The 2022 Greenhouse and Nursery Labor Employment Survey

Summary of Preliminary Findings

By Zachariah Rutledge,[1] J. Edward Taylor,[2] Edward Whitney,[3] and Dahye Kim[4]

Recent studies reveal that the supply of farm workers from rural Mexico, the main source of hired labor for US agriculture, is decreasing (Charlton and Taylor, 2016). Because the vast majority of hired farm workers in the United States are from Mexico, a negative trend in farm labor migration from Mexico creates challenges for US farmers. For example, Rutledge and Mérel (2022) find that the declining farm labor supply could have economically significant impacts for California's specialty crop producers, with potential losses in the billions of dollars over the course of a decade.

Growing labor scarcity creates incentives for farmers to adjust their production practices, labor management techniques, and technology use. The COVID-19 pandemic may have strengthened these incentives, encouraging growers to switch to more labor-saving technologies or crops or to seek new ways of recruiting workers. The purpose of the 2022 Green Industry Labor Survey was to collect information about how growers are adapting to reduced farm worker availability, how the COVID-19 pandemic has impacted farming operations (including costs), and the extent to which labor-saving technologies are helping mitigate problems stemming from labor shortages. This report describes the survey response and summarizes a number of key preliminary findings.

Survey Sample and Response

Workforce development and labor availability is one of the most critical issues AmericanHort's advocacy team works to address to better meet the needs of the green industry. **The 2022 Greenhouse and Nursery Labor Employment Survey** was conducted in collaboration between AmericanHort, the leading trade association for the green industry, and researchers from the University of California Davis, and Michigan State University. The purpose of this study is to help understand the depth of labor scarcity impacting the greenhouse and nursery sectors of the green industry.

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The survey was emailed to the growers in the nursery and greenhouse industry. The generalizability of responses to the population of all nursery and greenhouse growers in the U.S. depends on (a) how representative these survey respondents are of that population, and (b) whether those who chose to complete the survey are similar statistically to those who did not. A total of 443 growers responded to the survey. Not all respondents answered all questions, so sample sizes vary from one question to another. The response reflects a broad survey coverage across US states.

States And Commodities Generating the Highest Share of Total Sales

Our survey respondents were asked in which state they produced the highest percentage of their total sales in 2021. The top five states where survey respondents reported growing the largest share of their total sales are Virginia (11%), Ohio (9%), California (8%), Florida (6%), and Michigan (6%), amounting to 40% of all respondents.

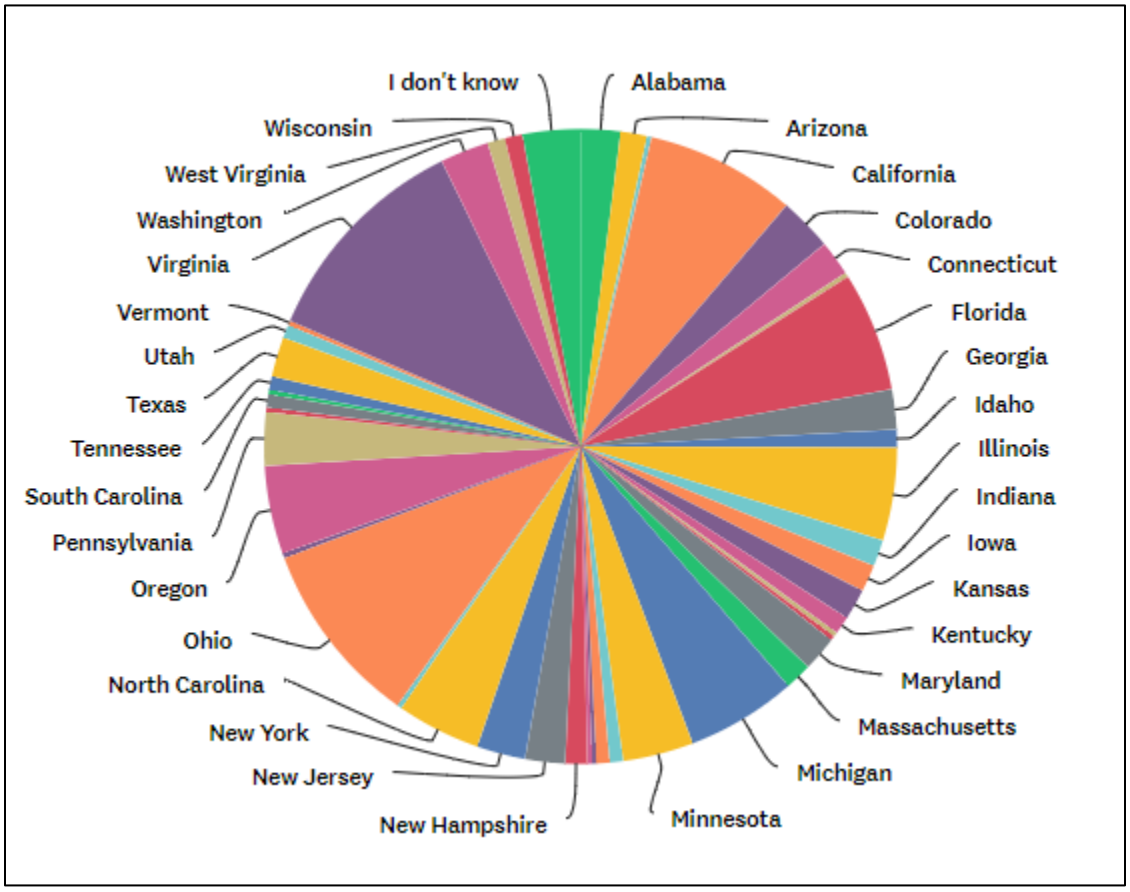

Figure 1. Answer to question: "In which state did you produce the highest percentage of your total sales during 2021?" Sample size: 443

Our survey respondents were asked which commodity produced the highest percentage of their total sales in their main production state in 2021. The leading category was nursery and greenhouse plants (including all woody and herbaceous finished plants, young plants, and cuttings) (90%), followed by cut flowers and cut foliage (2%), fruits, vegetables, or herbs for consumption (2%), and Christmas trees (1%). Four percent of the respondents did not select one of the commodities on the list but instead selected the "Other (please specify)" option.

