Arizona State University, UC Davis, and California Farm Bureau Federation 2022 Farm Labor Survey

Summary of Preliminary Findings

Zachariah Rutledge[1], J. Edward Taylor[2], and Edward Whitney[3]

Recent studies reveal that the supply of farm workers from rural Mexico, the main source of labor for California 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 California 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, labor management, and technologies, as documented in a 2019 California Farm Bureau Federation (CFBF) – University of California, Davis (UCD) survey. The COVID-19 pandemic may have strengthened these incentives, encouraging farmers to switch to more labor-saving technologies or crops or to seek new ways of recruiting workers. The purpose of the 2022 Farm Labor Survey was to collect information about how farmers 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

The survey was sent to all members of the California Farm Bureau Federation (CFBF) and the Farm Employers Labor Service (FELS). The generalizability of responses to the population of all farmers in California depends on (a) how representative CFBF and FELS members 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 920 farmers 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 California counties and commodities.

[1] Postdoctoral Research Scholar, Morrison School of Agribusiness, W. P. Carey School of Business, Arizona State University. Zachariah Rutledge gratefully acknowledges funding from the Agriculture and Food Research Initiative (AFRI), National Institute for Food and Agriculture (NIFA) (proposal number 2018-08525).
[2] Distinguished Professor, Agricultural and Resource Economics, University of California, Davis
[3] Ph.D. Candidate, Agricultural and Resource Economics, University of California, Davis.

Farmers responded from 52 of the 58 California counties. The top five counties where survey respondents reported growing the largest share of their total sales accounted for roughly 35% of all respondents. The most prominent counties were San Diego (11%), Fresno (7%), San Joaquin (6%), Tulare (6%), and Sonoma (5%).

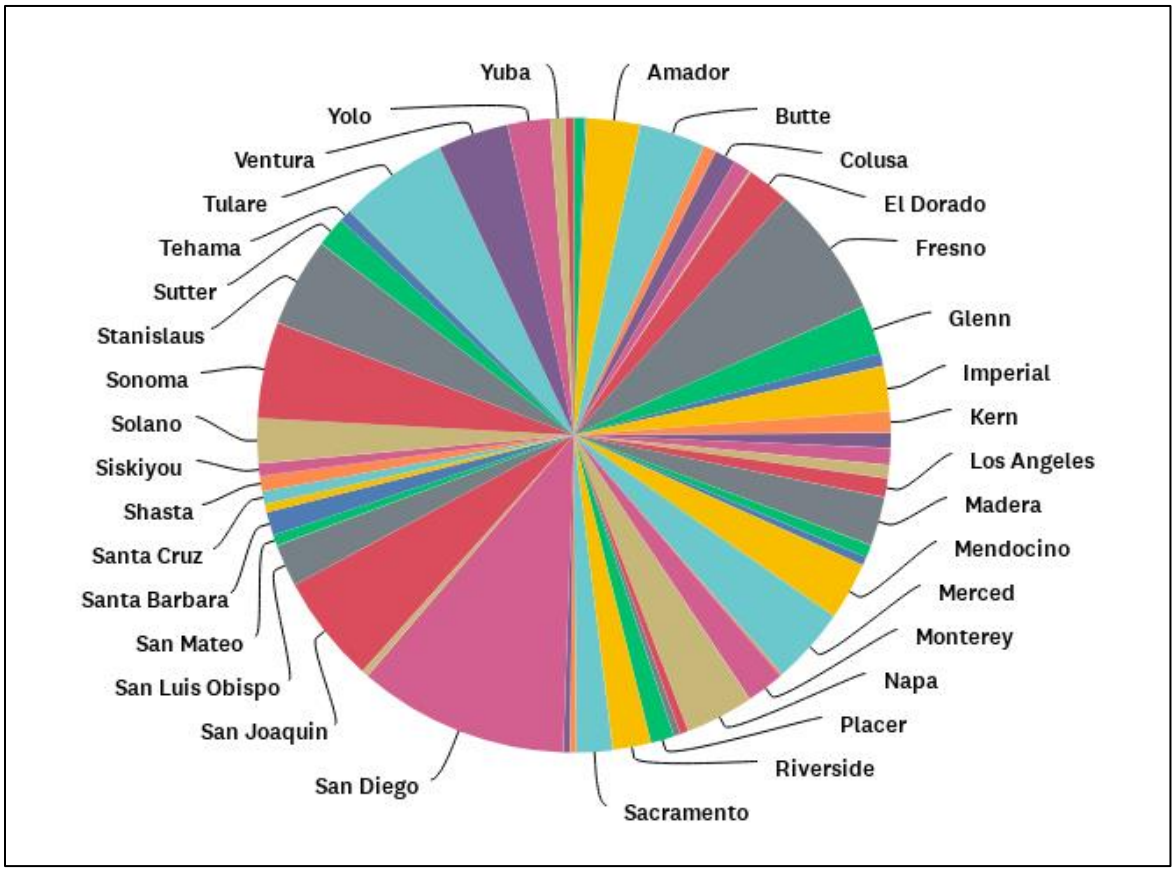
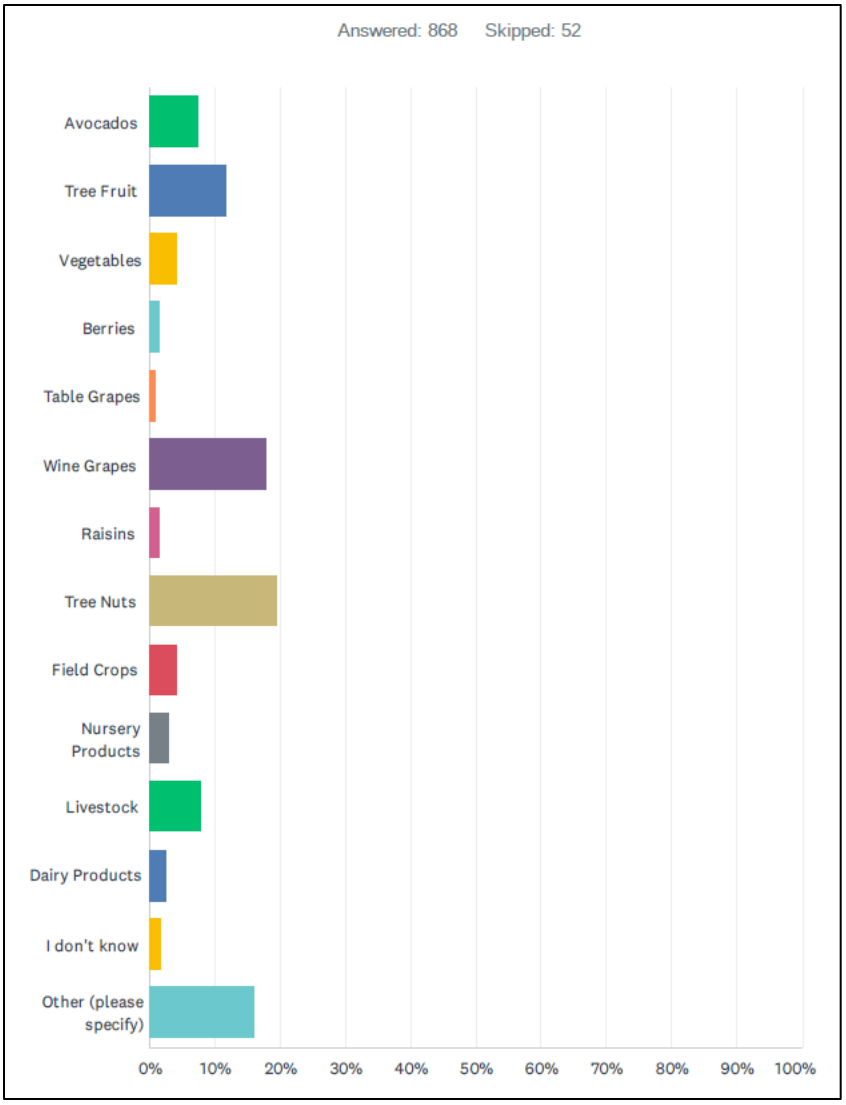


