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Impacts of COVID-19 on U.S. aquaculture, aquaponics, and allied businesses: Quarter 1 Results

March 23, 2020 to April 10, 2020 survey

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Introduction

The coronavirus (COVID-19) disease pandemic has disrupted the lives and livelihoods of everyone on our planet. As governments around the globe implemented measures to protect the health and safety of their populations, there were multiple ripple effects that reverberated throughout all sectors of our economy. The aquaculture and aquaponics sectors were also amongst those affected by the impacts of COVID-19. The implementation of "social distancing" policies, restaurant dine-in prohibitions, and stay-at-home orders across the U.S. has translated into a disruption of market channels for aquaculture, aquaponics, and allied businesses. It was estimated that 68% of all seafood consumed in the U.S. is consumed at food service establishments (NOAA, 2018). As a result of the lost market channels, businesses have experienced a loss of revenue, interruptions in cash flow, challenges with production, challenges with labor, and more.

In order to address the challenges faced by the industry, a study was launched to assess the impacts of the coronavirus disease (COVID-19) on U.S. aquaculture, aquaponics, and allied businesses. This study was a collaborative effort between Virginia Tech and The Ohio State University Extension, prompted by contacts with producers raising their concerns and attempting to identify resources that could aid their businesses. This fact sheet summarizes the first quarter survey results from this study, covering the survey period from March 23rd to April 10th, 2020.

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 first quarter survey was launched on March 23rd, 2020 and closed on April 10th, 2020. Results were exported and summarized using Microsoft Excel software.

Results

Characterization of Respondents

The total number of recorded responses at the termination of the survey on April 10th, 2020 was 652, of which 537 were sufficiently complete to be usable. Based on the 2018 Census of Aquaculture, this response represents approximately 18% of all U.S. aquaculture operations (USDA, 2019). Amongst the participants of the survey 41% of responses represent mollusk farms or businesses (n = 454). Twenty-one percent of respondents represent foodfish, while 7% represent ornamental fish, 6% aquaponics, and 6% sportfish (Table 1).

Table 1. Primary product produced by respondents.

Category	Percentage
Mollusks	41%
Foodfish	21%
Other	9%
Ornamental fish	7%
Aquaponics	6%
Sportfish (incl. trout)	6%
Allied business	3%
Crustaceans	3%
No response	1%
Baitfish	1%
Seaweed	1%
Aquatic plants	< 1%

Table 2. Primary marketing channel for respondents.

Category	Percentage
Distributor	31%
Direct to consumer	18%
Processor	16%
Other	12%
Restaurants	11%
Other aquaculture /aquaponics	8%
No response	3%
Grocery store / market	3%

Marketing channels

Respondents were asked to indicate their primary marketing channels (Table 2). Of these 11% sold directly to restaurants, with another 16% selling to processors, and 31% to distributors, who sell varying percentages to restaurants.

Scale of farms/businesses

Responding farms and businesses were of various scales of production (Table 3). Although 11.5% of responding farms or businesses chose not to answer this question (n = 452), 21% reported to be at a scale for annual sales volume greater than $1 million. Followed by 13.7% of responding farms and businesses at a scale between $100,001 and $250,000 in annual sales volume. Twenty-eight percent of responding farms and businesses reported annual sales volume of less than $100,000.

The 2018 Census of Aquaculture showed similar percentages of farms in the $100,000 to $499,999 (24%) and $500,000 to $1 million (7%) categories to the survey responses; but lower percentages of the largest farms (> $1 million) at 9% and greater percentages of farms with less than $100,000 in annual sales (61%). It is possible that smaller aquaculture farms may not belong to the aquaculture associations and Extension listserves that were used to distribute the survey to the extent that larger farms do. It is also possible that smaller farms had less time to respond to the survey or did not consider responding due to their focus on dealing with more immediate needs of their farm or business.

Table 3. Scale of respondent farms/business.

Category	Percentage
> $1 million	22%
$100,001 - $250,000	14%
$250,001 - $500,000	14%
No response	12%
$500,001 - $1 million	12%
$50,001 - $100,000	10%
$25,001 - $50,000	6%
$10,001 - $25,000	5%
$5,001 - $10,000	3%
$1 - $1,000	3%
$1,001 - $5,000	2%

Aquaculture Regions

Nearly half (49%) of responding farms and businesses (n = 499) were located in the Southern Aquaculture Region (SRAC). This was followed by the Northeastern Aquaculture Region (26%), the North Central Aquaculture Region (11%), the Western Aquaculture Region (10%), and the Tropical and Sub-tropical Aquaculture Region (3%). Table 4 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). Participation in this study was reflective of the size of each respective aquaculture region based on the number of farms reported in the 2018 USDA Census of Aquaculture. USDA Census data show that the Southern and Northeast region account for the larger percentages of aquaculture farms.

Table 4. Participation by aquaculture region.

Region	Percentage of USDA census reporting farms	Percentage of survey respondents
Southern	59%	49%
Northeast	18%	26%
Western	12%	10%
North Central	9%	11%
Tropical and Sub-tropical	2%	3%

Key Findings

Ninety percent of respondents (n = 537) indicated that their farm or business had been impacted by the coronavirus disease pandemic. Only 3% of respondents indicated that their farm business had not been impacted, while 7% of respondents were uncertain whether their farm or business had been impacted or not. Of those who reported not being impacted or uncertain about being impacted by the coronavirus pandemic (n = 54), 20% expected their farm or business would "definitely" be impacted in 2020. Half of respondents expected that their farm or business would "probably" be impacted in 2020. While 20% expected their farm or business would "probably not" be impacted in 2020. Only 4% of respondents reported that their farm would "definitely not" be impacted in 2020.

Only 34% of respondents indicated that their farm or business would survive the next 3 months without any external interventions (n = 458). Fifty-one percent indicated that "maybe" their farm or business would survive 3 months without external intervention. When asked if a respondent's farm or business would survive for 6 months without external intervention, 32% of respondents said "no" they would not (n = 458); while 47% said "maybe". Only 20% of respondents indicated their farm or business could survive 6 months without any external intervention. When the time frame was extended to 12 months, 50% percent of respondents indicated that their business would not survive without external intervention (n = 458).

90% of respondents indicated that their farm or business had been impacted by the coronavirus disease pandemic.

Lost Sales

Eighty-four percent of respondents reported that their farm or business had experienced lost sales due to the coronavirus disease pandemic (n = 499). Approximately one quarter of respondents also reported lost sales to the lack of international markets (n = 436). When asked about the value of lost sales, 19% of respondents indicated that they could not estimate a value at the time of taking the survey (n = 434). Fifty percent of respondents indicated their farm or business had lost between $10,001 and $250,000. Respondents were also asked about the cancellation of contracts or orders as a result of the coronavirus disease pandemic; with 9% reporting their farm or business had government orders cancelled (n = 485), and 80% reporting that their farm or business had private orders or contracts cancelled (n = 482).

84% of respondents reported that their farm or business had experienced lost sales due to the coronavirus disease pandemic.

When asked what challenges farms or businesses expected to experience in 2020 as a result of coronavirus disease, 86% responded they expect to experience lost sales (n = 485). With 27% expecting to experience lost sales to international markets (n = 433). Twenty percent of respondents were unable to estimate the value of lost sales at the time of the survey (n = 431); with 50% reporting their farm or business expected to experience losses between $10,001 and $250,000 in sales. Four percent of respondents indicated their farm or business expected to experience over $1 million in lost sales; with one respondent estimating $15 million in lost sales.

Respondents were also asked to estimate how many months their business could operate without any sales before suffering longer term cash flow effects. Forty-three percent of respondents said their farm or business could operate without any sales for between 1 and 3 months before suffering longer-term cash flow effects (n = 456). As of the preparation of this fact sheet, it has been already been three weeks since some respondents completed the survey. Only 5% of respondents indicated their farm or business could survive without sales for a period of more than 10 months.

Labor

Forty percent of respondents indicated that their farm or business had not laid off any employees as a result of the coronavirus disease pandemic; while 33% of respondents reported that their farm or business did lay off employees (n = 478). Twenty-six percent reported that they would have to lay off employees "soon". Respondents were asked about the number of employees that had been laid off, with the majority (57%) stating that between 1 and 3 employees had been laid off (n = 154). Twenty percent of respondents indicated this number to be between 4 and 6 employees. Although only 7% of respondents indicated that greater than 20 employees were laid off, the maximum number reported in the study was 329 employees at a single farm/business. Other respondents reported measures such as standby layoffs for over 290 employees, owners working without pay, or salary reductions for management.

When asked how long farms or businesses had to make a decision about whether to lay off employees or not, the majority of respondents (54%) indicated a period between 1 – 3 weeks (n = 123). Furthermore, 15% of respondents indicated they had less than a week to make a decision about laying off employees. Only 2% of respondents reported having more than 10 weeks to make a decision about laying off employees. **It should be noted that data collection through the survey was open for a period of 3 weeks.**

Respondents were asked how many employees the farm or business would have to lay off (n = 123), the majority of respondents (62%) indicated between 1 and 3 employees. Of the employees that were laid off or would have to be laid off, 35% of respondents indicated these would be employees classified as "Short-Time" or "Shared-Work" employees (n = 278). Respondents were also asked about employees missing work due to the coronavirus disease pandemic. Seventy percent of respondents indicated that their farm or business did not have any employees miss work (n = 473). Twenty-nine percent of respondents did experience employees that missed work (n = 473); with 29% of those respondents reporting that employees missed between 11 and 14 days of work (n = 132).

Challenges to the farm/business

Forty-one percent of responding farms or businesses experienced production challenges that were not related to labor (n = 499). This was followed by 41% of respondents reporting their farm or business had experienced issues with labor. A quarter of respondents indicated their farm or business had experienced an increased cost of production.

Challenges with production inputs (feed, chemicals, therapeutants, etc.) were reported by 43% of responding farms and businesses (n = 200). This was followed by 32% of respondents who experienced challenges with repair, construction, consultant or engineering services. Twenty-nine percent of

respondents also reported they had experienced challenges with financial services.

When asked about expecting to experience challenges at the farm or business, 47% of respondents indicated they expect to experience challenges with production inputs (n = 217). This was followed by 30% of respondents who expected challenges with financial services. Responding farms and businesses also reported challenges with holding market-ready product that would become an issue for new crops or plantings. Forty-two 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 = 443). Only 6% of responding farms and businesses could hold market ready product for more than 10 months without it becoming an issue for new production.

Marketing of products

Respondents were asked if holding product that is ready for market as a result of the coronavirus disease pandemic would make it less marketable in the future. The majority (60%) of respondents said "yes", holding product would make it less marketable (n = 453). Only 17% of respondents said that "no", holding market ready product would not make it less marketable in the future. Asked about the effects on marketability of products, respondents acknowledged both reduced quantities sold (71%) and reduced price (68%) for products (n = 268).

Increased demand for products

Only 5% of respondents indicated they had experienced increased demand for their products (n = 499). However, 37% of responding farms or businesses could not estimate the value of increased sales (n = 27). Seven percent of respondents expected to see increased demand for their products in 2020 (n = 485), although the majority (52%) of respondents were unable to estimate the value of increased sales at the time of the survey (n = 33).

Assistance to farms/businesses

Respondents were asked about various assistance options that may be helpful to their farm or business. The majority of respondents (65%) indicated that Federal assistance would increase the likelihood for their farm or business to survive (n = 446). This was followed by 47% of respondents who also selected State assistance as a mechanism that would increase their likelihood of survival.

Thirty-one percent of responding farms and businesses indicated that waiving or delay of State fees would be helpful to them (n = 443). Twenty-nine percent of respondents also selected loan guarantees as a helpful form of assistance, 27% indicated that assistance with identifying new markets would be helpful, and 23% also selected specialty crop insurance as a help.

When asked if there were existing programs that farms and businesses do not currently qualify for that would increase the likelihood of their survival, 77% of respondents did not respond to the question (n = 442), with 10% of respondents saying "yes" and 13% of respondents saying "no".

Discussion and Conclusion

The results of the Quarter 1 survey clearly demonstrate that U.S. aquaculture, aquaponics, and allied businesses have been seriously negatively impacted by the coronavirus disease (COVID-19) pandemic. With 80% of respondents reporting cancellations for orders or contracts and over 80% reporting and expecting to experience lost sales, there is a clear crisis underway in cash revenue receipts. Similarly, respondents reported challenges with production, financing, and other essential services upon which their survival depends. That only 34% of participating respondents indicated their farm or business would survive the next three months without external intervention is cause for grave concern; 64% of respondents indicating that "maybe" or "no" their farm or business would not survive three months. This signals an urgent need to address and overcome the challenges identified by the industry. Furthermore, longer-term impacts of the coronavirus disease on the aquaculture, aquaponics, and allied businesses should continue to be monitored, given that 50% of the participating farms and businesses expect they will not survive 12 months without external intervention. The main takeaways from the Quarter 1 results are:

- *90% have been impacted by COVID-19*

- *80% have had orders/contracts cancelled*
- *59% have or will soon have to lay off employees*
- *84% have experienced lost sales*
- *34% can survive 3 months without external intervention*

References

National Marine Fisheries Service. 2018. "Fisheries of the United States, 2017". U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2017 Available at: https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2017-report. (last accessed, April 12th, 2020)

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)

Additional Resources

Additional information and a summary of all Quarter 1 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 1 results".

