



Impacts of COVID-19 on U.S. aquaculture, aquaponics, and allied businesses: Quarter 2 Results

April 10, 2020 to June 29, 2020 survey

Authored by Jonathan van Senten, Assistant Professor and Extension Specialist Virginia Seafood AREC, Department of Agricultural and Applied Economics, Center for Coastal Studies Affiliate Faculty, Virginia Tech; Matthew A. Smith, Extension Specialist, The Ohio State University; Carole R. Engle, Engle-Stone Aquatic\$, LLC, Adjunct Faculty, Virginia Seafood AREC, Virginia Tech; Charles Clark, Virginia Seafood AREC, Virginia Tech; Shannon Fluharty, Department of Agricultural and Applied Economics, Virginia Tech; and Michael H. Schwarz, Virginia Seafood AREC

Introduction

In response to the coronavirus (COVID-19) disease pandemic, a collaborative initiative was launched by The Ohio State University, Virginia Tech, and Engle-Stone Aquatic\$, LLC to assess the impacts of the pandemic on U.S. aquaculture, aquaponics, and allied industry. Results from the first quarter survey (AAEC-218NP) demonstrated that the U.S. aquaculture industry has been impacted by the coronavirus (COVID-19) disease pandemic; with 90% of respondents reporting that their farm or business had been affected by the pandemic in some way. The Q1 impacts reported by respondents can be broadly summarized as the disruption of traditional marketing channels, challenges with labor, and challenges with production. Over the course of the first quarter of 2020, the U.S. government developed and implemented several emergency relief measures, in an effort to assist small businesses and individuals. The Q2 survey asked specifically about these relief and assistance programs, as well as questions on adaptations and changes being implemented by farms and businesses in response to the ongoing challenges. This fact sheet summarizes the Q2 results of this study, covering the period from April 10th to June 29th, 2020

Methods

Detailed methods for this study and an explanation of the survey activities can be viewed in the Q1

report (AAEC-218NP). The data for this study was collected through an online survey, administered through Qualtrics. Using an online platform ensured that the survey instrument could be rapidly and widely distributed, to include as much of the U.S. aquaculture industry as possible. It should be noted that there was no sampling methodology employed, which means that respondents self-selected for participation in the study. As a result, it is possible that responses are skewed towards those farms and businesses that have been more affected by the coronavirus (COVID-19) disease pandemic. The Q2 survey instrument underwent several adjustments, based on information obtained from the Q1 survey responses. In addition, the Q2 survey also included new questions on the government developed relief programs implemented in response to the pandemic and how helpful these have been to aquaculture, aquaponics, and allied businesses. Questions were also added to assess the effects of the pandemic on prices for aquaculture products, in an effort to gather data required for the USDA CFAP (Coronavirus Food Assistance Program). Last but not least, the Q2 survey also incorporated new questions on adaptations and changes in marketing channels attempted by respondents. The second quarter survey was launched on June 29th, 2020 and closed on July 17th, 2020. Responses to the survey were exported from Qualtrics and processed using Microsoft Excel.

Results

Characterization of Respondents

The total number of recorded responses at the termination of the Q2 survey on July 17th, 2020 was 256; of which 3 were completely blank. Eighty-seven of the surveys were less than 25% complete; the number of fully completed surveys was 150. The 248 usable responses represent approximately 8% of the U.S. aquaculture operations reported on the 2018 Census of Aquaculture (USDA, 2019). This represents a sharp reduction in the number of responses compared to the Q1 survey (which had 537 usable responses). The exact reasons for this decline in participation are unknown, but anecdotal evidence suggests survey fatigue and a sense of helplessness affected participation in the study. In addition, some segments of the U.S. aquaculture industry reported increased business activities and sales as several states around the country moved towards reopening; it is possible that this also affected participation in the study.

Amongst the 248 participants of the Q2 survey, 47% of responses represented mollusk farms or businesses. Twenty-eight percent of respondents represented foodfish, 6% of respondents elected not to identify the product their farm or business produces, 4% represented the sportfish sector, 2% aquaponics, and 2% the ornamental fish sector (Table 1).

Table 1. Primary product produced by respondents.

Category	Percentage
Mollusks	47%
Foodfish	28%
No response	6%
Sportfish (incl. trout)	4%
University / education	3%
Other	3%
Crustaceans	2%
Ornamental fish	2%
Aquaponics	2%
Baitfish	1%
Seaweed	1%
Allied business	1%
Aquatic plants	<1%

The majority of foodfish respondents (66%) were catfish producers, followed by other (14%), trout (8%) and tilapia (8%). The majority of sportfish respondents (73%) were trout producers, followed by 18% warmwater sportfish producers.

Scale of farms/businesses

Respondents represented various scales of production (Table 2). Twenty-four percent of Q2 respondents reported a pre-COVID annual sales volume in excess of \$1 million. This was followed by 14% of respondents that were in the \$500,001 to \$1 million scale, 13% of respondents in the \$100,001 to \$250,000 and \$250,001 to \$500,000 scale. Eight percent of Q2 respondents reported a pre-COVID scale of \$50,001 to \$100,000 in annual sales. Eight percent of respondents chose not to answer this question. Only 3% of respondents indicated their farm or business had an annual sales volume of \$5,001 to \$10,000, \$1,001 to \$5,000, or \$1 to \$1,000. As with the Q1 survey, it is possible that smaller aquaculture farms may not belong to the aquaculture associations and Extension contact lists that were used to distribute the survey. It is also possible that smaller farms had less time to respond or did not consider responding due to greater demands on their time dealing with the immediate needs of their farm or business.

Table 2. Scale of respondent farms/business.

Category	Percentage
> \$1 million	24%
\$500,001 - \$1 million	14%
\$250,001 - \$500,000	13%
\$100,001 - \$250,000	13%
No response	8%
\$50,001 - \$100,000	8%
\$25,001 - \$50,000	7%
\$10,001 - \$25,000	4%
\$5,001 - \$10,000	3%
\$1,001 - \$5,000	3%
\$1 - \$1,000	3%

Aquaculture Regions

Forty-two percent of responding farms and businesses (n = 159) were located in the Southern Aquaculture Region (SRAC). This was followed by the Northeastern Aquaculture Region (24%), the Western Aquaculture Region (14%), the North

Central Aquaculture Region (5%), and the Tropical and Sub-tropical Aquaculture Region (2%). Thirteen percent of respondents elected not to answer this question. Table 3 depicts the percentage of farms reported in the 2018 USDA Census of Aquaculture located in each region and the percentage of survey respondents from each respective aquaculture region (2019).

Table 3. Participation by aquaculture region.

Region	Percentage of USDA census reporting farms	Percentage of survey respondents
Southern	59%	42%
Northeast	18%	24%
Western	12%	14%
North Central	9%	5%
Tropical and Sub-tropical	2%	2%

Key Findings

Seventy-eight percent of Quarter 2 respondents (n = 158) indicated that their farm or business had been impacted by the coronavirus disease pandemic. Another 4% of respondents indicated that their farm or business had not been impacted, and 6% of respondents were uncertain whether their farm or business had been impacted or not. Of the 17 Q2 respondents who reported being uncertain or not impacted by the coronavirus (COVID-19) pandemic, 12% expected their farm or business would “definitely” be impacted in 2020. Forty-seven percent of these respondents expected that their farm or business would “probably” be impacted in 2020, while 35% expected their farm or business would “probably not” be impacted in 2020. No respondents reported that their farm would “definitely not” be impacted in 2020, and 6% of respondents elected not to answer this question.

Forty-five percent of respondents indicated that their farm or business would survive the next 3 months without any external interventions (n = 121). Forty-six percent indicated that “maybe” their farm or business would survive 3 months without external intervention, while 7% of respondents indicated that their farm or business would not survive 3 months

without external intervention. This percentage of respondents reporting not being able to survive for 3 months without intervention was lower than in the Q1 survey; at that time, 13% of respondents (n = 458) reported that their farm or business would not survive for 3 months without external intervention.

78% of Q2 respondents indicated that their farm or business had been impacted by the coronavirus disease pandemic.

When the time period for the question was extended to 6 months, 17% of respondents said their farm or business would not survive without external intervention (n = 121); while 50% said “maybe”, and 31% indicated their farm or business could survive 6 months without intervention. Extending this timeframe further, to 12 months, 31% percent of respondents indicated that their business would not survive without external intervention (n = 121). It is possible that some of the respondents to the Q1 survey have permanently closed since the completion of that survey and therefore did not participate in the Q2 survey.

Lost Sales

Lost sales were one of the major impacts reported by respondents in the Q1 survey; with 84% of respondents (n = 499) reporting lost sales. Results from the Q2 survey indicate that respondents also experienced lost sales in the second quarter of 2020; with 74% of respondents (n = 150) reporting lost sales. Approximately one quarter (22%) of Q2 respondents reported lost sales to international markets (n = 111). Respondents also reported on the value of lost sales in the second quarter (Table 4), with 22% of respondents indicating that they had lost between \$100,001 and \$250,000 in sales. Followed by 18% of respondents that had lost between \$50,001 and \$100,000 or \$10,001 and \$25,000 during the second quarter of 2020. Respondents were also asked about the status of contracts during the second quarter (n = 124). Thirteen percent had government contracts delayed, and 8% reported government contract cancellations.

Ten percent of Q2 respondents indicated that their farm or business had made new government (state or federal) contracts during the second quarter; with 2% reporting government contracts re-instated. As for private contracts, 43% of respondents indicated that their farm or business had private contracts cancelled during Q2. This was followed by 33% that had contracts delayed, and only 2% that reported new private contracts or private contracts re-instated.

Table 4. Value of lost sales during Q2

Category	Percentage
\$100,001 - \$250,000	22%
\$10,001 - \$25,000	18%
\$50,001 - \$100,000	18%
\$25,001 - \$50,000	11%
\$500,001 - \$ 1 million	8%
\$1,001 - \$5,000	7%
\$250,001 - \$500,000	6%
\$5,001 - \$10,000	3%
Greater than \$1 million	3%
Cannot estimate at this time	3%
No response	1%
\$1 - \$1,000	0%

Sixty-eight percent of Q2 respondents indicated that they expected to experience additional lost sales in Q3 of 2020 (n = 141), with 21% of respondents expecting to experience decreased sales to international markets (n = 96).

74% of Q2 respondents reported that their farm or business had experienced lost sales due to the coronavirus disease pandemic.

A new question for the Q2 survey asked respondents about the availability of cash on hand to cover operating expenses. A quarter of respondents (25%), indicated that they have sufficient cash on hand to cover 1 to 3 months of operations (n = 121). This was followed by 21% of respondents who indicated having enough cash on hand for 4 to 6 months of operations. Nine percent of respondents to the Q2 survey said they had no cash on hand for business

operations. While 22% of respondents reported less than 1 month of cash on hand. It is worth noting that the Q2 survey was open for a period of 3 weeks for data collection, meaning that respondents who completed the survey shortly after it was distributed may have already exhausted their cash on hand by the time this fact sheet was prepared.

Labor

Fifty percent of Q2 survey respondents reported that their farm or business had experienced no change in employment during the second quarter (n = 123). Twenty-seven percent of respondents had terminated employees during the second quarter; while 15% of respondents reported that their farm or business would “have to soon”. Five percent of respondents had hired additional employees. Respondents were asked about the number of employees that had been terminated during Q2, with the majority (64%) indicating that between 1 and 3 employees had been let go (n = 33). Twenty-four percent of respondents indicated the number of employees terminated during the second quarter to be between 4 and 6. Although only 6% of respondents indicated that greater than 20 employees were terminated, the maximum number of employees terminated by a single respondent was 400.

Respondents were also asked how long before their farm or business had to make a decision about whether to terminate employees or not, the majority of respondents (61%) indicated a period between 4 and 6 weeks (n = 18). Furthermore, 6% of Q2 respondents indicated that they had less than a week to make a decision about terminating employees. Another 6% of respondents reported having more than 10 weeks to make a decision about laying off employees. Respondents were then asked how many employees the farm or business would have to lay off (n = 18), the majority of respondents (83%) indicated between 1 and 3 employees. Of those respondents that hired additional employees during the second quarter (n = 6), 83% hired between 1 and 3 employees, with the remaining 17% hiring between 4 and 6 employees.

Survey respondents were also asked about employees missing work due to the coronavirus (COVID-19) disease pandemic. Sixty-one percent of respondents indicated that their farm or business did not have any employees miss work (n = 123), while

37% percent of respondents did experience employees that had missed work. Forty percent of those Q2 respondents (n = 45) indicated that employees had missed in excess of 14 days of work during the second quarter. This was followed by 24% reporting employees had missed between 11 and 14 days of work, and 20% reporting between 7 and 10 days of work missed.

Challenges to the farm/business

Thirty-five percent of responding Q2 farms and businesses experienced production challenges that were not related to labor (n = 150). Tied by 35% of respondents reporting their farm or business had experienced issues with labor. This was followed by 32% of Q2 respondents who indicated they had experienced an increased cost of production, and 31% of respondents who reported being unable to pay bills or cover their liabilities during the second quarter. Only 7% of Q2 respondents reported experiencing an increased demand for their product.

More specifically, 46% of Q2 respondents reported challenges with production inputs such as feed, chemicals, therapeutants, etc. (n = 50). This was followed by 36% of Q2 respondents who experienced other challenges, 28% who experienced challenges with repair, construction, consultant or engineering services, and another 28% who reported they had experienced challenges with financial services. Ten percent of Q2 respondents reported that they could not identify specific challenges at the time they completed the survey.

Another new question for the second quarter survey was whether farms or businesses had missed any bill or loan payments as a result of the pandemic (n = 45). A third of respondents chose not to answer this question. Eighteen percent of Q2 respondents indicated that they had missed between \$1,001 and \$5,000 in bill or loan payments. Followed by 13% of respondents who could not estimate the value of missed payments at the time they completed the survey, 9% of respondents who had missed between \$10,001 and \$25,000, and 7% of respondents who had missed between \$25,001 and \$50,000 in payments during the second quarter.

When asked about expecting to experience challenges at the farm or business during Q3, 39% of respondents indicated they expect to experience challenges with production inputs (n = 49). This was followed by 37% of Q2 respondents who expected challenges with financial services. Responding farms and businesses also reported challenges with market-ready product taking up space and interfering with new stocking or planting. Thirty-nine percent of respondents reported that their farm or business could hold market ready product for a period of 1 to 3 months before it would interfere with new production (n = 121). Twenty-one percent of Q2 respondents could hold market ready product for less than 1 month, before it would interfere with future production; while 9% percent of responding farms and businesses could hold market ready product for more than 10 months before it becomes an issue for new production.

Marketing of products

Second quarter respondents were also asked about the effects of holding market ready product on price, quality, and quantities sold. The majority (73%) of respondents said “yes”, holding product would make it less marketable (n = 121). Specifically, 66% of Q2 respondents indicated that holding product would result in a reduced price, 59% indicated that holding product would reduce the quality of products, and 56% indicated that holding product would result in a lower quantity sold (n = 88).

Marketing channels

Respondents were also asked to indicate their primary marketing channels before the effects of the coronavirus (COVID-19) disease pandemic (Table 5). Twenty-nine percent of Q2 respondents indicated that they previously primarily sold their products through a distributor. This was followed by 22% that sold primarily to a processor, and 13% that sold primarily to restaurants. Eleven percent of Q2 respondents indicated that they previously sold direct to consumers.

Table 5. Primary marketing channel for respondents.

Category	Percentage
Distributor	29%
Processor	22%
Restaurants	13%

Direct to consumer	11%
No response	11%
Other	8%
Other aquaculture /aquaponics	4%
Grocery store / supermarket	1%

Respondents were also asked about adaptations or changes in their marketing channel in response to the pandemic, to which 34% of respondents said “yes” they had implemented or attempted to implement a new marketing channel (n = 137). Forty-five percent of respondents said that they had not implemented or attempted to implement a new marketing channel during the second quarter of 2020. Of those respondents who had implemented or attempted to implement direct to consumer sales (n = 27), 70% had used online sales. This was followed by 59% who had implemented “curbside pickup”, and 44% who had implemented home delivery services.

Relief and assistance programs

As an important new addition to the Q2 survey, respondents were asked about the various assistance and relief programs that had been announced during Q2 of 2020. Respondents were asked to identify to which programs they had applied, whether they had received the requested support, and whether that support had been helpful to their farm or business. Nearly half (48%) of Q2 respondents (n = 141) had applied for the Paycheck Protection Program (PPP). This was followed by 33% of respondents who had applied for Economic Injury Disaster Loans (EIDL), 19% who had applied for a personal bank loan or line of credit, 18% who had applied for a Small Business Administration (SBA) loan, and 11% who had applied for unemployment benefits. Thirteen percent of Q2 respondents reported that their farm or business had not applied for any assistance programs during the second quarter.

As for having received the support that was requested (n = 100), 9% of Q2 respondents indicated that they had applied but not yet received assistance, while 5% reported having been declined or denied assistance. Ninety percent of Q2 respondents who had applied for a PPP loan had received the requested support. Table 6 breaks down the various

support programs and the percent of Q2 respondents that reported receiving that support.

The majority of respondents (56%) indicated that Federal assistance would increase the likelihood for their farm or business to survive (n = 140). This was followed by 33% of respondents who also selected State assistance as a mechanism that would increase their likelihood of survival.

Thirty-four percent of Q2 respondents indicated that specialty crop insurance would be helpful to them (n = 139). Twenty-six percent indicated that waiving or delay of State fees would be helpful, and 19% indicated that assistance with identifying new markets would be helpful.

