completing licensure requirements from 2014-2016. The most typical candidate was a White female. In fact, 65.2% of the licensed-eligible program completers were female with 33.7% ($f = 751$) male, and 1.1% ($f = 26$) were unknown.

The majority of female license-eligible program completers from 2014-2016 were White (91.5%; $f = 1,320$). Table 16 details all other reported ethnicities of female license-eligible program completers: Hispanic (4.85%; $f = 70$), American Indian/Alaskan Native (1.3%; $f = 17$) and African American (.62%; $f = 9$). A breakdown of all ethnicities by year is shown in Table 17.

The majority ethnicity of male license-eligible program completers from 2014-2016 was white (88.8%; $f = 677$) white. Of male license-eligible program completers, the majority of the non-white population was Hispanic (55%; $f = 47$), African American (15%; $f = 13$) and 14% ($f = 12$) of all males reported were unknown. A breakdown of all ethnicities by year is shown in Table 18.

Table 16

Employment Plans of License-Eligible Program Completers

Employment Plan	2013-2014	2014-2015	2015-2016	Total
SBAE in-state	469	446	508	1432
SBAE out-of-state	45	66.5	61	172.5
Graduate school	52	64	56	172
Agribusiness	58	64	47	169
Teaching another subject	16	31.5	29	76.5
Other	-	-	20	20
Unknown	41	12	16	69
Unemployed	-	12	11	11
Production agriculture	8	9	11	28
Extension	22	13	10	45
Military	2	1	3	6
Total	713	719	772	2204

Note. Upon review of the instrument, additional categories were added

Table 17

Ethnicity of Female License-Eligible Program Completers

Ethnicity	2013-2014		2014-2015		2015-2016		Total	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
African American	4	.9	2	.4	3	.6	9	.6
American Indian/Alaskan Native	3	.7	11	2.3	5	1.0	19	1.3
Asian	2	.5	0	-	4	.8	6	.4
Bi-Racial/Multi-Racial	4	.9	3	.6	5	1.0	12	.8
Hispanic	22	5.0	24	4.9	24	4.7	70	4.9
Hawaiian/Pacific Islander	0	-	0	-	1	.19	1	.1
White	405	92.0	447	91.8	468	90.6	1,320	91.5
Other	0	-	0	-	1	.19	1	.1
Unknown	0	-	0	-	5	.97	5	.3
Total	440		487		516		1,443	

Table 18

Ethnicity of Male License-Eligible Program Completers

Ethnicity	2013-2014		2014-2015		2015-2016		Total	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
African American	7	2.9	3	1.2	3	1.2	13	1.7
American Indian/Alaskan Native	1	.0	4	1.5	0	-	5	.7
Asian	0	-	0	-	0	-	0	-
Bi-Racial/Multi-Racial	1	.0	1	.4	0	-	2	.3
Hispanic	16	6.3	14	5.4	17	6.6	47	6.1
Hawaiian/Pacific Islander	3	.01	1	.3	0	-	4	.5
White	223	88.9	231	90.5	223	87.1	677	88.8
Other	0	-	0	-	2	.8	2	.3
Unknown	0	-	1	.39	11	4.2	12	1.6
Total	251		255		256		762	

Comparison of SBAE teacher candidates to students enrolled in SBAE. The project team was curious about ethnicity and gender of license-eligible program completers compared to other populations reflected within agricultural education.

Table 19 and Table 20 highlight a comparison between the 2015-2016 license-eligible program completers and total FFA membership enrollment (B. Meyer, personal communication, August 25, 2016). While FFA membership does not represent the ethnicity of all students in school-based agricultural education nationally, it does provide a snapshot of the composition of current membership in comparison to those preparing to teach them.

Table 19

Comparison of Ethnicity of License-Eligible Program Completers and Students Enrolled in School-Based Agricultural Education

Ethnicity	Total program completers 2015-2016		FFA membership enrollment 2016 ^a	
	<i>f</i>	%	<i>f</i>	%
African American	6	0.8	18,663	0.05
American Indian/Alaskan Native	5	0.7	30,136	3.6
Asian	4	0.5	5,183	0.62
Bi-Racial/Multi-Racial	0	0.0	42,291	5.05
Hispanic	41	5.3	77,369	9.24
Hawaiian/Pacific Islander	1	0.0	2,277	0.27
White	691	90.0	390,570	46.70
Other	3	0.4	7,826	0.93
Unknown	16	2.0	262,436	31.30
Total	767		836,751	

^a FFA Enrollment is reported for comprehensive agricultural education programs and includes duplicated students are reported in grades 7-12 and/or 9-12

Table 20

Comparison of Gender of License-Eligible Program Completers and Students Enrolled in School-Based Agricultural Education 2016 data

Ethnicity	License-eligible program completers		FFA members	
	<i>n</i>	%	<i>n</i>	%
Female	1,454	65.17	357,901	40.80
Male	751	33.66	472,697	53.89
Unknown	26	1.17	46,587	5.31
Total	2,231		877,185	

Comparison of license-eligible program completers to teachers in public elementary and secondary schools. In the 2011–12 school year, 82% of public-school teachers were white, 7% were black, 8% were Hispanic (USDE, 2016). Similarly, the ethnic diversity of school-based agricultural education program license-eligible program completers, on average from 2013-2016; 90% of graduates were White, 1% African American, 5% Hispanic, and 3% other.

Comparison of license-eligible program completers to general education population. The elementary and secondary school teacher workforce in the United States is not as racially diverse as the population at large or the students (USDE, 2016). The public-school student population is projected to increase in diversity (USDE, 2016). The NCES predicts that white students will represent 46% of public-school students in 2024, and the proportion of Hispanic and Asian/Pacific Islander students are projected to represent 6% total enrollment in 2024. Further, Black students are projected to be 15% of all public-school students in 2024 (USDE, 2016). When comparing the ethnic diversity of license-eligible program completers from 2013-2016, on average 90% of graduates were White, 1% African American, 5% Hispanic, and 3% other.

Comparison of license-eligible program completers to general U.S. population. The U.S. Census Bureau (2017) reported the ethnicity of the population in the U.S. in 2015 as 77% White, 17% Hispanic/Latino, 13% African American, 5.6% Asian, 2.6% two or more races, 1% American Indian/Alaskan Native, and .2% Hawaiian/Pacific Islander. When comparing license-eligible program completers from 2013-2016, on average 90% are White, 5% Hispanic/Latino, 1% African American, 1% American Indian/Alaskan Native, >1% Asian, and >1% Hawaiian/Pacific Islanders.

Objective 4: Describe the Scope of School-Based Agriculture Programs in the United States

Reflective of the 1917 Smith-Hughes Vocational Education Act, the earliest tracking of school-based agricultural education program scope in the U.S. is 1918 (Federal Board of Vocational Education, 1921) with a total of 609 programs reported. Table 21 presents the total programs and total number of reported teachers from 2011 to 2016.

Table 21

Total Number of Programs and Teachers

Year	Total number programs reported	Total number teachers reported
2011	7,123	10,196
2012	7,413	10,466
2013	7,109	10,180
2014	7,424	10,874
2015	8,167	11,834
2016	7,775	11,557.5

Note. Discrepancies between years 2015 and 2016 are due to nonresponse/incorrect reporting.

Gender of school-based agriculture teachers. The gender of school-based agriculture teachers was added to the data collection for 2015 and 2016, based on input from stakeholders. Figure 11 indicates the average percentage of male and female teachers in those 2 years. In 2015 (male = 6,526; female = 4,881) and in 2016 (male = 6,512; female = 4,988.5) teachers were reported. Ethnicity was not collected on SBAE teachers (see Figure 11).

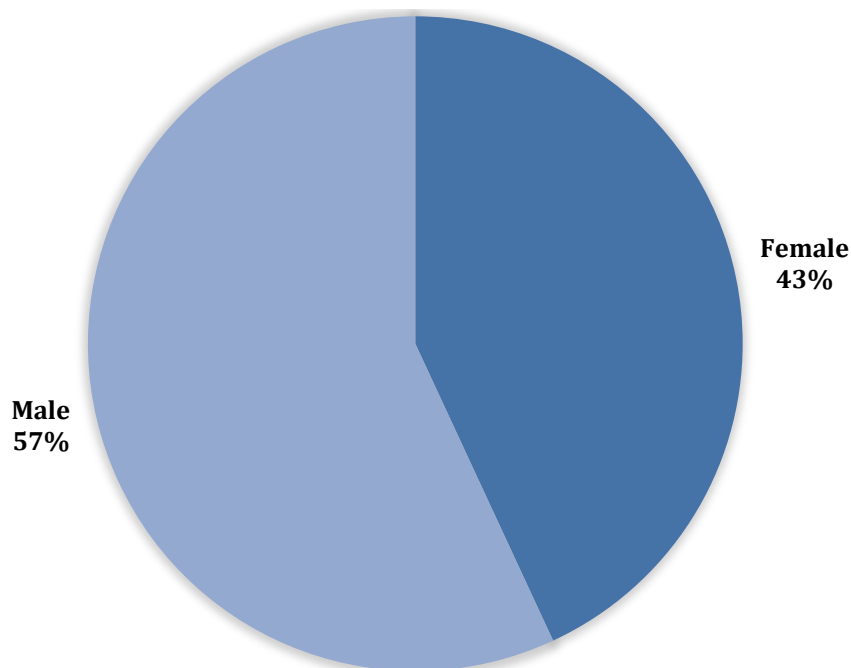


Figure 11. Gender of School-Based Agriculture Teachers.

Employment status of school-based agriculture teachers. The majority of school-based agriculture teachers are employed as full-time teachers, with approximately less than 5% employed as part-time (see Figure 12).

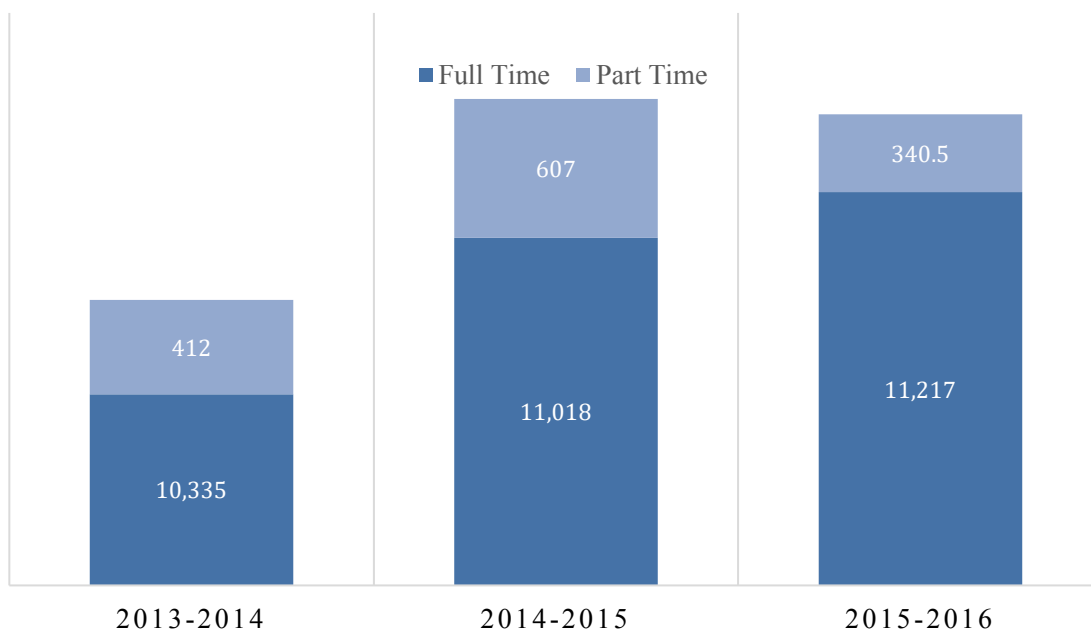


Figure 12. Full-Time and Part-Time Employment of School-Based Agriculture Teachers.

Table 22 reports the source of new hires. The majority of new hires in school-based agricultural education are in-state teachers, simply moving to a new school. The second highest source of new hires is new licensed undergraduates prepared in state. After input from stakeholders, it was concluded that

many states define non-licensed and/or alternative licensed in a variety of ways. In 2016, the option of alternative licensure was added to the instrument. Note the increase in non-licensed and alternatively licensed new hires ranging from 14.5% non-licensed in 2014 to 22.9% non-licensed and alternatively licensed teachers combined in 2016.

Table 22

Source of New Hires in School-Based Agricultural Education (SBAE)

Source of new teachers	2014		2015		2016	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Teaching SBAE in state; moved to new school	449	35.8	555	38.4	539	38.2
Newly licensed undergraduate; prepared in-state	378	30.1	447	30.9	405	28.6
Newly licensed undergraduate; prepared out-state	86	6.8	79	5.5	6	0.4
Newly licensed graduate; prepared in-state	121	9.6	88	6.1	86	6.1
Newly licensed graduate; prepared out-state	18	1.4	2	0.1	8	0.5
Nonlicensed	183	14.5	207	14.3	80	5.6
2016 alternative licensure/route	n/a	n/a	n/a	n/a	245	17.3
Unknown/other	19	1.5	64	4.4	43	3.0
Total	1,254		1,442		1,412	

New positions and programs in school-based agricultural education. Table 23 identifies the number of new school-based agriculture teaching positions and new programs added each year. Over 500 school-based agriculture-teaching positions and new agriculture programs have been created in the last 3 years.

Table 23

Number of new Positions and Programs in School-Based Agricultural Education

Year	Positions	Programs
2014	162.5	253
2015	197.5	142.5
2016	175	149
Total	535	544.5

Positions and programs lost in school-based agricultural education. On average, 72 positions and 62 programs were lost or reported as closed between 2014-2016. A variety of responses were given that indicate reasons for closing programs or positions. Those decisions are typically local decisions including changing Career and Technical Education focus, student interest, political pressures and community support. Overall 52.6% of positions or programs lost are due to the inability to find a Licensed teacher, 34.6% is due to a lack of student enrollment and 12.9% is due to lack of funding availability.

Vacant positions in school-based agricultural education. As of September 15, an average of 74.6 full-time positions and 6 part-time positions are vacant as reported in Table 24.

Table 24

Number of Vacant Full-Time and Part-Time Positions in School-Based Agricultural Education

Year	Vacant full time	Vacant part time
2014	86	10
2015	72	8
2016	66	0
Total	224	18
Average	74.6	6

School-based agriculture teachers leaving the classroom. On average, agricultural education lost approximately 787 teachers each year, resulting in a total of 2,361 teachers from 2014-2016. Table 25 shows the total number of teachers who left and where they went. The majority of teacher departure is due to retirement at nearly 30%; 15% leave SBAE to work in agribusiness or industry, and 10% are terminated or not offered a contract.

Table 25

Number of School-Based Agricultural Education Teachers Leaving the Classroom

Reason for leaving	2014	2015	2016	Total	%
Retirement	204	248	201	653	27.6
Agribusiness/industry	118	96	112	326	13.8
Terminated	64	89	81	234	9.9
Other	102	115	10	227	9.6
Administrator	53	65	41	159	6.7
Production agriculture/farming	49	54	51	154	6.5
Another educational area (outside of ag ed)	41	40	53	134	5.7
Stay at home	39	42	31	112	4.7
Moved out of state (continue to teach)	21	34	28	83	3.5
Graduate school/continuing education	15	23	18	56	2.4
Unknown	8	11	26	45	1.9
Extension/nonformal	-	31	15	46	1.9
Post-secondary	8	12	20	40	1.7
Health	9	12	10	31	1.3
Ag ed leader	-	11	17	28	1.2
FBM/Adult	5	10	2	17	0.7
Death	3	8	5	16	0.7
Total	739	901	721	2,361	

Demand metrics. The project team was interested in looking closer at demand versus supply; therefore, with the data provided, a “Demand Metric” (see Figure 13) was developed, which allowed for a Total Demand Score (see Figure 14) to be calculated and compared to candidate production resulting in a Shortfall Score (see Figure 15). For a Shortfall Score to be calculated, a state had to report both supply and demand numbers for 3 years. Table 26 presents states ranked from highest Shortfall Score (most acute shortage) to lowest Shortfall Score.

Figure 13. Demand Metric Formula.

$$\text{Demand Metric} = (\text{Ag Teachers Not Returning to Ag Ed} + \text{New Positions}) - \text{Positions Lost}$$

Figure 14. Total Demand Score Formula.

$$\text{Total Demand} = 2014 \text{ Demand Metric} + 2015 \text{ Demand Metric} + 2016 \text{ Demand Metric}$$

Figure 15. Shortfall Score Formula.

$$\text{Shortfall Score} = \text{Total Candidates Produced in State} - \text{Total Demand}$$

Table 26

State by Shortfall Score

AAAE region	State	Shortfall score (demand-production)	AAAE Region	State	Shortfall score (demand-production)
NC	Illinois	75	NC	Rhode Island	2
S	Alabama	60	S	Oklahoma	2
NC	Ohio	57	S	Texas	0
NC	Kansas	44	NC	Iowa	-1
S	North Carolina	39	W	Nevada	-2
NC	Indiana	35	NC	New York	-3
W	Arizona	33	NC	South Dakota	-3
S	Tennessee	25	S	Arkansas	-5
S	Louisiana	20	S	South Carolina	-6
NC	Maryland	19	S	Florida	-6
NC	Nebraska	18	NC	Missouri	-6
W	Colorado	17	NC	Connecticut	-7
NC	Michigan	14	S	Mississippi	-7
NC	Minnesota	12.6	W	Montana	-8
NC	Vermont	11	NC	West Virginia	-12
NC	North Dakota	11	W	Wyoming	-14
W	Utah	10	S	Kentucky	-15
S	Virginia	9.5	NC	Wisconsin	-17
NC	New Jersey	9	W	California	-27
W	Oregon	8	NC	Pennsylvania	-28
W	Idaho	6	W	New Mexico	-30
S	Georgia	4			
W	Hawaii	2			
NC	New Hampshire	2			

Capacity for teacher educator prediction of supply. Each year, from 2013-2016, teacher educators were asked to provide estimates on license-eligible program completers for the upcoming three years. Table 27 represents the number of predicted program completers, reported on a yearly basis. As seen in Table 27, there was a 10-16% decrease from the predicted number of completers to the actual number of program completers.