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Appendix

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

Quarter 1 Results

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VIRGINIA TECH

THE OHIO STATE UNIVERSITY

ENGLE-STONE Aquatic$

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Q4. Has your farm or business had to lay off any employees due to the coronavirus disease (COVID-19)? 7

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? 7

Q4.2. How many employees has your farm or business had to lay off in response to the coronavirus disease (COVID-19)? 8

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)? 8

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Q6. Does your farm or business make use of H2A or H2B workers?.....10

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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? 13

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. 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? 15

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. 16

Q8.1. Does your farm or business expect to experience lost sales to international or export markets (outside of the Unites States), as a result of the coronavirus disease (COVID-19)?....16

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?....17

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. 18

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? 19

Q9. Without external intervention (for example, governmental assistance), will your farm or business survive in the next 3 (three) months? 20

Q10. Without external intervention (for example, governmental assistance), will your farm or business survive in the next 6 (six) months?....20

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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?....21

Q13. Will holding market ready product, as a result of the coronavirus disease (COVID-19), make it less marketable?....22

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Q17. Would assistance with any of the following be helpful to your farm or business right now? Please select all that apply. 25

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Q20. How does your farm or business primarily market or sell aquaculture / aquaponics products? 28

Q21. Please indicate the scale of your farm or business by annual sales volume before the effects of coronavirus disease (COVID-19): 29

Q22. In which USDA defined Aquaculture Region is your farm or business located? 30

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 1 survey closed on April 10th, 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 first quarter survey was launched on March 23rd, 2020 and closed on April 10th, 2020. Results were exported and summarized using Microsoft Excel software.

Response Rate

At the time of closing the survey had 652 responses. Of those responses, 30 were noted as "partial" responses. Another 47 recorded responses were left completely blank. After a review of all recorded responses, a total of 115 observations were removed from the dataset for being blank or greater than 75% incomplete. The adjusted response for the study was 537 observations. Discounting the number of "allied businesses" that participated in the study (n = 15), the number of farms that participated is roughly equal to 18% of the total number of U.S. farms recorded in the 2018 Census of Aquaculture (USDA, 2019).

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.

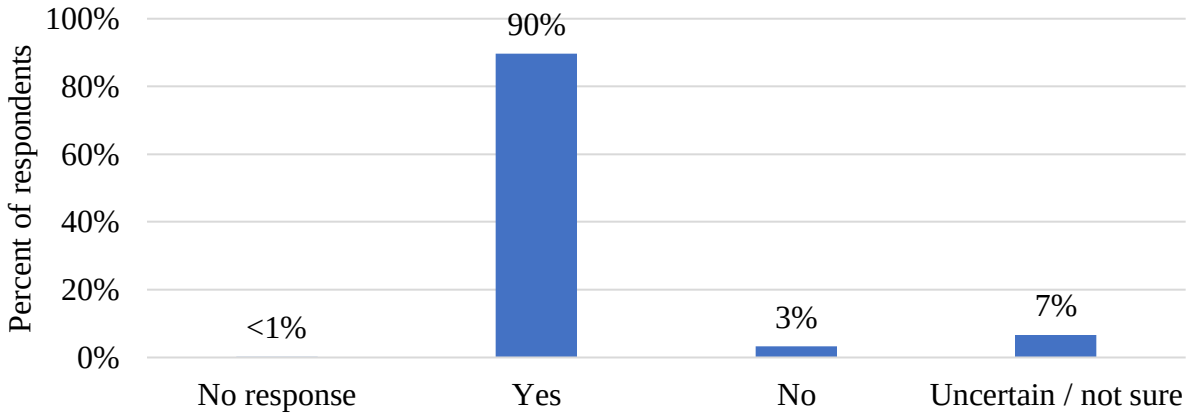
Survey results for each question

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

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

(n = 537)

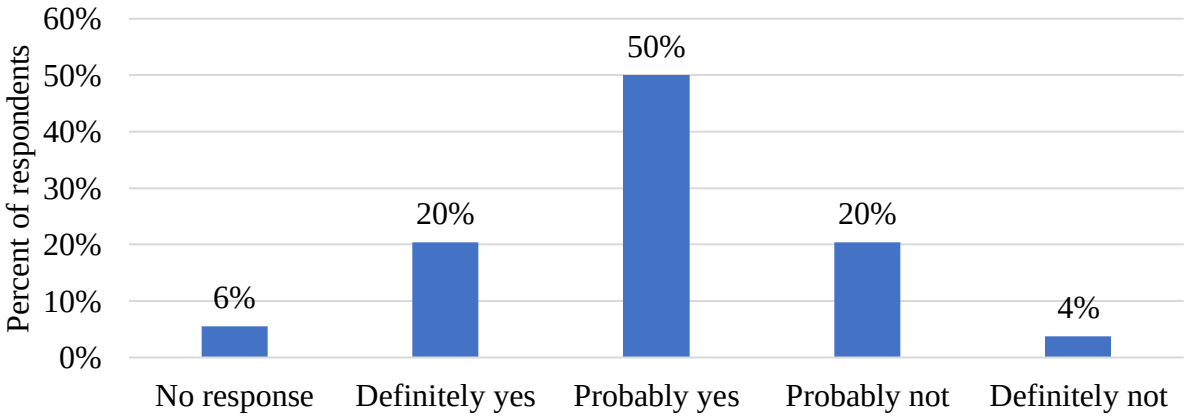
- No response : < 1%
- Yes : 90%
- No : 3%
- Uncertain / Not Sure : 7%



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

(n = 54)

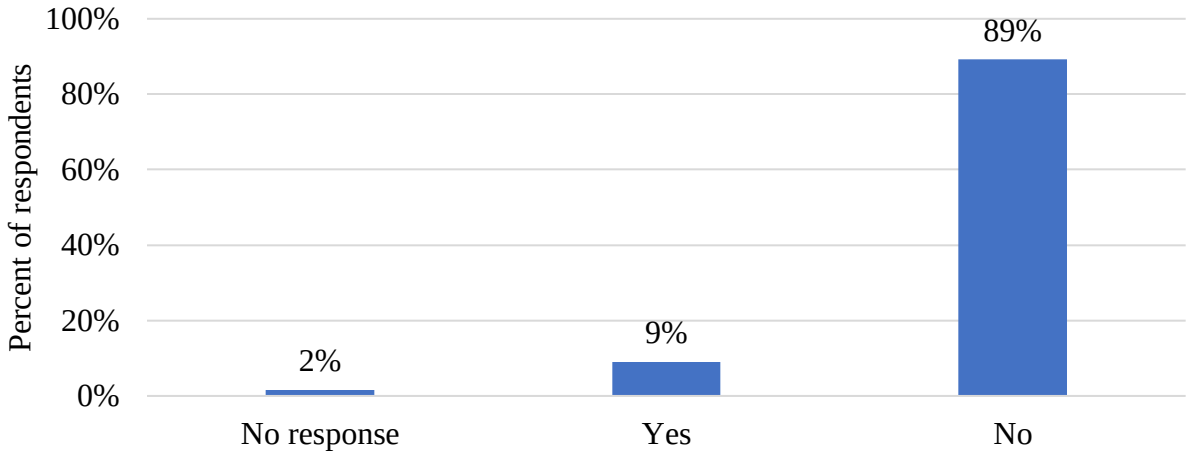
- No response : 6%
- Definitely yes : 20%
- Probably yes : 50%
- Probably not : 20%
- Definitely not : 4%



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

(n = 485)

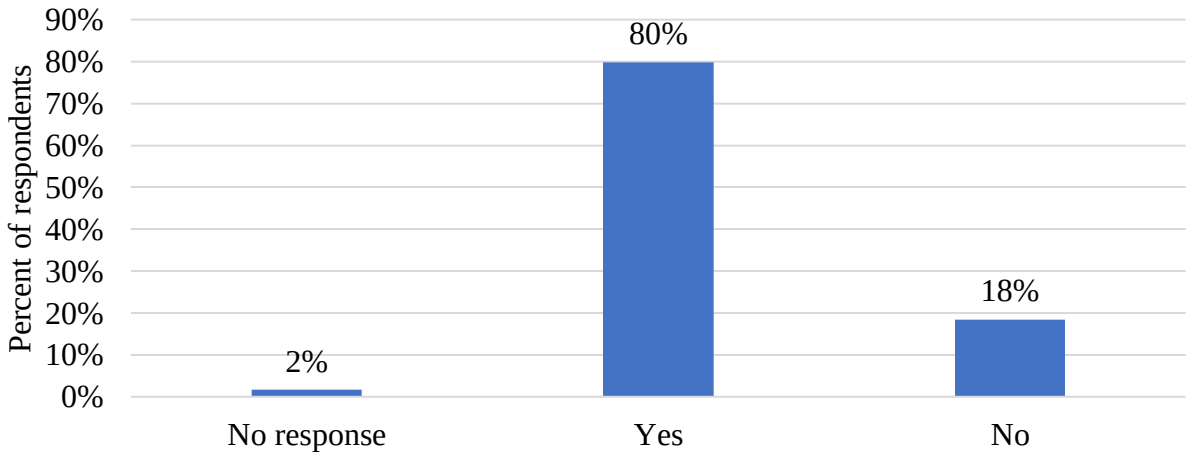
- No response : 2%
- Yes : 9%
- No : 89%



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

(n = 482)

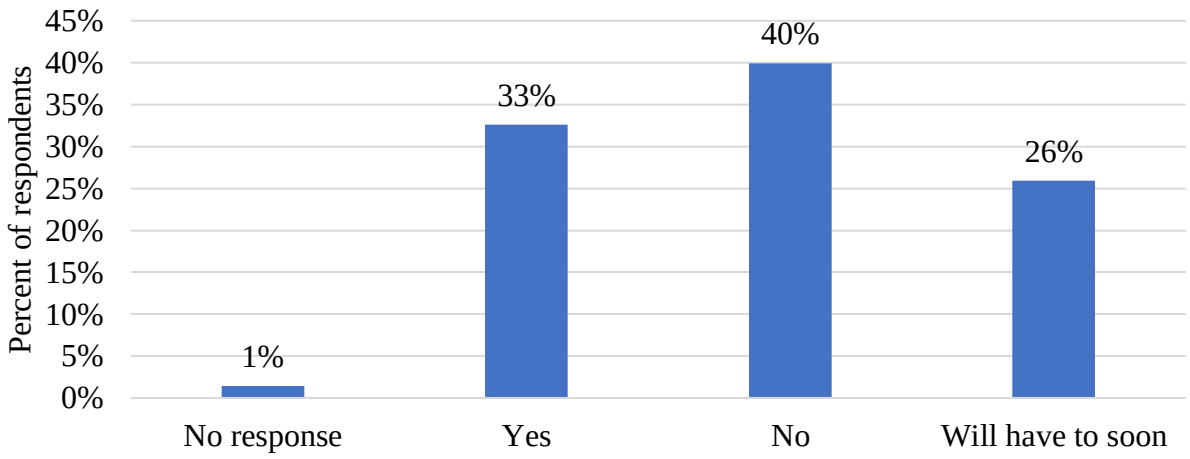
- No response : 2%
- Yes : 80%
- No : 18%



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

(n = 478)

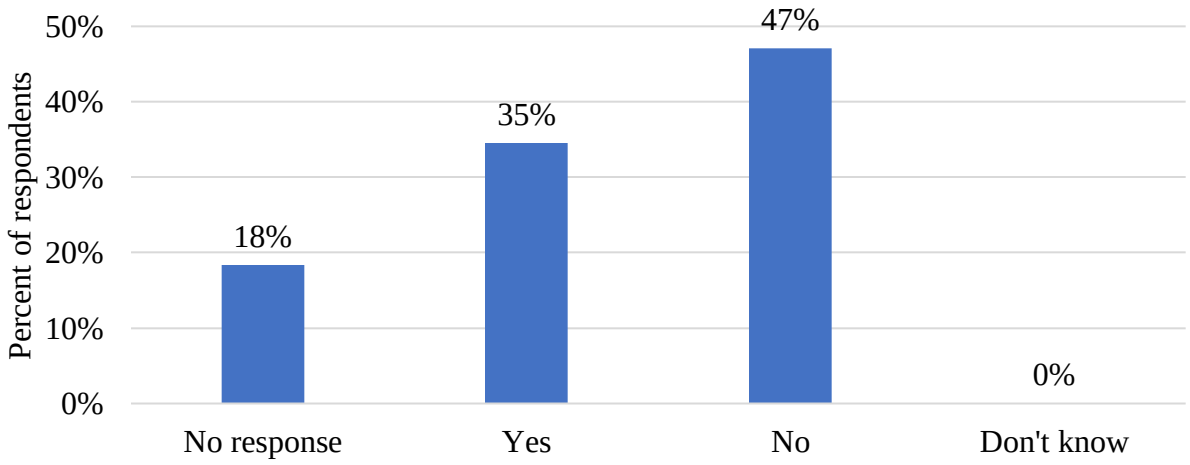
- No response : 1%
- Yes : 33%
- No : 40%
- Will have to soon : 26%



