

# **Adapting to Farm Labor Scarcity Survey UC Davis and California Farm Bureau Federation**

## **Summary of Preliminary Findings**

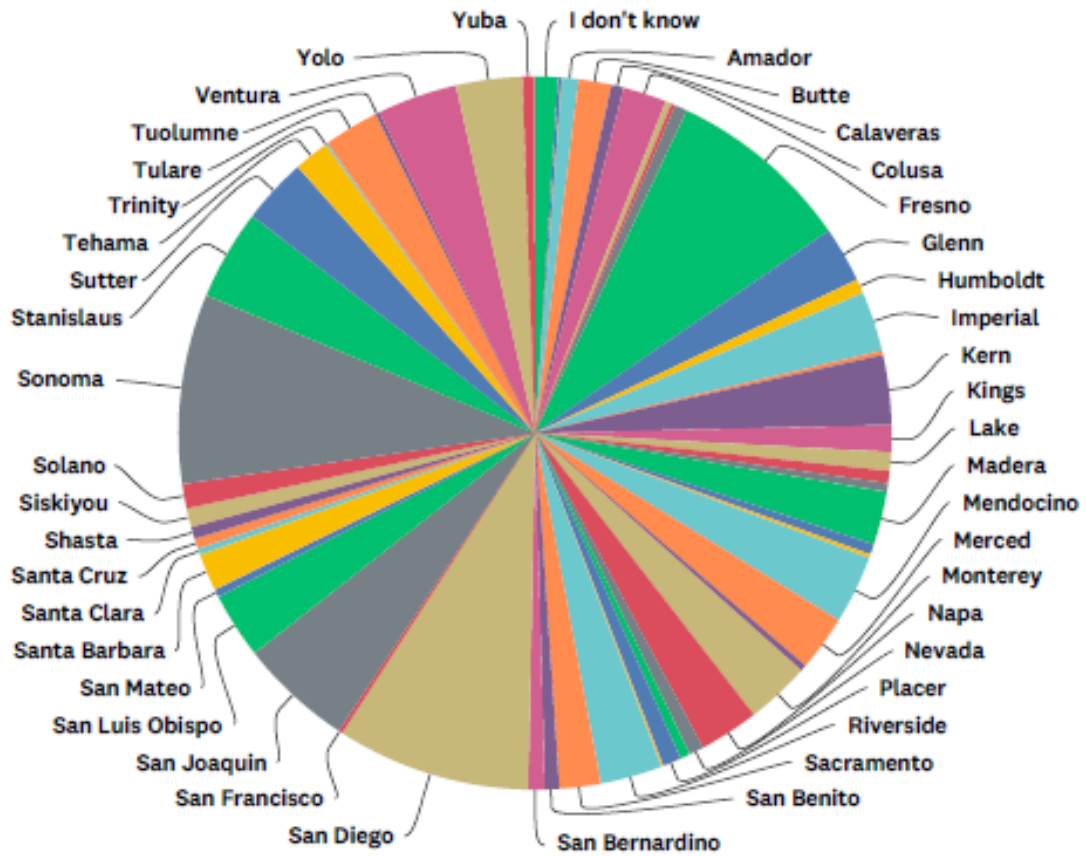
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Recent studies show that the supply of farm workers from rural Mexico is decreasing (Charlton and Taylor, 2016). Because the vast majority of hired farm workers in the United States are from Mexico, a negative trend in farm labor migration from Mexico creates challenges for California farmers. The purpose of this survey is to collect information about changes in farming practices resulting from the increased incidence of farmworker scarcity. This report describes the survey response and summarizes a number of key preliminary findings.

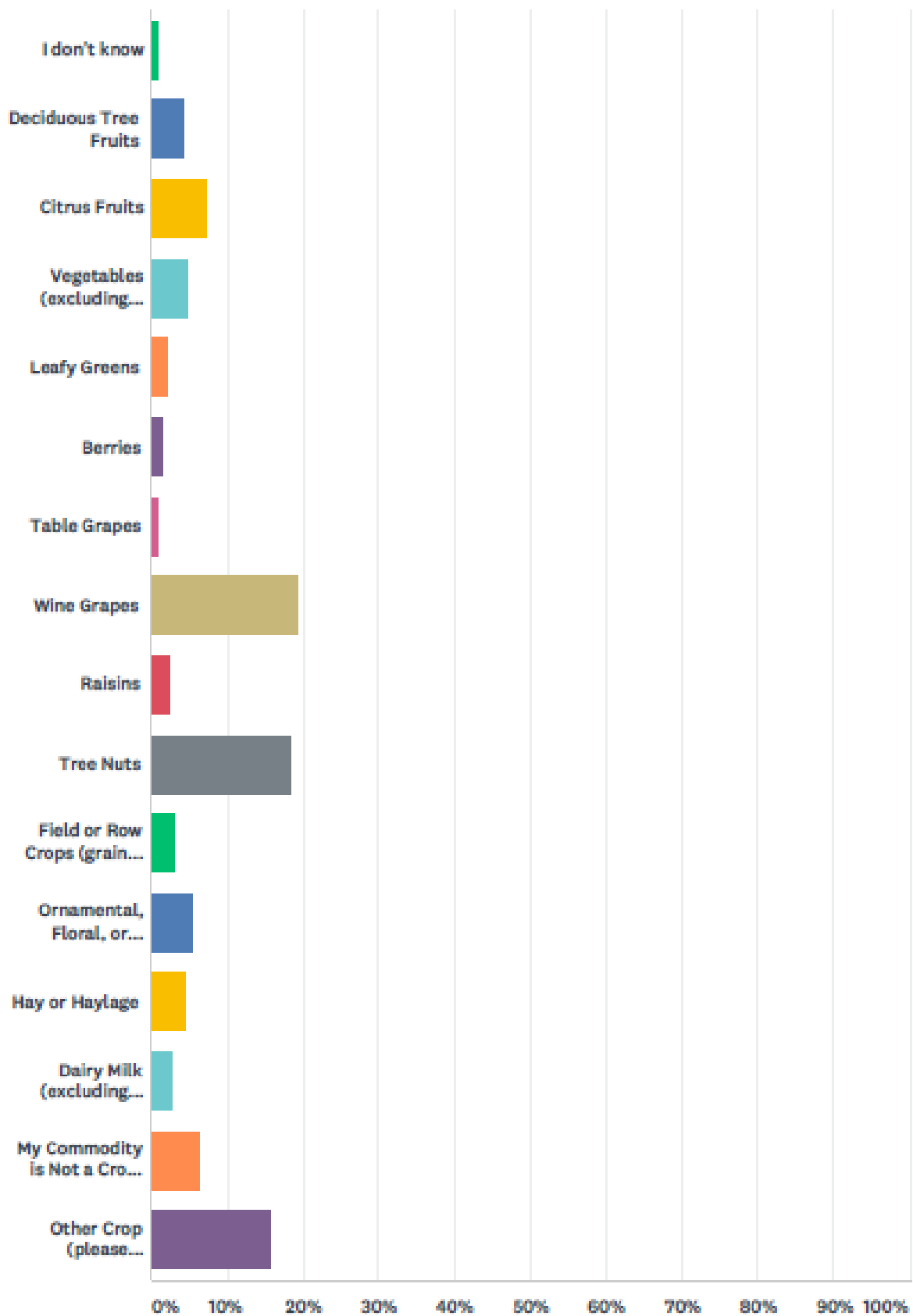
### **Survey Sample and Response**

The survey was sent to all members of the California Farm Bureau Federation (CFBF). The generalizability of responses to the population of all farmers in California depends on (a) how representative CFBF members are of that population, and (b) whether those who chose to complete the survey are similar statistically to those who did not. We hope to learn more about the representativeness of this sample in the future, by comparing its characteristics to farmer characteristics in data from other sources, particularly USDA NASS data.

A total of 1,071 farmers responded to the survey. Not all respondents answered all questions, so sample sizes vary somewhat from one question to another. The response reflects a broad survey coverage across California counties (Figure 1) and commodities (Figure 2).



