

October 2019  
19-PB 26

## Midwest Crop Farmers' Perceptions of the U.S.-China Trade War

**Shuyang Qu**, Assistant Professor, Department of Agricultural Education and Studies, Iowa State University, [squ@iastate.edu](mailto:squ@iastate.edu)

**Wendong Zhang\***, Assistant Professor, Department of Economics and Center for Agricultural and Rural Development, Iowa State University, [wdzhang@iastate.edu](mailto:wdzhang@iastate.edu)

**Minghao Li**, Assistant Professor, Department of Economics, Applied Statistics & International Business, New Mexico State University, [minghao@nmsu.edu](mailto:minghao@nmsu.edu)

**Lulu Rodriguez**, Global Programs Lead, Seed Science Center, Iowa State University, [lulurod@iastate.edu](mailto:lulurod@iastate.edu)

**Guang Han**, Graduate Research Assistant, Department of Agricultural Education and Studies and Sustainable Agriculture Graduate Program, Iowa State University, [guanghan@iastate.edu](mailto:guanghan@iastate.edu)

**Erin Cork**, Undergraduate Research Assistant, Department of Agronomy and Economics, Iowa State University, [encork@iastate.edu](mailto:encork@iastate.edu)

**James M. Gbeda**, Graduate Research Assistant, Department of Economics, Applied Statistics & International Business, New Mexico State University, [jmgbeda@nmsu.edu](mailto:jmgbeda@nmsu.edu)

\*Corresponding Author

Published by the Center for Agricultural and Rural Development, 578 Heady Hall, Iowa State University, Ames, Iowa 50011-1070; Phone: (515) 294-1183; Fax: (515) 294-6336; Web site: [www.card.iastate.edu](http://www.card.iastate.edu).

© Author(s). The views expressed in this publication do not necessarily reflect the views of the Center for Agricultural and Rural Development or Iowa State University.

Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. veteran. Inquiries can be directed to the Interim Assistant Director of Equal Opportunity and Compliance, 3280 Beardshear Hall, (515) 294-7612.

## **Executive Summary**

The trade dispute between the United States and China that began in 2018 quickly reached an unprecedented level. As of June 2019, several rounds of talks had failed to prevent the United States from imposing tariffs on more than \$250 billion worth of Chinese products. China then retaliated with tariffs on more than \$110 billion worth of U.S. products, including substantial tariffs on agricultural products such as soybeans, pork, and ethanol. The trade war escalated yet again on August 23, when China announced tariffs on another \$75 billion worth of U.S. products in response to President Trump's newest tariffs on \$300 billion worth of Chinese imports. The United States implemented the new tariffs in two rounds, on September 1 and December 15, 2019, along with renewed 5% hikes on \$250 billion worth of previously taxed Chinese products. Overall, the average U.S. tariff rates on Chinese products rose from 3.1% in January 2018 to 12.4% in September 2018, and eventually climbed to 24.3% in December 2019. The Chinese tariffs on U.S. exports rose from an average of 8.0% in January 2018 to 16.5% in June 2019; however, this figure is set to increase to an average of 25.9% by December 2019.

As of September 1, 2019, China's retaliatory tariffs cover almost all agricultural exports from the United States. It is important to understand the ongoing U.S.-China trade war's impacts on the agricultural economy and wellbeing of American farmers, considering that the United States ships more than \$20 billion worth of agricultural products, including one in four rows of soybeans, to China each year. While economists have begun in earnest to examine the effects of the trade dispute on the U.S., Chinese, and global economies, scholars are yet to evaluate how U.S. farmers, especially those from agricultural states, perceive the immediate and long-term repercussions of this protracted trade war. How do they keep themselves informed of rapidly evolving events? Where do they get news and information to cope with the prolonged disruption of trade with a major market? Do their perceptions correlate with the information they get from these sources, their farming characteristics, and the actual economic impacts of this trade disruption? How do farmers' adjust planting, marketing, and risk management decisions to the trade war?

We fill this research gap by providing a micro-level analysis of farmers' perceptions and views of the U.S.-China trade war. We asked farmers in Minnesota, Iowa, and Illinois with at least 250 operating acres of corn or soybeans to respond to an online questionnaire administered from February to April 2019. We mailed two follow-up questionnaires, following Dillman's Tailed Survey Design method and closed the data collection in June 2019. Both online and the mailed survey yielded 794 responses, resulting in a response rate of 26.5%. A total of 693 out of 794 responses were deemed usable for analysis, 44% were from Iowa, 32% were from Illinois, and 23% were from Minnesota. The vast majority are male (96%), and 36% have a bachelor's or higher degree. Slightly over one-third also raise livestock, and two-thirds derive income from off-farm sources. Thirty-one percent report a 2018 total annual gross farm income of \$250K–\$499K, 27% said they earned \$500K–\$999K per year, and 21% report farm earnings of over \$1 million.

