AGRICULTURAL JOB MARKET REPORT

MAY 2024

PURDUE UNIVERSITY | Agricultural Economics

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EXECUTIVE SUMMARY

PURPOSE

Purdue University's Department of Agricultural Economics started collecting data on agricultural job postings during the summer of 2021. This data is collected every four weeks, and this report represents an overview of the agricultural job market over time. The data extends from June 2021 to May 2024. The Agricultural Job Market Report provides a measurement of the current state of the job market and discussions on any trends or changes.

ABOUT THIS REPORT

Google's job search engine pulls job postings from thousands of job boards. These job boards can be company-specific or common job postings sites like LinkedIn and Glassdoor.

JOB TRENDS

Agricultural Job postings were collected 27 times between May 20, 2022, and May 15, 2024. On average, there are 2689 new job openings every four weeks. There were 2332 new job openings on Google between April 17, 2024, and May 15, 2024. This is the second straight collection in which new jobs were below the two-year average. Current job openings have also decreased for the second straight month. The number of postings per opening was higher on May 15th than on April 17th.

SALARY

The average agricultural job salary since May 2022 is $49,237. On May 15, 2024, the average salary was $56,551, which marks the fourth straight scrapes in which the average salary has increased. Jobs in research, lending and finance, and animal science are among the highest-paying jobs in agriculture. Additionally, jobs in the Midwest had the highest average salary among the geographical regions, but remote jobs had higher average salaries.
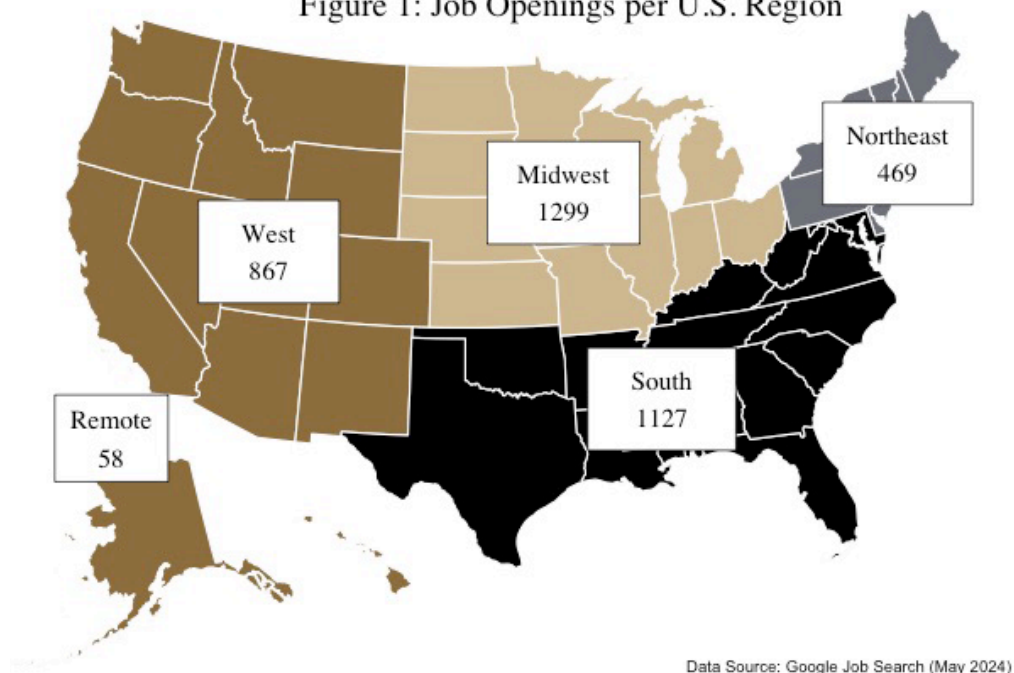
DESCRIPTION ANALYSIS

Experience is mentioned in the description of 95% of agricultural jobs, making it the most common job requirement on May 15, 2024. The most common types of job openings are lending and finance, natural resources, and engineering. Academic jobs were the least common.

JOB POSTINGS & OPENINGS

In the report, "job posting" refers to any separate occurrence of a job advertisement for an individual job. Any representation of a single specific job opportunity of a company will always be phrased as a "job opening." Some companies have existing career pages on their website but continue to post to job boards, like LinkedIn and ZipRecruiter. Companies post to multiple job boards to cast a wider net for potential hires.