Table 6. Assistance received by Q2 respondents

Category	(N =)	Percentage
Private bank loans / line of credit	27	67%
Small Business Administration loans (SBA)	26	62%
Paycheck Protection Program loans (PPP)	68	90%
Economic Injury Disaster Loans (EIDL)	46	67%
Unemployment benefits	15	87%
Other Federal program	5	60%
Other State program	4	50%
Other Local program	1	100%
Farm or business has applied but not yet received	100	9%
Farm or business applications have been denied / declined	100	5%

Discussion and Conclusion

Results of the Q2 survey demonstrate that U.S. aquaculture, aquaponics, and allied businesses are still experiencing negative impacts from the coronavirus (COVID-19) disease pandemic. Although the total number of respondents for the Q2 survey was lower, many of the responses indicate a similar trend as was observed in the Q1 results. While many Q2 respondents have been able to obtain external assistance and relief, there are still several impacts that will have longer term consequences for the industry. These include the

continued disruption of traditional marketing channels, increasing costs of production, challenges obtaining services and inputs, challenges with cash on hand to cover operating expenses, and missed or delayed loan and bill payments. Comments provided by respondents reveal that some producers have ceased all harvest activity or preparations for future production. Lost revenue continues to be a significant challenge for respondents, with 74% of Q2 respondents reporting lost sales. Challenges reported with labor and production, also reinforce Q1 results in suggesting negative impacts on future supply of aquaculture and aquaponics products. The key points from the Quarter 2 survey results are:

- *78% had been impacted by COVID-19 during Q2*
- *43% had had private orders/contracts cancelled*
- *27% had terminated employees*
- *74% had experienced lost sales*
- *9% had no cash available to cover operating expenses*
- *22% had less than 1 month of cash available to cover operating expenses*
- *45% would survive 3 months without external intervention*
- *48% applied for the Paycheck Protection Program, 33% for an Economic Injury Disaster Loan, 19% for a personal bank loan or line of credit, and 11% for unemployment benefits.*
- *56% indicated that Federal assistance would help their farm or business to survive, and 33% indicated that state assistance would help their farm or business to survive.*

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- 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. (last accessed, April 12th, 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/aaec-218/AAEC-218.pdf

Additional Resources

van Senten, J., C.R. Engle, and M. Smith. 2020. Impacts of COVID-19 on U.S. aquaculture, aquaponics, and allied businesses. *Journal of the World Aquaculture Society* 51(3):571-573.

A summary of all Quarter 2 survey results may be found in the Appendix document to this fact sheet, titled: "Summary of COVID-19 impacts on U.S. aquaculture, aquaponics, and allied businesses: Quarter 2 Results".

All study results and disaggregated reports are/will be published online and available at: https://www.arec.vaes.vt.edu/arec/virginia-seafood/research/Impacts_of_COVID19.html

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2020

AAEC-228NP
VSG-20-10

Appendix

Summary of COVID-19 impacts on U.S. aquaculture, aquaponics, and allied businesses:

Quarter 2 Results

Jonathan van Senten, Virginia Tech

Matthew A. Smith, The Ohio State University

Carole R. Engle, Engle-Stone Aquatics, LLC, Virginia Tech

Charles Clark, Virginia Tech

Shannon Fluharty, Virginia Tech

Michael H. Schwarz, Virginia Tech



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Q23. How did your farm or allied business primarily market or sell aquaculture / aquaponics products before the effects of the coronavirus disease pandemic (COVID-19)?..... 37

Q23.1. Did your farm or allied business implement or attempt to implement a new marketing or sales channel in the period of time between April 10th 2020 and June 29th 2020 because of coronavirus disease (COVID-19)? 38

Q23.2. What percent of sales from your farm or allied business in the period of time between April 10th 2020 and June 29th 2020 went through a new marketing channel? 38

Q23.3. If your farm or allied business implemented or attempted to implement a "Direct to consumer / end user" marketing channel, please specify the method(s) from the options below: (please select all that apply)?. 39

Overview

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 will be administered quarterly for the duration of 2020 in order to capture the evolving effects of the coronavirus disease pandemic (COVID-19) on the industry. The Quarter 2 survey closed on July 17th, 2020 at 11:59 pm.

Methods

Data for this study was collected through a survey, which was developed in Qualtrics so that it could be rapidly distributed online and through social media to aquaculture, aquaponics, and allied businesses around the U.S. The survey underwent a review by aquaculture and aquaponics experts prior to being submitted to the Virginia Tech Institutional Review Board for a human subjects research determination. Having been granted an exemption by the IRB, the survey was pre-tested with several aquaculture producers. The survey was intended for commercial aquaculture, aquaponics, and allied businesses; with distribution of the survey occurring through e-mail and social media. The National Aquaculture Association (NAA), USDA NIFA Cooperative Extension, National Sea Grant Extension, multiple industry associations, and other stakeholders assisted in distribution of the survey. Given the urgency to gather exploratory information on how U.S. aquaculture was being affected, a non-probability, self-selection method was used. The survey will be distributed quarterly throughout 2020, to capture the evolving effects of coronavirus disease (COVID-19) on the industry. The second quarter survey was launched on June 29th, 2020 and closed on July 17th, 2020. Results were summarized using Microsoft Excel software.

Response Rate

At the time of closing the survey had a total of 256 responses. Two of the recorded responses were completely blank. Another 87 responses were less than 25% complete. A total of 100 observations were less than 75% complete. Blank responses were removed from the dataset. For each question summarized in this document the total number of respondents is denoted ($n = _$). Discounting the number of “allied businesses” ($n = 3$) and “university/education” ($n = 7$) respondents that participated in the study, the number of farms that participated is roughly equal to 8% of the total number of U.S. farms recorded in the 2018 Census of Aquaculture (USDA, 2019). This response is lower than the Q1 survey, to which an approximate 18% of the total number of U.S. farms recorded in the 2018 Census of Aquaculture (USDA, 2019) responded.

No Response

The survey made use of skip and display logic, in order to minimize the number of questions presented to participants that were not relevant based on previous answers. As a result, the “No response” category presented in this report is a count of the number of participants presented with the question who proceeded without answering that question.

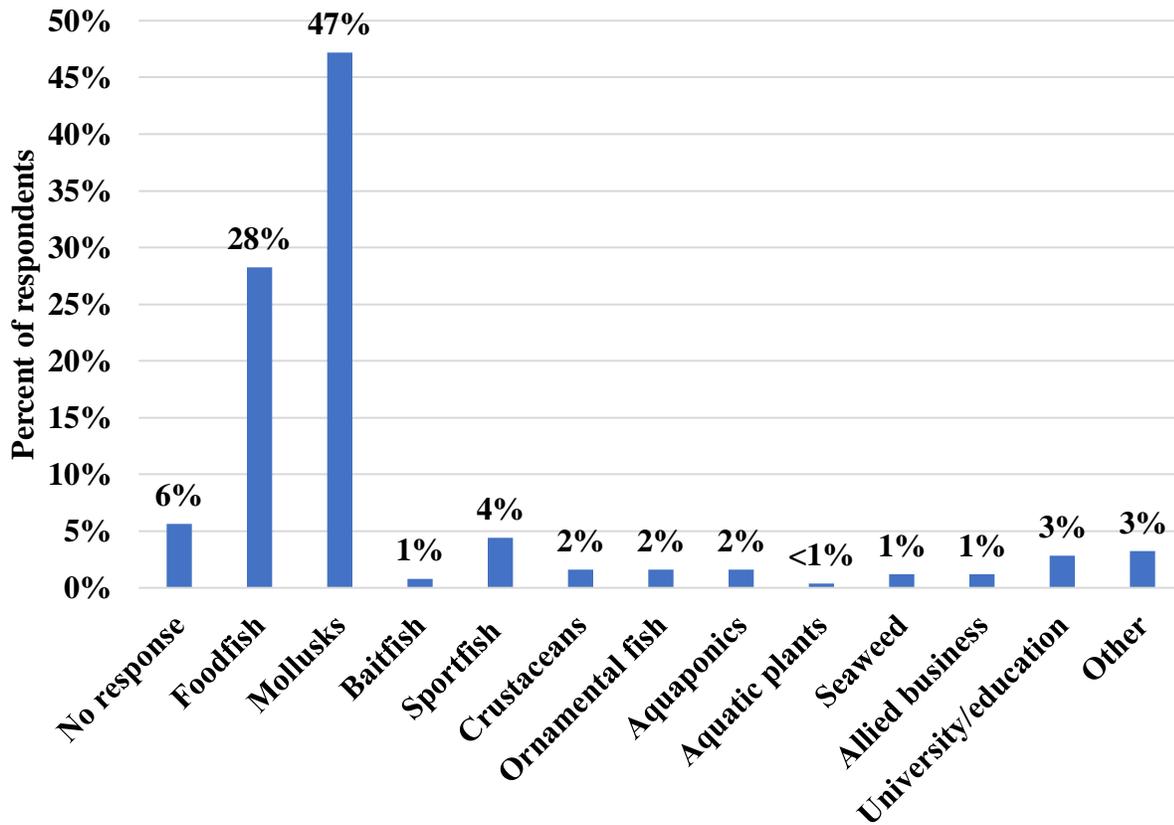
Survey results for each question

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

Q1. What is the primary product that your farm or allied business produces?

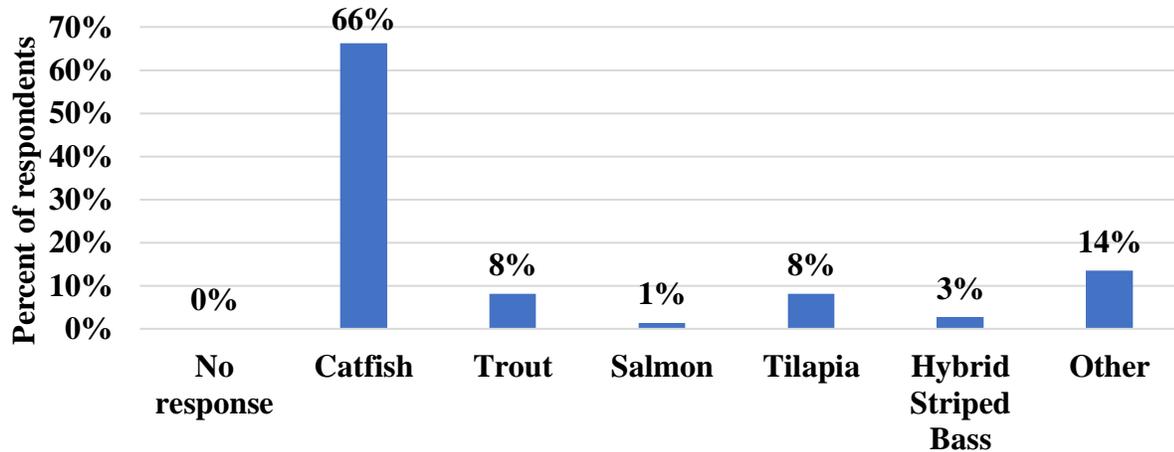
(n = 248)

- No response : 6%
- Foodfish : 28%
- Mollusks (oysters, clams, mussels, etc.) : 47%
- Baitfish : 1%
- Sportfish / recreational fish, including trout : 4%
- Crustaceans (crawfish, soft crab, shrimp, etc.) : 2%
- Ornamental fish (aquarium or water garden) : 2%
- Aquaponics : 2%
- Aquatic plants : < 1%
- Seaweed : 1%
- Allied business (equipment, chemicals, etc.) : 1%
- University or other research / education organization : 3%
- Other : 3%



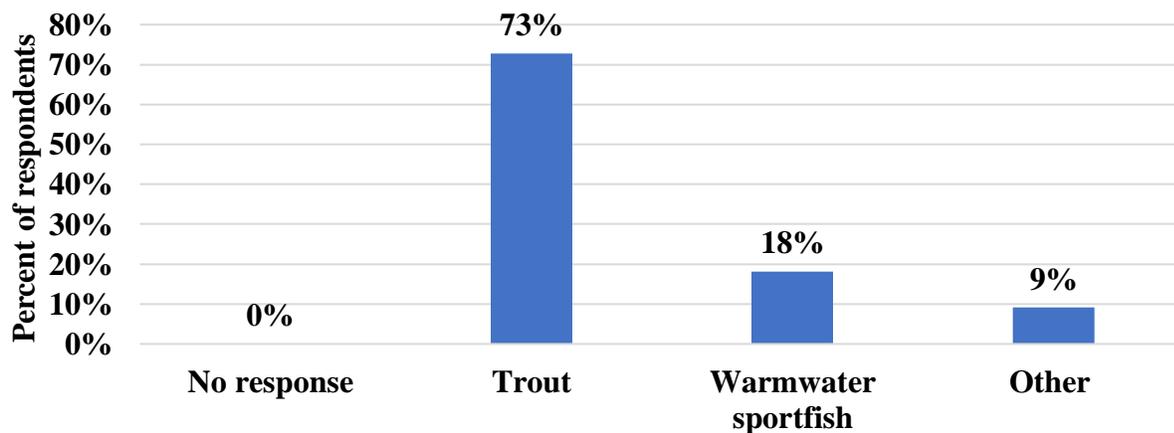
Q1.1. Please indicate which is the major species of foodfish raised by your farm or business:
(n = 74)

- No response : 0%
- Catfish : 66%
- Trout : 8%
- Salmon : 1%
- Tilapia : 8%
- Hybrid Striped Bass : 3%
- Other : 14%



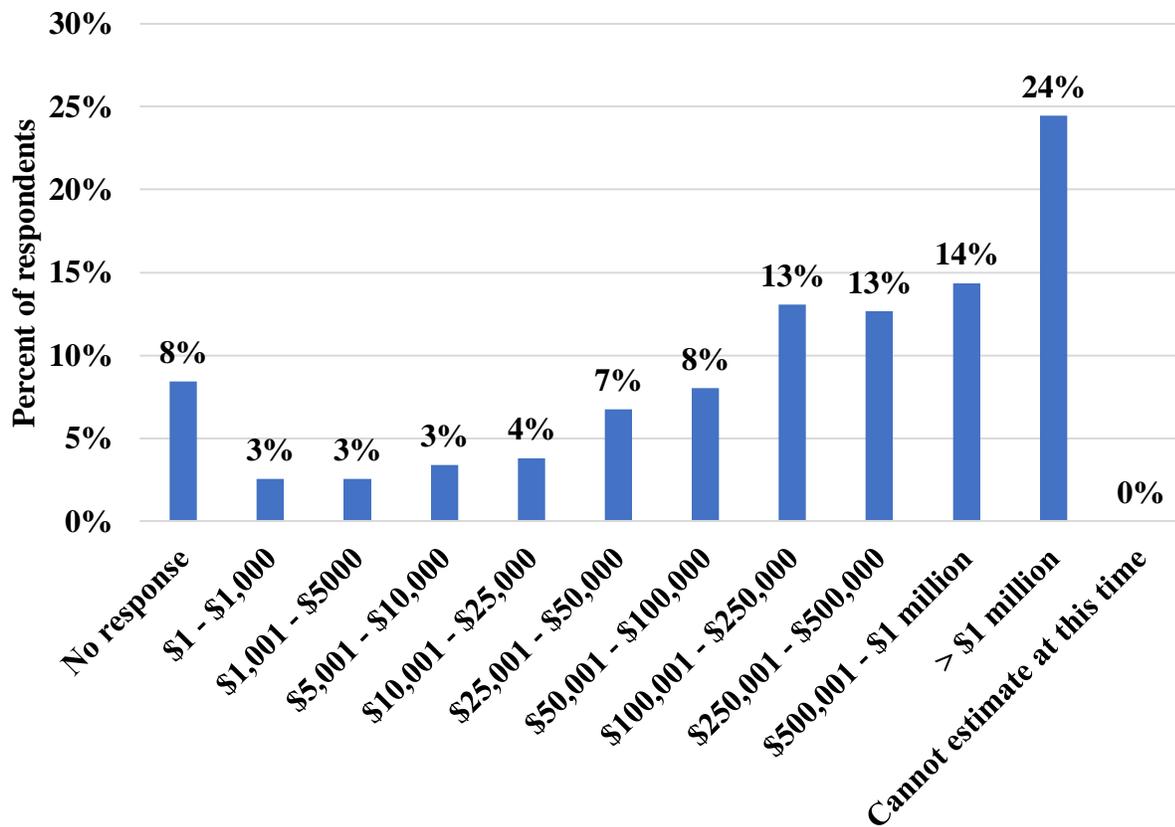
Q1.2 Please indicate which is the major species of sportfish raised by your farm or business:
(n = 11)

- No response : 0%
- Trout : 73%
- Warmwater sportfish : 18%
- Other : 9%



Q2. Please indicate the scale of your farm or business by annual sales volume before the effects of coronavirus disease (COVID-19):
(n = 237)

- No response : 8%
- \$1 - \$1,000 : 3%
- \$1,001 - \$5,000 : 3%
- \$5,001 - \$10,000 : 3%
- \$10,001 - \$25,000 : 4%
- \$25,001 - \$50,000 : 7%
- \$50,001 - \$100,000 : 8%
- \$100,001 - \$250,000 : 13%
- \$250,001 - \$500,000 : 13%
- \$500,001 - \$ 1million : 14%
- Greater than \$1 million : 24%
- Cannot estimate at this time : 0%



Q3. Please provide the average price and approximate inventory of the primary product (market-sized) on your farm or business for the following periods of time:

(n = N/A)

	Average price per unit (\$ USD)	Average inventory (# of units)	Unit (lbs, count, etc.)
No response	N/A	N/A	N/A
As of January 1 st 2020	N/A	N/A	N/A
As of April 1 st 2020	N/A	N/A	N/A
As of July 1 st 2020	N/A	N/A	N/A