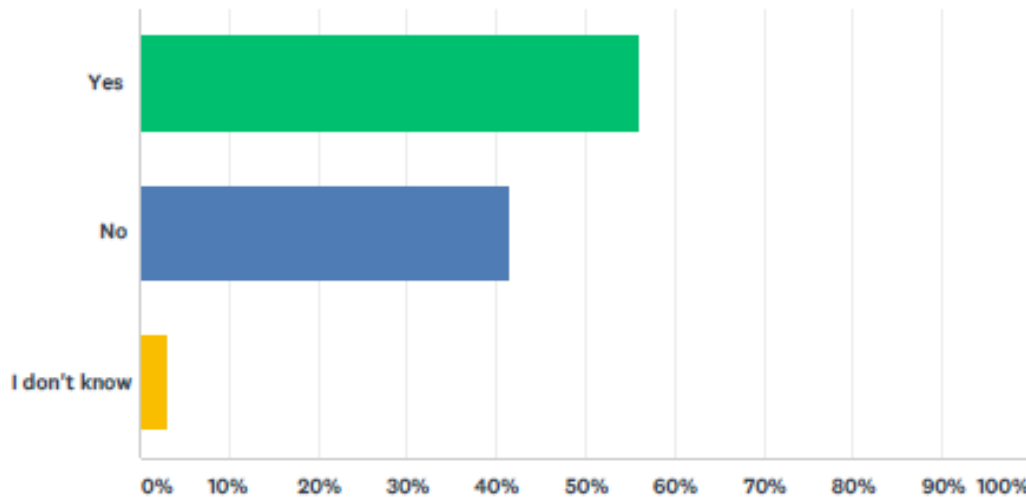
**Figure 1.** Answer to question: “In which California county did you produce the highest percentage of your total sales during 2018?” Sample size: 1,071.



**Figure 2.** Answer to question: “Which commodity produced during 2018 in [your main] county generated the highest percentage of your total sales? Sample size: 1,022.

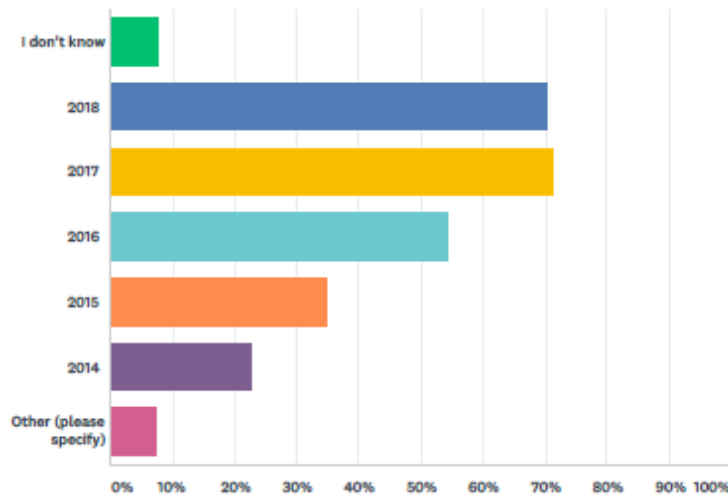
## Farm Labor Shortages

Most respondents—56%—answered “yes” to the question: “During the past 5 years, have you ever been unable to obtain all the workers you needed for the production of [your main crop] in [your main] county?” (See Figure 3). Forty-one percent answered “no” to this question, and just under 3% said they did not know.



**Figure 3.** Answer to question: “During the past 5 years, have you ever been unable to obtain all the workers you needed for the production of [your main crop] in [your main] county?” Sample size: 815.

We asked farmers who responded “yes” to the previous question “During which of the years listed below were you unable to obtain all the workers you needed to produce [your main crop] in [your main] county? (please check all that apply or click “I don’t know).” The responses indicate that the percentage experiencing labor shortages was significantly higher (greater than 70%) in 2017 and 2018 than in previous years (Figure 4).



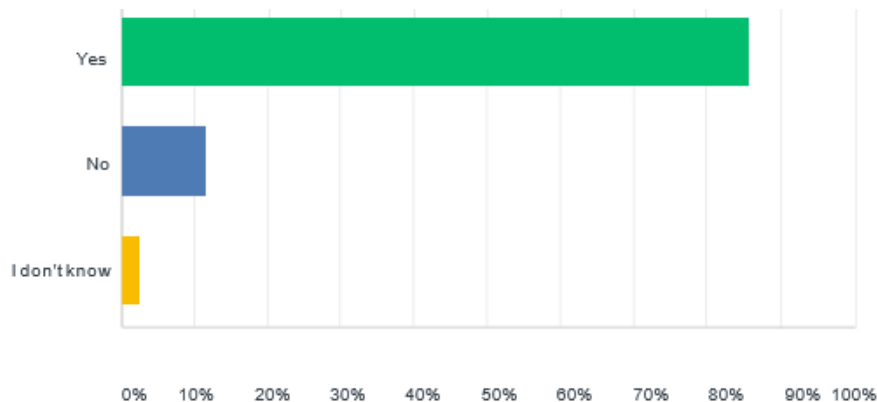
**Figure 4.** Answer to question: “During which of the years listed below were you unable to obtain all the workers you needed to produce [your main crop] in [your main] county? (please check all that apply or click “I don’t know”).” Sample Size: 441 of the 455 who answered “yes” to the previous question.

### Farmer Responses to Labor Shortages

We asked farmers a series of questions about actions they have taken to avoid or respond to farm labor shortages.

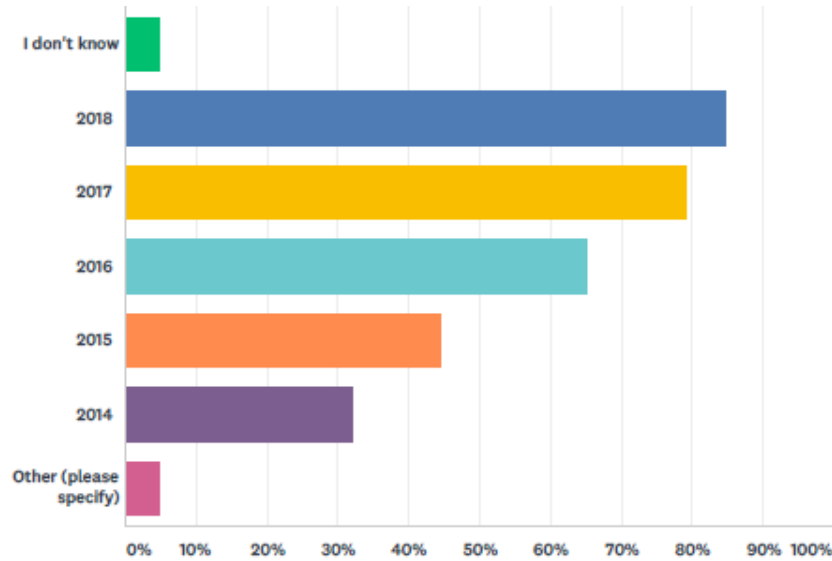
*Farmers are paying higher wages.*

Eighty-six percent of all farmers who responded to our survey answered “yes” to the question “In order to obtain enough workers for the production of [your main crop] in [your main] county, have you increased the amount you paid for labor during the past 5 years?” (See Figure 5). Just under 12% answered that they had not.



**Figure 5.** Answer to question: In order to obtain enough workers for the production of [your main crop] in [your main] county, have you increased the amount you paid for labor during the past 5 years?” Sample size: 808.

