# The University of Georgia

**Center for Agribusiness and Economic Development**

**College of Agricultural and Environmental Sciences**

# Perspectives from Georgia's Agribusiness Industry on the Market for College-Educated Workers

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# Executive Summary

## Key Findings

■ **Level of Employer Satisfaction: 67%** of employers were satisfied with the quality and **69%** were satisfied with the quantity of graduates produced by the University System of Georgia (USG). Overall, most employers were satisfied with the technical knowledge of graduates.

■ **College-educated Workforce Needs:** employers' largest need was for degrees in • Agribusiness/ Agricultural Economics/General Business • Public Relations & Communications, and • Information Technology (IT)/Computer Science.

■ **Employer Concerns:** respondents expressed concern about finding workers who can think, problem solve, communicate, provide quality customer service, and take initiative – i.e., employers were concerned about the levels of **"soft skills"** but not with the technical knowledge.

Recruitment and retention were most impacted by • employees' unrealistic promotion and/or salary expectations and • employee expectations that were not consistent with actual job requirements.

■ **Future Demand for College-educated Workforce: 1/3** of respondents speculated that having a college degree would be very important in the next 5 years; that number is expected to increase to 45% by the end of 10 years.

■ **Likely Impact of Technology and Innovations:** more than **75%** of respondents anticipated that future industry changes would impact the skills or training needed in the agribusiness workforce.

Likely innovations were expected in • alternative energy, • conservation, • food safety, • management and marketing, and • production-related technology.

■ **Employers' recruiting efforts:** were not limited to graduates from the USG or the state of Georgia. The main sources of graduates were the University of Georgia (UGA), Abraham Baldwin Agricultural College (ABAC), and Auburn University.

■ **Agribusiness Job Growth Projections:** 9,320 annual job openings are expected each year in Georgia to the year 2014 of which **1,045** will require college-level training in agribusiness fields.

■ **Agribusiness Degree Program Offerings:** 151 core and allied agribusiness programs were offered by USG institutions with the largest number of programs in • Engineering and Technology (28) • Forestry/ Natural Resources/Conservation (18) • Animal Sciences (18) and • Environmental Science (14).

■ **Average Annual Net Supply:** an adjusted net supply of **577** graduates were produced annually from the USG in agriculture and allied disciplines from 2002 – 2006 (adjustments made using USDA recommendations).

■ **Labor Market Gap:** a shortage of **468** workers annually. **B<u>ottom Line</u>**: supply of graduates available for work (net supply) = **55%** of projected demand - i.e., almost ½ of projected demand will go unfilled by USG graduates (based on trends since 2002). The largest shortfalls were in occupations related to government, education, and communication, while the smallest gap existed in scientific and engineering fields.

■ **Areas For Future Focus:** curriculum needs identified by **e**mployers were • broader training in a wide range of issues beyond "textbook" matters • a deeper understanding and responsiveness to changes in government policy and the development of niche markets for Georgia's specialty crops • additional training in economics and accounting principles, business ethics, statistics, and leadership.

■ **Key Recommendations from Employers:** Degree programs should offer more focus on • government/policy implications • business applications • internships and other "real world" types of preparation • immigration issues • production agriculture.

■ **Conclusion:** Employers are looking for workers with strong technical skills that are complemented by an appropriate level of professional skills so that graduates can successfully transition from school to work.

## Sponsorship and Outline of Study

In an effort to better link the University System's intellectual capital to the needs of Georgia's agribusiness enterprises, the University System of Georgia's Office of Economic Development (OED) commissioned the Center for Agribusiness and Economic Development (CAED) at the University of Georgia to conduct an Agribusiness Workforce Needs Assessment. As part of the project, a survey was conducted to gather information about the industry's current and future workforce needs and the types of skills required to support economic growth in Georgia. Specifically, the research was designed to ascertain the college-educated workforce needs of the agribusiness industry and the System's ability to meet those needs.[1]

This report summarizes the findings of the study completed by the CAED regarding the workforce needs of the agribusiness industry and includes the results from the survey administered to agribusiness stakeholders on their workforce needs.

## Report Summary

Results from the survey of agribusiness employers identified those 'soft skills' that are critical to the composition and size of the agribusiness workforce and that influence the quality of labor demanded. Although satisfied with the level of technical knowledge provided in the current college curriculum, employers were less pleased with the professional skills demonstrated by their college-educated workers, noting particular shortcomings in the levels of team building, initiative, leadership, and communication skills. From the results, it is evident that one of the challenges that must be faced in the agribusiness labor market is how to bridge the gap between the skills needed by agribusiness employers and the curriculum content of major agribusiness-related degree programs.

### 1. Labor Market Analysis Summary Statistics

The quantity of labor demanded is calculated by the Georgia Department of Labor (DOL) as the total annual openings from the creation of new jobs/positions due to business expansion (*employment growth*) and openings due to such factors as retirement, relocation, or labor shifts to other occupations and industries (*replacements*). Based on DOL projections, growth in total job openings in Georgia's agribusiness industry is projected to increase about 1.4% per year to the year 2014. Workforce growth projections for demand for college-educated workers in the agribusiness industry are slightly higher, at an annual growth rate of 1.5%.

A comparison of the data on the annual production of graduates from the University System of Georgia (USG) institutions and DOL projections on annual job openings revealed a deficit of almost 500 workers (468) for the more than 1,000 positions anticipated each year to 2014. Using those labor market estimates, the projected demand for college-educated workers with the requisite technical knowledge and "soft" skills will exceed the projected supply generated by the University System. The adjusted supply of graduates[2] is projected to meet only 55% of the projected demand, meaning that, based on current trends, almost ½ of projected demand will go unfilled by graduates from the USG.

The largest workforce gaps are projected to be created in education, communication, and governmental services (a shortage of 251 workers) while scientific and engineering occupations are anticipated to have the smallest deficits of just over 50 workers annually.

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1 A copy of the report submitted to the Board of Regents can be obtained at http://www.icapp.org/pubs/agribusiness_workforce.pdf

2 The net supply of graduates was calculated by adjusting the supply of graduates reported by the USG to account for such factors as graduates who do not enter the workforce and graduates who pursue advanced degree programs. Adjustments to the labor demand estimates from the DOL were made to reflect the fact that jobs in the agribusiness industry may be filled by graduates who hold degrees in non-agribusiness or allied programs.

### 2. Major Source of Employees/ Supply of Graduates

Georgia agribusiness employers typically look to the University of Georgia (UGA) and Abraham Baldwin Agricultural College (ABAC) as primary sources of employees to fill their vacant positions. Other universities in Georgia, including Georgia Southern University, Georgia Institute of Technology, and Georgia College and State University, also serve as sources of supply of graduates. However, employers' recruiting efforts are not limited to graduates from the USG or the state of Georgia, as almost ¼ of respondents indicated that their recruitment efforts included universities outside of Georgia, including Auburn University, Ohio State University, Middle Tennessee State University, and North Carolina State University.