Figure 1 illustrates the number of job openings for each region of the United States. There were 4021 job postings for 3820 unique jobs on May 15, 2024. The most job openings were in the Midwest and South. Over one-third of all job openings were in the Midwest. Relative to the collection on April 17, 2024, only jobs in the Northeast were higher. There were 58 remote job openings on May 15th, which is the lowest number of openings to date in 2024. This is also the case for job openings in the Midwest, South, and West. The ranking of regions in terms of total job openings was the same in the two most recent collections.
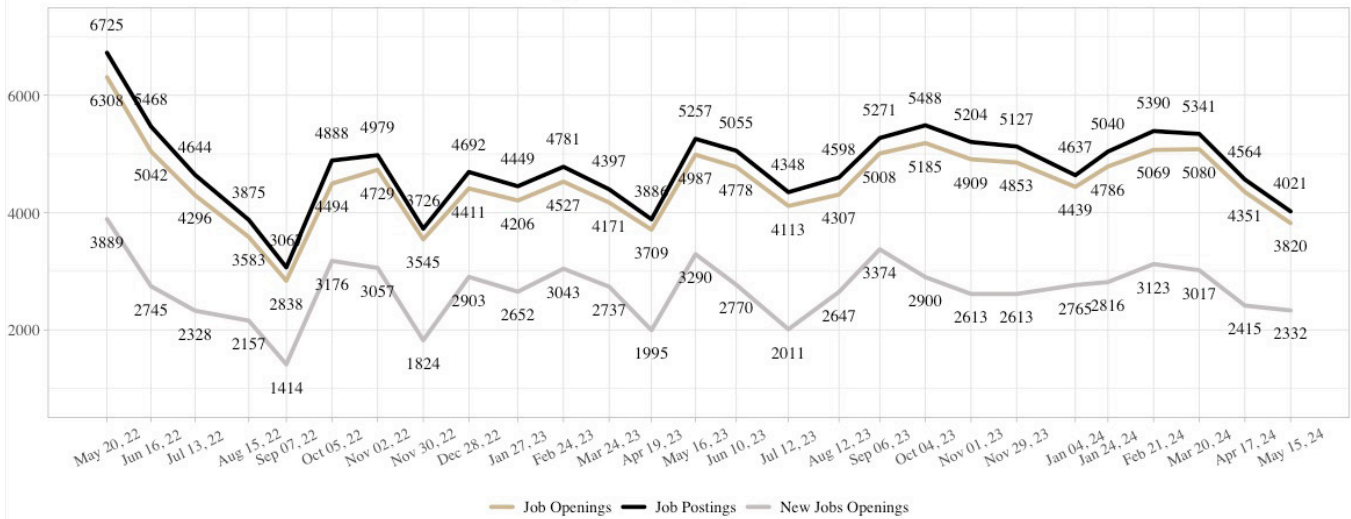

Figure 1: Job Openings per U.S. Region

Northeast 469

Midwest 1299

West 867

South 1127

Remote 58

Data Source: Google Job Search (May 2024)

JOB TRENDS

Figure 2 represents job postings collected every four weeks from May 20, 2022, to May 15, 2024. On average, there were 2689 new openings present every four weeks. On May 15, 2024, there were 2332 new jobs collected. This is the third straight collection in which new job openings have decreased. It is the lowest number of new job openings since July 2023. On average, there were 4502 job openings at each collection date. On May 15th, there were 3820 unique job openings, which is the lowest number of jobs since April 19, 2023. The number of job openings has now decreased for two straight months.
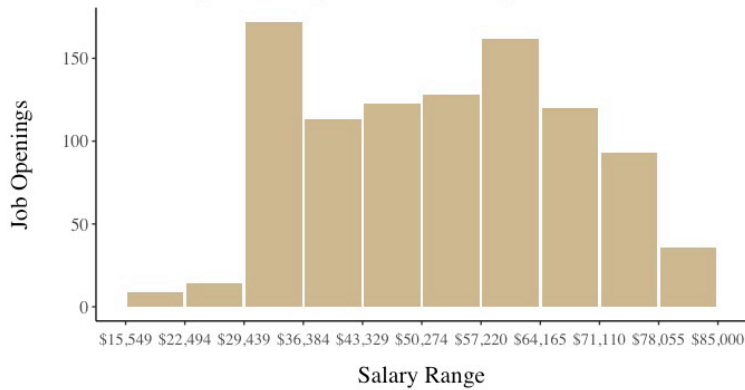

Figure 2: Agricultural Jobs

Data Source: Google Job Search (May 2022 - May 2024)

SALARY

The national median salary computed for the last 24 months was $47,1338/year. The average salary was $49,237 /year. Only 19% of job openings included salary information. Figure 3 illustrates the salary distribution among agricultural job openings for February of 2024. According to ZipRecruiter, the national average salary for agricultural-related jobs is $47,486/year.

