



## North Central Region

Center for FSMA Training, Extension  
and Technical Assistance

# Produce Safety Alliance Growers Training One-Year Follow-Up Evaluation Survey Results

May 2019

Results compiled by Arlene Enderton, evaluator for the North Central Region Center for FSMA Training, Extension and Technical Assistance, housed at Iowa State University

## Introduction

Congress passed the Food Safety Modernization Act (FSMA) and President Obama signed it into law in 2011. The law is the first to regulate fruit and vegetable farms and handlers in decades. The law includes seven rules, one of which is the Produce Safety Rule.

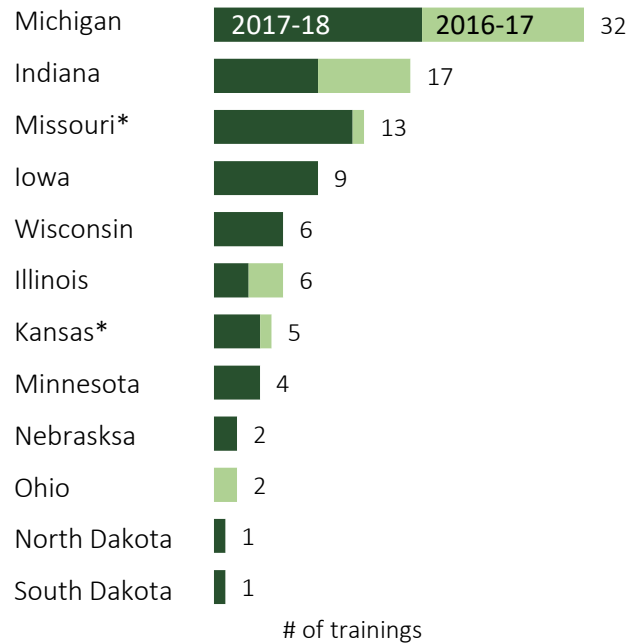
The law also established four regional centers that work with extension, state departments of agriculture, and farm service providers to organize and equip them to educate small-scale growers and processors about FSMA and help them comply. The North Central Region Center for FSMA Training, Extension and Technical Assistance (NCR FSMA) is housed at Iowa State University and serves 12 Midwest states.

One requirement of the Produce Safety Rule is that farmers who are covered under the rule participate in an approved food safety course. The Produce Safety Alliance (PSA) Grower Training is the only approved course at this time.

During the winter of 2017-18 NCR FSMA partners evaluated 69 PSA trainings; in the winter of 2016-17, six NCR states held 28 trainings. Figure 1 shows that Michigan has held the most trainings, followed by Indiana.

Approximately one year after each training season, we contacted training participants with a follow-up survey to see what changes they had made on their farms or in their work in preparation for FSMA compliance since the training. This report summarizes those results.

**Figure 1: A total of 69 trainings were evaluated by NCR FSMA partners in 2017-18, and 27 in 2016-17.**



\*Missouri and Kansas held one joint training in 2016-17.

## Methods

Food safety specialists from 10 states sent the survey to their contact lists to follow up with 2017-18 trainings; Minnesota and Ohio did not send the survey. Six states participated in the survey to follow up on trainings held in 2016-17.

The survey was conducted electronically using Qualtrics™ for participants who use technology. It was sent out by postal mail to participants who do not use technology, except in Wisconsin where paper copies were sent to all participants and electronic invitations to those who use technology. One or two reminders were sent to those who use technology; no reminder was sent to those who received paper copies. Table 1 shows the dates when invitations were sent for each round of surveys and the survey format used (electronic and/or paper).

