



## Impacts of COVID-19 on U.S. aquaculture, aquaponics, and allied businesses located in the USDA Western Aquaculture Region: Quarter 1 Results

March 23, 2020 to April 10, 2020

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### Introduction

On March 23rd, 2020 Virginia Tech Seafood AREC and The Ohio State University Extension initiated an online survey of the U.S. aquaculture, aquaponics, and allied businesses. This survey was designed to capture and quantify the effects of the coronavirus disease (COVID-19) on the aquaculture, aquaponics, and allied industries. The survey closed April 10th, 2020 at 11:59 pm. The survey will be distributed at the conclusion of every quarter for 2020, to attempt to capture the evolving impacts of COVID-19 over time.

Survey methods are detailed in the Virginia Cooperative Extension Fact Sheet VCE-AAEC-218, available at:

[https://www.arec.vaes.vt.edu/arec/virginia-seafood/research/Impacts\\_of\\_COVID19.html](https://www.arec.vaes.vt.edu/arec/virginia-seafood/research/Impacts_of_COVID19.html). This report is a supplemental report to the overall survey that summarizes results of the USDA **Western Aquaculture Region** respondents.

The USDA Western Aquaculture Region is comprised of the following states: Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

### Methods

For a detailed description of the methods for this study, please consult the factsheet summarizing the

Q1 results (AAEC-218NP). Data for this study were collected through an online survey distributed through Qualtrics. It should be noted that respondents self-selected for participation in the study and there was no specific sampling protocol followed due to time constraints and challenges with obtaining contact lists. It is therefore possible that responses are skewed towards those farms and businesses that have been more affected by the coronavirus (COVID-19) disease pandemic. This study is being conducted for the duration of 2020, with a survey being administered quarterly to capture the evolving effects and impacts of the coronavirus diseases (COVID-19) pandemic on U.S. aquaculture, aquaponics, and allied businesses. The responses summarized in this fact sheet were collected during the Q1 survey, between March 23rd and April 10th, 2020.

### Results

#### Characterization of Respondents

Quarter 1 survey results showed that there were **45 participants from the Western Aquaculture Region** as defined by USDA. Thirty-three percent of Western respondents sold their products to

distributors, 29% sold direct to customers, 13% sold to restaurants, 11% to other, un-categorized channels, 4% to processors, 4% to other aquaculture/aquaponic farms, and 2% to grocery stores/supermarkets (Table 1). Two percent did not respond to the question.

Table 1. Primary marketing channel for Western respondents.

Category	Percentage
Distributors	33%
Direct to customers	29%
Restaurants	13%
Other	11%
Other aquaculture/aquaponic farms	4%
Processors	4%
No response	2%
Grocery stores/supermarkets	2%

### Scale of farms/businesses

Respondents in the Western region varied in terms of their reported scale of production. Respondents to the survey included those with scales of production from sales of \$1 to \$1,000 year up to as much as \$40 million (Table 2). The greatest percentage (40%) of respondents had sales >\$1 million, followed by those with sales of \$100,001 to \$250,000 (16%), \$500,001 to \$1 million (11%), \$250,001 to \$500,000 (11%), \$50,001 to \$100,000 (4%), \$1,001 to \$5,000 (4%), \$25,001 to \$50,000 (2%), and \$5,001 to \$10,000 (2%). No respondents sold from \$10,001 to \$25,000 (0%), and \$1 to \$1,000 (0%). Nine percent did not respond to this question.

Table 2. Scale of Western respondent farms/businesses.

Category	Percentage
> \$1 million	40%
\$100,001 - \$250,000	16%
\$500,001 - \$1 million	11%
\$250,001 - \$500,000	11%
No response	9%
\$50,001 - \$100,000	4%
\$1,001 - \$5,000	4%
\$25,001 - \$50,000	2%
\$5,001 - \$10,000	2%
\$10,001 - \$25,000	0%
\$1 - \$1,000	0%

## Key Findings

Ninety-three (93%) percent of survey respondents from the Western Aquaculture Region reported that their farm or business had been impacted by the COVID-19 pandemic. Two percent said that their farm or business had not been impacted, and another 4% were uncertain or unsure whether their farm or business had been impacted. Those who reported that their farm or business had not been impacted, were asked if their farm or business expected to be impacted in 2020; none said “definitely yes”; 67% said “probably yes”, 33% said that their business would “definitely not” be impacted, and no respondents said “probably not”.

When asked whether their farm or business would survive the next 3 months without external intervention (such as government assistance), 48% said, “yes”. Forty-one percent reported that their farm or business would “maybe” survive 3 months without external assistance, and 9% said that their farm or business would not survive 3 months without external assistance. When asked the same question, but for the next 6 months, 27% said that their farm or business would survive, 45% said “maybe,” and **25% said that their farm/business would not survive the next 6 months without external assistance.** Increasing the term to 12 months without external assistance, **45% of respondents in the Western Aquaculture Region indicated that they would not survive,** 32% said that their farm or business would “maybe” survive, and only 20% said that they would survive.

## Lost Sales

**Eighty percent of Western Aquaculture Region farm or businesses indicated that they had lost sales due to the COVID-19 pandemic.** Thirty-five percent of survey respondents indicated that they had lost sales to international or export markets outside the U.S. In terms of the volume of sales that had been lost in the first quarter of 2020, 16% indicated they had lost between \$10,001 and \$25,000 and \$100,001 to \$250,000. Eleven percent said that they had lost more than \$1 million and another 11% said that they had lost \$500,001 to \$1 million. Eight percent of respondents each reported losses between \$250,000 to \$500,000; \$50,001 to \$100,000; and \$1 to \$1,000. Five percent reported losses between \$25,001 and \$50,000. Three percent

reported losses between \$5,001 and \$10,000. Eleven percent of respondents could not estimate at the time of this time and 3% of respondents did not respond to this question.

Reported lost sales included canceled private and government contracts; 81% percent of survey respondents reported losing private contracts for sales and 12% reported losing government (state or federal) contracts for sales. One respondent reported the loss of sales for 4 weeks due to the closures of restaurants and their farm was the sole supplier for that state.

Survey participants were asked what challenges they expected to experience on their farms or businesses as a result of the coronavirus pandemic in 2020.

**Eighty-two (82%) percent of responding Western Aquaculture Region farms or businesses indicated that they expected to lose sales in 2020**, with 36% expecting to lose sales to international markets. Eight (8%) percent of respondents could not estimate the value of expected lost sales at the time of the survey. Of the respondents that could estimate expected lost sales, 17% indicated they expected to lose between \$250,001 and \$500,000; 11% expected to lose \$500,001 to \$1 million; 11% \$50,001 to \$100,000; and 11% from \$10,001 to \$25,000. Eight percent of respondents expected to lose from \$100,001 to \$250,000 and from \$25,001 to \$50,000. Six percent of respondents expected to lose either \$5,001 to \$10,000 or \$1 to \$1,000. One respondent reported losing about \$4 million every 30 days and another that losses were \$5 million between January 25th and April 7th. Other respondents reported losses of \$3 to \$4 million.

When asked how long their farm or business could survive without sales before suffering longer term cash flow effects, 52% said 1 to 3 months, 11% said 4 to 6 months, 9% said less than one month, 7% said 7 to 10 months, and another 7% stated more than 10 months. Fourteen percent did not respond to the question. **It should be noted that data collection through the survey was open for a period of 3 weeks (March 23rd to April 10th), meaning that more than 1 month had already eclipsed between respondent participation and the preparation of this report.**

## Labor

**Forty-eight percent of respondents reported that they had laid off employees as a result of the COVID-19 pandemic**, and 26% of respondents indicated that they “will have to soon”. Twenty-six percent of responding farms and businesses had not laid off employees at the time of the Quarter 1 survey. Thirty-five percent of Western region farm or business respondents indicated that they had laid off between 1 and 3 employees. Fifteen percent of respondents had laid off between 4 and 6 employees, 11 to 15 employees, 16-20 employees, and more than 20 employees. Five percent had laid off between 7 and 10 employees. Of those employees who had been laid off, 35% of Western region respondents indicated that these were “Short-Time” or “Shared-Work” employees. Forty-eight percent stated that none of the workers laid off were in this category. Sixteen percent chose not to respond to this question. One respondent reported having placed 292 employees on standby layoff, and 172 were laid off under the “Shared Work” program. In addition, company owners were working without pay and those with salaries greater than \$70,000 had a 10% reduction in salary. Another respondent indicated that they will have to lay off approximately 200 employees.

Respondents were also asked how many weeks before they would have to decide whether to lay off employees. **Forty-five (45%) of survey respondents indicated that they would have to decide within 1 to 3 weeks whether to lay off employees.** Twenty-seven percent said they had between 4 and 6 weeks to make a decision, and 9% each said that they had either less than 1 week, from 7 to 10 weeks, and more than 10 weeks to make a decision. **It should be noted that the data collection period was open for 3 weeks, which means that some respondents completed the survey more than a month before the preparation of this report.** Western Aquaculture Region respondents were further asked how many employees they would need to lay off at that time. Twenty-seven percent said that they will have to lay off from 1 to 3 employees and another 27% said more than 20 employees. Eighteen percent of respondents stated they will need to lay off between 11 and 15 employees, 9% will need to lay off

between 16 and 20 employees, 7 to 10 employees, and from 4 to 6 employees.

Fifty percent of respondents had experienced some type of labor challenge. Forty-three percent of respondents reported employees to have missed work due to the COVID-19 pandemic. The labor shortage due to sickness or self-quarantine has resulted in some things on the farm being left unattended. **Twenty-eight percent of responding farms or businesses indicated that employees had missed work between 7 and 10 days or between 4 to 6 days, followed by 22% who reported employees missing between 11 and 14 days, 17% who reported from 1 to 3 days, and 6% that employees had missed more than 14 days. No respondents reported missing less than 1 day.**

Many respondents commented on labor challenges that began with self-quarantines, illness, employee layoffs, and reduced hours due to lost revenue. Restrictions to essential personnel only have limited the number of employees available to work. One respondent reported that lack of labor was not the issue; given the number of people who have been laid off, there is plenty of labor available if they need it. This respondent reported having developed a COVID response plan for all their facilities to keep employees safe and hopefully prevent the introduction of the virus into their workforce.

## Challenges to the farm/business

Sixty-four percent of respondents had experienced production challenges not related to labor. Production challenges include challenges with production inputs (43%), repair, construction, consultant, or engineering services (39%), challenges with financial services (29%), and other challenges (36%). Fourteen percent responded that they could not identify specific production challenges at this time. Respondents noted production input difficulties with the slowdown in the supply chain resulting in delayed deliveries as well as issues of availability of production inputs, such as feed and other finished raw materials. Another respondent mentioned the lack of gear to hold product until orders begin to come in again. Availability of supplies was mentioned as especially problematic for farms that sourced outside mainland

USA. Other respondents mentioned the challenges related to obtaining seed for next year's crop.

Increased production costs were reported by several respondents, including increased trucking costs, inefficiencies due to reduced labor, increased feed, electricity, oxygen, and labor costs due to the fish remaining longer in the system. Stockpiling fish upfront will result in wasted feed and supplies as well as culling stock that cannot be used for production. Several respondents reported needing to sell the current crop to make room for the next.

Production challenges, not including labor, noted by respondents also included maintenance and repairs concerns. For example, closure of suppliers, including an irrigation/pipe company had created challenges. Delays in construction of harvest gear were reported. With the closure of support businesses for repairs and maintenance along with sickness and quarantine, these services are not available. The result has been major construction delays, cancellation of contract work. Supply chain slowdown was reported related to delays in fabrication, shipping, and clearing customs. Other respondents reported that their fabrication facilities have been shut down with all projects put on hold. A \$5 million wet storage facility that was 80% complete was put on hold that will result in a \$37,000 restart penalty from the contractor. Several consultants have been put on hold, and lawyers and communications consultants were reported to be working without pay, agreeing to work out compensation down the road. One respondent had intended to rebuild their dock and transfer to a rack and bag growout method off bottom in response to a decision by the U.S. Army Corps of Engineers to not give them a permit to repair the 100-year old dikes. That transition has been put on hold due to the pandemic.

Respondents who responded that there were financial services challenges commented that it was difficult to purchase feed, other supplies, repairs, accounting services, leases, loan payments, and other bills because, without revenue, they cannot pay for it. Similarly, reduced income has created challenges to pay workers and for other supplies, including seed and the need to plant. One respondent reported looking to sell real estate and other assets to fund hatchery and nursery operations to plant and

maintain crops. Another respondent reported being maxed out on their operating loan. Other respondents reported that no loans were available and that existing loan applications had to be canceled as their customers (primarily restaurants) have cancelled orders. Another respondent commented that the debt-to-asset ratios required by lenders were limiting their ability to borrow adequate amounts of capital. Moreover, their bank, Wells Fargo, had declined their application for the Payroll Protection Program and would limit their loans to companies with 50 or fewer employees and nonprofit organizations. Other banks were reported to not be accepting applications from non-clients.

“Other” production challenges, not including labor, reported by respondents included uncertainties about the future. One respondent reported how much time it took to redirect employees to maintenance from production tasks and that Human Resources was stressed attempting to deal with the challenges. With poorly defined and/or untimely policies, it was difficult to plan overall. Comments were made about losing thousands of dollars of product that is not being harvested and that will die before they can get back to work. One respondent reported limited air cargo space particularly for Asian exports.