Figure 1: Answer to question: "In which California county did you produce the highest percentage of your total sales during 2020?" Sample size: 920

Our survey respondents were asked which commodity produced the highest percentage of their total sales in their main production county in 2020. There was a wide diversity of crops grown, but the three top crop types comprised roughly 50% of the sample. These leading categories were tree nuts (20%), wine grapes (18%), and tree fruits (12%). Sixteen percent of the respondents did not select one of our canned answers but instead selected the "Other (please specify)" option and typed in the main crop they grew. The



most prominent "other" answers were olives, hay, and rice.

Figure 2. Answer to question: "Which commodity produced during 2020 in [your main county] generated the highest percentage of your total sales?" Sample size: 868.

Farm Labor Shortages

Nearly half of the respondents—45%—answered "Yes" to the question: "During 2020, were you ever unable to hire all of the employees you wanted for the production of [your main crop] in [your main] county?" (See Figure 3). Forty-eight percent answered "No" to this question, and 7% said they did not know.

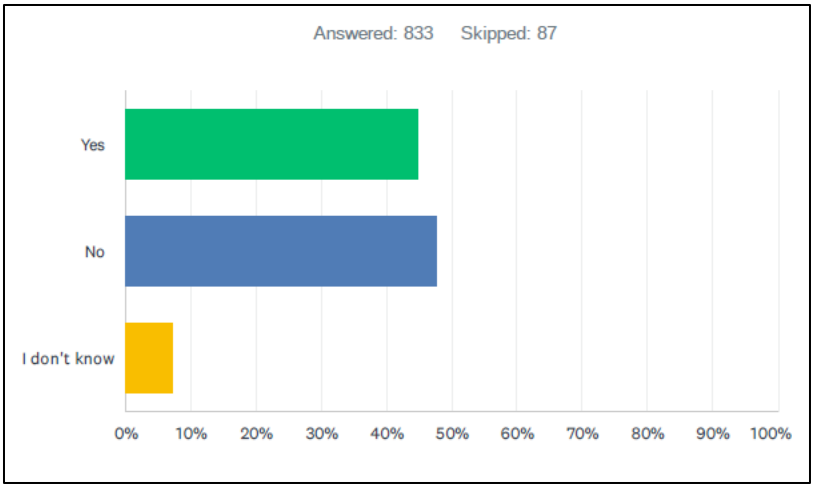


Figure 3: Answer to question: "During 2020, were you ever unable to hire all of the employees you wanted for the production of [your main crop] in [your main county]?" Sample size: 833

We asked farmers who responded "yes" to the previous question "In percentage terms, approximately how many employees did you lack for the production of [your main crop] in [your main county]?" The responses ranged from 1% to 100%, and the average was 20%.

Impacts of COVID-19 on Labor Shortages

Three hundred and fifty-two of the 375 farmers who reported experiencing labor shortages in 2020 responded to a question about whether COVID-19 caused them to experience additional labor shortages in 2020. Fifty-five percent, or 194, responded "Yes," 35% responded "No," and 10% responded that they did not know.

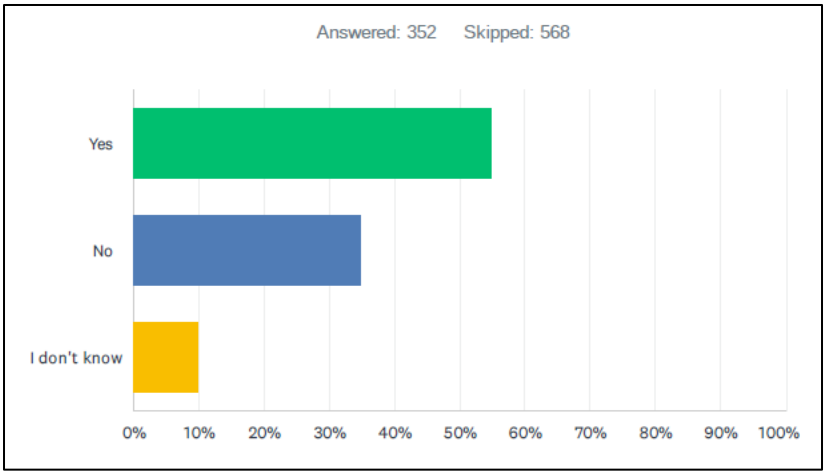


Figure 4. Answer to question: "During 2020, did COVID-19 cause you to experience additional labor shortages in the production of [your main crop] in [your main county]?" Sample Size: 352

We asked those who indicated that COVID-19 had caused them to experience additional labor shortages in 2020 to explain why, by selecting from a list of ways in which COVID-19 led to additional labor shortages in 2020. Respondents could select more than one option. The most common responses were that employees had been exposed to COVID-19 or were quarantined (with 53% of farmers selecting this option), that employees' family members or close friends had been exposed or were quarantined (49%), or that employees were diagnosed with or suspected of being infected with COVID-19 (47%). The next most common response was that employees were unable to work due to government-mandated shelter-in-place or quarantine orders. Some farmers reported other reasons not listed among the options we provided for them to select from. The most common "other" answer was that generous unemployment benefits provided their employees with an opportunity to generate more income by not working.

ANSWER CHOICES	RESPONSES	
Employees were unable to work due to local or state quarantine, shelter-in-place, or shelter-at-home orders	36.98%	71
Employees were exposed to COVID-19 or were quarantined	52.60%	101
Employees were diagnosed with or suspected of infection with COVID-19	47.40%	91
Employees were in a high-risk group	11.98%	23
Employees had family member/household member/close friend in high-risk group	30.21%	58
Employees had family member/household member/close friend exposed or quarantined	48.96%	94
Employees had family member/household member/close friend in need of COVID-19 related care	22.40%	43
Employees did not have childcare options available to them	28.65%	55
I don't know	6.77%	13
Other (please specify)	19.27%	37
Total Respondents: 192		

Table 1. Responses to the question "During 2020, which COVID-19 factors led to

additional labor shortages in [your main crop] in [your main county]? (please select all that apply).” Sample size: 192

Among the farmers who indicated they had a labor shortage in 2020, we asked whether they experienced the same labor shortage problems in 2021. Seventeen percent responded that they had hired more employees in 2021, 21% indicated that they hired fewer employees in 2021, and 55% stated that they hired about the same number of employees in 2020 and 2021.