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 = 278)

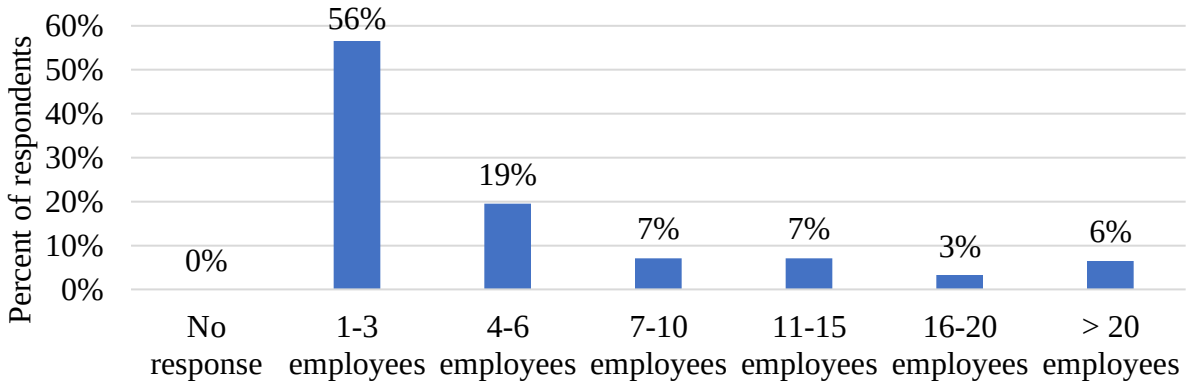
- No response : 18%
- Yes : 35%
- No : 47%
- Don’t know : 0%



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

(n = 154)

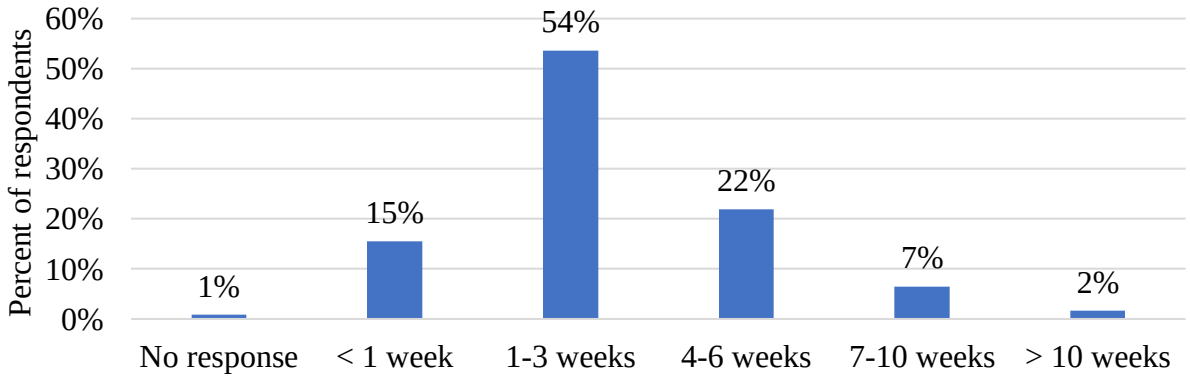
- No response : 0%
- 1 – 3 employees : 56%
- 4 – 6 employees : 19%
- 7 – 10 employees : 7%
- 11 – 15 employees : 7%
- 16 – 20 employees : 3%
- More than 20 employees : 6%



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 = 123)

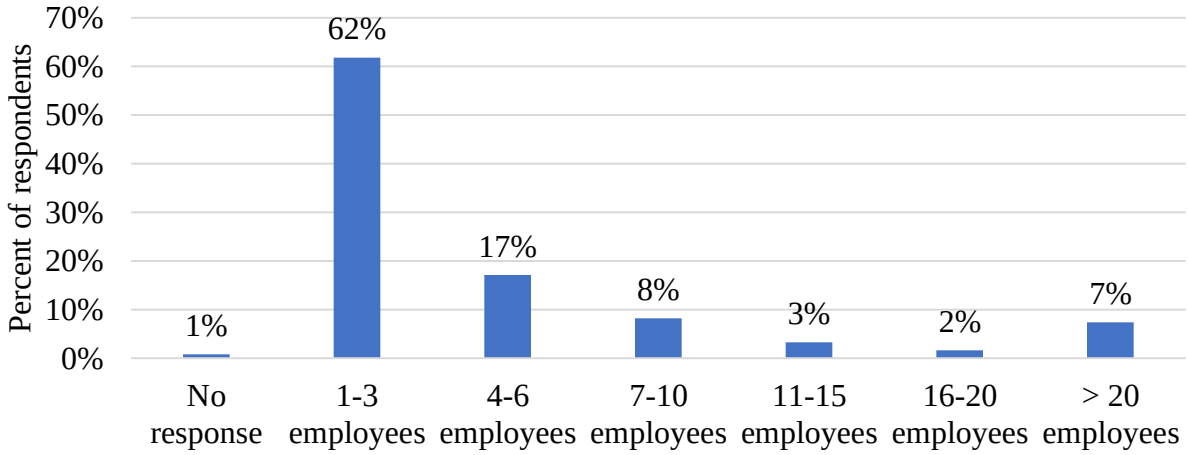
- No response : 1%
- Less than 1 week : 15%
- 1 – 3 weeks : 54%
- 4 – 6 weeks : 22%
- 7 – 10 weeks : 7%
- More than 10 weeks : 2%



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 = 123)

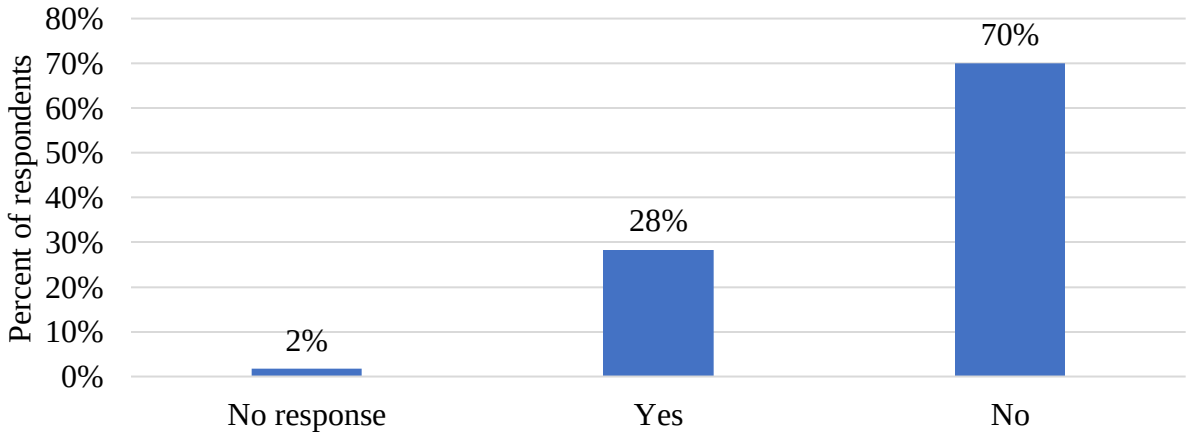
- No response : 1%
- 1 – 3 employees : 62%
- 4 – 6 employees : 17%
- 7 – 10 employees : 8%
- 11 – 15 employees : 3%
- 16 – 20 employees : 2%
- More than 20 employees : 7%



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

(n = 473)

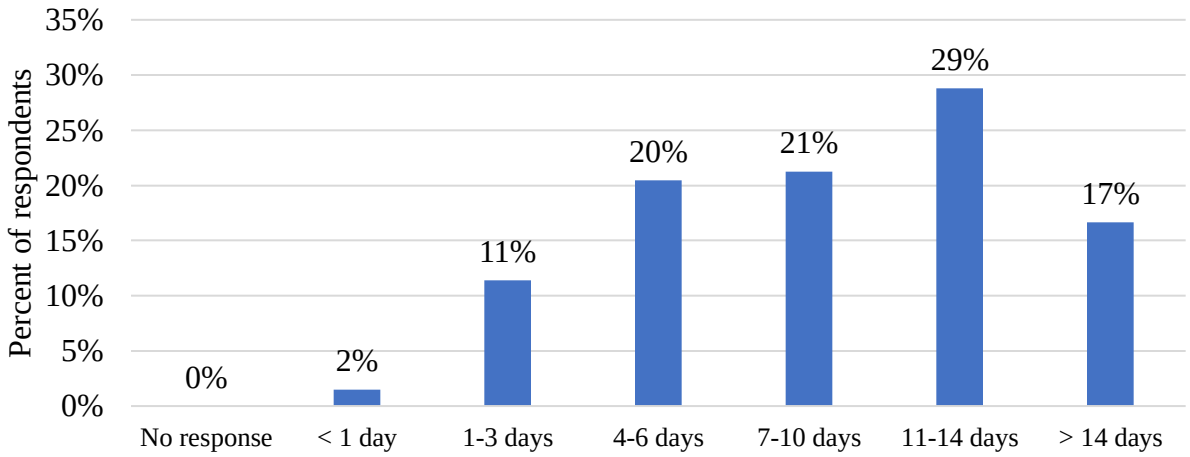
- No response : 2%
- Yes : 28%
- No : 70%



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 = 132)

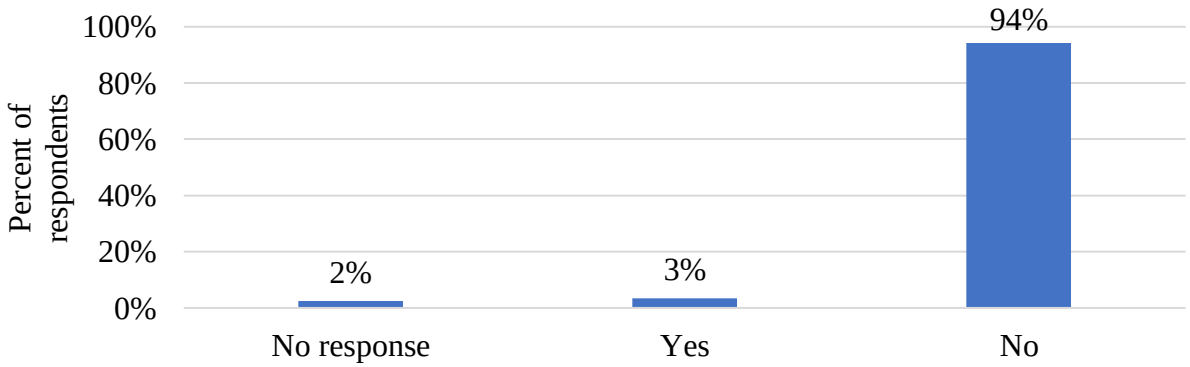
- No response : 0%
- Less than a day : 2%
- 1 -3 days : 11%
- 4 – 6 days : 20%
- 7 – 10 days : 21%
- 11 – 14 days : 29%
- More than 14 days : 17%



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

(n = 468)

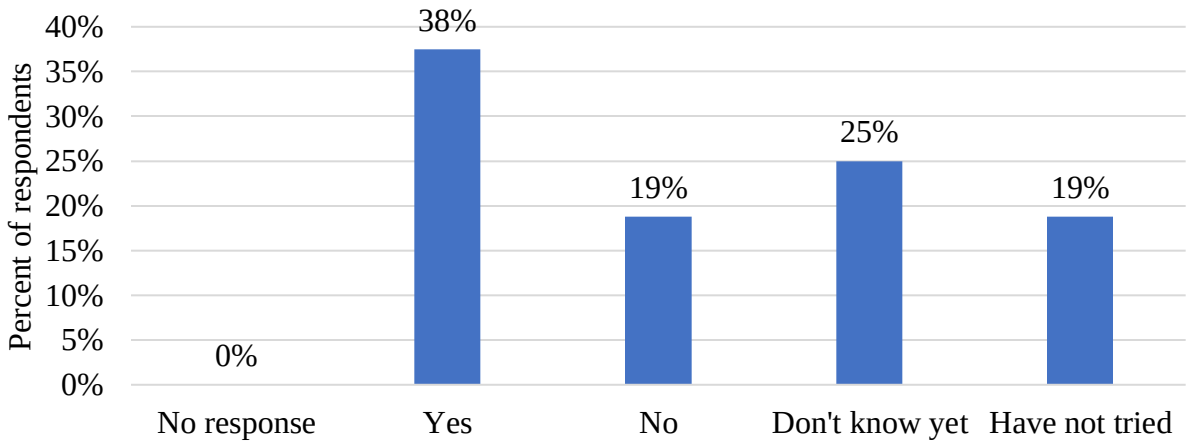
- No response : 2%
- Yes : 3%
- No : 94%