Survey participants were asked what challenges they expected to experience on their farms or businesses as a result of the coronavirus pandemic in 2020. Thirty percent of farms expect challenges with production inputs (e.g. feed and seed), another 25% expect challenges with repair, construction, consultant or engineering services, 25% with financial services, and 10% expect “other” challenges. Thirty percent could not identify specific production challenges at this time. One respondent reported that, when sales do re-open, that there will be a glut of product on the market and prices will plummet.

### **Marketing of products**

Thirty-two percent of respondents stated they could hold market ready product for less than one month before it becomes an issue for new crops or plants, 27% said 1 to 3 months, 11% 4 to 6 months, and 9% said more than 10 months. Twenty percent did not respond to the question.

Forty-eight percent of respondents said “yes” holding market ready product would make it less marketable. Twenty-three percent said “no” and 25% said “don’t know.” Sixty-two percent of respondents stated that holding market ready product would lead to reduced quantity sold, 62% stated that holding market ready product would lead to reduced price, and 33% stated that holding market ready product would lead to “other”. Respondents reported that, since processors were not taking their fish, that they would have to reduce feeding to maintain the fish in a marketable size range. Further comments indicated that holding fish longer at higher stocking densities may stress fish and create animal welfare issues that lead to disease and greater mortality. Overall, the lost sales were resulting in higher density of fish in the ponds that leads to a poorer feed conversion ratio and slower growth.

Cash flow problems, increased costs of production, interrupted flow of hatch to market, and missed seasonal hatches were reported as effects of the loss of sales. One respondent reported that their product was live trout eggs that have a shipping window of around 10 days; they cannot be held any longer than that. Another respondent reported that by the time that restaurants reopen, their fish will be too large for the size requirement. A respondent reported that, with reduced number of orders, that they were individually flash freezing fillets, but that they have only so much capacity in their freezer, since they have been moving mostly fresh product. Another respondent reported that the disruptions to the supply process from hatching through growout will result in a gap or reduced supply 14 months from now. Oysters will become too large to meet the high value of the half shell market. Another respondent reported that the shelf life of their product is 3 days on ice.

Other respondents commented on an expected glut on the market when everyone begins reselling at once, with the backlog of seafood product making producers want to dump product on the market. Another reported that producers in the 48 states were already dropping their prices to the level of retail market wholesale prices. Growers in Alaska cannot grow oysters for those rates and are dependent on direct sales to local restaurants and retailers. Others reported being unable to charge more for their fish, even though their costs have increased.

## Increased Demand for Products

Five percent of respondents reported an increase in demand for their products. However, neither of the respondents who reported an increase in demand for their products could estimate a value of increased demand.

Eleven percent respondents reported that they expected to experience an increase in demand. Of these, 20% said that they expected increased demand of \$1 to \$1,000 or \$1,001 to \$5,000. Sixty percent of those who expected to experience an increase in demand could not estimate a value at the time of the survey.

## Assistance to Farms/Businesses

The survey also included questions on the types of assistance that might be helpful to the farm or business of respondents. Fifty-nine percent of Western Aquaculture Region respondents indicated that federal assistance would increase the likelihood of survival of their farm or business. Forty-five percent of respondents said that state assistance would help, and 25% said local assistance would help. Twenty-three percent said assistance from associations would be helpful. Eleven percent said there were other steps or types of assistance that would increase the likelihood for the farm or business to survive. Twenty-three percent said none.

When asked more specifically about the types of assistance that would be helpful to their farm or business, 41% said waiving or delaying of state fees would be helpful, 30% said loan guarantees, 30% said receiving assistance on identifying new markets, 16% said specialty crop insurance, and 14% said tariff relief. Seven percent of respondents suggested other assistance that would be helpful to their farm or business.

Common mentions of the specific types of assistance that would be of greatest help were those related to cash grants and emergency funding for feed, electricity, labor costs, and other bills. Loans with zero or low interest rates and forgiveness, bridge loans, and loan guarantees were mentioned as well as delays and deferrals of payments on FSA loans, tax relief, and deferral of marine payments and property taxes. SBA loans were mentioned. In addition, one respondent mentioned that the state of

Washington had been severely impacted by the China tariff war, and that they are overseen by NOAA and not by the Department of Agriculture. Thus, they did not qualify for federal aid, and stated that that needed to be changed. Assistance selling to local markets, extended unemployment benefits, and keeping the department of health shellfish program operating were also mentioned so that they could sustain at least some limited sales.

Respondents indicated that associations needed to continue providing information, including communications on COVID-19 philanthropy projects and continuing to communicate the needs of aquaculture to policy-makers. Positive comments were made about the support received from their associations with frequent communications and meetings.

Other types of assistance mentioned included assistance for employees that have been laid off, ending the pandemic, health care for all employees so that employees are not tempted to try and work while sick or to avoid hospitals. A nationwide marketing campaign to educate chefs that a properly frozen fish can be of equivalent quality to that of fresh fish and a campaign to consumers to encourage preparation of seafood at home. Other sources of assistance mentioned included waiving of sales, use, and property taxes, workers comp insurance, DNR and import permit fees, the Department of Ecology Wastewater Discharge Permit Fee (WAS 173-224), the Department of Health certification fees, and the Department of Natural Resources lease fees.

When asked if there were existing programs for which their farm or business does not currently qualify that would be of assistance during the pandemic, 20% said “Yes”, with 23% saying “No”. Fifty-seven percent did not respond to this question.

## Discussion and Conclusion

Responses by the Western Aquaculture Region farms and businesses to the Quarter 1 survey show that the aquaculture, aquaponics, and allied businesses within the region have been severely impacted by the COVID-19 pandemic. Ninety-three percent of responding farms or businesses indicated that they had been affected by the pandemic. Eighty

percent had experienced lost sales, and 81% have had orders from private companies canceled (12% had government orders canceled). While lost sales were the immediate challenge and concern for farms and businesses, other challenges related to production, financing, and other essential services that are critical to survival of the farm or business were also mentioned. Forty-eight percent indicated that holding market ready product would make it less marketable in the future; with resulting consequences for the quantity of product sold (62%), and reduced prices for products (62%). Fifty percent of Western Aquaculture Region farm and business respondents indicated that their farm or business would maybe or would not survive the next 3 months without external assistance. Twenty-seven percent responded “Yes” when asked if they could survive six months without external assistance, and 20% said they could survive 12 months. Key findings from Western Aquaculture Region and business respondents include:

- *93% have been impacted by COVID-19*
- *81% have had private orders/contracts canceled*
- *74% have or will soon have to lay off employees*
- *80% have experienced lost sales*
- *48% can survive 3 months without external intervention*

## References

United States Department of Agriculture. 2019. 2018 Census of Aquaculture. National Agricultural Statistics Service, USDA, Washington, District of Columbia, USA. Accessed April 2020 at: [https://www.nass.usda.gov/Surveys/Guide\\_to\\_NASS\\_Surveys/Census\\_of\\_Aquaculture/index.php](https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Census_of_Aquaculture/index.php). (last accessed, April 12<sup>th</sup>, 2020)

van Senten, J., Smith, M.A., and Engle, C.R. 2020. Impacts of COVID-19 on U.S. aquaculture, aquaponics, and allied businesses: Quarter 1 Results. AAEC-218NP. Available at: [https://www.pubs.ext.vt.edu/content/dam/pubs\\_ext\\_vt\\_edu/AAEC/aec-218/AAEC-218.pdf](https://www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/AAEC/aec-218/AAEC-218.pdf)

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2020

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# Appendix

## Summary of COVID-19 impacts on U.S. aquaculture, aquaponics, and allied businesses located in the USDA Western Aquaculture Region

### Quarter 1 Results

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# Overview

On March 23<sup>rd</sup>, 2020 Virginia Tech Seafood AREC and The Ohio State University Extension initiated an online survey of the U.S. aquaculture, aquaponics, and allied businesses. This survey was designed to capture and quantify the effects of the coronavirus disease (COVID-19) on the aquaculture, aquaponics, and allied industries. The survey closed April 10<sup>th</sup>, 2020 at 11:59 pm. The survey will be distributed at the conclusion of every quarter for 2020, to attempt to capture the evolving impacts of COVID-19 over time.

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- Arizona
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- Montana
- Nevada
- New Mexico
- Oregon
- Utah
- Washington
- Wyoming

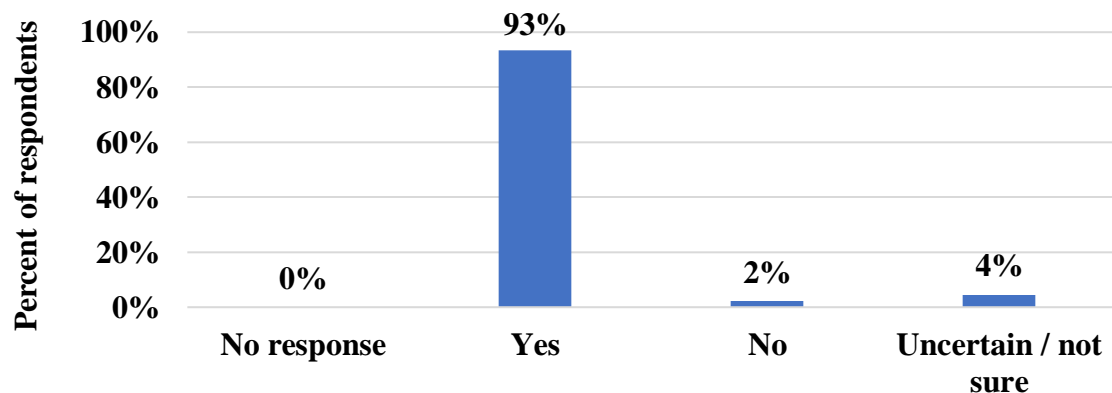
# Survey results for each question

The number of respondents to each question presented in this summary is denoted as (n = ).

## Q1. Has your farm or business been impacted by the coronavirus disease (COVID-19)?

(n = 45)

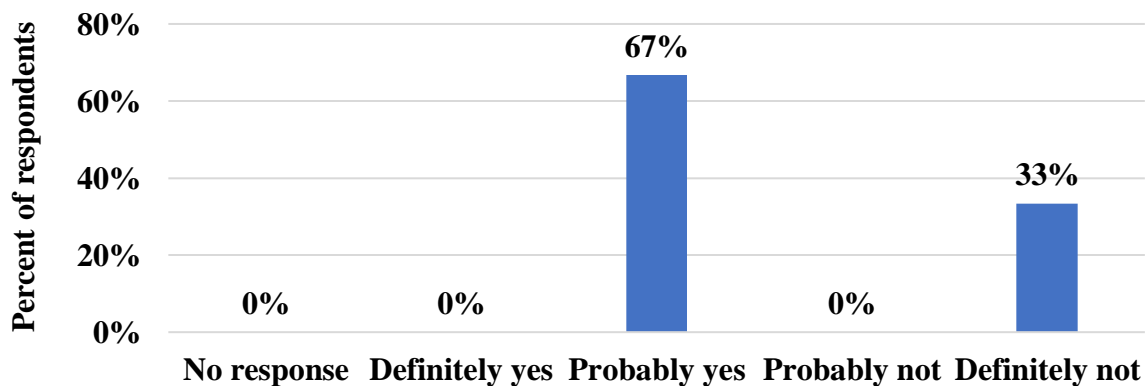
- No response : 0%
- Yes : 93%
- No : 2%
- Uncertain / Not Sure : 4%



## Q1.1. Does your farm or business expect to be affected by the coronavirus disease (COVID-19) in 2020?

(n = 3)

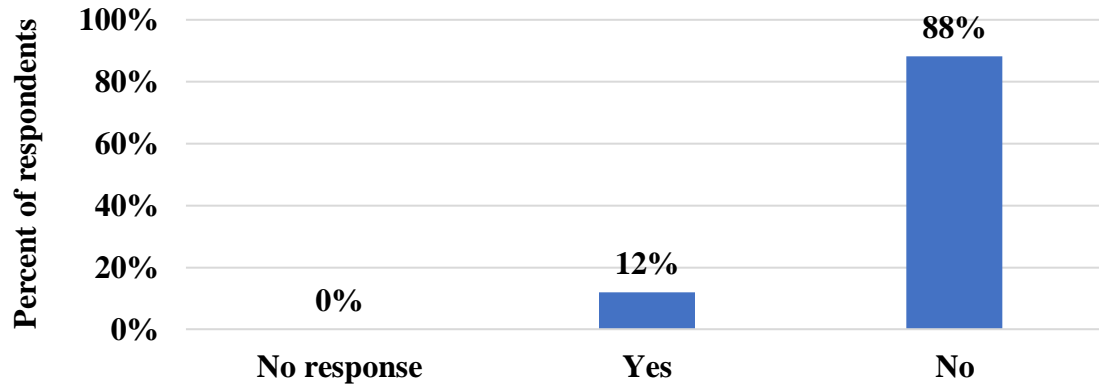
- No response : 0%
- Definitely yes : 0%
- Probably yes : 67%
- Probably not : 0%
- Definitely not : 33%



**Q2. Has your farm or business had government (state or federal) contracts canceled for 2020 because of the coronavirus disease (COVID-19)?**

(n = 42)