**Table 1:**  
**2017-18 training follow-up**

State	Send date	Format	# of invitations	# of responses
Illinois	01/30/19	Paper and electronic	60*	9
Indiana	12/13/18	Paper and electronic	59	14
Iowa	01/16/19	Paper and electronic	183	44
Kansas/Missouri	12/19/18	Paper and electronic	359	99
Michigan	12/03/18	Electronic only	495	105
Nebraska	11/26/19	Electronic only	47	14
North Dakota	02/11/19	Electronic only	17	5
South Dakota	02/20/19	Electronic only	20*	0
Wisconsin	01/01/19	Paper and electronic	196	74
<b>2017-18 TOTAL</b>			<b>1,436</b>	<b>364</b>
<b>RESPONSE RATE</b>				<b>25.3%</b>
<hr/>				
<b>2016-17 training follow-up</b>				
Illinois	05/09/2018	Electronic and paper	47	11
Indiana	04/04/2018	Electronic only	86	23
Kansas/Missouri	11/22/2017	Electronic only	28	10
Michigan	02/07/2018	Electronic only	600	92
Ohio	02/01/2018**	Paper only	20	4
<b>2016-17 TOTAL</b>			<b>781</b>	<b>140</b>
<b>RESPONSE RATE</b>				<b>18%</b>
<b>OVERALL TOTAL</b>			<b>2,217</b>	<b>504</b>
<b>OVERALL RESPONSE RATE</b>				<b>22.7%</b>

\*Estimates

\*\*Approximate date

Evaluator Arlene Enderton analyzed the data using SPSS™ (version 25).

The overall response rate was 22.7 percent across the two years, with the response rate from 2017-18 (25.3 percent) moderately higher than from 2016-17 (18 percent).

## Results

### How did respondents take to the survey?

Only in 2017-18 we tracked how surveys were sent (electronically or on paper) as well as the format in which responses were received. Approximately two of three (63 percent) responses to the 2017-18 survey were submitted electronically (Figure 2).

We found that the response rate was higher from those who received paper surveys (33 percent) than from those who received the survey invitation electronically (22 percent, Figure 3).

This was especially noticeable with the responses from Wisconsin. Wisconsin sent a paper copy of the survey to every participant (196 participants) and sent an invitation to the online survey to those for whom they had an email address (87 participants). Therefore, those who provided an email address received the invitation both on paper and electronically, whereas the other states sent participants with an email address only the electronic invitation. We received 74 responses from Wisconsin; 68 were on paper and 6 were electronic. Hence, their response rate to the paper survey was 35 percent, whereas their response rate to the electronic survey was significantly lower (7 percent).

This indicates respondents may be more likely to respond to a paper copy if given the option. While more time and expense are involved with sending paper surveys than electronic, sending paper surveys to all participants may be worth considering if budgets allow, because it appears to encourage a higher response rate.

Figure 2

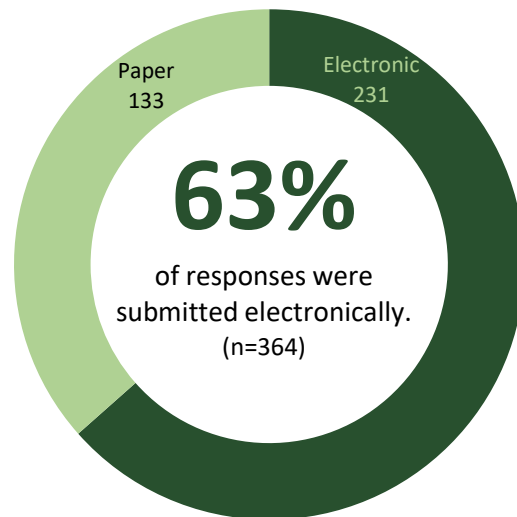


Figure 3: The response rate to paper surveys was much higher than to electronic.