### 3. Summary of Findings about Graduates

Employers appeared to be more concerned about the quality of college-educated applicants, in terms of the match between their skill sets and the job requirements, than with the quantity of graduates in the labor pool. Although no severe labor shortages were projected in the University System's ability to meet the demand for college-educated labor in the agribusiness industry, what may be the bigger challenge is meeting the industry's needs for critical thinking skills, leadership/initiative, and communication skills in new hires. Most respondents indicated that the growth of their companies was not limited by either the quality or quantity of graduates produced in Georgia. However, that level of satisfaction does not transfer to their perceptions about graduates' skills or with the depth of preparation provided by employers' perceptions of an otherwise knowledge-based curriculum. Of particular concern to respondents was their perception that graduates are ill prepared for the workplace in terms of job requirements and salary and promotion opportunities. As stated by a survey respondent, efforts are needed to "bridge the gap between academics and the real world, preferably by building partnerships with industry."

### 4. Recruitment and Retention Concerns

Employers have developed diverse strategies for finding college-educated applicants for positions. They are relying less on graduate placement resources available at colleges and more on internal promotions and employee referrals. GeorgiaHIRE was not a resource with which employers were familiar; 85% of respondents had not used those services to reach college-educated applicants. There was also a low level of reliance on college career fairs and placement offices, although the reason was not apparent. Employers were inclined to seek alternative recruitment strategies for reaching college-educated applicants and were not limited to the traditional outlets provided by colleges. However, they were open to exploring closer contacts with universities in their search for qualified applicants who are college-educated. Employers were optimistic that established internship programs and access to a university-managed resume bank would be somewhat or very important to the growth of their companies. Respondents emphasized the need for the growth of programs that offered students opportunities for more hands-on experience and courses in production management, government and policy, and agricultural business technology.

## Future Implications

Survey participants were very clear in expressing their opinions that existing skill shortages are urgent and must be addressed through the expansion of hands-on industry experience provided through internships and similar learning opportunities. Further, many participants stressed the need for the creation of curricula that are flexible and responsive to changes in the structure of Georgia's agribusiness industry. The results of the study suggest that significant returns on investment can be earned from building agribusiness curricula that marry adaptability to industry changes while maintaining the current level of technical and scientific knowledge imparted in the existing curricula.

Survey participants frequently echoed the lack of opportunity to provide input into curricula and their interest in reaching qualified applicants in a cost-effective manner. That so few of the respondents

depended on resources within the University System to meet their recruitment needs or have had any formal contact with the institutions about program design or course content speaks to the need for enhanced public/private partnerships between the University System and the agribusiness employers. As Georgia's competitive advantages change with national and global competition, the link between higher education and industry needs will be all the more important in ensuring that graduates possess the skills and knowledge needed to support agribusiness industry trends.

## Acknowledgements

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# The Demand for College-Educated Workers by Georgia's Agribusinesses

**Introduction**

The labor market analysis contained in this report explores the survey responses and existing labor market data that provide answers to three key questions as follows:

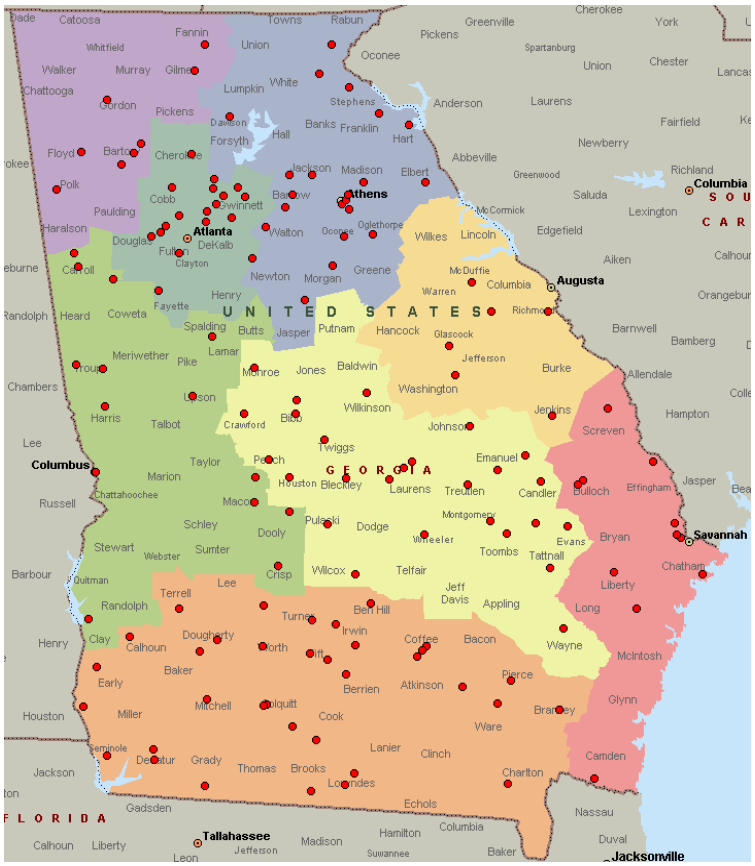
- What is the likely source and size of future employment demand from the agribusiness industry for college-educated workers?

- How does the demand for college-educated workers compare to the supply of graduates produced by the System in key agribusiness degree programs?

- Does the USG have the capacity to support Georgia's long-term college-educated workforce needs by producing graduates who possess the knowledge and skills desired by agribusiness employers?

## Broad Description of Survey Participants

**Chart 1 – Geographic Location of Survey Respondents**




Survey respondents represented a diverse geographic region across the State, covering a large share of Georgia (Chart 1). Diversity was also reflected in the NAICS categories represented among the survey respondents. Relatively speaking, the largest group of respondents represented the "green industry" (including landscaping and landscape design, horticulture, and turf grass management) at 13.6%, while agro-tourism firms represented only 2.5% of the total respondents (Table 1). The only categories not represented were the mining and construction and utilities subsectors whose individual impacts on Georgia's economy are less than 1/2 of 1% (0.4%).

