AGRICULTURAL JOB MARKET REPORT

JUNE 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 June 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 June 16, 2022, and June 12, 2024. On average, there are 2669 new job openings every four weeks. There were 3336 new job openings on Google between May 15, 2024, and June 12, 2024. This marks the first time since February that the number of new jobs has increased and the greatest number of new jobs that have been present since September 2023. Current Job openings increased for the first time in three months, and the number of postings per opening decreased for the first time in three months.

SALARY

The average agricultural job salary since June 2022 is $49,410. On June 12, 2024, the average salary was $55,280, which marks the end of a four-month streak of increasing average salaries. Jobs in academics, economics, and engineering 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.
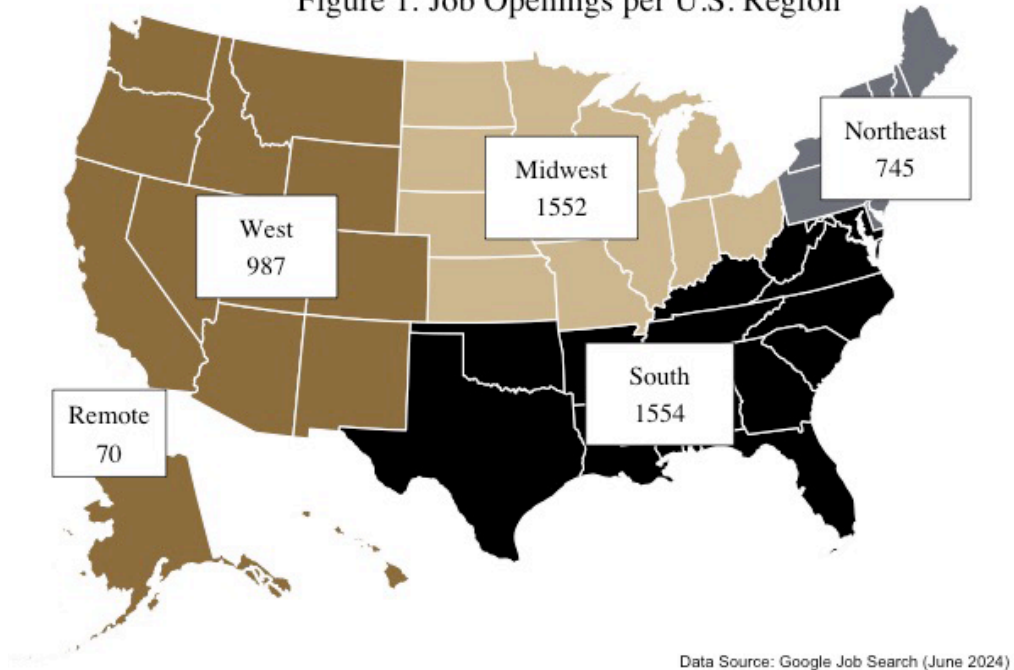
DESCRIPTION ANALYSIS