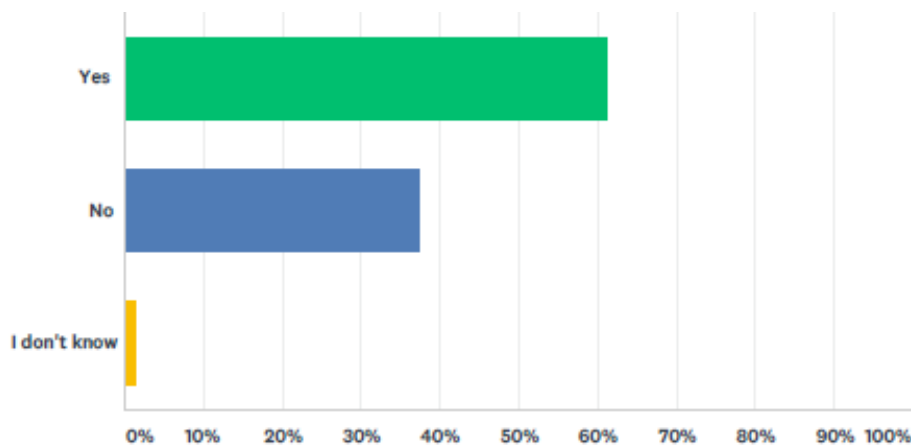
Of the farmers who answered “yes” to the previous question, we asked “During which of the years listed below did you increase the amount you paid for labor in order to obtain enough workers to produce [your main crop] in [your main] county? (please check all that apply).” Their responses show that the percentage of farmers who increased the amount they pay for labor is very high (85% in 2018), and it is increasing (it was only 32% in 2014) (See Figure 6).



**Figure 6.** Answer to question: “During which of the years listed below did you increase the amount you paid for labor in order to obtain enough workers to produce [your main crop] in [your main] county? (please check all that apply).” Sample size: 692 of the 693 who answered “yes” to the previous question.

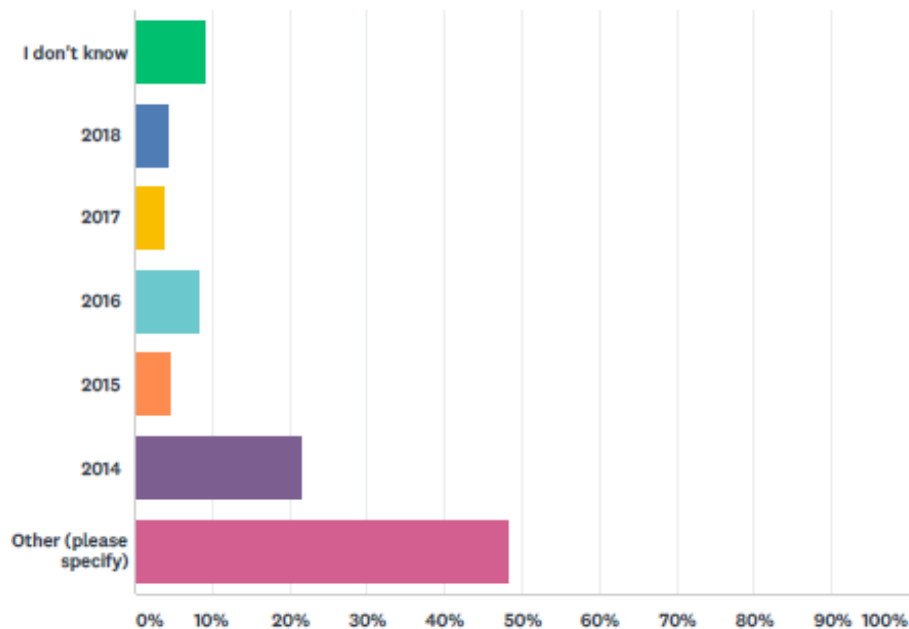
*More farmers are using labor contractors.*

We asked farmers the question: “During the past 5 years, have you used a farm labor contractor to produce [your main crop] in [your main] county?” Sixty-one percent said that they had, and 37% said they had not (Figure 7).



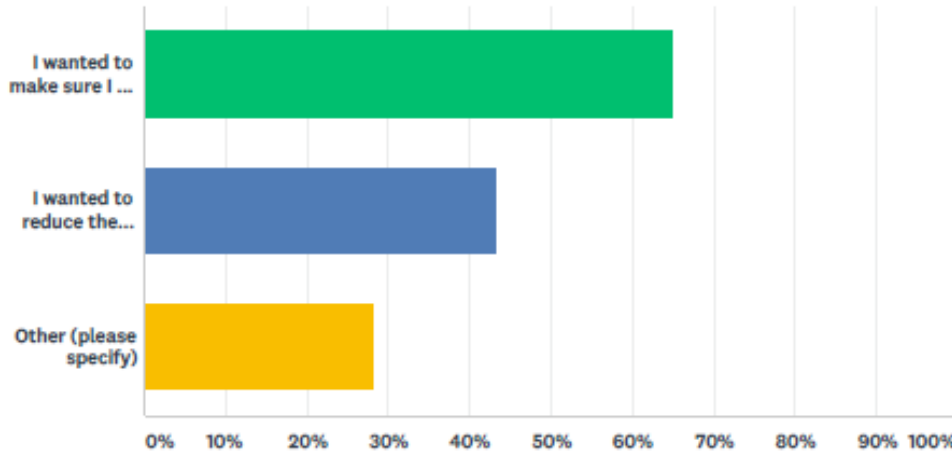
**Figure 7.** Answer to question: “During the past 5 years, have you used a farm labor contractor to produce [your main crop] in [your main] county?” Sample size: 807.

We asked those who had used a farm labor contractor during the past 5 years “In [your main] county, when was the first year you used a farm labor contractor to obtain workers to produce [your main crop]?” The response (See Figure 8) reveals that about half of the farmers (48%) who used labor contractors have been doing so for more than 5 years. There was a sharp increase (just over 8%) in 2016, followed by increases of around 4% in 2017 and 2018. Over 21% reported first using a labor contractor in 2014—more than four times higher than in 2015. It is not clear whether that number indicates a large increase in labor contractor use in 2014 or whether some farmers who began using labor contractors earlier chose 2014 as the best option (instead of choosing “other” then specifying the earlier year). Of the 237 individuals who selected the “other” option, only 199 responded with answers that could be matched to a specific year. After discarding responses that could not be matched to a specific year, 25% of farmers indicated that they started using a farm labor contractor for the first time between 2000 and 2013, and 19% indicated that they started using farm labor contractors prior to 2000.



**Figure 8.** Answer to question: “In [your main] county, when was the first year you used a farm labor contractor to obtain workers to produce [your main crop]?” Sample size: 491 of 493 who answered “yes” to the question “During the past 5 years, have you used a farm labor contractor to produce [your main crop] in [your main] county?”

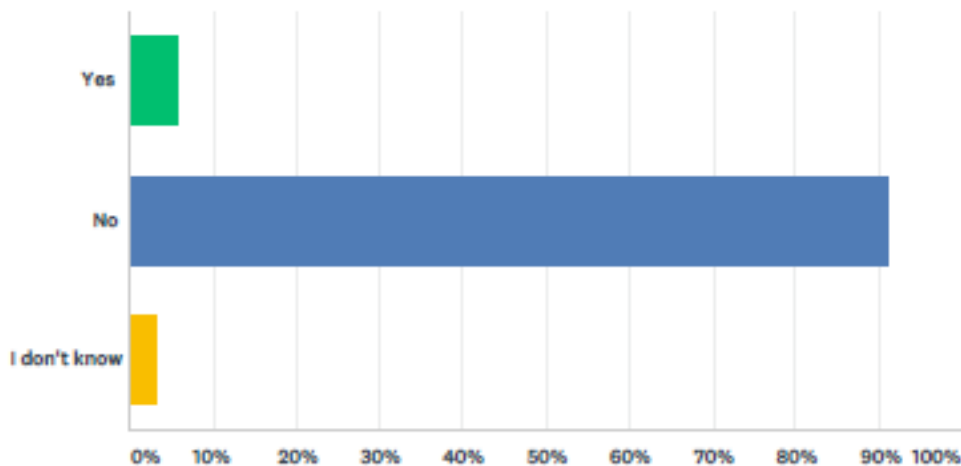
We explored more deeply the relationship between labor contractor use and labor scarcity by asking those who used labor contractors the following question: “What made you decide to use a farm labor contractor to produce [your main crop] in [your main] county that first year? (please select all that apply).” Nearly two-thirds (65%) answered that they first used labor contractors in order to make sure they had enough workers (Figure 9). Forty-three percent answered that they first used labor contractors in order to reduce the administrative burden associated with employment, and 28% gave other reasons (which we have not yet examined).