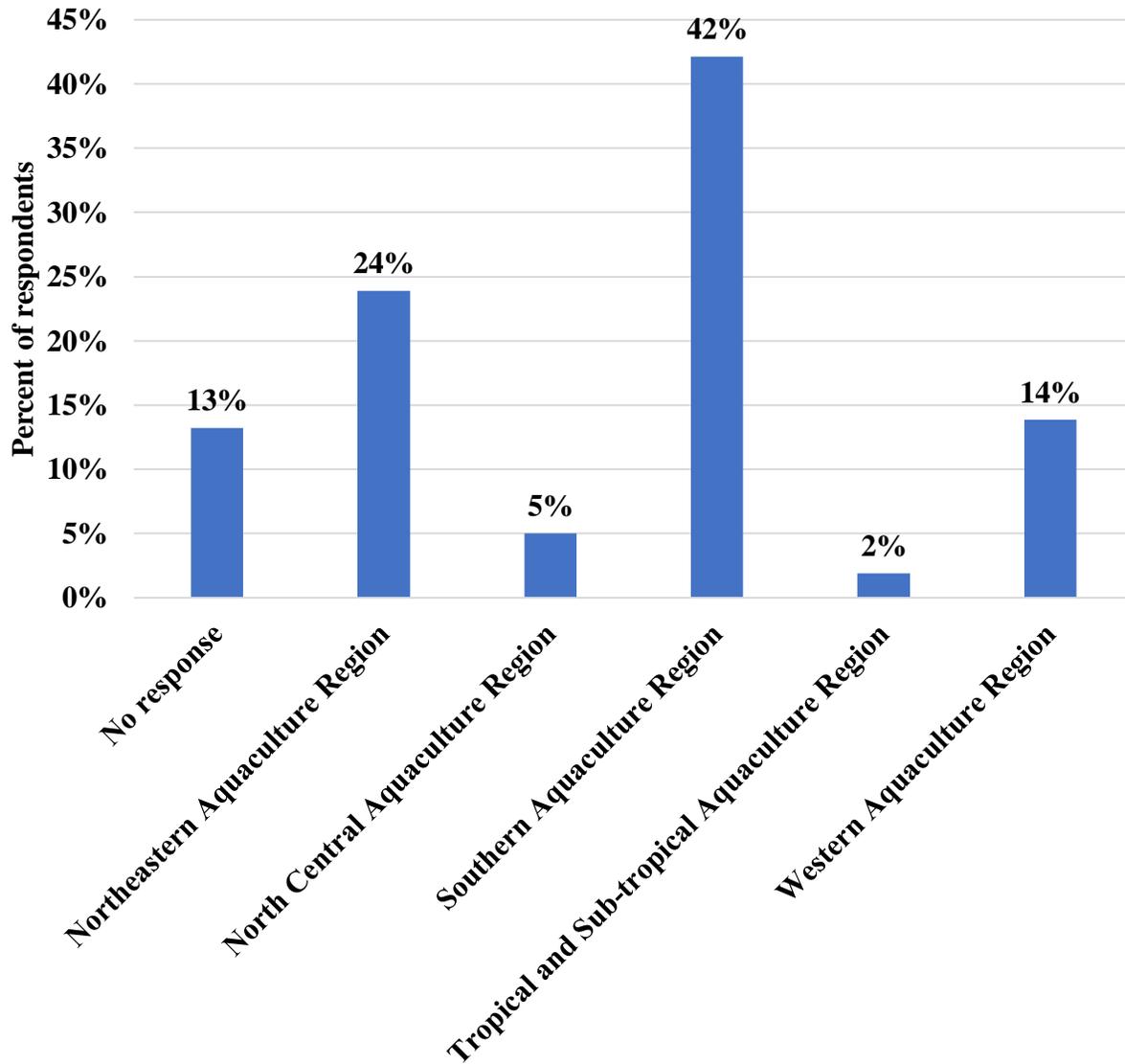
Q3.1. Please provide the volume of the primary product (market-sized) sold by your farm at the market price and the volume sold at a reduced price due to being out-of-size for the following periods of time:

(n = N/A)

	Unit (lbs, count, etc.)	Average number of units sold at market price	Average number of units sold at reduced price
No response	N/A	N/A	N/A
Q1: January - March 2020	N/A	N/A	N/A
Q2: April – June 2020	N/A	N/A	N/A

Q4. In which USDA defined Aquaculture Region is your farm or business located?
 (n = 159)

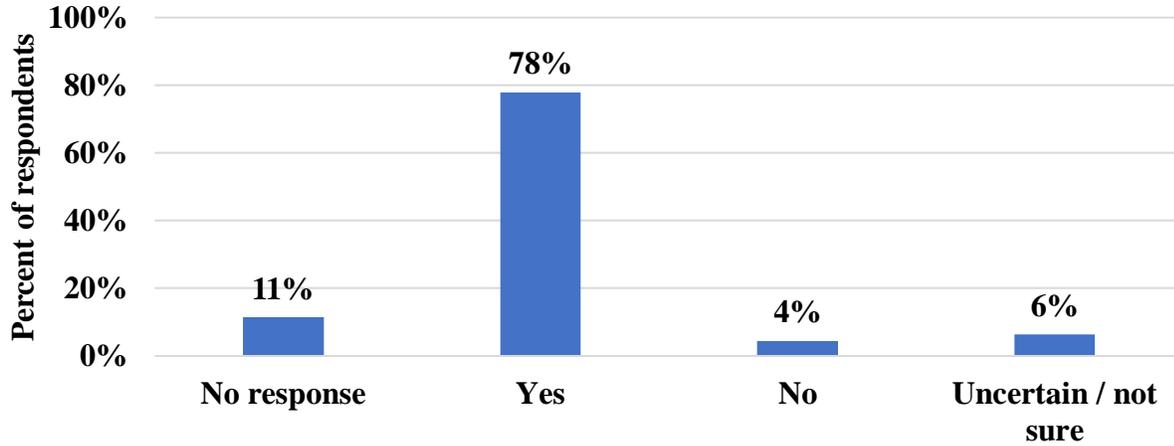
- No response : 13%
- Northeastern Aquaculture Region : 24%
- North Central Aquaculture Region : 5%
- Southern Aquaculture Region : 42%
- Tropical and Sub-Tropical Aquaculture Region : 2%
- Western Aquaculture Region : 14%



Q5. Has your farm or allied business been impacted, either positively or negatively, by the coronavirus disease (COVID-19) in the period of time between April 10th 2020 and June 29th 2020?

(n = 158)

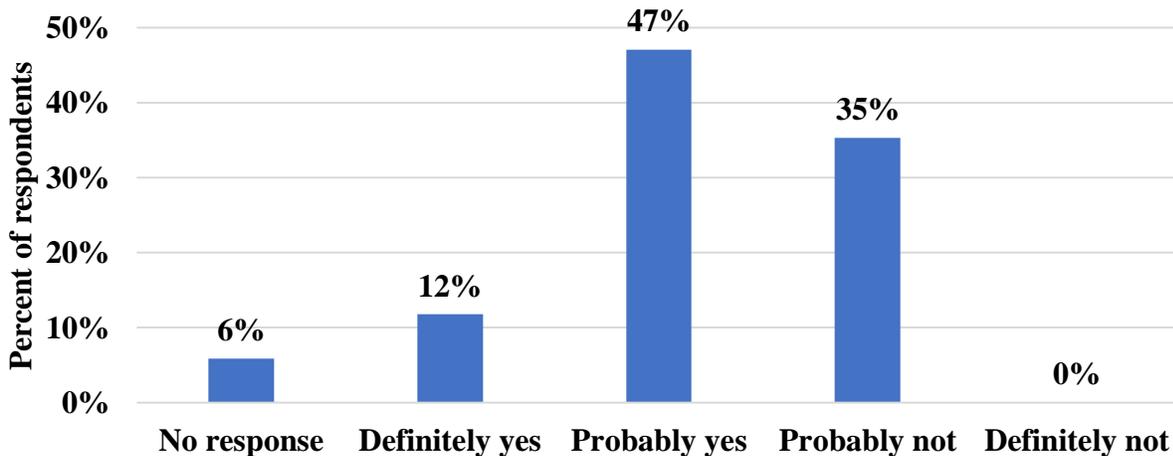
- No response : 11%
- Yes : 78%
- No : 4%
- Uncertain/not sure : 6%



Q5.1. Does your farm or allied business expect to be affected, either positively or negatively, by the coronavirus disease (COVID-19) in 2020?

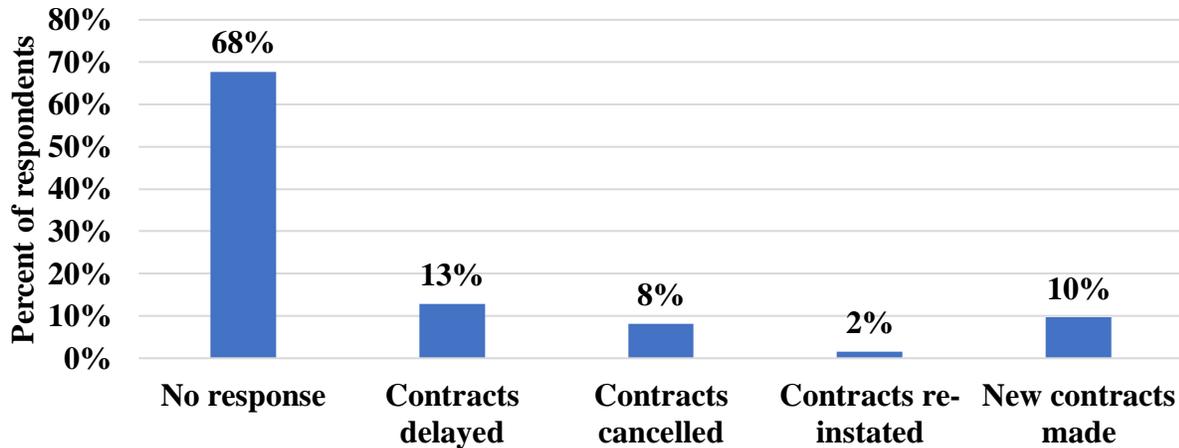
(n = 17)

- No response : 6%
- Definitely yes : 12%
- Probably yes : 47%
- Probably not : 35%
- Definitely not : 0%



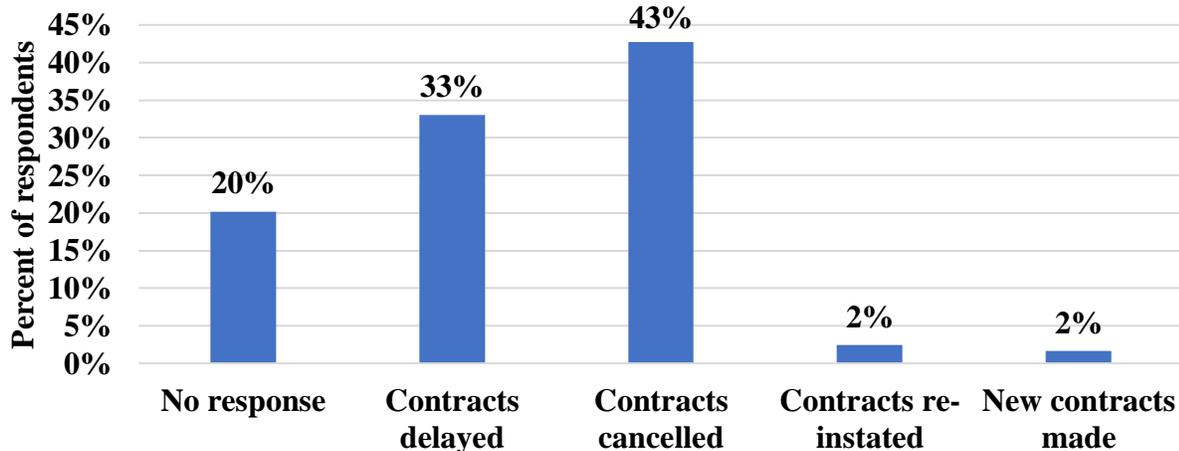
Q6. Have there been changes in government (state or federal) contracts in the period of time between April 10th 2020 and June 29th 2020 because of the coronavirus disease (COVID-19)?
 (n = 124)

- No response : 68%
- Contracts delayed : 13%
- Contracts cancelled : 8%
- Contracts re-instated : 2%
- New contracts made : 10%



Q7. Have there been changes in private contracts in the period of time between April 10th 2020 and June 29th 2020 because of the coronavirus disease (COVID-19)?
 (n = 124)

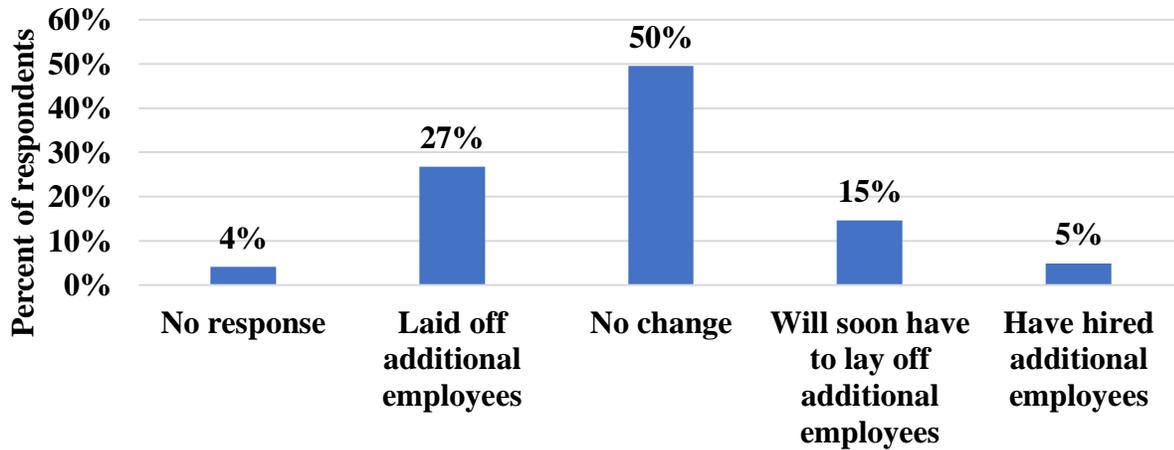
- No response : 20%
- Contracts delayed : 33%
- Contracts cancelled : 43%
- Contracts re-instated : 2%
- New contracts made : 2%



Q8. Please indicate what types of changes in employment have occurred in the period of time between April 10th 2020 and June 29th 2020 due to the coronavirus disease (COVID-19)?

(n = 123)

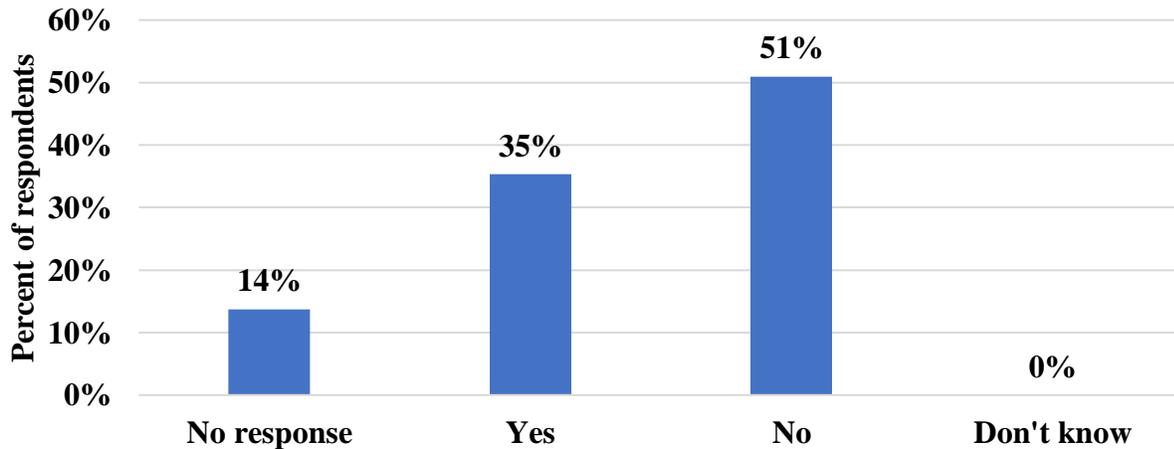
- No response : 4%
- Laid off additional employees : 27%
- No change : 50%
- Will soon have to lay off additional employees : 15%
- Have hired additional employees : 5%



Q8.1. 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 = 51)

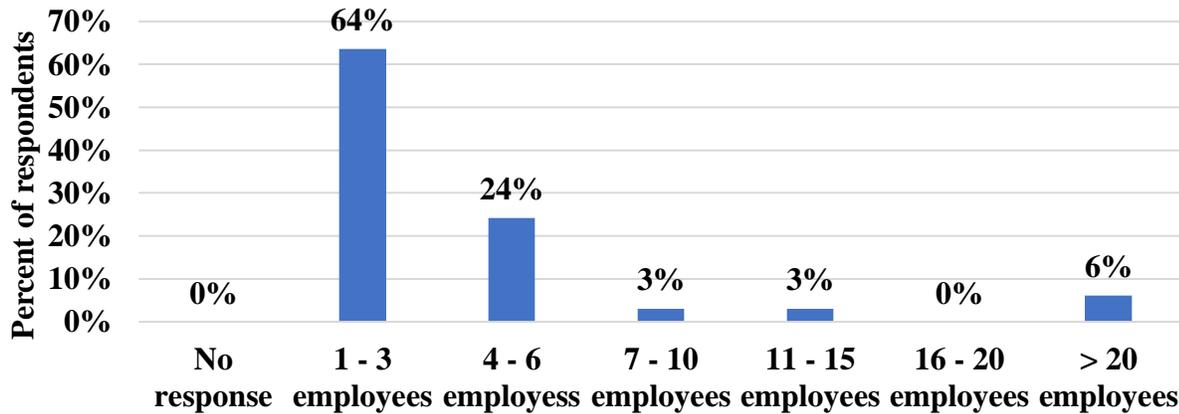
- No response : 14%
- Yes : 35%
- No : 51%
- Don't know : 0%



Q8.2. How many employees has your farm or business had to lay off in the period of time between April 10th 2020 and June 29th 2020 in response to the coronavirus disease (COVID-19)?