Experience is mentioned in the description of 97% of agricultural jobs, making it the most common job requirement on June 12, 2024. The most common types of job openings are lending and finance, research, 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 5159 job postings for 4908 unique jobs on June 12, 2024. The most job openings were in the South and Midwest. This was the first collection of 2024 that the Midwest did not have the largest number of job openings. Relative to the collection on May 15, 2024, job openings in all four geographical regions and remote job openings increased.
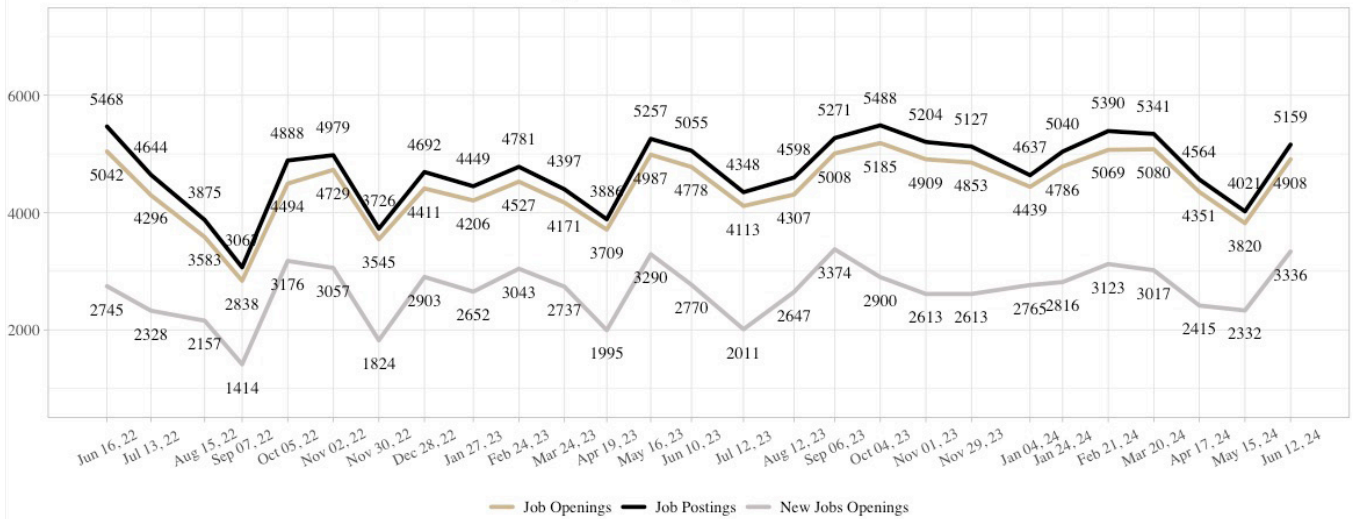
Figure 1: Job Openings per U.S. Region

Northeast
745

Midwest
1552

West
987

South
1554

Remote
70

Data Source: Google Job Search (June 2024)

JOB TRENDS

Figure 2 represents job postings collected every four weeks from June 20, 2022, to June 12, 2024. On average, there were 2669 new openings present every four weeks. On June 12, 2024, there were 3336 new jobs collected, which is nearly a 50% increase over the 2332 new jobs on May 15, 2024. This is the first time new job openings have increased since February 21, 2024, and it is the greatest number of new jobs present since September 2023. On average, there were 4450 job openings at each collection date. On June 12th, there were 4908 unique job openings, which ends the two-month streak of decreasing job openings.

Figure 2: Agricultural Jobs

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

SALARY

The national median salary computed for the last 24 months was $47,250/year. The average salary was $49,410 /year. Only 19% of job openings included salary information over the past two years. Figure 3 illustrates the salary distribution among agricultural job openings for February of 2024. Over 400 jobs have posted salaries between $34,899 and $41,282, and over 300 jobs have posted salaries between $54,048 and $60,432. In the most recent scrape, 36% of jobs had posted salaries. This is the highest percentage of jobs with posted salaries in the last two years. According to ZipRecruiter, the national average salary for agricultural-related jobs was $47,486/year on June 11th.

Figure 3: Agricultural Salary Distribution

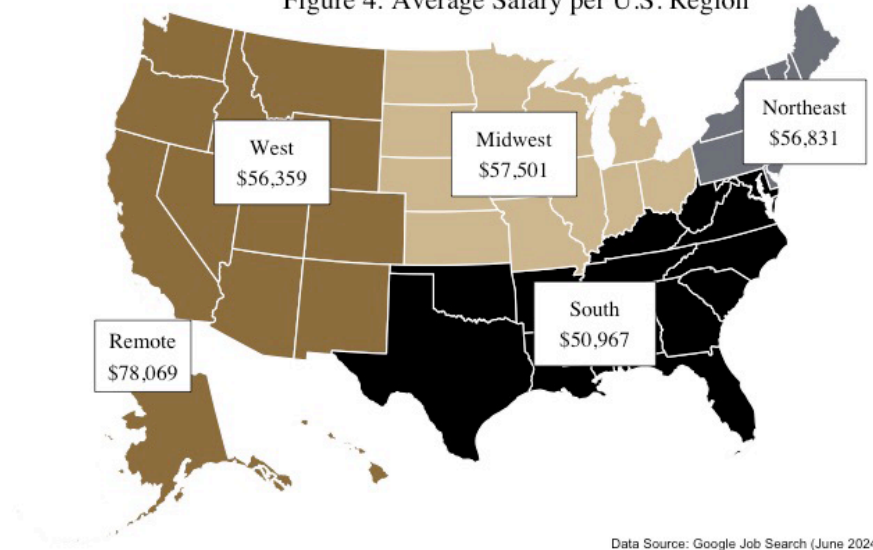Data Source: Google Job Search (June 2024)