Figure 3: Agricultural Salary Distribution

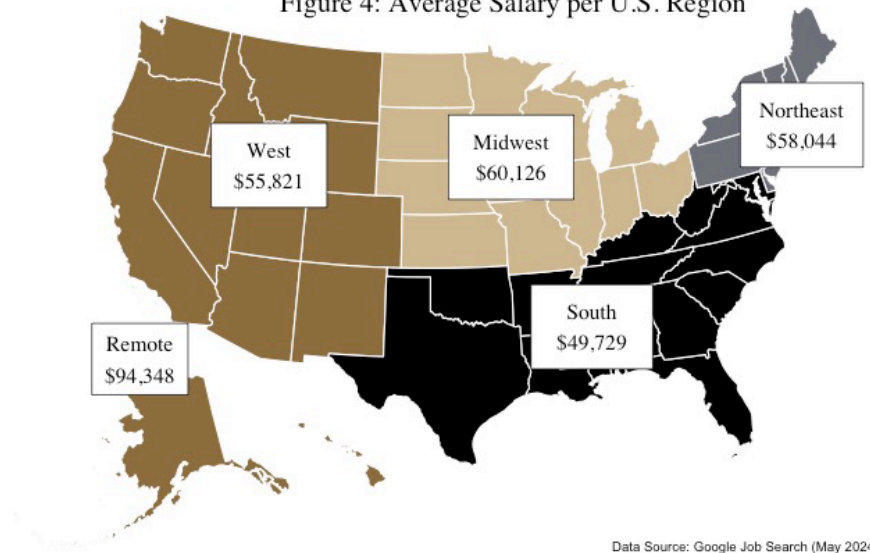Data Source: Google Job Search (May 2024)

SALARY BY SUBSECTOR

The distribution of salaries varies across the different subsectors of agricultural jobs, as shown in Table 1. Jobs in research ($60,087/year), lending and finance ($58,197/year), and animal science ($57,966/year) had the highest average salaries. Food Science jobs had the lowest average salary ($46,903/year). Economic jobs had the largest decrease in average salary of job openings between April 17th and May 15th, decreasing by $7,000. Animal science jobs' average salary increased by $5,000 between April 17th and May 15th. It is important to note that jobs can fall into multiple subsectors. It is also possible that specific subsectors exclude salaries more often or have outlier salaries that are excluded from analysis.

Table 1 Job Salary by Subsector	Average Salary	Median Salary
Academic	$55,788	$62,106
Economics	$56,125	$54,343
Education	$55,932	$55,026
Engineering	$56,039	$55,779
Sales	$56,874	$51,362
Agronomy	$56,487	$58,240
Animal Science	$57,966	$57,394
Farming	$56,488	$55,000
Food Science	$46,903	$46,160
Lending and Finance	$58,197	$58,612
Natural Resources	$57,204	$58,000
Research	$60,087	$60,473
Google Job Search (May 2024)		