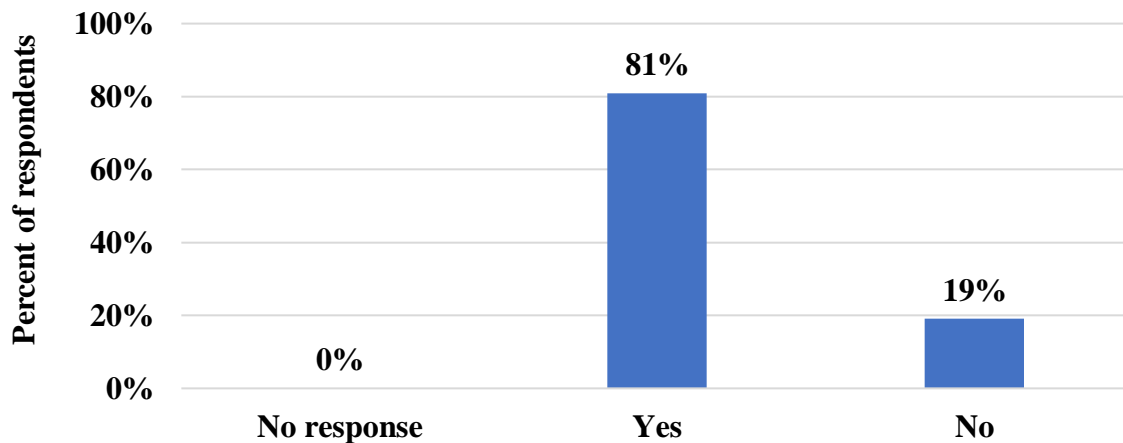
- No response : 0%
- Yes : 12%
- No : 88%



**Q3. Has your farm or business had private contracts / orders canceled for 2020 because of the coronavirus disease (COVID-19)?**

(n = 42)

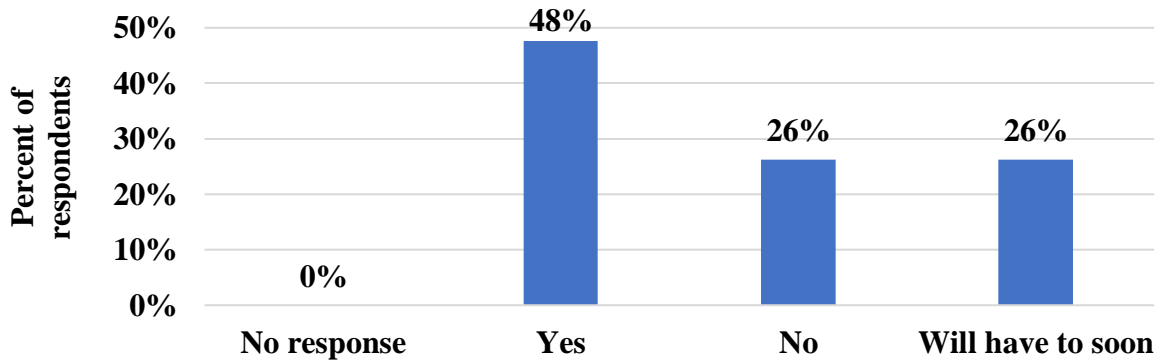
- No response : 0%
- Yes : 81%
- No : 19%



**Q4. Has your farm or business had to lay off any employees due to the coronavirus disease (COVID-19)?**

(n = 42)

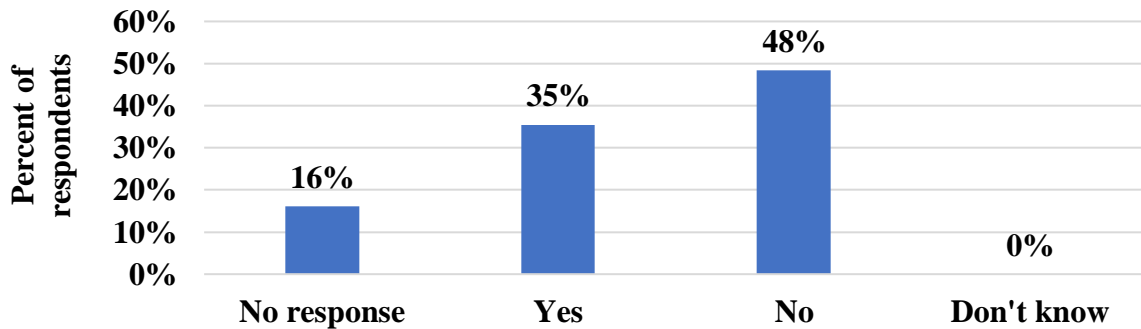
- No response : 0%
- Yes : 48%
- No : 26%
- Will have to soon : 26%



**Q4.1. Are any of the employees that your farm or business had to, or will have to, lay off due to the coronavirus disease (COVID-19) designated as "Short-Time" or "Shared-Work" employees?**

(n = 31)

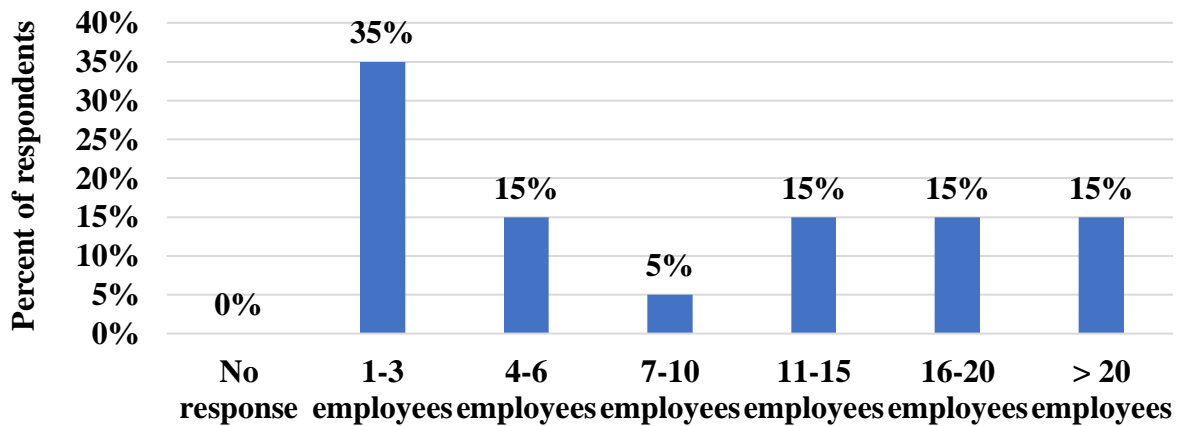
- No response : 16%
- Yes : 35%
- No : 48%
- Don't know : 0%



**Q4.2. How many employees has your farm or business had to lay off in response to the coronavirus disease (COVID-19)?**

(n = 20)

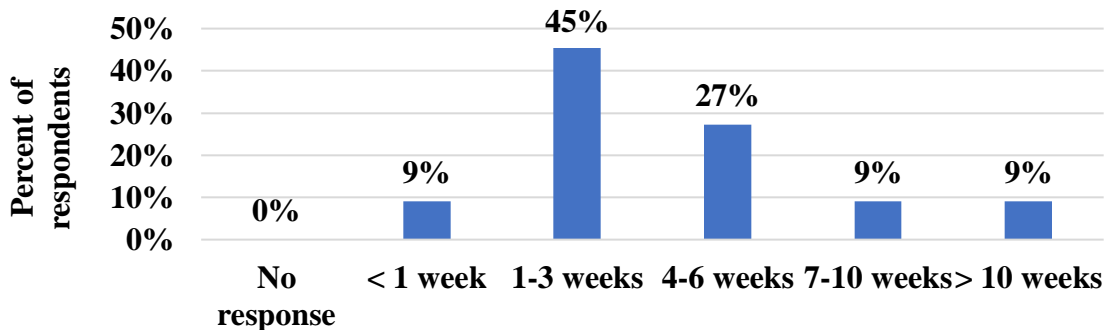
- No response : 0%
- 1 – 3 employees : 35%
- 4 – 6 employees : 15%
- 7 – 10 employees : 5%
- 11 – 15 employees : 15%
- 16 – 20 employees : 15%
- More than 20 employees : 15%



**Q4.3. How many weeks before your farm or business will have to make a decision to lay off employees, in response to the coronavirus disease (COVID-19)?**

(n = 11)

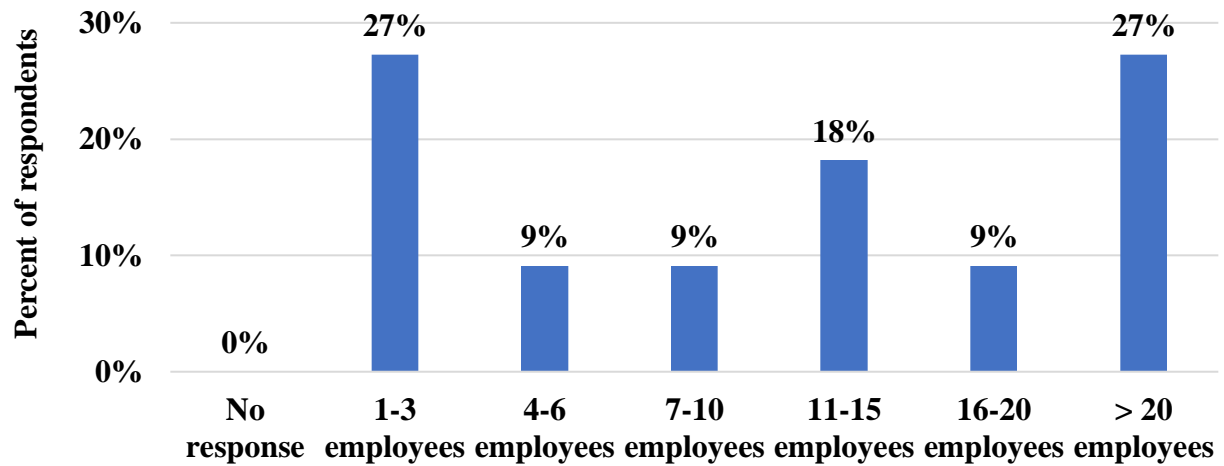
- No response : 0%
- Less than 1 week : 9%
- 1 – 3 weeks : 45%
- 4 – 6 weeks : 27%
- 7 – 10 weeks : 9%
- More than 10 weeks : 9%



**Q4.4. How many employees do you estimate your farm or business will have to lay off in response to the coronavirus disease (COVID-19)?**

(n = 11)

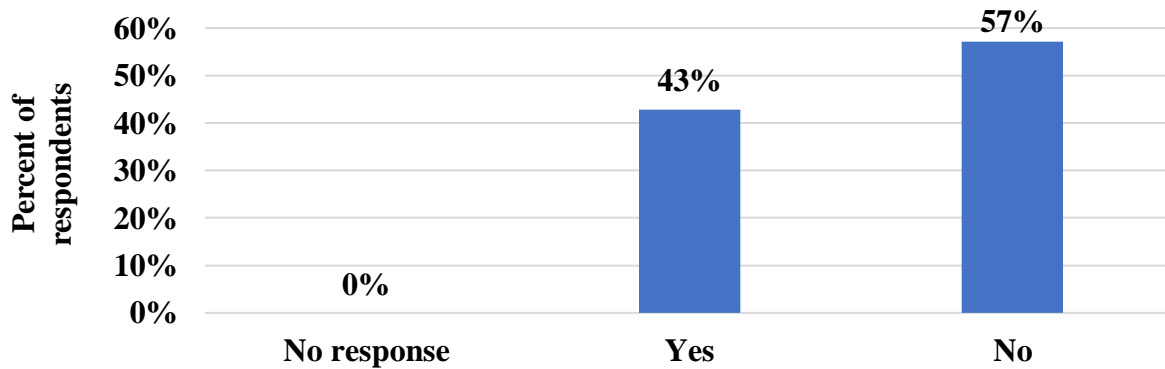
- No response : 0%
- 1 – 3 employees : 27%
- 4 – 6 employees : 9%
- 7 – 10 employees : 9%
- 11 – 15 employees : 18%
- 16 – 20 employees : 9%
- More than 20 employees : 27%



**Q5. Has your farm or business had any employees miss work due to the coronavirus disease (COVID-19)?**

(n = 42)

- No response : 0%
- Yes : 43%
- No : 57%

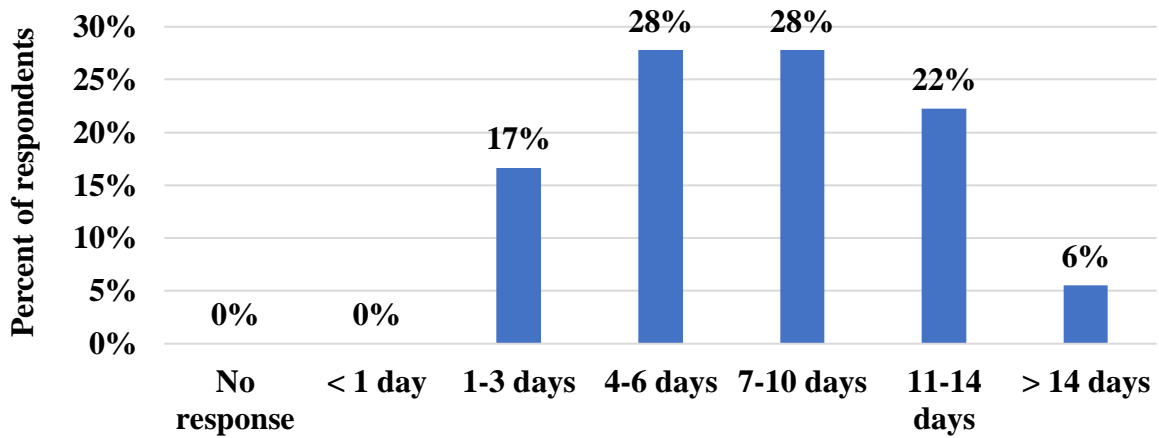




**Q5.1. In total, approximately how many days have any employees in your farm or business missed work due to the coronavirus disease (COVID-19)?**