SALARY BY SUBSECTOR

The distribution of salaries varies across the different subsectors of agricultural jobs, as shown in Table 1. Jobs in academics ($58,114/year), economics ($57,906/year), and engineering ($56,889/year) had the highest average salaries. Food Science jobs had the lowest average salary ($45,181/year). Academic, economics, and engineering were the only three subsectors with increasing average posted salaries between May 15, 2024, and June 12, 2024. The average salary of food science jobs is the lowest it has been in the past two years.

Table 1 Job Salary by Subsector	Average Salary	Median Salary
Academic	$58,114	$57,750
Economics	$57,906	$59,966
Education	$55,687	$54,472
Engineering	$56,889	$59,966
Sales	$54,640	$51,765
Agronomy	$53,798	$49,146
Animal Science	$55,145	$55,000
Farming	$55,853	$54,472
Food Science	$45,181	$43,080
Lending and Finance	$56,599	$54,557
Natural Resources	$56,538	$56,379
Research	$56,465	$56,488
Google Job Search (June 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 $78,069/year. The Midwest has the highest average regional salary of job postings at $57,501/year, followed by the Northeast at $56,831/year. The third highest average salary by region is the West at $56,359/year, followed by the South at $50,967/year. Relative to the average regional salaries on May 15, 2024, Average salaries in the Northeast, Midwest, and remote jobs decreased, and average salaries in the South and the West increased.
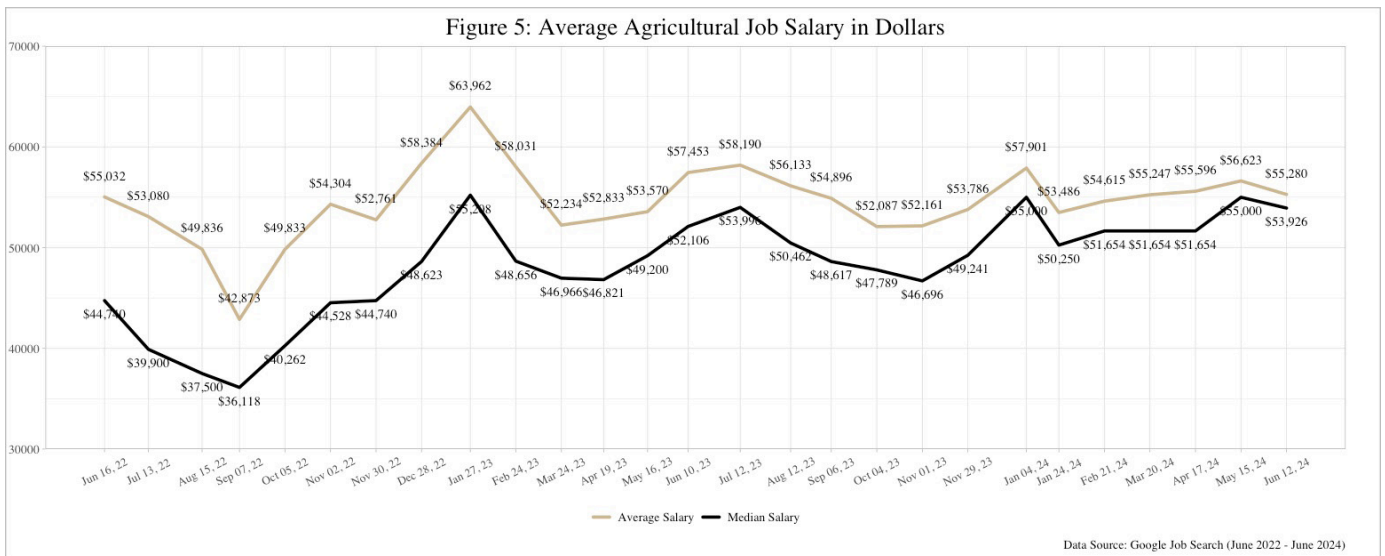

Figure 4: Average Salary per U.S. Region

West $56,359
Midwest $57,501
Northeast $56,831
South $50,967
Remote $78,069

Data Source: Google Job Search (June 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 $55,280, and the median reported salary was $53,926. June 12, 2024, marks the first time the average or median salaries have decreased since January 24, 2024. Relative to June 2023, the mean salary was lower, and the median salary was higher for June 2024.