SALARY BY REGION

Average salaries vary by region. Figure 4 illustrates the variation in average salaries across the U.S. Fully remote jobs have an average salary of $94,348/year. The Midwest has the highest average regional salary in job postings at $60,126/year, followed by the Northeast at $58,044 /year. The third highest average salary by region is the West at $55,821/year, followed by the South at $49,729/year. Relative to the average regional salaries on April 17, 2024, Average salaries in the Northeast and West decreased, and average salaries in the Midwest, South, and remote jobs increased.
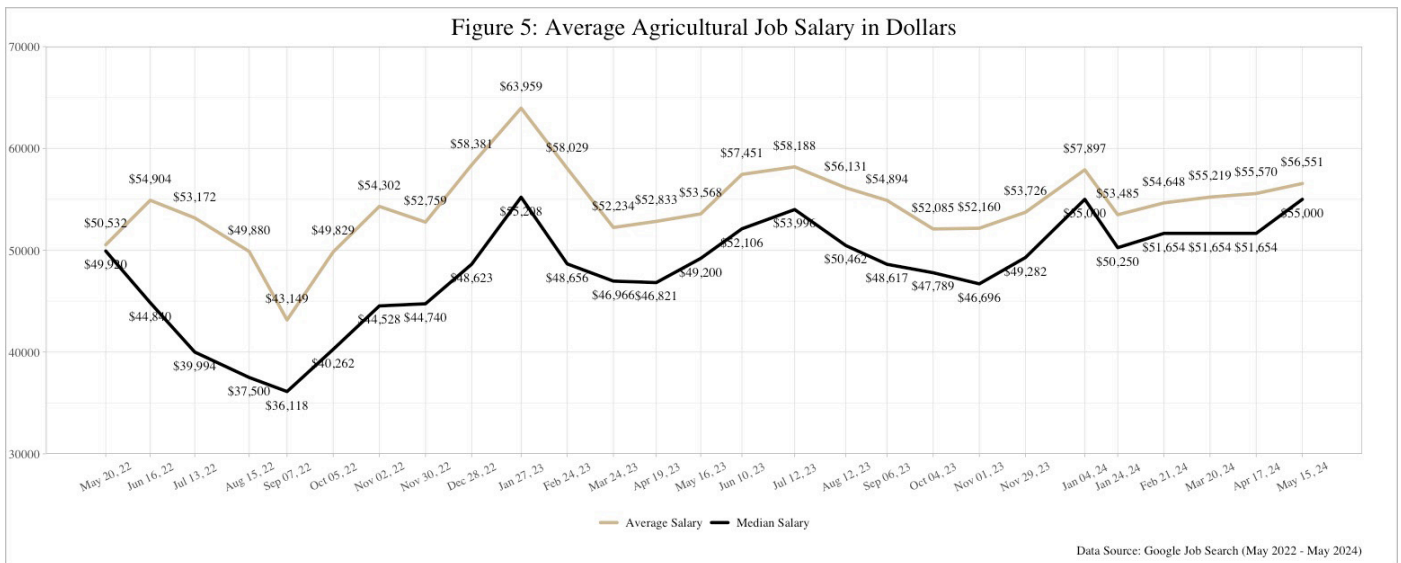

Figure 4: Average Salary per U.S. Region

West
$55,821

Midwest
$60,126

Northeast
$58,044

Remote
$94,348

South
$49,729

Data Source: Google Job Search (May 2024)

SALARY TRENDS

The average and median salary for observed agricultural jobs over the past two years are depicted in Figure 5. Most recently, the average reported salary for agricultural jobs was $56,551, and the median reported salary was $55,000. The median salary for May 15th matched the high for 2024 to date. There has not been a decrease in mean or median salary since January. Relative to May 2023, both mean and median salaries are higher in 2024.

Figure 5: Average Agricultural Job Salary in Dollars

Data Source: Google Job Search (May 2022 - May 2024)

DESCRIPTION ANALYSIS

INDUSTRY SUBCATEGORY

The job openings can be grouped by keywords mentioned within their descriptions. Based on company type or job responsibilities, it is possible for a job to fit in multiple different subcategories. For example, if a job on a farm requires feeding animals and operating machinery, it would be both animal sciences and farming. Table 2 reports the percentage of job openings that include each word or some variation. The top three subsectors are lending and finance, natural resources, and engineering.

Table 2 Industry Subsector	Job Openings that Mention
Academic	2.9%
Ag Education	47.5%
Agronomy	35.8%
Animal Science	21.2%
Economics	34.1%
Engineering	59.6%
Farming	58.2%
Food Science	23.4%
Lending and Finance	76.3%
Natural Resources	71.4%
Research	54.9%
Sales	56.5%
Google Job Search (May 2024)	

JOB REQUIREMENTS

Table 3 shows the average percentage of mentions for specific job requirements. Experience is required by 95% of jobs, while over 50 percent of jobs also require leadership, education, communication, and travel. Throughout the data collection, experience has always been the most common requirement. Leadership has been the second most common requirement since December 2022.

Table 3 Requirements	Job Openings that Mention
Communication	72.1%
Critical Thinking	17.9%
Data	49.0%
Education	75.4%
Experience	95.4%
Leadership	85.9%
Microsoft	43.2%
Programming	10.0%
Public Speaking	37.6%
Quantitative	43.0%
Remote Work	19.7%
Teamwork	46.4%
Travel	50.6%
Google Job Search (May 2024)	

DESIRED EDUCATION

Table 4 reports the percentage of job postings in agriculture that mention each desired level of education by applicants. To be included, the educational term must be explicitly written in a job description. A job can mention multiple levels of education. Generally, a low share of agricultural jobs indicates a required education. According to Table 4, a bachelor's degree, the most cited requirement, is mentioned in 28.4% of agricultural job postings. A Master's degree was more cited than a high school diploma for the first time since January.