**Figure 9.** Answer to question: “What made you decide to use a farm labor contractor to produce [your main crop] in [your main] county that first year? (please select all that apply).” Sample size: 473 of 493 answering “yes” to the question “During the past 5 years, have you used a farm labor contractor to produce [your main crop] in [your main] county?” Percentages add to more than 100% because farmers could report multiple reasons.

*More farmers are using the H-2A Program.*

We asked farmers “During the past 5 years, have you enrolled in the H-2A visa program to bring in workers to produce [your main crop] in [your main] county?” We found that only a small percentage of farmers, just under 6%, have enrolled in the H-2A program in the last 5 years (Figure 10).

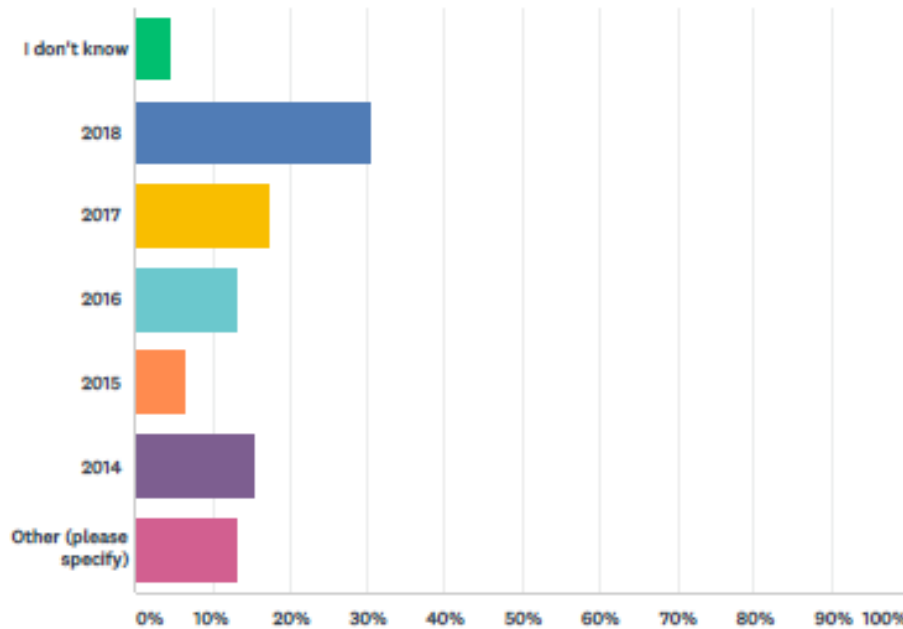


**Figure 10.** Answer to question: “During the past 5 years, have you enrolled in the H-2A visa program to bring in workers to produce [your main crop] in [your main] county? Sample size: 785.

If a farmer reported enrolling in the H-2A program in the last 5 years, we asked the following question: “In [your main] county, when was the first year you enrolled in the H- 2A visa program to

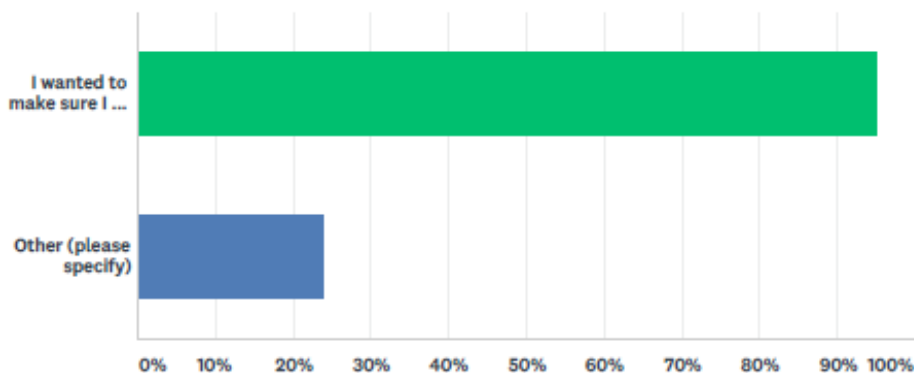


bring in workers to produce [your main crop]?” The answers to this question reveal that, even though a minority of farmers are enrolled in the H-2A program, the percentage is increasing over time (Figure 11). Of those who were enrolled, just over 30% did so in 2018.



**Figure 11.** Answer to question: “In [your main] county, when was the first year you enrolled in the H-2A visa program to bring in workers to produce [your main crop]?” Sample size: 46 of the 46 answering “yes” to the previous question.

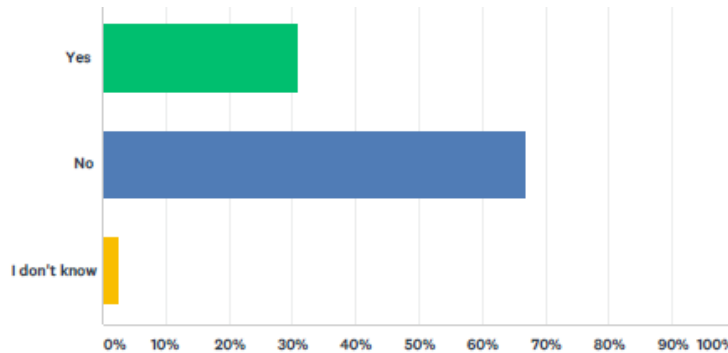
We asked farmers who had enrolled in the H-2A program “What made you decide to enroll in the H-2A visa program to produce [your main crop] in [your main] county during that first year? (please select all that apply).” Their answers (Figure 12) reveal that the vast majority—95%--enrolled in the H-2A program in order to make sure they had enough workers.



**Figure 12.** Answer to question: “What made you decide to enroll in the H-2A visa program to produce [your main crop] in [your main] county during that first year? (please select all that apply).” Sample size: 42 of the 46 answering “yes” to the question: “During the past 5 years, have you enrolled in the H-2A visaprogram to bring in workers to produce [your main crop] in [your main] county?” Percentages add to more than 100% because farmers could report multiple reasons.

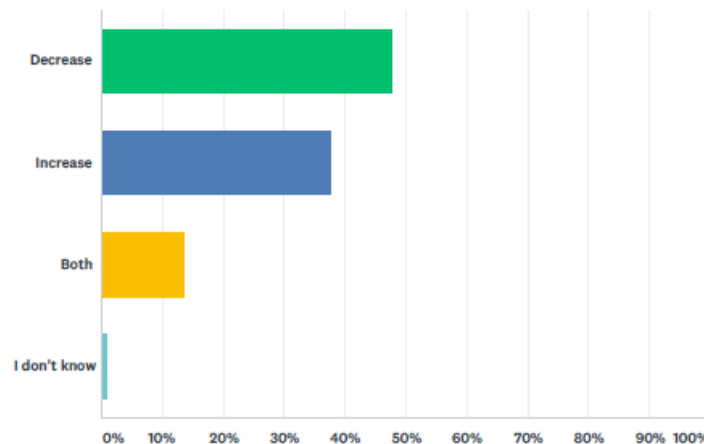
*Farmers are changing the acreage of their main crops.*

In order to gain insight into how farmers may be changing their cropping patterns, we asked “Outside of a typical crop rotation, have you intentionally changed the number of acres dedicated to the production of [your main crop] in [your main] county during the past 5 years?” Approximately one-third of farmers (31%) indicated that they had changed the number of acres of their main crop. Sixty-six percent indicated that they have not changed acres, and 2% said that they did not know (Figure 13).