ANSWER CHOICES	RESPONSES	
Nursery and Greenhouse	89.82%	353
Other (please specify)	3.82%	15
Cut Flowers and Cut Foliage	1.78%	7
Fruit, Veg, Herbs	1.78%	7
Christmas Trees	1.27%	5
I don't know	1.02%	4
Other (please specify)	0.51%	2
TOTAL		393

Table 1. Answers to question: "Which commodity produced during 2021 in [your main state] generated the highest percentage of your total sales?" Sample size: 393

Sixty-three percent of the respondents answered "Yes" to the question: "During 2021, were you ever unable to hire all of the employees you wanted for the production of [your main commodity] in [your main state]?" Thirty-five percent answered "No" to this question.

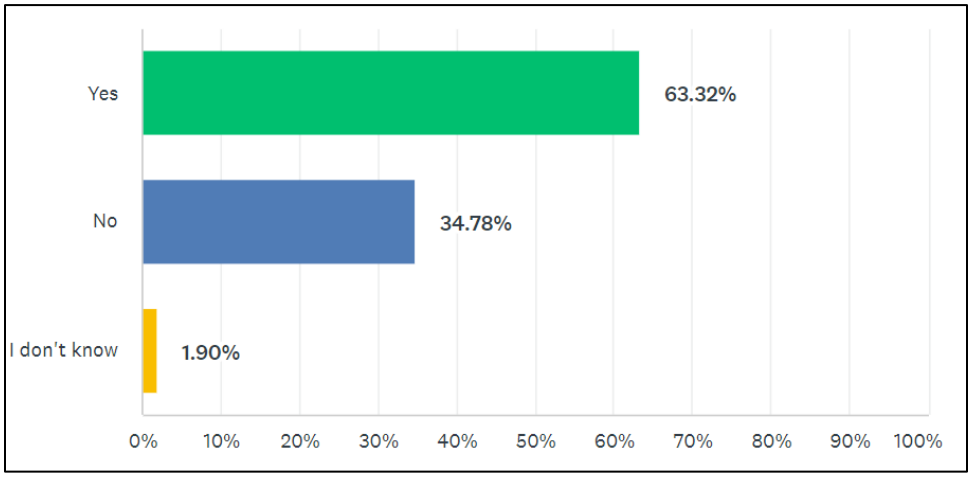

Figure 2. Answer to question: "During 2021, were you ever unable to hire all of the employees you wanted for the production of [your main commodity] in [your main state]?" Sample size: 368

We asked growers how many employees they needed to run their operations at full capacity. Responses ranged from a low of one worker to a high of 6,480, and the average and median were 190 and 50 workers, respectively. We also asked them how many employees they actually employed. The average and median number of employees actually employed was 131 and 47, respectively.

There were a variety of incentives offered to their main crop employees in their main production state in 2021. The leading incentives were schedule/work flexibility (66%) and health insurance (64%), followed by production bonuses (39%), transportation stipends (9%), and childcare (1%). Thirty-two percent of the respondents did not select one of our canned answers but instead selected the "Other (please specify)" option. The most prominent "other" answers were signing/referrals bonus, 401(k) plans, and paid holiday leave.

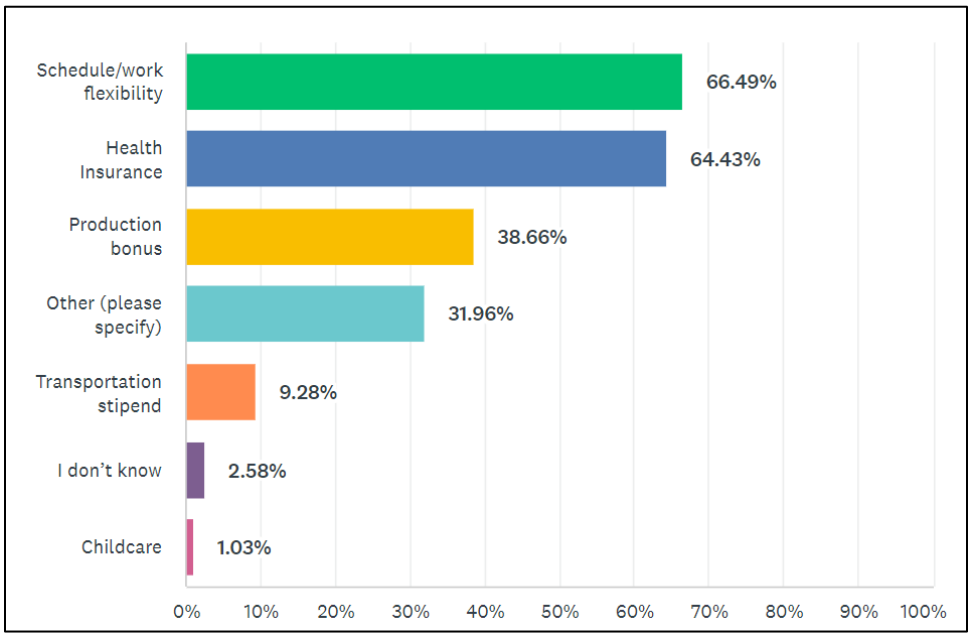

Figure 3. Answer to question: "During 2021, what incentives did you offer your [main commodity] employees in [your main state]? (Please select all that apply)." Sample size: 194

Of the 233 growers who reported experiencing a labor shortage in 2021, 199 responded to a question about whether COVID-19 caused them to experience additional labor shortages in 2021. Sixty-one percent of the growers responded “Yes,” and 32% responded “No”.