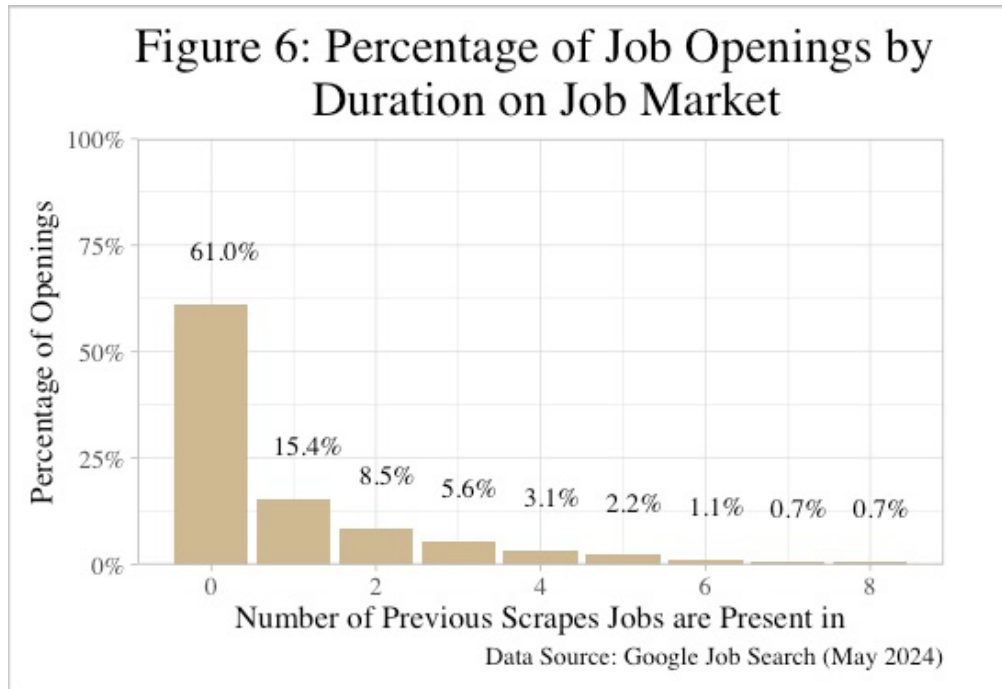| Table 4 Desired Education	Job Openings that Mention
High School	19.7%
Associates	5.9%
Bachelors	28.4%
Masters	23.5%
PhD	12.4%
Google Job Search (May 2024)	

JOB BENEFITS

Key terms related to job benefits are in Table 5. These include benefits, diversity, equal opportunity, tuition reimbursement, and 401(K). In the same way companies may not post salaries with online listings, they may also not report all the relevant benefits. These numbers should serve as guides to understand what is being displayed in job descriptions but are unlikely to fully capture the benefit packages offered by agricultural employers. We can see that 62% of agricultural job postings use some general terms of benefits in the description, but few reference specific benefits such as 401(K) and tuition reimbursement. Additionally, 92% of jobs included mention of equal opportunity. These levels of mentions have maintained relative stability throughout data collection.

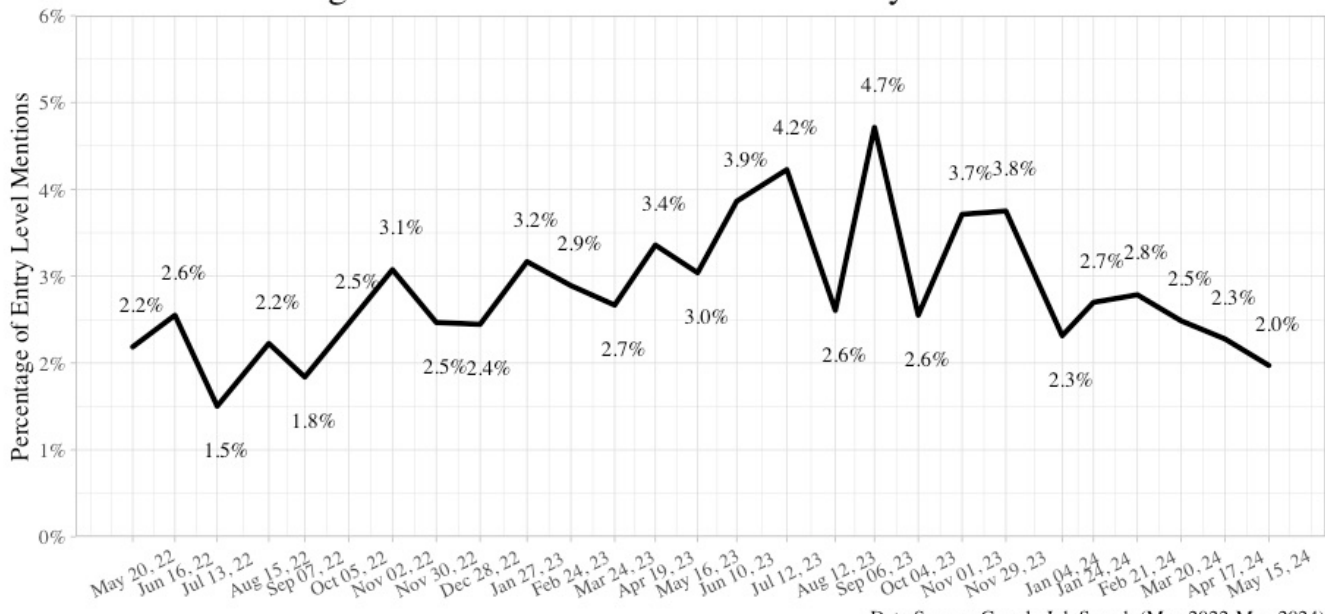| Table 5 Benefits	Job Openings that Mention
401(K)	9.6%
General Benefits	62.2%
Diversity	16.4%
Equal Opportunity	92.2%
Google Job Search (May 2024)	