(n = 33)

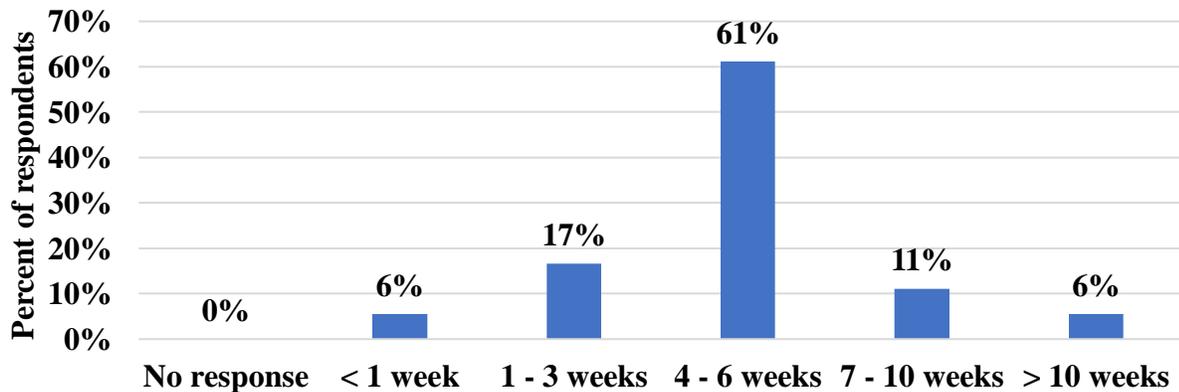
- No response : 0%
- 1 – 3 employees : 64%
- 4 – 6 employees : 24%
- 7 – 10 employees : 3%
- 11 – 15 employees : 3%
- 16 – 20 employees : 0%
- More than 20 employees : 6%



Q8.3. 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 = 18)

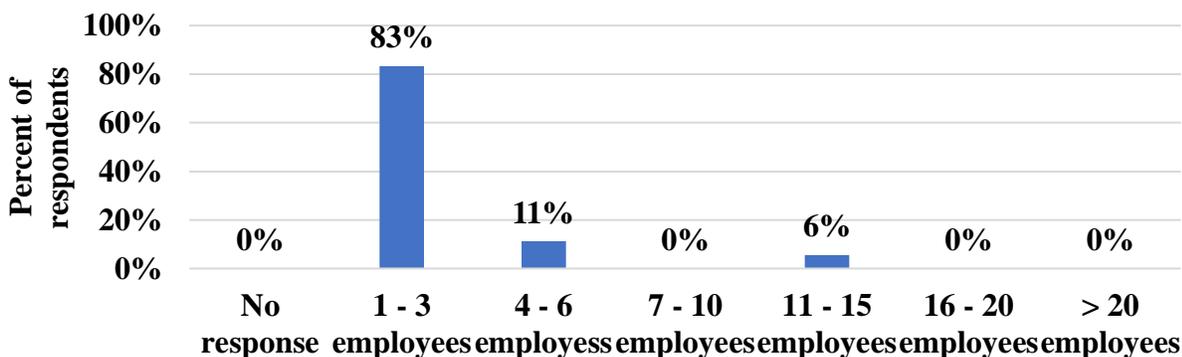
- No response : 0%
- Less than 1 week : 6%
- 1 – 3 weeks : 17%
- 4 – 6 weeks : 61%
- 7 – 10 weeks : 11%
- More than 10 weeks : 6%



Q8.4. How many employees do you estimate your farm or business will have to lay off in response to the coronavirus disease (COVID-19)?

(n = 18)

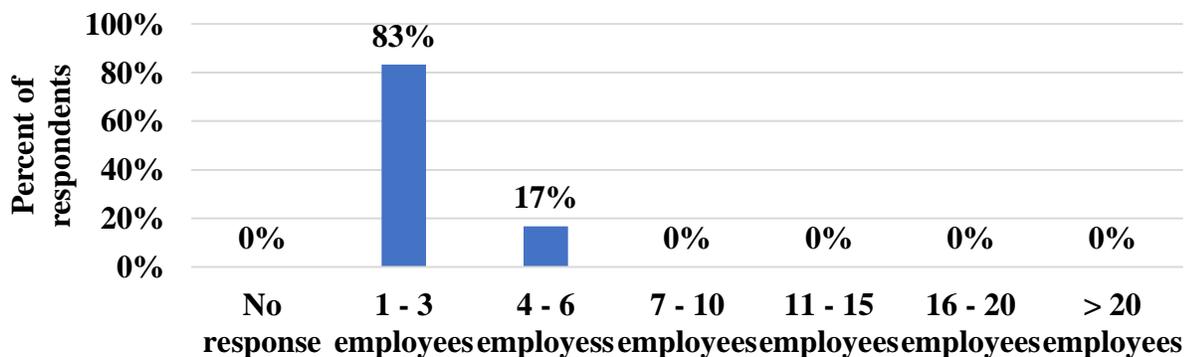
- No response : 0%
- 1 – 3 employees : 83%
- 4 – 6 employees : 11%
- 7 – 10 employees : 0%
- 11 – 15 employees : 6%
- 16 – 20 employees : 0%
- More than 20 employees : 0%



Q8.5 How many additional employees has your farm or allied business hired in the period of time between April 10th 2020 and June 29th 2020 in response to the coronavirus disease (COVID-19)?

(n = 6)

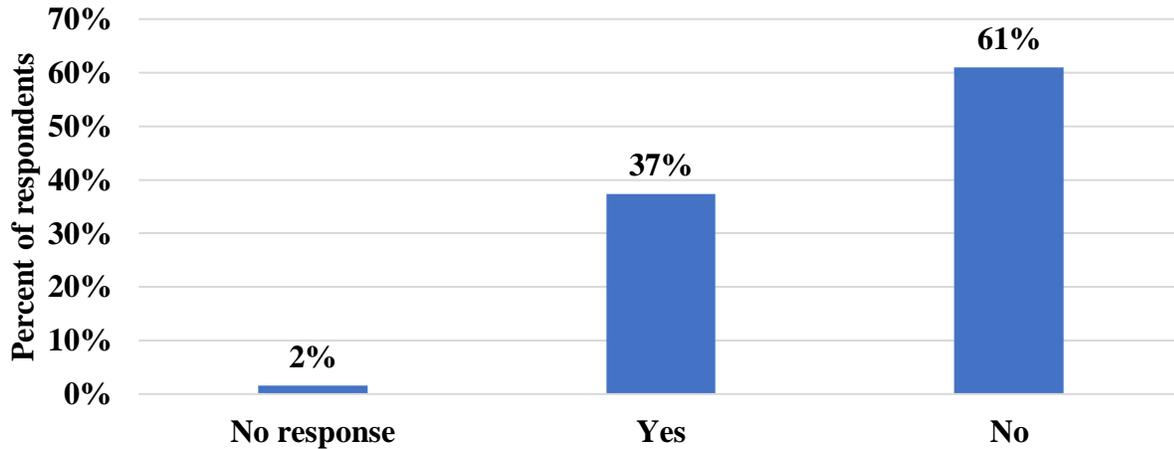
- No response : 0%
- 1 – 3 employees : 83%
- 4 – 6 employees : 17%
- 7 – 10 employees : 0%
- 11 – 15 employees : 0%
- 16 – 20 employees : 0%
- More than 20 employees : 0%



Q9. Has your farm or business had any employees miss work due to the coronavirus disease (COVID-19) in the period of time between April 10th 2020 and June 29th 2020?

(n = 123)

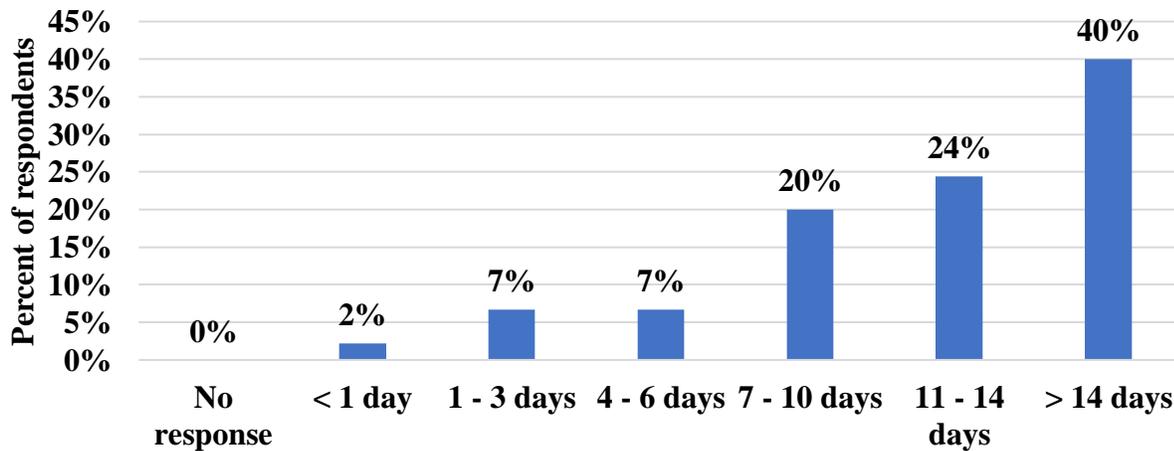
- No response : 2%
- Yes : 37%
- No : 61%



Q9.1. In total, approximately how many days have any employees in your farm or business missed work due to the coronavirus disease (COVID-19) in the period of time between April 10th 2020 and June 29th 2020?

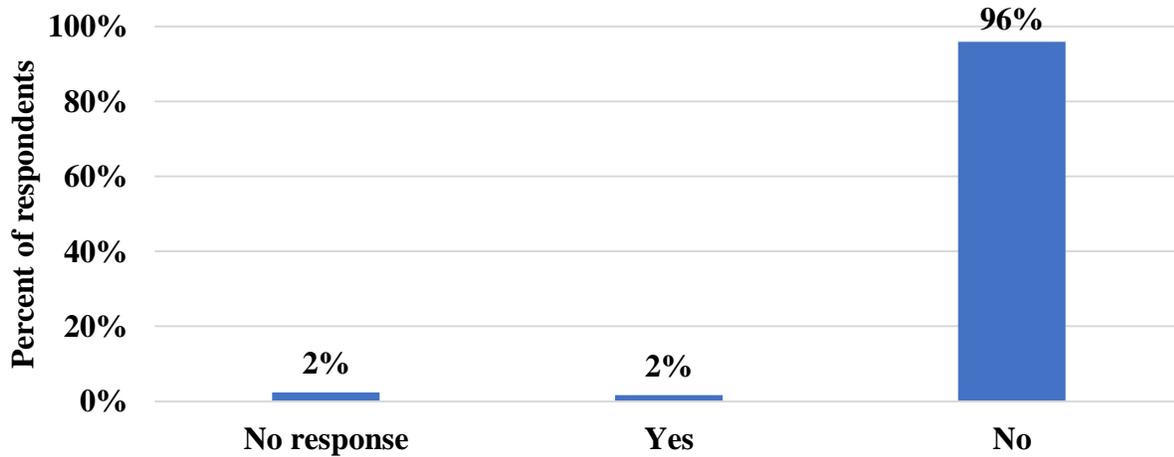
(n = 45)

- No response : 0%
- Less than a day : 2%
- 1 -3 days : 7%
- 4 – 6 days : 7%
- 7 – 10 days : 20%
- 11 – 14 days : 24%
- More than 14 days : 40%



Q10. Does your farm or business make use of H2A or H2B workers?
(n = 122)

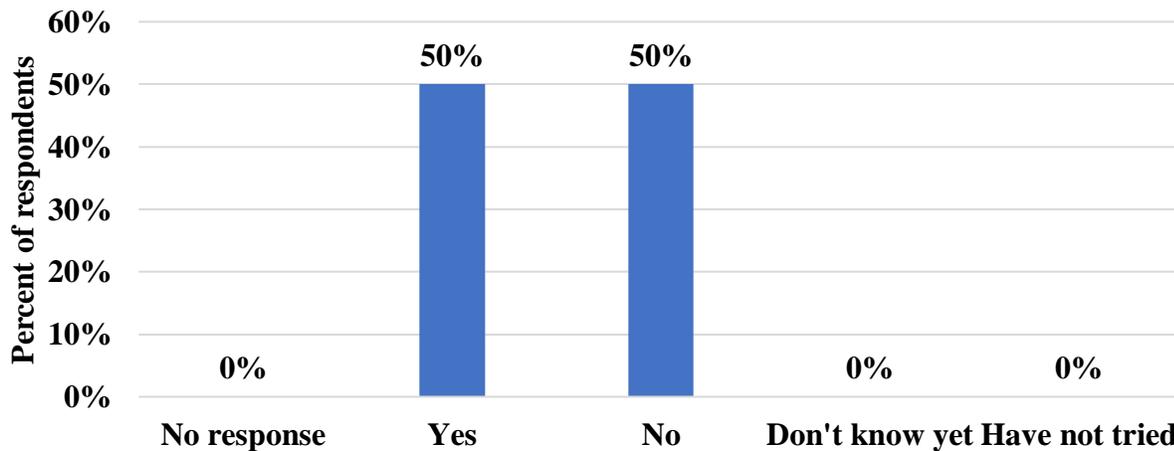
- No response : 2%
- Yes : 2%
- No : 96%



Q10.1. Has your farm or business been able to secure H2A and H2B workers during the coronavirus disease (COVID-19) pandemic in the period of time between April 10th 2020 and June 29th 2020?

(n = 2)

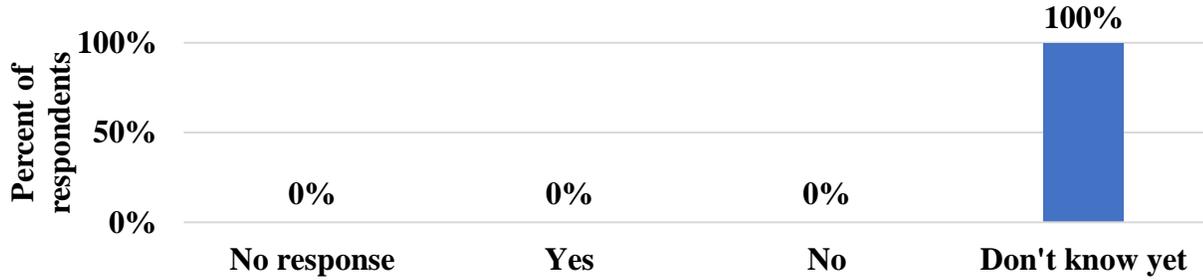
- No response : 0%
- Yes : 50%
- No : 50%
- Don't know yet : 0%
- Have not tried : 0%



Q10.2. Is your farm or business currently at risk of losing H2A or H2B workers due to the coronavirus disease (COVID-19) pandemic?

(n = 2)

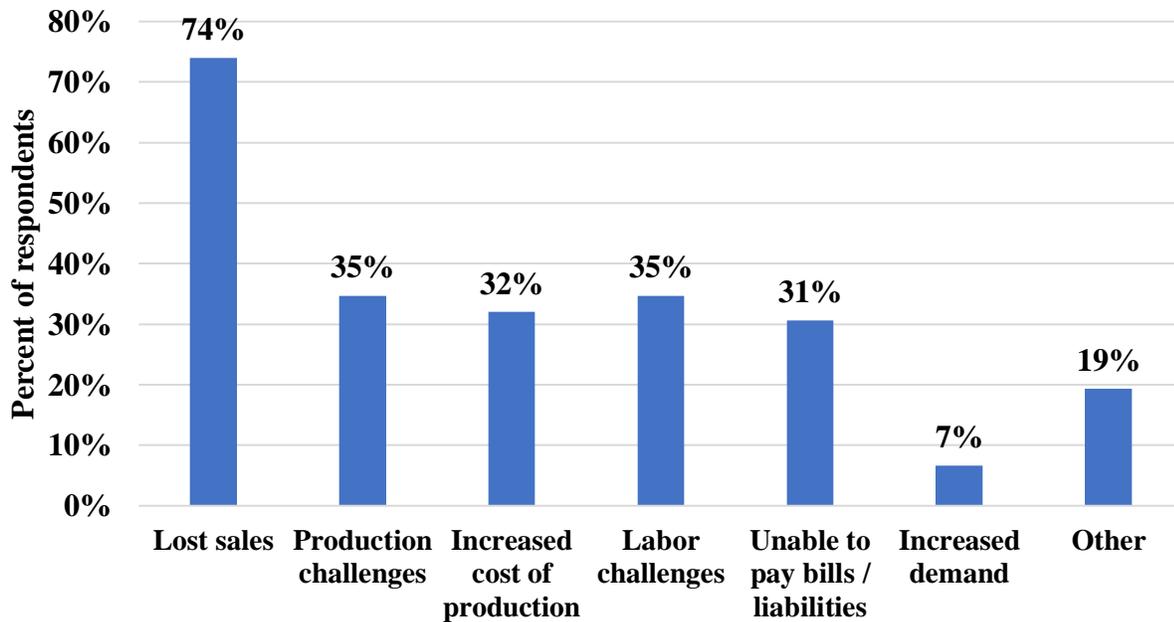
- No response : 0%
- Yes : 0%
- No : 0%
- Don't know yet : 100%



Q11. Has your farm or business experienced any of the following as a result of the coronavirus disease (COVID-19) in in the period of time between April 10th 2020 and June 29th 2020? Please select all that apply.

(n = 150)

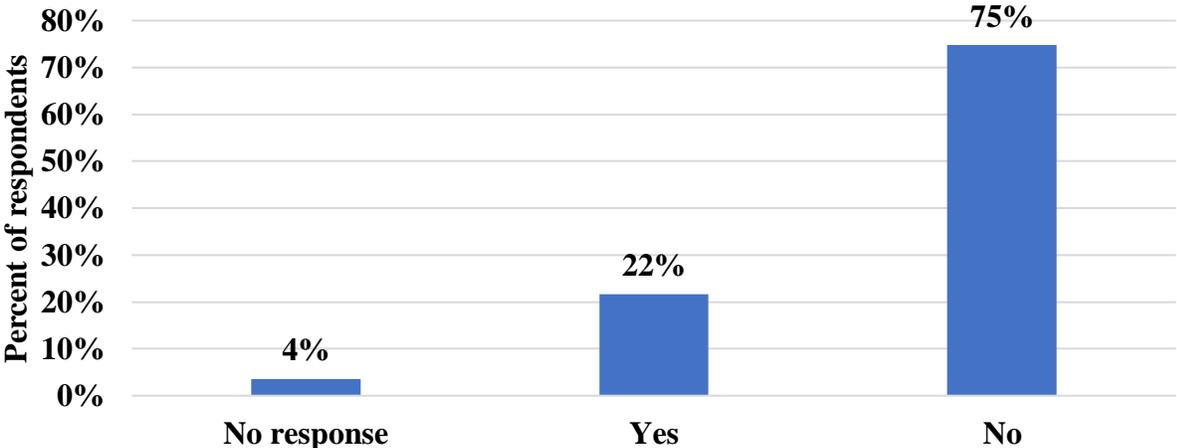
- Lost sales : 74%
- Production challenges (not related to labor) : 35%
- Increased cost of production : 32%
- Labor challenges : 35%
- Unable to pay bills or cover liabilities : 31%
- Increased demand for products : 7%
- Other : 19%



Q11.1. 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) in the period of time between April 10th 2020 and June 29th 2020?