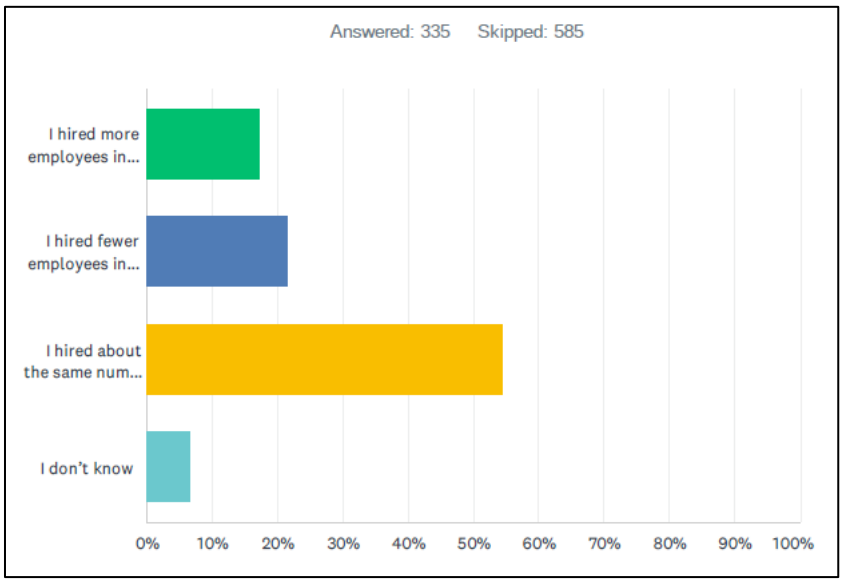


Figure 4: Response to the question “Did you experience the same labor shortage problems in 2021 for the production of [your main crop] in [your main county]?” Sample size: 335

We also asked farmers who experienced a labor shortage in 2020 whether they also had a labor shortage in 2019. Thirty-four percent responded “Yes” while 60% said “No.” Six percent reported that they did not know.

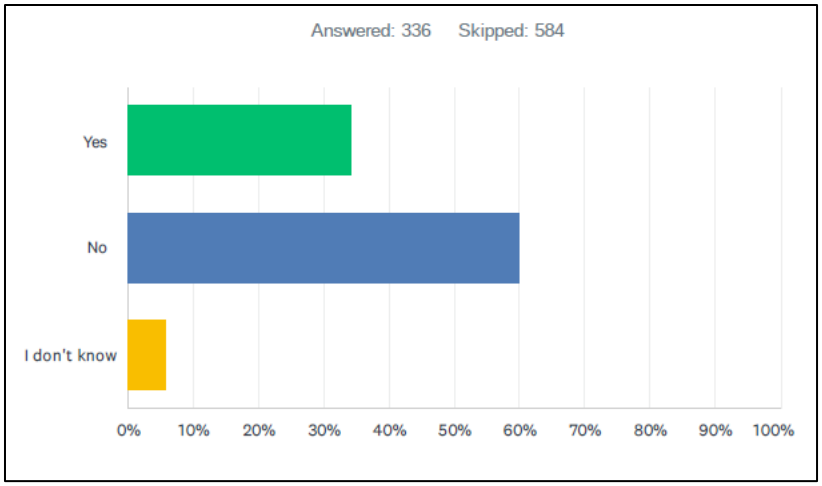


Figure 5: Response to question "A year earlier, during 2019, did you have too few [your main crop] employees in [your main county]? Sample size: 336.

For the farmers who experienced a labor shortage in 2019 and 2020, we asked during which year the labor shortage was worse. Fifty-two percent responded that they had worse labor shortages in 2020 while 10% said the labor shortage was worse in 2019. Thirty-five percent said that the labor shortage was about the same in both years while 3% said they did not know.

ANSWER CHOICES	RESPONSES	
I had a harder time finding employees in 2020 than I did in 2019	52.17%	60
I had a harder time finding employees in 2019 than I did in 2020	10.43%	12
I had about the same amount of difficulty finding employees in 2019 and 2020	34.78%	40
I don't know	2.61%	3
TOTAL		115

Table 2: Response to the question "Was your [your main crop] labor shortage in [your main county] worse in 2019 or 2020?" Sample size: 115

COVID-19 Costs

We asked all the farmers whether they incurred additional costs related to the implementation of social distancing or other COVID-19 prevention measures. Fifty-five percent indicated that they had incurred additional COVID-related costs while 39% reported that they did not, and 6% did not know.

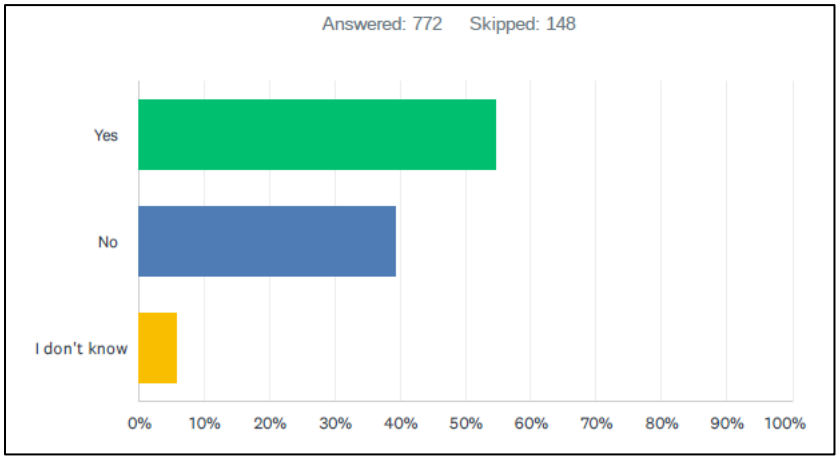


Figure 6: Response to the question "During 2020, did you incur any additional costs related to the implementation of social distancing or other COVID-19 prevention measures?" Sample size: 772

The 423 farmers 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 for protective equipment for

employees (85%), followed by cleaning and sanitation activities (82%), sanitation facilities/equipment (60%), employee screening measures (50%), and workplace accommodations for social distancing (45%). Other responses included paying additional sick leave and paid time off for employees who had sick family members and making changes to workplace practices to maintain compliance with government regulations.

ANSWER CHOICES	RESPONSES	
Personal protective equipment for employees	84.86%	353
Additional cleaning/sanitization activities	81.49%	339
Additional sanitation facilities/equipment	59.62%	248
Employee screening measures	50.24%	209
Additional transportation for employees	18.75%	78
Additional housing to accommodate H-2A employees	4.81%	20
Workplace accommodations for social distancing	45.19%	188
I don't know	1.68%	7
Other (please specify)	11.06%	46
Total Respondents: 416		

Table 3: Responses to the question "During 2020, which of the following caused you to incur additional costs (please select all that apply)?" Sample size: 416

The 423 farmers who indicated they had incurred additional COVID-19 related costs were asked how much they spent per employee. The most common response was between $100 and $499 (33%), followed by $500 to $1,999 (21%). Thirteen percent of farmers indicated that they spent less than $100 per employee while 25% indicated that they spent at least $2000, and 8% did not know. Three percent of the farmers indicated that they spent over $50,000 per employee.