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

(n = 16)

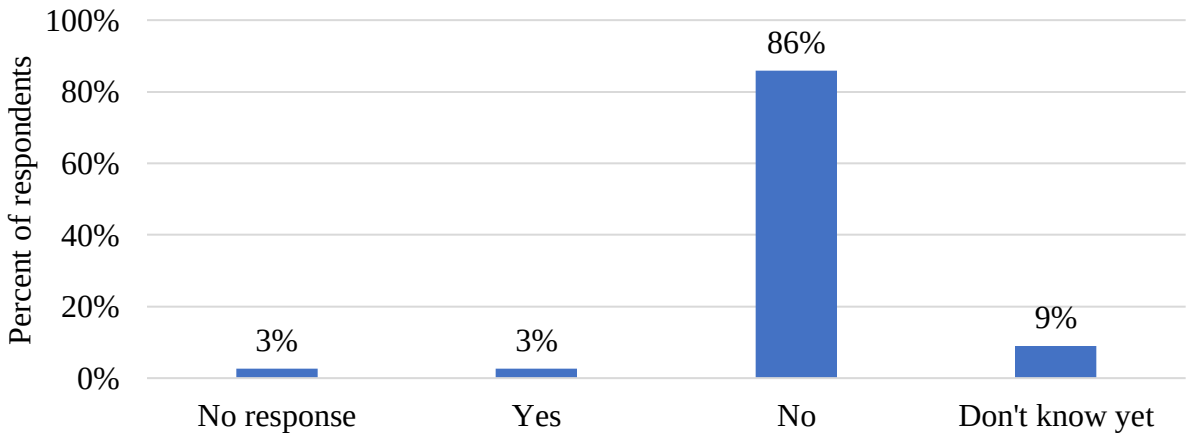
- No response : 0%
- Yes : 38%
- No : 19 %
- Don't know yet : 25%
- Have not tried : 19%



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 = 466)

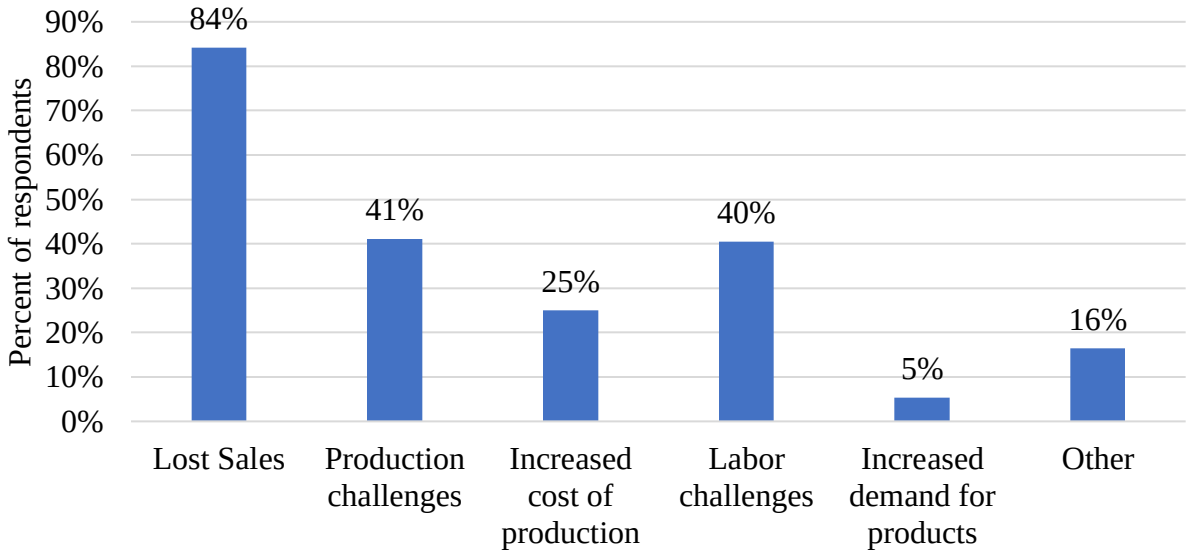
- No response : 3%
- Yes : 3%
- No : 86%
- Don't know yet : 9%



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

(n = 499)

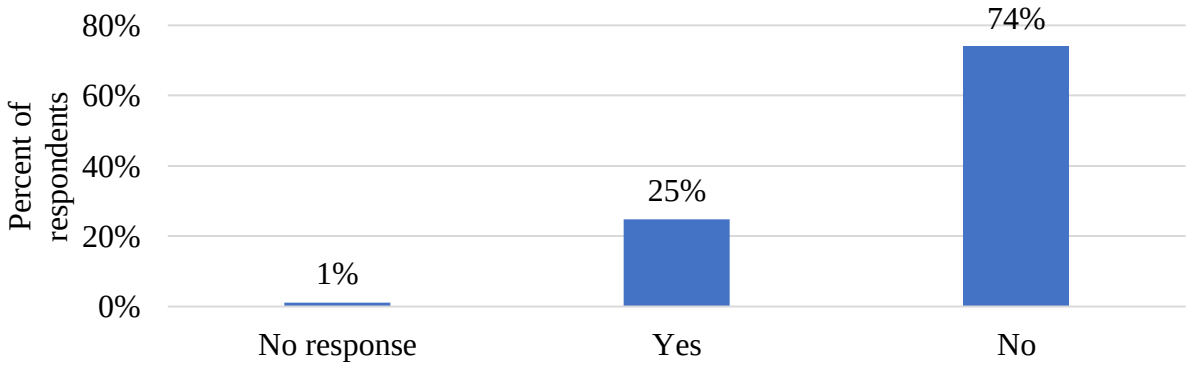
- Lost sales : 84%
- Production challenges (not related to labor) : 41%
- Increased cost of production : 25%
- Labor challenges : 40%
- Increased demand for products : 5%
- Other : 16%



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

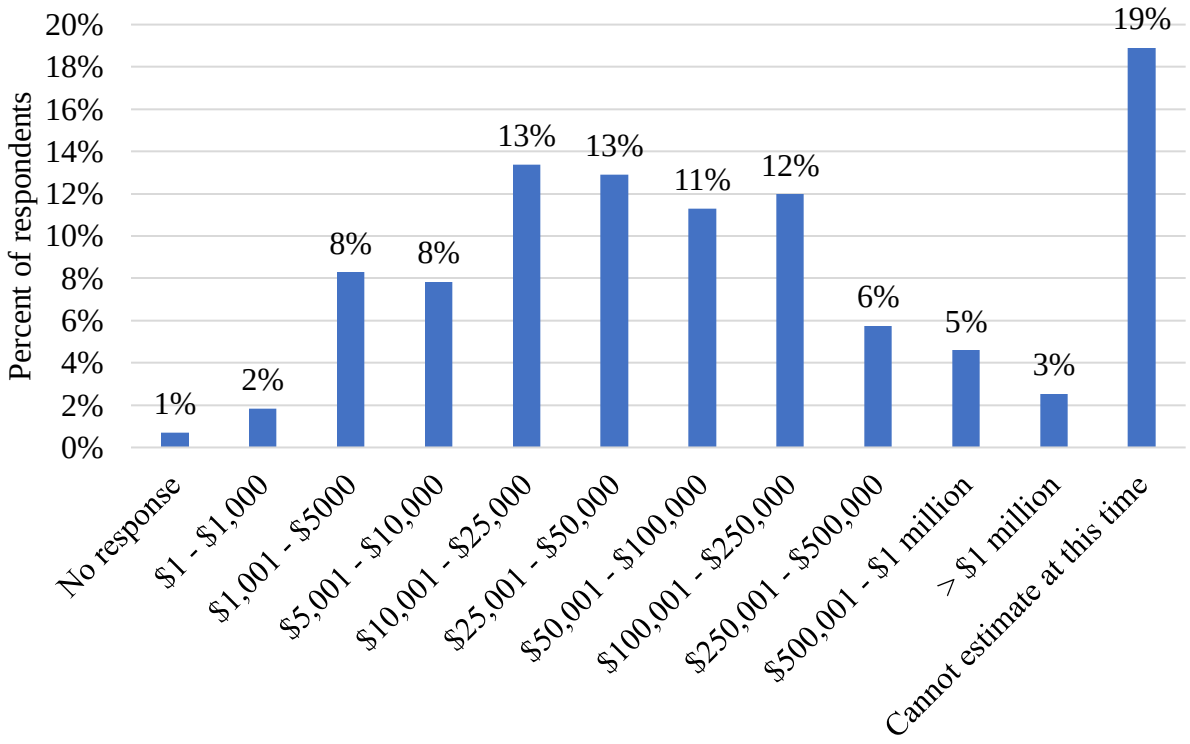
(n = 436)

- No response : 1%
- Yes : 25%
- No : 74%



Q7.2. If your farm or business has <u>experienced lost sales</u> as a result of the coronavirus disease (COVID-19), please estimate the value of lost sales?
(n = 434)

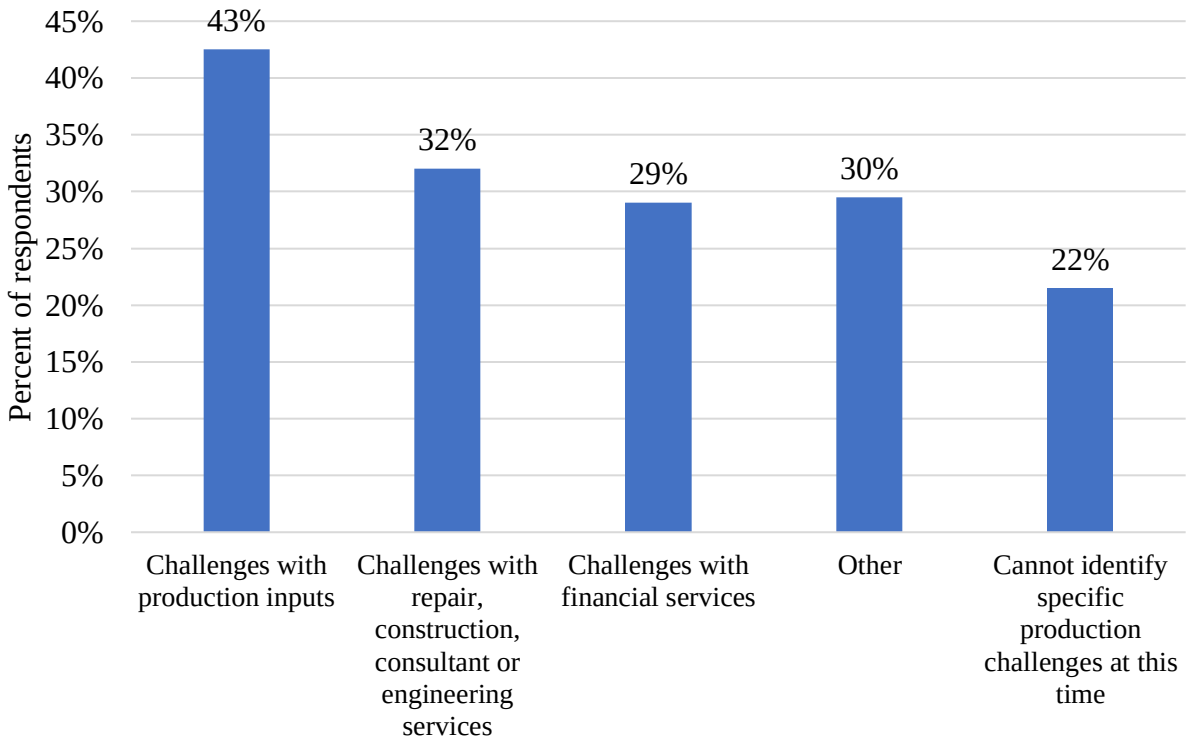
- No response : 1%
- $1 - $1,000 : 2%
- $1,001 - $5,000 : 8%
- $5,001 - $10,000 : 8%
- $10,001 - $25,000 : 13%
- $25,001 - $50,000 : 13%
- $50,001 - $100,000 : 11%
- $100,001 - $250,000 : 12%
- $250,001 - $500,000 : 6%
- $500,001 - $ 1million : 5%
- Greater than $1 million : 3%
- Cannot estimate at this time : 19%



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

(n = 200)