Figure 5: Average Agricultural Job Salary in Dollars

Data Source: Google Job Search (June 2022 - June 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, research, and engineering. 51% of jobs fall in the natural resources subsector, which is the smallest percentage the subsector has been in the last two years. Agronomy (31% of jobs) is also at a two-year minimum in terms of the percentage of subsector jobs to total jobs. Education made up 54% of jobs. This is the first time the subsector has exceeded 50% of jobs in the past two years.

Table 2 Industry Subsector	Job Openings that Mention
Academic	2.0%
Ag Education	31.6%
Agronomy	48.0%
Animal Science	38.2%
Economics	54.4%
Engineering	64.4%
Farming	59.1%
Food Science	17.2%
Lending and Finance	83.0%
Natural Resources	51.0%
Research	68.1%
Sales	61.5%
Google Job Search (June 2024)	

JOB REQUIREMENTS

Table 3 shows the average percentage of mentions for specific job requirements. Experience is required by 97% of jobs. The next two most common requirements are leadership and education. Remote work, data skills, quantitative skills, and education are at the highest level in terms of percent of total jobs mentioning the requirement they have been at in the past two years. Communication, travel, teamwork, public speaking, and Microsoft were mentioned by the smallest percentage of jobs of the past two years.

Table 3 Requirements	Job Openings that Mention
Communication	64.1%
Critical Thinking	26.4%
Data	62.6%
Education	83.1%
Experience	96.7%
Leadership	89.4%
Microsoft	32.5%
Programming	8.1%
Public Speaking	32.0%
Quantitative	60.2%
Remote Work	44.8%
Teamwork	29.8%
Travel	37.1%
Google Job Search (June 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. According to Table 4, a bachelor's degree, the most cited requirement, is mentioned in 27.9% of agricultural job postings. At 25.9%, master's degrees were the second most cited education level. This is the highest percentage of jobs that have mentioned master's degrees in the past two years.

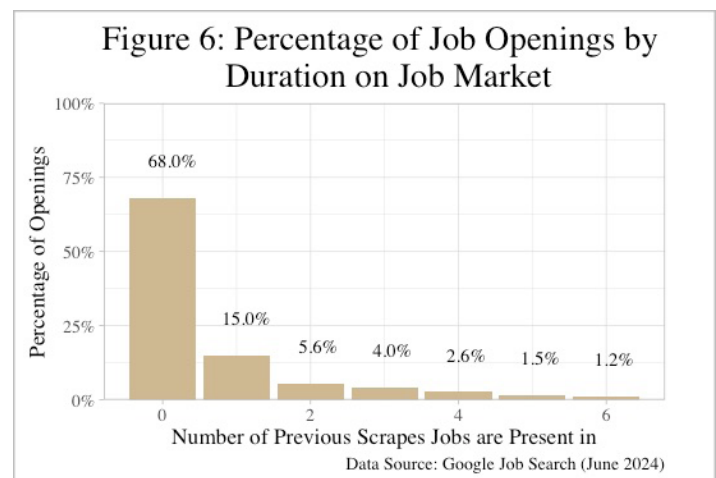| Table 4 Desired Education	Job Openings that Mention
High School	24.3%
Associates	4.8%
Bachelors	27.9%
Masters	25.9%
PhD	13.9%
Google Job Search (June 2024)	

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 54% 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, 94% of jobs included mention of equal opportunity. These levels of mentions have maintained relative stability throughout data collection.