(n = 111)

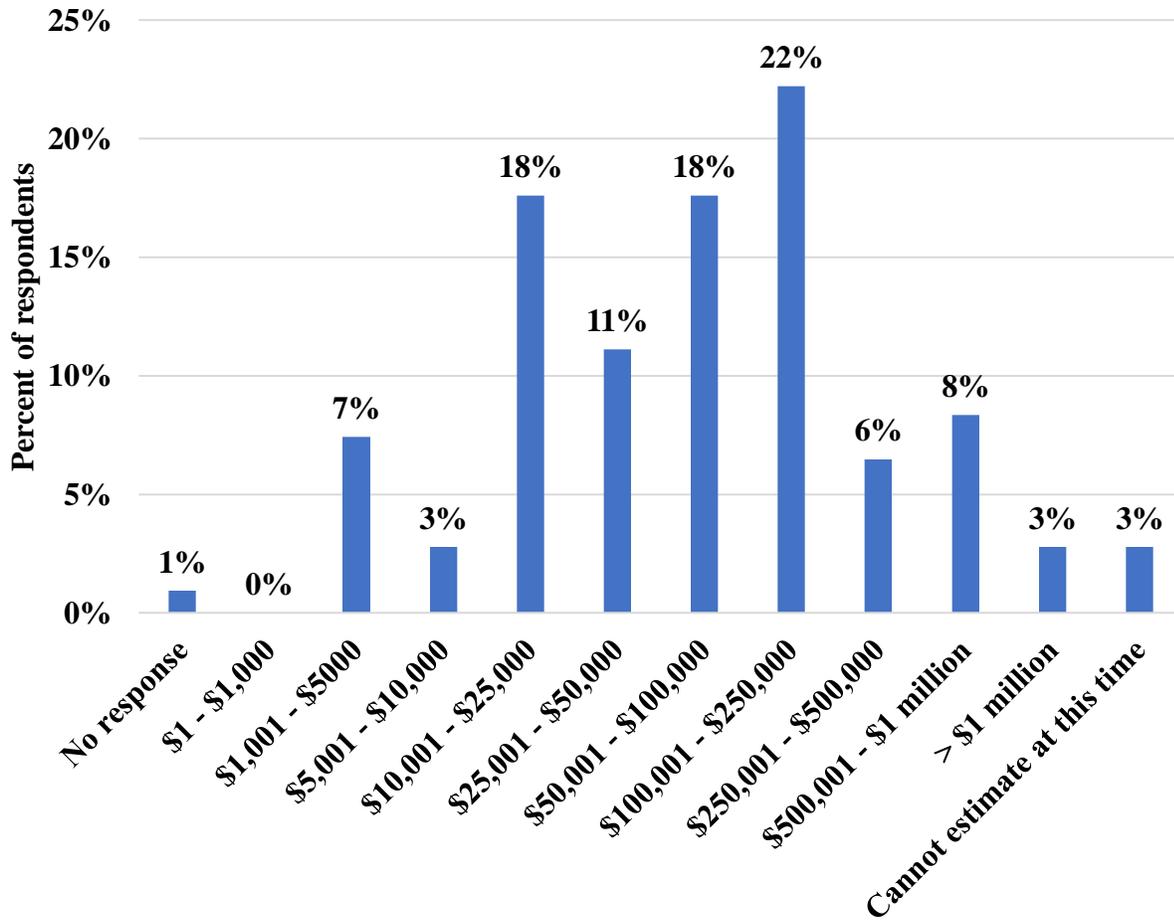
- No response : 4%
- Yes : 22%
- No : 75%



Q11.2. If your farm or business has experienced lost sales as a result of the coronavirus disease (COVID-19) in the period of time between April 10th 2020 and June 29th 2020? Please estimate the value of lost sales:

(n = 108)

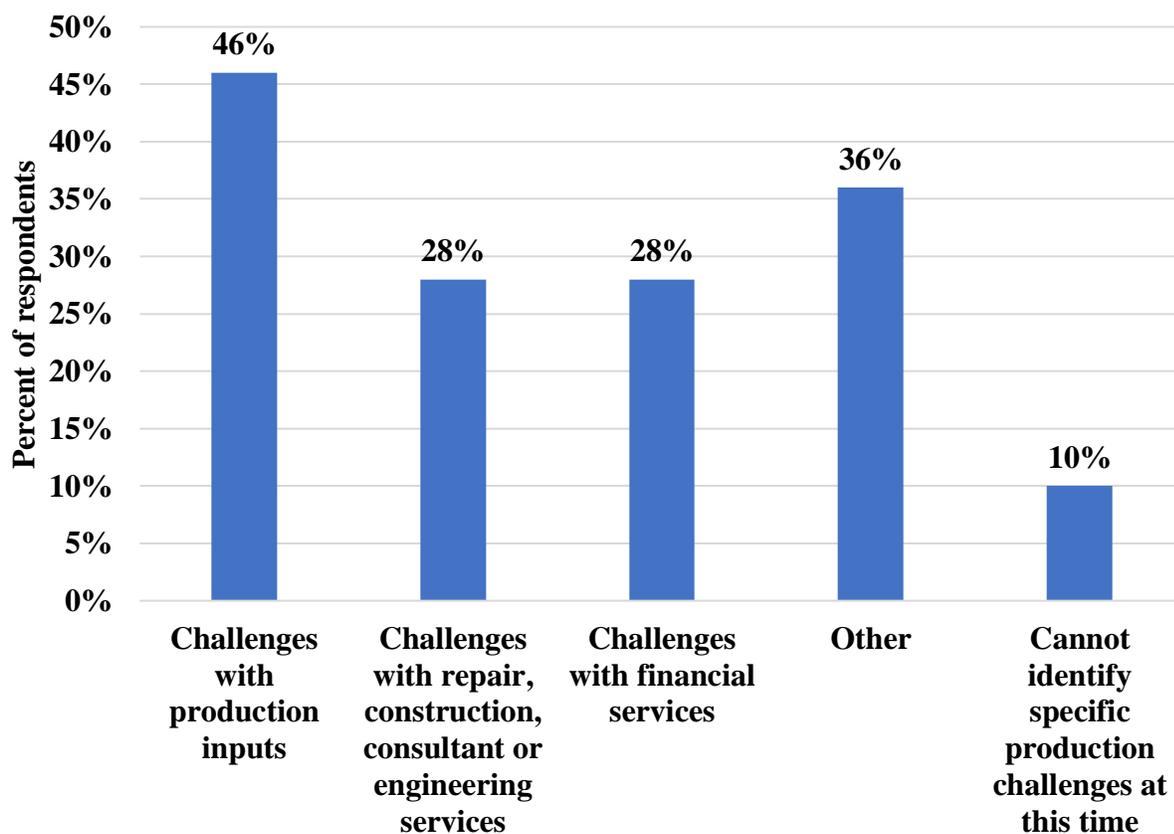
- No response : 1%
- \$1 - \$1,000 : 0%
- \$1,001 - \$5,000 : 7%
- \$5,001 - \$10,000 : 3%
- \$10,001 - \$25,000 : 18%
- \$25,001 - \$50,000 : 11%
- \$50,001 - \$100,000 : 18%
- \$100,001 - \$250,000 : 22%
- \$250,001 - \$500,000 : 6%
- \$500,001 - \$1million : 8%
- Greater than \$1 million : 3%
- Cannot estimate at this time : 3%



Q11.3. If your farm or business has experienced production challenges (not related to labor) as a result of the coronavirus disease (COVID-19) in the period of time between April 10th 2020 and June 29th 2020, can those challenges be specified? Please select all that apply.

(n = 50)

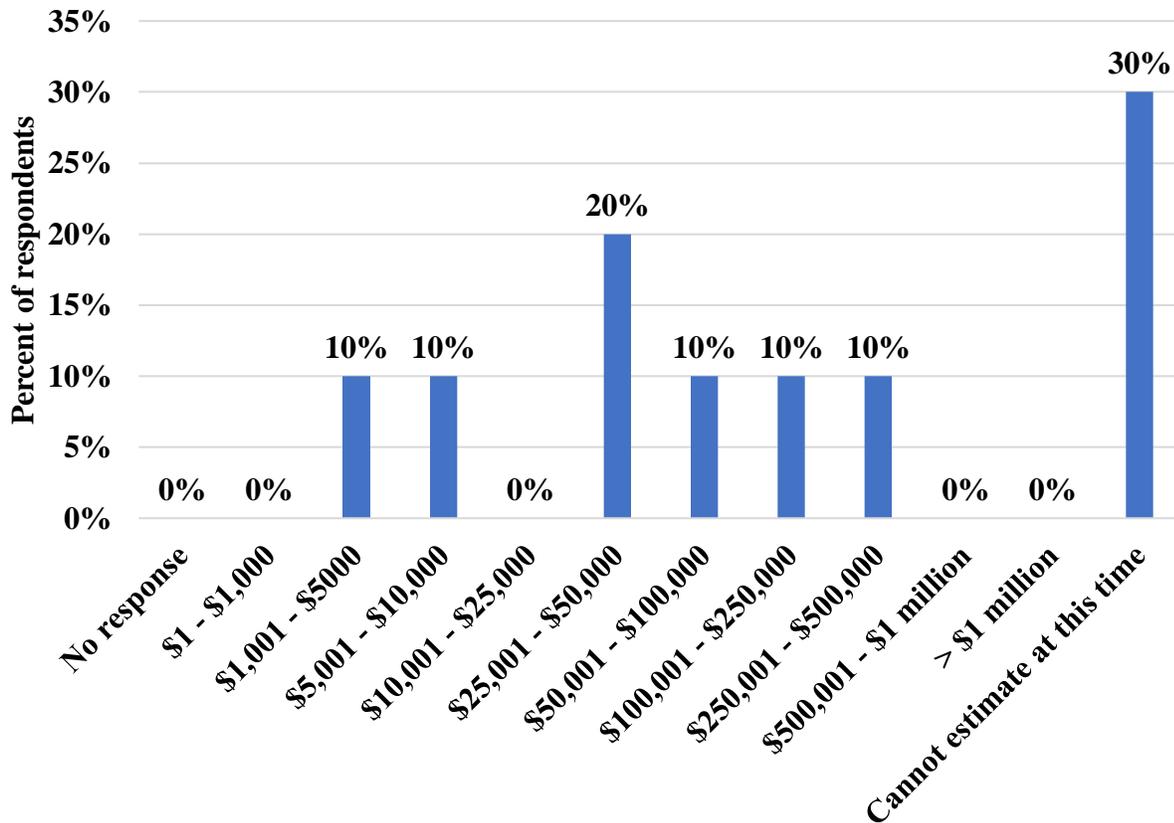
- Challenges with production inputs (feed, chemicals, therapeutants, etc.) : 46%
- Challenges with repair, construction, consultant or engineering services : 28%
- Challenges with financial services (operating loans, leases, etc.) : 28%
- Other : 36%
- Cannot identify specific production challenges at this time : 10%



Q11.6. If your farm or business has experienced increased demand for products as a result of the coronavirus disease (COVID-19) in the period of time between April 10th 2020 and June 29th 2020? Please estimate the value of those effects on sales:

(n = 10)

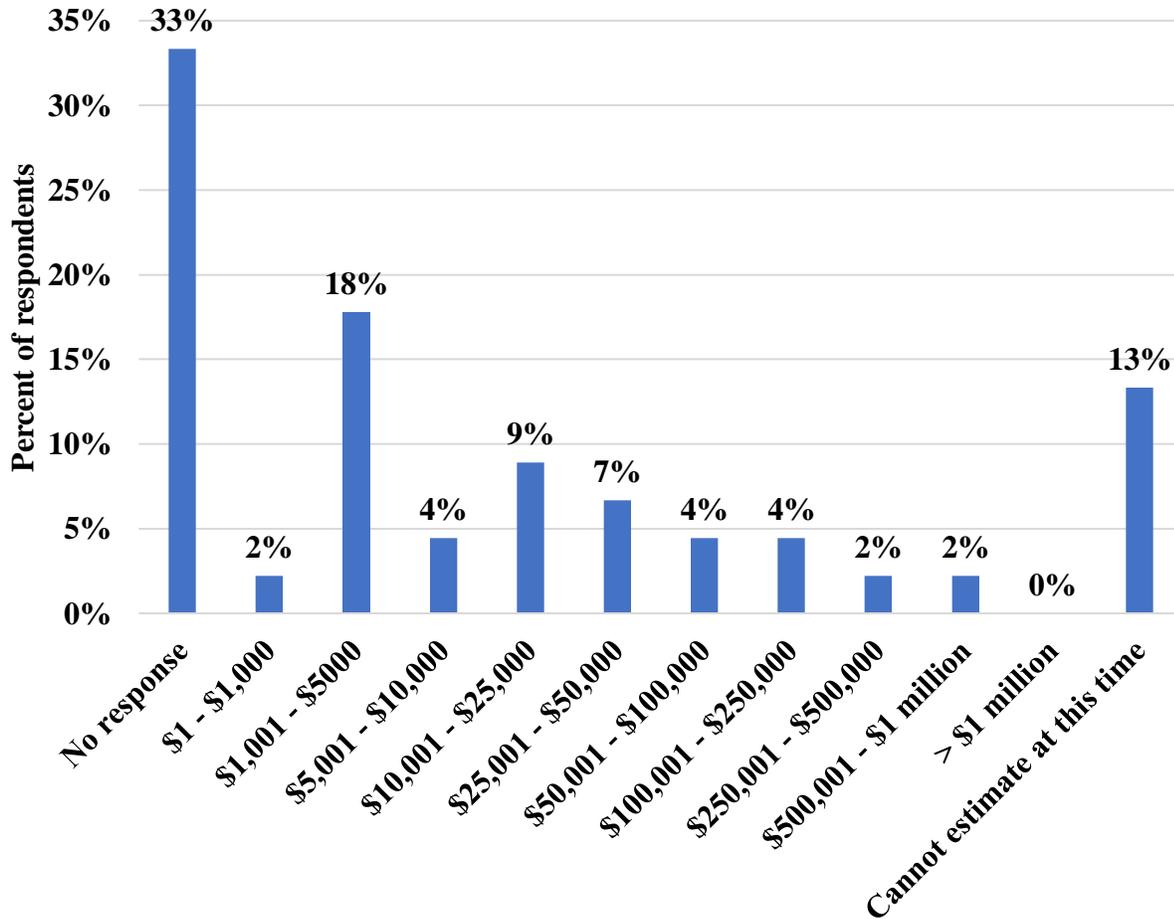
- No response : 0%
- \$1 - \$1,000 : 0%
- \$1,001 - \$5,000 : 10%
- \$5,001 - \$10,000 : 10%
- \$10,001 - \$25,000 : 0%
- \$25,001 - \$50,000 : 20%
- \$50,001 - \$100,000 : 10%
- \$100,001 - \$250,000 : 10%
- \$250,001 - \$500,000 : 10%
- \$500,001 - \$ 1million : 0%
- Greater than \$1 million : 0%
- Cannot estimate at this time : 30%



Q11.8. If your farm or allied business has experienced missed bill or loan payments as a result of the coronavirus disease (COVID-19) in the period of time between April 10th 2020 and June 29th 2020? Please estimate the value of those missed payments:

(n = 45)

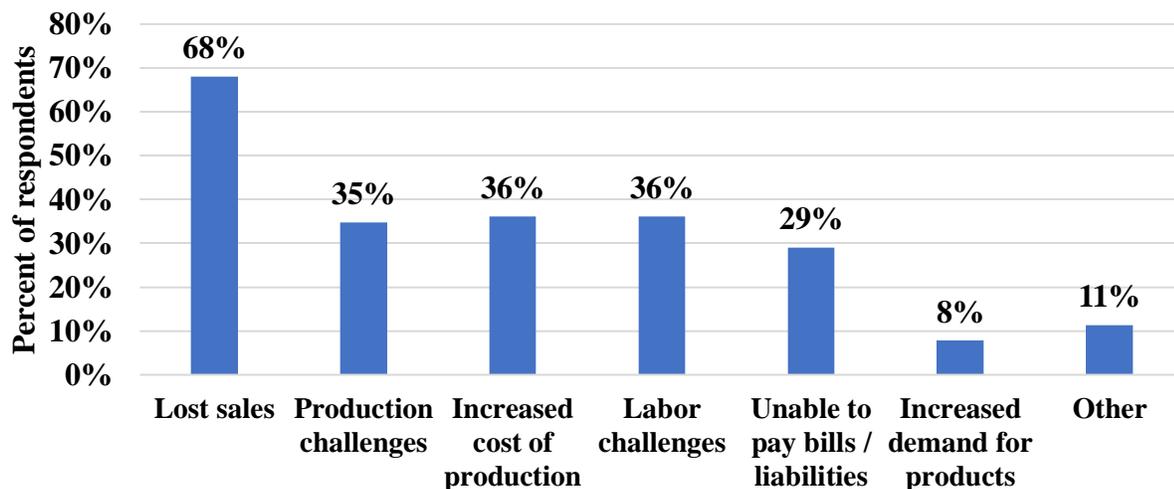
- No response : 33%
- \$1 - \$1,000 : 2%
- \$1,001 - \$5,000 : 18%
- \$5,001 - \$10,000 : 4%
- \$10,001 - \$25,000 : 9%
- \$25,001 - \$50,000 : 7%
- \$50,001 - \$100,000 : 4%
- \$100,001 - \$250,000 : 4%
- \$250,001 - \$500,000 : 2%
- \$500,001 - \$ 1million : 2%
- Greater than \$1 million : 0%
- Cannot estimate at this time : 13%



Q12. Does your farm or business expect to experience any of the following as a result of the coronavirus disease (COVID-19) in the 3rd Quarter of 2020 (July, August, September)? Please select all that apply.

(n = 141)

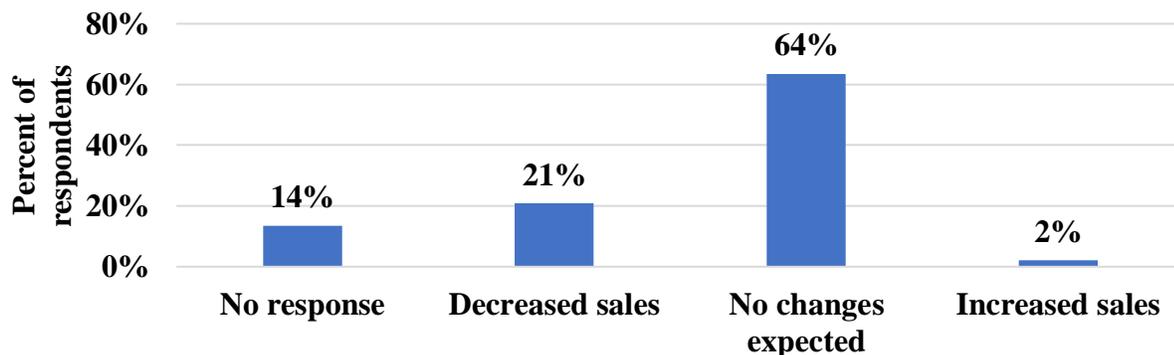
- Lost sales : 68%
- Production challenges (not related to labor) : 35%
- Increased cost of production : 36%
- Labor challenges : 36%
- Unable to pay bills or cover liabilities : 29%
- Increased demand for products : 8%
- Other : 11%



Q12.1. Does your farm or allied business expect to experience changes in sales to international or export markets (outside of the United States), as a result of the coronavirus disease (COVID-19), in the 3rd Quarter of 2020 (July, August, September)?