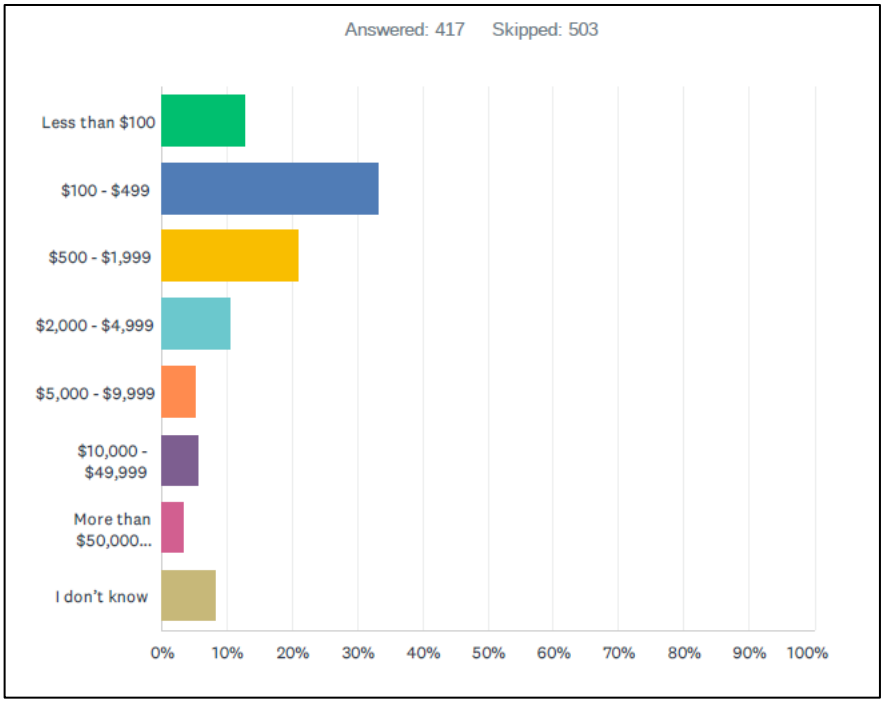


Figure 7: Responses to the question "During 2020, approximately how much additional expenses did you incur per employee on efforts related to social distancing or COVID-19 prevention measures? (please select one option). Sample size: 417

H-2A Visa Use

Only a small share (5%) of our survey respondents reported using the H-2A visa program to bring in employees to produce their main crop in their main county. Ninety-two percent reported that they did not use the program, and 3% did not know.

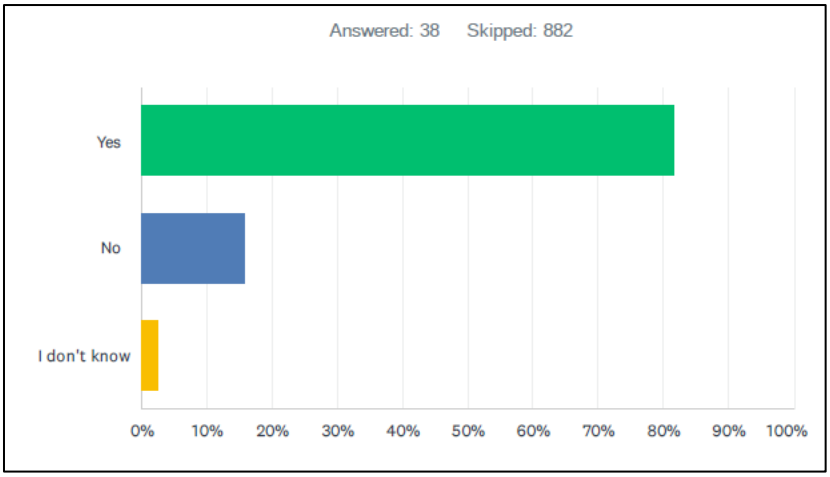
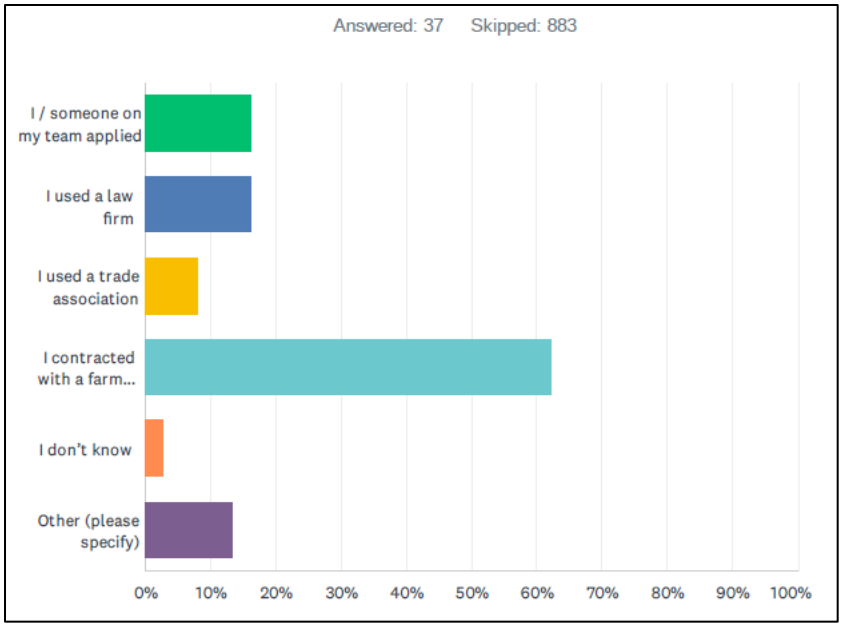


Figure 8: Answers to the question "During 2020, did you enroll in the H-2A visa program to bring in employees to produce [your main crop] in [your main county]?" Sample size: 761



Farmers who responded "Yes" to the previous question were asked how they navigated the H-2A visa application process. Most of the respondents (62%) reported hiring a farm labor contractor who provided the H-2A workers, while 16% indicated that they applied on their own, and 16% reported hiring a law firm. Eight percent reported using a trade association.

Figure 9: Responses to the question "How did you navigate the application process for H-2A employees in 2020? (please select all that apply or click "I don't know")." Sample size: 37

We asked farmers who used the H-2A program in 2020 approximately how much of their main crop labor force in their main county was comprised of H-2A workers. Answers ranged from 1% to 100%, and the average was 44%.

For farmers who used the H-2A program in 2020, we asked if they would utilize workers for more than the maximum of 10 months if that option were available. Forty three percent responded "No," 41% responded "Yes," and 16% did not know.

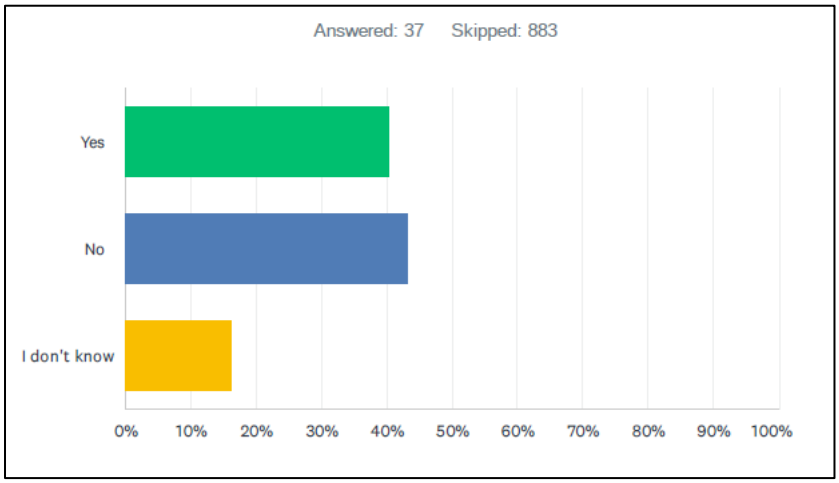


Figure 10: Response to the question "H-2A employees are normally restricted to a maximum of 10 months of work in the U.S. Would you employ them longer if you could?" Sample size: 37

Among the farmers who utilized the H-2A visa program in 2020, 82% indicated that they also had used the program in 2019, whereas 16% said they had not and 3% did not know.