Table 27

Agricultural Teacher Educator Supply Prediction Vs. Actual

Year	2014	2015	2016	2017	2018	2019
2014	Actual 2014 717	Predict 2015 828	Predict 2016 859	Predict 2017 888		
2015		Actual 2015 741	Predict 2016 835	Predict 2017 943	Predict 2018 1,067	
2016			Actual 2016 772	Predict 2017 840	Predict 2018 1017	Predict 2019 1,090

Conclusions, Discussion and Implications

The purpose of the National Supply and Demand Study is to provide stakeholders in agricultural education with current, accurate estimates of the supply and demand for teachers of school-based agricultural education through the collaborative efforts of agriculture teacher educators, agricultural education organizations, and state agricultural education staff and other partners. To celebrate the achievements of agriculture teacher preparation as well as highlight opportunities for improvement, data-driven policy decisions may find the 2014-2016 data useful.

The following are conclusions, discussion, and implications related to the objectives that guided the study.

Objective 1: Describe Historical Trends of Agricultural Education in the United States.

The importance of a well-prepared teacher and the role that teacher training plays in success of school-based agricultural education is evidenced in the provisions of the Smith-Hughes Vocational Education Act of 1917, a significant piece of legislation impacting agricultural education. For example, states participating were mandated to use the minimum amount appropriated for the training of teachers in order to secure other benefits of the act (Swanson, 1942). Evidence of agricultural teacher education programs exists as early as 1907 (Bailey, 1980) with reports of candidate supply existing as of 1920 (Fed Board for Voc Ed, 1921; Jarvis, 1921).

For over a century, teacher preparation has been an integral part of university-based agricultural education programs. Through collaborative efforts of teachers, state supervisors, and university faculty, agriculture teacher preparation has served as the major source of school-based agriculture teachers in the U.S. Programs in agriculture teacher preparation in the U.S. are at historic highs. Yet, full-time employment and full-time tenure-track positions in agricultural teacher education have steadily decreased. The composition of faculty in agricultural education has steadily shifted from ranked, tenure-track positions to contingent faculty. There has been significant growth in the number of faculty at American colleges and universities over the last 20 years who are employed in part- or full-time nontenure track positions (Anderson, 2002; Baldwin & Chronister 2001; Conley, Lesley, & Zimbler,

2002; Ehrenberg, 2004; Ehrenberg & Zhang, 2004). The substitution or addition of contingent faculty for tenure-track faculty is often due to budget constraints, decreasing state support, retirements, and changing enrollment patterns (Green, 2007). Critics charge that universities exploit contingent faculty and graduate students, engaging in a type of bait and switch to attract applicants advertising institutional standing based on distinguished faculty who seldom teach undergraduates, and as a result provide undergraduates with an inadequate educational experience (Cross & Goldenberg, 2011).

The future of agriculture teacher preparation programs requires additional tenure-track faculty to support the training of future teachers. It is important to recognize that the preeminent concern of the general public and policymakers is the effectiveness of educators in leading their students to high and increasing levels of achievement (American Psychological Association [APA], 2014). While the increase in contingent hires in agriculture teacher preparation may have a positive influence on institutional budgets, program enrollment and research productivity of tenure-track faculty, it is recommended that institutions carefully consider the instance of non-tenure track faculty and graduate students teaching key agriculture teacher preparation and licensure courses. Departments must ensure quality instruction, meeting instructional standards of the institution as well as school-based agricultural education, meet state and federal licensure requirements, and continue to promote research in agricultural education to remain current with national trends in education.

Colleges of agriculture across the U.S. appear to be the primary academic home for faculty and programs related to agricultural education, although there are a number of agriculture teacher preparation programs and faculty housed in other colleges. Regional differences and unequal access to agricultural education teacher preparation programs exist in the U.S. The majority (52%) of all bachelor, master, and doctoral degrees are offered in the Southern Region; 31% in the North Central Region; and only 17% in the Western Region of AAEE. Further examination of the supply and demand of agricultural education should compare the opportunities available for degrees and the shortage of teachers in each region. Eighty-four institutions offer undergraduate programs in agricultural education, 76 masters-level programs are available, and 22 doctoral programs. With a decrease in tenure-track faculty positions and increase in contingent faculty within agricultural education, what is the demand for advanced degrees in agriculture teacher preparation? An exploration of graduate programs across the U.S. should occur to determine degree type and job placement of graduate degree seeking students.

From a 100-year perspective, there is a downward trend in license-eligible program completers in agricultural education. This trend is not uncommon across teacher education, regardless of subject area. Teacher education enrollments have dropped by 35% and graduates by 23% (Sutcher, Darling-Hammond, & Carver-Thomas, 2016). The shortages continue to impact education overall, with demand for teachers continuing to be on the rise. Sutcher et al. estimated approximately 60,000 shortages in teachers for the 2015-16 school year. Nevertheless, the 3-year summary of the National Supply and Demand Study for Agricultural Education (2014-2016) identified a slight increase in the number of students enrolled in agricultural education. The project team acknowledges that this increase could be due to multiple variables including the design, development, and restructure of the Supply and Demand instrument, the continued partnership with the National FFA Local Program Success staff and the NAAE, National Teach Ag Campaign allowing for more accurate data to be collected. Stakeholders in agricultural education need a continued, comprehensive, long-term solution to creating a strong and stable agriculture teacher workforce. Recommendations include continued support and utilization of the National Teach Ag Campaign and targeted recruitment efforts by inservice teachers and teacher educators.

Although the number of license-eligible program completers has had a downward trend over the last 30 years, the yield of license-eligible program completers accepting a school-based agricultural education teaching position has had an upward trend. Further research is needed to understand why this trend is occurring.

Objective 2: Describe Agriculture Teacher Education Programs in the United States.

As mentioned above, in the 21st century, there has been a noticeable change in the composition of FTEs in agriculture teacher education programs (see Table 4). We have seen a 15-20% decrease in the number of FTE and ranked, tenure-track faculty dedicated to preparing agriculture teachers. This shift away from ranked, tenure-track faculty in agricultural teacher education may create challenges in the profession. Ehrenberg and Zang (2004) provided evidence that the use of part- and full-time nontenure track faculty adversely affects undergraduates enrolled at 4-year universities by reducing their 5- and 6-year graduation rates. While expanding the use of nontenure track faculty may be beneficial in allowing tenure track faculty to focus on research, Ehrenberg and Zang found a small positive effect on the volume of external research and development expenditures for tenure track faculty with the addition of full-time nontenure track faculty and no effect with the addition of part-time nontenure track faculty. This further supports our recommendation that institutions carefully consider the impact of non-tenure track faculty and graduate students who teach undergraduate agriculture teacher preparation and licensure courses.

Of reporting institutions in 2014, a vast majority of agricultural education programs require completion of agriculture teacher licensure requirements (65%). Some institutions offer a nonteaching option to students (p. 26) which vary significantly from institution to institution. Licensure requirements include a student teaching internship, typically completed in the spring semester for 15 weeks. Further, license-eligible program completers in agricultural education are highly likely to accept a position in school-based agricultural education, with approximately 70% entering the classroom upon receiving licensure (see Table 12).

While the central mission of agricultural education programs is the preparation of educators in agriculture, applications extend beyond that (Barrick, 1993). Nearly one-third of graduates choose careers other than school-based agricultural education; this reiterates the versatility of the agricultural education degree program and curriculum. Licensure programs not only are valuable for preparing individuals for school-based teaching careers, but also for a variety of careers in the agriculture, food and fiber industry (Garton & Robinson, 2006). The results from this study acknowledges the adaptability of agricultural education graduates for careers in the traditional industry, education, and service careers areas.

Relatively few agriculture teacher preparation programs produced the vast majority of total license-eligible program completers from 2014-2016. With a small number of programs producing 2/3rds ($f = 1,452$) of the total supply of school-based agriculture teachers, this results in the uneven availability of license-eligible program completers available for employment across the nation.

Further, agriculture teacher educators face unique challenges and feel under duress due to internal and external challenges of admissions, teacher licensure requirements, and general administrative decisions. These challenges are far ranging and outlined in Appendix E.

Objective 3: Describe Characteristics of Licensed Program Completers.

The vast majority of agricultural teacher licensure program completers completed a program at the undergraduate level (80.9%). In 2014-2016, a total of 2,226 students graduated with a teaching license in agriculture and 73.8% accepted employment teaching school-based agricultural education. Only 26.2% entered careers outside the SBAE classroom. Many of the agricultural education graduates who did not choose the formal classroom were drawn to education as substitute teachers, community college instructors, university staff employees, trainers in industry, and seek additional education in other areas (not graduate school). Other employment obtained by agricultural education graduates includes an assortment of domestic and international service such as student ministry, Habitat for Humanity, mission work, and the Peace Corp.

Historically, the placement rate for newly qualified potential teachers increased substantially over the historic norm of just over 50% to 63.8% (Camp, 2000). Many non-placements result from new graduates who choose not to teach. The placement rate of those who are newly qualified and who wanted to teach was higher still (77.0%). Agricultural education remains a field in which the placement rate is relatively high for those who desire teaching jobs. Nevertheless, whether we look at the gross placement rate or the placement rate from the more selective group who were judged by their professors as “probably wanted to teach,” a substantial proportion of our newly qualified potential teachers (26.2%) fail to take teaching positions even though positions are going to under-qualified people or indeed remaining unfilled. While, agricultural education remains a field in which the placement rate is relatively high for those who desire teaching jobs, a de-facto shortage of qualified potential teachers willing to accept available teaching positions remains a problem for the profession.

Further, the majority of license-eligible program completers accepted a school-based agricultural education position in the state of their degree-granting institution. It is important to note that only 83 teachers moved across state lines in 2014-2016. Recommendations include additional research focused on teacher mobility, motivations to move, and established trends in teacher mobility.

Approximately 90% of program completers from 2013-2016 were White, 1% African American, 5% Hispanic, and 3% other. Agricultural education continues to see a small number of program completers who identify as African American and Hispanic and even fewer Native American, Asian or Pacific Islander descent. This is consistent with data reported by Camp (2000).

Approximately 69% of all school-based agricultural education teachers are disproportionately white, non-Hispanic with almost 47% being white male and 21% being white female. Additionally, these numbers may be much higher with 2,349 or 28% of the teachers reported as an unknown or other race/ethnicity. Much of this inaccuracy is due to a lack of tracking gender and ethnicity based on program area, or at all, in some cases. If teachers included as unknown ethnicity are included, 31% of the agricultural teaching community at the middle and high school levels is non-Caucasians. If teachers identified as unknown or other are removed, there is only 4% that is non-Caucasian. This is problematic.

Racial and gender percentages of school-based agriculture teachers vary somewhat by state and region. In some cases, general population patterns may partially explain the racial/ethnic differences among school-based agriculture teachers. One might speculate that higher percentages of female teachers in the Eastern and Western regions reflect less conservative attitudes toward gender stereotyping than may be prevalent in Southern and Central regions.

Kantrovich (2010) stated the tide seemed to be slowly turning with regard to gender equity given that approximately 53% of newly qualified teachers from 2006-2009 were female. Yet, we are still far behind the actual profession (54% male, 22% female, 23% unknown). However, the tides have turned within agriculture teacher preparation programs. Currently, 65.2% of graduates are female and 33.7% are male (1.1% unknown). This may lead to gender inequality with males in the profession. While we have seen the success of focused recruitment of females in agricultural education since Camp (2000) and Kantrovich (2010), we now need to pursue focused efforts to recruit young men to the profession and, quite possibly, to post-secondary education as well. Diversity should be reflected by teachers of school-based agricultural education, as teachers should be reflective of their student population and our school population should be reflective of the world in general.

The agricultural education community still lacks diversity to a proportion that would not be tolerated by many state and federal agencies. Approximately 88% of all agricultural education teachers are white with almost 64% being white male. Only 12% of the agricultural teaching community at the middle and high school levels is non-Caucasians. Caucasians also represent the majority of those becoming licensed; we are seeing close to a 50/50 split between white males and white females. We must do a better job of attracting and retaining minority faculty to assist in the recruitment and retention of minority students and agricultural teachers in the field. Ethnic minorities are so badly under-represented in agricultural education that major efforts should be made to recruit and prepare minority teachers for the profession.

Objective 4: Describe the Scope of School-Based Agriculture Programs in the United States

In the past 50 years, the number of school-based agriculture teachers and programs in the U.S. has changed minimally, with only 7% growth in programs. Over the course of this study (2014-2016) there were a small number of programs (2%) unable to fill a vacant teaching position. The vast majority of positions in school-based agricultural education continue to be full-time positions with limited part-time opportunities. The primary sources of new hires in school-based agricultural education are current SBAE teachers (35.8%) and newly licensed agriculture teachers (30.1%) prepared in an in-state agriculture teacher preparation.

Of the 2,204 license-eligible program completers, 599.5 (27.2%) did not accept a position teaching school-based agricultural education immediately after completing licensure requirements. Unfortunately, this is not a new trend. C.H. Lane of the Federal Board for Vocational Education stated, “experience has shown that many students who work in teacher-training classes do not become teachers” (Jarvis, 1921, as cited in Camp, 2000, p. 4). A shortage of school-based agricultural education teachers has been documented as early as 1921 (Camp, 2000). In 1979, Parmley, Bowen, and Warmbrod concluded that teacher shortage problems reported in previous national supply and demand studies of agricultural education did not result from a shortfall of graduates, but rather from the low percentage of graduates choosing to teach.

Annually, on average, 6.8% or 787 of school-based agriculture teachers leave the profession. With a large proportion of school-based agriculture teachers nearing retirement age, this is likely to continue and will likely increase. With this annual average ($f = 787$) graduating each year and approximately 72% of those enter teaching, we will continue to see a shortage by only filling approximately 530 positions each year. The most commonly reported reason for closing a school-based agriculture programs or losing positions was inability to find a licensed agriculture teacher. Over the 2014-2016 data collection period, 72 positions were lost and 62 programs were closed. While these numbers represent a miniscule

number of total agricultural education programs and positions as reported by National FFA (8,568 programs and more than 11,000 school-based agriculture teachers), the loss continues to be a concern.

Additional data suggest there is a growing number of non-licensed and/or alternatively-certified school-based agriculture teachers, increasing to 23% over the last 3 years. In California, New Jersey, and Texas, it is estimated that 20% of teachers hired in the last three decades have entered the profession through alternate certification programs such as Teach for America and Alternative Certification for Teaching (Zhang & Zeller, 2016). These programs allow individuals with a bachelor's degree to begin teaching and obtain certification by taking concurrent teacher preparation coursework or passing a certification examination (Felton, 2016). Other states are recruiting teachers before they are prepared, offering the opportunity to apprentice alongside an expert teacher in a high-need classroom, providing living stipends and tuition support in exchange for a commitment to teach once training is complete (Guha, Hyler, & Darling-Hammond, 2016). Such circumstances present even greater challenges for institutions involved in agriculture teacher preparation. While providing support and mentorship to new teachers in the form of teacher induction programs has been common practice in agricultural education, the influx of non-licensed and/or alternatively-certified school-based agriculture teachers likely demands additional programming. A focused effort by state agricultural education staff, teacher associations, and teacher educators should be made to develop programs designed to increase the likelihood of non-licensed and/or alternatively-certified school-based agriculture teachers remaining in the profession. Reported data from 2014-2016 indicates 26 states are experiencing a "short-fall" in regard to needed license-eligible program completers for school-based agricultural education positions (see Table 28).

Agriculture teacher educators may be overly optimistic about predicting candidate completion of licensure programs. While there seems to be an increase in undergraduates within agriculture teacher preparation, their commitment and ability to meet state and institutional requirements for entrance into teacher preparation programs remains to be seen.

Recommendations for Future Research and Practice

The American Association for Agricultural Education National Research Agenda (Roberts, Harder, & Brashears, 2016) identifies several research priority areas directly related to the preparation of school-based agriculture teachers. Research Priority 3: Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century (Stripling & Ricketts, 2016) addresses the complex economic, social, and environmental challenges related to agriculture that is dependent upon our ability to prepare a sufficient scientific and professional workforce that understands the multidisciplinary nature of agriculture and is diverse, globally competent, and possesses 21st century skills. This includes the preparation of school-based agriculture teachers. Research Priority 4: Meaningful, Engaged Learning in All Environments (Edgar, Retallick, & Jones, 2016) encourages the development of present-day best practices and research-based pedagogies and technologies that not only meet the goal of agricultural education but also address society's greatest challenges.

Two challenges facing agricultural education today include the need for a critical mass of agriculturalists interested in food and agriculture and to the need to educate those who do not understand food and agriculture systems (Mercier, 2015). Additionally, school-based agricultural education must continue to be mindful of employer demands for those entering careers in food and agriculture. Employers are demanding that employees demonstrate 21st century skills (American Association of Colleges of Teacher Education [AACTE], 2010), including global competency; "the modern workplace requires workers to have broad cognitive and affective skills" (AACTE, 2010).

Recommendations for future research include, but are not limited to, the following: impacts of long-term recruitment and retention efforts for agriculture teacher preparation programs and inservice teacher programs, the impact of nontenure track faculty and graduate student teaching in quality school-based agriculture teacher preparation, agriculture teacher preparation, effective strategies to recruit underrepresented populations, and teacher mobility.

Recommendations for practice include continued support and utilization of the National Teach Ag Campaign and targeted recruitment efforts by teachers, state staff, and teacher educators, and departmental safeguards to ensure quality agriculture teacher preparation programs.