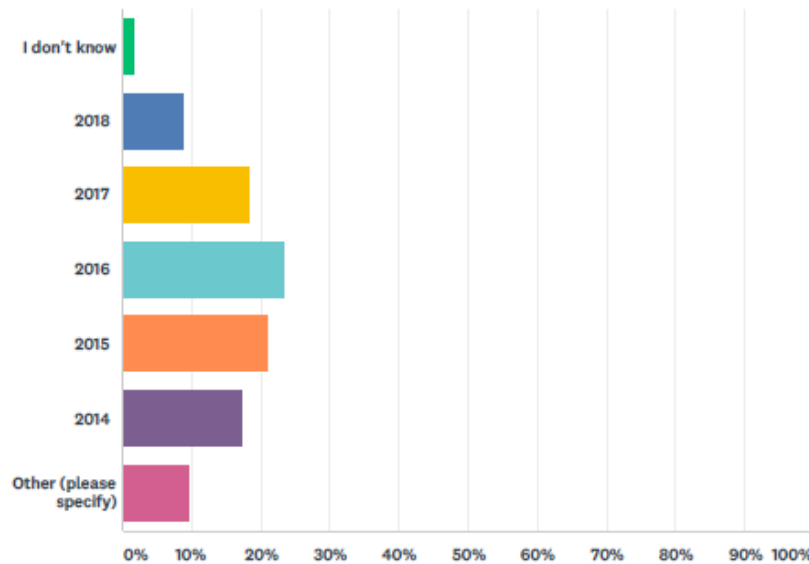
**Figure 13.** Answer to question: “Outside of a typical crop rotation, have you intentionally changed the number of acres dedicated to the production of [your main crop] in [your main] county during the past 5 years? Sample size: 780.

If a farmer reported “yes” to the previous question, we asked “During the past 5 years, was the change in acreage of [your main crop] in [your main] county a decrease, an increase, or both?” Forty-eight percent of farmers reported that they had decreased the acreage of their main crop, while 38% reported that they increased it (See Figure 14). Another 14% indicated that they had both decreased and increased acreage, and 1% reported that they did not know.



**Figure 14.** Answer to the question: “During the past 5 years, was the change in acreage of [your main crop] in [your main] county a decrease, an increase, or both?” Sample size: 241 including all 240 of those answering “yes” to the question “Outside of a typical crop rotation, have you intentionally changed the number of acres dedicated to the production of [your main crop] in [your main] county during the past 5 years?” and one individual who mistakenly selected “yes,” answered this question, then changed their answer to the previous question.

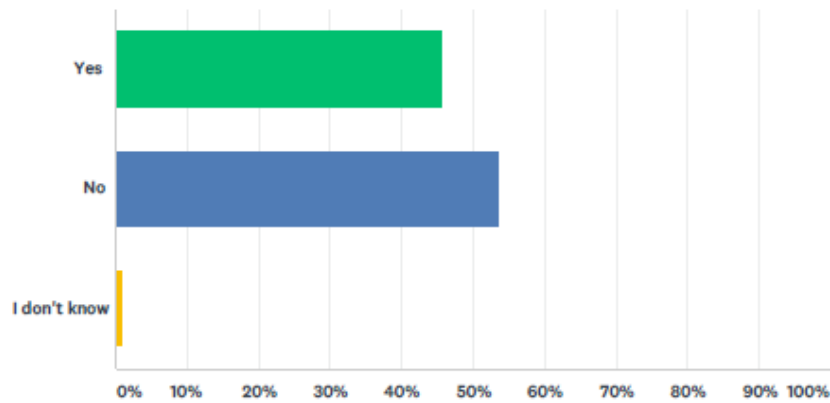
We asked farmers who reported decreasing the acreage of their main crop during the past 5 years the following question: “When was the first year you decreased the acreage dedicated to the production of [your main crop] in [your main] county?” Eighty-nine percent of those who made a decrease in acreage during the past 5 years reported that it was their first time decreasing acreage, while 11% indicated that they had also made decreases in prior years (Figure 15). Of the farmers who made a decrease in the acreage of their main crop during the past 5 years, 17% decreased the acreage of their main crop for the first time in 2014, 24% decreased acreage for the first time in 2016, and 9% decreased acreage for the first time in 2018.



**Figure 15.** Answer to the question: “When was the first year you decreased the acreage dedicated to the production of [your main crop] in [your main] county?” Sample size: All 115 of those who responded “decrease” to the question “During the past 5 years, was the change in acreage of [your main crop] in [your main] county a decrease, an increase, or both?”

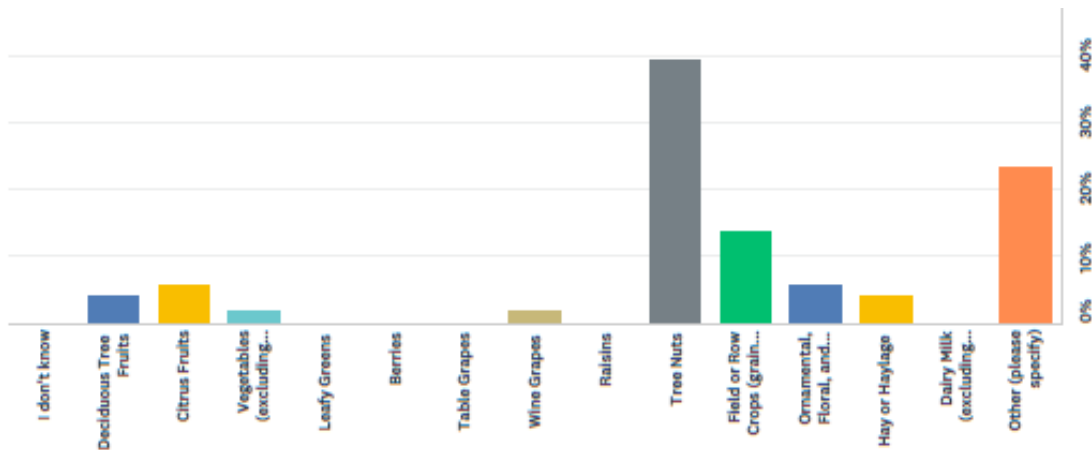
*Farmers are switching to less labor-intensive crops.*

We asked farmers who reported decreasing the acreage of their main crop during the past 5 years the following question: “During the first year you decreased the acreage of [your main crop] in [your main] county, did you switch any of those acres into the production of another commodity?” Forty-six percent reported that they switched some acres of their main crop into another crop, while 54% indicated that they did not (Figure 16).



**Figure 16.** Answer to the question: “During the first year you decreased the acreage of [your main crop] in [your main] county, did you switch any of those acres into the production of another commodity?” Sample size: 112 of the 115 answering “decrease” to the question “During the past 5 years, was the change in acreage of [your main crop] in [your main] county a decrease, an increase, or both?”

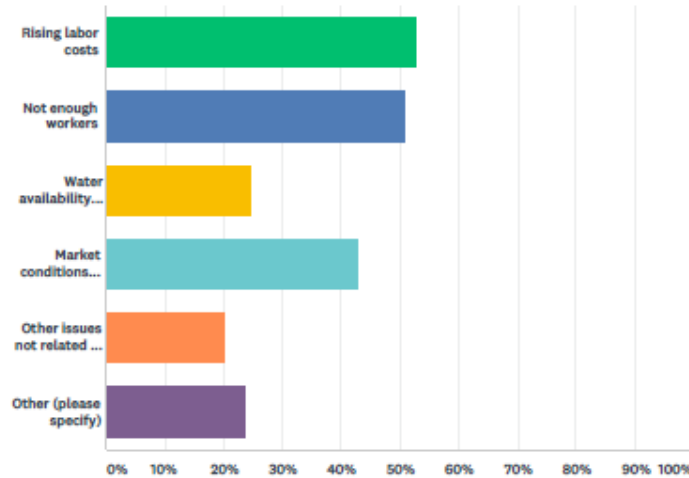
To get an idea of what types of crops farmers are switching their acreage into, we asked those who reported decreasing acreage and who also switched some of those acres into another crop the following question: “In [your main] county, which commodity did you switch the largest portion of those (...) acres into during that first year?” Fifty-seven percent of those who responded reported switching some acreage into crops that we could determine were non-labor-intensive such as tree nuts (39%), field or row crops such as corn or cotton (14%), or hay (4%) (Figure 17).



**Figure 17.** Answer to the question: “In [your main] county, which commodity did you switch the largest portion of those (...) acres into during that first year?” Sample size: All 51 of those who responded “yes” to the question “During the first year you decreased the acreage of [your main crop] in [your main] county, did you switch any of those acres into the production of another commodity?”