**Table 1 – Distribution of Respondents by Agribusiness Enterprise Categories**

| Agribusiness Enterprise Categories | Response Percent | Response Count |
|---|---|---|
| Green Industry | 13.6% | 27 |
| Wood Product Manufacturing | 11.1% | 22 |
| Agricultural Product Manufacturing | 9.0% | 18 |
| Professional, Scientific, and Technical Services | 9.0% | 18 |
| Agricultural Chemical & Machinery Manufacturing | 8.5% | 17 |
| Farm Suppliers and Food Wholesale and Retail Distributors | 7.5% | 15 |
| Crop Production | 7.0% | 14 |
| Animal Production/Processing | 6.5% | 13 |
| Administration and Education related to Agricultural Production | 5.5% | 11 |
| Pulp and Paper Manufacturing | 5.5% | 11 |
| Forestry and Logging Operations | 4.0% | 8 |
| Agricultural Finance and Risk Minimization | 3.5% | 7 |
| Support Activities for Agricultural Production | 3.5% | 7 |
| Farm Product Warehousing and Storage | 3.0% | 6 |
| Nature-based/Agro-tourism | 2.5% | 5 |
| ***Total*** | ***100.0%*** | **199** |

**Company Demographics; Current Size of College-educated Workforce**

Responses to the question about the current size of their Georgia-based workforce revealed that the median number of employees in Georgia was 78 workers while the comparable number for the companies' U.S. locations was 154 employees. Overall, the requirements for a college degree for full-time positions were higher for U.S. operations (15.3%) as compared to positions located in Georgia (13.9%). On average, positions in administration and education were more likely to require a college degree (47.3% in Georgia and 57.5% nationally) when compared to the total group of respondents. Positions in animal production/processing, crop production, and wood product manufacturing were less likely to require a college-educated workforce.

**Table 2 – Current Size and Degree Requirements of Agribusiness Workforce**

| Median | % Degreed Positions in Georgia | % Degreed Positions in U.S. | Approx. Number of Employees in Georgia | Approx. Number of Employees in U.S. |
|---|---|---|---|---|
| **Median of All Respondents** | **13.9%** | **15.3%** | **78** | **154** |

## Broad Outline of Survey Results

Results from the survey of agribusiness employers[3] provided much insight into the qualitative analysis by identifying those 'soft skills' that are critical to the composition and size of the agribusiness workforce and that influence the quality of labor demanded. From the results, it is evident that one of the challenges that must be faced in the agribusiness labor market is how to bridge the gap between the skills needed by agribusiness employers and the curriculum content of major agribusiness-related degree programs.

[3] Detailed tables, by agribusiness enterprise categories, can be accessed at the Center's website (URL: www.caed.uga.edu).

Although satisfied with the level of technical knowledge provided in the college education received by employees, employers were less pleased with the professional skills demonstrated by their college-educated workers, noting particular shortcomings in the levels of team building, initiative, leadership, and communication skills. Employers appeared to be more concerned about the quality of college-educated applicants in terms of the match between their skill sets and the job requirements than with the quantity of graduates in the labor pool. Although no severe labor shortages were projected in the University System's ability to meet the demand for college-educated labor in the agribusiness industry, what may be the bigger challenge is meeting the industry's needs for critical thinking skills, leadership/initiative, and communication skills in new hires. Most respondents indicated that the growth of their companies was not limited by either the quality or quantity of graduates produced in Georgia. However that level of satisfaction does not transfer to their perceptions about graduates' skills or with the depth of preparation provided by an otherwise knowledge-based curriculum.

**Employers' Perspectives on the College-educated Workforce**

Survey participants expressed overall satisfaction with the quality of education received by college graduates. Approximately 2/3 of the respondents indicated that growth of their companies was not limited by lack of access to quantity or quality of college graduates (Tables 3). However, there were significant differences among enterprise categories with regard to those impacts. Employers in administration and education related to agricultural production, agricultural chemical and machinery manufacturing, and the green industry indicated that expansion plans had been significantly impacted by the quality and quantity of graduates.

**Table 3 – Impact of the Quality and Quantity of Graduates on Expansion Plans**

| Average Responses: All Respondents | Yes - A lot | Yes - Some | Yes - A little | No | Number of Responses |
|---|---|---|---|---|---|
| Quality of Graduates | 2.2% | 16.1% | 14.4% | 67.2% | 170 |
| Quantity of Graduates | 3.1% | 13.2% | 15.1% | 68.6% | 149 |

On the other hand, almost 90% of companies involved in agricultural product manufacturing and wood product manufacturing responded that neither the quality nor quantity of graduates had any noticeable impact on their expansion plans.

A review of the results of the survey suggested that many of the respondents were concerned about having access to the right kinds of employees who possessed the right combination of technical knowledge and professional skills. Participants expressed their opinions that these skill shortages are urgent and must be addressed through the expansion of hands-on industry experience provided through internships and similar learning opportunities. Further, many participants stressed the need for the creation of curricula that are flexible and responsive to changes in the structure of Georgia's agribusiness industry.

**Demand for College-Educated Workers**

The demand side of the market for college-educated workers in the agribusiness sector is influenced by two factors:

1. The estimated numbers of workers needed to produce the projected demand for agribusiness products and services (quantity of labor demanded); and
2. The ability of the higher education system to graduate a college-educated workforce that reflects the kinds of skills sought by agribusiness employers (quality of labor demanded).

Taking these two factors into consideration, the demand from agribusiness employers varied widely in terms of both types of degree/subject matter foci and the types of skills needed by agribusiness enterprise categories. The results of the analyses are summarized below.

**1. By Specific Subject Matter:**

When asked about specific subject matter needs, the majority of respondents (56%) indicated that a degree in a specific subject matter was not required for entry-level positions in their companies. Only 2% responded that a specific subject matter is required for all entry-level positions. Agricultural finance and risk minimization businesses were most likely to require a degree in a specific subject matter for entry level positions while the converse was true for nature-based agro-tourism enterprises. Generally, the more specialized the agribusiness enterprise, the more likely the respondent was to require a specific subject matter degree field.

**Table 4 – Requirement of a College Degree in a Specific Subject Matter for Entry-level Positions**

| Average Responses: All Respondents | Yes - All | Yes - Most | Yes - Some | No | Number of Responses |
|---|---|---|---|---|---|
| Degree Required in Specific Subject | 2.1% | 10.3% | 31.3% | 56.4% | 185 |

For those employers who require a college degree in a specific subject matter, the most popular degree programs were those in business (agribusiness, general business, or agricultural economics). More than 75% of the employers who required that degree for one or more position openings in their companies indicated that at least 25% of their positions required a degree in those fields. On the other hand, of the employers who had one or more openings that required a food science degree, fewer than 10% reported that all or almost all of their position openings would require a degree in that field. Other fields reported included economic development, engineering, government relations, management, and sales. The top three subject matter degree fields were Agribusiness/Agricultural Economics/General Business, Public Relations & Communications, and IT/Computer Science.