Using annual data, trends over time may be observed from this research. Acknowledging recognized trends could lead to projections that would enable the profession to proactively address upcoming challenges, rather than reactive to issues once they arise. Other potential, value-added outcomes of this study include identifying nationwide employment opportunities for agricultural education program graduates, determining barriers of teacher mobility in school-based agricultural education, and seeking input from various stakeholders regarding characteristics desired of potential teacher candidate.

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Appendices

Appendix A

Historical Timeline of AAAE National Supply and Demand Study

Date	Description
2014-Present	A RFP was distributed to the AAAE membership to collect data for a 6-year period of time from 2014-2020. Dr's. Daniel Foster of Pennsylvania State University, Amy Smith of University of Minnesota and Rebecca Lawver of Utah State University were selected by the AAAE Member Services Committee and AAAE Board of Directors with the directive of preparing six annual reports and two 3-year reports. Upon completion of the reports Dr's. Foster, Smith, and Lawver would receive \$1,000 for their work. Stakeholder groups in agricultural education were contacted to assist in adequate data collection. Those include, but are not limited to NAAE, AAAE, NASAE, and the National Teach Ag Campaign.
2009-2013	No National Supply and Demand Study conducted by AAAE
2004-2009	Project leader was Adam J. Kantrovich, Michigan State University Extension
2004	Delegation of the American Association of Agricultural Education voted to move their annual meeting to no longer be held in conjunction with the Association of Career and Technical Education. In May 2014, Adam J. Kantrovich of Morehead State University is selected to lead the project with the assistance of Dr. Tom Broyles of Virginia Polytechnic Institute and State University.
1995	Last annual study conducted
1994	American Vocational Association, Agricultural Education Division, votes at annual convention to change to a 3-year cycle study.
1992-2001	Project leader was William G. Camp, Virginia Polytechnic Institute and State University
1990-1991	Project leader was J. Oliver of Virginia Polytechnic Institute and State University
1985-1989	Project leader was William G. Camp, Virginia Polytechnic Institute and State University
1974-1984	Project leader was David Craig, University of Tennessee
1965-1973	Project leader was Ralph Woodlin, Ohio State University and University of Tennessee, Knoxville

Note. Publications can be found at <http://aaaeonline.org/Teacher-Supply-and-Demand>

Appendix B

American Association for Agricultural Education (AAAE) Regional Breakdown

Regional information in this report was primarily organized by the regional breakdown of the American Association of Agricultural Education (AAAE) as identified by that organization constitution (AAAA, n.d.). Institutions listed were institutions that comprised the most recent, most accurate frame of the national supply data collection in 2016 ($N = 101$).

State	Teacher education institutions
North Central Region ($n = 24$)	($n = 38$)
Connecticut	University of Connecticut
Delaware	University of Delaware Delaware State University
Illinois	Western Illinois University University of Illinois – Urbana-Champaign Southern Illinois University – Carbondale Illinois State University
Indiana	Purdue University
Iowa	Dordt College Iowa State University
Kansas	Kansas State University Fort Hays State University
Maine	No agricultural teacher education institution identified
Maryland	University of Maryland, College Park University of Maryland, Eastern Shore
Massachusetts	University of Massachusetts
Michigan	Michigan State University
Minnesota	University of Minnesota, Twin Cities University of Minnesota, Crookston Southwest Minnesota State University
Missouri	University of Missouri Northwest Missouri State University Missouri State University Southeastern Missouri State University College of the Ozarks
Nebraska	University of Nebraska-Lincoln
New Hampshire	University of New Hampshire
New Jersey	Rutgers University
New York	Cornell University State University of New York, Oswego
North Dakota	North Dakota State University
Ohio	Wilmington College Ohio State University

continues

State	Teacher education institutions
Pennsylvania	Pennsylvania State University Delaware Valley University
Rhode Island	No agricultural teacher education institution identified
South Dakota	South Dakota State University
Vermont	No agricultural teacher education institution identified
West Virginia	West Virginia University
Wisconsin	University of Wisconsin - River Falls University of Wisconsin - Platteville
Southern Region (<i>n</i> = 15)	(<i>n</i> = 46)
Alabama	Auburn University
Arkansas	University of Arkansas at Pine Bluff University of Arkansas Arkansas State University Arkansas Tech University Southern Arkansas University
Florida	University of Florida
Georgia	Fort Valley State University University of Georgia
Kentucky	Murray State University University of Kentucky Western Kentucky University Eastern Kentucky University Morehead State University
Louisiana	Louisiana State University Louisiana Tech University McNeese State University
Mississippi	Alcorn State University Mississippi State University
North Carolina	North Carolina A&T State University North Carolina State University University of Mount Olive
Oklahoma	Northwestern Oklahoma State University Panhandle State University Oklahoma State University
Puerto Rico	University of Puerto Rico
South Carolina	Clemson University
Tennessee	University of Tennessee Martin Tennessee Technological University Middle Tennessee State University Tennessee State University University of Tennessee

continues

State	Teacher education institutions
Texas	Texas Tech University Angelo State University Sul Ross State University Tarleton State University Texas A&M University Texas State University Sam Houston State University Stephen F. Austin State University Texas A&M University - Kingsville West Texas A&M University Texas A&M University - Commerce
Virginia	Virginia State University Ferrum College Virginia Tech
Virgin Islands	No agricultural teacher education institution identified
Western Region ($n = 14$)	($n = 17$)
Alaska	University of Alaska
Arizona	University of Arizona
California	California State University, Chico California State Polytechnic University, San Luis Obispo University of California, Davis California State Polytechnic University, Pomona California State University, Fresno
Colorado	Colorado State University
Guam	No agricultural teacher education institution identified
Hawaii	No agricultural teacher education institution identified
Idaho	University of Idaho
Montana	Montana State University
Nevada	University of Nevada
New Mexico	New Mexico State University Eastern New Mexico University
Oregon	Oregon State University
Utah	Utah State University
Washington	Washington State University
Wyoming	University of Wyoming

Appendix C
2016 National Supply Instrument

Supply & Demand of Secondary Agricultural Education Teachers in the United States



SUPPLY: FALL 2016

Thank you for agreeing to participate in the National Ag Ed Supply and Demand Project. Your responses are very important to us. The information you provide will be helpful in assessing, and addressing, the current shortage of agriculture teachers we face across the nation. Information will be shared among agricultural education family organizations, including AAAE, NAAE, NASAE, and the National FFA Organization. National Teach Ag Campaign staff will collaborate with our team in producing and disseminating national, regional, and state profiles based upon the data gathered.

Your participation in this research is entirely voluntary. You may refuse to participate or withdraw at any time without consequence. Should you choose to withdraw, you may email the research team at nsd@aaaeonline.org.

Research records will be kept confidential, consistent with federal and state regulations. The Institutional Review Board for the protection of human participants at Pennsylvania State University has approved this research study, IRB#45604. If you have any questions or concerns about your rights or a research-related injury and would like to contact someone other than the research team, you may contact the IRB Administrator at 814-865-1775 or email tkahler@psu.edu to obtain information or to offer input.

This instrument is designed to collect information regarding students pursuing **teacher licensure** in Agricultural Education at your institution. For the first five items, please consider **only** the 2015-2016 program completers (*those who fulfilled licensure requirements between August 2015 and August 2016*).

How many total **program completers** (those who have fulfilled licensure requirements) in Agricultural Education were produced by your program in the 2015-2016 academic year?

As of September 15, 2016, please indicate **confirmed and/or intended employment plans** for 2015-2016 program completers.

Note: The total must equal the number of licensed, program completed reported in the preceding question.

Teaching school-based agriculture in this state	<input type="text" value="0"/>
Teaching school-based agriculture out of state	<input type="text" value="0"/>
Teaching another subject	<input type="text" value="0"/>
Agribusiness/Industry/Agency	<input type="text" value="0"/>
Extension/Non-formal agricultural education	<input type="text" value="0"/>
Production agriculture/Farming	<input type="text" value="0"/>
Graduate school	<input type="text" value="0"/>
Military	<input type="text" value="0"/>
Other employment	<input type="text" value="0"/>
Unemployed and/or Undecided	<input type="text" value="0"/>
Unknown	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

If "Other employment" was selected in the preceding question, please elaborate in the space below. Also address any other items needing clarification.

The following two questions request information about the licensure and/or degrees received by program completers. The total of the two fields (female and male) must equal _____.

Indicate the **licensure/degree** received by **FEMALE** program completers in 2015-2016.

Licensure only, non-degree/no degree awarded	<input type="text" value="0"/>
Undergraduate/Baccalaureate	<input type="text" value="0"/>
Post-baccalaureate (5th year program, no additional degree)	<input type="text" value="0"/>
Graduate	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

Indicate the **licensure/degree** received by **MALE** program completers in 2015-2016.

Licensure only, non-degree/no degree awarded	<input type="text" value="0"/>
Undergraduate/Baccalaureate	<input type="text" value="0"/>
Post-baccalaureate (5th year program, no additional degree)	<input type="text" value="0"/>
Graduate	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

The following two questions request information about the race of program completers. Please note that the number of program completers by gender reported here (according to race) much match the number reported above (according to licensure/degree).

Please report the **race** of **FEMALE** program completers in 2015-2016. Based upon your previous response, this total must equal _____.

African American/Black, Non-Hispanic	<input type="text" value="0"/>
American Indian/Alaska Native	<input type="text" value="0"/>
Asian	<input type="text" value="0"/>
Bi-racial/Multi-racial	<input type="text" value="0"/>
Hispanic/Latino	<input type="text" value="0"/>
Native Hawaiian/Other Pacific Islander	<input type="text" value="0"/>
White, Non-Hispanic	<input type="text" value="0"/>
Other	<input type="text" value="0"/>
Unknown	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

Please report the **race** of **MALE** program completers in 2015-2016. Based upon your previous response, this total must equal _____.

African American/Black, Non-Hispanic	<input type="text" value="0"/>
American Indian/Alaska Native	<input type="text" value="0"/>
Asian	<input type="text" value="0"/>
Bi-racial/Multi-racial	<input type="text" value="0"/>
Hispanic/Latino	<input type="text" value="0"/>
Native Hawaiian/Other Pacific Islander	<input type="text" value="0"/>
White, Non-Hispanic	<input type="text" value="0"/>
Other	<input type="text" value="0"/>
Unknown	<input type="text" value="0"/>
Total	58 <input type="text" value="0"/>

Looking to the future, how many **license-eligible, program completers** in Agricultural Education do you anticipate will be produced by your institution in...

2016-2017

2017-2018

2018-2019

What **unique circumstances, challenges, or considerations** (*if any*) should be shared regarding your institution's efforts to prepare school-based Agricultural Education teachers?

What **advice, suggestions, tips, or thoughts** would you like to share with National Supply and Demand research team so that we may better help you, your institution, and/or the Ag Ed profession?

When **2016-2017 annual supply data** is collected one year from now, will you be the appropriate contact? If NO, please indicate who should be contacted for this valuable information.

☐ Yes

☐ No (Please provide NAME, TITLE & EMAIL)

Respectfully submitted by:

Name

Title

Institution

State

Email

Phone



Appendix D
2016 National Demand Instrument

Supply & Demand of Secondary Agricultural Education Teachers in the United States



DEMAND: Fall 2016

Thank you for agreeing to participate in the National Ag Ed Supply and Demand Project. Your responses are very important to us. The information you provide will be helpful in assessing, and addressing, the current shortage of agriculture teachers we face across the nation. Information will be shared among agricultural education family organizations, including AAAE, NAAE, NASAE, and the National FFA Organization. National Teach Ag Campaign staff will collaborate with our team in producing and disseminating national, regional, and state profiles based upon the data gathered.

This instrument is designed to collect information regarding changes within your state's agricultural education profession since the last academic year. Please consider only **CURRENT** circumstances in your state. Use September 15, 2016 as the baseline date for responses.

Your participation in this research is entirely voluntary. You may refuse to participate or withdraw at any time without consequence. Should you choose to withdraw, you may email the research team at nsd@aaaeonline.org.

Research records will be kept confidential, consistent with federal and state regulations. The Institutional Review Board for the protection of human participants at Pennsylvania State University has approved this research study, IRB#45604. If you have any questions or concerns about your rights or a research-related injury and would like to contact someone other than the research team, you may contact the IRB Administrator at 814-865-1775 or email tkahler@psu.edu to obtain information or to offer input.

Between the 2015-2016 and 2016-2017 academic years, were any school-based agricultural education positions lost and/or programs closed in your state?

- ☐ No
☐ Yes

Please report the total **number of programs closed** in your state between the 2015-2016 and 2016-2017 academic years.

Please report the **number of positions lost** in your state between the 2015-2016 and 2016-2017 academic years.

For each of the _____ positions lost (reported above), please indicate the reason, if known.

Note: Total must match the number reported above.

Licensed teacher not available	<input type="text" value="0"/>
Lack of enrollment	<input type="text" value="0"/>
Lack of funding	<input type="text" value="0"/>
Other (please explain) <input type="text"/>	<input type="text" value="0"/>
Unknown	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

Between the 2015-2016 and 2016-2017 school years, how many agricultural education teachers **left school-based Agricultural Education** and will not be returning to teach this year?

For each of the _____ teachers who left SBAE, please indicate the reason, if known.

Note: Total must match the number reported above.

Employment in agribusiness/industry/agency	<input type="text" value="0"/>
Employment in production agriculture/farming	<input type="text" value="0"/>
Employment in another educational content area (outside of Ag Ed)	<input type="text" value="0"/>
Employment as school administrator (Principal, Superintendent, CTE Director, etc.)	<input type="text" value="0"/>
Employment in extension/non-formal agricultural education	<input type="text" value="0"/>
Employment in adult education/Farm Business Management	<input type="text" value="0"/>
Employment as Ag Ed leader (District, State supervisor, FFA staff, etc.)	<input type="text" value="0"/>
Employment in postsecondary education	<input type="text" value="0"/>
Continuing education/graduate school	<input type="text" value="0"/>
Moved out of state (will continue teaching Ag Ed)	<input type="text" value="0"/>
Personal reasons: Health	<input type="text" value="0"/>
Personal reasons: Stay at home parent/caregiver	<input type="text" value="0"/>
Personal reasons: Retirement	<input type="text" value="0"/>
Personal reasons: Death	<input type="text" value="0"/>
Not offered a contract/terminated	<input type="text" value="0"/>
Unknown	<input type="text" value="0"/>
Other (please explain) <input type="text"/>	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

For the next items, please consider only **CURRENT circumstances** in your state. Use September 15, 2016 as the baseline for responses.

Please indicate the number of active **PROGRAMS** and **TEACHERS** in your state for the 2016-2017 academic year.

School-based Agricultural Education PROGRAMS	<input type="text" value="0"/>
School-based Agricultural Education TEACHERS	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

Please indicate the number of **FULL TIME** and **PART TIME TEACHERS** in your state for the 2016-2017 academic year.

Note: Total number combined should equal the number of teachers reported in the preceding question.

FULL TIME school-based Agricultural Education teachers employed	<input type="text" value="0"/>
PART TIME school-based Agricultural Education teachers employed	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

Please indicate the number of teachers in your state by **GENDER**.

Note: Total number combined should equal the number of teachers reported in the preceding question(s).

Female	<input type="text" value="0"/>
Male	<input type="text" value="0"/>
Unknown	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

We would like to know the sources of **new SBAE hires** in your state.

Considering the total number of agricultural education **teachers who accepted new positions** in your state this year, identify their **professional background or preparation** immediately prior to this position.

Note:

A "program completer" is a candidate who has fulfilled program area teacher licensure requirements. This may be considered a program graduate in some cases.

An "alternative licensure/route completer" has met all licensure requirements to teach SBAE, but did not complete a agricultural education teacher education program.

A "non-licensed individual" is someone who has not completed all requirements for teacher licensure. This may include individuals who are pursuing an alternative route to licensure, were hired as a community expert, etc.

Previously licensed Ag Ed teacher; moved to a different school-based Ag Ed program	<input type="text" value="0"/>
Newly licensed Ag Ed undergraduate program completer (prepared in-state)	<input type="text" value="0"/>
Newly licensed Ag Ed undergraduate program completer (prepared out-of-state)	<input type="text" value="0"/>
Newly licensed Ag Ed graduate program completer (prepared in-state)	<input type="text" value="0"/>
Newly licensed Ag Ed graduate program completer (prepared out-of-state)	<input type="text" value="0"/>
Alternative licensure/route completer	<input type="text" value="0"/>
Non-licensed individual	<input type="text" value="0"/>
Other <input type="text"/>	<input type="text" value="0"/>
Unknown	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

For the _____ **non-licensed individuals** reported as new hires, please indicate **prior educational/employment experience**.

New agriculture graduates (not an Ag Ed graduate program completer)	<input type="text" value="0"/>
New education graduates (not an Ag Ed graduate program completer)	<input type="text" value="0"/>
Other new graduates (not agriculture or education)	<input type="text" value="0"/>
Agribusiness, farming, or industry professional	<input type="text" value="0"/>
Education professional (other content area, etc)	<input type="text" value="0"/>
Retired educator	<input type="text" value="0"/>
Other <input type="text"/>	<input type="text" value="0"/>
Unknown	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

How many positions, if any, remain **unfilled** in your state?

VACANT FULL TIME positions in school-based Agricultural Education

0

VACANT PART TIME positions in school-based Agricultural Education

0

Total

0

How many positions and programs were **NEW** for the 2016-2017 academic year?

New/additional positions created in school-based Agricultural Education programs
(program expansion from 1 teacher to 2 teachers, etc)

0

NEW programs created in school-based Agricultural Education

0

Total

0

To further identify potential/anticipated program growth and expansion opportunities in your state, please list any school districts which have expressed interest in offering school-based agricultural education, yet have not moved forward to date.

Each year, annual supply data is collected from **teacher educators representing each institution that prepares agricultural educators**. To verify information, please identify all institutions in your state that should be included. Also, please indicate the key faculty contact at each.

Ex. University of ABC, John Doe, jdoe@abc.edu

When **2017-2018 annual demand data** is collected one year from now, will you be the appropriate contact? If NO, please indicate who should be contacted for this valuable information. Please include NAME, TITLE and EMAIL.