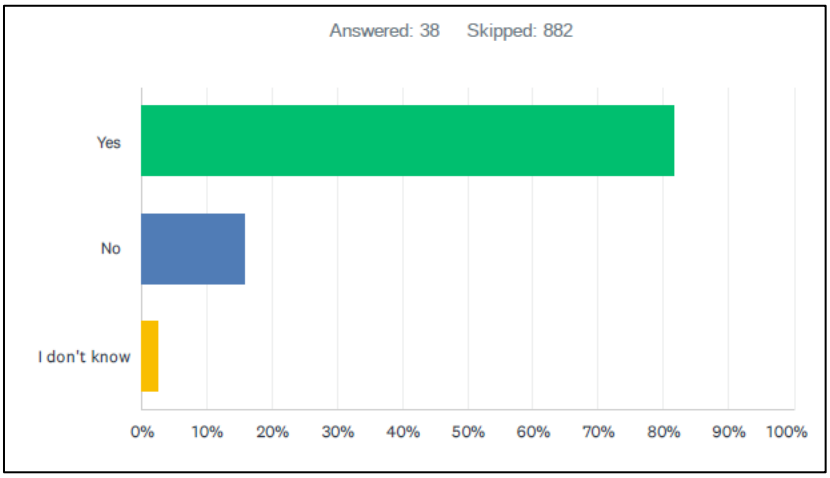


Figure 11: Responses to the question "A year earlier, during 2019, did you employ any H-2A employees to produce [your main crop] in [your main county]?" Sample size: 38

Labor-Saving Technology Adoption

Farmers 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 county in 2020. Twenty-seven percent responded "Yes," while 70% responded "No," and 3% did not know.

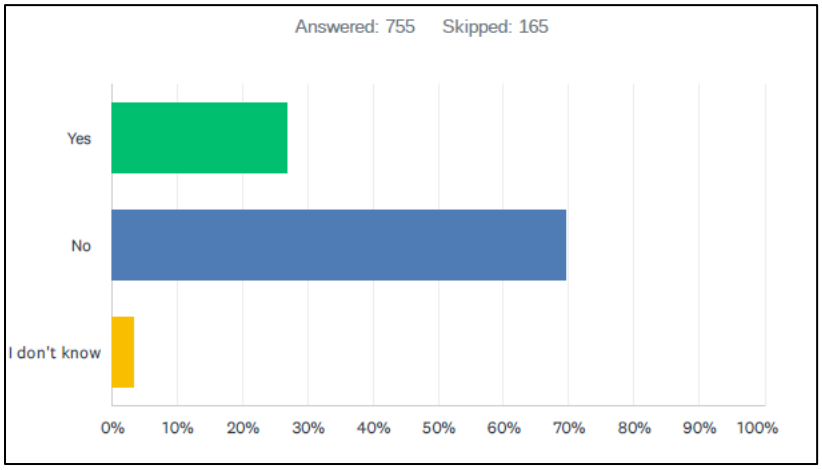


Figure 12: Responses to the question "During 2020, did you implement any new labor-saving technologies to reduce the number of employees you required to produce [your main crop] in [your main county]? (please select one option)." Sample size: 755

When asked which labor-saving technology reduced their labor needs the most for the production of their main crop in their main county, the leading answers were updated irrigation equipment (with 22% of respondents choosing this option), mechanical harvesters (15%), and specialized tractor attachments (15%). Twenty-five percent of farmers did not choose one of our pre-selected options but instead provided an "Other" answer. Among these "other" answers were chemical suckering, mechanical pruning, and autonomous tractors.

ANSWER CHOICES	RESPONSES	
Mechanical planter	3.45%	7
Mechanical harvester	15.27%	31
Updated irrigation equipment	22.17%	45
Pre-pruner	9.36%	19
In-field conveyor-belt or packaging platform	0.49%	1
Specialized tractor attachment	14.78%	30
Mechanical weeder or thinner	6.90%	14
I don't know	2.96%	6
Other (please specify)	24.63%	50
TOTAL		203

Table 4: Responses to the question "During 2020, which labor-saving technology reduced [your main crop] labor needs the most in [your main county]?" Sample size: 203

Farmers were asked to give the percentage of the main crop in their main county that the labor-saving technology was used on. Answers ranged from a low of 1% to a high of 100%, with the average response being 66%. Farmers were also asked how much the

labor-saving technology reduced labor needs for the main crop in their main county. The average farmer reported that the technology they adopted reduced their labor needs by 29%. We asked farmers who used a labor-saving technology in 2020 whether they also had used that technology in 2019. Fifty-three percent of the 177 farmers who answered that question responded "No," 46% responded "Yes," and 1% did not know. We also asked farmers the reasons why they chose to use the labor-saving technology. Most farmers (81%) indicated that rising labor costs caused them to adopt the technology. Labor-availability issues related to COVID-19 (38%) and not related to COVID-19 (33%) were the second and third most common responses.

ANSWER CHOICES	RESPONSES	
Crop prices	27.68%	49
Rising labor costs	81.36%	144
Non-labor input prices	14.12%	25
Labor-availability issues related to COVID-19	37.85%	67
Labor-availability not related to COVID-19	32.77%	58
I don't know	0.56%	1
Other (please specify)	12.43%	22
Total Respondents: 177		

Table 5: Responses to the question "Why did you use the [labor-saving technology] to produce [your main crop] in [your main county] during 2020?" Sample size:177

Farmers who used the labor-saving technology in both 2019 and 2020 were asked whether they increased their use of the technology in 2020 relative to 2019. Eighty percent responded "Yes," while 17% responded "No," and 2% did not know.

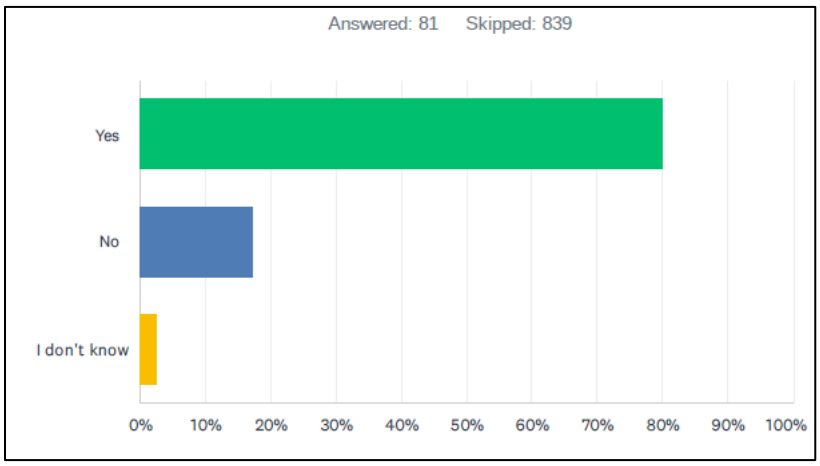


Figure 13: Responses to the question "Relative to 2019, did you increase the use of the [labor-saving technology] for [your main crop] in [your main county]?" Sample size: 81

Among the 65 farmers who increased their use of the labor-saving technology between 2019 and 2020, 42% indicated that the increase was due to COVID-19 while 58% said it was not.