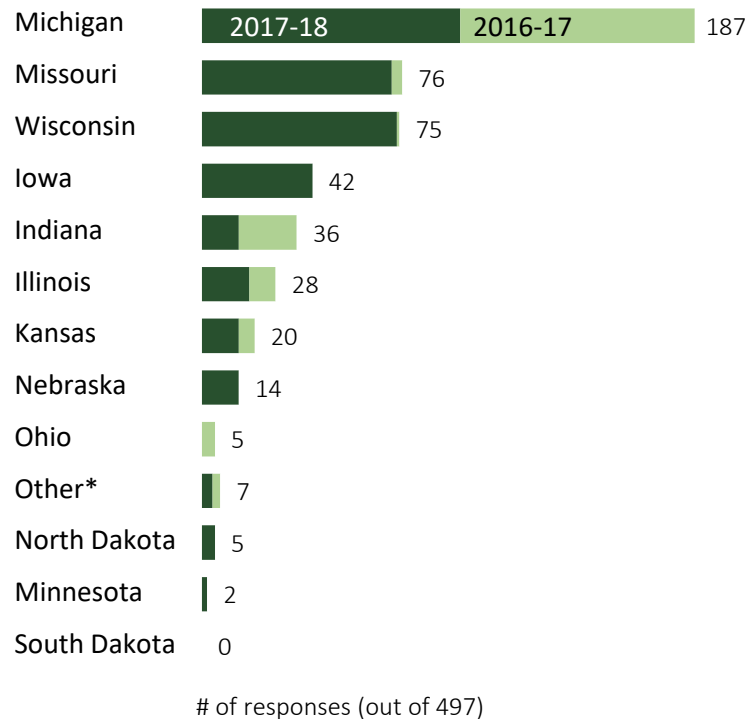


## Who responded to the survey?

Figure 4 shows the state in which each participant works. Most responses in the last two years came from respondents who work in Michigan, which is appropriate, because Michigan held the most trainings. South Dakota did not receive any responses to the survey. Two participants from Minnesota responded, even though Minnesota did not distribute the survey. These respondents work in Minnesota but participated in a training in another state.

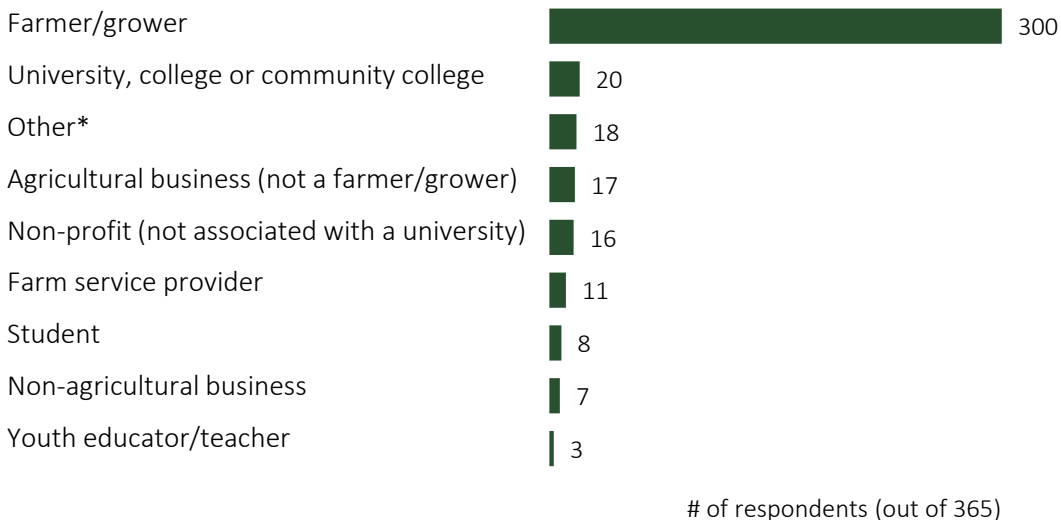
In 2017-18 only, the survey asked respondents to identify their occupation. They could choose all that applied. Figure 5 shows that the majority (82 percent) of respondents were farmers/growers. It was also common for people working in higher education, agricultural business (other than farming) and non-profits to participate in the course.