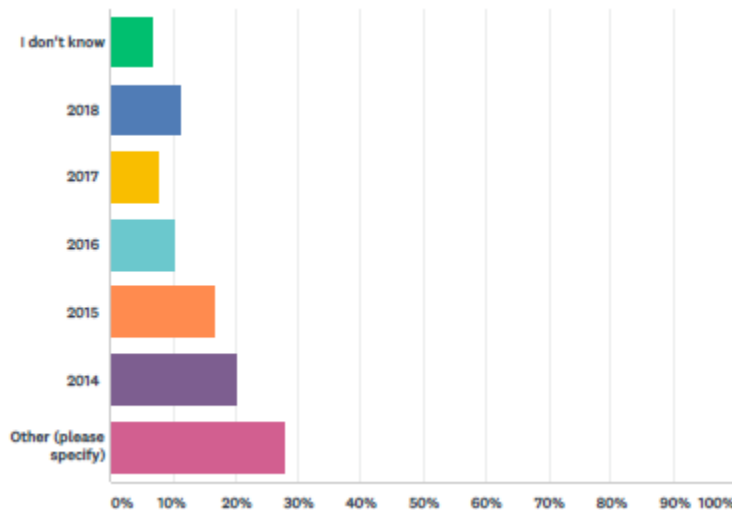
We asked farmers who reported decreasing the acreage of their main crop during the past 5 years the following question: “What made you decide to decrease the acreage dedicated to the production of [your main crop] in [your main] county that first year? (please select all that apply).” Acreage

decreases were primarily due to issues related to labor, with 53% reporting a decrease in acreage due to rising labor costs and 51% reporting that it was due to there not being enough workers (percentages add up to more than 100% because farmers were allowed to select more than one reason). However, a substantial percentage of farmers (43%) also responded that market conditions related to input costs or commodity prices also played a role (See Figure 18).



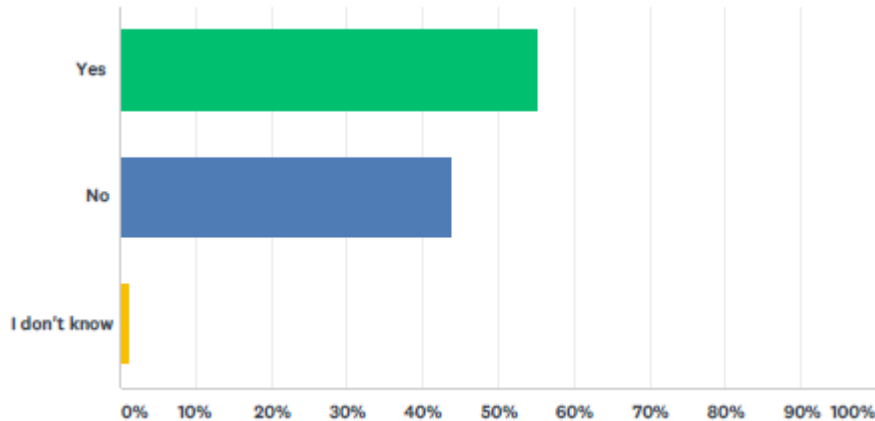
**Figure 18.** Answer to the question: “What made you decide to decrease the acreage dedicated to the production of [your main crop] in [your main] county that first year? (please select all that apply).” Sample size: 110 of the 115 who responded “decrease” to the question “During the past 5 years, was the change in acreage of [your main crop] in [your main] county a decrease, an increase, or both?”

To those who responded that they increased the acreage of their main crop during the past 5 years, we asked the following question: “When was the first year you increased the acreage dedicated to the production of [your main crop] in [your main] county?” Of the farmers who increased the acreage of their main crop during the past 5 years, 66% increased the acreage of that crop for the first time during the past 5 years, while 28% had increased the acreage of that crop prior to 2014, and 7% did not know (See Figure 19). Fewer farmers (11%) increased acreage for the first time in 2018 compared with 20% in 2014. Twenty-eight percent of farmers increased the acreage of their main crop for the first time in a year prior to 2014.



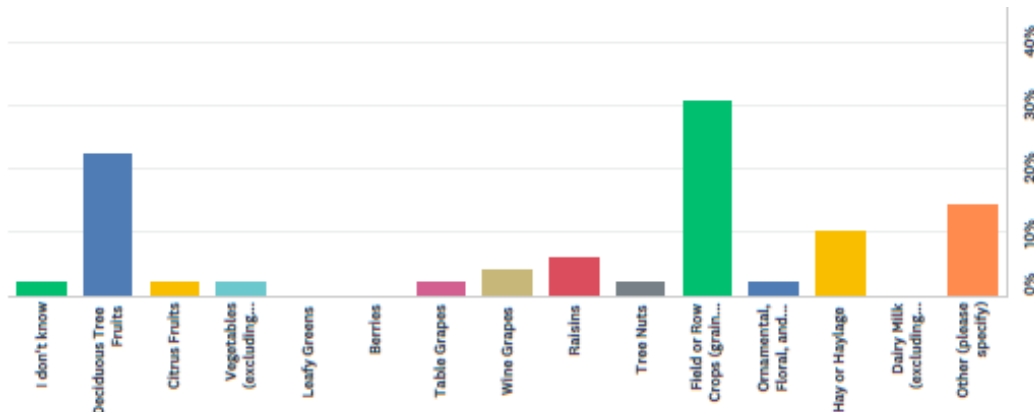
**Figure 19.** Answer to the question “When was the first year you increased the acreage dedicated to the production of [your main crop] in [your main] county?” Sample size: 90 of the 91 who responded “increase” to the question “During the past 5 years, was the change in acreage of [your main crop] in [your main] county a decrease, an increase, or both?”

We asked those who increased acreage of their main crop during the past 5 years the following question: “During the first year you increased the acres of [your main crop] in [your main] county, did you switch any of those acres out of producing a different commodity?” Most of the farmers (55%) answered “yes,” while 44% answered no, and 1% indicated that they did not know (See Figure 20).



**Figure 20.** Answer to the question: “During the first year you increased the acres of [your main crop] in [your main] county, did you switch any of those acres out of producing a different commodity?” Sample size 89 of the 91 who responded “increase” to the question “During the past 5 years, was the change in acreage of [your main crop] in [your main] county a decrease, an increase, or both?”

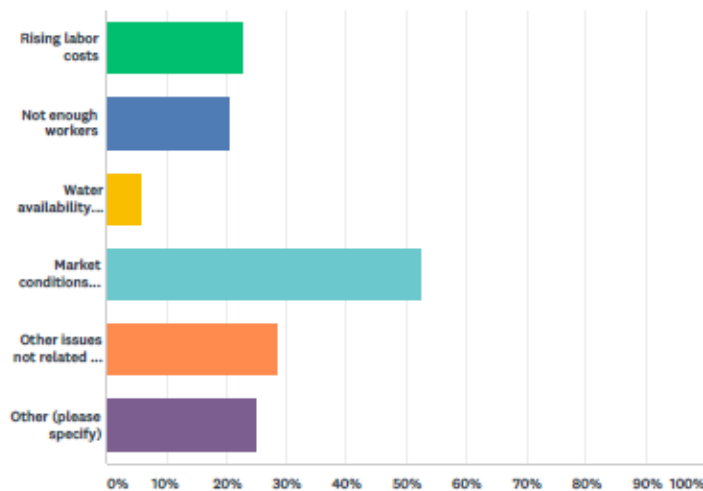
We asked those who responded “yes” to the previous question “In [your main] county, which commodity did you switch the largest portion of those (...) acres out of producing during that first year?” Forty-one percent indicated that they switched some acres out of the production of labor-intensive crops such as tree fruits and vegetables (Figure 21). Another 31% switched acreage from field and row crops such as corn or cotton, and 24% switched acreage out of producing hay products or some “other” crop.



**Figure 21.** Answer to the question: “In [your main] county, which commodity did you switch the largest portion of those (...) acres out of producing during that first year?” Sample size: All 49 of those who responded “yes” to the question “During the first year you increased the acres of [your main crop] in [your main] county, did you switch any of those acres out of producing a different commodity?”