☐ Yes

☐ No

Respectfully submitted by:

State

Name

Title

Email

Phone

Optional Response Items

If the following information is available for your state, please provide.

Average total starting salary for beginning teachers in school-based Agricultural Education:

Average contract length for school-based Agricultural Education teachers in your state:

Note: Please include text clarification (Ex. 20 days extended contract OR 12 month contract)

Percentage of school-based Agricultural Education teachers who receive a stipend for FFA advisement (beyond extended contract):



Appendix E:

Comprehensive Opened Ended Unique Challenges of Agricultural Teacher Educators Responses from 2014

- **Boards/Departments of Education/Educational Policy**

- Our state board of education imposes several requirements which makes the process of teacher certification complicated and costly.
- State Accreditation, Continuing Portfolio Assessments, Recently Added PRAXIS II Pedagogy and Content, State Legislature and Institution are considering additional changes from institution-based portfolio to edTPA or other system. Many changes are occurring simultaneously.
- We are facing sweeping changes in teacher certification mandated by the Department of Elementary and Secondary Education in <State> that will potentially cause a teacher shortage in all content areas, statewide. Increased grade point averages, new tests, more tests, tests that have a very low pass rate for all subject areas, and an increased cost for tests (triple), will be very prohibitive in the future. It is a time of big change and flux, and thus our supply may change drastically after next year.
- Preparation of provisionally endorsed teachers (e.g., formalized program to do so);
- We are in the process of adding a BS in Agriscience Education for Fall 2014. One challenge is all students must pass Praxis I and II prior to student teaching. This can hold them up 1 or more semesters from graduating if they don't pass the first time.
- Specialty Praxis test;
- Testing and the costs associated with all the requirements.
- The state teacher certification agency, which is not part of the State Department of Education nor the University system, has aggressively imposed new rules on teacher education such as edTPA, and ethics and content testing beyond what we already do in teacher education. These new certification requirements must be paid for by students as additional fees not included in tuition. Additional fees this year are \$600-\$700 per student to pay for content testing, ethics testing, edTPA, etc. While we are short on qualified teachers in our state, and have been for many years, the certification agency is making it harder to attract students to education.
- Constant demand on teachers for update renewing, expanding certificate; always something else to do, distracts from profession; extra hoops to jump through

- **Administrative/Institutions Decisions & Factors**

- Our College will be dropping the undergraduate Agricultural Degree program after Spring 2017. It will concentrate on the Master's Degree. It will only offer certification at the Master's Degree level.
- The amount of hours required for a BS degree is being reduced (e.g., from 132 to 120 in past 15 years = loss of 1 semester);
- university and college enrollment limits for freshmen
- No 4-year degree in Ag Ed; no "real" program for Ag Ed, it is combined with Science
- We operate certification in collaboration with <Name> College. <University Name> provides agricultural education specific content and <Name> College provides general pedagogy and foundational aspects.

- Our students intern (student teach) for a year - both Fall and Spring semester during a fifth professional year. They graduate with a BS in <Degree Name> and then come back for the fifth year. It does add an extra expense (~\$12500 in tuition alone).
- Enrollment low; New administration, hopefully they will support Ag Ed. The old admin did not.
- <Name> College had their Ag Ed Endorsement approved on March 24, 2014. So our program is just getting off the ground and has 2 students committed to complete their degree. We will have at least 2 more freshmen in our program next Fall.
- we just started the program. Thus the numbers are initially low, but growing rapidly. Great support among FFA in our quarter of state (<State Name>) and also southern <State Name>
- In 2000, <University Name> and <University Name> began operating a joint Ag Ed Program. Three years ago, the former <University Name> Chancellor decided to eliminate the Ag Ed Program. The new (current Chancellor) has decided to have it reinstated as a <University Name> alone program rather than a joint program. Hence, this will be the last year we have Agricultural Education graduates for about 3 years pending reinstatement by the <University Name> system and the <State> Board of Teaching. Our anticipated reinstatement date is Fall, 2015. Of course it will take 2 or 3 years for the new system to again produce graduates.
- University enrollment requirements are increasing, making it more difficult for admission at the undergraduate level for many students.
- Lack of Scholarships
- Our College of Agriculture only offers a degree in Animal Science with a concentration in Agricultural Education at the BS and MS level. The coursework the students complete is a traditional Agricultural Education program, however, the degree says Animal Science. The reasoning behind this is because we are a small school and the state higher education coordinating board mandated that low-producing programs be dissolved. We avoided Agricultural Education being cut by combining degrees.
- Don't call Ag Ed degree -- it is Ag Science
- Student teaching field experiences are offered both fall and spring semesters. My appointment is in the Dept. of Agriculture. But my students must take course work in conjunction with the College of Education and Behavioral Sciences. I have very little input on the direction of my Ag. Ed. students in taking classes to comply with the College of Ed.
- We have recently transitioned into a year-long student teaching program.
- Student teachers are placed in schools with little input from AgEd faculty
- Beginning in 2014-15 academic year, AgEd preservice teachers will no longer take teaching methods lecture and practicum focused on AgEd or even CTE, but rather general secondary ed.
- Repetitive material offered through both agriculture education and education courses.

• **Teacher Education Program Specific Factors**

- Our students take 15 hours of student teaching (14 hours in our department). Prior to student teaching, they take 18-21 hours in our department. This is a big change from 15 years ago when they took one course prior to student teaching in our department. This has resulted in increased faculty involvement with our students and the creation of a student organization specific to teaching high school agricultural science called Future Agricultural Science Teachers. Our students are more prepared than they have been in the past, but there is more work to do!
- Practice teaching - 2x per week, for 16 weeks
- We still operate under a 4 week block before student teachers spend 12 weeks in the schools.
- Very strong Ag Mech program
- Increasing GPA to 2.75 from 2.5 to get teacher license -- will hurt a number of students

- Ag Ed program of study was first available in Fall of 2011.
- Numbers are down and we are trying to figure out why. Could be any of several factors. Putting together external review team to investigate issue in Fall 2014.
- The 5th year requirement and student teaching can be a negative to some students.
- The students attend student teacher 5 day a week all academic year. In the Fall the student teachers return to the university 4 afternoon or evenings, making the students choose between after school FFA activities and attending classes.
- Jobs are in very rural, hard to fill locations. Students struggle to find support in rural areas. Students, now, are more prepared for urban diverse locations, not programs with 5 or less students per class.

- **External Partners**

- <State> Team AgEd has recruitment and retention as one of its priorities for 2013-2016.
- <State> Education Roundtable has provided a grant for Agricultural Education teacher education student recruitment.
- <Institution> College of Agriculture has provided funding to assist with recruitment and retention.
- Difficult to compete with the robust agriculture opportunities.
- There are 4 regional institutions in our state that also have an agricultural education teacher ed program.
- Ag industry - competitive salary

- **Lack of Human Resources/Faculty**

- Reduced number of FTEs dedicated to teacher preparation;
- No faculty FTE commitment for AgEd; AgEd is coordinated as one component of Agriculture staff member's assignment with courtesy (unpaid) faculty recognition in Education and adjunct (paid) instructor for summer methods course in Ag Education.
- We need a second faculty member to recruit students.
- There is only one faculty member managing ALL matters having to do with agriculture education

- **Candidates Challenges**

- Potential teacher candidates are arriving with much less technical agricultural experience;
- few students are from a farm background
- Also credentials to get into <University Name> continue to increase both in terms of High School GPA and ACT scores. Students have to be excellent scholars to be admitted.
- Challenges in getting students to understand the importance of teaching agriculture. Aggressive recruitment.
- Prepare minority teachers; trying hard to get african american males into the classroom
- Recruiting undergraduates to major in Ag Ed at an 1890 HBCU is no small feat.
- Having difficulty recruiting male students. Oil and gas companies are hiring them.
- Need more teacher candidates. Need a gender balance between males and female
- encouraging students to complete a teaching certification program, rather than just going out to find a job
- Some students have difficulty meeting the 2.75 cumulative GPA required for admission into the Teacher Education program in the College of Education.

- **Current School-Based Agricultural Education Program Challenges**

- Cooperating centers without adequate SAE engagement by students - teachers don't comprehend experiential learning compared to SAE;
- SBAE emphasis and core shifting from agriculture to leadership/human development emphasis (i.e. excess FFA influence on curricular decisions both within the classroom and SAE);
- Spring statewide testing takes instructional time away; along with fairs during the spring
- Finding appropriate student teaching locations with a large number of people retiring in the state.
- finding appropriate placements with qualified teachers
- Mentor teachers for practicum placements and student teaching are not readily available in the <City> area. Students can choose to student teach out of area, but the practicum experiences prior to internship may not be in ideal settings or may involve extensive travel for the teacher-candidate.

- **Broad Program Mission**

- We prepare all vocational education (CTE) area teachers, including Agriculture, FACS (family consumer science), Business and all trade areas offered in NYS BOCES (trade type HS programs) including electrical trades, construction trades, culinary arts, cosmetology, and many more.

Appendix F

2016 Supply Institutional Contacts

University	Prefix	First name	Last name
University of Alaska	Dr.	Meriam	Karlsson
California State University, Chico	Dr.	Bradley	Dodson
California State Polytechnic University, San Luis Obispo	Dr.	Robert	Flores
University of California, Davis	Dr.	Lynn	Martindale
California State Polytechnic University, Pomona	Dr.	Kimberley	Miller
California State University, Fresno	Dr.	Rosco	Vaughn
University of Idaho	Dr.	James	Connors
Montana State University	Dr.	Carl	Igo
University of Nevada	Dr.	Dale	Holcombe
Oregon State University	Dr.	Misty	Lambert
Utah State University	Dr.	Becki	Lawver
Washington State University	Mr.	J.D.	Baser
University of Wyoming	Dr.	J. Chris	Haynes
University of Florida	Dr.	Andrew	Thoron
Fort Valley State University	Dr.	Curtis	Borne
University of Georgia - Athens	Dr.	Eric	Rubenstein
University of Georgia - Tifton	Dr.	Jason	Peake
Murray State University	Dr.	Kimberly	Bellah
University of Kentucky	Dr.	Rebekah	Epps
Western Kentucky University	Dr.	Thomas	Kingery
Eastern Kentucky University	Dr.	Mike	McDermott
Morehead State University	Dr.	Joyce	Stubbs
North Carolina A&T State University	Dr.	Antoine	Alston
North Carolina State University	Dr.	Jim	Flowers
University of Mount Olive	Dr.	Sandy	Maddox
University of Puerto Rico	Dr.	David	Padilla-Velez
Clemson University	Dr.	Thomas	Dobbins
University of Tennessee Martin	Dr.	Will	Bird
Tennessee Technological University	Dr.	O.P.	McCubbins
Middle Tennessee State University	Dr.	Cliff	Ricketts
Tennessee State University	Dr.	John	Ricketts
University of Tennessee	Dr.	Christopher	Stripling
Virginia State University	Dr.	Chris	Catanzaio
Ferrum College	Dr.	Mary Ann	Norman
Virginia Tech	Dr.	Donna	Westfall-Rudd
West Virginia University	Dr.	Harry	Boone, Jr.

University	Prefix	First name	Last name
University of Connecticut	Dr.	Patricia	Jepson
University of Delaware	Dr.	Arba	Henry
Delaware State University	Ms.	Amanda	Powell
University of Maryland, College Park	Dr.	Bill	Phillips
University of Maryland, Eastern Shore	Dr.	George	Shorter
University of Massachusetts	Dr.	James	Alicata
University of New Hampshire	Dr.	Tom	Schram
Rutgers University	Dr.	Mark	Robson
Cornell University	Mr.	Jeffrey	Perry
State University of New York, Oswego	Dr.	Jan	Woodworth
Wilmington College	Dr.	Monte	Anderson
Ohio State University	Dr.	Susie	Whittington
Pennsylvania State University	Dr.	Daniel	Foster
Delaware Valley University	Dr.	David	Timothy
Western Illinois University	Dr.	Andrew	Baker
University of Illinois – Urbana-Champaign	Ms.	Debra	Korte
Southern Illinois University – Carbondale	Dr.	Seburn	Pense
Illinois State University	Dr.	Richard	Steffen
Purdue University	Dr.	Allen	Talbert
Dordt College	Mr.	Gary	De Vries
Iowa State University	Dr.	Scott	Smalley
Michigan State University	Dr.	Matt	Raven
University of Minnesota, Twin Cities	Dr.	Brad	Greiman
University of Minnesota, Crookston	Dr.	Lyle	Westrom
Southwest Minnesota State University	Dr.	Kristin	Kovar
University of Missouri	Dr.	John	Tummons
Northwest Missouri State University	Dr.	Rod	Barr
Missouri State University	Dr.	James	Hutter
Southeastern Missouri State University	Dr.	David	Mauk
College of the Ozarks	Dr.	Donn	Russell
University of Nebraska-Lincoln	Dr.	Lloyd	Bell
North Dakota State University	Dr.	Adam	Marx
South Dakota State University	Dr.	Troy	White
University of Wisconsin - River Falls	Dr.	James	Graham
University of Wisconsin - Platteville	Dr.	Mark	Zidon
Auburn University	Dr.	Jimmy	Lindner
University of Arizona	Mr.	Quintin	Molina
University of Arkansas at Pine Bluff	Dr.	Edmund	Buckner
University of Arkansas	Dr.	Kate	Shoulders
Arkansas State University	Dr.	J. Kevin	Humphrey

University	Prefix	First name	Last name
Arkansas Tech University	Dr.	Justin	Killingsworth
Southern Arkansas University	Dr.	Copie	Moore
Colorado State University	Dr.	Kellie	Enns
Kansas State University	Dr.	Gaea	Hock
Fort Hays State University	Dr.	Don	Benjamin
Louisiana State University	Dr.	Kristin	Stair
Louisiana Tech University	Mr.	Track	Kavanaugh
McNeese State University	Dr.	Chip	Lemieux
Alcorn State University	Dr.	Avis	Joseph
Mississippi State University	Dr.	Kirk	Swortzel
New Mexico State University	Dr.	Frank	Hodnett
Eastern New Mexico University	Dr.	Marshall	Swafford
Northwestern Oklahoma State University	Dr.	Mindi	Clark
Panhandle State University	Dr.	Nels	Peterson
Oklahoma State University	Dr.	Jon	Ramsey
Texas Tech University	Dr.	Rudy	Ritz
Angelo State University	Dr.	Will	Dickison
Sul Ross State University	Dr.	Christopher	Estepp
Tarleton State University	Dr.	David	Frazier
Texas A&M University	Dr.	Tim	Murphy
Prairie View A&M University	Dr.	Wash	Jones
Texas State University	Dr.	Douglas	Morrish
Sam Houston State University	Dr.	Dwayne	Pavelock
Stephen F. Austin State University	Dr.	Dale	Perritt
Texas A&M University - Kingsville	Dr.	Steven	Chumley
West Texas A&M University	Dr.	Kevin	Williams
Texas A&M University - Commerce	Dr.	Robert	Williams

Appendix G

2016 Demand State Contacts

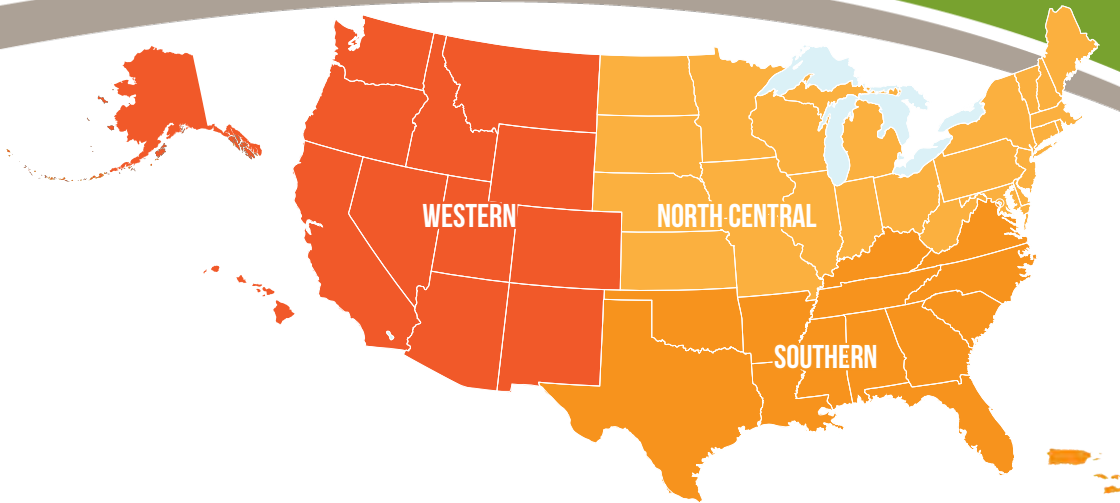
State	Prefix	First Name	Last Name
Alabama	Mr	Jacob	Davis
Alaska	Mr	Kevin	Fochs
Arizona	Mr	Bruce	Watkins
Arkansas	Mr	Marion	Fletcher
California	Dr	Lloyd	McCabe
Colorado	Mr	Michael	Womochil
Connecticut	Mr	Harold	Mackin
Delaware	Dr.	Bart	Gill
Florida	Dr.	Andrew	Thoron
Georgia	Mr	Chip	Bridges
Hawaii	Mr	Michael	Barros
Idaho	Mr	Jerry	Severe
Illinois	Mr	Harley	Hepner
Indiana	Dr.	Allen	Talbert
Iowa	Mr	Scott	Johnson
Kansas	Mr.	Kurt	Dillon
Kentucky	Mr	Brandon	Davis
Louisiana	Ms	Kathy	Conerly
Maine	Mr	Doug	Robertson
Maryland	Dr	David	Miller
Massachusetts	Ms	Kimberly	LaFleur
Michigan	Mr.	Mark	Forbush
Minnesota	Mr	Joel	Larsen
Mississippi	Mr	Lee	James
Missouri	Mr	Leon	Busdieker
Montana	Mr.	Jim	Rose
Nebraska	Mr	Matthew	Kreifels
Nevada	Ms	Anne	Willard
New Hampshire	Ms	Maria	VanderWoude
New Jersey	Dr	Nancy	Trivette
New Mexico	Mr	Les	Purcella
New York	Mrs.	Shari	Lighthall
North Carolina	Mr	Gerald	Barlow
North Dakota	Mr	Aaron	Anderson
Ohio	Mr	Matt	Winkle