Combining Likert scale items with open-ended questions, we elicited farmers' insights into how they view general U.S.-China bilateral relations, identify their information needs regarding this issue, and solicit their suggestions about how the impasse can be resolved. Aside from teasing out farmers' preferred information sources, our survey examines how their planting, marketing, and storage decisions may have shifted due to the trade dispute.

Our results show that despite the immediate negative economic impacts they have experienced, over 56% were still somewhat (38%) or strongly supportive (22%) of President Trump's tariffs on Chinese products. Only 18% strongly oppose raising tariffs, and only 12% were somewhat opposed to it. This generally favorable assessment of the president's stance prevails even though the vast majority of our respondents report experiencing substantial economic loss because of

the trade disruptions. Over 80% thought the trade disruption had an adverse effect on net farm income in 2018, and 42% and 29% saw their net farm income go down 10–20% or by over 20%, respectively. Therefore, it is not surprising that 81% wish for normal trade relations to resume. It is important to note that farmers experience significant income shocks, but that did not affect their support for the president's approach. This relates, in part, to the 2018 Market Facilitation Program payments that a vast majority of farmers (86%) find at least somewhat useful. It is worth noting that our survey was conducted before farmers were given \$16 billion in payments in the 2019 Market Facilitation Program.

We find that in general, our farmer-respondents largely view the trade disruption as a short-term-pain/long-term-gain phenomenon. More than half of our sample (54.8%) disagree or strongly disagree that nothing good will come out of the trade disruption. Farmers are more optimistic about the prospect of future gains while being conscious regarding future economic losses resulting from China's diversification efforts away from the United States. While only 14% thought their farm operation would be better off financially a year from now because of the trade disruption, the number of farmers who think the U.S. economy will be stronger in three years rose to 44%. At the same time, a vast majority (76%) recognize that American farmers will bear the brunt of the tariffs imposed by China, and 62% agree that U.S. agriculture is likely to lose markets.

Consistent with the perception of treating this trade disruption as a short-term phenomenon, we did not detect changes in farmers' planting, marketing and/or storage decisions due to the trade disruption with China (e.g., farmers did not plant less soybeans compared to the 2013–17 level, and did not make more sales using pre-harvest marketing tools).

What do farmers think about U.S.-China economic and political relations in general? A majority of our sample harbor five "pain points" related to China: poor intellectual property protection, the trade deficit, the U.S. Treasury debt it holds, cyber-economic espionage, and job losses to China. Although respondents split on opinions about whether or not China is an ally to the US economically, they think it is important for the United States to maintain a healthy economic relationship with China.

Regarding their communication habits when it comes to trade and other economic issues, our sample tends to rely on newsletters from farmers' groups and organizations, radio, and TV news, in that order. FOX News, farm bureaus, and *Successful Farming* magazine were the most frequently cited information sources.

Given the fluid nature of the trade negotiations, it is important to note that our findings represent only a snapshot of the opinions held by farmers in three Midwestern states. Their views and decisions may have shifted depending on several factors, including the extent of the 2019 MFP payments they receive, further threats of tariffs, and recent progress in trade talks with a possible phase 1 of a trade deal. Our survey also focuses exclusively on crop farmers, though livestock farmers also have experienced significant business disruption.

## **Introduction**

The trade dispute between the United States and China that began in 2018 quickly reached an unprecedented level. As of June 2019, several rounds of talks failed to prevent the United States from imposing tariffs on more than \$250 billion worth of Chinese products.

China has imposed tariffs on more than \$110 billion worth of U.S. products, including substantial tariffs on agricultural products such as soybeans, pork, and ethanol. The trade war escalated yet again on August 23, 2019 when China announced tariffs on another \$75 billion worth of U.S. products in response to President Trump's newest tariffs on \$300 billion worth of Chinese imports. The United States implemented the new tariffs in two rounds, on September 1 and December 15, 2019, along with renewed 5% hikes on \$250 billion worth of previously taxed Chinese products. Overall, the average U.S. tariff rates on Chinese products rose from 3.1% in January 2018 to 12.4% in September 2018, and eventually climbed to 24.3% in December 2019. The Chinese tariffs on U.S. exports rose from an average of 8.0% in January 2018 to 16.5% in June 2019. This figure is set to increase to an average of 25.9% by December 2019. As of September 1, 2019, China's retaliatory tariffs cover almost all agricultural exports from the United States.