DURATION ON JOB MARKET

The amount of time a job opening is listed can indicate how fast agricultural jobs are filled and how long agricultural employers search for potential candidates. Figure 6 shows the duration current jobs have been on the market. 61% of agricultural jobs were not present in the prior scrape. 15.1% of jobs have been present for more than two previous collections. Relative to April 17th, new jobs make up a larger percent of job openings on May 15th.

Figure 6: Percentage of Job Openings by Duration on Job Market
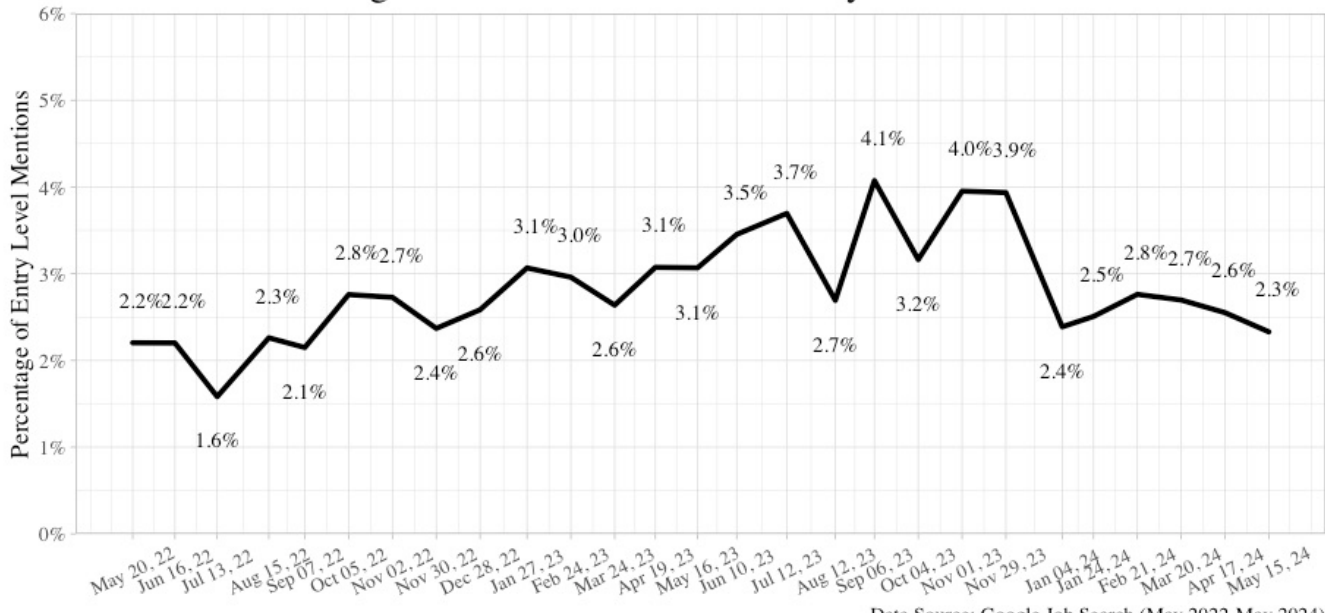
ENTRY LEVEL OPENINGS

With graduation season in full swing, many graduates are transitioning from school to the workforce. These graduates may have a job lined up or may be actively searching for employment. Either way, the new labor force participants will likely be filling entry-level positions. Figure 7 and Figure 8 show the percentage of new jobs and unique jobs that are entry-level positions over the past two years, respectively. 2.0% of new jobs and 2.3% of unique jobs mentioned entry-level work in their descriptions on May 15, 2024, respectively. These are both lower than the percentage of entry-level work in May 2023. In general, entry-level jobs have been less common in 2024 than in 2023.