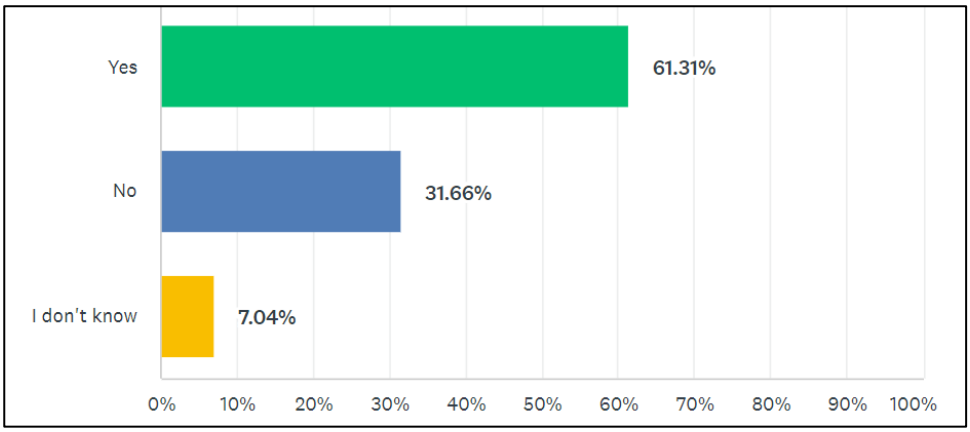

Figure 4. Answer to question: “During 2021, did COVID-19 cause you to experience additional labor shortages in the production of [your main commodity] in [your main state]?” Sample Size: 199

We asked those who indicated that COVID-19 had caused them to experience additional labor shortages in 2021 to explain why, by selecting from a list of ways in which COVID-19 led to additional labor shortages in 2021. Respondents could select more than one option. The most common responses were that employees had been exposed to COVID-19 or were quarantined (with 84% of growers selecting this option), that employees were diagnosed with or suspected of being infected with COVID-19 (82%), that employees’ family members or close friends had been exposed or were quarantined (72%), or that employees did not have childcare options available to them (54%). Some farmers reported other reasons not listed among the options we provided them. The most common “other” answer was a lack of incentives to work due to unemployment benefits.

ANSWER CHOICES	RESPONSES	
Employees were exposed to COVID-19 or were quarantined	83.90%	99
Employees were diagnosed with or suspected of infection with COVID-19	82.20%	97
Employees had family member/household member/close friend exposed or quarantined	72.03%	85
Employees did not have childcare options available to them	54.24%	64
Employees had family member/household member/close friend in high-risk group	38.14%	45
Employees were unable to work due to local or state quarantine, shelter-in-place, or shelter-at-home orders	37.29%	44
Employees had family member/household member/close friend in need of COVID-19 related care	37.29%	44
Employees were in a high-risk group	18.64%	22
Other (please specify)	11.02%	13
I don't know	3.39%	4
Total Respondents: 118		

Table 2. Responses to the question "During 2021, which COVID-19 factors led to additional labor shortages for the production of [your main commodity] in [your main state]? (Please select all that apply)." Sample size: 118

Among the growers who indicated they had a labor shortage in 2021, we asked whether they experienced the same labor shortage problems in 2022. Forty-two percent responded that they had hired more employees in 2022, 19% indicated that they hired fewer employees in 2022, and 38% stated that they hired about the same number of employees in 2021 and 2022.

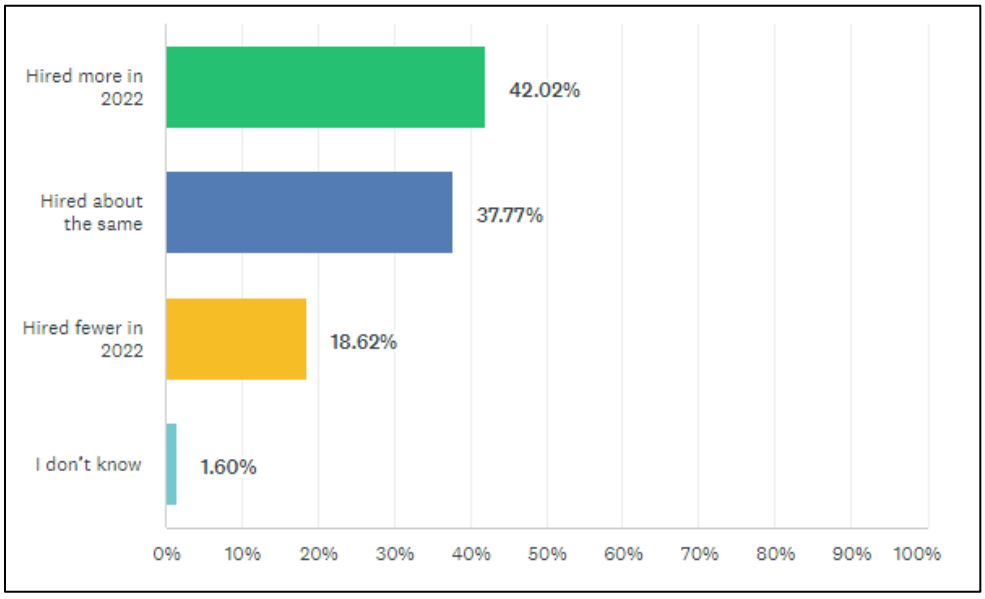

Figure 5. Response to the question "Did you experience the same labor shortage problems in 2022 for the production of [your main commodity] in [your main state] as you had in 2021?" Sample size: 188

We also asked growers who experienced a labor shortage in 2021 whether they also had a labor shortage in 2020. Seventy-one percent responded “Yes” while 25% said “No.”