State	Prefix	First Name	Last Name
Oklahoma	Mr	Jack	Staats
Oregon	Dr	Reynold	Gardner
Pennsylvania	Dr.	John	Ewing
Puerto Rico	Dr.	Ana	Cordero Brenes
Rhode Island	Ms	Stacie	Pepperd
South Carolina	Mr	Billy	Keels
South Dakota	Ms	Michelle	Nelson
Tennessee	Mr	Steve	Gass
Texas	Mr	Tom	Maynard
Utah	Mr	William	Deimler
Vermont	Mr	Jay	Ramsey
Virgin Islands	Dr.	Eddie	Williams
Virginia	Ms	Carly	Woolfolk
Washington	Ms	Rebecca	Wallace
West Virginia	Mr	Jason	Hughes
Wisconsin	Mr	Jeff	Hicken
Wyoming	Ms	Stacy	Broda

Appendix H

Institutional level Supply Data by AAAE Region

2017 AGRICULTURE TEACHER SUPPLY AND DEMAND OVERVIEW AAAE REGIONS



	WESTERN	SOUTHERN	NORTH CENTRAL	NATIONWIDE*
AVERAGE SALARY	\$43,000	\$36,803	\$44,138	\$43,093
EXTENDED CONTRACT DAYS	47	41	22.5	33
AG TEACHERS	2,111	6,335	4,244	12,690
AG PROGRAMS	1,308	3,938	3,225	8,471
FEMALE/MALE TEACHERS	1,002/859	2,593/3,709	1,987/2,214	5,582/6,782
FULL-TIME/ PART-TIME TEACHERS	2,017/94	5,841/494	4,134/110	11,992/698
NEW POSITIONS	73	95	48	216
NEW PROGRAMS	32	82	75	189
RETIREMENTS	25	76	57	158
LEFT TEACHING	73	277	160	510
ALT. CERTIFIED/NON-LICENSED HIRES	51/11	169/63	136/32	356/106
POSITIONS TO FILL	151	415	246.3	812.3
PROGRAMS CLOSED/POSITIONS LOST	12/20	27/33	13/18.7	51/71.7
UNFILLED FULL-TIME POSITIONS	42	23	7	72
UNFILLED PART-TIME POSITIONS	2	0	2	4
AGRICULTURAL EDUCATION GRADUATES	129	407	204	740
AGRICULTURAL EDUCATION GRADUATES TEACHING	117	287	152	556
AG ED MAJOR ENROLLMENT	606	1,573	963	3,142



AGRICULTURE TEACHER SUPPLY AND DEMAND HIGHLIGHTS

- The **demand** for agriculture teachers continues due to **program growth**, **expansion**, **retirements** and **openings**.
- School districts **value** the agricultural education model of rigorous **STEM** based classroom and laboratory instruction, experiential learning and leadership development.
- The **retention rate** of agriculture teachers is historically **high** at nearly **96%**.
- Individuals majoring in **agricultural education** are **increasing** even as other education content areas are experiencing decreases.
- The **conversion rate** of agricultural education graduates is at an all-time **high** of **75%**.
- The **majority** of **new** agricultural education majors are **Caucasian female**.
- School districts are hiring an unprecedented number of **alternatively certified** and **non-licensed teachers** to **fill** open positions due to **demand**.

www.naae.org/teachag

Smith, A. R., Lawver, R. G., & Foster, D. D. (2018). National Agricultural Education Supply and Demand Study, 2017 Executive Summary. Retrieved from: <http://aaaeonline.org/Teacher-Supply-and-Demand/>

AGRICULTURAL EDUCATION DEGREE INSTITUTIONS

Visit the Teach Ag website at www.naae.org/teachag/college.cfm for program links

Auburn University
Auburn, AL
Arkansas State University
Jonesboro, AR
Arkansas Tech University
Russellville, AR
University of Arkansas - Pine Bluff
Pinebluff, AR
Southern Arkansas University
Magnolia, AR
University of Arkansas
Fayetteville, AR
University of Arizona
Tucson, AZ
University of California, Davis
Davis, CA
California State University, Chico
Chico, CA
California State University, Fresno
Fresno, CA
Cal Poly - Pomona
Pomona, CA
Cal Poly - San Luis Obispo
San Luis Obispo, CA
Colorado State University
Ft. Collins, CO
University of Connecticut
Storrs, CT
Delaware State University
Dover, DE
University of Delaware
Newark, DE
University of Florida
Gainesville, FL
Fort Valley State University
Fort Valley, GA
University of Georgia
Athens, GA
Dordt College
Sioux Center, IA
Iowa State University
Ames, IA
University of Idaho
Moscow, ID
Illinois State University
Normal, IL
Southern Illinois University
Carbondale, IL
Western Illinois University
Macomb, IL
University of Illinois
Urbana, IL

Huntington University
Huntington, IN
Purdue University
Lafayette, IN
Fort Hayes State University
Hayes, KS
Kansas State University
Manhattan, KS
Eastern Kentucky University
Richmond, KY
Morehead State University
Morehead, KY
Murray State University
Murray, KY
Western Kentucky University
Bowling Green, KY
University of Kentucky
Lexington, KY
Louisiana State University
Baton Rouge, LA
Louisiana Tech University
Ruston, LA
McNeese State University
Lake Charles, LA
University of Massachusetts
Amherst, MA
University of Maryland College Park
College Park, MD
University of Maryland Eastern Shore
Princess Anne, MD
Michigan State University
East Lansing, MI
Southwest Minnesota State University
Marshall, MN
University of Minnesota - Twin Cities
St. Paul, MN
University of Minnesota - Crookston
Crookston, MN
College of the Ozarks
Point Lookout, MO
Missouri State University
Springfield, MO
Northwest Missouri State University
Maryville, MO
Southeast Missouri State University
Cape Girardeau, MO
University of Missouri
Columbia, MO
Alcorn State University
Alcorn State, MS
Mississippi State University
Mississippi State, MS

Montana State University-Bozeman
Bozeman, MT
Brevard College
Brevard, NC
North Carolina A&T State University
Greensboro, NC
North Carolina State University
Raleigh, NC
University of Mount Olive
Mount Olive, NC
North Dakota State University
Fargo, ND
University of Nebraska
Lincoln, NE
University of New Hampshire
Durham, NH
Eastern New Mexico State University
Portales, NM
New Mexico State University
Las Cruces, NM
Rutgers University
New Brunswick, NJ
University of Nevada - Reno
Reno, NV
Cornell University
Ithaca, NY
State University of New York at Oswego
Oswego, NY
Central States University
Wilberforce, OH
The Ohio State University
Columbus, OH
Wilmington College
Wilmington, OH
Northwestern Oklahoma State
Alva, OK
Oklahoma State University
Stillwater, OK
Panhandle State University
Goodwell, OK
Oregon State University
Corvallis, OR
Delaware Valley College
Doylestown, PA
The Pennsylvania State University
University Park, PA
University of Puerto Rico - Mayaguez
Mayaguez, Puerto Rico
Clemson University
Clemson, SC
South Dakota State University
Brookings, SD

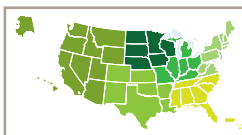
Middle Tennessee State University
Murfreesboro, TN
Tennessee State University
Nashville, TN
Tennessee Technological University
Cookeville, TN
University of Tennessee
Knoxville, TN
University of Tennessee at Martin
Martin, TN
Angelo State University
San Angelo, TX
Sam Houston State University
Huntsville, TX
Stephen F. Austin State University
Nacogdoches, TX
Sul Ross State University
Alpine, TX
Tarleton State University
Stephenville, TX
Texas A&M University
College Station, TX
Texas A&M University - Commerce
Commerce, TX
Texas A&M University - Kingsville
Kingsville, TX
Texas State University - San Marcos
San Marcos, TX
Texas Tech University
Lubbock, TX
West Texas A&M University
Canyon, TX
Utah State University
Logan, UT
Ferrum College
Ferrum, VA
Virginia State University
Petersburg, VA
Virginia Tech University
Blacksburg, VA
Washington State University
Pullman, WA
University of Wisconsin - Platteville
Platteville, WI
University of Wisconsin - River Falls
River Falls, WI
West Virginia University
Morgantown, WV
University of Wyoming
Laramie, WY

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Newsletters



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Degree Institution



Interactive Games



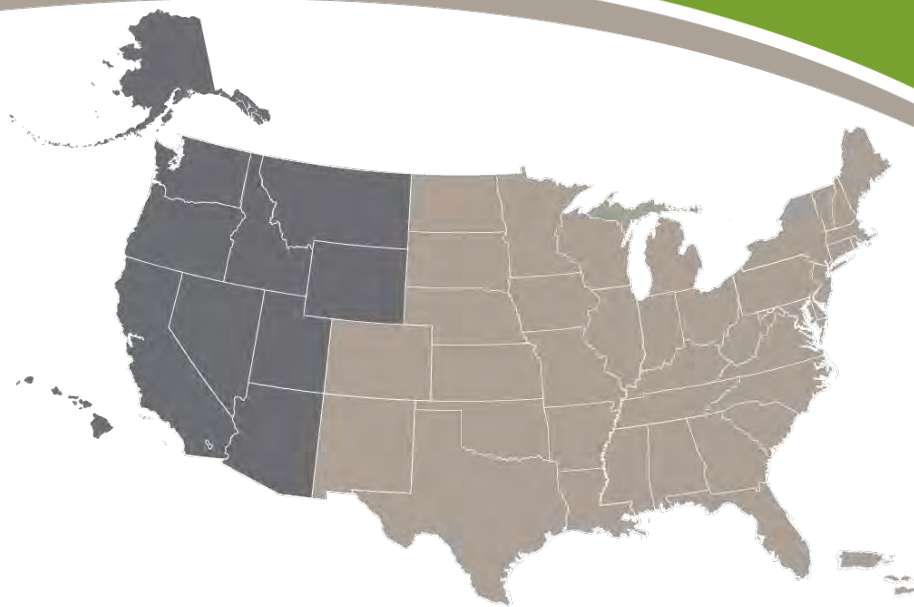
Teach Ag Day
Activities



Appendix I

State-Level Supply and Demand Data by NAAE Region

2014-2017 AGRICULTURE TEACHER SUPPLY AND DEMAND OVERVIEW REGION 1



	2014	2015	2016	2017	NATIONWIDE*
AVERAGE SALARY	\$37,353	\$38,000	\$38,000	\$43,000	\$43,093
EXTENDED CONTRACT DAYS	22	32	32	28	33
AG TEACHERS	1,446	1,781	1,573	1,872	12,690
AG PROGRAMS	874	1,042	897	1,102	8,471
FEMALE/MALE TEACHERS	NA	847/802	725/848	893/729	5,582/6,782
FULL-TIME/ PART-TIME TEACHERS	NA	1,720/81	1,459/114	1,778/94	11,992/698
NEW POSITIONS	76	20	27	70	216
NEW PROGRAMS	16	14	17	30	189
RETIREMENTS	25	32	32	20	158
LEFT TEACHING	NA	51	80	65	510
ALT. CERTIFIED/NON-LICENSED HIRES	13	14	25/6	42/11	356/106
POSITIONS TO FILL	NA	88	93	135	812.3
PROGRAMS CLOSED/POSITIONS LOST	NA	24	13/14	12/20	51/71.7
UNFILLED FULL-TIME POSITIONS	35	16	15	40	72
UNFILLED PART-TIME POSITIONS	6	3	0	1	4
AGRICULTURAL EDUCATION GRADUATES	90	100	113	117	740
AGRICULTURAL EDUCATION GRADUATES TEACHING	78	82.5	96	107	556
AG ED MAJOR ENROLLMENT	372	NA	NA	540	3,142

*not all states reported



AGRICULTURE TEACHER SUPPLY AND DEMAND HIGHLIGHTS

- The **demand** for agriculture teachers continues due to **program growth, expansion, retirements** and **openings**.
- School districts **value** the agricultural education model of rigorous **STEM** based classroom and laboratory instruction, experiential learning and leadership development.
- The **retention rate** of agriculture teachers is historically **high** at nearly **96%**.
- Individuals majoring in **agricultural education** are **increasing** even as other education content areas are experiencing decreases.
- The **conversion rate** of agricultural education graduates is at an all-time **high** of **75%**.
- The **majority** of **new** agricultural education majors are **Caucasian female**.
- School districts are hiring an unprecedented number of **alternatively certified** and **no80censed teachers** to fill open positions due to **demand**.

www.naae.org/teachag

Smith, A. R., Lawver, R. G., & Foster, D. D. (2018). National Agricultural Education Supply and Demand Study, 2017 Executive Summary. Retrieved from: <http://naaeonline.org/Teacher-Supply-and-Demand/>

AGRICULTURAL EDUCATION DEGREE INSTITUTIONS

Visit the Teach Ag website at www.naae.org/teachag/college.cfm for program links

University of Arizona
Tucson, AZ

University of California, Davis
Davis, CA

California State University, Chico
Chico, CA

California State University, Fresno
Fresno, CA

Cal Poly - Pomona
Pomona, CA

Cal Poly - San Luis Obispo
San Luis Obispo, CA



University of Idaho
Moscow, ID

Montana State University-Bozeman
Bozeman, MT

University of Nevada - Reno
Reno, NV

Oregon State University
Corvallis, OR

Utah State University
Logan, UT

Washington State University
Pullman, WA

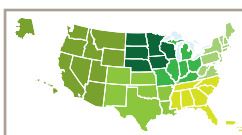
University of Wyoming
Laramie, WY

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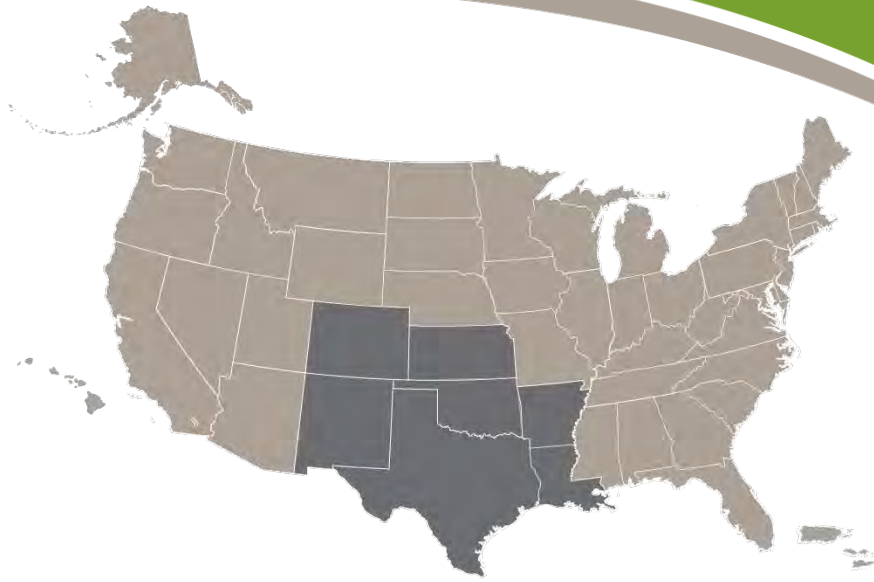
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2014-2017 AGRICULTURE TEACHER SUPPLY AND DEMAND OVERVIEW REGION 2



	2014	2015	2016	2017	NATIONWIDE*
AVERAGE SALARY	\$39,000	\$38,000	\$39,000	\$42,660	\$43,093
EXTENDED CONTRACT DAYS	50	32	47.5	47.5	33
AG TEACHERS	3,172	1,781	3,634	3,879	12,690
AG PROGRAMS	1,965	1,042	2,197	2,230	8,471
FEMALE/MALE TEACHERS	NA	847/802	1,186/2,448	1,489/2,390	5,582/6,782
FULL-TIME/ PART-TIME TEACHERS	NA	1,720/81	3,525/109	3,399/480	11,992/698
NEW POSITIONS	25	20	40	65	216
NEW PROGRAMS	23	14	28	39	189
RETIREMENTS	54	32	52	48	158
LEFT TEACHING	268	51	209	178	510
ALT. CERTIFIED/NON-LICENSED HIRES	26/NA	14	93/16	69/29	356/106
POSITIONS TO FILL	NA	88	238	280	812.3
PROGRAMS CLOSED/POSITIONS LOST	NA	24	8/11	8/11	51/71.7
UNFILLED FULL-TIME POSITIONS	16	16	9	11	72
UNFILLED PART-TIME POSITIONS	0	3	0	1	4
AGRICULTURAL EDUCATION GRADUATES	295	100	293	270	740
AGRICULTURAL EDUCATION GRADUATES TEACHING	189	82.5	196	191	556
AG ED MAJOR ENROLLMENT	899	NA	NA	978	3,142

*not all states reported



AGRICULTURE TEACHER SUPPLY AND DEMAND HIGHLIGHTS

- The **demand** for agriculture teachers continues due to **program growth**, **expansion**, **retirements** and **openings**.
- School districts **value** the agricultural education model of rigorous **STEM** based classroom and laboratory instruction, experiential learning and leadership development.
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www.naae.org/teachag