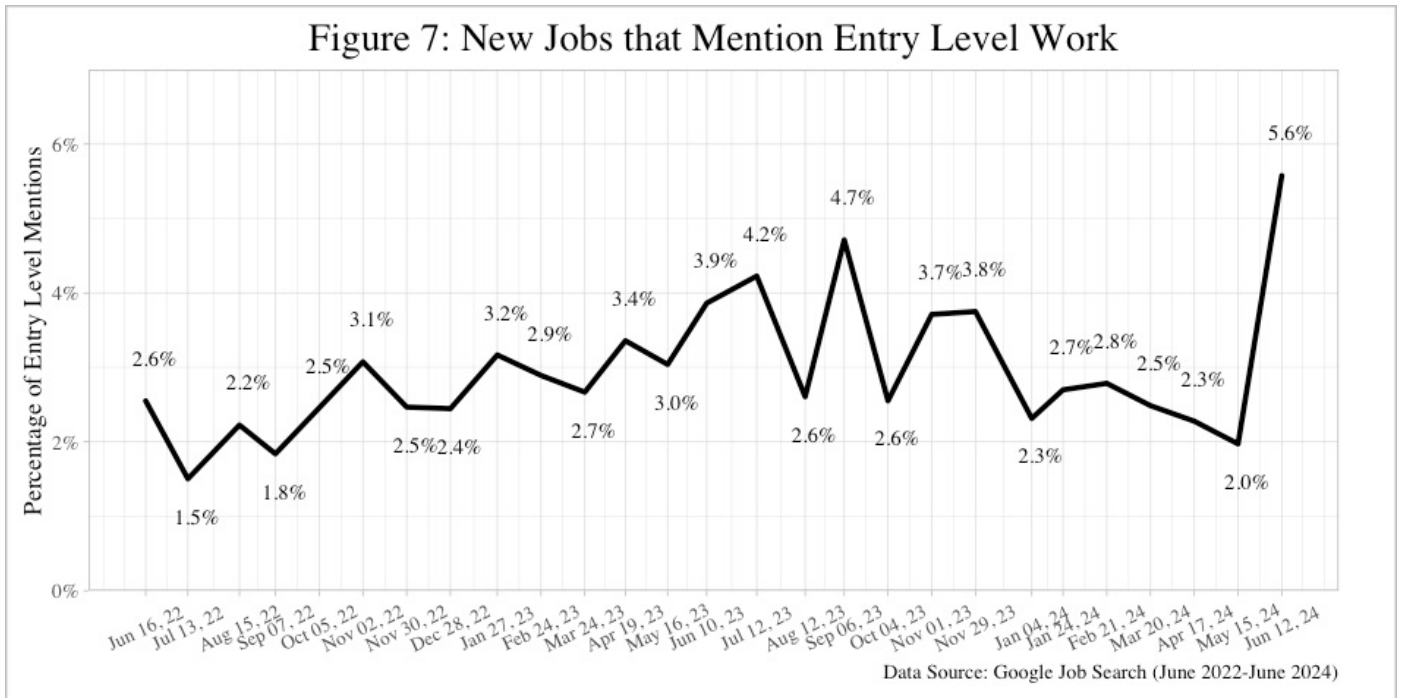| Table 5 Benefits	Job Openings that Mention
401(K)	5.0%
General Benefits	53.7%
Diversity	11.9%
Equal Opportunity	93.9%
Google Job Search (June 2024)	

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. 68% of agricultural jobs were not present in the prior scrape. Only 11.4% of jobs have been present for more than two previous collections. Relative to May 15th, new jobs make up a larger percent of job openings on June 12th.

Figure 6: Percentage of Job Openings by Duration on Job Market

ENTRY LEVEL OPENINGS

Figure 7 shows the percentage of new jobs that are entry-level positions over the past two years. In the past two months, we have discussed the coming and going of graduation season, where newly graduated high schoolers and graduates were entering the workforce. During April and May, we have had the lowest percentage of jobs mentioning entry-level work since October 2022. This trend did not continue into June. 5.6% of new jobs mentioned entry-level work in their descriptions on June 12, 2024. This is a 3.6 percentage point increase over May 15th and the highest percent of new jobs that mention entry level in the past two years.

Figure 7: New Jobs that Mention Entry Level Work

Data Source: Google Job Search (June 2022-June 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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