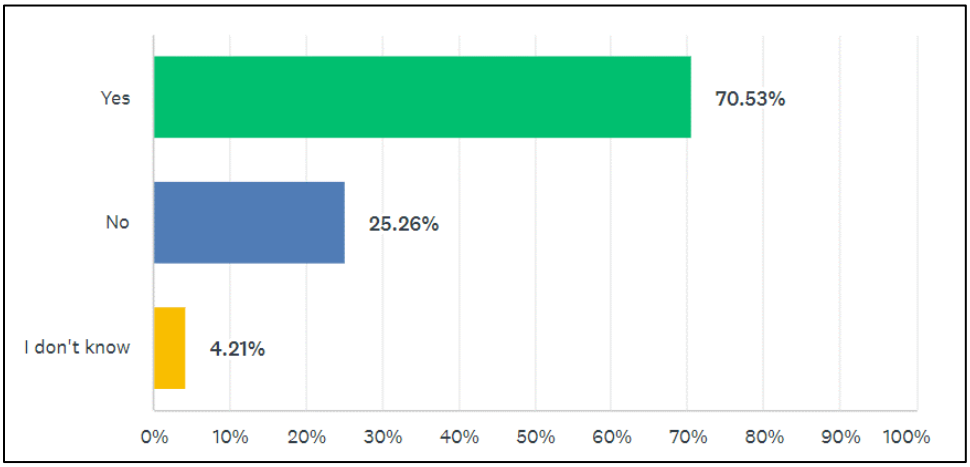

Figure 6. Response to question “A year earlier, during 2020, did you have too few [your main commodity] employees in [your main state]?” Sample size: 190

For the growers who experienced a labor shortage in 2020 and 2021, we asked which year the labor shortage was worse. Forty-one percent responded that they had worse labor shortages in 2021, while 20% said the labor shortage was worse in 2020. Thirty-seven percent said that the labor shortage was about the same in both years.

ANSWER CHOICES	RESPONSES	
I had a harder time finding employees in 2021 than I did in 2020	40.91%	54
I had about the same amount of difficulty finding employees in 2020 and 2021	37.12%	49
I had a harder time finding employees in 2020 than I did in 2021	20.45%	27
I don’t know	1.52%	2
TOTAL		132

Table 3. Response to the question “Was your [your main commodity] labor shortage in [your main state] worse in 2020 or 2021?” Sample size: 132

H-2A Visa Use

About a third (35%) of our survey respondents reported using the H-2A visa program to bring in employees to produce their main crop in their main state in 2021. Sixty-four percent reported that they did not use the program.

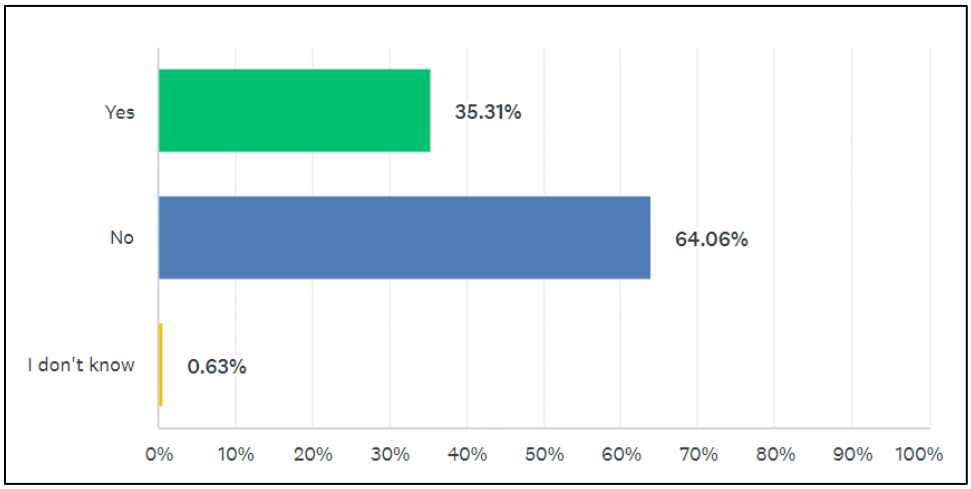

Figure 7. Response to question "During 2021, did you enroll in the H-2A visa program to bring in employees to produce your [main commodity] in [your main state]? (Please select one option)." Sample size: 320

Growers who responded "Yes" to the previous question were asked how they navigated the H-2A visa application process. Forty-one percent reported using a third-party agent, 29% reported hiring a farm labor contractor to bring in H-2A workers, 19% applied on their own, and 12% hired a law firm.

ANSWER CHOICES	RESPONSES	
I used a third-party agent	40.74%	44
I contracted with a farm labor contractor who provided H-2A employees	28.70%	31
I / someone on my team applied	18.52%	20
I used a law firm	12.04%	13
I don't know	4.63%	5
I used a grower association	3.70%	4
Other (please specify)	3.70%	4
Total Respondents: 108		

Table 4. Response to question "How did you navigate the application process for H-2A employees in 2021? (Please select all that apply or click "I don't know"). Sample size: 108

We asked growers who employed H-2A employees in 2021 how many they employed. Some growers reported employing as few as one H-2A worker while others employed as many as 350. The average and median responses were 69 and 44 workers, respectively.

Among the growers who used the H-2A program in 2021, we asked if they would utilize workers for more than the maximum of 10 months if it that were allowed. Forty-nine percent responded "Yes," 49% responded "No."

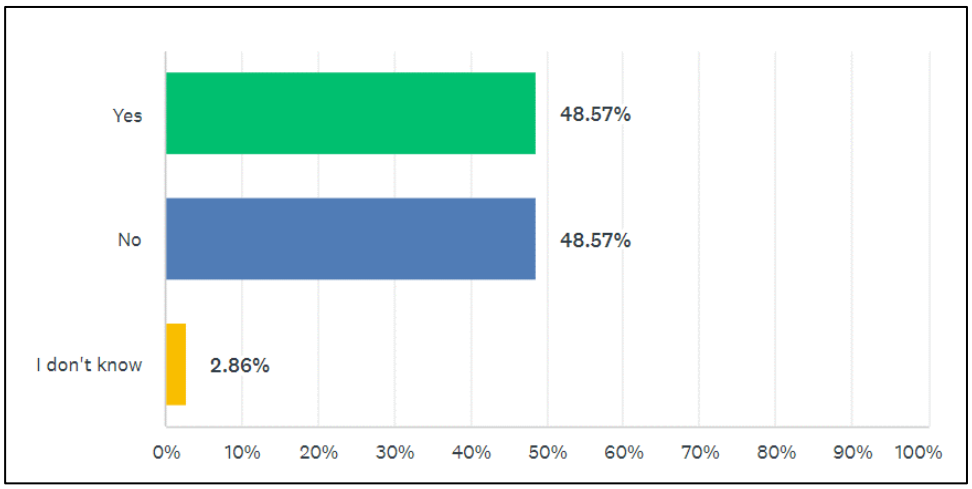

Figure 8. Response to question "H-2A employees are normally restricted to a maximum of 10 months of work in the U.S. Do you have employment opportunities longer than 10 months at your farm for which you would employ H-2A workers if it were allowed? (Please select one option)." Sample size: 105

Growers were also asked how many years they have used H-2A labor to produce their main crop in their main state. Eighteen percent indicated that they had used the program for one year or less, 47% used it between two and five years, 10% had used the program between six and 10 years, and 21% had used the program for more than 10 years.