Figure 7: New Jobs that Mention Entry Level Work

Data Source: Google Job Search (May 2022-May 2024)

Figure 8: Jobs that Mention Entry Level Work

Data Source: Google Job Search (May 2022-May 2024)

APPENDIX

DATA COLLECTION

For this research, data was collected through Google's job search engine utilizing an Application Programming Interface (API) provided by SerpApi. The data collected for the report includes job title, company name, description, salary (if posted), posting date, and original job board site name.

Not all online job postings appear on Google's job search engine and as a result the data discussed in the report should be treated as a sample of job openings existing within the agriculture industry. Indeed.com, the number 1 job site in the world, does not share job posting data with Google. Google's job search engine represents only a fraction of jobs posted online. Job postings can be posted on multiple job boards such as LinkedIn, Glassdoor, as well as company websites that allow Google's Cloud Talent Solution to analyze their job postings and display them on Google's job search engine.

Job postings that are available on Google's job search engine are curated to best fit the search terms of the user. The data in this report was collected using a general search term of "agriculture". Data presented in this report could impose bias that is specific to Google's job search engine data. Although possible, we believe the data collected is valuable for industry employers as a metric for comparing company hiring to the agricultural industry. Therefore, this report is an analysis of Google's data and is not fully representative of the agricultural job market.

Note that not all online job postings appear on Google's job search engine. Job postings can be posted on multiple job boards such as LinkedIn, Glassdoor, as well as company websites that allow Google's Cloud Talent Solution to analyze their job postings and display them on Google's job search engine. Job postings that are available to Google's Cloud Talent Solution are curated to best fit the search terms of the user. For this study, the search term included: "agriculture." This allows for a broad variety of jobs to be collected that exist within the agricultural job market. The data discussed in this report represents all job postings in the United States collected from Google's job search engine from June 2021 to November 2022. Google's job search engine is a conglomerate of multiple online job boards. Within the data, no jobs were collected from Indeed.com. Indeed.com does not allow Google access to their job board unlike other popular job sites. Google must be granted access to a company's job posting before advertising on Google's job search engine. Many job openings appear

on multiple job boards at a given time to get more advertising to potential employees.

Google's job search engine hosts thousands of job boards' data. Due to the immense amount of job boards available, job advertising is a competitive market. Companies seeking premium talent should post to the more popular job boards which produce more traffic.

DESCRIPTION ANALYSIS

From the data, each job posting has a description. Text mining was used to pull information from these descriptions, and it is possible to quantify the amount of mentions of specific characteristics. We were able to extract salary if not already mentioned, subsector information, requirements, and education. The categories were found using the "bag of words" technique. A list of words was created to represent any similar phrases and synonyms that represent a characteristic of interest. For example, quantitative skills would be marked as appearing in a job posting if terms appear in the description such as "quantitative", "analysis", "prediction", "mathematics", and "statistics." These terms are represented as nouns, verbs, and adjectives to catch all forms of context that might be represented in written language. Descriptions are then searched to evaluate if any of these terms were mentioned. If a term was mentioned once or more, the description was tallied as mentioning those specific characteristics.