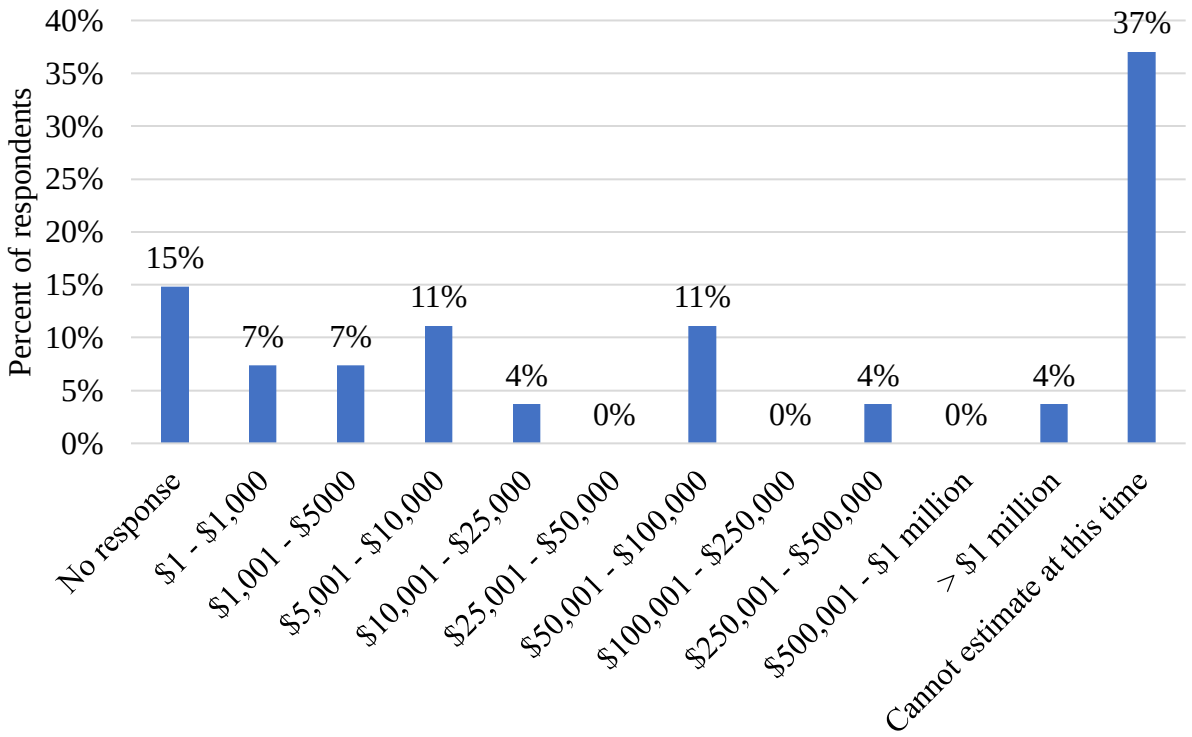
- Challenges with production inputs (feed, chemicals, therapeutants, etc.) : 43%
- Challenges with repair, construction, consultant or engineering services : 32%
- Challenges with financial services (operating loans, leases, etc.) : 29%
- Other : 30%
- Cannot identify specific production challenges at this time : 22%



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

(n = 27)

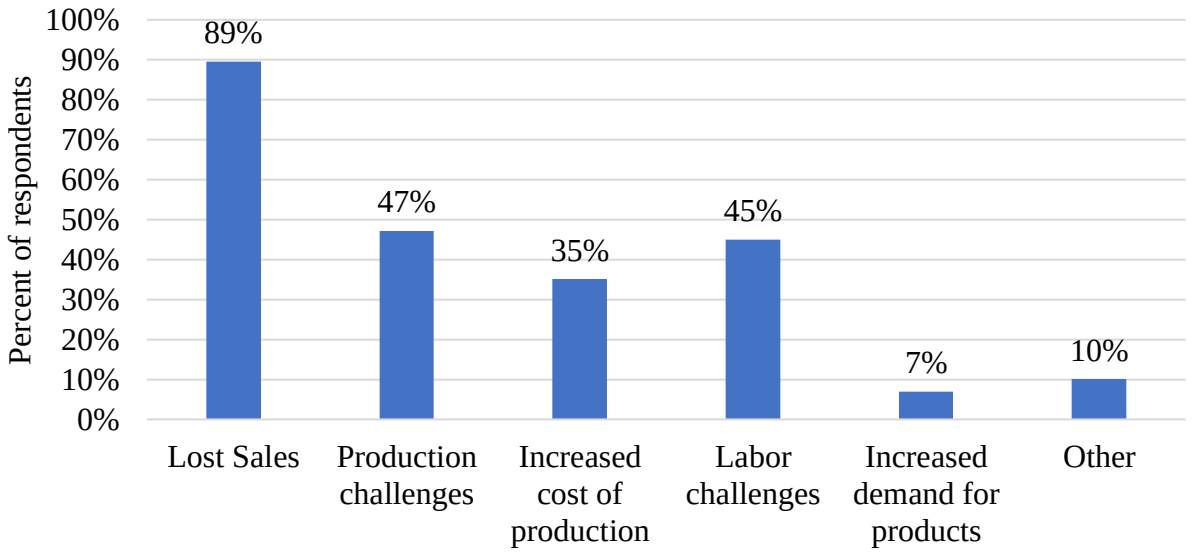
- No response : 15%
- $1 - $1,000 : 7%
- $1,001 - $5,000 : 7%
- $5,001 - $10,000 : 11%
- $10,001 - $25,000 : 4%
- $25,001 - $50,000 : 0%
- $50,001 - $100,000 : 11%
- $100,001 - $250,000 : 0%
- $250,001 - $500,000 : 4%
- $500,001 - $ 1million : 0%
- Greater than $1 million : 4%
- Cannot estimate at this time : 37%



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

(n = 485)

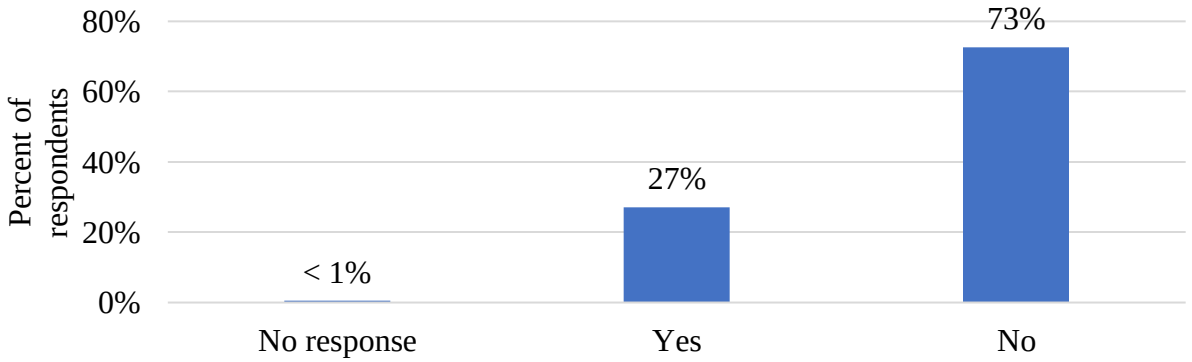
- Lost sales : 89%
- Production challenges (not related to labor) : 47%
- Increased cost of production : 35%
- Labor challenges : 45%
- Increased demand for products : 7%
- Other : 10%



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

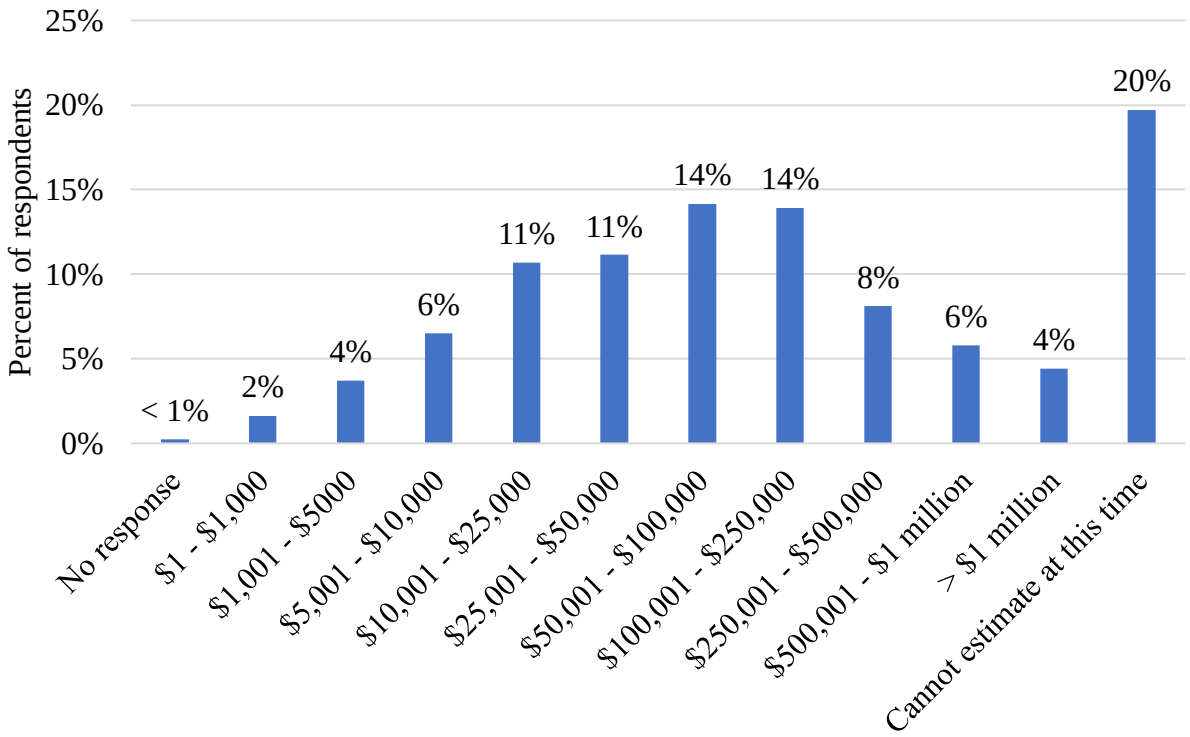
(n = 433)

- No response : < 1%
- Yes : 27%
- No : 73%



Q8.2. Does your farm or business <u>expect to experience lost sales</u> as a result of the coronavirus disease (COVID-19), please estimate the value of lost sales?
(n = 431)

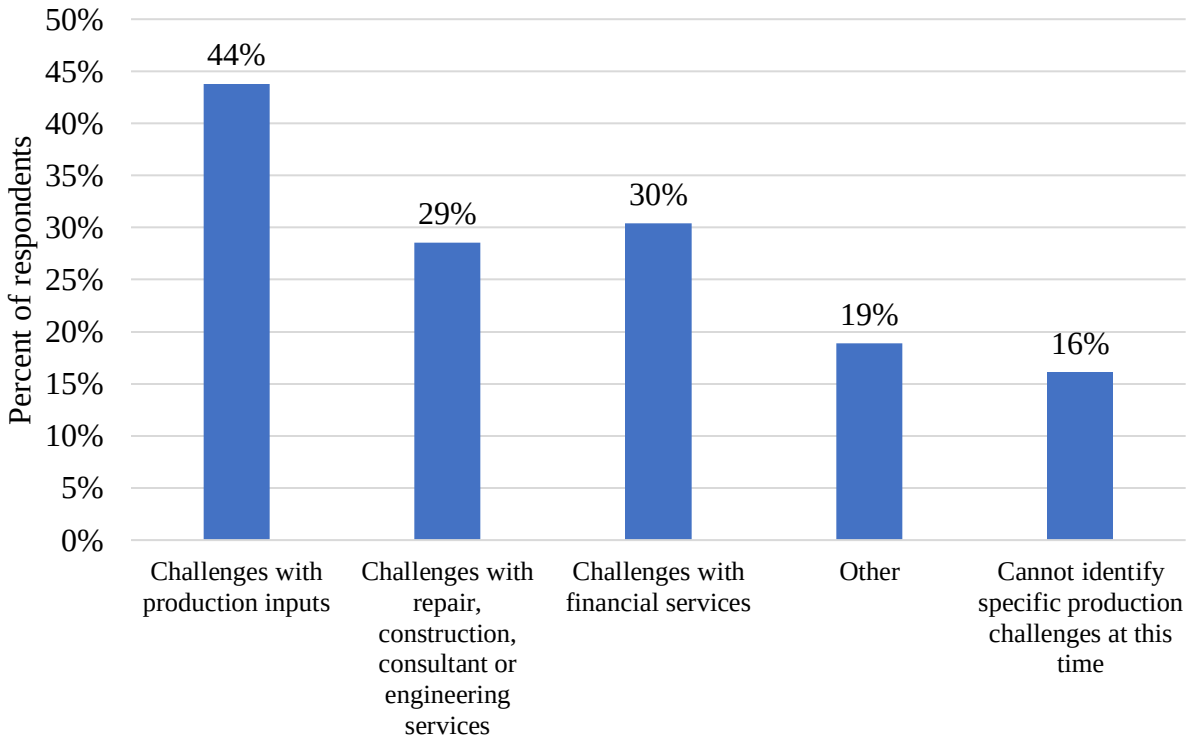
- No response : < 1%
- $1 - $1,000 : 2%
- $1,001 - $5,000 : 4%
- $5,001 - $10,000 : 6%
- $10,001 - $25,000 : 11%
- $25,001 - $50,000 : 11%
- $50,001 - $100,000 : 14%
- $100,001 - $250,000 : 14%
- $250,001 - $500,000 : 8%
- $500,001 - $ 1million : 6%
- Greater than $1 million : 4%
- Cannot estimate at this time : 20%