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AGRICULTURAL EDUCATION DEGREE INSTITUTIONS

Visit the Teach Ag website at www.naae.org/teachag/college.cfm for program links

Arkansas State University
Jonesboro, AR

Arkansas Tech University
Russellville, AR

Southern Arkansas University
Magnolia, AR

University of Arkansas
Fayetteville, AR

University of Arkansas - Pine Bluff
Pinebluff, AR

Colorado State University
Ft. Collins, CO

Fort Hayes State University
Hayes, KS

Kansas State University
Manhattan, KS

Louisiana State University
Baton Rouge, LA

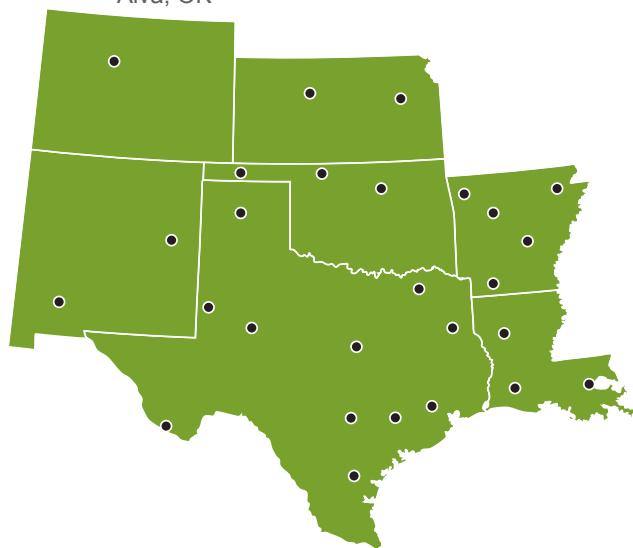
Louisiana Tech University
Ruston, LA

McNeese State University
Lake Charles, LA

Eastern New Mexico State University
Portales, NM

New Mexico State University
Las Cruces, NM

Northwestern Oklahoma State
Alva, OK



Oklahoma State University
Stillwater, OK

Oklahoma Panhandle State University
Goodwell, OK

Angelo State University
San Angelo, TX

Sam Houston State University
Huntsville, TX

Stephen F. Austin State University
Nacogdoches, TX

Sul Ross State University
Alpine, TX

Tarleton State University
Stephenville, TX

Texas A&M University
College Station, TX

Texas A&M University-Commerce
Commerce, TX

Texas A&M University-Kingsville
Kingsville, TX

Texas State University-San Marcos
San Marcos, TX

Texas Tech University
Lubbock, TX

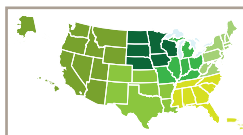
West Texas A&M University
Canyon, TX

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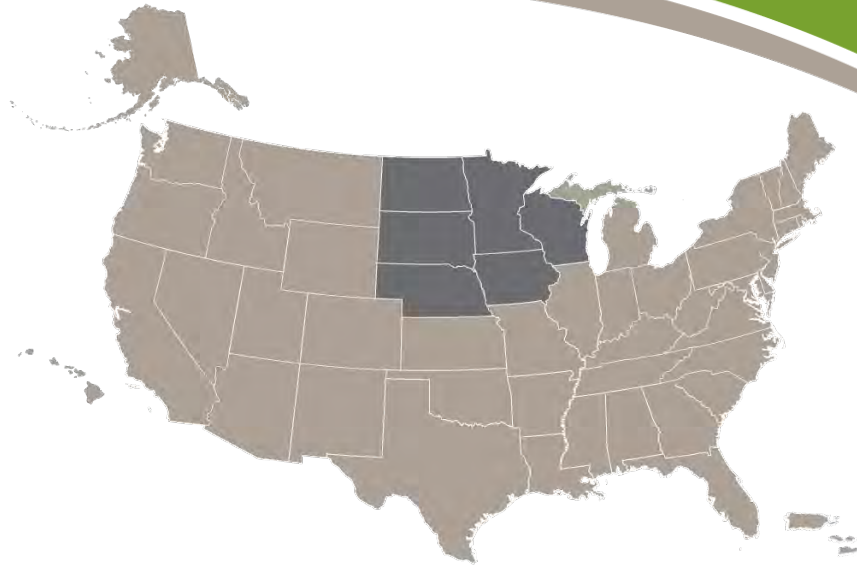
Job Openings by State



Testimonials



2014-2017 AGRICULTURE TEACHER SUPPLY AND DEMAND OVERVIEW REGION 3



	2014	2015	2016	2017	NATIONWIDE*
AVERAGE SALARY	\$36,000	\$38,526	\$38,526	N/A	\$43,093
EXTENDED CONTRACT DAYS	22	28	28	27	33
AG TEACHERS	1,122	1,138	1,182	1224	12,690
AG PROGRAMS	982	1,000	1013	1048	8,471
FEMALE/MALE TEACHERS	NA	561/575	545/637	600/624	5,582/6,782
FULL-TIME/ PART-TIME TEACHERS	NA	1,087/51	1,118/64	1151/73	11,992/698
NEW POSITIONS	23	20	19	11	216
NEW PROGRAMS	30	26	20	26	189
RETIREMENTS	20	17	23	20	158
LEFT TEACHING	59	58	77	44	510
ALT. CERTIFIED/NON-LICENSED HIRES	18/NA	NA/24	22/6	37/10	356/106
POSITIONS TO FILL	NA	97	89	71.3	812.3
PROGRAMS CLOSED/POSITIONS LOST	NA	NA/4	5/7	5/3.7	51/71.7
UNFILLED FULL-TIME POSITIONS	12	10	14	2	72
UNFILLED PART-TIME POSITIONS	2	2	0	0	4
AGRICULTURAL EDUCATION GRADUATES	81	75	77	80	740
AGRICULTURAL EDUCATION GRADUATES TEACHING	51	49	60	59	556
AG ED MAJOR ENROLLMENT	268	NA	NA	378	3,142

*not all states reported



AGRICULTURE TEACHER SUPPLY AND DEMAND HIGHLIGHTS

- The **demand** for agriculture teachers continues due to **program growth, expansion, retirements** and **openings**.
- School districts **value** the agricultural education model of rigorous **STEM** based classroom and laboratory instruction, experiential learning and leadership development.
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www.naae.org/teachag

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AGRICULTURAL EDUCATION DEGREE INSTITUTIONS

Visit the Teach Ag website at www.naae.org/teachag/college.cfm for program links

Dordt College
Sioux Center, IA

Iowa State University
Ames, IA

Southwest Minnesota State University
Marshall, MN

University of Minnesota - Twin Cities
St. Paul, MN

University of Minnesota - Crookston
Crookston, MN

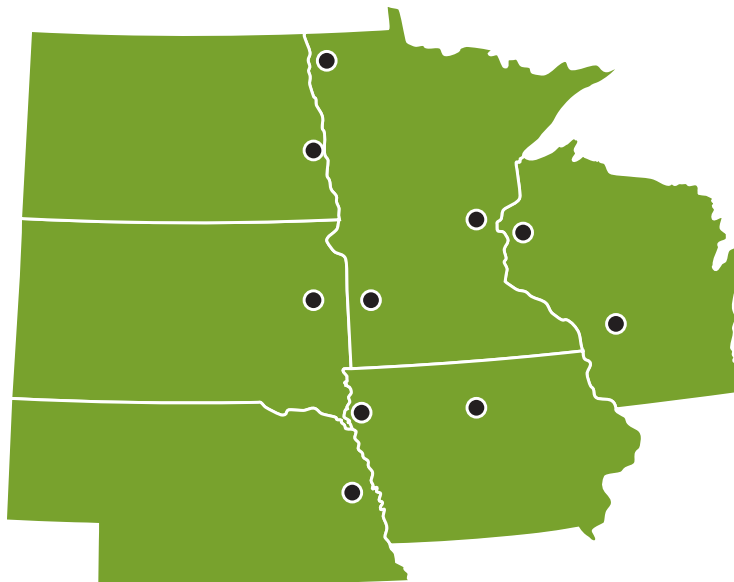
University of Nebraska
Lincoln, NE

North Dakota State University
Fargo, ND

South Dakota State University
Brookings, SD

University of Wisconsin - Platteville
Platteville, WI

University of Wisconsin - River Falls
River Falls, WI

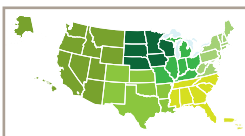


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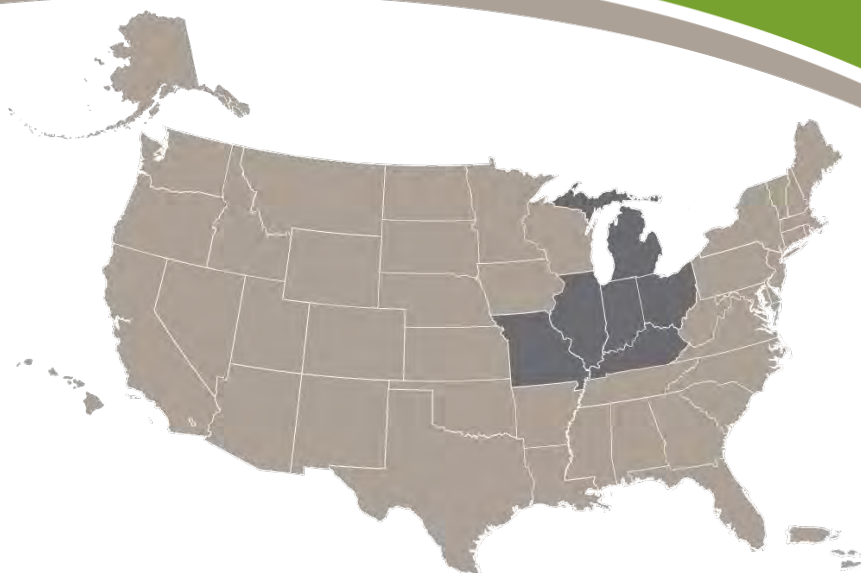
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2014-2017 AGRICULTURE TEACHER SUPPLY AND DEMAND OVERVIEW REGION 4



	2014	2015	2016	2017	NATIONWIDE*
AVERAGE SALARY	\$39,455	\$43,403	\$43,403	\$ 43,986	\$43,093
EXTENDED CONTRACT DAYS	39	37	37	43	33
AG TEACHERS	1,992	2,021	1,578	2,059	12,690
AG PROGRAMS	1,432	1,462	1,140	1,511	8,471
FEMALE/MALE TEACHERS	NA	907/1,114	663/915	888/1,130	5,582/6,782
FULL-TIME/ PART-TIME TEACHERS	NA	1,624/397	1,567/11	2,045/14	11,992/698
NEW POSITIONS	51	59	31	31	216
NEW PROGRAMS	32	34	17	20	189
RETIREMENTS	57	53	28	23	158
LEFT TEACHING	184	96	138	98	510
ALT. CERTIFIED/NON-LICENSED HIRES	51/NA	NA/26	21/23	62/7	356/106
POSITIONS TO FILL	NA	199	148	141	812.3
PROGRAMS CLOSED/POSITIONS LOST	NA	NA/13	7/21	2/11	51/71.7
UNFILLED FULL-TIME POSITIONS	11	5	6	0	72
UNFILLED PART-TIME POSITIONS	1	1	0	1	4
AGRICULTURAL EDUCATION GRADUATES	99	114	115	105	740
AGRICULTURAL EDUCATION GRADUATES TEACHING	75	88	93	85	556
AG ED MAJOR ENROLLMENT	330	NA	NA	591	3,142

*not all states reported



AGRICULTURE TEACHER SUPPLY AND DEMAND HIGHLIGHTS

- The **demand** for agriculture teachers continues due to **program growth, expansion, retirements** and **openings**.
- School districts **value** the agricultural education model of rigorous **STEM** based classroom and laboratory instruction, experiential learning and leadership development.
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www.naae.org/teachag

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AGRICULTURAL EDUCATION DEGREE INSTITUTIONS

Visit the Teach Ag website at www.naae.org/teachag/college.cfm for program links

Illinois State University
Normal, IL

Southern Illinois University
Carbondale, IL

Western Illinois University
Macomb, IL

University of Illinois
Urbana, IL

Huntington University
Huntington, IN

Purdue University
Lafayette, IN

Eastern Kentucky University
Richmond, KY

Morehead State University
Morehead, KY

Murray State University
Murray, KY

Western Kentucky University
Bowling Green, KY



University of Kentucky
Lexington, KY
Michigan State University
East Lansing, MI

College of the Ozarks
Point Lookout, MO

Missouri State University
Springfield, MO

Northwest Missouri State University
Maryville, MO

Southeast Missouri State University
Cape Girardeau, MO

University of Missouri
Columbia, MO

Central State University
Wilberforce, OH

The Ohio State University
Columbus, OH

Ohio State University ATI
Wooster, OH

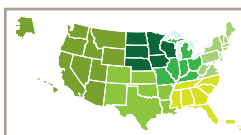
Wilmington College
Wilmington, OH

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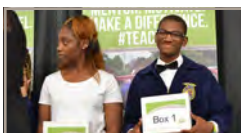
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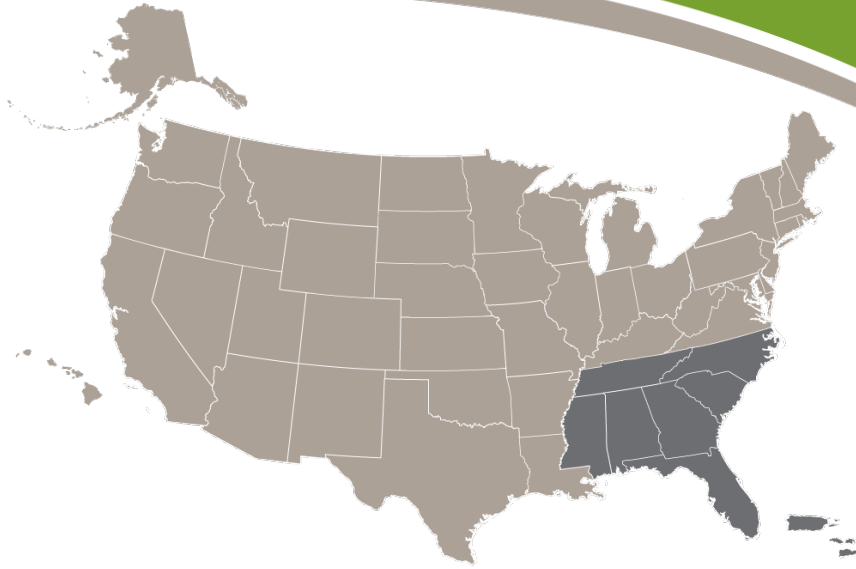
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2014-2017 AGRICULTURE TEACHER SUPPLY AND DEMAND OVERVIEW REGION 5



	2014	2015	2016	2017	NATIONWIDE*
AVERAGE SALARY	\$36,004	\$39,408	\$39,408	\$40,619	\$43,093
EXTENDED CONTRACT DAYS	60	40	40	37	33
AG TEACHERS	2,246	2,210	2,308	2,358	12,690
AG PROGRAMS	1,615	1,649	1,693	1,759	8,471
FEMALE/MALE TEACHERS	NA	940/1,271	1,164/1,141	1,036/1,322	5,582/6,782
FULL-TIME/ PART-TIME TEACHERS	NA	2,200/10	2,284/24	2,349/9	11,992/698
NEW POSITIONS	63	31.5	46	30	216
NEW PROGRAMS	49.5	36	49	47	189
RETIREMENTS	37	39	52	27	158
LEFT TEACHING	128	103	159	87	510
ALT. CERTIFIED/NON-LICENSED HIRES	73/NA	NA/84	60/14	114/36	356/106
POSITIONS TO FILL	NA	160.5	172	125	812.3
PROGRAMS CLOSED/POSITIONS LOST	NA	NA/17	28/33	19/19	51/71.7
UNFILLED FULL-TIME POSITIONS	7	26	14	13	72
UNFILLED PART-TIME POSITIONS	0	0	0	0	4
AGRICULTURAL EDUCATION GRADUATES	128	138	130	111	740
AGRICULTURAL EDUCATION GRADUATES TEACHING	88	90	94	79	556
AG ED MAJOR ENROLLMENT	514	NA	NA	472	3,142

*not all states reported



AGRICULTURE TEACHER SUPPLY AND DEMAND HIGHLIGHTS

- The **demand** for agriculture teachers continues due to **program growth, expansion, retirements** and **openings**.
- School districts **value** the agricultural education model of rigorous **STEM** based classroom and laboratory instruction, experiential learning and leadership development.
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AGRICULTURAL EDUCATION DEGREE INSTITUTIONS