We conducted a micro-level analysis of farmers' perceptions and views of the U.S.-China trade war by administering online and mailed questionnaires to farmers in Minnesota, Iowa, and Illinois from February to April 2019.

## **Data Collection**

The population of interest in this study was corn and soybean farmers (age 18 or older) operating 250 acres or more acres in Iowa, Illinois, or Minnesota, the top three corn and soybean producing states in the country. We selected a stratified random sample of 3,000 farmers based on these criteria to represent all counties across the three states, with 1155 from Iowa, 1058 from Illinois, and 787 from Minnesota. Following Dillman's Tailored Survey Design method, we sent the first invitation to complete the questionnaire online to the sample of farmers on March 13; and we sent printed questionnaires on April 15 and a follow-up second mailing on May 7 (with the option of responding online) to farmers who had not completed the questionnaire by the time of distribution. We closed the data collection on June 12.

The questionnaire asked farmers about their information seeking habits regarding the U.S.-China trade disruption, general attitude toward the trade dispute, perceived impact on their own farms and U.S. agriculture as a whole, knowledge and expectations of the trade disruption, crop marketing and storage behavior from 2013 to date, and plans for the future.

Both online and the mailed survey yielded 794 responses, resulting in a response rate of 26.5%. A total of 693 out of 794 responses were deemed usable for analysis, 44% were from Iowa, 32% were from Illinois, and 23% were from Minnesota. The number of responses used for each table below may vary to take advantage of more responses to certain questions.

## **Awareness of, and Attitude about, the Trade Disruption**

Over 80% of respondents indicate they were moderately to very informed about the trade dispute, and less than 10% report that they were slightly informed to not informed at all. More than half feel the amount of information they have heard about the issue is "about right," and about 23% feel they have not heard enough about it. These findings suggest that although more than 90% of surveyed farmers feel they are at least moderately informed, more than 20% of them indicate they hear too little or far too little about this issue, as shown in tables 1 and 2.

**Table 1. How Informed Respondents are about the Trade Disruption**

	Not Informed	Slightly Informed	Moderately Informed	Very Informed	Extremely informed
#	1	50	284	274	82
%	0.1	7.2	41.1	39.7	11.9

**Table 2. How Much Respondents have heard about the Trade Disruption**

	Far Too Little	Too Little	About Right	Too Much	Far Too Much
#	19	143	370	112	45
%	2.8	20.8	53.7	16.3	6.5

As table 3 shows, nearly 60% of respondents somewhat support or strongly support raising tariffs on products imported from China, while about 30% somewhat or strongly oppose it.

**Table 3. Respondents' Level of Support for Raising Tariffs on Products Imported from China**

	Strongly Oppose	Somewhat Oppose	Neither	Somewhat Support	Strongly Support
#	117	82	71	250	142
%	17.7	12.4	10.7	37.8	21.5

### Views about the Impacts of the Trade Disruption on U.S. Agriculture

As shown in table 4, the majority of respondents feel the negative effects of the trade disruption on their farm. Only about 14% believe their farm operation will be better off financially a year from now because of the trade disruption, while slightly more than 20% think the same about U.S. agriculture as a whole. More than 40% believe the trade disruption will enhance the U.S. economy as a whole three years from now. As farmers perceive more benefits in the future, they tend to feel less negative about the trade dispute. Although the majority think the agricultural sector, including their farm, will suffer the most, many believe the U.S. economy will benefit from the trade dispute with China. Over 80% want the trade disruption to end, over 70% feel American farmers will bear the brunt of the tariffs, and more than 60% feel the United States is losing customers to competitors as a result. These findings suggest the frustration and magnitude of potential risks farmers see themselves as facing due to the trade dispute.