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

(n = 217)

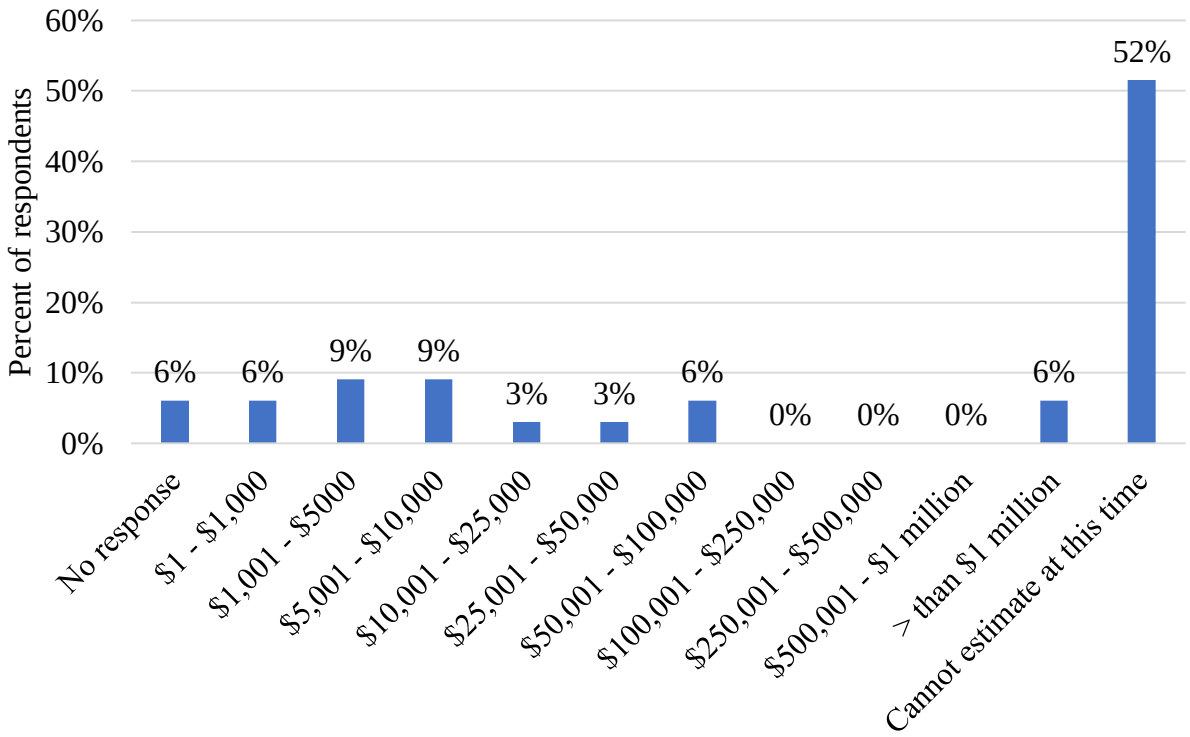
- Challenges with production inputs (feed, chemicals, therapeutants, etc.) : 44%
- Challenges with repair, construction, consultant or engineering services : 29%
- Challenges with financial services (operating loans, leases, etc.) : 30%
- Other : 19%
- Cannot identify specific production challenges at this time : 16%



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

(n = 33)

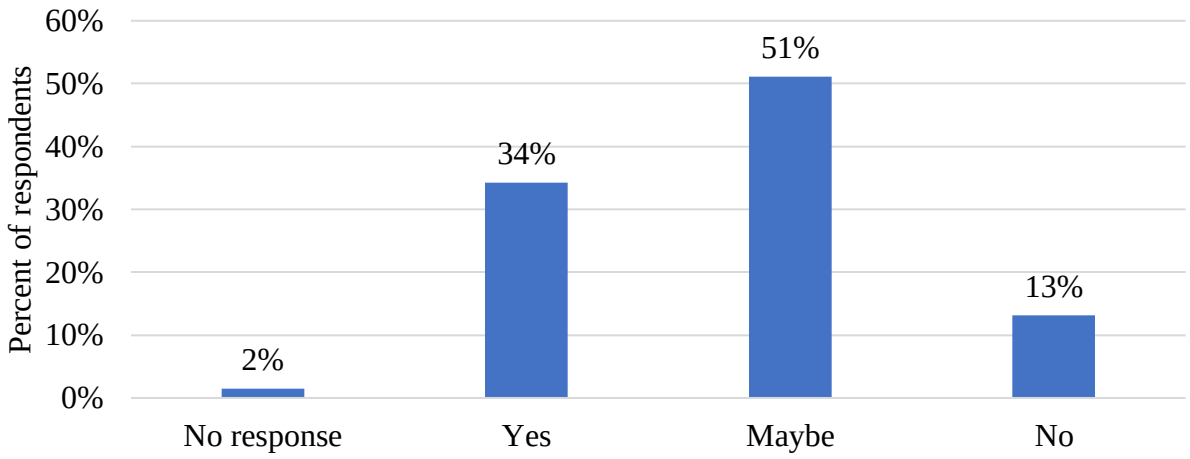
- No response : 6%
- $1 - $1,000 : 6%
- $1,001 - $5,000 : 9%
- $5,001 - $10,000 : 9%
- $10,001 - $25,000 : 3%
- $25,001 - $50,000 : 3%
- $50,001 - $100,000 : 6%
- $100,001 - $250,000 : 0%
- $250,001 - $500,000 : 0%
- $500,001 - $ 1million : 0%
- Greater than $1 million : 6%
- Cannot estimate at this time : 52%



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

(n = 458)

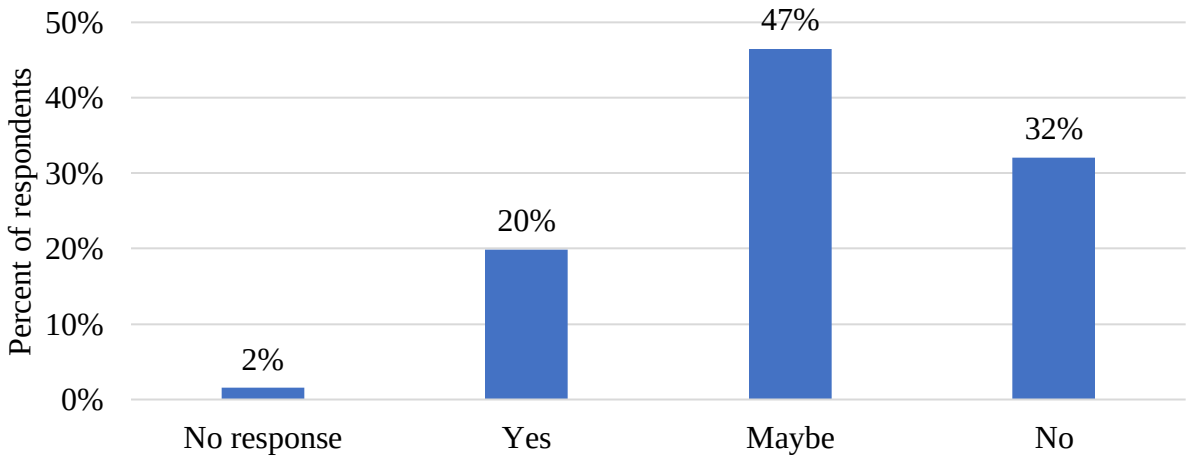
- No response : 2%
- Yes : 34%
- Maybe : 51%
- No : 13%



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

(n = 458)

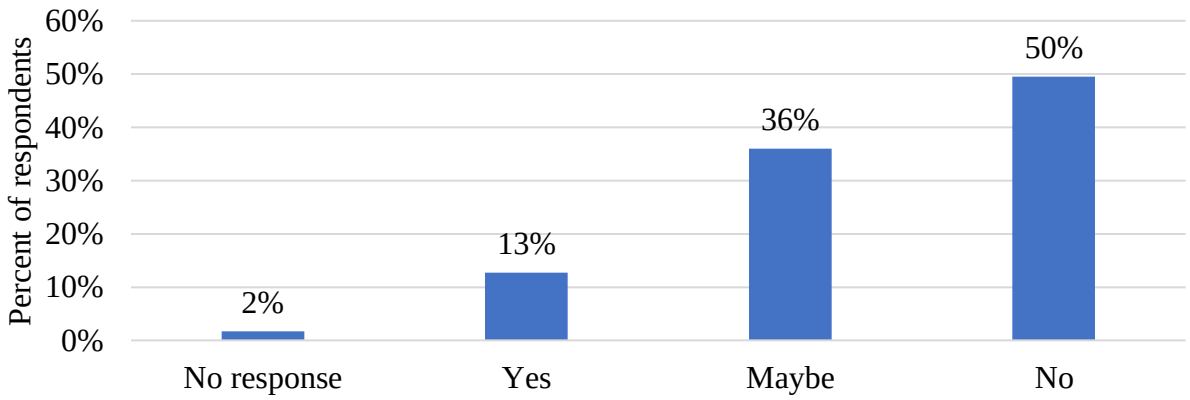
- No response : 2%
- Yes : 20%
- Maybe : 47%
- No : 32%



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

(n = 458)

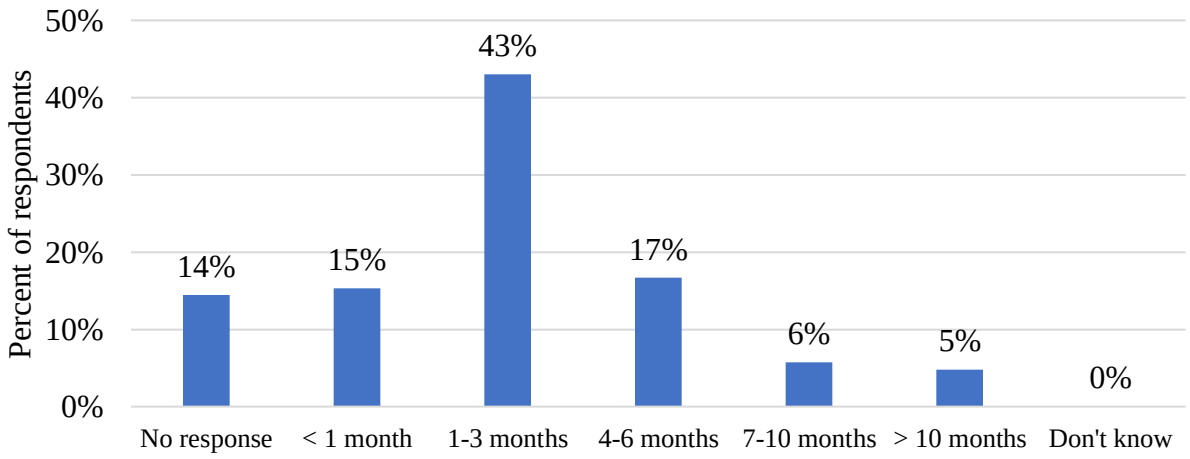
- No response : 2%
- Yes : 13%
- Maybe : 36%
- No : 50%



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 = 456)

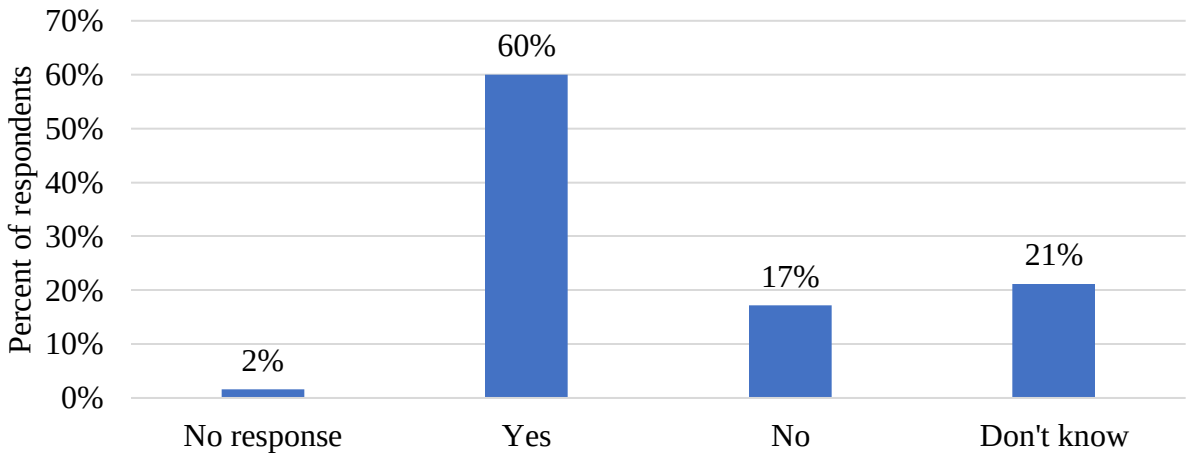
- No response : 14%
- Less than 1 month : 15%
- 1 – 3 months : 43%
- 4 – 6 months : 17%
- 7 – 10 months : 6%
- More than 10 months : 5%
- Do not know : 0%