Visit the Teach Ag website at www.naae.org/teachag/college.cfm for program links

Auburn University

Auburn, AL

University of Florida

Gainesville, FL

University of Florida - Plant City

Plant City, FL

Fort Valley State University

Fort Valley, GA

University of Georgia

Athens, GA

University of Georgia - Tifton

Tifton, GA

Alcorn State University

Alcorn State, MS

Mississippi State University

Mississippi State, MS

Brevard College

Brevard, NC

North Carolina A&T State University

Greensboro, NC

North Carolina State University

Raleigh, NC

University of Mount Olive

Mount Olive, NC

University of Puerto Rico - Mayaguez

Mayaguez, Puerto Rico

Clemson University

Clemson, SC

Middle Tennessee State University

Murfreesboro, TN

Tennessee State University

Nashville, TN

Tennessee Technological University

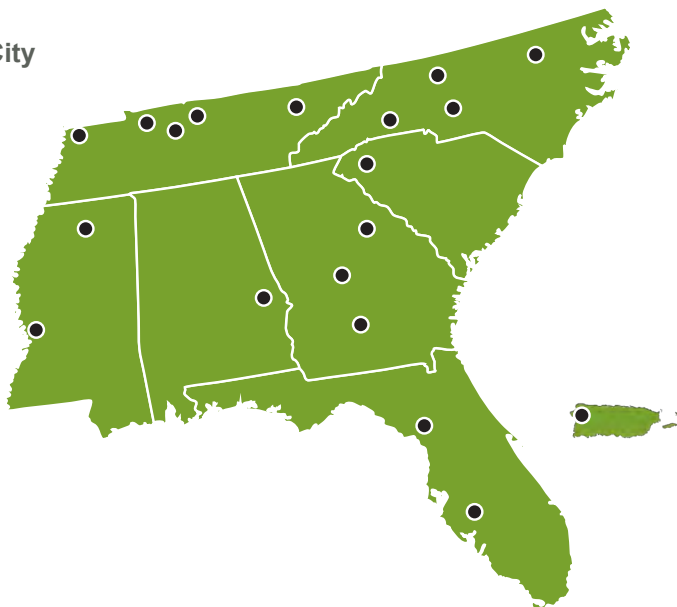
Cookeville, TN

University of Tennessee

Knoxville, TN

University of Tennessee at Martin

Martin, TN

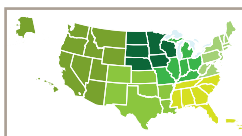


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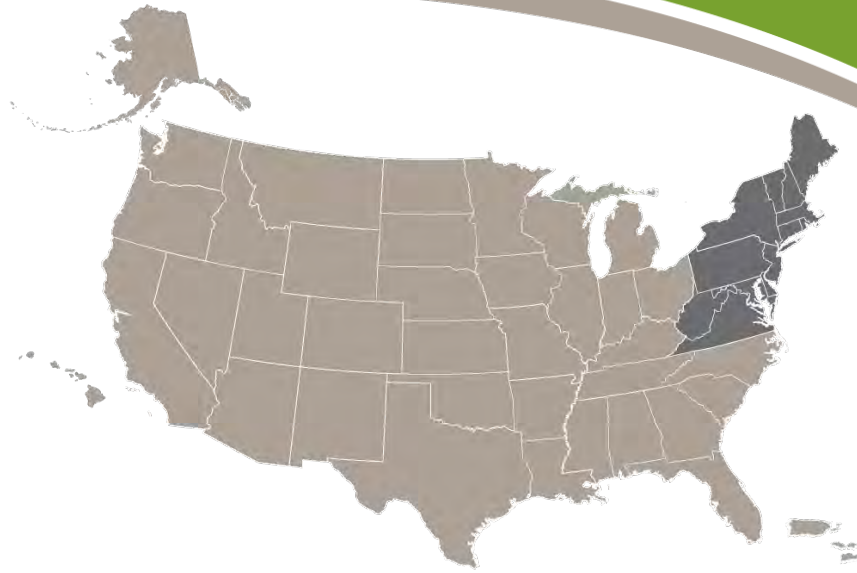


Job Openings by State



Testimonials

2014-2017 AGRICULTURE TEACHER SUPPLY AND DEMAND OVERVIEW REGION 6



	2014	2015	2016	2017	NATIONWIDE*
AVERAGE SALARY	\$47,549	\$42,516	\$42,516	\$45,200	\$43,093
EXTENDED CONTRACT DAYS	20	35	35	13	33
AG TEACHERS	896	1,294	1,282.5	1,298	12,690
AG PROGRAMS	556	839	835	821	8,471
FEMALE/MALE TEACHERS	NA	637/587*	705.5/523	676/587	5,582/6,782
FULL-TIME/ PART-TIME TEACHERS	NA	1,070/15*	1,264/18.5	1,270/28	11,992/698
NEW POSITIONS	15	14	12	9	216
NEW PROGRAMS	12	11.5	18	27	189
RETIREMENTS	11	24	14	20	158
LEFT TEACHING	24	33	58	38	510
ALT. CERTIFIED/NON-LICENSED HIRES	2/NA	NA/27	24/15	32/13	356/106
POSITIONS TO FILL	NA	65	57.5	60	812.3
PROGRAMS CLOSED/POSITIONS LOST	NA	NA/10	12/12.5	6/7	51/71.7
UNFILLED FULL-TIME POSITIONS	5	8	8	6	72
UNFILLED PART-TIME POSITIONS	1	1	0	1	4
AGRICULTURAL EDUCATION GRADUATES	53	51	44	57	740
AGRICULTURAL EDUCATION GRADUATES TEACHING	33	27	30	35	556
AG ED MAJOR ENROLLMENT	192	NA	NA	183	3,142

*not all states reported



AGRICULTURE TEACHER SUPPLY AND DEMAND HIGHLIGHTS

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AGRICULTURAL EDUCATION DEGREE INSTITUTIONS

Visit the Teach Ag website at www.naae.org/teachag/college.cfm for program links

University of Connecticut
Storrs, CT

Delaware State University
Dover, DE

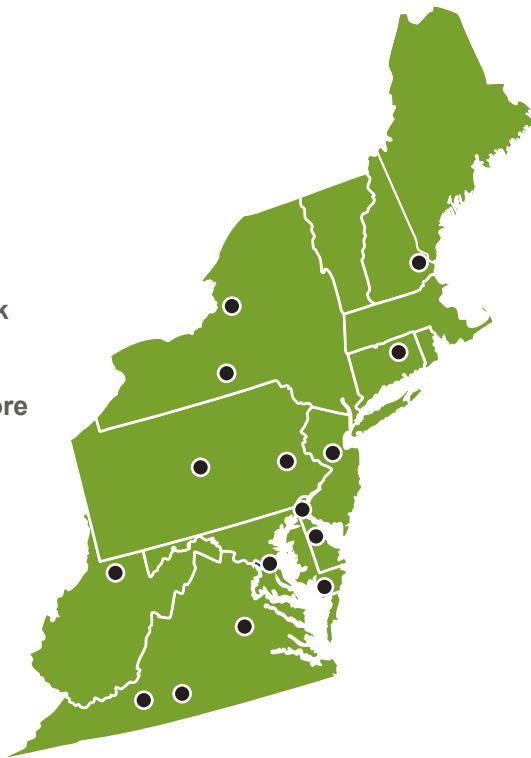
University of Delaware
Newark, DE

University of Maryland College Park
College Park, MD

University of Maryland Eastern Shore
Princess Anne, MD

University of New Hampshire
Durham, NH

Rutgers University
New Brunswick, NJ



Cornell University
Ithaca, NY

State University of New York at Oswego
Oswego, NY

Delaware Valley University
Doylestown, PA

The Pennsylvania State University
University Park, PA

Ferrum College
Ferrum, VA

Virginia State University
Petersburg, VA

Virginia Tech University
Blacksburg, VA

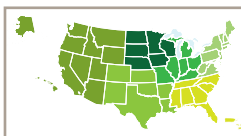
West Virginia University
Morgantown, WV

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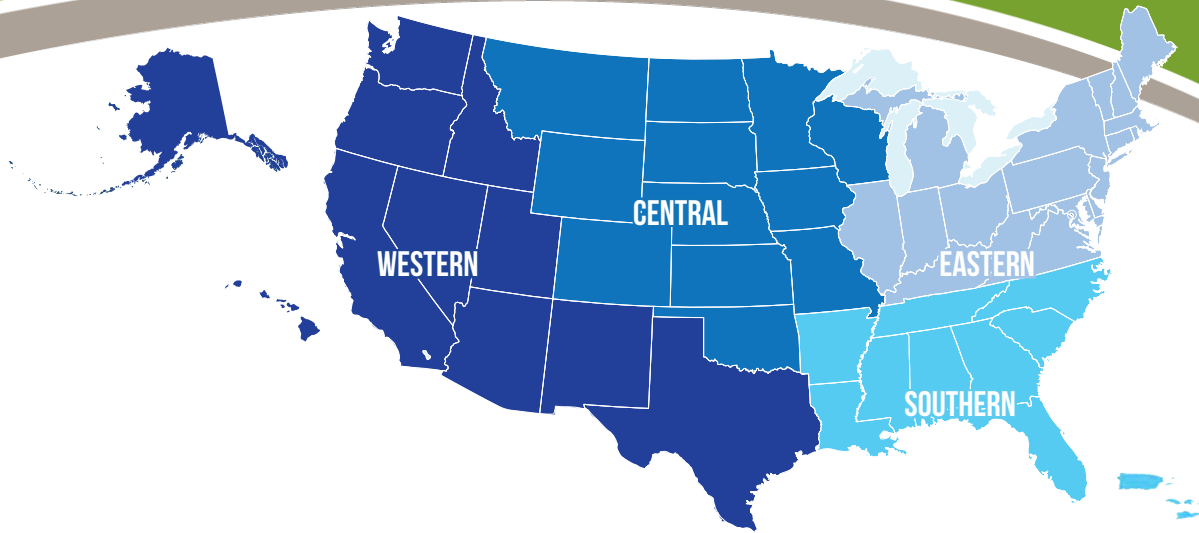


Testimonials

Appendix J

State-Level Supply and Demand Data by National FFA Region

2017 AGRICULTURE TEACHER SUPPLY AND DEMAND OVERVIEW FFA REGIONS



	WESTERN	CENTRAL	SOUTHERN	EASTERN	NATIONWIDE*
AVERAGE SALARY	\$43,666	\$37,106	\$40,691	\$46,162	\$43,093
EXTENDED CONTRACT DAYS	32	33	42	21	33
AG TEACHERS	4,217	2,710	2,926	2,837	12,690
AG PROGRAMS	2,091	2,226	2,176	1,978	8,471
FEMALE/MALE TEACHERS	1,906/2,061	1,084/1,626	1,215/1,711	1,377/1,384	5,582/6,782
FULL-TIME/ PART-TIME TEACHERS	3,930/287	2,627/83	2,640/286	2,795/42	11,992/698
NEW POSITIONS	110	27	46	33	216
NEW PROGRAMS	41	48	55	45	189
RETIREMENTS	47	42	34	35	158
LEFT TEACHING	181	103	105	121	510
ALT. CERTIFIED/NON-LICENSED HIRES	84/21	58/22	121/46	93/17	356/106
POSITIONS TO FILL	310	163.3	165	174	812.3
PROGRAMS CLOSED/POSITIONS LOST	17/28	7/8.7	20/20	8/15	51/71.7
UNFILLED FULL-TIME POSITIONS	46	3	17	6	72
UNFILLED PART-TIME POSITIONS	0	2	0	2	4
AGRICULTURAL EDUCATION GRADUATES	270	189	154	127	740
AGRICULTURAL EDUCATION GRADUATES TEACHING	217	141	108	90	556
AG ED MAJOR ENROLLMENT	1,112	784	614	632	3,142



AGRICULTURE TEACHER SUPPLY AND DEMAND HIGHLIGHTS

- The **demand** for agriculture teachers continues due to **program growth, expansion, retirements** and **openings**.
- School districts **value** the agricultural education model of rigorous **STEM** based classroom and laboratory instruction, experiential learning and leadership development.
- The **retention rate** of agriculture teachers is historically **high** at nearly **96%**.
- Individuals majoring in **agricultural education** are **increasing** even as other education content areas are experiencing decreases.
- The **conversion rate** of agricultural education graduates is at an all-time **high** of **75%**.
- The **majority** of **new** agricultural education majors are **Caucasian female**.
- School districts are hiring an unprecedented number of **alternatively certified** and **non-licensed teachers** to **fill** open positions due to **demand**.

www.naae.org/teachag

Smith, A. R., Lawver, R. G., & Foster, D. D. (2018). National Agricultural Education Supply and Demand Study, 2017 Executive Summary. Retrieved from: <http://naaeonline.org/Teacher-Supply-and-Demand/>

AGRICULTURAL EDUCATION DEGREE INSTITUTIONS

Visit the Teach Ag website at www.naae.org/teachag/college.cfm for program links

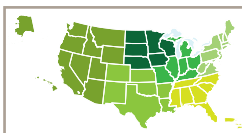
Auburn University Auburn, AL	Huntington University Huntington, IN	Montana State University-Bozeman Bozeman, MT	Middle Tennessee State University Murfreesboro, TN
Arkansas State University Jonesboro, AR	Purdue University Lafayette, IN	Brevard College Brevard, NC	Tennessee State University Nashville, TN
Arkansas Tech University Russellville, AR	Fort Hayes State University Hayes, KS	North Carolina A&T State University Greensboro, NC	Tennessee Technological University Cookeville, TN
University of Arkansas - Pine Bluff Pinebluff, AR	Kansas State University Manhattan, KS	North Carolina State University Raleigh, NC	University of Tennessee Knoxville, TN
Southern Arkansas University Magnolia, AR	Eastern Kentucky University Richmond, KY	University of Mount Olive Mount Olive, NC	University of Tennessee at Martin Martin, TN
University of Arkansas Fayetteville, AR	Morehead State University Morehead, KY	North Dakota State University Fargo, ND	Angelo State University San Angelo, TX
University of Arizona Tucson, AZ	Murray State University Murray, KY	University of Nebraska Lincoln, NE	Sam Houston State University Huntsville, TX
University of California, Davis Davis, CA	Western Kentucky University Bowling Green, KY	University of New Hampshire Durham, NH	Stephen F. Austin State University Nacogdoches, TX
California State University, Chico Chico, CA	University of Kentucky Lexington, KY	Eastern New Mexico State University Portales, NM	Sul Ross State University Alpine, TX
California State University, Fresno Fresno, CA	Louisiana State University Baton Rouge, LA	New Mexico State University Las Cruces, NM	Tarleton State University Stephenville, TX
Cal Poly - Pomona Pomona, CA	Louisiana Tech University Ruston, LA	Rutgers University New Brunswick, NJ	Texas A&M University College Station, TX
Cal Poly - San Luis Obispo San Luis Obispo, CA	McNeese State University Lake Charles, LA	University of Nevada - Reno Reno, NV	Texas A&M University - Commerce Commerce, TX
Colorado State University Ft. Collins, CO	University of Massachusetts Amherst, MA	Cornell University Ithaca, NY	Texas A&M University - Kingsville Kingsville, TX
University of Connecticut Storrs, CT	University of Maryland College Park College Park, MD	State University of New York at Oswego Oswego, NY	Texas State University - San Marcos San Marcos, TX
Delaware State University Dover, DE	University of Maryland Eastern Shore Princess Anne, MD	Central States University Wilberforce, OH	Texas Tech University Lubbock, TX
University of Delaware Newark, DE	Michigan State University East Lansing, MI	The Ohio State University Columbus, OH	West Texas A&M University Canyon, TX
University of Florida Gainesville, FL	Southwest Minnesota State University Marshall, MN	Wilmington College Wilmington, OH	Utah State University Logan, UT
Fort Valley State University Fort Valley, GA	University of Minnesota - Twin Cities St. Paul, MN	Northwestern Oklahoma State Alva, OK	Ferrum College Ferrum, VA
University of Georgia Athens, GA	University of Minnesota - Crookston Crookston, MN	Oklahoma State University Stillwater, OK	Virginia State University Petersburg, VA
Dordt College Sioux Center, IA	College of the Ozarks Point Lookout, MO	Panhandle State University Goodwell, OK	Virginia Tech University Blacksburg, VA
Iowa State University Ames, IA	Missouri State University Springfield, MO	Oregon State University Corvallis, OR	Washington State University Pullman, WA
University of Idaho Moscow, ID	Northwest Missouri State University Maryville, MO	Delaware Valley College Doylestown, PA	University of Wisconsin - Platteville Platteville, WI
Illinois State University Normal, IL	Southeast Missouri State University Cape Girardeau, MO	The Pennsylvania State University University Park, PA	University of Wisconsin - River Falls River Falls, WI
Southern Illinois University Carbondale, IL	University of Missouri Columbia, MO	University of Puerto Rico - Mayaguez Mayaguez, Puerto Rico	West Virginia University Morgantown, WV
Western Illinois University Macomb, IL	Alcorn State University Alcorn State, MS	Clemson University Clemson, SC	University of Wyoming Laramie, WY
University of Illinois Urbana, IL	Mississippi State University Mississippi State, MS	South Dakota State University Brookings, SD	

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Supply and Demand Data



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Appendix K

Annual Executive Summaries: 2014, 2015, 2016



National Agricultural Education Supply & Demand Study

Daniel D. Foster, Rebecca G. Lawver, Amy R. Smith

2014 Executive Summary

The National Agricultural Education Supply and Demand Study has been an ongoing project sanctioned and sponsored by the American Association for Agricultural Education (formerly the American Association for Teacher Educators in Agriculture) since 1965.

Beginning in 2014, Drs. Daniel Foster (Pennsylvania State University), Rebecca G. Lawver (Utah State University), and Amy R. Smith (University of Minnesota) were awarded a contract to coordinate efforts and conduct the national agriculture teachers' supply and demand research. Under their leadership, data will be collected on an annual basis (2014-2020). Supply and demand summaries will be provided to the AAEE executive committee annually, with a comprehensive report produced every three years.

Need for the Project

Stakeholders in the agricultural education profession need current, accurate estimates of the supply and demand for teachers of Agricultural Education to provide for meaningful policy decisions at all levels (Kantrovich, 2010). Teacher educators, agricultural education organizations, and state agricultural education staff need such data as well, for use in recruitment efforts of potential teachers of Agricultural Education.

Data Collection/ Methods

Every effort was made to streamline the process of supply and demand data collection and reduce burden to respondents. Instruments were reviewed and revised to clarify items, minimize repetition, and eliminate unnecessary content. Teacher educators at institutions with Agricultural Education teacher preparation programs were contacted for supply data, while state supervisors/executive secretaries were contacted for demand data. In each case, an online instrument was distributed via email using Qualtrics.

A total of 91 teacher educators representing 45 states provided supply data, resulting in an 88% response rate (N=103). Four states (Hawaii, Maine, Rhode Island, and Vermont) do not offer Agricultural Education teacher preparation. Data was not available from the following institutions: University of Arkansas – Pine Bluff, Fort Hays State University, University of Maryland – College Park, University of Massachusetts, College of the Ozarks, Missouri State

University, University of New Hampshire, Delaware Valley College, Middle Tennessee State University, Angelo State University, Prairie View A&M, and University of Wisconsin – Platteville.

A total of 47 states provided demand data, resulting in a 92% response rate (N=51). Data was not available from the following states: Massachusetts, Puerto Rico, Virginia, and Washington.