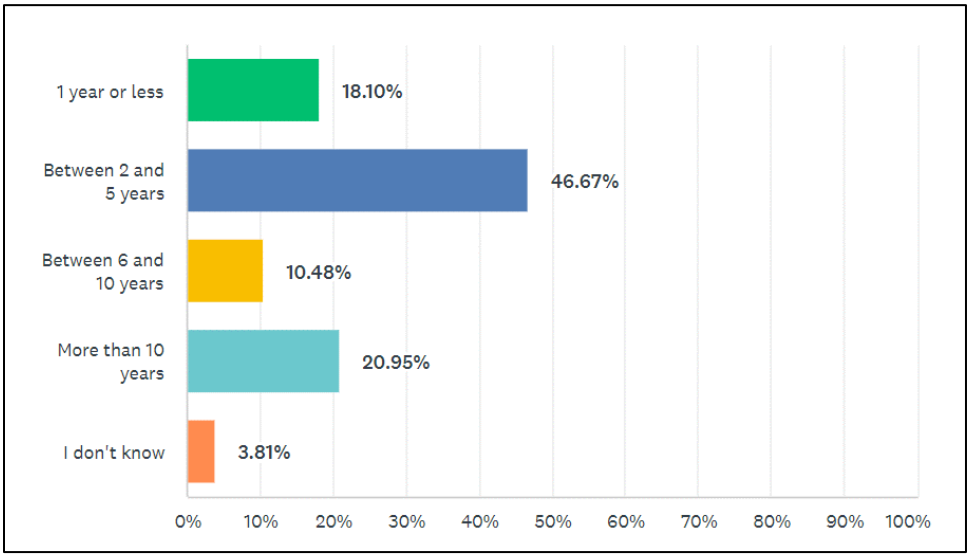

Figure 9. Response to question "For how many years have you used H-2A labor to produce your [main commodity] in [your main state]? (Please select one option)." Sample size: 105

Labor-Saving Technology Adoption

Growers were asked whether they implemented any new labor-saving technologies to reduce the number of employees required to produce their main crop in their main state in 2021. Forty-six percent responded "Yes," while 52% responded "No."

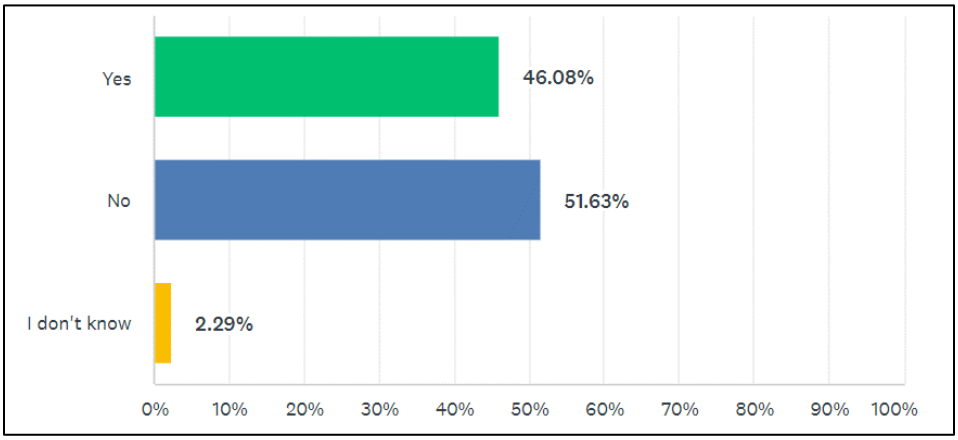

Figure 10. Response to question "During 2021, did you implement any new labor-saving technologies to reduce the number of employees you required to produce your [main commodity] in [your main state]? (Please select one option)." Sample size: 306

Growers were asked which labor-saving technologies they invested in to produce their main crop in their main state in 2021. The five top technologies were robotic liner, plug, or cutting planting automation (30%), automated substrate mixing and delivery systems, pot or tray dispensing/loading systems or potting production lines (30%), and transportation automation such as field or greenhouse conveyor systems, pot/tray lifts or spaces and moving bench systems (29%). Twenty-eight percent of the respondents specified an "other" response, which included irrigation improvements, LEAN labor evaluations methods, and automated trimming, among others.

ANSWER CHOICES	RESPONSES	
Robotic liner, plug, or cutting planting automation	29.71%	41
Automated substrate mixing and delivery systems, pot or tray dispensing/loading systems or potting production lines	29.71%	41
Transportation automation such as field or greenhouse conveyor systems, pot/tray lifts or spacers and moving bench systems	28.99%	40
Other (please specify)	28.26%	39
Production / inventory counting, monitoring and scoreboard display systems	21.74%	30
Automated fertilizer or crop protection application	19.57%	27
Automated container label application machinery	17.39%	24
I don't know	5.07%	7
Unmanned aerial vehicles (drones) for crop monitoring or inventory	2.17%	3
Total Respondents: 138		

Table 5. Responses to the question "During 2021, which labor-saving technologies did you invest in to produce your [main commodity] in [your main state]?" Sample size: 138

Of the growers who adopted a new labor-saving technology in 2021, 42% indicated that they had invested less than $100,000 in labor-saving technology to produce their main crop in their main state, while 27% percent said they invested between $100,000 and $249,999, nine percent between $250,000 and $499,000, and 14% indicated that they had invested $500,000 or more.