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

(n = 453)

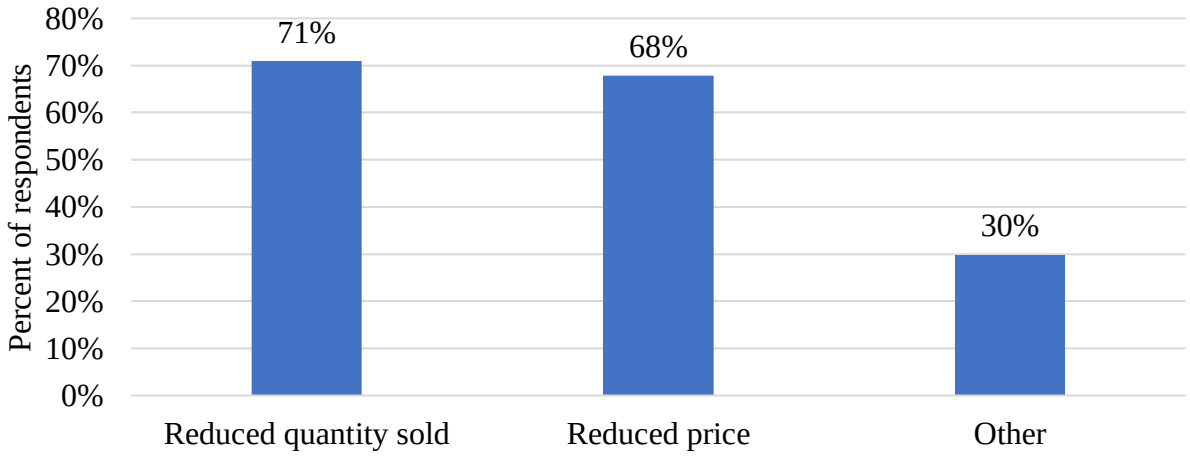
- No response : 2%
- Yes : 60%
- No : 17%
- Don't know : 21%



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

(n = 268)

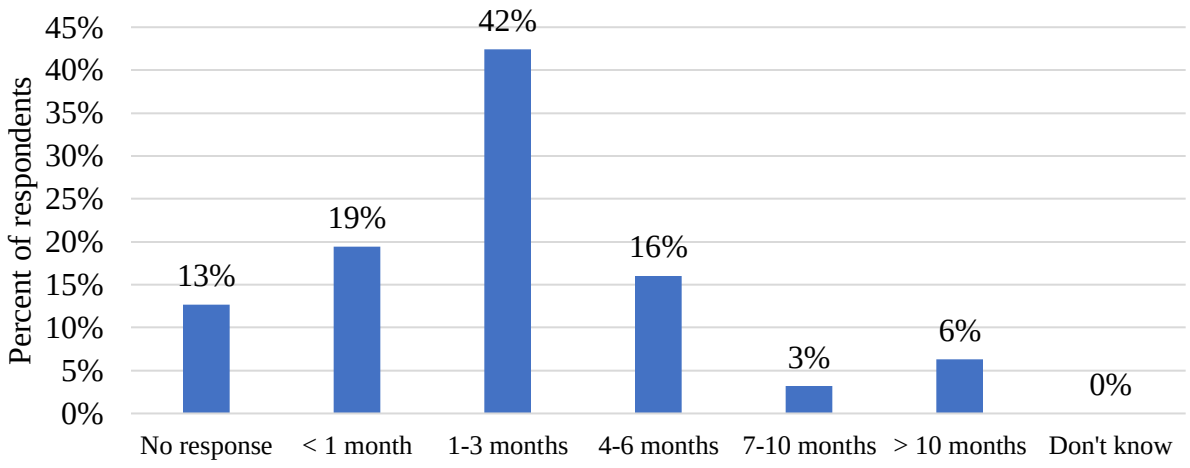
- Reduced quantity sold : 71%
- Reduced price : 68%
- Other : 30%



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?

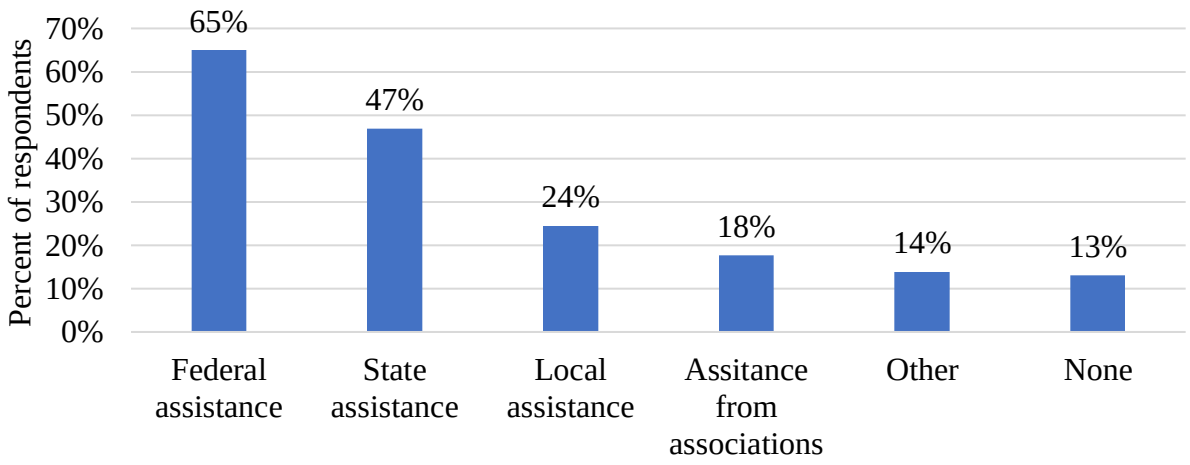
(n = 443)

- No response : 13%
- Less than 1 month : 19%
- 1 – 3 months : 42%
- 4 – 6 months : 16%
- 7 – 10 months : 3%
- More than 10 months : 6%
- 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 = 446)

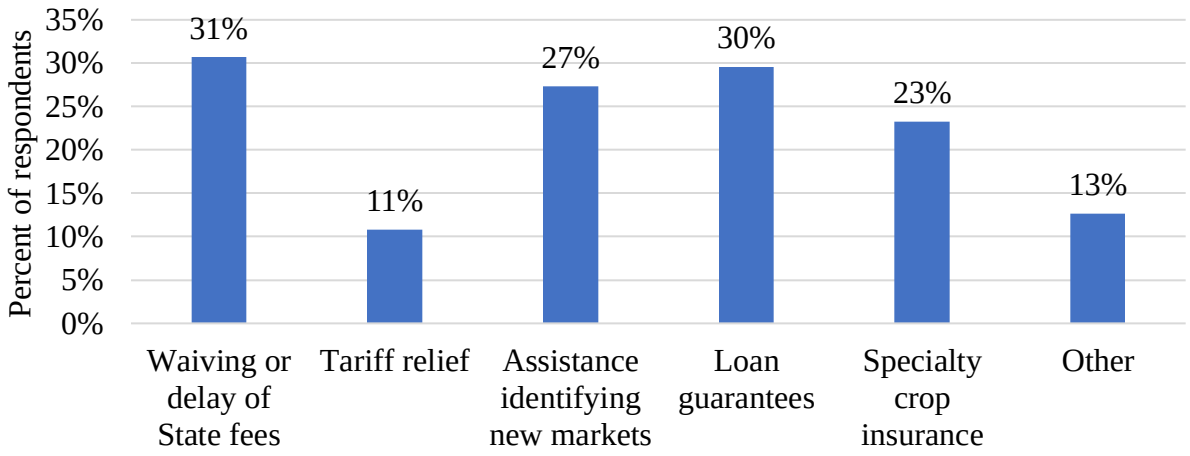
- Federal assistance : 65%
- State assistance : 47%
- Local assistance : 24%
- Assistance from associations : 18%
- Other : 14%
- None : 13%



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

(n = 443)

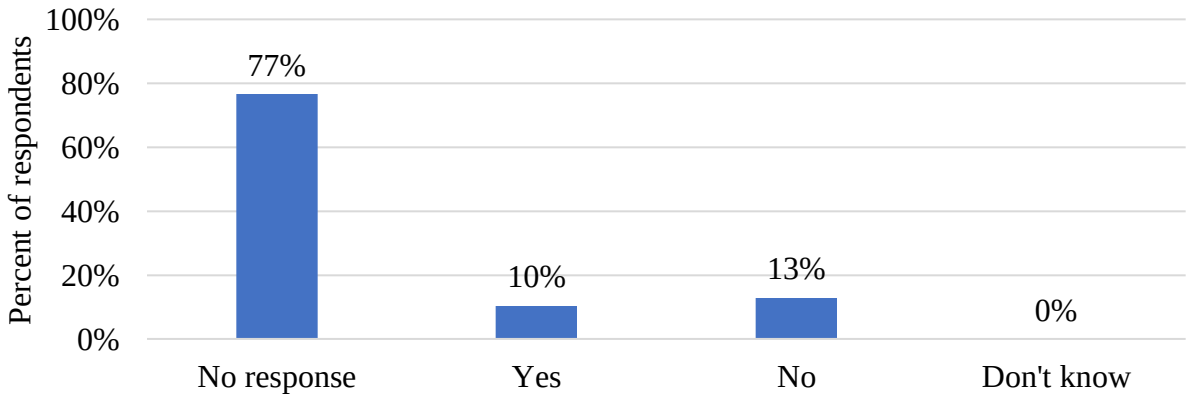
- Waiving or delay of State fees : 31%
- Tariff relief : 11%
- Assistance identifying new markets : 27%
- Loan guarantees : 30%
- Specialty Crop Insurance : 23%
- Other : 13%



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?

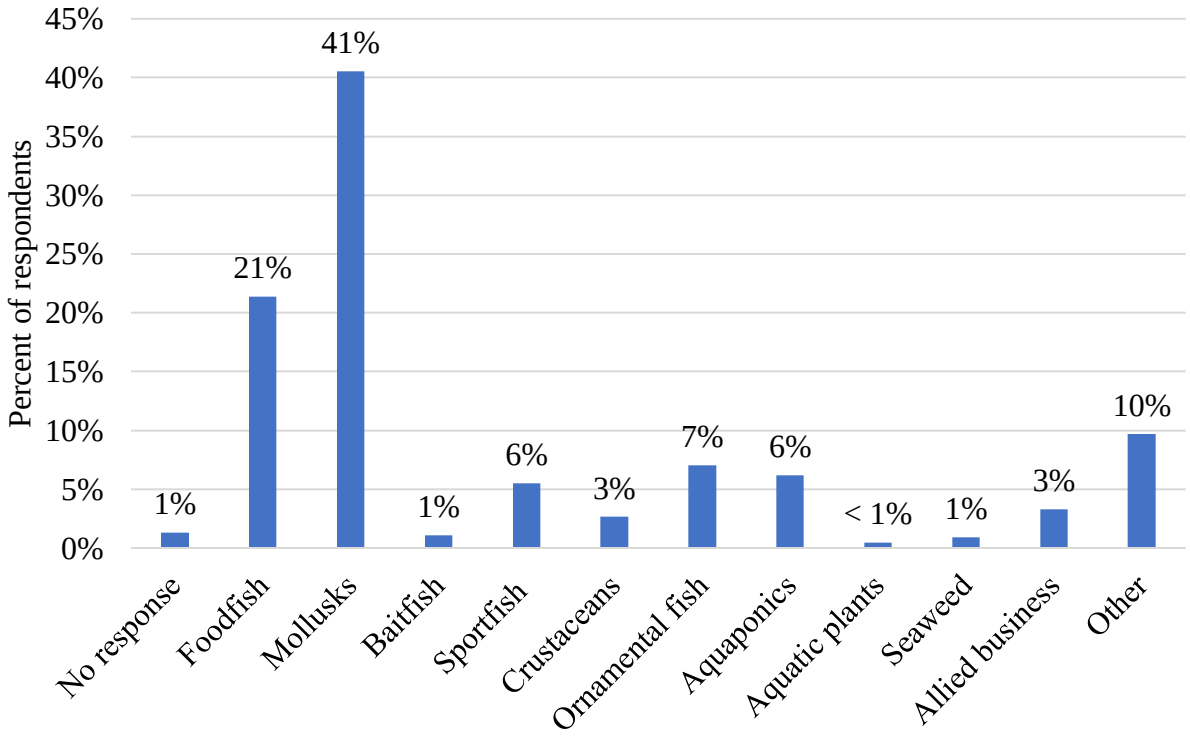
(n = 442)

- No response : 77%
- Yes : 10%
- No : 13%
- Don't know : 0%



Q19. What is the primary product that your farm or business produces?
(n = 454)