Key Findings

As of September 15, 2014, state supervisors reported a total of 7,424 school based agricultural education programs, with 10,874 teachers. Of that total, 1,366 new hires in school based agricultural education (SBAE) were reported. Table 1 identifies the source of new hires, according to data reported.

Table 1. Source of 2014-2015 new hires in SBAE (n=1,366)

Source	<i>f</i>	%
Licensed ag teacher (moved to new school)	449	32.9
Newly licensed undergraduate (prepared in-state)	378	27.7
Non-licensed individual	183	13.4
Newly licensed graduate (prepared in-state)	121	8.8
Other	109	7.9
Newly licensed undergraduate (prepared out-of-state)	86	6.3
Unknown	22	1.6
Newly licensed graduate (prepared out-of-state)	18	1.3

Of the 183 non-licensed individuals hired to teach school based agricultural education in 2014-2015, 82 were graduates of an agriculture program, 26 were graduates of an education program, 22 were unknown, 20 were from agribusiness, farming, or industry, 14 were from other areas of education, 9 were "other" and 1 was a graduate outside of agriculture or education. Nonetheless, additional teachers were still needed to meet demand in SBAE; state supervisors reported 86 full time and 10 part time vacancies as of September 15, 2014. Further, substantial growth and expansion in school based agricultural education occurred in 2014-2015, with 253 new positions and 162.5 new programs reported.

Despite program growth, 27 of 47 states reported a loss of programs or positions since 2011. On average, 67 positions and 45 programs were lost each year. Respondents from 39 states reported a total of 739 school based agricultural educators who taught in the 2013-2014 school year would not be returning to the classroom in 2014-2015. Table 2 identifies their reasons for leaving, if known.

Table 2. Reported reasons for leaving SBAE in 2014-2015 (n=739)

Source	<i>f</i>	%
Retirement	204	24.4
Employed in business/industry	118	14.1
Other	102	12.2
Not offered a contract/terminated	64	7.6
Employed in school administration	53	6.4
Employed in production agriculture/farming	49	5.9
Employed in another educational content area (outside of Ag ed)	41	4.9
Stay at home parent/caregiver	39	4.7
Moved out of state	21	2.5
Continuing education/grad school	15	1.8
Health	9	1.1
Unknown	8	1.0
Employed in postsecondary education	8	1.0
Employed in adult education/FBM	5	.6
Death	3	.3

A total of 87 Agricultural Education teacher preparation programs reported 717 license-eligible, program completers in 2014. Of these graduates, 440 were female, 251 male, and 26 not reported. Table 3 provides an overview of the ethnicity of program completers.

Table 3. Ethnicity of license-eligible program completers (n=691)

Ethnicity	Female	Male
African American/Black	4	7
American Indian/Alaska	3	1
Asian	2	0
Bi-racial/Multi	4	1
Hawaiian/Pacific Islander	0	3
Hispanic/Latino	22	16
White, Non Hispanic	405	223

Note: Ethnicity not reported for 26 program completers.

Of the 717 program completers in 2014, 536 were undergraduate completers, 47 post-baccalaureate program completers, and 68 graduate program completers. Table 4 outlines the post graduation employment plans of 2014 license-eligible program completers as reported.

*Table 4. Employment plans of license-eligible program completers (n=746)**

Source	<i>f</i>	%
SBAE in-state	469	62.8
Agribusiness	58	0.8
Graduate school	52	0.7
SBAE out-of-state	45	0.6
Unknown to teacher educator	41	0.5
Undecided	33	0.4
Extension	22	0.3
Teaching another subject	16	0.2
Farming	8	0.1
Military	2	0.1

**Note: Numbers as reported by key contacts in each state.*

Future Plans

As year one of this multi-year project concludes, minor revisions to the instruments will be made. Finally, continued collaboration with the American Association for Agricultural Education, the National Association of Agricultural Educators, Teach Ag Campaign, National Association of Supervisors of Agricultural Education, National FFA and Local Program Success Specialists will be critical and assist researchers in identifying and accessing the best source of data from each institution and/or state.

Kantrovich, A. J. (2010). *The 36th volume of a national study of the supply and demand for teachers of agricultural education 2006-2009*. West Olive, MI: Michigan State University. American Association for Agricultural Education.

For questions or concerns regarding this study, please email nsd@aaaeonline.org.

Note: Any data collected after the release of this executive summary will be included in the 2014-2016 three-year report.

Revised 3-1-15



National Agricultural Education Supply & Demand Study

Daniel D. Foster, Rebecca G. Lawver, Amy R. Smith

2015 Executive Summary

Since 1965, the National Agricultural Education Supply and Demand Study has been sanctioned and sponsored by the American Association for Agricultural Education (formerly the American Association for Teacher Educators in Agriculture). In 2014, Drs. Daniel Foster (Pennsylvania State University), Rebecca G. Lawver (Utah State University), and Amy R. Smith (University of Minnesota) were awarded a contract to coordinate and conduct the national agriculture teachers' supply and demand research. Under their leadership, data will be collected on an annual basis (2014-2020). This document is a summary of findings from the second year (2015) of data collection.

Need for the Project

At present, more than 30 states are experiencing a shortage of agriculture teachers (NAAE, 2015). In 2014-2015 alone, a deficit of more than 400 agriculture teachers was reported by state supervisors responding to the National Agricultural Education Supply and Demand Study (Foster, Lawver, & Smith, 2015).

To appropriately respond to such concerns, agricultural education stakeholders need current, accurate estimates of agriculture teacher supply and demand to provide for meaningful policy decisions at all levels (Kantrovich, 2010). Teacher educators, agricultural education organizations, and state agricultural education staff need such data as well, for use in recruitment efforts of potential agriculture teachers.

Data Collection/Methods

Following the collection of 2014 supply and demand data, efforts were made to clarify or operationalize terminology used, further refine the data collection process, thus reducing burden to respondents. Teacher educators at institutions with Agricultural Education teacher preparation programs were contacted for supply data, while state supervisors/executive secretaries were contacted for demand data. In each case, an online instrument was distributed via email using Qualtrics. Multiple follow-up contacts were made to each respondent and/or alternate contacts in some cases. The data collection timeline was adjusted in 2015, with instruments distributed in September rather than May, to better accommodate teacher educators and elicit more accurate data regarding program completer employment plans.

Supply of Agriculture Teachers

A total of 96 teacher education programs provided supply data, resulting in a 97% response rate (N=99). Six states (Hawaii, Maine, Nevada, New Hampshire, Rhode Island, and Vermont) and the Virgin Islands currently have no existing Agricultural Education teacher preparation programs. Data was not available from three institutions: Delaware State University, University of Arkansas – Pine Bluff, and University of Georgia – Tifton.

Of the 742 license-eligible program completers reported in 2015, 599 were undergraduate completers, 52 post-baccalaureate program completers, and 59 graduate program completers. Table 1 outlines the post graduation employment plans of the 2015 license-eligible program completers as reported.

Table 1. Employment plans of license-eligible program completers (n=742)

Source	f	%
SBAE in-state	446	60.1
SBAE out-of-state	66.5	9.0
Graduate school	65	8.8
Agribusiness	64	8.6
Teaching another subject	31.5	4.2
Extension	13	1.8
Unemployed	12	1.6
Unknown to teacher educator	12	1.6
Production agriculture	9	1.2
Military	1	0.1

**Note: Numbers as reported by state contacts.*

Teacher educators indicated that of the license-eligible program completers, 498 (67%) were female and 244 (33%) were male. Nearly 92% of all license-eligible program completers were reported as White, Non Hispanic, with 5% Hispanic/Latino, 2% American Indian/Alaskan, and less than 1% African American.

Demand for Agriculture Teachers

A total of 49 states and the Virgin Islands provided demand data, resulting in a 96% response rate (N=52). Demand data was not available for Puerto Rico or Massachusetts.

As of September 15, 2015, state supervisors reported a total of 8,167 school based agricultural education programs, with 11,834 teachers. Of the total number of teachers, 1462 (12%) were considered new hires in school based agricultural education (SBAE). Table 2 identifies the source of new hires, according to data reported.

Table 2. Source of new hires in SBAE (n=1462)

Source	<i>f</i>	%
Licensed ag teacher (moved to new school)	555	38.0
Newly licensed undergraduate (prepared in-state)	448	30.6
Non-licensed individual	207	14.2
Newly licensed graduate (prepared in-state)	96	6.6
Newly licensed undergraduate (prepared out-of-state)	79	5.4
Other	64	4.4
Unknown	8	0.5
Newly licensed graduate (prepared out-of-state)	5	0.3

Prior educational/employment experience was reported for 203 of the 207 non-licensed individuals hired to teach school based agricultural education in 2015-2016. In total, 104 were graduates of an agriculture program, 34 were graduates of an education program, 24 were from other areas of education, 21 were from agribusiness, farming, or industry, 14 were from other areas of education, 9 were graduates outside of agriculture or education, 6 were unknown, 2 retired educators, and 3 reported "other".

Nonetheless, additional teachers were still needed to meet demand in SBAE; state supervisors reported 72 full time and 8 part time vacancies as of September 15, 2015. Further, substantial growth and expansion in school based agricultural education occurred in 2015-2016, with 201.5 new positions and 145.5 new programs reported.

Despite program growth, 27 states reported a loss of programs or positions. A total of 75.4 positions and 42 programs were lost. Respondents reported a total of 901 school based agricultural educators who taught in the 2014-2015 school year would not be returning to the classroom in 2015-2016. Table 2 identifies their reasons for leaving, if known.

For questions or concerns regarding this study, please email nsd@aaaeonline.org.

Note: Any data collected after the release of this executive summary will be included in the 2014-2016 three-year report.

Table 3. Reported reasons for leaving SBAE (n=901)

Source	<i>f</i>	%
Retirement	248	27.5
Unknown	115	12.8
Employed in business/industry	96	10.7
Not offered a contract/terminated	89	9.9
Employed in school administration	65	7.2
Employed in production agriculture/farming	54	6.0
Stay at home parent/caregiver	42	4.7
Employed in another educational content area (outside of Ag Ed)	40	4.4
Moved out of state (still teaching Ag)	34	3.8
Employment in extension/non-formal education	31	3.4
Continuing education/grad school	23	2.6
Health	12	1.3
Employed in postsecondary education	12	1.3
Ag Ed state staff	11	1.2
Other	11	1.2
Employed in adult education/FBM	10	1.1
Death	8	0.9

Future Plans

Prior to data collection in 2016, additional measures will be taken to further refine the instrument, inserting definitions to help clarify terminology used (ex. license-eligible program completer, non-licensed). Additionally, Qualtrics functions will be enabled to immediately send respondents a summary of data submitted to facilitate checks for accuracy in a timely manner.

An annual supply and demand summary will be generated for 2016, in addition to a more comprehensive report compiling 2014-2016 data. Continued collaboration with the American Association for Agricultural Education, the National Association of Agricultural Educators, Teach Ag Campaign, National Association of Supervisors of Agricultural Education, National FFA and Local Program Success Specialists will be critical and assist researchers in identifying and accessing the best source of data from each institution and/or state.

References

Foster, D. D., Lawver, R. G., & Smith, A. R. (2015). *National Agricultural Education Supply and Demand Study, 2014 Executive Summary*. Retrieved from The American Association for Agricultural Education Website: http://aaaeonline.org/Resources/Documents/NSD_Summary_1_22_2015_Final.pdf

Kantrovich, A. J. (2010). *The 36th volume of a national study of the supply and demand for teachers of agricultural education 2006-2009*. West Olive, MI: Michigan State University. American Association for Agricultural Education.



National Agricultural Education Supply & Demand Study

Amy R. Smith, Rebecca G. Lawver, and Daniel D. Foster

Contributions by: Ellen C. Thompson, National Teach Ag Campaign



2016 Executive Summary

Since 1965, the National Agricultural Education Supply and Demand Study has been sanctioned and sponsored by the American Association for Agricultural Education (AAAE). In 2014, Drs. Daniel Foster (Pennsylvania State University), Rebecca G. Lawver (Utah State University), and Amy R. Smith (University of Minnesota) were selected to conduct the national agriculture teachers' supply and demand research. This document is a summary of findings from the third year (2016) of data collection.

Need for the Project

Numerous challenges facing school-based agricultural education include, but are not limited to, student enrollment, funding, and obtaining licensed teachers. Agriculture teacher preparation programs face related dilemmas such as shifting licensure requirements, challenging fiscal implications of pursuing a career in school-based agricultural education, and an absence of diverse teacher candidates.

While many stakeholders in agricultural education are aware of these challenges, additional research is needed to best determine a course of action. Current, accurate agriculture teacher supply and demand information will allow for meaningful, data-driven policy decisions at all levels.

Data Collection/Methods

Following the collection of 2015 supply and demand data, efforts were continued to refine the data collection process, incorporating operational definitions when needed and customizing validation settings to reduce mathematical errors in data entry. Teacher educators at institutions with Agricultural Education teacher preparation programs were contacted for supply data, while state supervisors/executive secretaries were contacted for demand data. In each case, an online instrument was distributed via email using Qualtrics. Multiple follow-up contacts were made to each respondent and/or alternate contacts in some cases. Both supply and demand instruments were distributed in September to accommodate teacher educators and elicit more accurate data regarding program completer employment.

Supply of Agriculture Teachers

A total of 101 teacher education programs provided supply data, resulting in a 100% response rate (N=101). Hawaii, Maine, Rhode Island, Vermont, and the Virgin Islands currently have no existing Agricultural Education teacher preparation programs.

Of the 772 license-eligible program completers reported in 2016, 596 were undergraduate completers, 60 post-baccalaureate program completers, and 58 graduate program completers. An additional 58 individuals completed licensure only. Table 1 outlines the post graduation employment plans of the 2016 license-eligible program completers as reported.

Table 1. Employment plans of license-eligible program completers (n=772)

Source	<i>f</i>	%
SBAE in-state	508	65.8
SBAE out-of-state	61	8.0
Graduate school	56	7.0
Agribusiness	47	6.0
Teaching another subject	29	3.7
Other	20	2.5
Unknown to teacher educator	16	2.0
Unemployed	11	1.4
Production agriculture	11	1.4
Extension	10	1.3
Military	3	0.3

**Note: Numbers as reported by state contacts.*

Teacher educators indicated that of the license-eligible program completers, 516 (67%) were female and 256 (33%) were male. Nearly 89.5% of all license-eligible program completers were reported as White, Non Hispanic, with 5.0% Hispanic/Latino, 0.7% African American, 0.6% American Indian/Alaskan, 0.6% Bi-racial/Multi-racial, 0.5% Asian, and 0.1% Native Hawaiian/Other Pacific Islander. Teacher educators reported Other or Unknown ethnicity for approximately 2.5% of license-eligible program completers.

Demand for Agriculture Teachers

A total of 49 states and the Virgin Islands provided demand data, resulting in a 96% response rate (N=52). No data was available for Washington and Puerto Rico. Additionally, a number of states were unable to provide all data requested.

As of September 15, 2016, state supervisors reported a total of 7,775 school-based agricultural education programs employing 11,557.5 teachers. Of the total number of teachers, 1476 (13%) were considered new hires in school-based agricultural education (SBAE). Table 2 identifies the source of new hires, according to data reported.

Table 2. Source of new hires in SBAE (n=1476)

Source	<i>f</i>	%
Licensed ag teacher (moved to new school)	539	36.5
Newly licensed undergraduate (prepared in-state)	405	27.4
Alternative licensure route completer	245	16.6
Newly licensed graduate (prepared in-state)	86	5.8
Non-licensed individual	80	5.4
Newly licensed undergraduate (prepared out-of-state)	60	4.1
Other	43	2.9
Unknown	10	0.6
Newly licensed graduate (prepared out-of-state)	8	0.5

Prior educational/employment experience was reported for non-licensed individuals hired to teach school-based agricultural education in 2016-2017. In total, 20 were graduates of an agriculture program, 4 were graduates of an education program, 33 were from agribusiness, farming, or industry, 22 were from other areas of education, and 1 was a graduate outside of agriculture or education.

Additional teachers were still needed to meet demand in SBAE; state supervisors reported 66 full time vacancies as of September 15, 2016. Further, substantial growth and expansion in school-based agricultural education occurred in 2016-2017 with 175 new positions and 149 new programs reported.

Despite program growth, 27 states reported a loss of programs or positions. A total of 98.5 positions were lost and 73 programs closed. Respondents reported a total of 721 school-based agricultural educators who taught in the 2015-2016 school year would not be returning to the classroom in 2016-2017. Table 3 identifies their reasons for leaving, if known.

Table 3. Reported reasons for leaving SBAE (n=721)

Source	<i>f</i>	%
Retirement	201	28.0
Employed in business/industry	112	15.5
Not offered a contract/terminated	81	11.0
Employed in another educational content area (outside of Ag Ed)	53	7.3
Employed in production agriculture/farming	51	7.0
Employed in school administration	41	5.6
Stay at home parent/caregiver	31	4.2
Moved out of state (still teaching Ag)	28	3.8
Unknown	26	3.0
Employed in postsecondary education	20	2.7
Continuing education/grad school	18	2.4
Ag Ed state staff	17	2.3
Employment in extension/non-formal education	15	2.0
Health	10	1.3
Other	10	1.3
Death	5	0.6
Employed in adult education/FBM	2	0.2

Future Plans

In addition to this annual summary document, a more comprehensive report compiling 2014-2016 data will be produced and disseminated to the profession. Continued collaboration with the American Association for Agricultural Education, the National Association of Agricultural Educators, Teach Ag Campaign, National Association of Supervisors of Agricultural Education, National FFA and Local Program Success Specialists will enable successful supply and demand data collection through 2020.

Recommended Citation

Smith, A. R., Lawver, R. G., & Foster, D. D. (2017). *National Agricultural Education Supply and Demand Study, 2016 Executive Summary*. Retrieved from: <http://aaaeonline.org/Resources/Documents/NSD2016Summary.pdf>

For questions or concerns regarding this study, please email nsd@aaaeonline.org.