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For those who indicated that they increased acreage, we asked the following question: “What made you decide to increase the acreage dedicated to the production of [your main crop] in [your main] county that first year? (please select all that apply).” Fifty-three percent increased acreage because of market conditions related to input or commodity prices. Twenty-three percent increased the acreage of their main crop due to rising labor costs, and 20% increased acreage due to there not being enough workers. These responses suggest that some farmers are switching acreage from labor-intensive crops into less labor-intensive crops due to increased labor scarcity. Twenty-nine percent of farmers responded that they increased acreage due to other issues not related to labor (these figures add up to more than 100% because farmers could select more than one reason) (Figure 22).

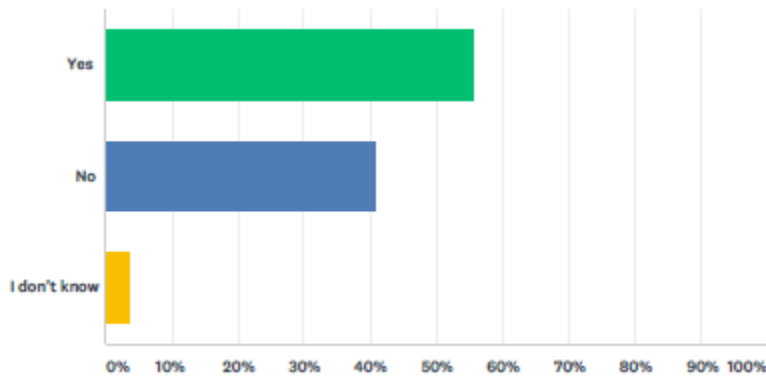


**Figure 22.** Answer to the question: “What made you decide to increase the acreage dedicated to the production of [your main crop] in [your main] county that first year? (please select all that apply).” Sample size: 88 of the 91 who responded “increase” to the question “During the past 5 years, was the change in acreage of [your main crop] in [your main] county a decrease, an increase, or both?”

## Technology Adoption

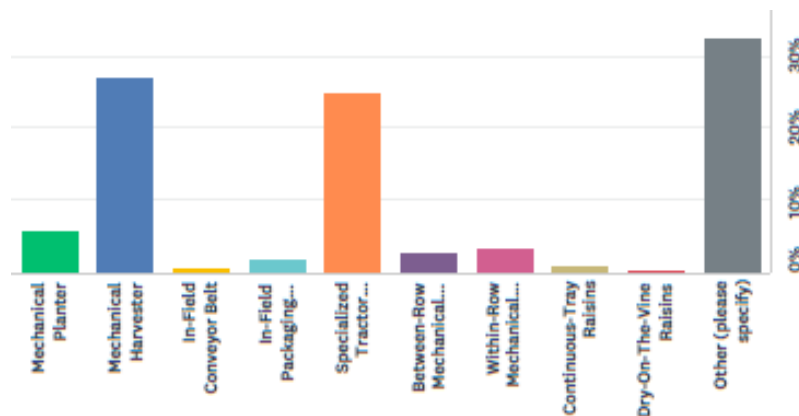
*Farmers are becoming more reliant upon technology due to rising wages and increased labor scarcity.*

We asked the following question to all farmers: “During the past 5 years, have you used a labor-saving technology that has reduced the amount of labor you require to produce [your main crop] in [your main] county?” Most of the farmers (56%) responded “yes,” while 41 % responded “no,” and 4% responded “I don’t know” (See Figure 23).



**Figure 23.** Answer to the question: “During the past 5 years, have you used a labor-saving technology that has reduced the amount of labor you require to produce [your main crop] in [your main] county?” Sample size: 768.

We asked the following question to farmers who indicated that they had used a labor-saving technology during the past 5 years: “Which labor-saving technology reduced your labor needs the most for the production of [your main crop] in [your main] county?” Twenty-seven percent indicated that a mechanical harvester reduced their labor the most (See Figure 24). Another 25% responded that a specialized tractor attachment reduced their labor need the most, and 33% responded that some “other” technology reduced their labor needs the most. Of those who selected “other” and typed in an answer, multiple farmers mentioned mechanical pruning devices, automated irrigation equipment, and newer, larger, or more efficient tractors.

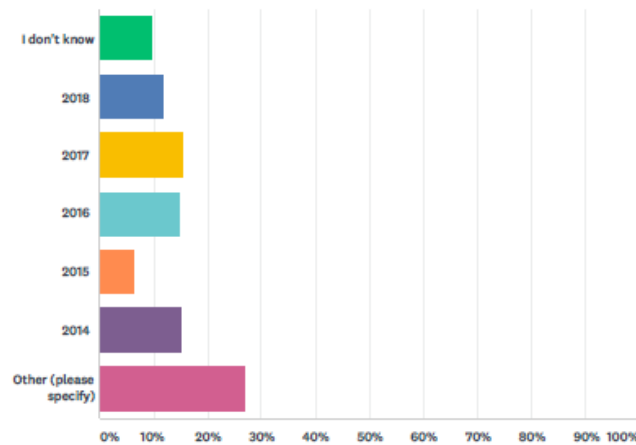


**Figure 24.** Answer to the question: “Which labor-saving technology reduced your labor needs the most for the production of [your main crop] in [your main] county?” Sample size: 429 including 427 of the 428 who responded “yes” to the previous question plus 2 individuals who initially answered “yes” to the previous question, answered this question, then switched their answers to the previous question.

We asked the farmers who used a labor-saving technology during the past 5 years the following question: “In [your main] county, when was the first year you started using the [technology selected above] to produce [your main crop]?” Nearly two-thirds (63%) of the farmers who used a labor-saving

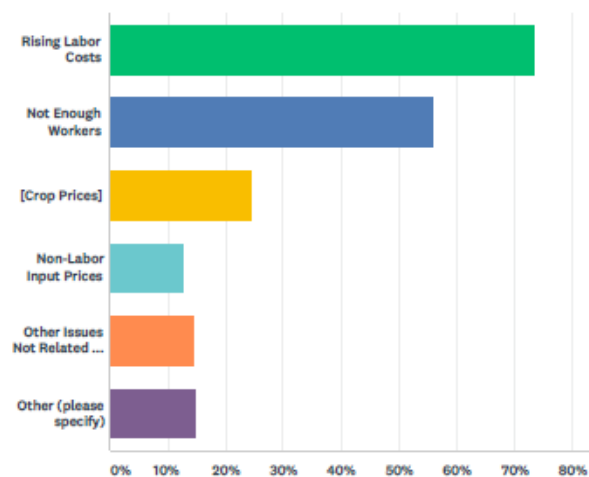


technology during the past 5 years started using that technology for the first time during this period (Figure 25). Another 27% had used the technology prior to 2014, and 10% did not know when they started using it.



**Figure 25.** Answer to the question: “In [your main] county, when was the first year you started using the [technology selected above] to produce [your main crop]?” Sample size: 425 of the 428 who replied “yes” to the question “During the past 5 years, have you used a labor-saving technology that has reduced the amount of labor you require to produce [your main crop] in [your main] county?”

We asked the following question to farmers who used a labor-saving technology during the past 5 years: “What made you decide to use the [technology selected above] to produce [your main crop] in [your main] county that first year? (please select all that apply).” Most of the farmers responded that they used a labor-saving technology because of issues related to labor (See Figure 26). Roughly three-quarters (74%) responded that they used the labor-saving technology because of rising labor costs, and 56% responded that they used it because there were not enough workers (these figures add up to more than 100% because farmers were allowed to select more than one reason).



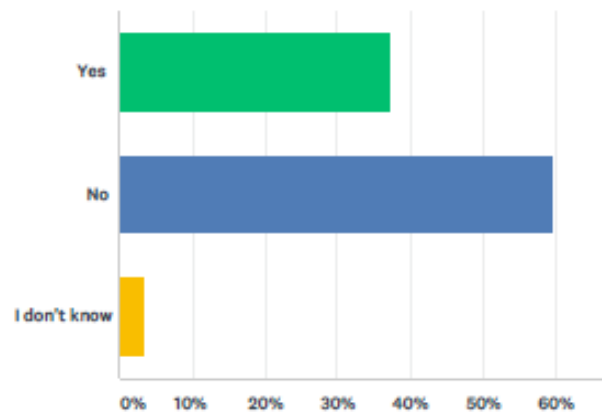
**Figure 26.** Answer to the question: “What made you decide to use the [technology selected above] to produce [your main crop] in [your main] county that first year? (please select all that apply).” Sample size: 415 of the 428 who replied “yes” to the question “During the past 5 years, have you used a labor-

saving technology that has reduced the amount of labor you require to produce [your main crop] in [your main] county?”