**Table 5 – Top Three Most Likely Subject Matter Degrees Requirements for Positions for which a College Degree is Required**

| Average Responses: All Respondents | Top Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| Top Degree Requirement | Agribusiness/Agricultural Economics/General Business | Public Relations & Communications | IT/Computer Science |
| Total Number of Responses | 111 | 95 | 88 |
| Number and % of Responses Indicating Degree Required for 51% or More of Positions | 58 (52.3%) | 43 (45.3) | 31 (35.2%) |
| Note: multiple selections were permitted so totals exceed # of respondents | | | |

**2. By Company Growth Expectations Over the Next Five Years**

Within the agribusiness sector, the number of job openings for occupations requiring a college degree (associate degree level and above) is expected to increase at a rate just slightly faster (1.5%) than that for all occupations and educational levels for the overall agribusiness economy (1.4%). By 2014, the demand for college-educated workers in the agribusiness industry is expected to reach 17% of the total agribusiness workers, in part due to the increase in the annual openings from growth.

Approximately 30% of the respondents expected their general and college-educated workforces to grow at a rate similar to that of the overall agribusiness industry as projected by the DOL (more than 6% over

the five year period) while roughly 60% projected a rate slower than that projected by the DOL.[4] These differences may be based on the fact that the survey respondents have a shorted projection time frame and more recent economic data on which to base their projections. Only 3% expected their general workforce numbers to decrease. This projected decrease was largest for businesses involved in administration and education related to agricultural production, support activities for agricultural production, and pulp and paper manufacturing.

With regard to their college-educated workforce needs, approximately 1/3 of the respondents expected their college-educated workforces to grow at a rate similar to that of the overall agribusiness industry as projected by the DOL (more than 6% over the five year period) while roughly 55% projected a rate slower than that projected by the DOL. None of the respondents expected their demand for college-educated workers to decrease over the next five years although increases of 2% or less were projected by a majority of businesses involved in animal production and processing, crop production, support activities for agricultural production, and pulp and paper manufacturing.

**Table 6 – Company Growth Expectations Over the Next Five Years**

| Average of All Respondents | Increase 6% or More | Increase 3-5% | Increase 2% or Less | Decrease | Don't Know/ Not Sure | Number of Responses |
|---|---|---|---|---|---|---|
| General Workforce | 29.1% | 15.3% | 43.4% | 3.2% | 9.0% | 179 |
| College-educated Workforce | 32.0% | 12.2% | 42.5% | 0.0% | 13.3% | 170 |

### 3. By Soft Skills

When asked about specific skills and attributes likely to be in demand, responses mentioned ranged from customer service skills to critical thinking/problem solving. On the whole, oral communication skills was the most required or preferred attribute demanded by respondents, followed by business ethics, critical thinking/problem solving, and ability to demonstrate initiative. Employers also valued customer service skills among those required or preferred skills/attributes that college-educated employees should bring to the work place. Foreign language capabilities and study abroad experience were not perceived to be critical skill needs among the respondents. The need for communication skills (written and/or oral) was identified by all categories of agribusiness enterprises. In addition, business ethics, customer service, and leadership were reported as a priority by almost all agribusiness enterprise categories. Although prior work experience and interpersonal/cultural diversity skills were ranked in the bottom five among required or preferred skills, more than half of respondents considered them to be valuable skills that employees should possess.

**Table 7 – Top Skills/Attributes Identified as Required or Preferred by 90% or More of Respondents**

| Skills/Attributes 100% Required or Preferred | Number of Responses Required or Preferred | % of All Responses |
|---|---|---|
| Oral communication | 178 | 96.7% |
| Business ethics | 176 | 95.7% |
| Critical thinking/problem solving | 176 | 95.1% |
| Initiative | 175 | 95.6% |
| Customer relations | 174 | 94.6% |
| Leadership/team building skills | 173 | 94.0% |
| Office software/computer competency | 169 | 91.8% |
| Written communication | 163 | 90.6% |

[4] This assumes a simple average over the five year period and ignores the effects of compounding.

### 4. By Innovation Prospects

Future technological changes in the agribusiness industry are projected to have some impact on the levels of skills or training needed in the agribusiness workforce for more than 75% of the survey respondents (responses other than "no"). Of the respondents, thirty four provided more details about the likely changes that include changes in information technology, bio energy, sustainability, waste management, and marketing (summarized in Table 9). Employers in pulp and paper manufacturing, agricultural product manufacturing, and wood product manufacturing were less likely to anticipate innovations that would impact their skills or training needs than those in administration and education related to agricultural production and animal production/processing. Employers in agricultural chemical & machinery manufacturing, professional, scientific, and technical services, and forestry and logging operations anticipated a moderate amount of changes that were likely to impact their workforce needs.

**Table 8 – Projections of Anticipated Changes in Technology and Innovation**

| Average Responses: All Respondents | Yes - A significant number | Yes - A moderate amount | Yes - A few | No |
|---|---|---|---|---|
| **Anticipated Changes** | **10.2%** | **32.8%** | **32.2%** | **24.9%** |
| **Number of Respondents** | **18** | **58** | **57** | **44** |

**Table 9 – Examples of Types of Anticipated Changes in Technology and Innovation**

| Anticipated Technology Changes and Innovations | Examples of Expected Changes |
|---|---|
| Alternative Energy | i. Biofuel from forest operations<br>ii. Alternative energy sources |
| Conservation | i. Sustainability and organics<br>ii. Energy conservation |
| Food Safety | i. Food distribution safety/Safety and Quality Foods (SQF)<br>ii. New food applications to improve shelf stability |
| Management and Marketing | i. Office management/time management<br>ii. Marketing of value-added or organic products |
| Skill Needs | i. More training for workers in operating fertigation systems<br>ii. Knowledge of waste-energy solutions and engineering software<br>iii. New machinery skills such as new pulping technology |
| Technology | i. Computerization of farmers' grain tickets and records<br>ii. Transportation technology<br>iii. Precision agriculture<br>iv. Nanotechnology; Artificial Intelligence (AI); mapping skills |

### 5. By Future Trends

In looking forward to the short and long runs, employers perceived that it will be important for employees to hold college degrees. Nearly 1/3 of respondents speculated that a college degree will be very important in the next 2-5 years.

**Table 10 – Expectations of Future College Degree Requirements, by Time Period**

| Average Responses: All Respondents | Very Important | Somewhat Important | Not Important | Don't Know/ Not Sure | Number of Responses |
|---|---|---|---|---|---|
| **In the Next 2 -5 Years** | **32.3%** | **42.3%** | **16.9%** | **8.5%** | **178** |
| **In the Next 6 - 10 Years** | **45.0%** | **37.2%** | **7.8%** | **10.0%** | **170** |

In the long run, nearly 45% of respondents felt that it would be very important for new employees to possess college degrees. The number who felt that it would not be important for new hires to hold college degrees fell from 17% in the short run to only 8% in the next 6-10 years. When analyzed by agribusiness enterprise categories, the data revealed major differences in the projections. Companies involved with agricultural finance and risk minimization, agricultural product manufacturing, forestry and logging operations, and wood product manufacturing reported significant increases in their expectations of the importance of a college-educated workforce in the long run as compared to the short run (responses to "very important"). For animal production/processing companies, while 36% felt that a college-educated workforce was not important in the next 2-5 years, that number fell to less than 17% in the long run.