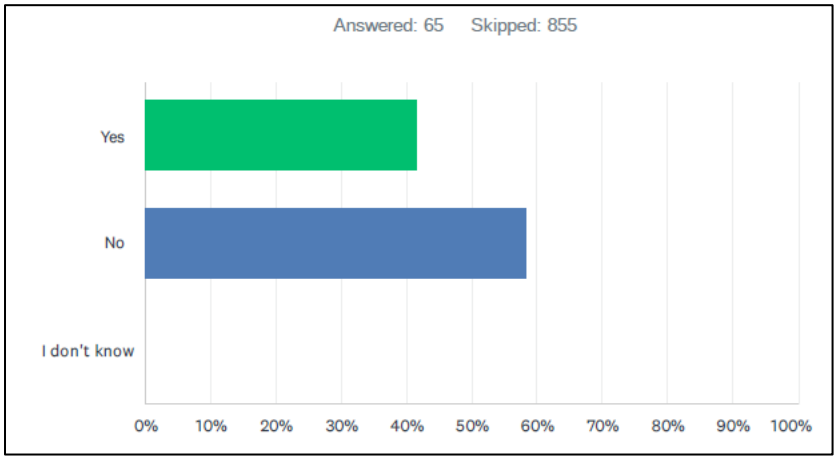


Figure 14: Responses to the question "Was your decision to increase your use of the [labor-saving technology] during 2020 related to COVID-19 labor-availability issues?" Sample size: 65

Mechanical Harvest Aids

We asked a series of questions about the adoption of mechanical harvest aids. Twenty-five percent of the 726 farmers who responded indicated that they had used a mechanical harvest aid during 2020 while 72% said they did not, and 3% did not know.

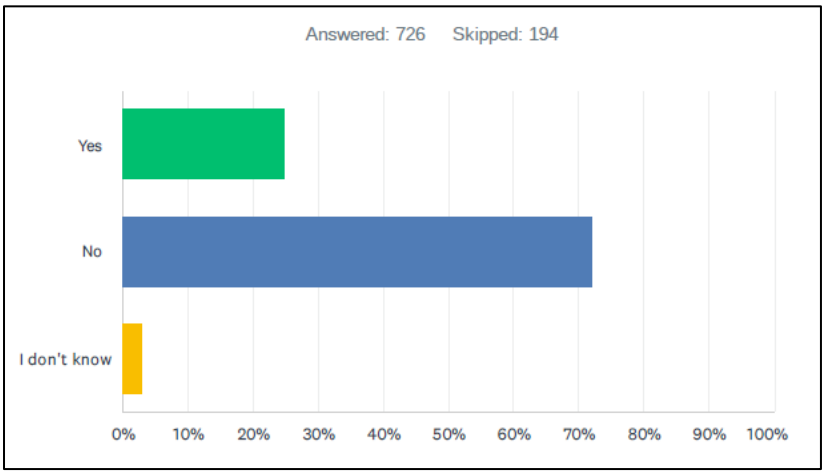


Figure 15: Responses to the question "Mechanical harvest aids for grapes and grain crops essentially replace the human(s) in the harvesting task. Devices like conveyors to carry bins of harvested strawberries out of the row in place of the harvest employee carrying bins to the end of the row would be an example of mechanical harvest aid. During 2020, did you use any type of mechanical harvest aid for the production of your [main crop] in [your main county]?" Sample size: 726

When asked whether they owned or rented the mechanical aid, 57% of the 177 farmers who reported using a mechanical harvest aid indicated that they owned it while 28% said they did not and 2% did not know. Thirteen percent of farmers identified an "other" response, the most common of which included contracting with a service provider.

ANSWER CHOICES	RESPONSES	
I owned the mechanical harvest aid	56.50%	100
I rented/leased the mechanical harvest aid	28.25%	50
I don't know	2.26%	4
Other (please specify)	12.99%	23
TOTAL		177

Table 6: Answers to the question "During 2020, did you own or rent the mechanical harvest aid for the production of [your main crop] in [your main county]?" Sample size: 177

When asked the reason for using the mechanical harvest aid, the most common response, chosen by 55% of those using a mechanical harvest aid, was to reduce the number of employees needed due to ongoing labor shortages. The second and third most frequent responses were to increase their harvest (28%) and to reduce reliance upon employees due to COVID-19 (25%).

ANSWER CHOICES	RESPONSES	
To reduce the number of employees I needed due to COVID-19 labor shortages	24.54%	40
To reduce the number of employees I needed due to ongoing labor shortages	55.21%	90
To increase my harvest	28.22%	46
To harvest faster	74.23%	121
To increase the number of times my employees could cover the land	11.04%	18
I don't know	1.84%	3
Total Respondents: 163		

Table 7: Answers to the question "During 2020, why did you use the mechanical harvest aid? (please select all that apply)." Sample size: 163

We asked farmers to report the type of mechanical harvest aid that boosted the efficiency of their workforce the most. Forty-eight percent of the 177 farmers who responded to this question selected an option other than our canned answers while 18% chose an in-field conveyor belt or packaging platform, 11% reported a hydraulic platform, and 7% reported a hand-held power tool. Among the most common "other" responses were mechanical harvesters, various kinds of bin transportation equipment, and new or more advanced bank-out machinery.

ANSWER CHOICES	RESPONSES	
In-field conveyor-belt or packaging platform	17.51%	31
Hydraulic platform	11.30%	20
Hand-held power tool	6.78%	12
I don't know	16.38%	29
Other (please specify)	48.02%	85
TOTAL		177

Table 8: Responses to the question "During 2020, what type of mechanical harvest aid increased the efficiency of [your main crop] workforce in [your main county]? (please select one option)." Sample size: 177

When farmers were asked what percentage of their main crop the mechanical harvest aid

was used on in 2010, 2015, and 2020, they reported an average of 49% of their crop in 2010, 57% in 2015, and 76% in 2020.

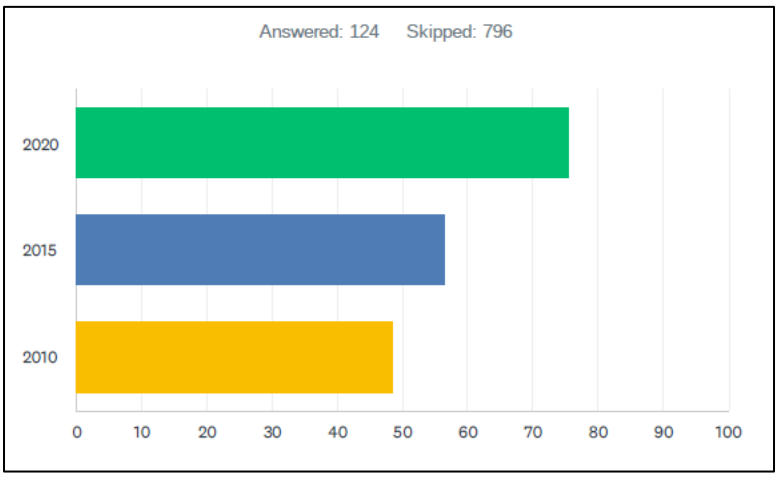


Figure 16: Responses to the question "Approximately what percentage of [your main crop] was the [mechanical harvest aid] used on during the years listed below?" Sample size: 124

Farmers were asked whether the mechanical harvest aid would enable them to feasibly maintain the current level of production of their main crop in their main county if fewer employees were available. Fifty percent of the 127 farmers who responded to this question said "Yes" while 35% said "No," and 16% did not know.