(n = 18)

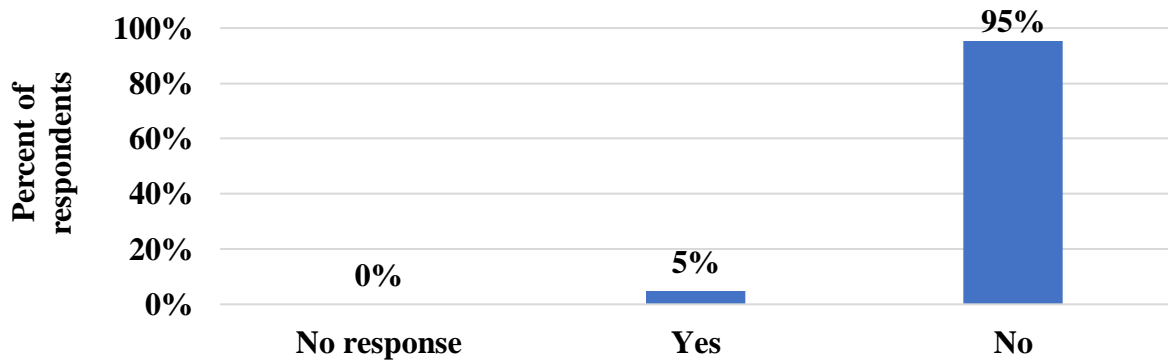
- No response : 0%
- Less than a day : 0%
- 1 -3 days : 17%
- 4 – 6 days : 28%
- 7 – 10 days : 28%
- 11 – 14 days : 22%
- More than 14 days : 6%



**Q6. Does your farm or business make use of H2A or H2B workers?**

(n = 42)

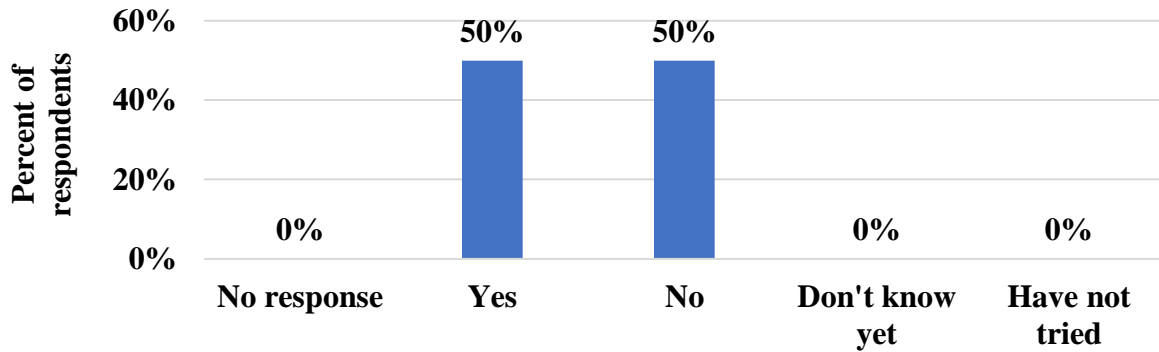
- No response : 0%
- Yes : 5%
- No : 95%



**Q6.1. Has your farm or business been able to secure H2A and H2B workers during the coronavirus disease (COVID-19) pandemic?**

(n = 2)

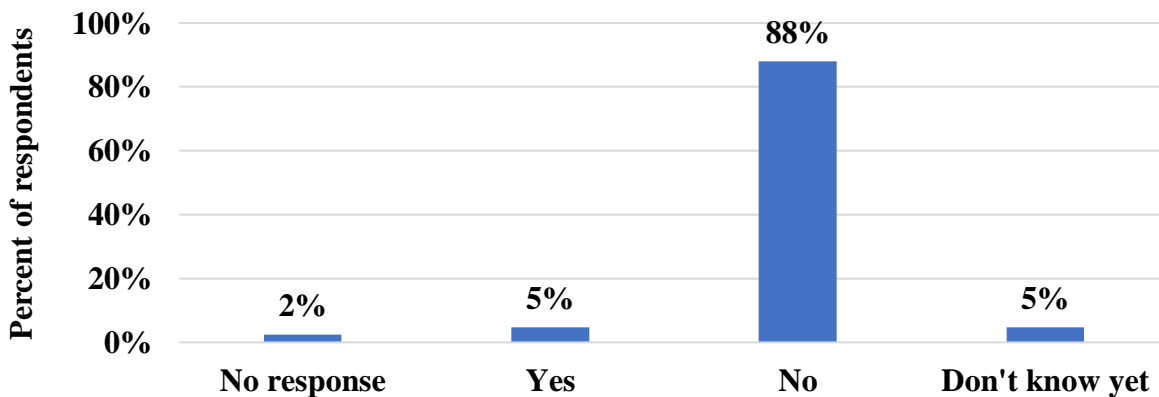
- No response : 0%
- Yes : 50%
- No : 50%
- Don't know yet : 0%
- Have not tried : 0%



**Q6.2. Is your farm or business currently at risk of losing H2A or H2B workers due to the coronavirus disease (COVID-19) pandemic?**

(n = 42)

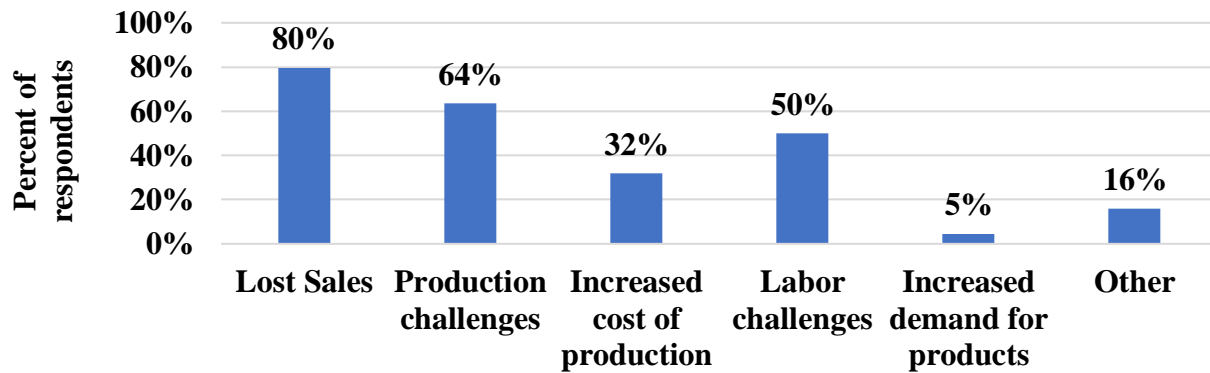
- No response : 2%
- Yes : 5%
- No : 88%
- Don't know yet : 5%



**Q7. Has your farm or business experienced any of the following as a result of the coronavirus disease (COVID-19) in 2020? Please select all that apply.**

(n = 44)

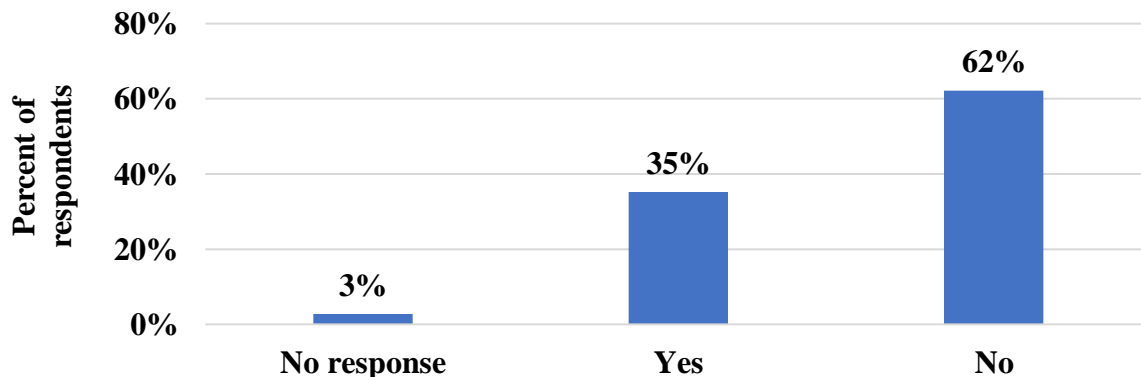
- Lost sales : 80%
- Production challenges (not related to labor) : 64%
- Increased cost of production : 32%
- Labor challenges : 50%
- Increased demand for products : 5%
- Other : 16%



**Q7.1. Has your farm or business experienced lost sales to international or export markets (outside of the United States), as a result of the coronavirus disease (COVID-19)?**

(n = 37)

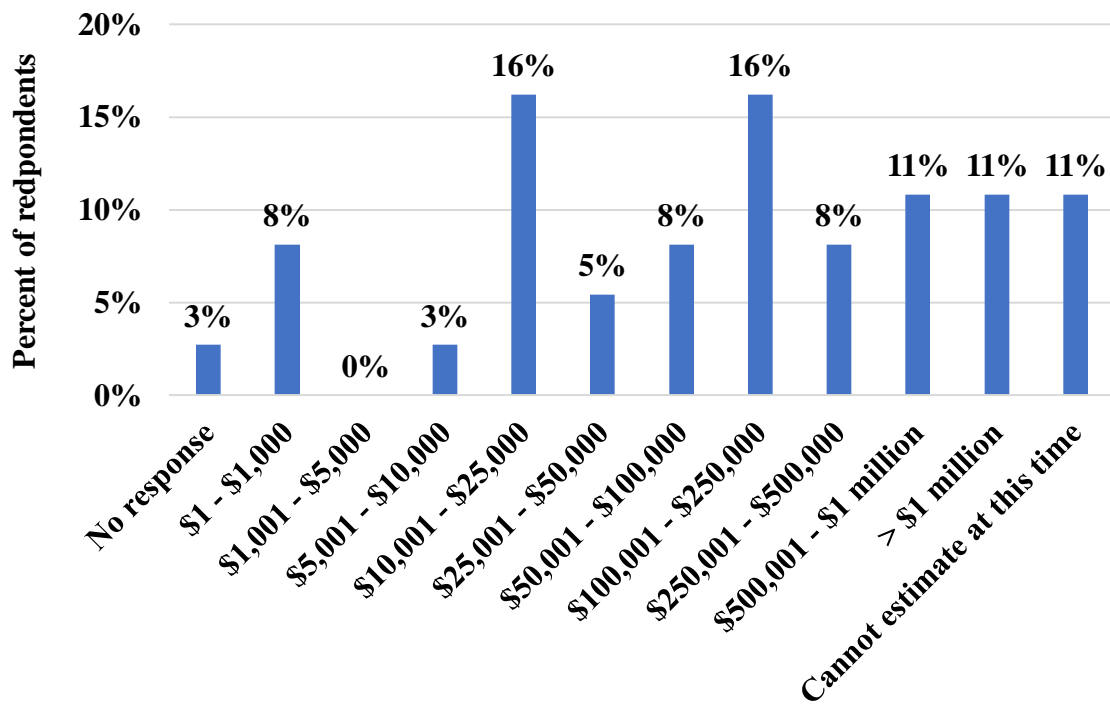
- No response : 3%
- Yes : 35%
- No : 62%



**Q7.2. If your farm or business has experienced lost sales as a result of the coronavirus disease (COVID-19), please estimate the value of lost sales?**

(n = 37)