**Table 4. Respondents' Extent of Agreement with Statements Regarding the Impact of the Trade Disruption on U.S. Agriculture**

	Strongly Disagree	Disagree	Neither agree nor Disagree	Agree	Strongly Agree
Nothing good will come out of this trade disruption.	15.9	38.7	15.5	17.2	12.7
I hope this trade disruption is resolved soon.	1.5	2.3	14.6	34.2	47.3
The trade disruption will make U.S. agriculture lose markets to our competitors.	5.1	14.7	17.8	33.5	28.9
The U.S. economy will suffer more than China's economy due to this trade disruption.	11.8	26.8	25.2	23.0	13.3
American farmers will bear the brunt of the tariffs imposed by the Chinese government.	3.4	5.6	15.1	41.6	34.3
A year from now, <b>my farm operation</b> will be better off financially because of this trade disruption.	26.4	26.9	32.8	11.3	2.7
A year from now, <b>U.S. agriculture</b> will be better off compared to now because of this trade disruption.	23.1	25.3	31.4	17.6	2.5
Three years from now, <b>the U.S. economy</b> in general will be better off because of the trade disruption.	13.3	13.0	28.3	33.6	9.8
The tariffs imposed by the U.S. and China on each other's products will have long-term negative effects on <b>U.S. agriculture</b> .	6.8	20.8	25.1	27.9	19.5
This trade disruption will enhance the economic relationship between the U.S. and China in the long run.	14.3	19.0	30.2	31.4	5.2

Note: Numbers represent percent of respondents, each row sums to 100.

### Views about the Economies of the United States and China and U.S.-China Economic Relations

More than 70% of respondents agree or strongly agree with the statements "The amount of U.S. debt held by China is a serious problem for the U.S.," "The trade deficit with China is harmful to the U.S. economy," and "China engages in cyber economic espionage against the U.S." However, more than 90% also believe it is important to maintain a healthy relationship with China. Respondents split on topics such as the Trans-Pacific Partnership (TPP) and China being an ally to the United States economically, but are neutral about or in favor of multilateral trade, as table 5 shows. These results indicate the majority negatively relate the current debt, deficits, and job losses to China, although they believe a healthy economic relationship with China is important.

**Table 5. Respondents' Extent of Agreement with Statements Related to the Economies of China and the United States**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
The amount of U.S. debt held by China is a serious problem for the U.S.	0.9	3.8	17.6	53.0	24.8
The trade deficit with China is harmful to the U.S. economy.	2.1	9.3	16.2	54.0	18.3
China engages in cyber economic espionage against the U.S.	1.1	1.4	27.0	43.2	27.3
The number of jobs Americans lose to China is problematic.	1.6	8.4	26.4	48.9	14.9
Economically, China is an ally of the U.S.	7.8	25.1	35.9	28.2	3.0
It is important for the U.S. to maintain a healthy economic relationship with China.	0.1	0.6	7.2	67.0	25.1
The U.S. will be better off using a multilateral approach, rather than a unilateral one, in dealing with trade disputes.	1.1	5.9	43.1	36.3	13.6
The U.S. is better off leaving the TPP (Trans-Pacific Partnership).	16.0	20.6	44.1	16.3	3.0

Note: Numbers represent percent of respondents, each row sums to 100.

Table 6 shows that less than 6% of respondents disagree or strongly disagree with the statements “The Chinese government exerts too much influence on the value of its currency,” “China’s record of enforcing intellectual property rights leaves much to be desired,” and “China often gets into territorial disputes with other countries.” However, more than 40% agree or strongly agree that “China’s growing economic strength is good for the world,” as shown in table 6. This shows the majority disagree with how China’s government deals with intellectual property and the nation’s currency. Most respondents see China’s economic strength, but not its conduct, as good for the world.

**Table 6. Respondents' Extent of Agreement with Statements Related to China**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
China's growing economic strength is good for the world.	3.4	16.6	38.6	38.1	3.3

The Chinese government exerts too much influence on the value of its currency.	0.6	2.3	38.5	45.2	13.5
China's record of enforcing intellectual property rights leaves much to be desired.	0.3	1.0	23.3	44.5	31.0
China often gets into territorial disputes with other countries.	0.6	4.9	47.8	35.5	11.3

Note: Numbers represent percent of respondents, each row sums to 100.

### Use of and Views about Trade Disruption Information Sources

Farmers use the radio, TV news, and farmers' groups/organizations most frequently to keep abreast of developments on this issue. Social media, online magazines, and online newspapers were the least-used information sources about the topic, as shown in table 7.