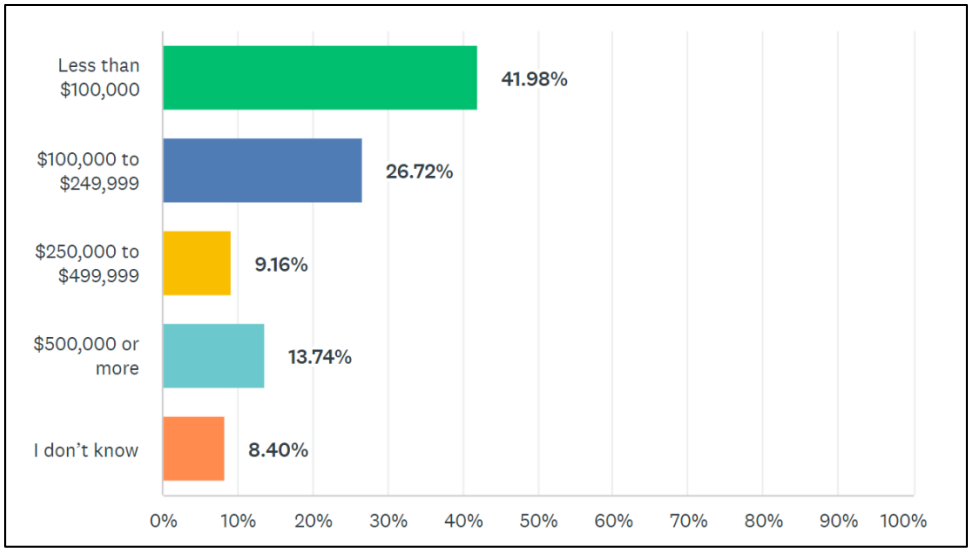

Figure 11. Response to question "During 2021, approximately how much did you invest in labor-saving technology to produce your [main commodity] in [your main state]? (Please select one option)" Sample size 131

We asked the following question to respondents: "In percentage terms, approximately how much did labor-saving technology reduce your labor needs (in terms of the number of employees) for your [main commodity] in [your main state] during 2021? The average was nine percent while answers ranged from a low of one percent to a high of 65%. The median was five percent.

Growers were asked whether their investment in labor-saving technology reduced their labor costs as a share of their total operating costs. Roughly half of respondents said the investment reduced their labor costs share, while 35% said it did not reduce it.

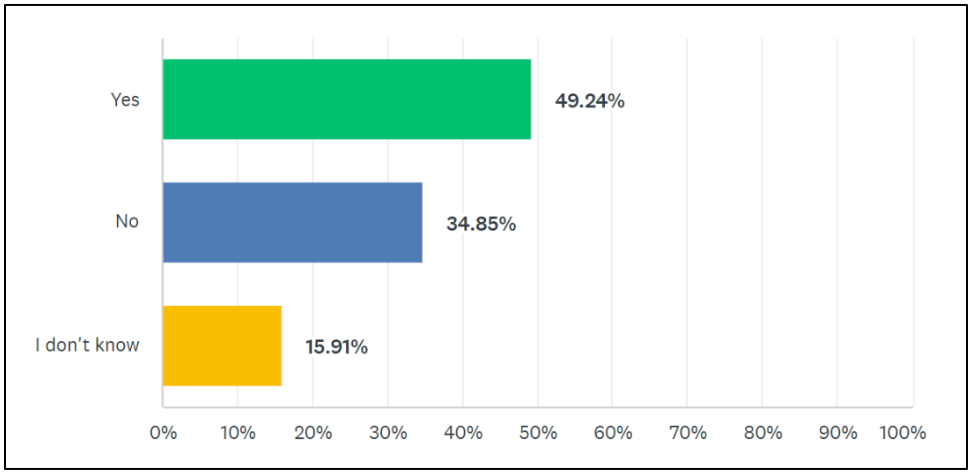

Figure 12. Response to question "Did your investment in labor-saving technology reduce your labor costs as a share of your total operating costs?" Sample size: 132

For the growers who responded "Yes" to the previous question, we asked the following question:

"In percentage terms, approximately how much did your investment in labor-saving technology reduce your labor costs as a share of your total operating costs? (Please enter a number between 1 (meaning 1%) and 100 (meaning 100%) in the box below or select "I don't know")" Answers ranged from one percent to 65%, while the average and median were nine percent and five percent, respectively. Thirty nine percent of respondents made changes to their product mix to reduce labor costs while 57% did not.

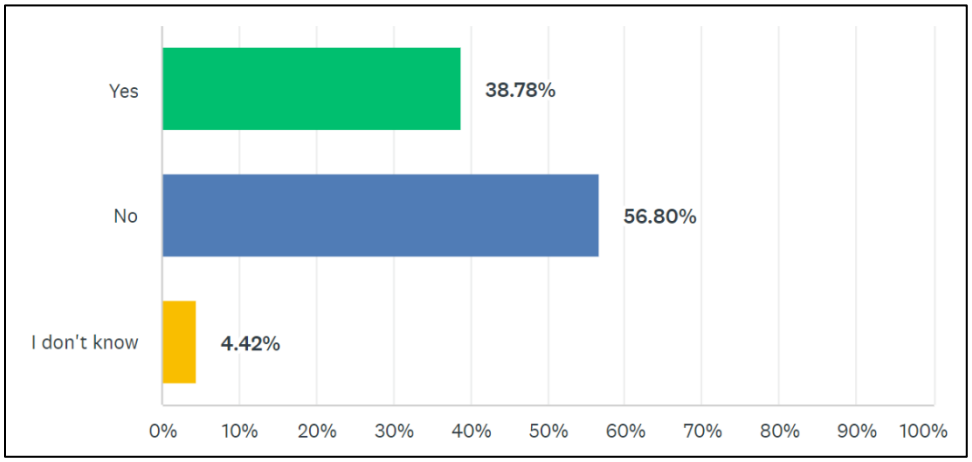

Figure 13. Response to question "Have you made changes to your product mix to reduce labor costs? (Please select one option)" Sample size: 294

When asked whether they made other operational changes to address labor availability issues, 65% of the respondents indicated that they made changes while 32% said they did not.