(n = 96)

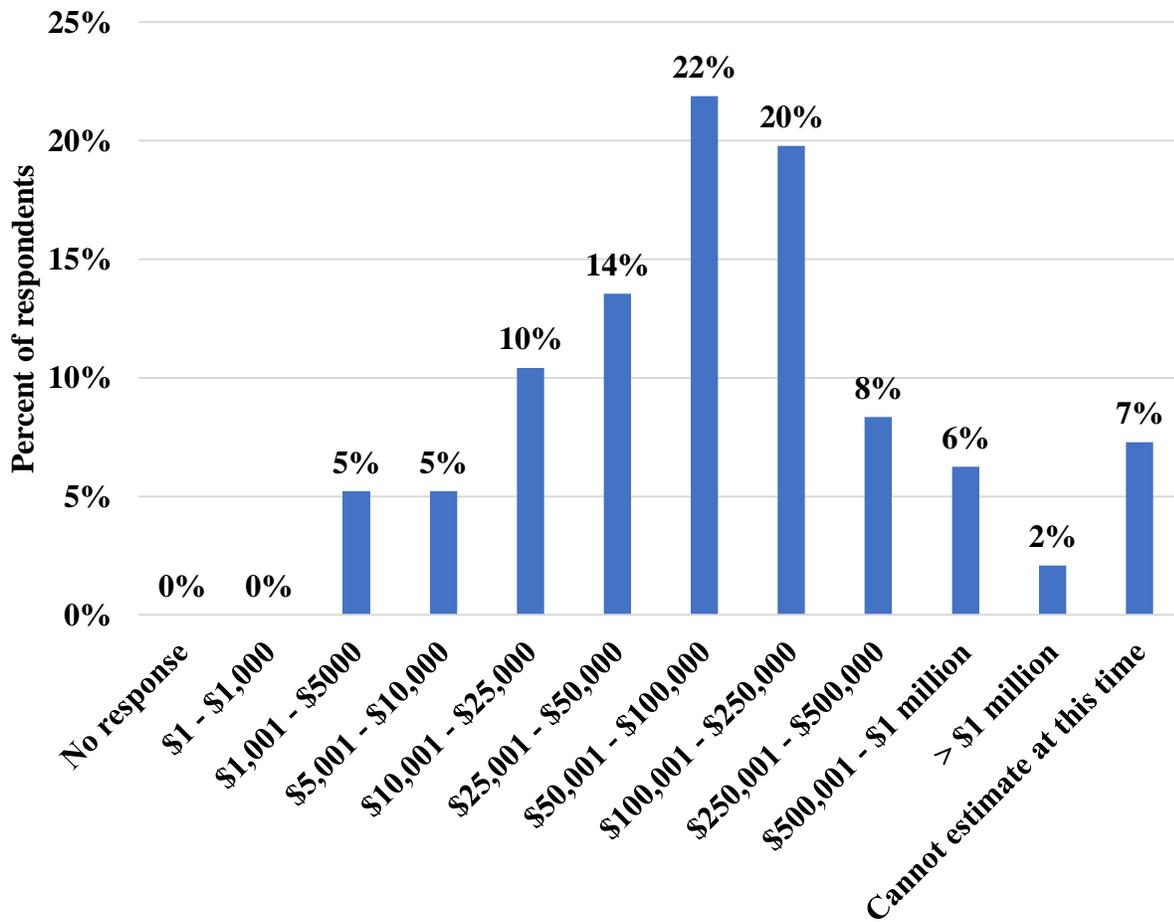
- No response : 14%
- Decreased sales : 21%
- No changes expected : 64%
- Increased sales : 2%



Q12.2. Does your farm or business expect to experience lost sales as a result of the coronavirus disease (COVID-19) in the 3rd Quarter of 2020 (July, August, September)? Please estimate the value of lost sales:

(n = 96)

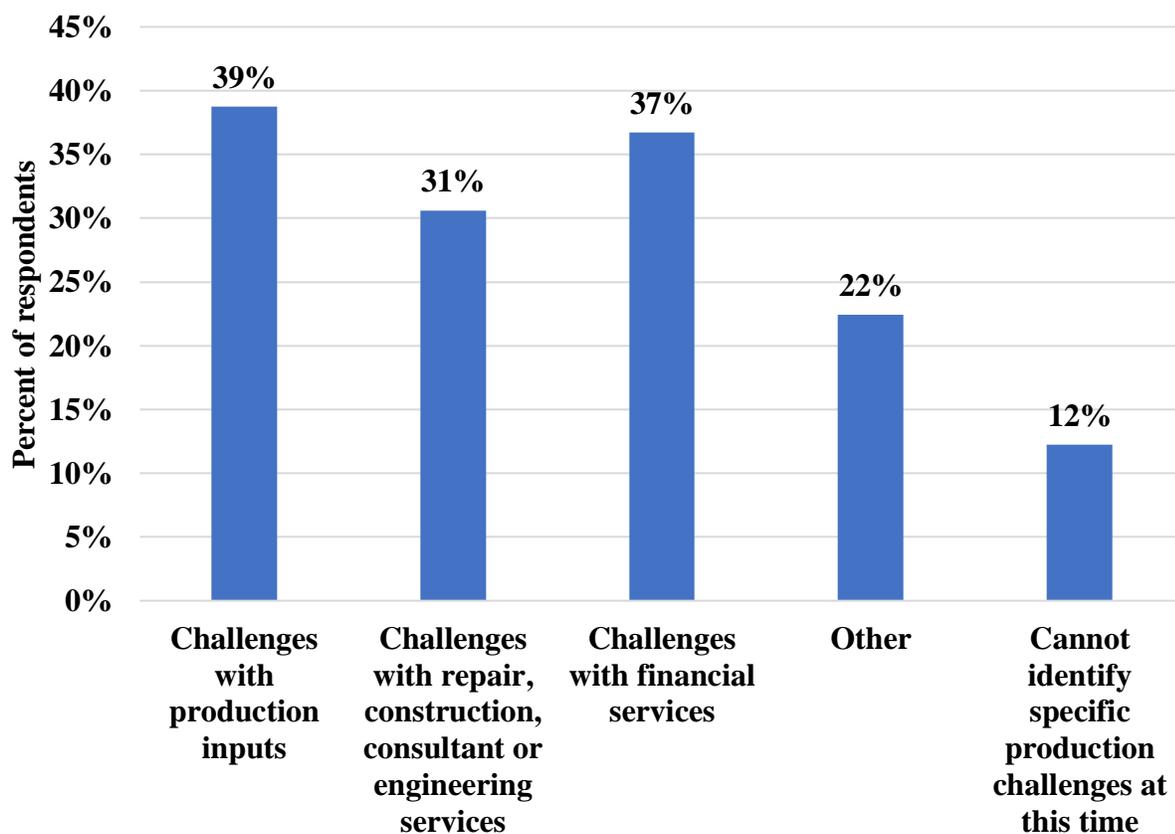
- No response : 0%
- \$1 - \$1,000 : 0%
- \$1,001 - \$5,000 : 5%
- \$5,001 - \$10,000 : 5%
- \$10,001 - \$25,000 : 10%
- \$25,001 - \$50,000 : 14%
- \$50,001 - \$100,000 : 22%
- \$100,001 - \$250,000 : 20%
- \$250,001 - \$500,000 : 8%
- \$500,001 - \$1million : 6%
- Greater than \$1 million : 2%
- Cannot estimate at this time : 7%



Q12.3. Does your farm or business expect to experience production challenges (not related to labor) as a result of the coronavirus disease (COVID-19) in the 3rd Quarter of 2020 (July, August, September), can those challenges be specified? Please select all that apply.

(n = 49)

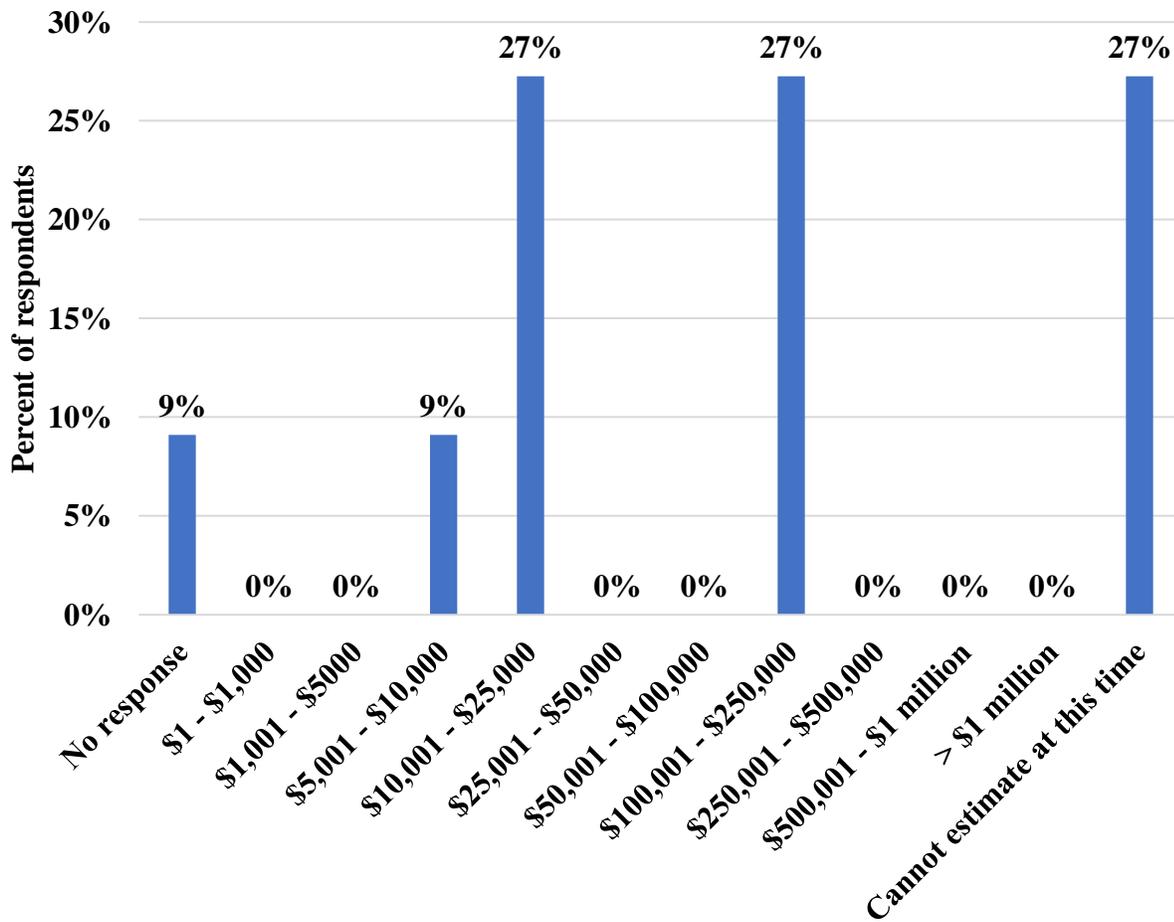
- Challenges with production inputs (feed, chemicals, therapeutants, etc.) : 39%
- Challenges with repair, construction, consultant or engineering services : 31%
- Challenges with financial services (operating loans, leases, etc.) : 37%
- Other : 22%
- Cannot identify specific production challenges at this time : 12%



Q12.6. Does your farm or business expect to experience increased demand for products as a result of the coronavirus disease (COVID-19) in the 3rd Quarter of 2020 (July, August, September)? Please estimate the value of those effects on sales:

(n = 11)

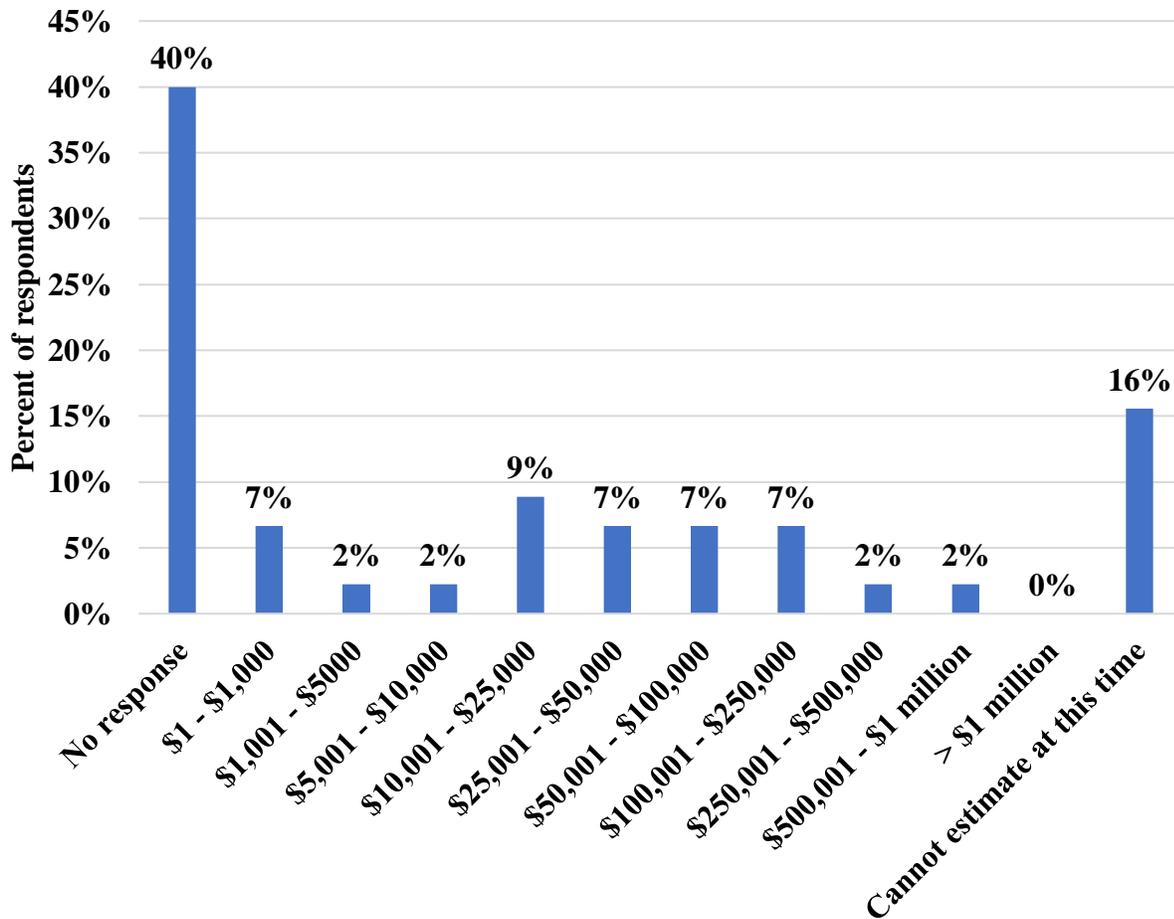
- No response : 9%
- \$1 - \$1,000 : 0%
- \$1,001 - \$5,000 : 0%
- \$5,001 - \$10,000 : 9%
- \$10,001 - \$25,000 : 27%
- \$25,001 - \$50,000 : 0%
- \$50,001 - \$100,000 : 0%
- \$100,001 - \$250,000 : 27%
- \$250,001 - \$500,000 : 0%
- \$500,001 - \$ 1million : 0%
- Greater than \$1 million : 0%
- Cannot estimate at this time : 27%



Q12.8. If your farm or allied business expects to miss bill or loan payments as a result of the coronavirus disease (COVID-19) in the 3rd Quarter of 2020 (July, August, September)? Please estimate the value of those missed payments:

(n = 45)

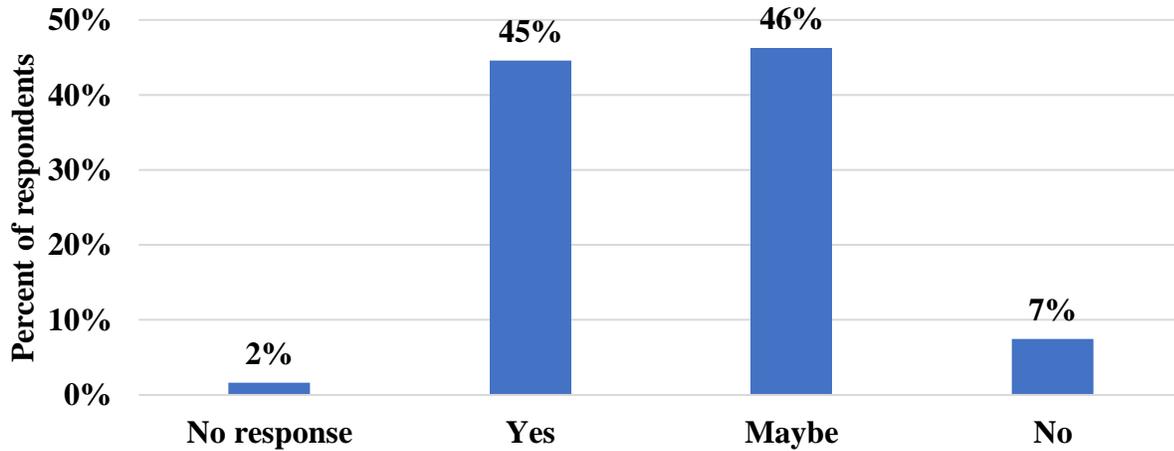
- No response : 40%
- \$1 - \$1,000 : 7%
- \$1,001 - \$5,000 : 2%
- \$5,001 - \$10,000 : 2%
- \$10,001 - \$25,000 : 9%
- \$25,001 - \$50,000 : 7%
- \$50,001 - \$100,000 : 7%
- \$100,001 - \$250,000 : 7%
- \$250,001 - \$500,000 : 2%
- \$500,001 - \$ 1million : 2%
- Greater than \$1 million : 0%
- Cannot estimate at this time : 16%



Q13. Without external intervention (for example, governmental assistance), will your farm or business survive in the next 3 (three) months?