**Table 7. How Frequently Respondents Seek Information about the Trade Disruption from Various Sources**

	Never	Rarely	Sometimes	Often	All the Time
TV news	10.3	17.4	32.3	31.1	8.9
Radio	7.8	15.6	36.2	31.3	9.1
Printed newspapers	16.1	21.0	32.3	25.0	5.6
Online newspapers	37.5	24.3	18.5	16.5	3.2
Printed magazines	11.7	15.6	39.4	28.6	4.7
Online magazines	44.1	24.8	18.6	10.1	2.4
Social media	47.7	20.2	20.0	8.6	3.5
Farmers' groups and organizations	7.7	13.5	39.9	30.6	8.3
University sources	18.6	27.6	35.4	16.5	2.0
Government agencies or officials	16.5	30.2	37.9	12.1	3.3
Family, friends, or neighbors	11.0	25.9	43.8	15.0	4.3

Note: Numbers represent percent of respondents; each row sums to 100.

As table 8 shows, respondents view social media and online sources as least credible, while farmers' groups, university sources, and the radio scored the highest in farmers' credibility ratings.



**Table 8. Credibility Ratings of Various Sources on the Trade Dispute Issue**

	Not at all Credible	Slightly Credible	Moderately Credible	Very Credible	Extremely Credible
TV news	16.0	22.6	43.2	13.2	5.0
Radio	5.3	15.7	50.9	22.7	5.4
Printed newspapers	9.8	19.5	50.1	17.0	3.7
Online newspapers	14.3	26.0	48.9	9.0	1.9
Printed magazines	6.1	13.7	55.9	20.8	3.5
Online magazines	12.6	21.2	52.9	11.5	1.8
Social media	26.6	33.5	34.4	4.0	1.6
Farmers' groups and organizations	2.8	10.0	43.0	34.1	10.2
University sources	4.1	11.4	44.1	32.9	7.5
Government agencies or officials	7.9	18.8	54.2	15.2	3.8
Family, friends, or neighbors	7.9	24.9	55.3	9.1	2.8

Note: Numbers represent percent of respondents; each row sums to 100.

Table 9 shows that respondents view farmers' groups and organizations as most informative about the trade war, and they view TV news, social media, and online sources as the least informative. Respondents view many of the mediated and interpersonal communication sources listed as moderately credible—only a few respondents indicated any of the sources as extremely informative.

**Table 9. How Informative Sources are about the Trade Disruption**

	Not at all Informative	Slightly Informative	Moderately Informative	Very Informative	Extremely Informative
TV news	12.6	25.9	43.2	13.7	4.7
Radio	5.6	20.5	47.8	21.0	5.1
Printed newspapers	7.7	22.4	49.4	17.0	3.5
Online newspapers	13.0	30.7	43.8	9.5	3.0
Printed magazines	4.9	18.1	52.1	20.9	4.1
Online magazines	12.1	26.1	48.4	9.6	3.9
Social media	22.6	34.4	35.1	5.5	2.5
Farmers' groups and organizations	2.7	11.5	45.3	30.3	10.3
University sources	3.8	15.9	46.5	27.1	6.7

Government agencies or officials	8.9	25.4	48.1	13.8	3.9
Family, friends, or neighbors	9.0	30.6	49.8	8.1	2.6

Note: Numbers represent percent of respondents, each row sums to 100.

### Most-frequently Used News Sources

When asked to specify their three most-frequently used news shows, channels, or programs, respondents say they most frequently turn to FOX News, farm bureaus, *Successful Farming*, the USDA, university extension, and CNN, with FOX News being the most referenced source. In particular, a total of 205 respondents rated FOX News as one of the three top sources regarding the trade disruption, followed by 201, 199, and 165 for farm bureaus, *Successful Farming*, and the USDA, respectively. Other sources mentioned include the *Wall Street Journal*, AgWeb, DTN, *Farm Journal*, farm magazines, WHO AM 1040, and *Wallaces Farmer*.

### Marketing and Risk Management

Respondents in spring 2019 indicated they primarily grow corn and soybeans with very few other crops planted or harvested in the past six years. Our results also show an increase in planned planting acres allocated to other crops for the 2019 season, mostly in Minnesota, due to a planned reduction in soybean planting acres.

The trade war has a direct impact on soybeans, as 62% of U.S. soybean exports were destined to China in 2016 and were cut in half in 2018. Adverse effects are less severe for corn, for which the U.S.-China is only 1.5% of total U.S. corn exports to the world. However, despite differences in the corn and soybean situation, survey results show that farmers do not intend to substantially change their planting decisions.. Table 10 shows that on average, farmers plan to plant 53.7% of their acreage with corn and 42.2% with soybeans, close to the average levels between 2013 and 2017, and the average levels in 2018. According to USDA's June 2019 acreage report (<http://bit.ly/JuneAcreageUSDA2019>), from 2018 to 2019, acreage planted for soybean substantially decreased across the three states—10% in Iowa, 4.6% in Illinois, and 11.5% in Minnesota. There are two potential sources for this discrepancy: (a) we only surveyed medium to large farms while smaller farms may change their planting decision; and, (b) farmers may have changed their planting intentions after our survey, possibly because of weather conditions.