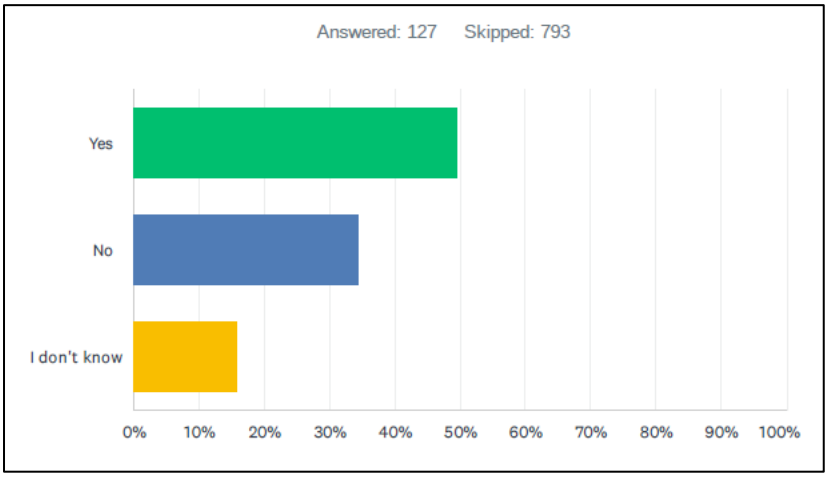


Figure 17: Responses to the question "If fewer employees were available, would the [mechanical harvest aid] enable you to feasibly maintain your current production of your [main crop] in [your main county]? (please select one option)." Sample size: 127

We asked farmers who used the mechanical harvest aid in 2020 whether they also used it in 2019. Seventy-seven percent said yes while 20% said no and 3% did not know.

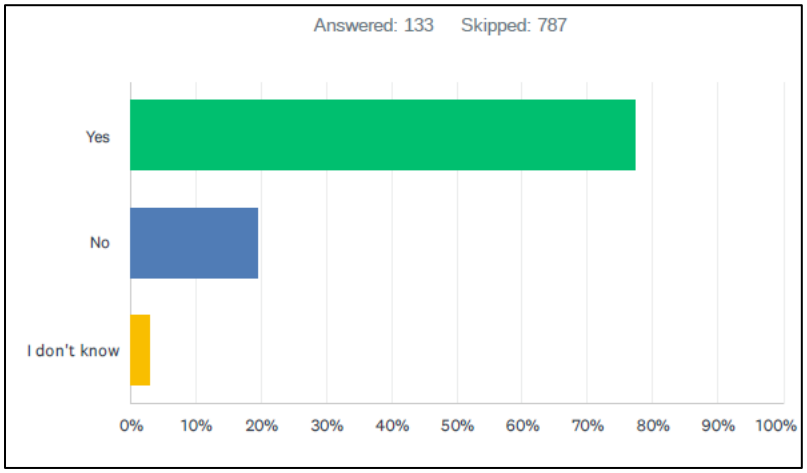


Figure 18: Responses to the question "A year earlier, during 2019, did you also use the mechanical harvest aid to produce [your main crop] in [your main county]? (please select one option)." Sample size: 133

Of the farmers who indicated they used the mechanical harvest aid in 2019 and 2020, 46% indicated that they increased their use of it in 2020 relative to 2019 while 51% said they did not, and 4% did not know.

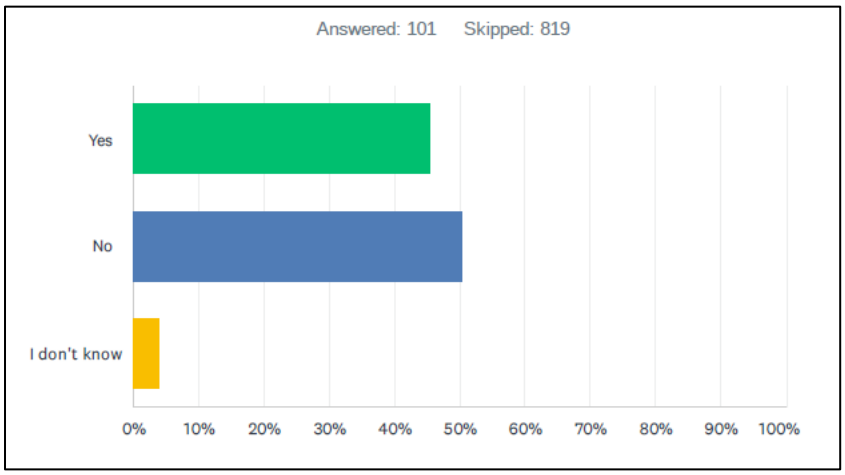


Figure 19: Answers to the question "Relative to 2019, did you increase the use of the [mechanical harvest aid] to produce [your main crop] in [your main county] in 2020? Sample size: 101

Of the farmers who increased their use of the mechanical harvest aid during 2020 relative to 2019, 28% indicated that they did so due to issues related to COVID-19 labor-availability issues while 65% said it was not related to COVID. Seven percent did not know.

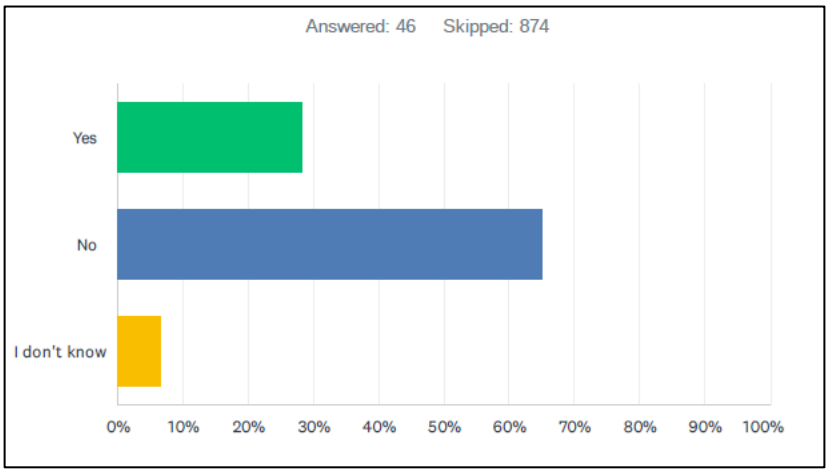


Figure 20: Responses to the question "Was your decision to increase your use of the [mechanical harvest aid] to produce [your main crop] in [your main county] during 2020 related to COVID-19 labor availability issues? (please select one option)." Sample size: 46

Changes in Crop Mix

We asked farmers whether they have switched or plan to switch any acreage out of the production of their main crop in their main county into the production of another crop that requires less labor to produce. Fifteen percent of the 702 farmers who responded to this question said "Yes" while 77% responded "No," and 9% indicated that they did not know.