### 6. By Future Program/Curriculum Needs

Survey participants were able to identify specific programs which may or may not prove to be helpful to the growth of their companies. Only a few programs were identified as being potentially "very helpful" to employers. The programs identified as being "very helpful" to a large number of the respondents were production management and agricultural business technology. In addition, government and policy was potentially "very helpful" to respondents. The numbers were almost evenly split on alternative fuel with 45% indicating that offering a program in that discipline would be somewhat to very helpful while 55% did not think it would be helpful or were unsure of its impact on the growth of their companies. Overall, the strongest support appeared to be for offering programs in production management, agricultural business technology, government and policy, and resource conservation.

**Table 11 – Top Four Subject Matter/Emphases Deemed "Helpful" to Future Agribusiness Growth**

| Average Responses: All Respondents | Top Choice | 2nd Choice | 3rd Choice | 4th Choice |
|---|---|---|---|---|
| **Subject Matter Most Helpful to Future Growth** | **Production management** | **Ag business technology /computers in ag** | **Government and policy** | **Resource conservation** |
| **Number of Responses and % of All Responses** | **117** (73.6%) | **96** (60.0%) | **85** (54.1%) | **80** (51.3%) |
| Based on responses to answer options "very helpful" and "somewhat helpful"<br>Note: multiple selections were permitted so totals exceed # of respondents | | | | |

### Factors Affecting Respondents' Demand for College-educated Workers

### 1. Workplace and Employee Characteristic Concerns that Limit Expansion

Various problems were reported by the respondents who disclosed the nature of the impacts of the quality and quantity of graduates on their companies' business expansion plans. A summary of the responses is provided in Tables 12 A and 12 B below. Workplace issues covered such topics as difficulty in filling rural positions, increased expectations and workloads for current employees because of inability to fill positions, and the unattractiveness of agriculture to younger workers.

**Table 12 – Summary of Issues Raised by Respondents that Limit Business Expansion**

**A: Workplace Concerns**

| Sample Comments Made by Survey Respondents About Workplace Issues that Limit Expansion |
|---|
| Forced to leave positions unfilled because of labor shortage |
| Difficulty filling positions in rural and remote counties, especially with county agents |
| Reliance on internal technical/non-college-educated staff to fill management positions – this has impacted growth because of the lack of leadership and interpersonal skills to deal most effectively with customers and partners |
| Longer work days and careers required for skilled professionals because of difficulty finding qualified workers |
| Working our skilled professionals longer because young people aren't attracted to an agriculture future |
| Reduced FTE'S - few replacement hires when people retire |
| Hard to find applicants that are workforce ready |
| Fully field-trained forestry workers are hard to find |

### B – Employee Characteristic Concerns

| Sample Comments Made by Survey Respondents About Employee Characteristics that Limit Expansion |
|---|
| Lack of diversity of graduates |
| Unrealistic expectations among many college (tech school) graduates who are unprepared to work in a multi-cultural environment, and are unwilling to adapt. They easily become disenchanted with the difficulty of the work, the cultural challenges, and the inability to immediately apply textbook concepts to actual work. Planning a future on this volatility is next to impossible. |
| Inadequate level of technical knowledge in forestry |
| A lack of broad perspective and knowledge in food industry |
| Graduates not workforce ready |
| Graduates are unwilling to go into our field because it sometimes requires long hours, … and getting their hands dirty |
| A lack of work ethic |

On the other hand, employers described graduates as having unrealistic workplace and promotion expectations, lacking in work ethic, and lacking the ability to transfer "textbook" knowledge to workplace applications. Overall, the general criticism was that graduates were not "workforce ready".

Similarly, unrealistic employees' promotion and/or salary expectations were the single most significant factor in employer's ability to recruit and retain college-educated workers, affecting more than 1/3 of all respondents. Expectations about job requirements and a lack of interest in relocating also posed problems for employers in recruiting and hiring college graduates. On the other hand, the lack of prior work experience was least problematic to employers, with fewer than 20% of respondents indicating that this issue was moderately or significantly important.

**Table 13 – Top Employee Characteristics Impacting Recruitment and Retention, by Rank**

| Most Likely Responses: Average of All Respondents | Top Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Employee Characteristics with Largest Impacts** | **Unrealistic promotion and /or salary expectations** | **Expectations inconsistent with job requirements** | **Lack of interest in relocating** |
| **Number of Responses and % of Responses** | **62** (38.5%) | **48** (29.8%) | **37** (23.6%) |
| Based on frequency of responses of more than 50% of recruitment efforts. Multiple responses possible. | | | |

The extent to which these issues will impact the demand for college-educated workers in the long run is yet unclear. However, based on the recommendations offered for consideration by the respondents, employers anticipate that solutions to the issues will be sought by the University System for the benefit of the agribusiness labor market.

### 2. Recruitment and Retention Strategies

Employers have developed diverse strategies for finding college-educated applicants for their vacant positions. They are relying less on graduate placement resources available at colleges and more on internal promotions and employee referrals. GeorgiaHIRE was not a resource with which employers were familiar; 85% of respondents had not used that service to reach college-educated applicants. There was also a low reliance on college career fairs and placement offices as recruitment tools.

**Table 14 – Recruitment Strategies Employed by Survey Respondents, by Rank**

| Most Likely Responses: Average of All Respondents | Top Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Top Recruitment Strategies** | **Promote from within** | **Referrals from employees** | **Personal contacts at universities** |
| **Number of Responses and % of Responses** | **67** (42.1%) | **37** (23.4%) | **29** (18.8%) |
| Based on frequency of use of more than 50%. Multiple responses possible. | | | |

Other recruitment outlets included industry contacts and the Internet, suggesting that employers are inclined to seek alternative recruitment strategies for reaching college-educated applicants and are not limiting themselves to the traditional outlets provided by colleges.

Employers looked to institutions both within and outside of Georgia to find qualified college-educated employees although they had the greatest success in recruiting graduates from the University of Georgia, Abraham Baldwin Agricultural College (Georgia), and Auburn University (Alabama). Employers were less successful in their hiring efforts from Fort Valley State University or Georgia Institute of Technology. However, this difference in success rates should not be interpreted as a reflection of the quality of the graduates or of their performance in the workplace but likely based on the total number and types of programs offered, and the numbers of students matriculating through the programs. The survey did not inquire as to the reason for the differences.