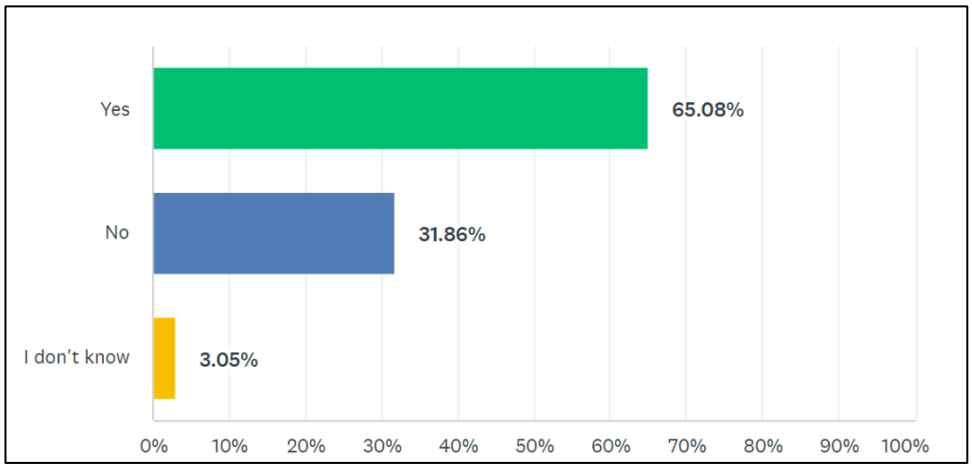

Figure 14. Response to question "Have you made other operational changes to address labor availability issues? (Please select one option)" Sample size: 295

We asked growers about the other types of operational changes they have made to help address labor availability issues. Some of their responses are listed below.

"Hired H-2B workers for 2022. Automated wherever we could."

"Worked more hours."

"Restructuring and adding additional responsibilities to other employees."

"Working longer days & more hours each week at work."

"Hiring more part time workers, hiring all workers as full time, instead of seasonal."

"Automating spray programs to reduce time spent manually spraying."

"Shortened our open hours. Closed on Sundays."

"Eliminating labor intensive plants as much as possible."

"Lowered production."

"Implemented H-2A labor."

COVID-19 Costs

We asked all the growers whether they incurred additional costs related to the implementation of social distancing or other COVID-19 prevention measures in 2020 and/or 2021. Seventy-nine percent indicated that they had incurred additional COVID-related costs while 19% reported that they had not.

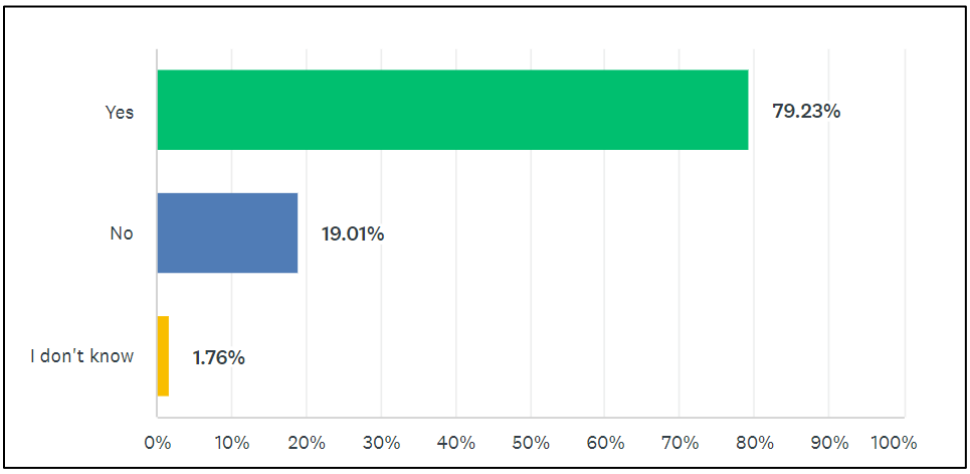

Figure 15. Response to question "During 2020 and/or 2021, did you incur any additional costs related to the implementation of social distancing or other COVID-19 prevention measures? (Please select one option)." Sample size: 284

The 225 growers who indicated that they had incurred additional costs related to COVID-19 prevention measures were asked what types of costs they incurred. Respondents could select more than one option. The leading responses were additional cleaning/sanitization activities (95%), followed by personal protective equipment for employees (92%), and workplace accommodations for social distancing (76%). Eight percent selected "Other (please specify)." Other responses included additional staff, overtime pay, and paid COVID-related leave.

ANSWER CHOICES	RESPONSES	
Additional cleaning/sanitization activities	95.09%	213
Personal protective equipment for employees	92.41%	207
Workplace accommodations for social distancing	75.89%	170
Additional sanitation facilities/equipment	72.77%	163
Employee screening measures	63.84%	143
Additional transportation for employees	29.02%	65
Additional housing to accommodate H-2A employees	10.71%	24
Other (please specify)	7.59%	17
I don't know	0.00%	0
Total Respondents: 224		

Table 6. Responses to the question "During 2020 and/or 2021, which of the following caused you to incur additional costs? (Please select all that apply)." Sample size: 224

Growers were also asked the following: "During 2020 and/or 2021, approximately how much additional expenses did you incur per employee on efforts related to social distancing or COVID-19 prevention measures? (Please select one option)." Roughly 55% of the respondents incurred up to $1,999, with $100-$499 being the most common response. Seventeen percent reported that they spent at least $10,000.