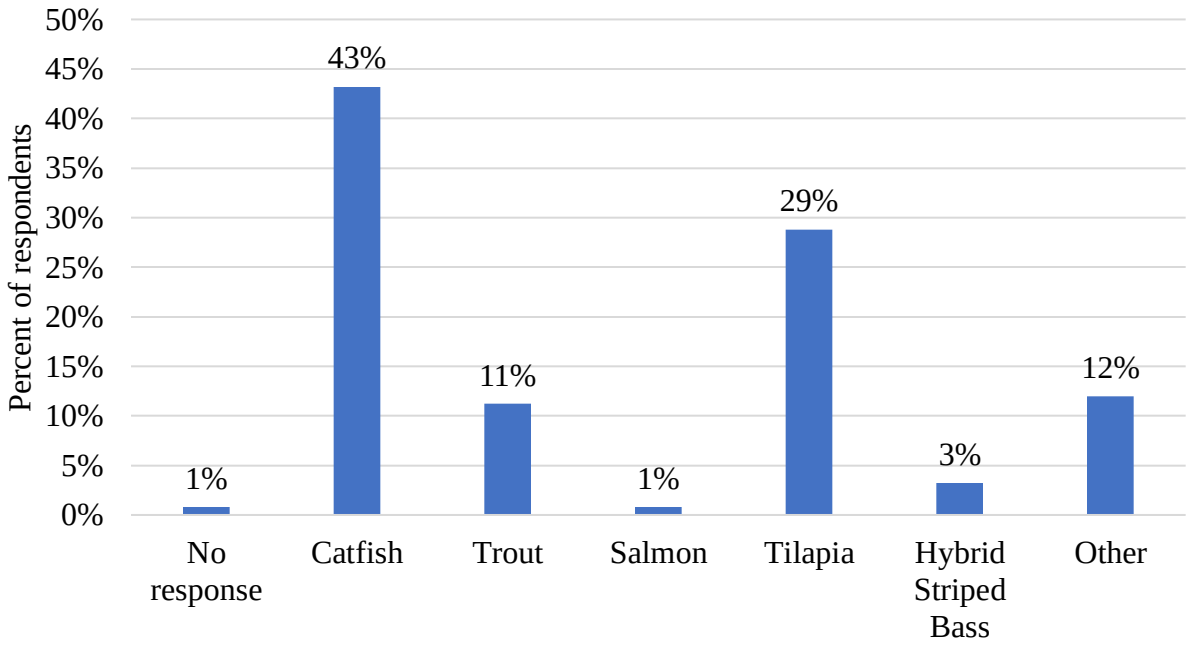
- No response : 1%
- Foodfish : 21%
- Mollusks (oysters, clams, mussels, etc.) : 41%
- Baitfish : 1%
- Sportfish / recreational fish, including trout : 6%
- Crustaceans (crawfish, soft crab, shrimp, etc.) : 3%
- Ornamental fish (aquarium or water garden) : 7%
- Aquaponics : 6%
- Aquatic plants : < 1%
- Seaweed : 1%
- Allied business (equipment, chemicals, etc.) : 3%
- Other : 10%



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

(n = 125)

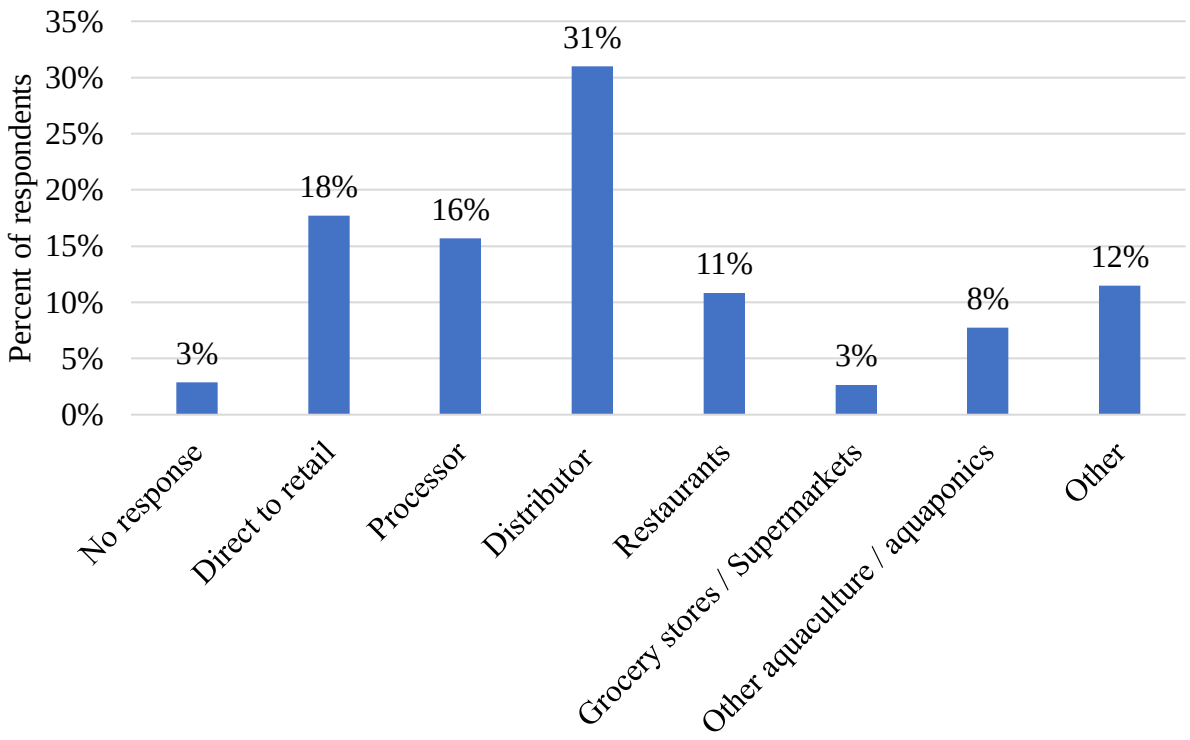
- No response : 1%
- Catfish : 43%
- Trout : 11%
- Salmon : 1%
- Tilapia : 29%
- Hybrid Striped Bass : 3%
- Other : 12%



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

(n = 452)

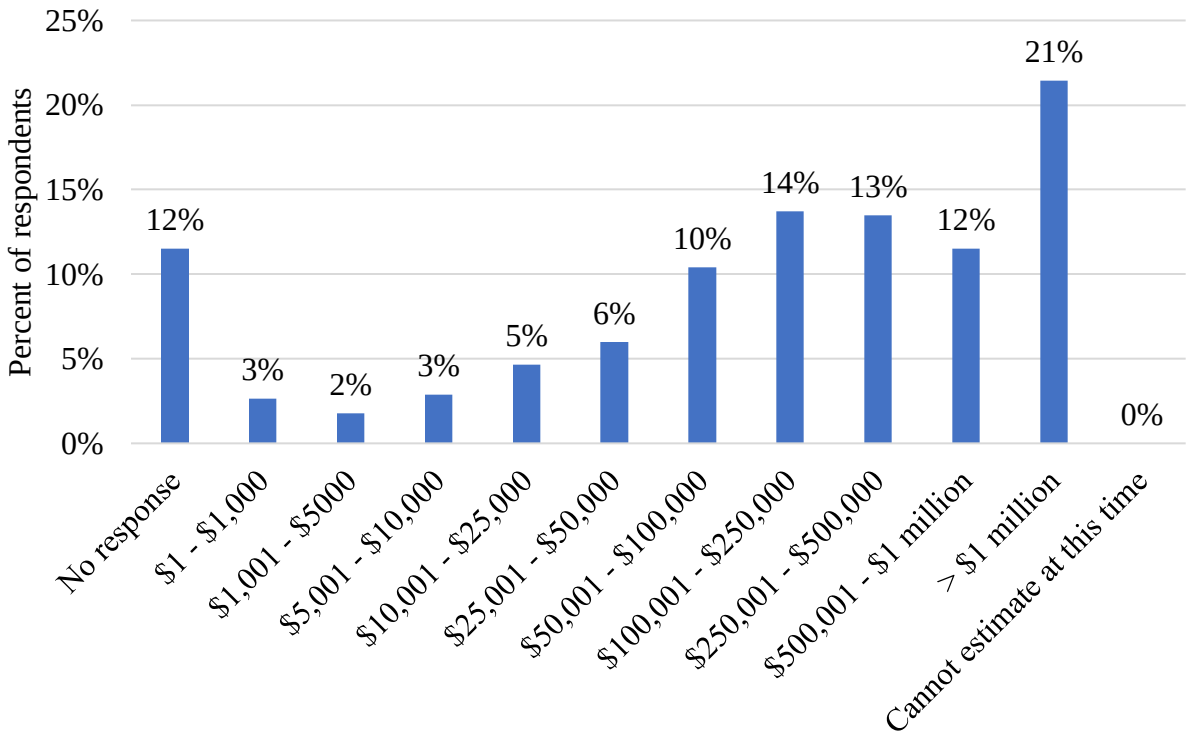
- No response : 3%
- Direct to retail (direct to consumers) : 18%
- Processor : 16%
- Distributor : 31%
- Restaurants : 11%
- Grocery Stores / Supermarkets : 3%
- Other aquaculture/aquaponics farms or businesses : 8%
- Other : 12%



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

(n = 452)

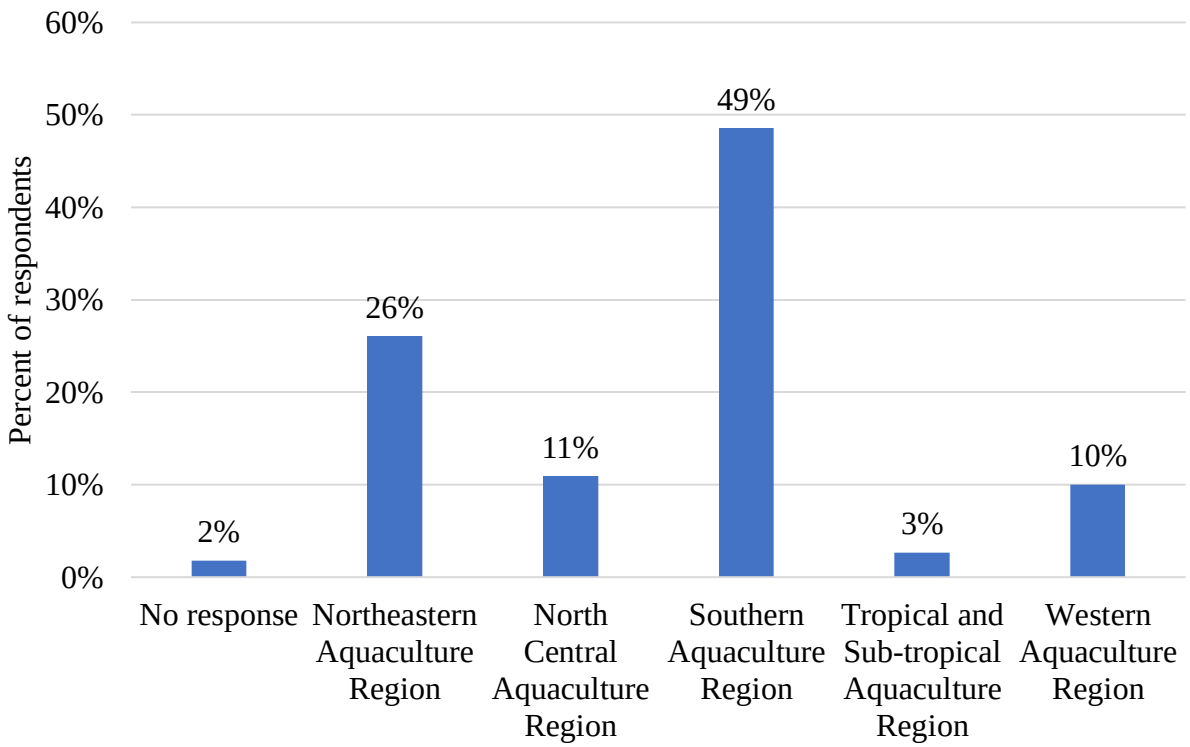
- No response : 12%
- $1 - $1,000 : 3%
- $1,001 - $5,000 : 2%
- $5,001 - $10,000 : 3%
- $10,001 - $25,000 : 5%
- $25,001 - $50,000 : 6%
- $50,001 - $100,000 : 10%
- $100,001 - $250,000 : 14%
- $250,001 - $500,000 : 13%
- $500,001 - $ 1million : 12%
- Greater than $1 million : 21%
- Cannot estimate at this time : 0%



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

(n = 449)

- No response : 2%
- Northeastern Aquaculture Region : 26%
- North Central Aquaculture Region : 11%
- Southern Aquaculture Region : 49%
- Tropical and Sub-Tropical Aquaculture Region : 3%
- Western Aquaculture Region : 10%



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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.

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