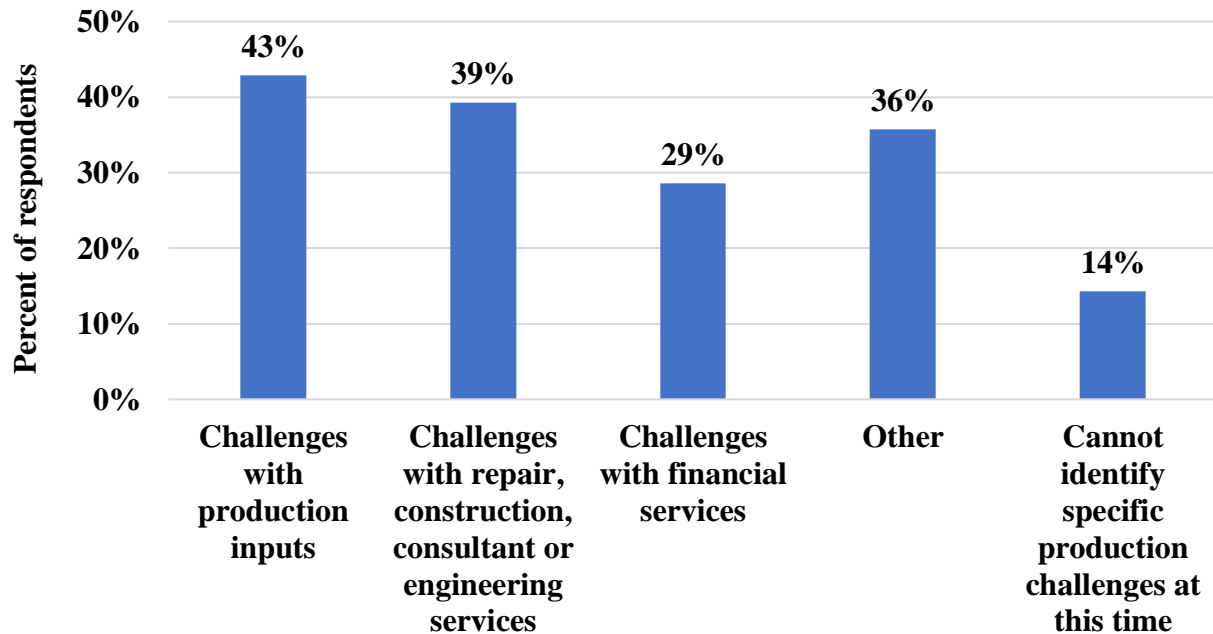
- No response : 3%
- \$1 - \$1,000 : 8%
- \$1,001 - \$5,000 : 0%
- \$5,001 - \$10,000 : 3%
- \$10,001 - \$25,000 : 16%
- \$25,001 - \$50,000 : 5%
- \$50,001 - \$100,000 : 8%
- \$100,001 - \$250,000 : 16%
- \$250,001 - \$500,000 : 8%
- \$500,001 - \$ 1million : 11%
- Greater than \$1 million : 11%
- Cannot estimate at this time : 11%



**Q7.3. If your farm or business has experienced production challenges (not related to labor) as a result of the coronavirus disease (COVID-19), can those challenges be specified? Please select all that apply.**

(n = 28)

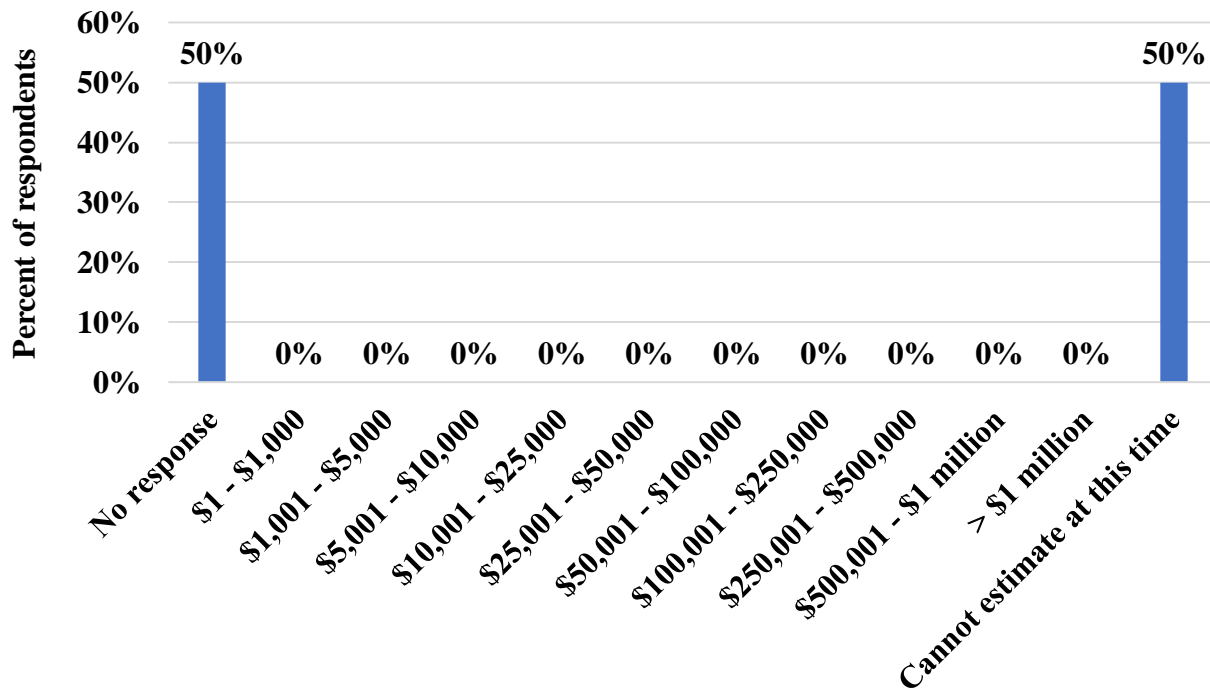
- Challenges with production inputs (feed, chemicals, therapeutants, etc.) : 43%
- Challenges with repair, construction, consultant or engineering services : 39%
- Challenges with financial services (operating loans, leases, etc.) : 29%
- Other : 36%
- Cannot identify specific production challenges at this time : 14%



**Q7.6. If your farm or business has experienced increased demand for products as a result of the coronavirus disease (COVID-19), please estimate the value of those effects on sales?**

(n = 2)

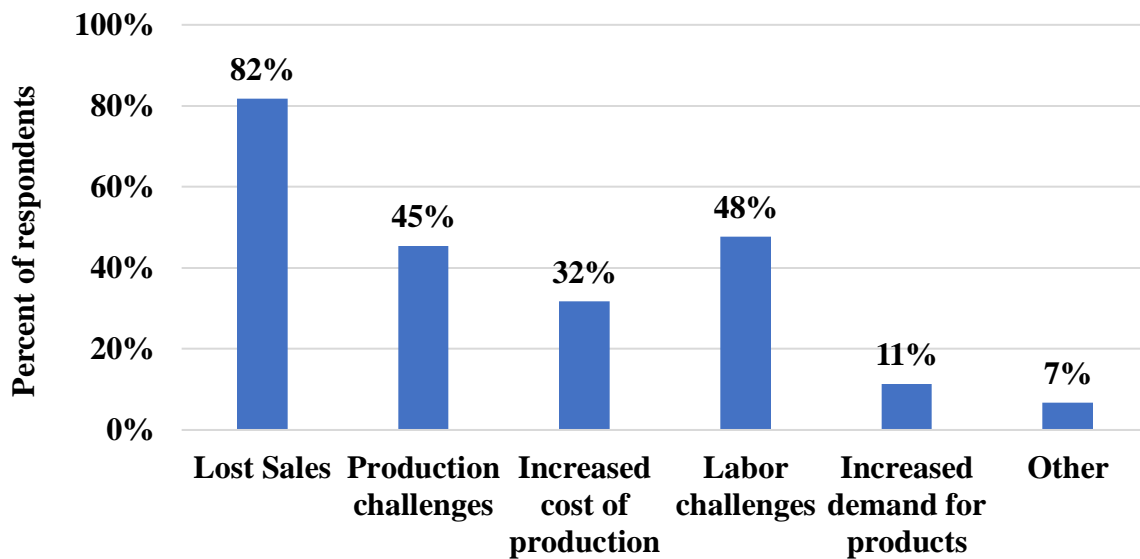
- No response : 50%
- \$1 - \$1,000 : 0%
- \$1,001 - \$5,000 : 0%
- \$5,001 - \$10,000 : 0%
- \$10,001 - \$25,000 : 0%
- \$25,001 - \$50,000 : 0%
- \$50,001 - \$100,000 : 0%
- \$100,001 - \$250,000 : 0%
- \$250,001 - \$500,000 : 0%
- \$500,001 - \$ 1million : 0%
- Greater than \$1 million : 0%
- Cannot estimate at this time : 50%



**Q8. Does your farm or business expect to experience any of the following as a result of the coronavirus disease (COVID-19) in 2020? Please select all that apply.**

(n = 44)

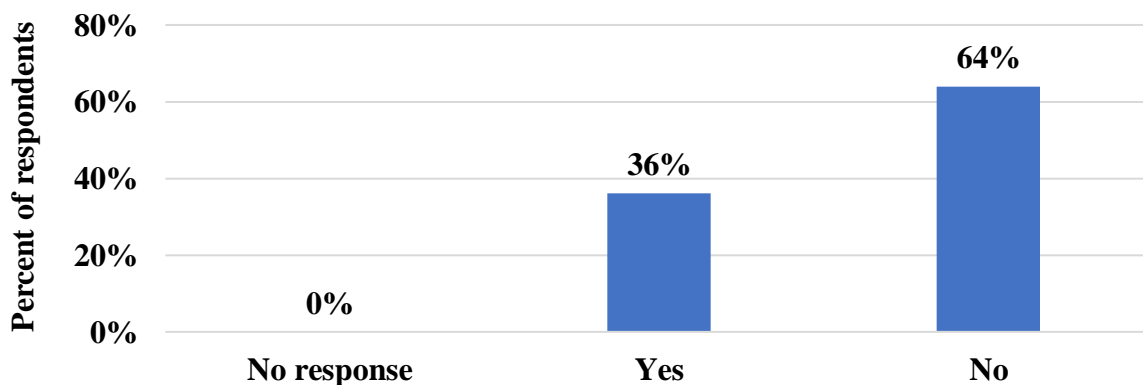
- Lost sales : 82%
- Production challenges (not related to labor) : 45%
- Increased cost of production : 32%
- Labor challenges : 48%
- Increased demand for products : 11%
- Other : 7%



**Q8.1. Does your farm or business expect to experience lost sales to international or export markets (outside of the United States), as a result of the coronavirus disease (COVID-19)?**

(n = 36)

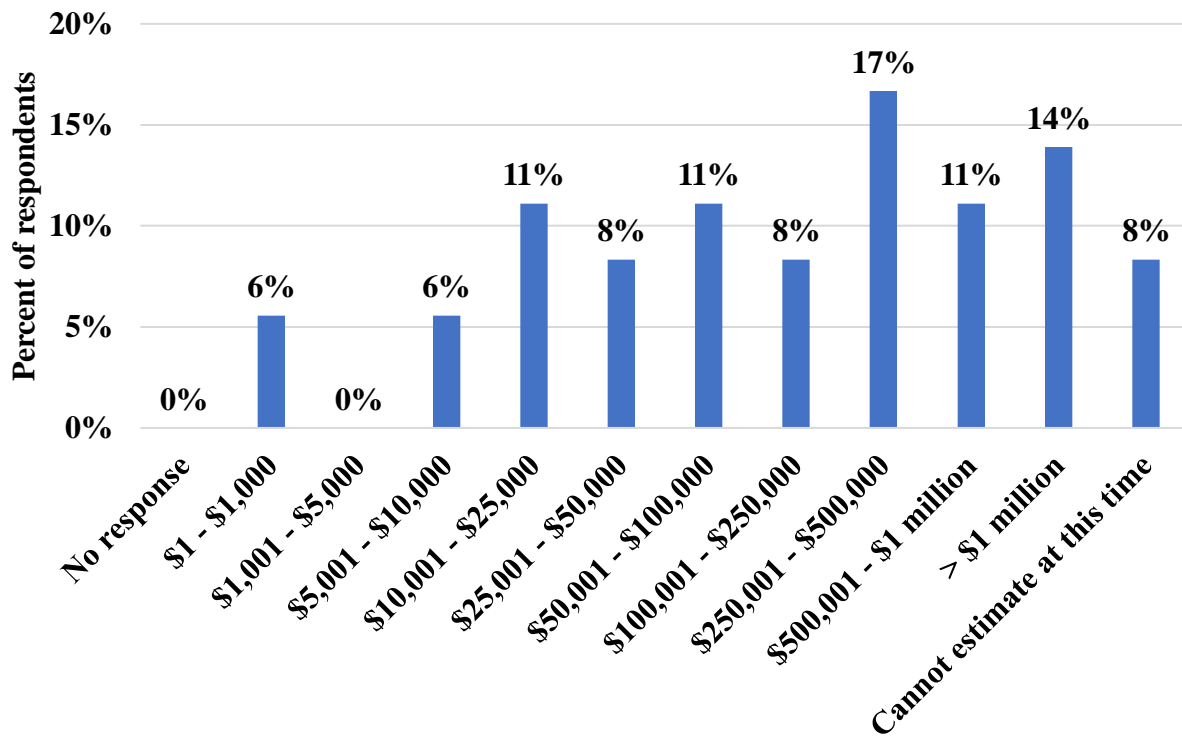
- No response : 0%
- Yes : 36%
- No : 64%



**Q8.2. Does your farm or business expect to experience lost sales as a result of the coronavirus disease (COVID-19), please estimate the value of lost sales?**

(n = 36)

- No response : 0%
- \$1 - \$1,000 : 6%
- \$1,001 - \$5,000 : 0%
- \$5,001 - \$10,000 : 6%
- \$10,001 - \$25,000 : 11%
- \$25,001 - \$50,000 : 8%
- \$50,001 - \$100,000 : 11%
- \$100,001 - \$250,000 : 8%
- \$250,001 - \$500,000 : 17%
- \$500,001 - \$ 1million : 11%
- Greater than \$1 million : 14%
- Cannot estimate at this time : 8%