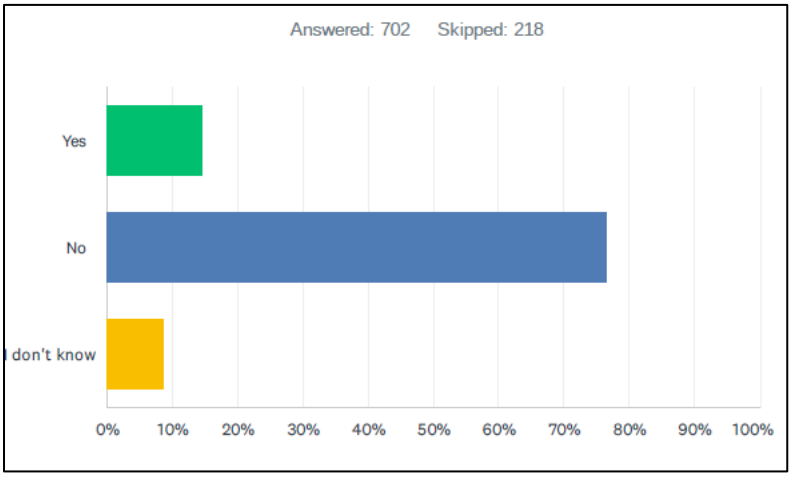


Figure 21: Responses to the question "Have you switched or do you plan to switch any of [your main crop] production in [your main county] into the production of a crop that requires less labor to produce?" Sample size: 702

Among the farmers who indicated that they had switched or are planning to switch acreage out of their main crop in their main county into the production of another crop, we asked what crop they were switching into. The leading response was tree nuts (38%), followed by wine grapes (9%), tree fruit and field crops (each with 8%), and avocados (6%). Twenty-nine percent of farmers reported a crop we did not list in our set of pre-selected options. Among those "other" crops were olives, pasture, and rice.

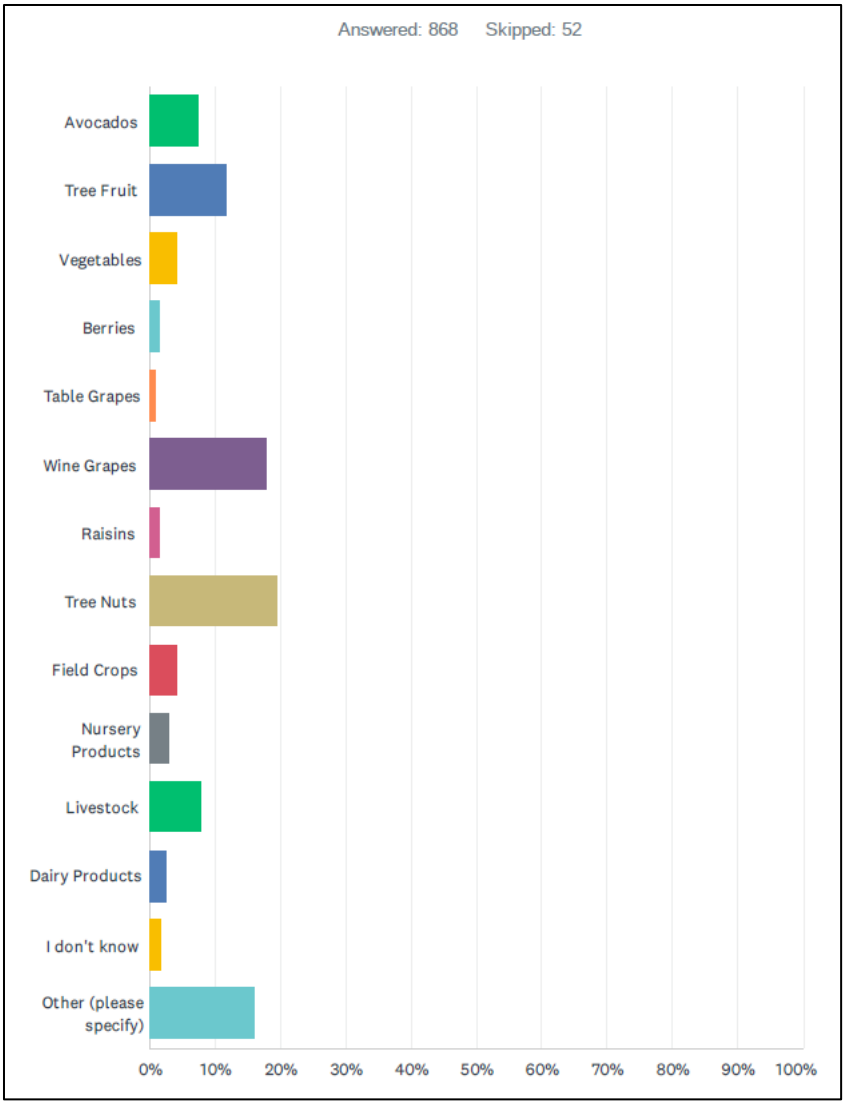


Figure 22: Responses to the question "You indicated that you have switched or are planning to switch some of [your main crop] production in [your main county] into a crop that requires less labor to produce. Which crop(s) did you produce or are you planning to produce instead of [your main crop] in [your main county]? (please select all that apply)." Sample size: 101

Conclusion

We surveyed a broad sample of California farmers covering 52 counties and numerous crop types. These farmers continued to report issues with labor scarcity that have persisted since our last farm labor scarcity survey in 2019. Nearly half of the farmers reported having difficulty hiring all the workers they wanted to produce their main crop in their highest revenue producing county during 2020. Among the farmers who reported labor shortages, the average shortage was 20% of the labor force they would have otherwise hired. To put this in perspective, if a farmer who faced a labor shortage would have normally hired 100 workers, she may have only been able to hire 80 during 2020.

COVID-19 also played a role labor shortage issues that farmers reported during 2020 with over half of the farmers who experienced a shortage indicating that COVID exacerbated it. Farmers reported a number of factors related to COVID-19 that contributed to labor shortages, including direct exposure to the virus, shelter-in-place orders, and generous unemployment benefits that allowed workers to generate more income from not working. Most farmers who faced labor shortages indicated that the labor shortages were worse in 2020 relative to 2019.

Farmers also 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. Farmers also reported having to pay for additional sick leave and time off for workers who contracted the virus or who had to take care of family members who were sick. Among the farmers who incurred additional COVID-19 related costs, the largest expense category ranged from $100 to $499 of additional expenses per employee, although some farmers reported incurring thousands of dollars of expenses for each employee.

While H-2A use continued to comprise a small share of labor use among survey respondents, a recent study in the journal California Agriculture reveals that the H-2A program in California is rapidly expanding (Martin and Rutledge, 2022).

Farmers also reported using labor-saving technologies and mechanical harvest aids to help them mitigate problems stemming from labor scarcity. Of the farmers who reported using them in 2020, their main labor-saving technology was used on an average of 66% of their main crop production in their main county. With respect to mechanical harvest aids, farmers reported increasing their use between 2010 and 2020. The average farmer who used a mechanical harvest aid used it on 49% of their crop in 2010, 57% of their crop in 2015, and 76% of their crop in 2020. The main reasons for using labor saving technologies and mechanical harvest aids were rising labor costs and the ability to harvest faster, respectively.

Overall, farmers continued to report issues stemming from a lack of labor while many are struggling to navigate the situation. While farmers are clearly making efforts to mitigate production and profit losses stemming from labor shortages, they continue to be a major challenge for California farmers.