Industry Subsector	Word List
Academic	Company name must contain "college", or "university" and Description must contain "professor", "dean", "adjunct", "tenure", "chair", "post doc", "postdoc", "faculty", "lecture", or "instructor"
Ag Education	"ag ed", "ag teacher", "agricultural teacher", "ag education", "agriculture education", "agricultural education", "educator", "teach", "teacher", "class", "classroom", "ffa", "4-h", "4h", "ag teacher", "teaching", "extension educator", "future farmers of america", "ext agent", or "extension"
Agronomy	"crop adviser", "agronomy", "agronomist", "corn", "soybeans", "soil", "seed", "crop", "grain", "cultivation", "greenhouse", "irrigation", "appraiser", "horticulture", "fertilizer", "pesticide", "fungicide", "herbicide", "applicator", "sprayer", or "botanist"
Animal Science	"animal", "veterinarian", "veterinary", "sheep", "cattle", "dairy", "swine", "pig", "pork", "beef", "livestock", "breed", "poultry", "equestrian", "horse", "bovine", "ranch", "farrowing", "feedlot", "grazing", "dairies", "milking", "egg gatherer", "herdsman", or "herdsperson"
Economics	"economic", "economist", "econometric", "statistician", "risk", "commodity", "price", "pricing", "policy specialist", "policy analyst",
Engineering	"ag systems management", "agricultural systems management", "asm", "engineer", "mechanic", "diesel", "equipment", "service tech", "service manager", "maintenance tech", "production tech", "electrical tech", "precision tech", "repair", "construction", "mechan", "weld", "precision", "digital ag", or "technology"
Farming	"farming", "farmhand", "planting", "plant", "harvest", "harvester", "farm", "forage", "combine", or "farmer"
Food Science	"food science", "food production", "meat packing", "butcher", "food distribution", "food handling", "food processes", "food product", "meat", or "produce"
Lending and Finance	"loan", "credit", "lender", "lending", "bank", "finance", "tax", "investment", "budget", "financial", "insurance", "account", "underwriter", "audit", or "collateral"
Natural Resources	"conservation", "wildlife", "environment", "environmental", "ecosystem", "forest", "tree", "raw materials", "nature", "energy", "pollution", "renewable", "fire", "climate", "natural", "sustainable", "resources", "surveyor", "fish", "microbiologist", "geologist", "biologist", or "biological"
Research	"research", "laboratory", "scientist", "chemist", or "lab"
Sales	"ag sales", "agricultural sales", "sell", "customer", "account", "commission", "sale", "seller", "buyer", or "buying"

Desired Education	Word List
High School	"high school"
Associates	"associate's", "associate degree", "associates's degree"
Bachelors	"bachelors", "bachelor's degree", "bachelor degree"
Masters	"masters", "master's degree", "master degree", "grad school", "gradschool", "graduate degree", "advanced degree"
PhD	"phd", "p.h.d", "ph.d", "doctorate", "doctoral degree"

Requirements	Word List
Communication	"communication", "communicate", "talk", "call", "email", "explain", "present", "speak"
Critical Thinking	"critical thinking", "problem solving", "analysis", "deliberate", "brainstorm", "reasoning"
Data	"data", "data analysis", "big data", "data analyst", "data wrangling", "data collection"
Education	"degree", "degrees", "college", "graduate", "undergrad", "doctorate", "phd", "bachelor", "bachelors", "education", "gpa"
Experience	"work experience", "experience", "training", "prior job", "familiarity", "practice", "knowledge", "background", "exposure to", "understanding of"
Leadership	"leadership", "lead", "leading", "leader", "manager", "management", "mentor", "supervision", "supervisor", "supervise"
Microsoft	"excel", "spreadsheet", "microsoft", "word", "powerpoint", "outlook"
Public Speaking	"public speaking", "speaking", "speech", "speeches", "speak", "present", "presentation"
Programming	"coding", "code", "python", "r ", "sql", "java", "c", "computing", "algorithm"
Quantitative	"quantitative", "analysis", "analyze", "analyst", "insight", "predict", "prediction", "predictive", "math", "mathematics", "statistics", "statistical", "optimization", "optimize", "regression"
Remote Work	"remote", "remote working", "home office", "work from home", "work at home"
Teamwork	"collaboration", "team", "teams", "teamwork"
Travel	"travel", "drive", "driving", "fly", "flying"

Benefits	Word List
General Benefits	"medical", "dental", "vision", "ad&d", "ad and d", "accidental death and dismemberment", "std", "short term disability", "short-term disability", "ltd", "long term disability", "long-term disability", "vacation", "holiday", "disability", "health insurance", "health savings account", "life insurance", "paid time off", "pto", "referral program", "retirement planning", "retirement"
Diversity	"diverse", "diversity"
Equal Opportunity	"equal opportunity", "without regard", "religion", "sex", "color", "age", "race"
Tuition Reimbursement	"tuition"
401(K)	"401k","401 k","401(k)"

States in Each Region from Figure 1 and 4	
Midwest	IN, IL, MI, OH, WI, IA, KS, MN, MO, NE, ND, SD
Northeast	CT, ME, MA, NH, RI, VT, NJ, NY, PA
South	DE, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AR, LA, OK, TX, DC
West	AZ, CO, ID, NM, MT, UT, NV, WY, AK, CA, HI, OR, WA

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