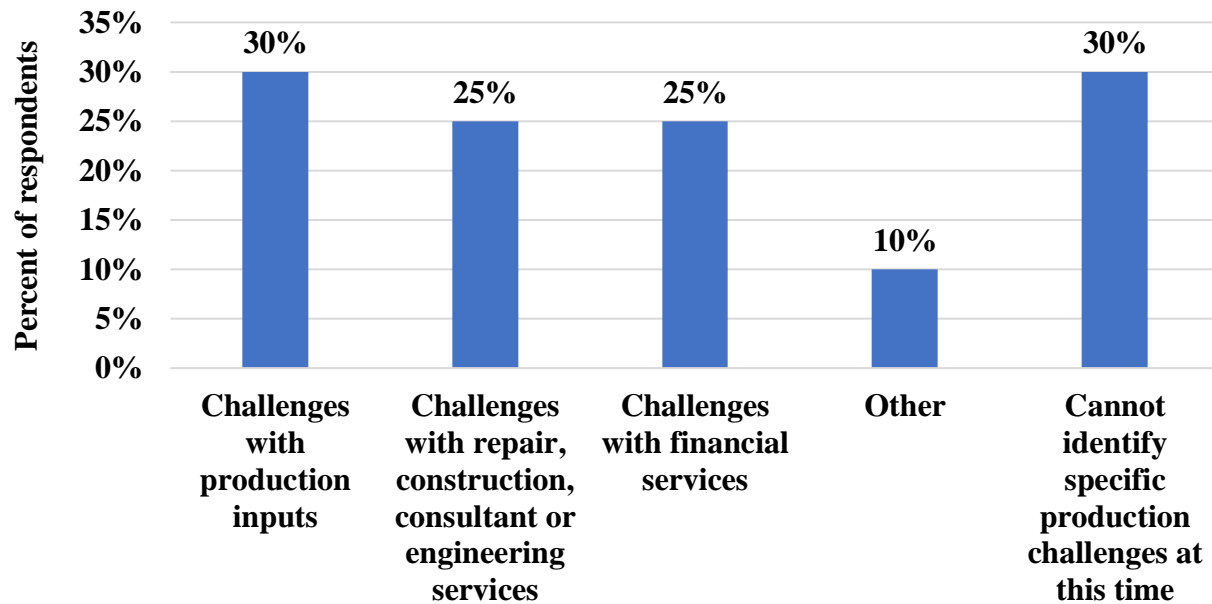




**Q8.3. Does your farm or business expect to experience production challenges (not related to labor) as a result of the coronavirus disease (COVID-19), can those challenges be specified? Please select all that apply.**

(n = 20)

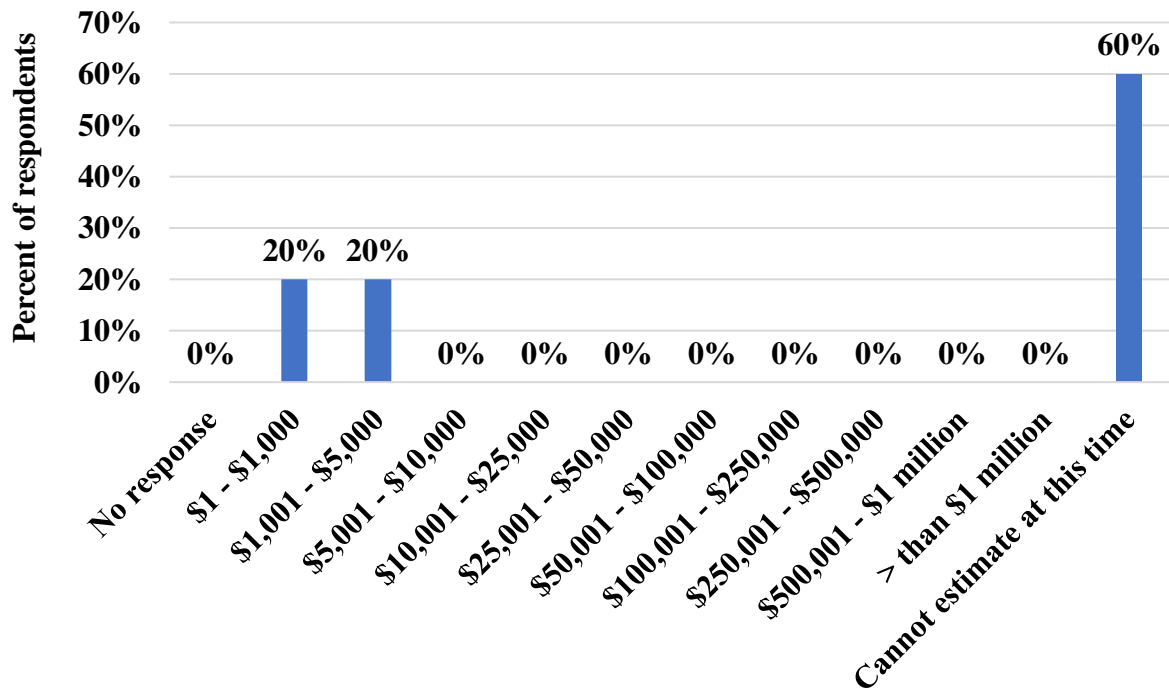
- Challenges with production inputs (feed, chemicals, therapeutants, etc.) : 30%
- Challenges with repair, construction, consultant or engineering services : 25%
- Challenges with financial services (operating loans, leases, etc.) : 25%
- Other : 10%
- Cannot identify specific production challenges at this time : 30%



**Q8.6. Does your farm or business expect to experience increased demand for products as a result of the coronavirus disease (COVID-19), please estimate the value of those effects on sales?**

(n = 5)

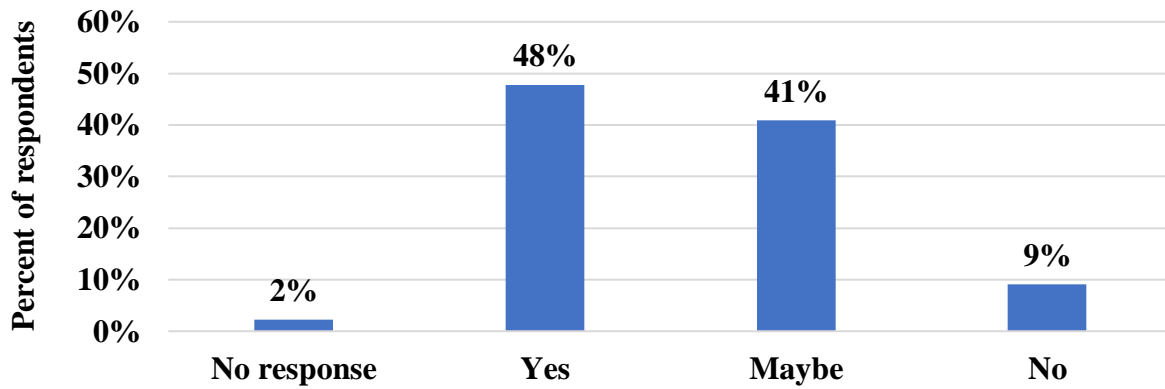
- No response : 0%
- \$1 - \$1,000 : 20%
- \$1,001 - \$5,000 : 20%
- \$5,001 - \$10,000 : 0%
- \$10,001 - \$25,000 : 0%
- \$25,001 - \$50,000 : 0%
- \$50,001 - \$100,000 : 0%
- \$100,001 - \$250,000 : 0%
- \$250,001 - \$500,000 : 0%
- \$500,001 - \$ 1 million : 0%
- Greater than \$1 million : 0%
- Cannot estimate at this time : 60%



**Q9. Without external intervention (for example, governmental assistance), will your farm or business survive in the next 3 (three) months?**

(n = 44)

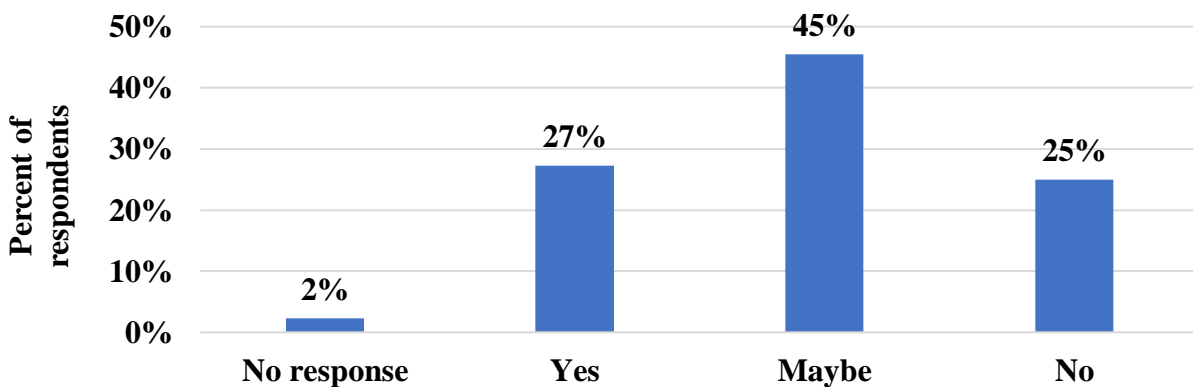
- No response : 2%
- Yes : 48%
- Maybe : 41%
- No : 9%



**Q10. Without external intervention (for example, governmental assistance), will your farm or business survive in the next 6 (six) months?**

(n = 44)

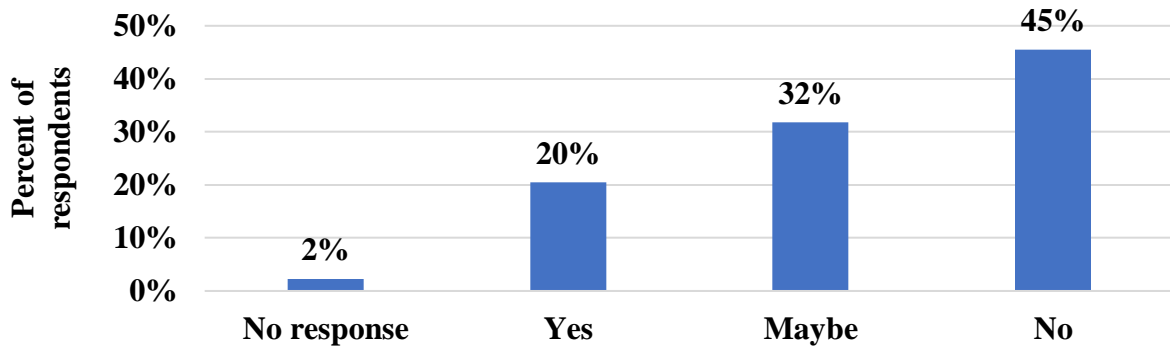
- No response : 2%
- Yes : 27%
- Maybe : 45%
- No : 25%



**Q11. Without external intervention (for example, governmental assistance), will your farm or business survive in the next 12 (twelve) months?**

(n = 44)

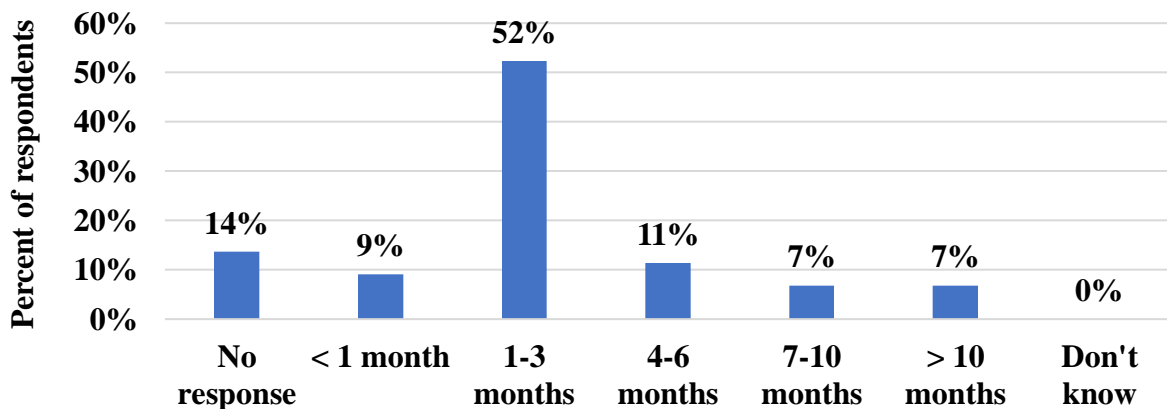
- No response : 2%
- Yes : 20%
- Maybe : 32%
- No : 45%



**Q12. How many months can your farm or business survive without sales, as a result of the coronavirus disease (COVID-19), before suffering longer term cash flow effects?**

(n = 44)