**Table 10. Average Percentage of Corn, Soybean, and Other Crops Planted, 2013–2017, in 2018, and Plans for 2019**

	2013–17 Average	2018	2019 Plan
Corn	54.0	53.1	53.7
Soybeans	43.8	44.4	42.2
Other crops	2.3	2.5	4.1
<b>Total</b>	<b>= 100%</b>	<b>= 100%</b>	<b>= 100%</b>

Post-harvest marketing is the most popular method of selling soybeans, and based on respondents' plans for 2019 it will remain so. At-harvest marketing rates were used slightly less in favor of pre-harvest marketing.

Pre-harvest marketing is an important way for farmers to mitigate risk. However, those we surveyed do not express substantially higher interest in pre-harvest marketing in response to the trade war. In 2018, the year the trade war started, farmers said they would sell 33.3% of their products through pre-harvest marketing, a moderate 2.2% increase from the 2013 to 2017 levels. For 2019, they say they plan to market essentially the same percentage of crops through pre-harvest marketing, as shown in table 11.

**Table 11. Percentage of Soybean Harvest Marketed Pre-harvest, at Harvest, and Post-harvest, 2013–17, in 2018, and Plans for 2019**

	2013–17 Average	2018	2019 Plan
Pre-harvest	31.1	33.3	33.5
At harvest	14.4	13.6	12.7
Post-harvest	54.6	53.2	53.8
<b>Total</b>	<b>= 100%</b>	<b>= 100%</b>	<b>= 100%</b>

In terms of marketing destinations, table 12 shows that cooperative elevators are the top choice—more than 60% of respondents indicate they sent soybeans to cooperative elevators in 2018. Private elevators, river terminals, and in-state soybean crushers are also major destinations, each receiving soybeans from about 20% of our respondents. A small minority (4.0%) sent their soybeans to out-of-state soybean crushers or had their soybeans picked up from the farm.

**Table 12. Marketing Destination(s) for 2018 Soybean Crop**

Marketing Destinations	% of Respondents	Standard Deviation
Cooperative county elevator	60.1	49.0
Private county elevator	21.3	41.0
River terminals	19.3	39.5
In-state soybean crusher	19.9	40.0
Out-of-state soybean crusher	4.0	19.5
Picked up from the farm, destination unknown	2.4	15.4

In 2018, 48% of respondents chose to store their soybean exclusively on-farm, 20.3% utilized only commercial storage, and 25.9% used both. Only 5.8% did not store soybeans at all, as shown in table 13.

**Table 13. How 2018 Soybean Crop was Stored**

Storage Plan	Average % of Respondents
On-farm only	48.0
Commercially only	20.3
Both on-farm and commercially	25.9
Did not store soybeans in 2018	5.8

As table 14 shows, 65.5% of respondents stored more than 50% of their soybean crop and 21.8% stored their entire crop in 2018. This suggests farmers heavily rely on storage in their crop marketing plan.

Tables 15 and 16 show that in response to the trade war, 33.6% of our farmer-respondents increased the amount of soybean they stored in 2018. Indeed, 15.5% say they substantially increased the percentage of the soybean crop they stored. A total of 29.5% say they plan to further increase storage in 2019, with 13.8% planning to store a lot more soybean relative to 2018. Storage can be used in combination with marketing tools such as the futures market in the risk management strategy. However, we only find modestly higher use of these marketing tools (see table 17). Therefore, instead of using storage to managing risk, it seems that farmers are mostly storing crops and waiting for soybean price to bounce back, which has not happened as of this writing.