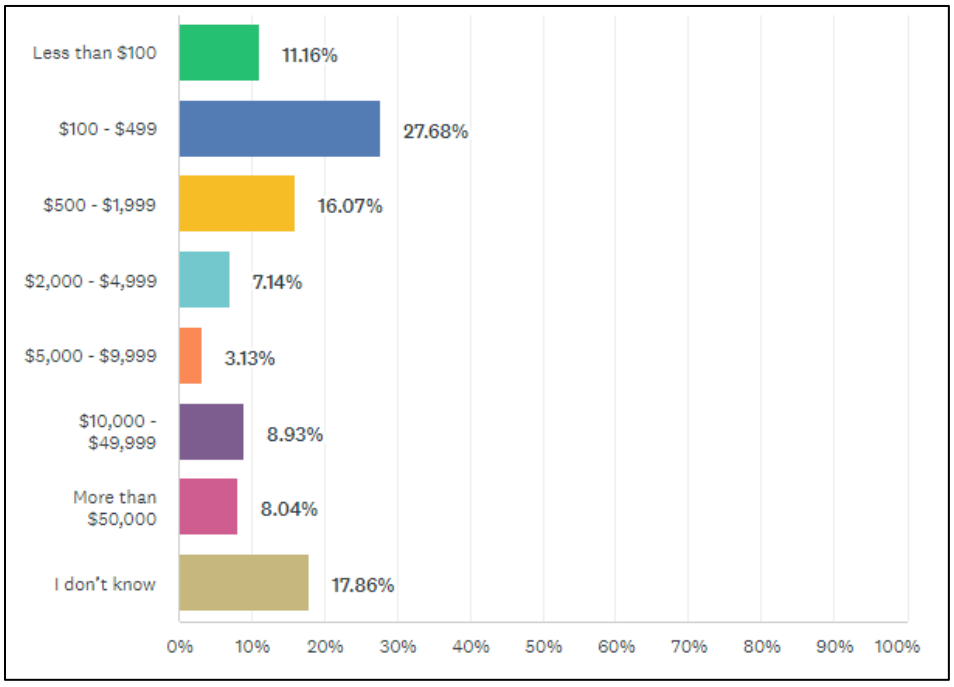

Figure 16. Response to question "During 2020 and/or 2021, approximately how much additional expenses did you incur per employee on efforts related to social distancing or COVID-19 prevention measures? (Please select one option)." Sample size: 224

Conclusion

We surveyed a broad sample of horticultural and nursery growers covering the entire United States. These growers reported significant labor shortages. Nearly two-thirds of the growers reported having difficulty hiring all the workers they wanted to produce their main commodity in their highest revenue producing state during 2021. After dropping apparent data entry errors, the average labor shortage was 18% of the labor force growers would have required to operate at full capacity. To put this in perspective, the average grower who would have normally hired 100 workers but faced a labor shortage would have only been able to hire 82 during 2021.

Growers reported incurring additional costs related to COVID-19, including purchasing additional personal protective equipment, extra cleaning and sanitation activities, and adding sanitation facilities for workers. Among the growers who incurred additional COVID-19 related costs, the largest share of farmers reported incurring $100 to $499 of additional expenses per employee, although some farmers reported spending thousands of dollars on each employee.

H-2A use was relatively common for this sample of growers, with 35% indicating that they had used the program to bring in employees. A recent USDA Economic Research Service study reveals that H-2A visa use is rapidly expanding (Castillo, Martin, and Rutledge, 2022), and there is no sign of this trend slowing down.

A significant share of growers also reported using a new labor-saving technology to help them mitigate problems stemming from labor scarcity. Of the growers who reported using a new labor-saving technology in 2021, about 25% reported spending between $100,000 to $249,000 and more than 10% spent $500,000 or more. About half of the growers who adopted labor-saving technology reported that it reduced labor's share of their total operating costs, with a cost percentage reduction of nine percent on average. More than a third of the growers made changes to their product mix to reduce labor costs.

Overall, this sample of growers reported significant issues stemming from a lack of labor, while many are struggling to navigate the situation. Growers are clearly making efforts to mitigate production and profit losses resulting from labor shortages; however, this issue continues to be a major challenge for horticultural and nursery farmers throughout the United States.

The Research Team

Zachariah Rutledge Ph.D.
Dr. Zachariah Rutledge is an assistant professor in the Department of Agricultural, Food, and Resource Economics at Michigan State University. He received training as an applied economist at the University of California, Davis where he earned a Ph.D. in Agricultural and Resource Economics in 2020. His research has appeared in peer-reviewed journals such as the American Journal of Agricultural Economics, Food Policy, and the IZA Journal of Development and Migration. He has also co-authored technical reports for organizations such as the Economic Policy Institute and the USDA Economic Research Service and has published outreach articles summarizing his academic work for layperson audiences. Dr. Rutledge's research covers a variety of topics related to low-skilled immigration in the United States, and his recent work focuses primarily on issues related to domestic agricultural labor markets. His current research efforts aim to document and understand issues related to farm labor scarcity and investigate market- and policy-based solutions to the problem. His research includes ongoing survey work with various industry groups to gain information about how farmers are dealing with limited access to immigrant labor.

J. Edward Taylor, Ph.D.
Dr. J. Edward Taylor is a Distinguished Professor in the Department of Agricultural and Resource Economics at the University of California, Davis. He is a fellow of the American Association for the Advancement of Science (AAAS) and the Agricultural and Applied Economics Association (AAEA). Ed's teaching and research are in the areas of Economic Development, Population and Resources, Labor Economics, Economy-wide Modeling, and Applied Microeconomics. He is widely cited in the academic economics literature and recently was Editor of the American Journal of Agricultural Economics.

Edward Whitney
Edward Whitney is a Ph.D. Candidate in the Agricultural and Resource Economics program at the University of California, Davis. Before returning to school, he worked for three years at the International Food Policy Research Institute as a research analyst, focusing mostly on poverty analysis in Pakistan. Mr. Whitney holds a Master's degree in International Development from American University and a Bachelor's degree in Economics from the University of Utah.

Dahye Kim
Dahye Kim is a 4th year Ph.D. student in the Department of Agricultural, Food, and Resource Economics at Michigan State University. She is broadly interested in consumer and labor economics and has presented academic research at the country's leading agricultural economics conferences. Dahye is currently working on her dissertation, which aims to explore issues related to farm labor shortages in the United States. Before joining Michigan State University, Dahye earned a Bachelor's degree in Commerce from the University of Melbourne in Australia and a Master's degree in Economics from Korea University in South Korea. Dahye has also worked for the Research Institute and the Food Industry Association in South Korea.