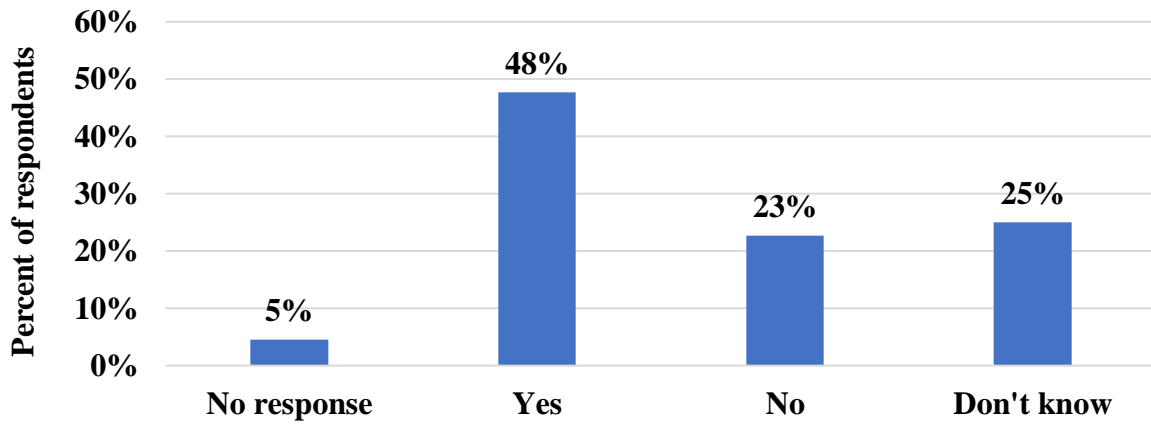
- No response : 14%
- Less than 1 month : 9%
- 1 – 3 months : 52%
- 4 – 6 months : 11%
- 7 – 10 months : 7%
- More than 10 months : 7%
- Do not know : 0%



**Q13. Will holding market ready product, as a result of the coronavirus disease (COVID-19), make it less marketable?**

(n = 44)

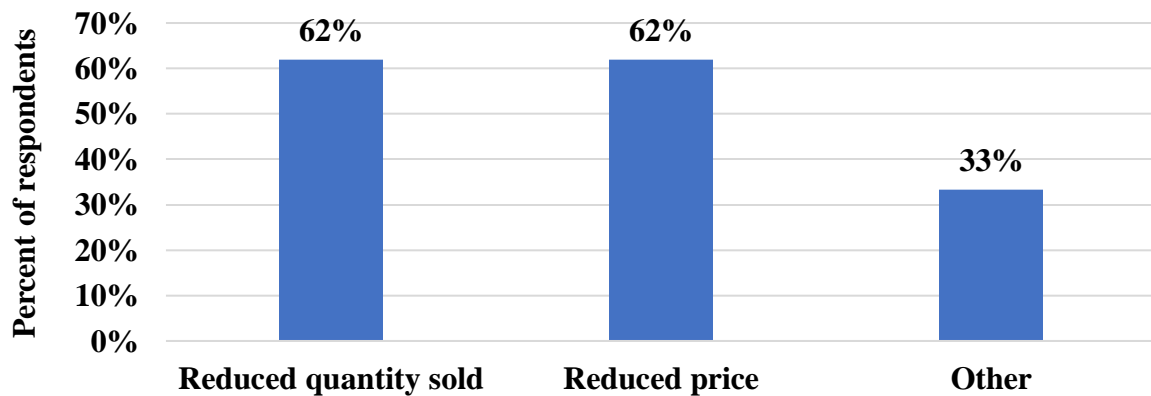
- No response : 5%
- Yes : 48%
- No : 23%
- Don't know : 25%



**Q13.1. Will holding market ready product, as a result of the coronavirus disease (COVID-19), result in: Please select all that apply.**

(n = 21)

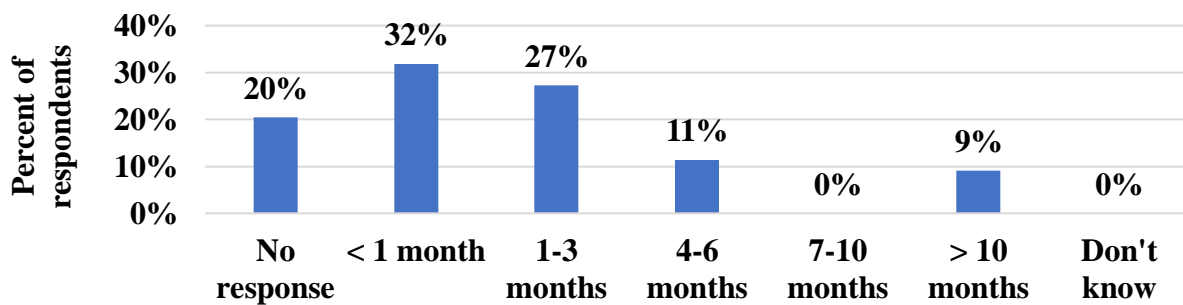
- Reduced quantity sold : 62%
- Reduced price : 62%
- Other : 33%



**Q14. How many months can your farm or business hold market ready product, as a result of the coronavirus disease (COVID-19), before it becomes an issue for new crops or planting?**

(n = 44)

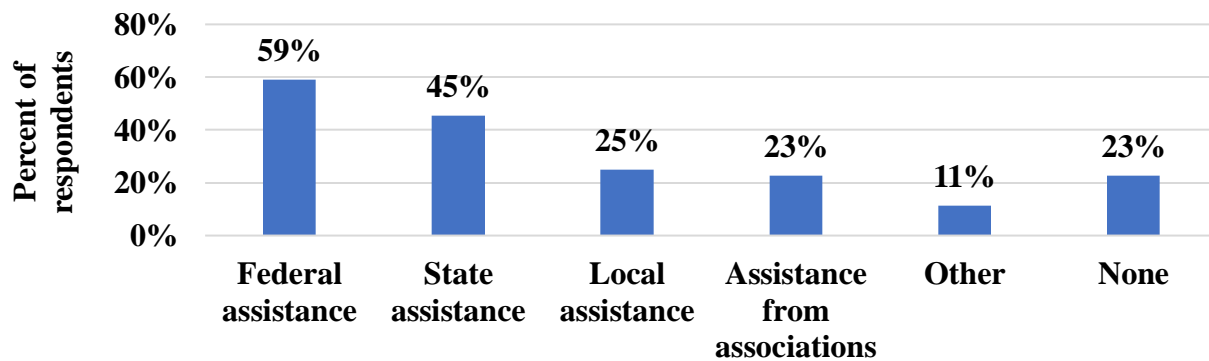
- No response : 20%
- Less than 1 month : 32%
- 1 – 3 months : 27%
- 4 – 6 months : 11%
- 7 – 10 months : 0%
- More than 10 months : 9%
- Don't know : 0%



**Q16. Are there specific steps or types of assistance that would increase the likelihood for your farm or business to survive? Please select all that apply.**

(n = 44)

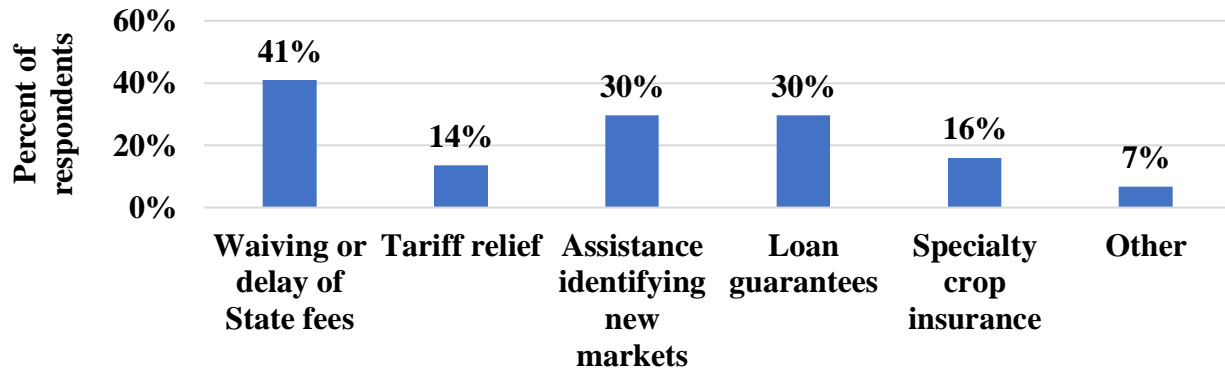
- Federal assistance : 59%
- State assistance : 45%
- Local assistance : 25%
- Assistance from associations : 23%
- Other : 11%
- None : 23%



**Q17. Would assistance with any of the following be helpful to your farm or business right now? Please select all that apply.**

(n = 44)

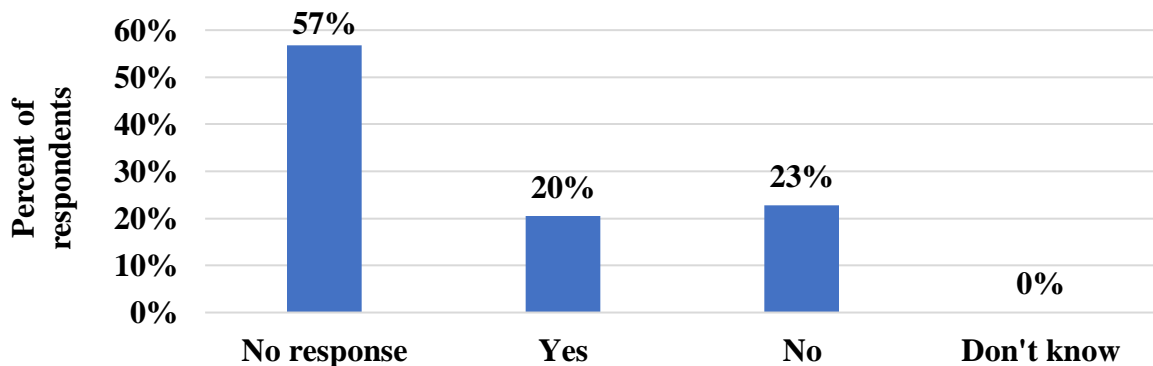
- Waiving or delay of state fees : 41%
- Tariff relief : 14%
- Assistance identifying new markets : 30%
- Loan guarantees : 30%
- Specialty Crop Insurance : 16%
- Other : 7%



**Q18. Are there any existing programs that your aquaculture, aquaponics, or allied business does not currently qualify for, that would increase the likelihood of survival of your farm or business?**

(n = 44)

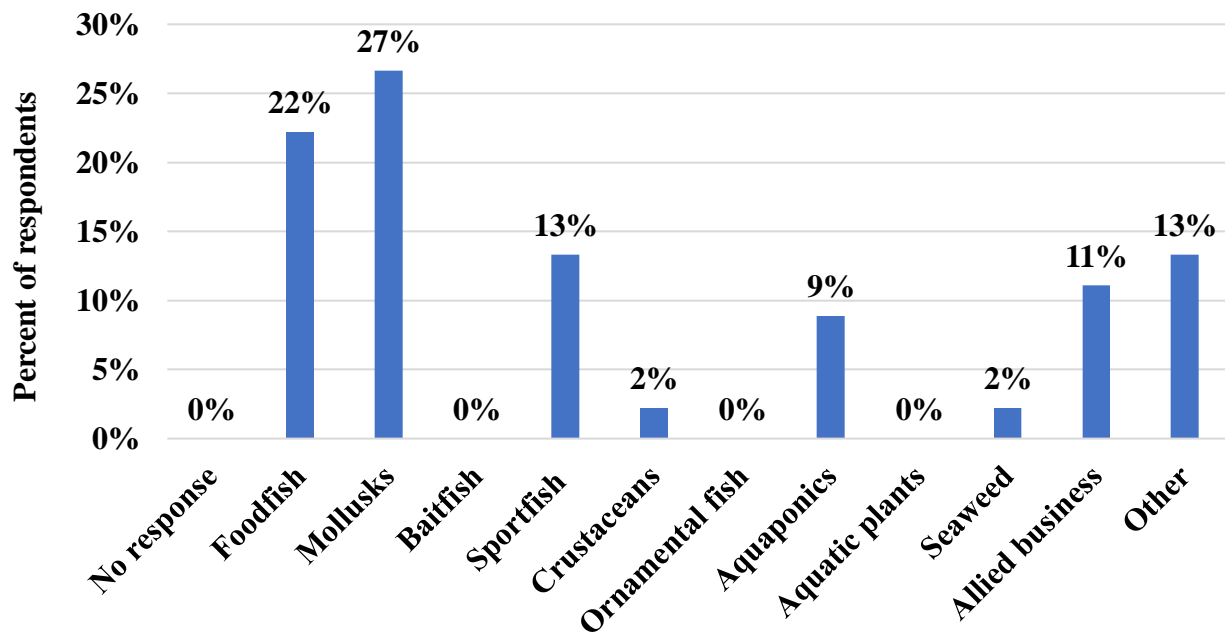
- No response : 57%
- Yes : 20%
- No : 23%
- Don't know : 0%



**Q19. What is the primary product that your farm or business produces?**

(n = 45)

- No response : 0%
- Food fish : 22%
- Mollusks (oysters, clams, mussels, etc.) : 27%
- Baitfish : 0%
- Sportfish / recreational fish, including trout : 13%
- Crustaceans (crawfish, soft crab, shrimp, etc.) : 2%
- Ornamental fish (aquarium or water garden) : 0%
- Aquaponics : 9%
- Aquatic plants : 0%
- Seaweed : 2%
- Allied business (equipment, chemicals, etc.) : 11%
- Other : 13%