(n = 121)

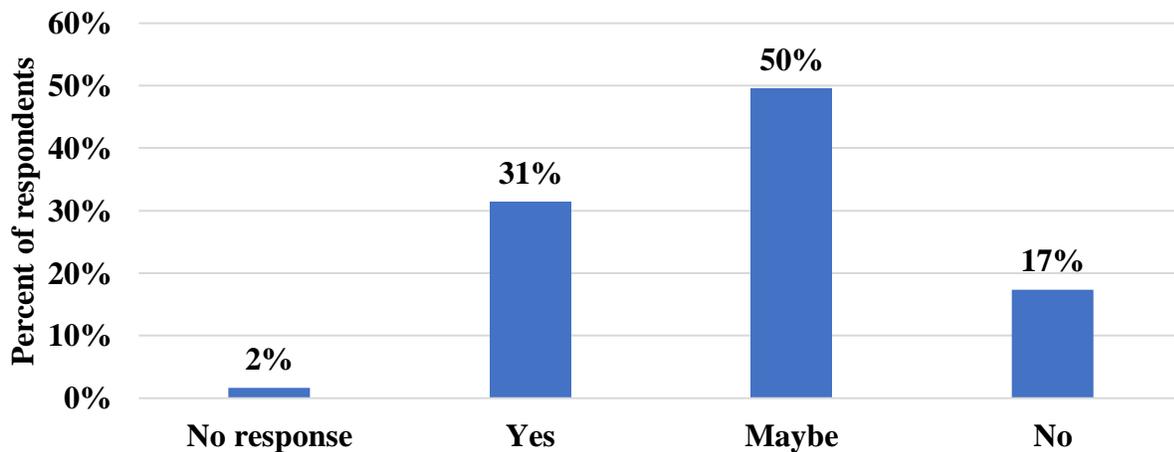
- No response : 2%
- Yes : 45%
- Maybe : 46%
- No : 7%



Q14. Without external intervention (for example, governmental assistance), will your farm or business survive in the next 6 (six) months?

(n = 121)

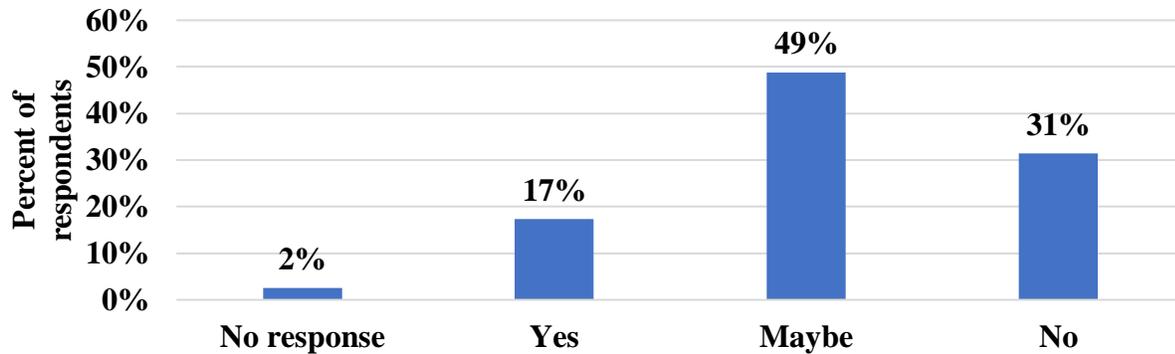
- No response : 2%
- Yes : 31%
- Maybe : 50%
- No : 17%



Q15. Without external intervention (for example, governmental assistance), will your farm or business survive in the next 12 (twelve) months?

(n = 121)

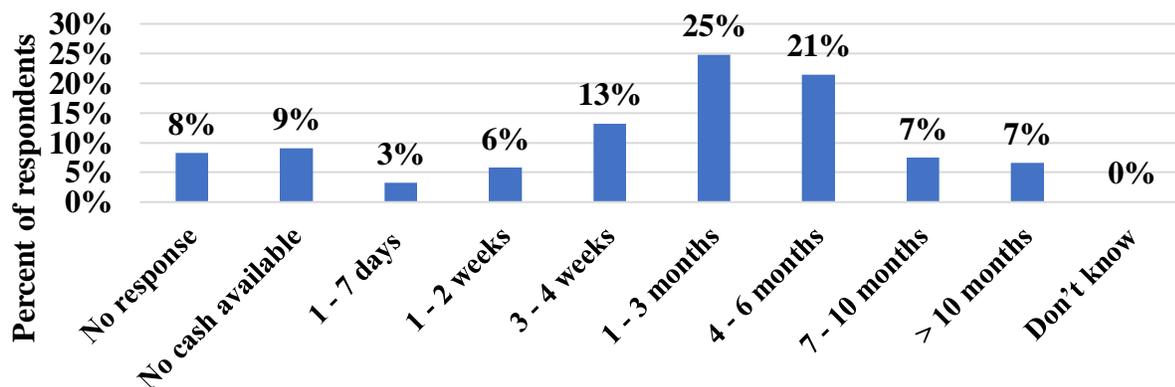
- No response : 2%
- Yes : 17%
- Maybe : 49%
- No : 31%



Q16. How would you describe the current availability of cash on hand for your farm or allied business, including financial assistance or loans? Please select how long a period the current cash on hand will cover:

(n = 121)

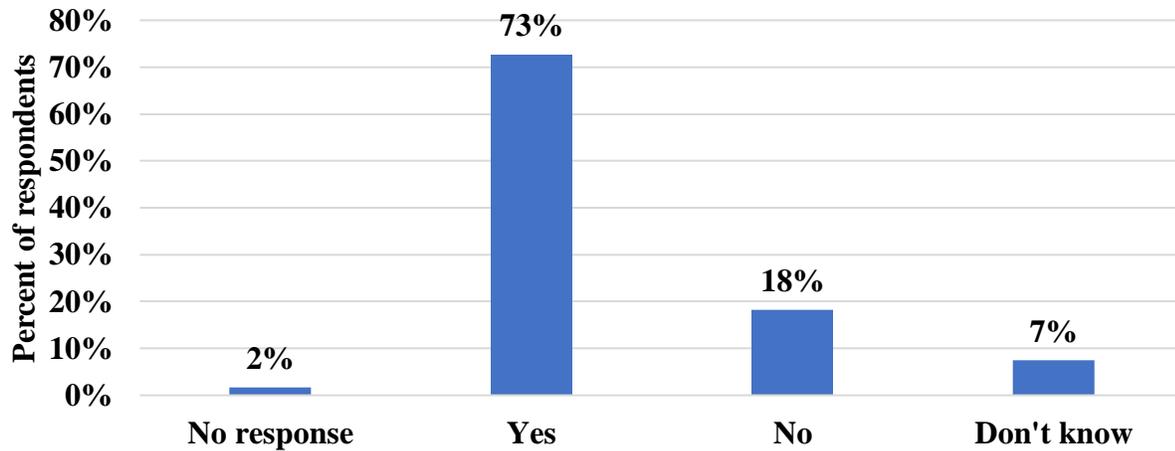
- No response : 8%
- No cash available for business operations : 9%
- 1 - 7 days of operations : 3%
- 1 - 2 weeks of operations : 6%
- 3 - 4 weeks of operations : 13%
- 1 - 2 months of operations : 25%
- 4 - 6 months of operations : 21%
- 7 - 10 months of operations : 7%
- More than 10 months of operations : 7%
- Don't know : 0%



Q17. Will holding market ready product, as a result of the coronavirus disease (COVID-19), make it less marketable?

(n = 121)

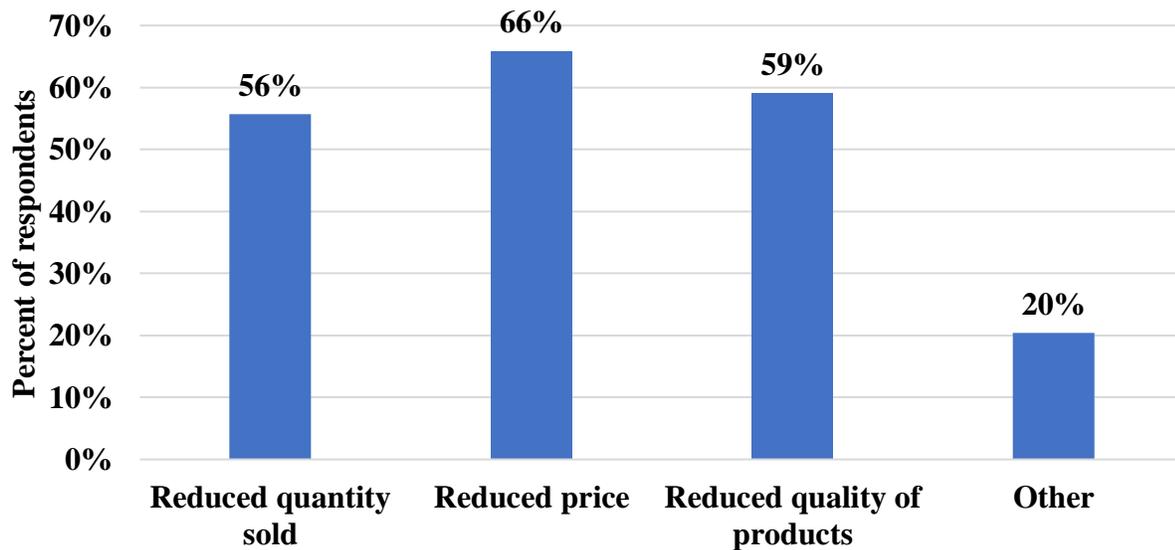
- No response : 2%
- Yes : 73%
- No : 18%
- Don't know : 7%



Q17.1. Will holding market ready product, as a result of the coronavirus disease (COVID-19), result in: Please select all that apply.

(n = 88)

- Reduced quantity sold : 56%
- Reduced price : 66%
- Reduced quality of product : 59%
- Other : 20%

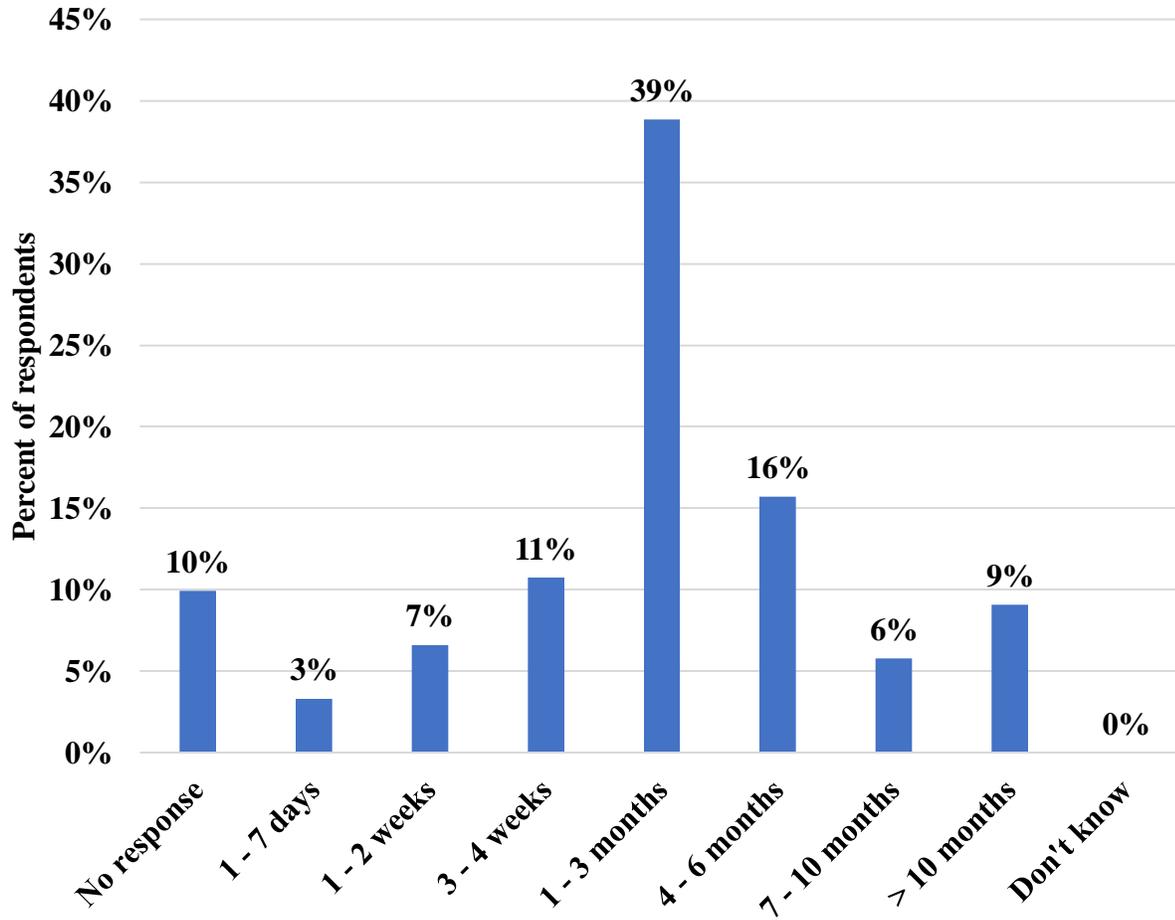


Q18. How long can your farm or allied business hold market ready product, as a result of the coronavirus disease (COVID-19), before it becomes an issue for new crops or planting?

(n = 121)

- No response : 10%

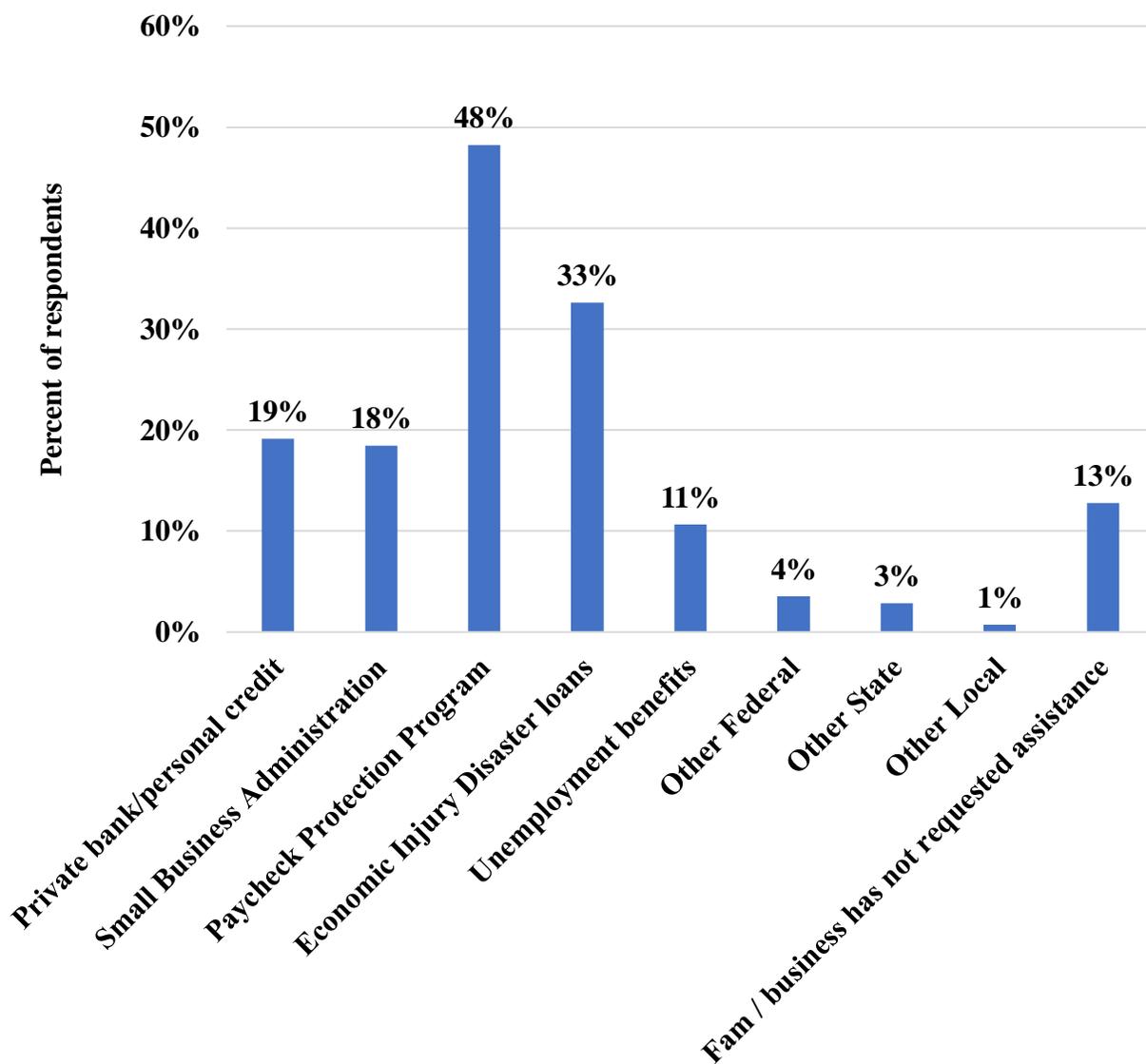
- 1 - 7 days : 3%
- 1 - 2 weeks : 7%
- 3 - 4 weeks : 11%
- 1 - 3 months : 39%
- 4 - 6 months : 16%
- 7 - 10 months : 6%
- More than 10 months : 9%
- Don't know : 0%



Q19. Please indicate if your farm or allied business has applied for loans or financial assistance from any of the following programs in the period of time between April 10th 2020 and June 29th 2020: (please select all that apply)