**Table 15 – Likely Source of College-Educated Applicants, by Rank**

| Most Likely Responses: Average of All Respondents | Top Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Most Likely Sources of Applicants** | **University of Georgia** | **Abraham Baldwin Agricultural College** | **Auburn University** |
| **Number of Responses and % of Responses** | **58** (39.5%) | **28** (20.9%) | **22** (17.5%) |
| Based on frequency of use of more than 50%. Multiple responses possible. | | | |

Employers reported having had success in hiring college-educated employees from 34 schools in Georgia, of which 23 were USG institutions. The list also included 25 schools in other states. Of the USG institutions, Georgia Southern was mentioned 13 times while other institutions included Kennesaw State, Valdosta State, Augusta State, and University of West Georgia.

### 3. Filling Vacant Positions

Employers expressed having few difficulties filling the majority of vacant positions, except for positions in mid-level management, entry-level management, and business operations. Other recruiting areas for which problems were expressed included positions in marketing and sales. On the other hand, few employers experienced problems filling prior vacancies in waste management or communications and public relations. Other critical areas mentioned were statistics and agricultural mechanization.

**Table 16 – Top Difficulties Experienced in Filling Prior Vacant Positions, by Rank**

| Agribusiness Enterprise Categories: Average of All Respondents | Top Choice | 2nd Choice | 3rd Choice | 4th Choice |
|---|---|---|---|---|
| **Top Difficulties Experienced** | **Mid-level management** | **Entry-level management** | **Business operations** | **Marketing and sales** |
| **Number of Responses and % of Vacant Positions** | **29** (29.0%) | **26** (25.5%) | **24** (27.3%) | **22** (27.2%) |
| Based on responses of more than 50% of prior vacant positions. Multiple responses possible. | | | | |

### 4. Access to Graduates

Employers would welcome closer contacts with universities in finding qualified college-educated applicants. They were optimistic that access to a university-managed resume bank and established internship programs would be somewhat or very important to the growth of their companies. In addition, employers recommended the establishment of university career centers that would serve only those students majoring in agricultural-related degree programs. However, employers did not think that university-sponsored on-site instructional programs would be important to the future growth of their companies.

**Table 17 – Employer Perspectives on Program Needs to Improve Access to Graduates**

| Most Likely Responses: Average of All Respondents | Very Important | Not Important |
|---|---|---|
| **Program Needs** | **Established internship programs** | **University sponsored on-site instruction** |
| **Number of Responses and % of Responses** | **36** (21.4%) | **52** (31.5%) |
| Based on number of responses to answer options "very important' and "not important". | | |

## Current Employment in Georgia's Agribusiness Industry

For the state of Georgia, the labor market has shown consistent growth since 1990. According to reports from the Georgia Department of Labor, Georgia has ranked fourth among all states in net labor force growth and has been the sixth fastest growing labor force in the nation since 1990.[5] Georgia's overall labor market is projected to increase by more than 750,000 jobs by 2014, an annual increase of 1.7% (compared to 1.4% for the agribusiness industry).[6] However, growth will not occur in all sectors as many sectors will not add new positions and many sectors will experience negative growth rates. Yet, despite some negative growth rates, employment levels will grow due to replacement positions arising from persons leaving the workforce for reasons such as retirement. This is particularly significant for subsectors such as crop production where technology changes and increases in productivity limit job creation but where high replacement rates due to retirement or turnover create more job openings.[7]

The average quarterly employment data for 2006-2007 from the Bureau of Labor Statistics (BLS) show that the largest employer of labor in Georgia is the food and drinking services industry which employed 10% of Georgia's workforce. By BLS estimates, the agribusiness industry employed almost 50% of Georgia's total workforce.

**Table 18 – Georgia Labor Force Employment Estimates and Distribution, BLS, 2006 – 2007**

| | |
|---|---|
| Total Estimate of Workers, All NAICS subsectors | 3,375,227 |
| Total Estimate of Workers in Agribusiness Industry | 1,608,729 |
| Agribusiness Employment as % of all Georgia | 47.7% |
| Food and Drinking Services as % of Total Georgia Employment | 8.8% |

Source: U.S. Census Bureau, Local Employment Dynamics, Bureau of Labor Statistics

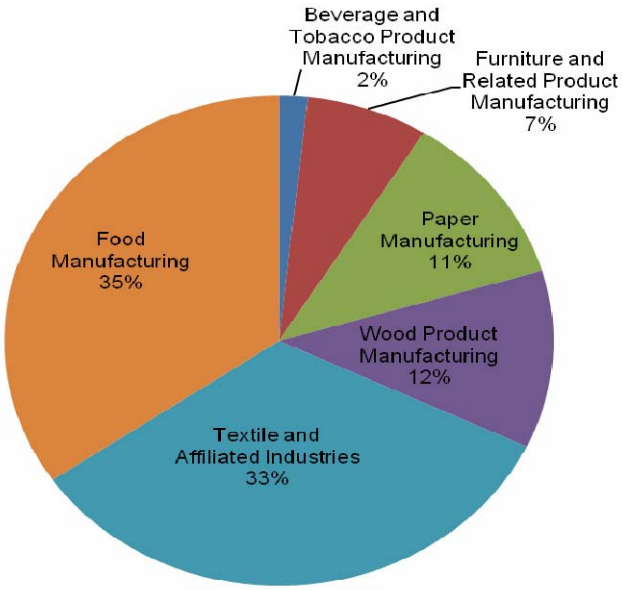
5 Georgia Annual Report Analysis, Georgia Department of Labor, Workforce Information & Analysis Division, p.4

6 According to the BLS, national occupational projections are developed on a 2-year schedule for national and state level data. While the current national projections cycle cover the 2006-2016 period, the most current state level data for Georgia covers the period 2004 -2014 (see www.bls.gov for more information).

7 Job openings = sum of new + replacement positions

**Chart 2 - Georgia Agribusiness-Related Manufacturing Employment, July 2006 to June 2007**

With an average quarterly employment of nearly 70,000 workers (69,792), food manufacturing is the largest employer within those manufacturing industries that hire agribusiness-related workers. On the other hand, the smallest workforce (3,402) is employed in those companies that are involved in beverage and tobacco product manufacturing. Despite losing an average of more than 2,000 jobs per quarter, the textile industry and affiliated product manufacturing companies are the second largest employers in agribusiness manufacturing.




## Long-term Projected Trends in the Demand for Labor in Georgia's Agribusiness Industry

The demand for college-educated agribusiness labor is defined in terms of the projected employment for those occupations identified by the Georgia Department of Labor and the Bureau of Labor Statistics (BLS) as typically requiring at least an associate's degree, and by CIP codes identified by the National Center for Education Statistics (NCES).[8] Projections from the DOL indicate that occupations linked to the agribusiness sector will experience an annual growth rate of 1.4% to 2014 but occupations for which a college education is typically required will grow at a rate just slightly higher (1.5%). As a result, the share of the college-educated workforce is projected to rise from 16.9% in 2004 to 17.0% of the total agribusiness workforce by 2014. Much of that increase will be due to the growth in the demand for graduates with bachelor's degrees or higher, which is expected to add 1,410 jobs annually from growth and replacements. Jobs for workers with associate's degrees are expected to increase by 170 annually.