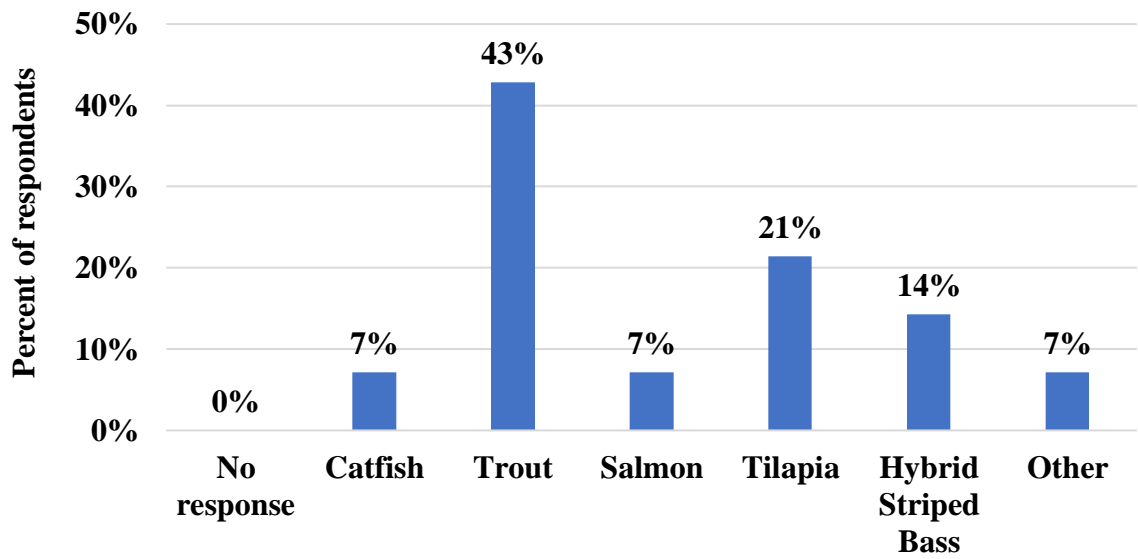




**Q19.1. Please indicate which is the major species of food fish raised by your farm or business:**

(n = 14)

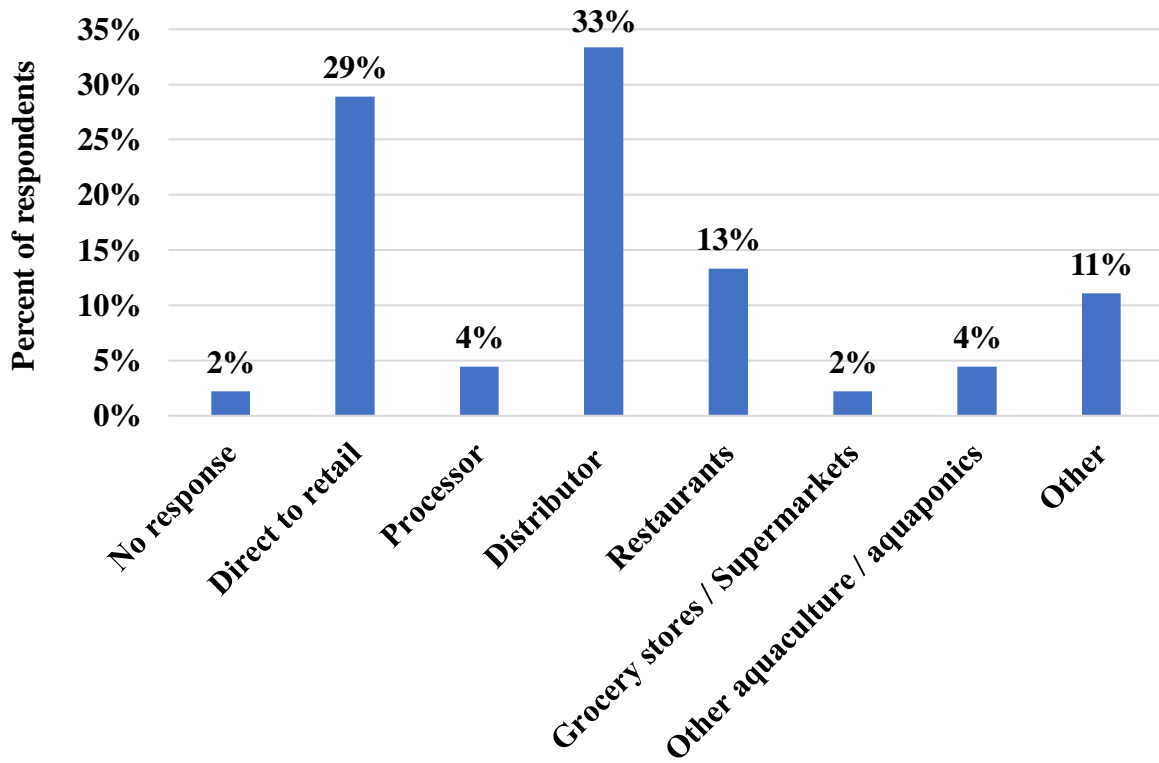
- No response : 0%
- Catfish : 7%
- Trout : 43%
- Salmon : 7%
- Tilapia : 21%
- Hybrid Striped Bass : 14%
- Other : 7%



**Q20. How does your farm or business primarily market or sell aquaculture / aquaponics products?**

(n = 45)

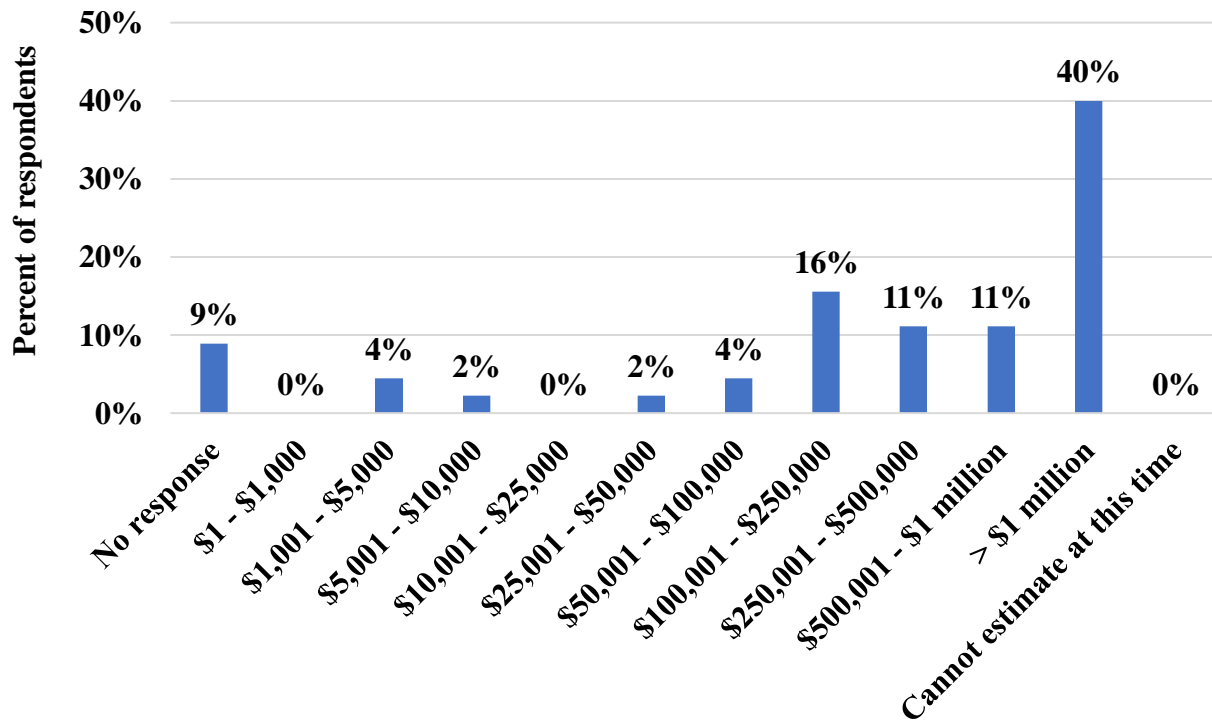
- No response : 2%
- Direct to retail (direct to consumers) : 29%
- Processor : 4%
- Distributor : 33%
- Restaurants : 13%
- Grocery Stores / Supermarkets : 2%
- Other aquaculture/aquaponics farms or businesses : 4%
- Other : 11%



**Q21. Please indicate the scale of your farm or business by annual sales volume before the effects of coronavirus disease (COVID-19):**

(n = 45)

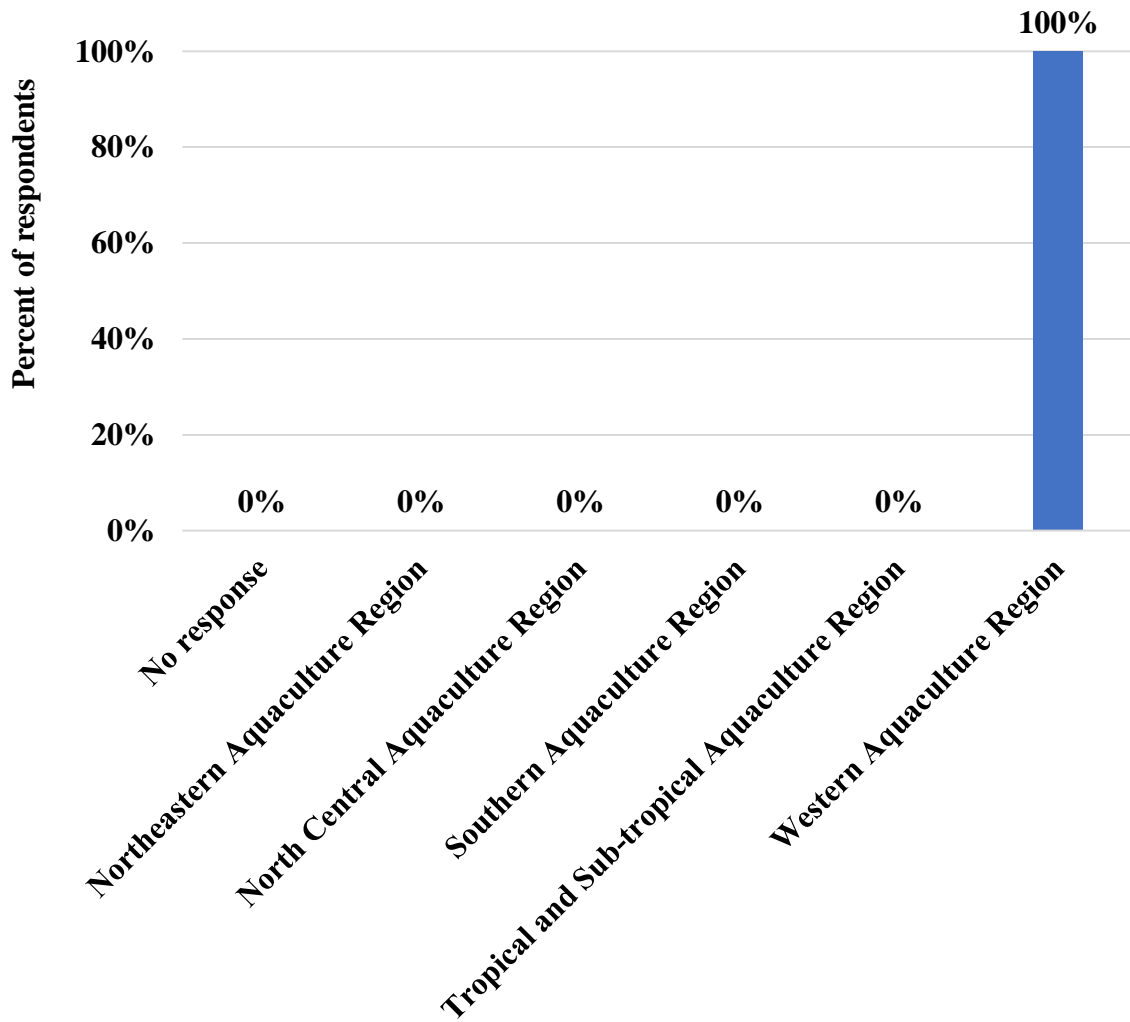
- No response : 9%
- \$1 - \$1,000 : 0%
- \$1,001 - \$5,000 : 4%
- \$5,001 - \$10,000 : 2%
- \$10,001 - \$25,000 : 0%
- \$25,001 - \$50,000 : 2%
- \$50,001 - \$100,000 : 4%
- \$100,001 - \$250,000 : 16%
- \$250,001 - \$500,000 : 11%
- \$500,001 - \$ 1 million : 11%
- Greater than \$1 million : 40%
- Cannot estimate at this time : 0%



**Q22. In which USDA defined Aquaculture Region is your farm or business located?**

(n = 45)

- No response : 0%
- Northeastern Aquaculture Region : 0%
- North Central Aquaculture Region : 0%
- Southern Aquaculture Region : 0%
- Tropical and Sub-Tropical Aquaculture Region : 0%
- Western Aquaculture Region : 100%



# References

USDA (United States Department of Agriculture). 2019. 2018 Census of Aquaculture. National Agricultural Statistics Service, USDA, Washington, District of Columbia, USA.

Accessed April 2020 at:

[https://www.nass.usda.gov/Surveys/Guide\\_to\\_NASS\\_Surveys/Census\\_of\\_Aquaculture/index.php](https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Census_of_Aquaculture/index.php).

# Acknowledgements

Thank you to all respondents who participated in this study. Also, thank you to all of the national, regional, and state associations, agencies, Extension, and all others who helped us disseminate the survey. There are simply too many names to list, thanks to all of you.