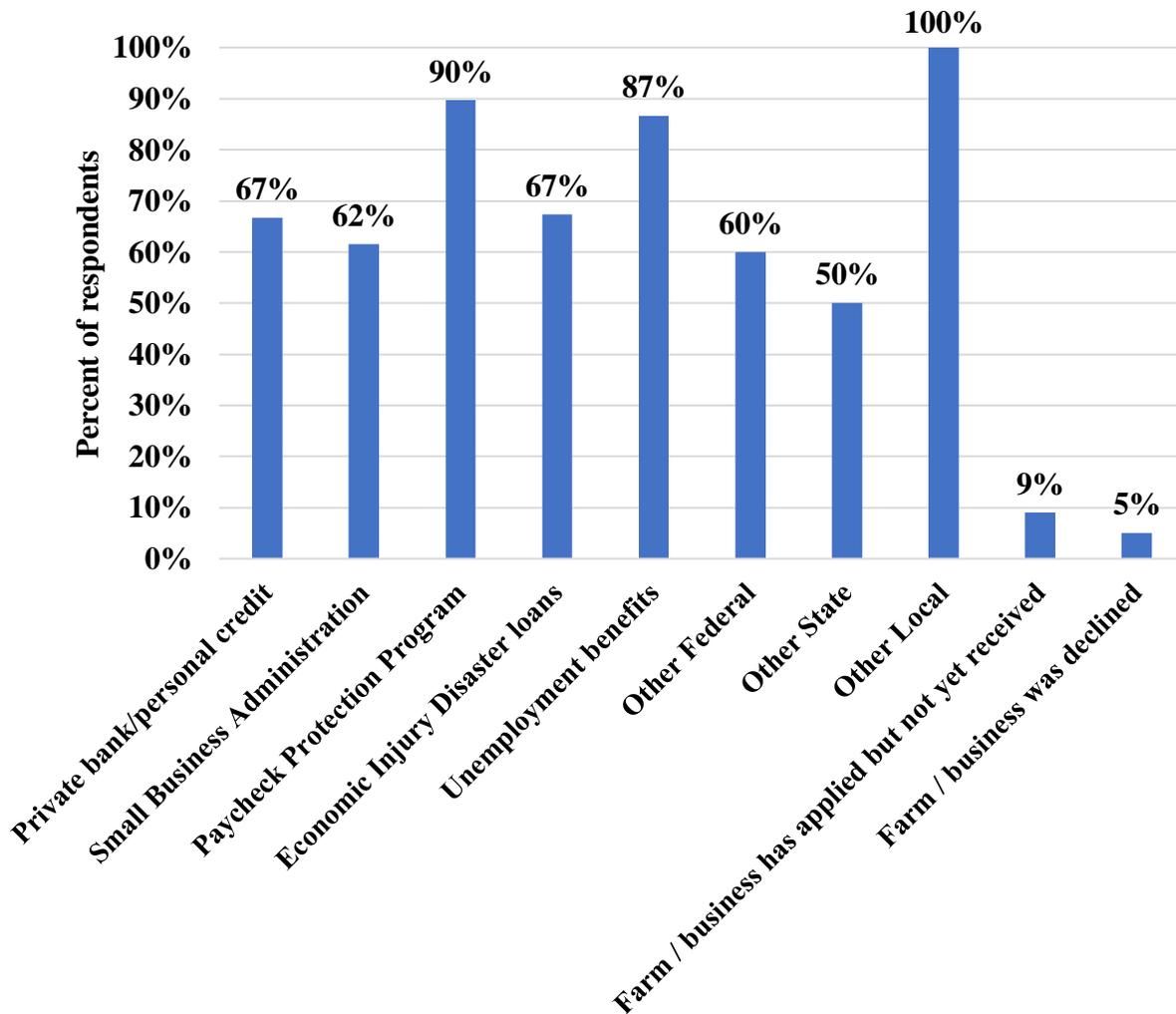
(n = 141)

- Private bank loans / personal line of credit : 19%
- Small Business Administration loans (SBA) : 18%
- Paycheck Protection Program loans (PPP) : 48%
- Economic Injury Disaster Loans (EIDL) : 33%
- Unemployment benefits : 11%
- Other **Federal** program or initiative (please describe): : 4%
- Other **State** program or initiative (please describe): : 3%
- Other **Local** program or initiative : 1%
- Farm or business has not requested financial assistance from any source : 13%



Q19.1. Please indicate if your farm or allied business has received loans or financial assistance from any of the following programs that you applied for: (please select all that apply)

- Private bank loans / personal line of credit (n = 27) : 67%
- Small Business Administration loans (SBA) (n = 26) : 62%
- Paycheck Protection Program loans (PPP) (n = 68) : 90%
- Economic Injury Disaster Loans (EIDL) (n = 46) : 67%
- Unemployment benefits (n = 15) : 87%
- Other **Federal** program or initiative (n = 5) : 60%
- Other **State** program or initiative (n = 4) : 50%
- Other **Local** program or initiative (n = 1) : 100%
- Farm or business has applied but not yet received loans or assistance (n = 100): 9%
- Farm or business applications have been denied / declined (n = 100) : 5%



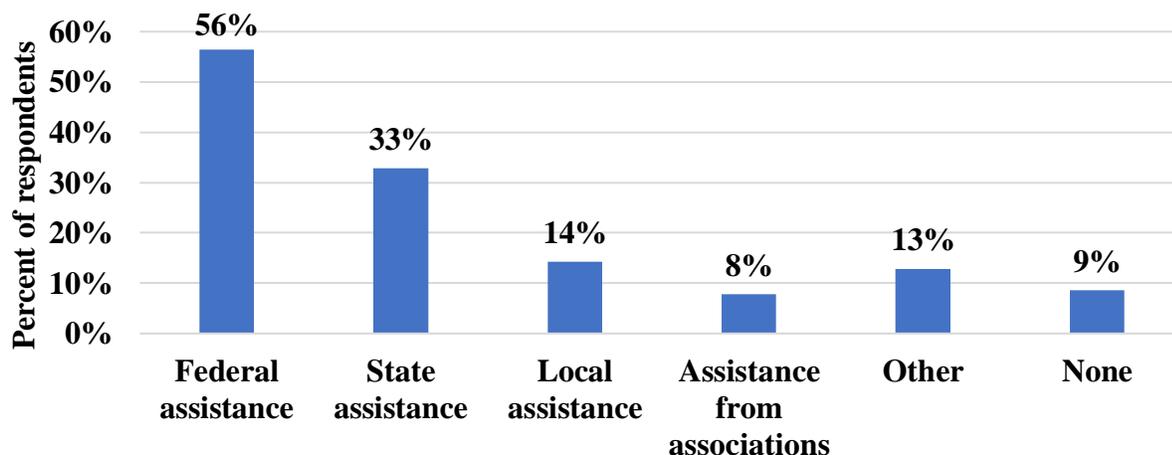
Q19.2. Please indicate if loans or financial assistance received by your farm or allied business has been helpful?

Financial Assistance Program	No response	Yes	No
Private bank loans / personal line of credit (n = 18)	0%	89%	11%
Small Business Administration loans (SBA) (n = 16)	0%	100%	0%
Paycheck Protection Program loans (PPP) (n = 61)	2%	97%	2%
Economic Injury Disaster Loans (EIDL) (n = 31)	0%	87%	13%
Unemployment benefits (n = 13)	0%	85%	15%
Other Federal program or initiative (n = 3)	33%	67%	0%
Other State program or initiative (n = 2)	0%	100%	0%
Other Local program or initiative (n = 1)	0%	100%	0%

Q20. 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 = 140)

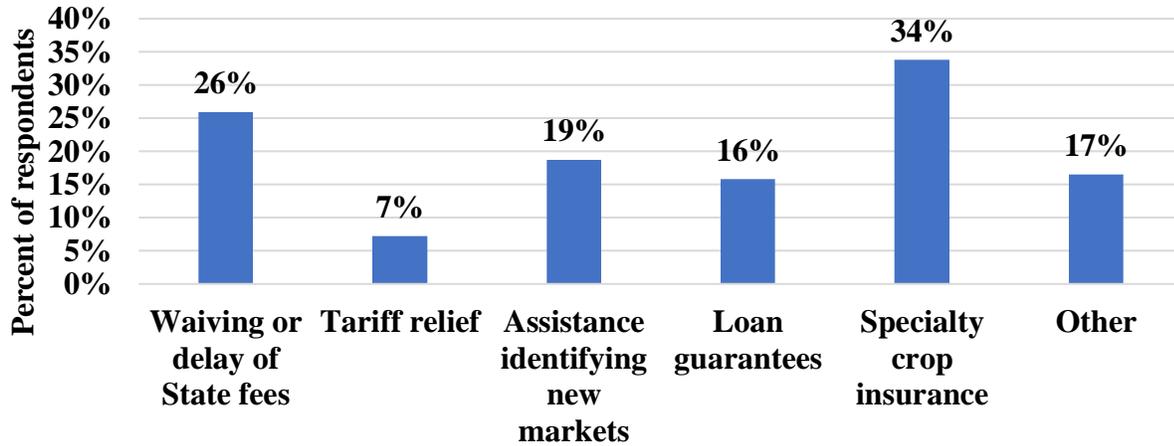
- Federal assistance : 56%
- State assistance : 33%
- Local assistance : 14%
- Assistance from associations : 8%
- Other : 13%
- None : 9%



**Q21. Would assistance with any of the following be helpful to your farm or business right now?
Please select all that apply.**

(n = 139)

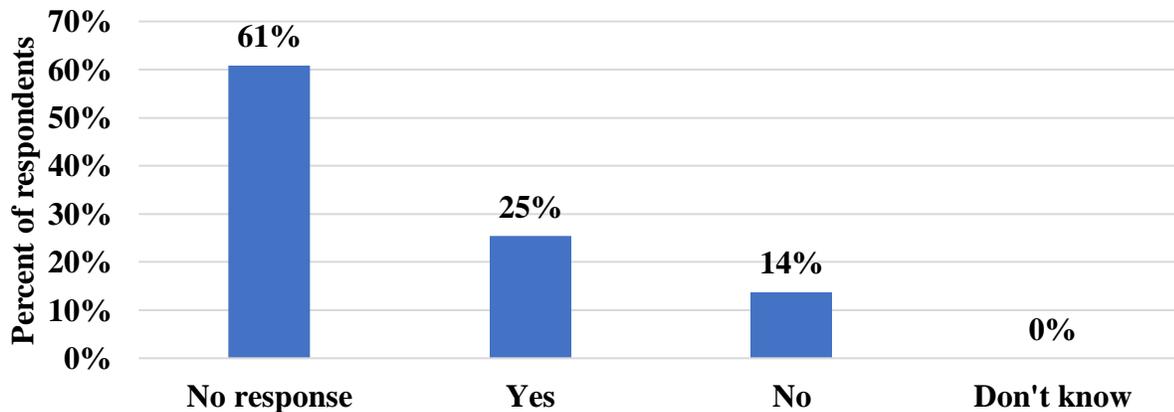
- Waiving or delay of State fees : 26%
- Tariff relief : 7%
- Assistance identifying new markets : 19%
- Loan guarantees : 16%
- Specialty Crop Insurance : 34%
- Other : 17%



Q22. 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 = 138)

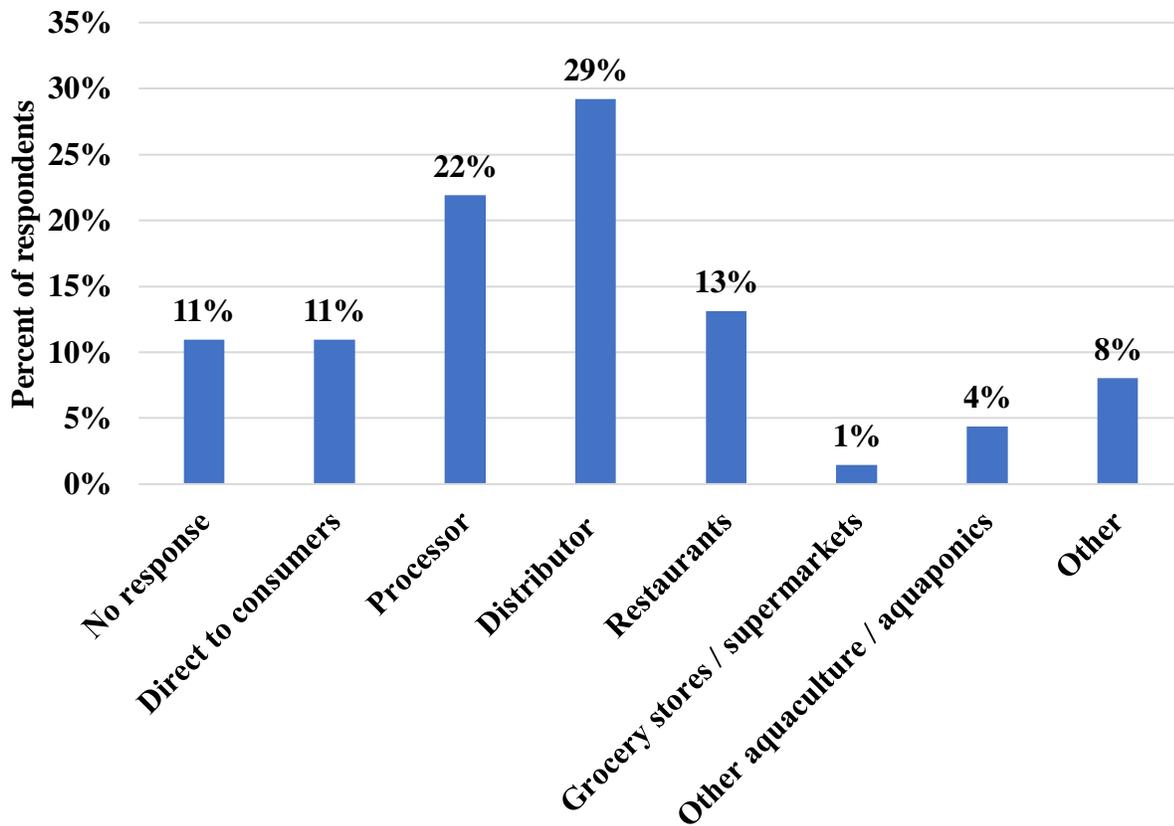
- No response : 61%
- Yes : 25%
- No : 14%
- Don't know : 0%



Q23. How did your farm or allied business primarily market or sell aquaculture / aquaponics products before the effects of the coronavirus disease pandemic (COVID-19)?

(n = 137)

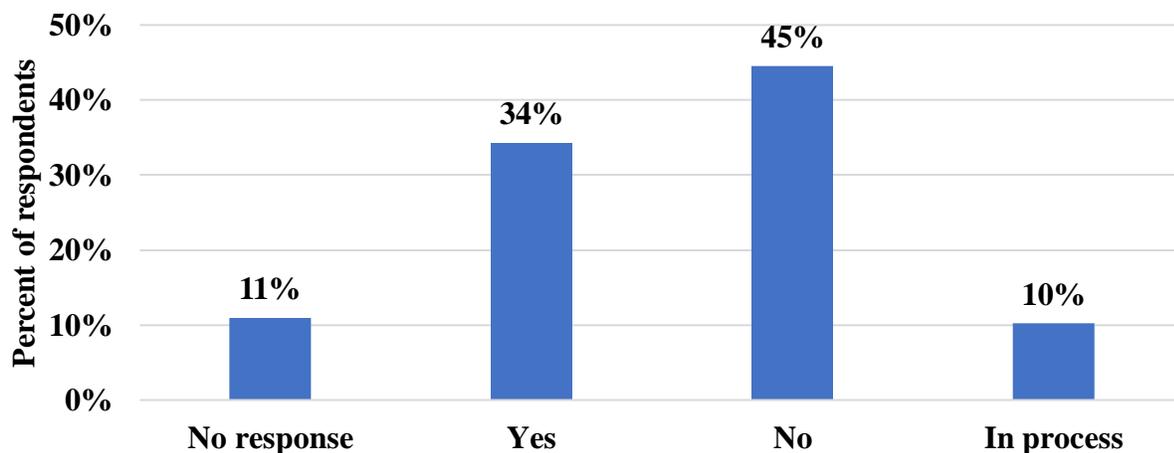
- No response : 11%
- Direct to consumers : 11%
- Processor : 22%
- Distributor : 29%
- Restaurants : 13%
- Grocery Stores / Supermarkets : 1%
- Other aquaculture/aquaponics farms or businesses : 4%
- Other : 8%



Q23.1. Did your farm or allied business implement or attempt to implement a new marketing or sales channel in the period of time between April 10th 2020 and June 29th 2020 because of coronavirus disease (COVID-19)?

(n = 137)

- No response : 11%
- Yes : 34%
- No : 45%
- In the process of implementing : 10%



Q23.2. What percent of sales from your farm or allied business in the period of time between April 10th 2020 and June 29th 2020 went through a new marketing channel?

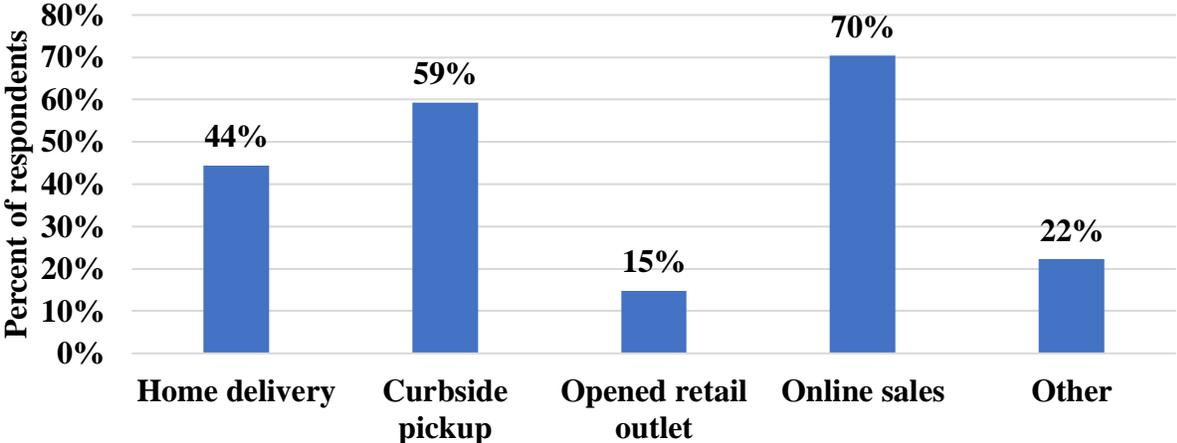
(n = 47)

Marketing Channel	Average percent of sales
Direct to consumers / end users	44%
Processor	74%
Distributor	41%
Restaurants	24%
Grocery stores / supermarkets	36%
Other aquaculture / aquaponics farms or business	43%
Other	45%

Q23.3. If your farm or allied business implemented or attempted to implement a "Direct to consumer / end user" marketing channel, please specify the method(s) from the options below: (please select all that apply)?

(n = 27)

- Home delivery : 44%
- Curbside pickup : 59%
- Opened a retail outlet : 15%
- Online sales : 70%
- Other : 22%



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.

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. Thank you to NOAA Sea Grant and the National Marine Fisheries Service for supporting this work.