**Table 14. Amount of 2018 Soybean Crop Respondents Stored**

Amount of Soybean Stored	Average % of Respondents
None, including pre-sold	12.0
Some, < 25%	7.7
25–50%	14.9
50–75%	20.8
75–99%	22.9
100%	21.8

**Table 15. How the Trade Disruption affected Soybean Storage Patterns in 2018**

Changes in 2018 Soybean Storage Patterns due to the Trade Disruption	Average % of Respondents
Decreased storage a lot	3.5
Decreased storage a little	3.8
Did not change storage	59.0

Increased storage a little	18.1
Increased storage a lot	15.5

**Table 16. Perceived Changes in 2019 Soybean Storage Plan Compared to 2018**

Intended Changes in 2019 Soybean Storage Patterns due to the Trade Disruption	Average % of Respondents
Will decrease storage a lot	3.5
Will decrease storage a little	6.1
Will not change storage	60.9
Will increase storage a little	15.7
Will increase storage a lot	13.8

Aside from adjusting their crop storage practices, farmers plan to employ other risk management tools. On average, they intend to lower cash sales by 3.8% and make use of other marketing channels that hedge against risk. Table 17 shows that among these risk management tools, basis contracts will see the largest increase—from 4.4% in 2018 to 7.2% in 2019. While hedging risks is a rational alternative, only slightly over half of the respondents use crop marketing tools, and the uncertainty from the trade war only modestly increased the usage of these tools. Researchers should pay attention to the barriers farmers face in adopting risk management strategies.

**Table 17. Percentage of Soybean Crop Marketed using Risk Management Tools, 2013–17, in 2018, and Plan for 2019**

	2013–2017 Average	2018	2019 Plan
Spot cash sale	43.9	42.8	39.0
Hedge-to-arrive contract	5.5	5.8	6.4
Options	0.9	0.7	1.9
Futures hedge	3.8	4.3	5.1
Cash forward contract	37.4	36.7	36.8
Basis contract	4.3	4.4	7.2
Other	4.3	5.3	4.4
<b>Total</b>	<b>=100.0%</b>	<b>=100.0%</b>	<b>=100.0%</b>

Note: Numbers indicate percent of respondents, each column sums to 100.

## Knowledge and Expectations about the Trade Disruptions

We find our respondents knowledgeable about the trade war and the levels of the trade aid payments they received. There are fewer correct responses when the questions are not directly related to the farm operation. In particular, we asked three questions to gauge respondents' knowledge about the agricultural trade situation with China: the tariff rate imposed by China on U.S. soybean exports, the payment level per bushel for soybean producers offered in the 2018 Market Facilitation Program (MFP), and the percent of U.S. soybean exports sent to China in 2016 before the trade disruption.

As table 18 shows, close to 64% know that the Chinese government imposed a 25% tariff on U.S. soybean exports in July 2018. However, about 36% provided inaccurate tariff percentages imposed on U.S. soybean exports by China. This suggests that our respondents are knowledgeable about the trade disruption in general and the tariffs China imposed on U.S. agricultural products in particular.

More than half of our respondents do not know the exact volume of U.S. soybean shipped to China in 2017. Specifically, as table 19 shows, about 65% of farmers answered this question incorrectly. Only 35% correctly said that the United States shipped 60% of soybeans to China in 2017.

Table 20 shows that 90.3% of respondents know the exact payment rate for soybean producers (\$1.65/bushel) from the 2018 MFP. Only a few (9.7%) could not provide the accurate payment rate.

**Table 18. Percent of Tariff Respondents Believe the Chinese Government Imposed on U.S. Soybean Exports in July 2018**

Tariff %	% of Respondents
10%	7.5
15%	13.1
<b>25% (Correct)</b>	<b>63.8</b>
35%	10.1
45%	5.5

**Table 19. Perceived Percentage of U.S. Soybean Exports Shipped to China in 2017**

Percent of Soybean Exported to China	% of Respondents
15%	4.9
30%	24.5
45%	27.7
<b>60% (Correct)</b>	<b>34.8</b>
70%	8.2

**Table 20. Perceived Payments Soybean Producers Received from the 2018 Market Facilitation Program**

MFP Rate for Soybean Producers	% of Respondents
\$.01/bu.	0.8
\$.14/bu.	1.7
\$.86/bu.	4.8
\$1/bu.	2.4
<b>\$1.65/bu. (Correct)</b>	<b>90.3</b>

Table 21 shows that the trade dispute negatively affected net farm incomes before the introduction of USDA trade assistance. Overall, 91.3% of respondents report having experienced a decline in net farm income. Of those respondents, 42.4% saw a 10–20% reduction, 29.3% saw a reduction greater than 20%, 14.7% saw a 5–10% reduction, and about 5% saw a reduction of less than 5% in 2018 before receiving assistance from USDA. Only a small percentage of farmers (4.2%) saw a gain in net income before they received support from USDA, and less than 10% saw no changes in net income in 2018 resulting from the trade dispute. The majority saw a cut in their income of more than 10% before the USDA assistance.