## Cultivation Practices

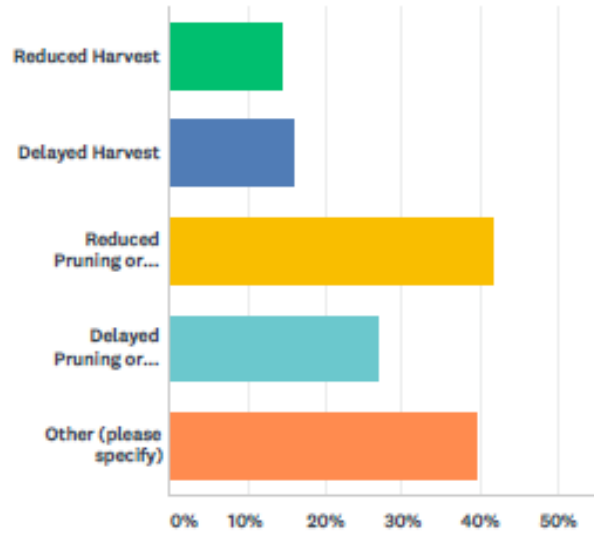
*Farmers are changing their cultivation practices because of rising wages and increased labor scarcity.*

We asked all farmers the following question: “During the past 5 years, have you changed cultivation practices for [your main crop] in [your main] county?” Of those farmers who responded, 37% said they had changed cultivation practices, while 60% said they had not (See Figure 27).



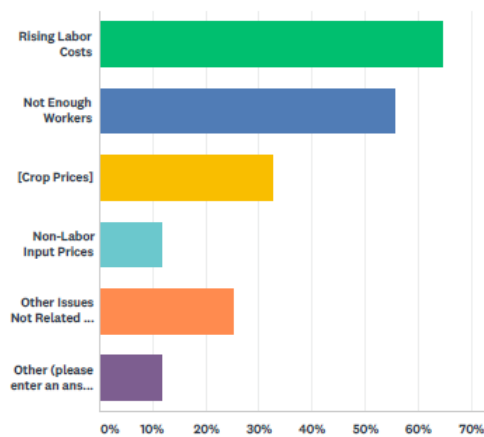
**Figure 27.** Answer to the question: “During the past 5 years, have you changed cultivation practices for [your main crop] in [your main] county?” Sample size: 752.

We asked farmers who said “yes” to the previous question: “During the past 5 years, which of the following cultivation practices has your farm operation changed? (please select all that apply).” The most common response was “reduced pruning or weeding,” selected by 42% of respondents, while 27% indicated that they delayed pruning or weeding (See Figure 28). Fourteen percent indicated that they reduced harvest, and 16% indicated that they delayed harvest. Forty percent reported that they changed some “other” cultivation practice.



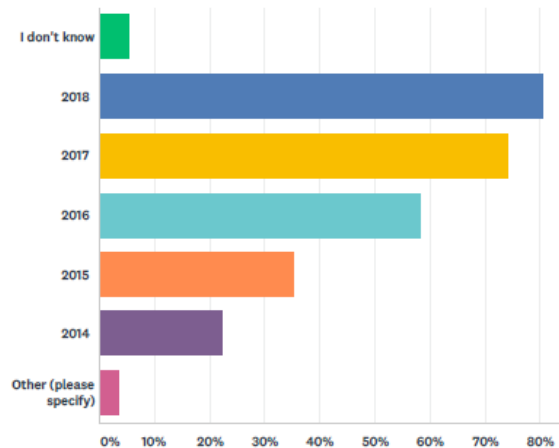
**Figure 28.** Answer to the question: “During the past 5 years, which of the following cultivation practices has your farm operation changed? (please select all that apply).” Sample size: All 278 of those who replied “yes” to the question: “During the past 5 years, have you changed cultivation practices for [your main crop] in [your main] county?”

We asked farmers who changed cultivation practices during the past 5 years the following question: “What made you decide to [change the cultivation practices selected above] on your [main] crop in [your main] county? (please select all that apply).” Nearly two-thirds (65%) responded that they changed cultivation practices due to rising labor costs, while 56% responded that they did so because there were not enough workers (See Figure 29). Thirty-three percent changed cultivation practices due to crop prices, and 25% did so because of other issues not related to labor. Twelve percent changed because of non-labor input prices, and 12% due to some “other” reason. (Figures add up to more than 100% because farmers were allowed to select multiple options).



**Figure 29.** Answer to the question: “What made you decide to [change the cultivation practices selected above] on your [main] crop in [your main] county? (please select all that apply).” Sample size: 275 of the 278 who responded “yes” to the question “During the past 5 years, have you changed cultivation practices for [your main crop] in [your main] county?”

We asked farmers who changed cultivation practices during the past 5 years the following question: “In [your main] county, which of the years listed below have you implemented [the changed cultivation practices selected above] on your [main crop]? (please select all that apply).” It is clear that more farmers have changed their farming practices over the past 5 years (See Figure 30). Only 22% of farmers who had changed cultivation practices during the past 5 years had done so in 2014, but that number had increased to 81% as of 2018.



**Figure 30.** Answer to the question: “In [your main] county, which of the years listed below have you implemented [the changed cultivation practices selected above] on your [main crop]? (please select all that apply).” Sample size: 273 of the 278 who responded “yes” to the question “During the past 5 years, have you changed cultivation practices for [your main crop] in [your main] county?”

## Conclusions

The results from this survey reveal that California farmers are adapting to labor scarcity through a number of different avenues. Most of the farmers we surveyed recently experienced some type of labor shortage, and the incidence of shortages has intensified over the past five years. Economic theory suggests that when the supply of a production input (such as farmworker labor) decreases, the price of that input (in this case farm wages) increases. The findings from our survey support this theory, as the vast majority of the farmers we surveyed report having raised wages in an attempt to retain an adequate labor force to meet their production needs. Our survey results indicate that, over the past five years, the proportion of farmers who have had to increase wages to find enough workers has nearly tripled.

Farmers are reacting through a variety of different coping mechanisms. More farmers are relying upon farm labor contractors and the H-2A visa program to meet their labor needs. Only a small percentage of California farmers have turned to the H-2A visa program to fill job vacancies, but the rate of H-2A use has increased sharply.

Farmers are also adjusting their crop mix. Roughly one-third of the farmers we surveyed responded that they had changed the number of acres dedicated to their main crop during the past 5 years. Some of these farmers switched acreage from labor-intensive crops such as tree fruits and vegetables into non-labor-intensive crops that can be mechanically harvested, such as tree-nuts, row crops (e.g., corn and cotton), and hay.

Farmers increasingly are adopting labor-saving technologies. A majority of the farmers we surveyed used a technology that reduced their reliance upon labor at some point during the past five years. Over one-third of the farmers we surveyed had started using a labor-saving technology for the first time during the past five years. The adoption of mechanical harvesters and specialized tractor attachments were the most widely-used labor-saving technologies; hand-held mechanical aids and automated irrigation technologies were also frequently mentioned. The up-front costs of adopting these technologies can be significant; however, it appears that many California farmers are resorting to their use in order to reduce their reliance upon farmworkers.

Farmers are also changing their cultivation practices. Over one-third of the farmers we surveyed reported changing cultivation practices during the past five years. Some farmers reduced or delayed harvests, while others reported reducing or delaying pruning or weeding. The percentage of farmers who have changed their cultivation practices has increased over the past five years.

It is clear that farmers are facing challenges related to labor availability. We have used this survey to gain some insight into the means that farmers are using to adjust to this new reality. Farmers are paying higher wages, and their farming practices are changing in response to reduced farmworker availability. Recent studies indicate that the availability of farm workers will continue to decline. We expect the trends outlined in this report to continue, as farmers change their production decisions and employ more advanced technologies in response to a smaller and more expensive farm work force.