**Table 19 – Long term Growth Projections by Occupation and Education**

| Long-Term Occupational Projections for Occupations in the Agribusiness-related NAICS Codes Georgia, 2004-2014 | | | | |
|---|---|---|---|---|
| **Type of Ag-related Occupation** | **Annual Openings from Growth** | **Annual Openings from Replacements** | **Total Annual Openings** | **Annual Growth Rate** |
| Total college occupations (certificates and above) | 706 | 902 | 1,600 | 1.5% |
| Total non-college occupations | 3,223 | 4,517 | 7,740 | 1.4% |
| **Total Georgia Agribusiness** | **3,924** | **5,405** | **9,320** | **1.4%** |

Source: Georgia Department of Labor. Note: Totals may not equal the sum of cells due to rounding and data suppression.

[8] SOC codes refer to the 2000 Standard Occupational Classification system used by to classify workers into occupational categories. CIP codes refer to the Classification of Instructional Programs used to identify instructional degree specialties (majors and minors). For more information, see www.bls.gov/SOC/ and www.nces.ed.gov/ipeds.

## Trends in the Supply of College-Educated Graduates for Georgia's Agribusiness Industry

### Introduction

Currently, the University System institutions offer a total of 151 degree programs and majors in agribusiness and allied disciplines, representing a diverse set of disciplines, ranging from the 'traditional" agribusiness fields, such as crop production and livestock husbandry, to many emerging fields such as agricultural tourism and biotechnology. In all, 15 of the System's institutions offered one or more degree programs in agribusiness or closely-related disciplines. Of those, 11 programs consisted of certificates of less than one year in such fields as agrosecurity, organic agriculture, and agricultural law. Another 34 programs were offered at the associate level (two-year programs), primarily in natural resources (forestry, wildlife, and environmental studies) and crop and animal production. It was of interest that no schools currently offer any programs in agricultural mechanization, an observation that did not go unnoted by several of the employers from whom comments were received.

According to statistics obtained from the University System of Georgia, there were more than 270,000 students enrolled in degree programs, 400,000 students enrolled in continuing education courses, and 40,000 faculty and staff employed throughout Georgia.[9] Enrollment has increased for most categories of students, except at the professional level, with growth in enrollment at the undergraduate level up almost 50% over the 2000 to 2006 period. These numbers compare very favorably to similar numbers for the U.S., with Georgia reporting higher growth rates at every level except professional students.

Overall, the largest number of degree programs was offered at the bachelor's level. Eight schools within the System's member institutions offered one or more degrees in core or allied agribusiness fields. By institution, the University of Georgia offered 79 of the 151 program offerings in agricultural and allied agribusiness disciplines while Abraham Baldwin Agricultural College offered 16 of the 35 associate degree programs.

**Table 20 – Degrees Offered by the University System of Georgia, by Fields/Majors, Summer 2008**

| Summary Fields/Majors | Number of Core & Allied Courses |
|---|---|
| Agricultural Education | 3 |
| Animal Sciences (including dairy & poultry) | 18 |
| Engineering and Technology | 28 |
| Environmental Science | 14 |
| Food Science/Food Technology | 4 |
| Plant/Crop Sciences and Plant Protection/Pest Mgt/Entomology | 13 |
| Agriculture/Agribusiness/Ag Economics/General Business | 7 |
| General Agriculture/Agricultural Production | 9 |
| Horticulture, Landscaping, and Turfgrass Management | 13 |
| Public Relations/Communications and Leadership | 3 |
| Forestry/Natural Resources/Conservation | 18 |
| Other Fields | 21 |
| **Total** | **151** |

[9] ICAPP website http://www.icapp.org/about/

## Assessing Agribusiness Labor Availability

Over the period 2002 to 2006, the University System of Georgia awarded an average of 501 undergraduate degrees and certificates and 253 graduate degrees and certificates in agribusiness-related (core and allied) programs. There were more than three times as many degrees awarded in related business-degree programs, many of whose graduates will supplement graduates from core and allied agribusiness majors in the agribusiness industry workforce. [10]

**Table 21 – Degrees Conferred by Award Level and Field, University System of Georgia, 2002 - 2006**

| Description | Total - All Award Levels | Total Undergraduate (including certificates) | Total Graduate |
|---|---|---|---|
| **Total - Core and Allied Programs** | **3770** | **2507** | **1263** |
| Average per year - Core and Allied Programs - all award levels (certificates and above) | 754 | 501 | 253 |
| Total Related programs – all award levels (including Business, Management, Marketing, and Related Support Services)[11] | 13,958 | 9.801 | 4,157 |
| **All University System of Georgia** | **213,545** | **158,328** | **55,217** |
| **Agribusiness as % of Total Degrees Conferred** | **1.8%** | **1.6%** | **2.3%** |

Although the University System institutions represent the major producer of agribusiness graduates in Georgia, approximately 2% of the more than 200,000 degrees awarded at System institutions over the 2002-2006 time period were awarded to graduates in core and allied agribusiness programs.

## Assessing the Agribusiness Labor Market – Workforce Gap Analysis

Using the framework and weights developed by the panel of experts associated with the national USDA agricultural workforce study,[12] gap analyses were performed using an available supply based on the average number of degrees conferred within the University System for the five-year period of 2002-2006 and the DOL employment projections. Adjustments were made to both the supply and demand sides of the projections based on the findings of the USDA study.[13] It is important to recognize the assumptions made by the Georgia Department of Labor in arriving at its projections and the data limitations imposed by suppressed data fields as these assumptions lead to an underestimation of the projected demand for college-educated labor.

Based on the average degree production over the 2002 – 2006 period, the calculations show an overall shortfall of 468 between the number of graduates and the projected annual openings for all degree levels. The gaps are largest for education, communication, and government services occupations and smallest for scientific and engineering occupations.[14]

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[10] In addition to data produced by the University System, additional data were collected from the Georgia Department of Labor, the Occupational Supply Demand System, and the Food and Agricultural Education Information System.

[11] This number represents only those CIP codes for programs selected as closely competitive with agribusiness degree programs.

[12] USDA, "Employment Opportunities for College Graduates in the U.S. Food, Agricultural, and Natural Resources System: 2005-2010."

[13] Ibid. p 2.

[14] The data conceal underreporting of job openings at the graduate level due to data suppression in the publicly accessible data for vocational teachers and economics teachers at the state level. The analysis assumed that all applicants are equally qualified for all open positions and it ignores issues of fit between job applicants and open positions.