**Table 21. Extent to which the Trade Disruption affected 2018 Farm Net Income before USDA Assistance**

Net Farm Income Changes due to the Trade Disruption	% of Respondents
Down >20%	29.3
Down 10–20%	42.4
Down 5–10%	14.7
Down <5%	4.9
No Change	4.6
Up <5%	0.9
Up 5–10%	0.5
Up 10–20%	1.4
Up >20%	1.4

Generally, the majority (82.9%) acknowledge that President Trump's \$12 billion trade relief plan will help to varying degrees. Notably, 39.7% think that the trade relief will be somewhat helpful, 25% think it will be very helpful, and 18.2% think it will be quite helpful, as table 22 shows. Only a few (7.2%) are unsure if the policy will be helpful, and only 6.2% think it will not be helpful at all. The vast majority believe the trade relief plan will at least be somewhat helpful.

**Table 22. Perceived Helpfulness of President Trump's \$12 Billion Trade Relief Plan**

Views about MFP Plan	% of Respondents
Not at all helpful	6.2
Somewhat helpful	39.7
Quite helpful	18.2
Very helpful	25.0
Not sure	7.2

### Demographics and Farm Characteristics

Of the 663 who returned complete and usable questionnaires, 96.3% are male, with ages ranging from 25 to 88 (M = 60.7; SD = 10.92). On average, respondents have 38.5 years of farming experience (SD = 12.33) (a minimum of 2 and a maximum of 67 years).

Table 23 shows the majority were willing to take risks in general and farming risks in particular.

**Table 23. Respondents' Willingness to Take Risks**

		1	2	3	4	5	6	7
		(Not Willing)						(Willing)
How willing are you to take risks in general?	#	7	38	98	177	228	83	40
	%	1.0	5.7	14.6	26.4	34.0	12.4	6.0
How willing are you to take risks as a farmer?	#	7	32	90	165	226	105	45
	%	1.0	4.8	13.4	24.6	33.7	15.7	6.7



Table 24 shows the sample's composition by state. The largest majority (43.4%) of farmers are from Iowa.

**Table 24. Primary State of Farm Operation**

State	# of Respondents	% of Respondents
Iowa	301	43.4
Illinois	217	31.8
Minnesota	160	23.1

Table 25 shows the types of livestock the respondents reportedly owned in 2018. Aside from crops, many (29.1%) raised beef cattle. The majority of the farm operations, however, did not include livestock.

**Table 25. Types of Livestock Owned in 2018**

Type of Livestock	# of Respondents	% of Respondents
Beef cattle	197	29.1
Dairy	7	1.0
Poultry	15	2.2
Hog	55	8.1
Other	23	3.4
No livestock	426	62.8

*Note:* The vast majority of the hog producers were custom-feed.

Table 26 shows the majority of farmers have internet service on both their farm and residence, or on just their farm.

**Table 26. Access to the Internet in 2018**

State	# of Respondents	% of Respondents
Residence only	12	1.8
Farm only	196	29.1
Both residence and farm	441	65.4
No internet connection	25	3.7

Table 27 shows the majority earn upwards of \$250,000 from their operation. Additionally, 32.2% earn off-farm income. An average of 27.2% of farmers' annual gross household income comes from off-farm sources.

**Table 27. Respondents' Total Annual Gross Farm Income in 2018**

Gross Farm Income	# of Respondents	% of Respondents
Less than \$50,000	25	4.0
\$50,000–\$99,999	25	4.0
\$100,000–\$249,999	82	13.0
\$250,000–\$499,999	196	31.2
\$500,000–\$1 million	168	26.7
\$1 million or greater	133	21.1

Table 28 shows that very few farmers have less than a GED—the majority have graduated high school and have a minimum of some college education.

**Table 28. Respondents' Highest Level of Education**

Highest Education Level	# of Respondents	% of Respondents
Some high school or less	9	1.3
High school diploma or GED	184	27.3
Some college, or associate degree	240	35.7
Bachelor's degree	211	31.4
Graduate or professional degree	29	4.3

Table 29 shows whether respondents have ever served on any type of board of commodity groups. Most responded that they have not, but 16% of respondents have served on the board of state-level commodity groups or local farm bureaus and 3% have served at both national and state level.

**Table 29. Service on the Board of Directors of National- or State-level Commodity Associations or Local Farm Bureaus**

Service Record	# of Respondents	% of Respondents
Never	538	81.0
State only	104	15.7
National only	0	0
State and national	22	3.3