**Table 22 – Comparison of Market for College-Educated Workers, by Occupational Cluster**

| Calculations of Projected Demand (by Employment Openings) and Supply of Graduates (Average Degrees Conferred), Adjusted for Market Factors Agricultural and Allied Programs by Occupational Cluster | | | | |
|---|---|---|---|---|
| **Occupational Clusters** | **5 Year Adjusted Average (Supply)** | **Georgia – Annual Employment Openings to 2014 (Demand)** | **GA Gap Openings Less Average Graduates** | **Employment Openings Less Average Supply(Qd-Qs)** |
| Scientific and Engineering | 141 | 195 | 54 | "Shortage" |
| Management and Business | 214 | 320 | 105 | "Shortage" |
| Agricultural and Forestry Production | 106 | 163 | 57 | "Shortage" |
| Education, Communication, and Governmental Services | 115 | 367 | 251 | "Shortage" |
| Total by Occupations | 577 | 1,045 | 468 | "Shortage" |
| Note: Numbers by category may not sum to the total due to rounding. | | | | |

**Summary and Conclusions**

Institutions within the University System of Georgia currently offer 151 degree programs and majors in agribusiness and allied disciplines ranging from certificates of less than one year to doctoral degrees. Although the majority of these programs are offered at the University of Georgia, diverse programs, primarily in allied disciplines, are offered throughout the University System. Considering all award levels, the System graduated an average of 754 students per year in these agribusiness and allied programs, a small portion of the University System's graduates of more than 40,000 annually over the 2002-2006 period. Based on the average degree production over that period, the calculations show an overall shortfall between the number of graduates and the projected annual openings of almost 500 graduates for all degree levels (assuming continued trends). Given the high mobility rates among the current workforce, the labor market should not be viewed exclusively in terms of regional or state boundaries or university systems. At the same time that persons earning degrees within Georgia may seek employment in other states or in international labor markets, graduates from other states may seek employment in Georgia. Thus, the gaps may be increased by out-migration of graduates or decreased by in-migration of workers to fill positions unmet by the number of graduates from within the University System of Georgia.

Employers who responded to the survey expressed overall satisfaction with the quality of education received by college graduates. However, many of the survey respondents expressed concern about having access to the right kinds of employees who possess the right combination of technical knowledge and professional skills. For the agribusiness sector, employers were less interested in the specific field in which employees' degrees were earned than they were in the soft skills acquired through their college education. Yet, the importance of a college degree was not minimized by the respondents, several of whom raised questions as to the issues that should be addressed in striking a balance between their workforce needs and the degrees offered/curricula adopted by the University System institutions. In the words of one individual interviewed, the task remains as to how to "bridge the gap between academics and the real world … to bring academics and work together" and how to focus on the "technical skills in the context of business management" so that students "see how classroom concepts play out in the real world" (quotes from survey participants).

The labor market shortages suggested by the previous analyses must be reviewed in light of the skills shortages suggested by the survey responses. From all indications, Georgia's agribusiness employers are looking for graduates who have an understanding of both the technical and business sides of agribusiness. The question that remains, however, is how their perspective will correlate with the state

and national projections of labor market shifts in the next six to ten years and whether or not the projected technological changes will significantly impact production and labor market patterns in the agribusiness industry.

The labor market success will depend on the adoption of successful strategies to both anticipate and respond to these changes. For instance, the congruence between the skills identified by the survey respondents and those identified by the DOL,[15] suggests that attention should be paid to the agribusiness curriculum in responding to employers' needs. As with all projections, concern must be expressed for the static nature under which such estimates are computed including the assumption that little change will occur in the fundamental economic structure. As we have seen in recent months, factors such as energy and food prices or salmonella outbreaks can have significant effects on consumer spending and the overall economy. In addition, population shifts and changes in college participation rates of high school students to college can also impact labor market patterns. While caution should be exercised in interpreting the projections, it is clear from the analyses that some consideration should be given to the degree programs offered and the content of these programs. Responding effectively to these perceptions and expressed needs will be a critical determinant of the degree to which the University System can effectively meet the needs of agribusiness employers. The results of the study suggest that significant returns on investment can be earned from building agribusiness curricula that marry adaptability to industry changes. However, such flexibility should not ignore the need to maintain the current level of technical and scientific knowledge imparted in the curricula that will be critical to the growth of Georgia's agribusiness industry.

## References


Boatright, Susan R. and John C. McKissick, 2007. "Georgia Farm Gate Vegetable Report." Compiled from information reported by Georgia Cooperative Extension County Agents. Center Report AR-08-02, Center for Agribusiness and Economic Development, UGA, April, 2008.

Commission for a New Georgia Work Force Development Task Force Final Report, Atlanta, GA, October, 2004. Ann Cramer, Chair.

Commission for a New Georgia Strategic Industries Task Force Final Report, August 2004, Atlanta GA. David C. Garrett III, Chairman.

FAEIS, Food and Agricultural Education Information System**,** interactive data base**.** College of Agriculture and Life Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA. Downloaded summer 2008.

Flanders, Archie, Sharon Kane, and John McKissick, 2008. "Economic Importance of Food and Fiber in the Georgia Economy." Center Report: CR-08-07, Center for Agribusiness and Economic Development, UGA, May 2008.

Georgia Department of Labor, Michael I. Thurmond, Commissioner, 2007. "Georgia Skills-based Employment Projections. Supply and Demand for Knowledge, Skills, and Generalized Work Activities over the Short-term from 2006-2008 & the Long-term from 2004-2014." Atlanta, GA, 2007.

USDA Cooperative State Research, Education, and Extension Services in cooperation with Purdue University, authored by Goecker, Allan D.; Gilmore, Jeffrey L.; Smith, Ella; and Smith, P. Gregory. "Employment Opportunities for College Graduates in the U.S. Food, Agricultural, and Natural Resources System: 2005- 2010." Blacksburg, VA, 2005.

U.S. Department of Labor, Bureau of Labor Statistics. Interactive database on employment and occupational projections, downloaded summer 2008 from http://www.bls.gov/oes/tables.htm.


[15] Georgia Skills-based Employment Projections, downloadable from www.dol.state.ga.us

# The Center for Agribusiness & Economic Development

The Center for Agribusiness and Economic Development is a unit of the College of Agricultural and Environmental Sciences of the University of Georgia, combining the missions of research and extension. The Center has among its objectives:

> To provide feasibility and other short term studies for current or potential Georgia agribusiness firms and/or emerging food and fiber industries.
>
> To provide agricultural, natural resource, and demographic data for private and public decision makers.

To find out more, visit our Web site at http://www.caed.uga.edu

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**J. Scott Angle, Dean and Director**
**College of Agricultural & Environmental Sciences**