**Figure 4: Most respondents work in Michigan, Missouri or Wisconsin.**



\*New York (2), Midwest, Texas, unspecified

**Figure 5: Most respondents were farmers or growers, but others also took the course.**



\*food safety consultant (3), regulator (3), public health (2), food safety coordinator, future farmer, farmers market manager, parent, food processor, testing lab, unspecified

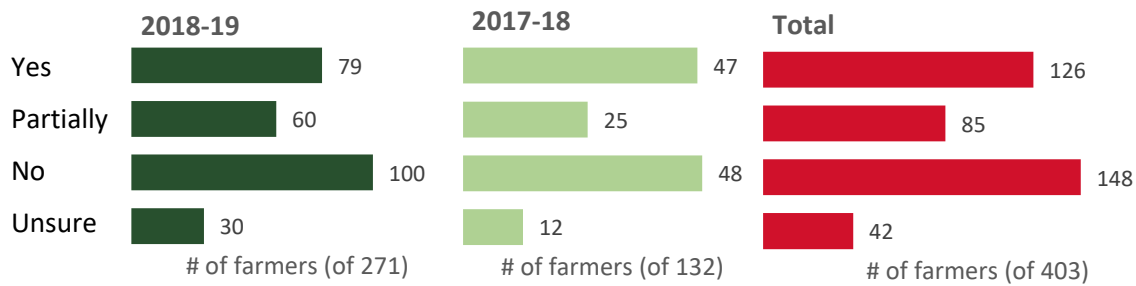
## Are grower respondents required to comply with the FSMA Produce Safety Rule?

In both years the survey was administered, the vast majority (90 percent) of respondents had determined their FSMA coverage status by the time they took the follow-up survey. This indicates most growers have the information they need to determine their status, including information about FSMA and sufficient on-farm record keeping.

Surprisingly, 42 respondents (10 percent) had yet to determine their coverage status, even though approximately a year had passed since taking the PSA Grower Training. This may indicate that a minority of growers do not understand how to determine their coverage status, or that they may not have adequate records to determine their status.

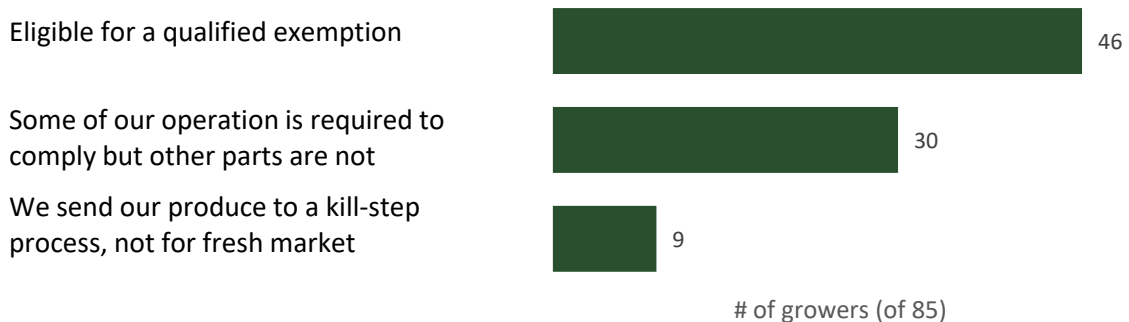
A little over one in three growers who responded are not required to comply with FSMA, and slightly fewer are required to comply, as shown in Figure 6. Those who are not required to comply most often have average annual sales below \$25,000.

**Figure 6: Most grower respondents are not required to comply with FSMA.**



Of those who are only partially required to comply with FSMA, the most common reason (46 of 85, 54 percent) was that they are qualified exempt (Figure 7). It was also common for growers to indicate that some of their operation is required to comply, but other parts are not. Sending produce to a kill-step process to eliminate any potential pathogens was not a common response.

**Figure 7: Qualified exemption was the most common reason for partial FSMA compliance.**



## What kinds of changes have farmers made since attending the training?

**73%** of grower respondents (293 of 404) made some sort of change on their farm to improve food safety practices since attending the training in the last two years.

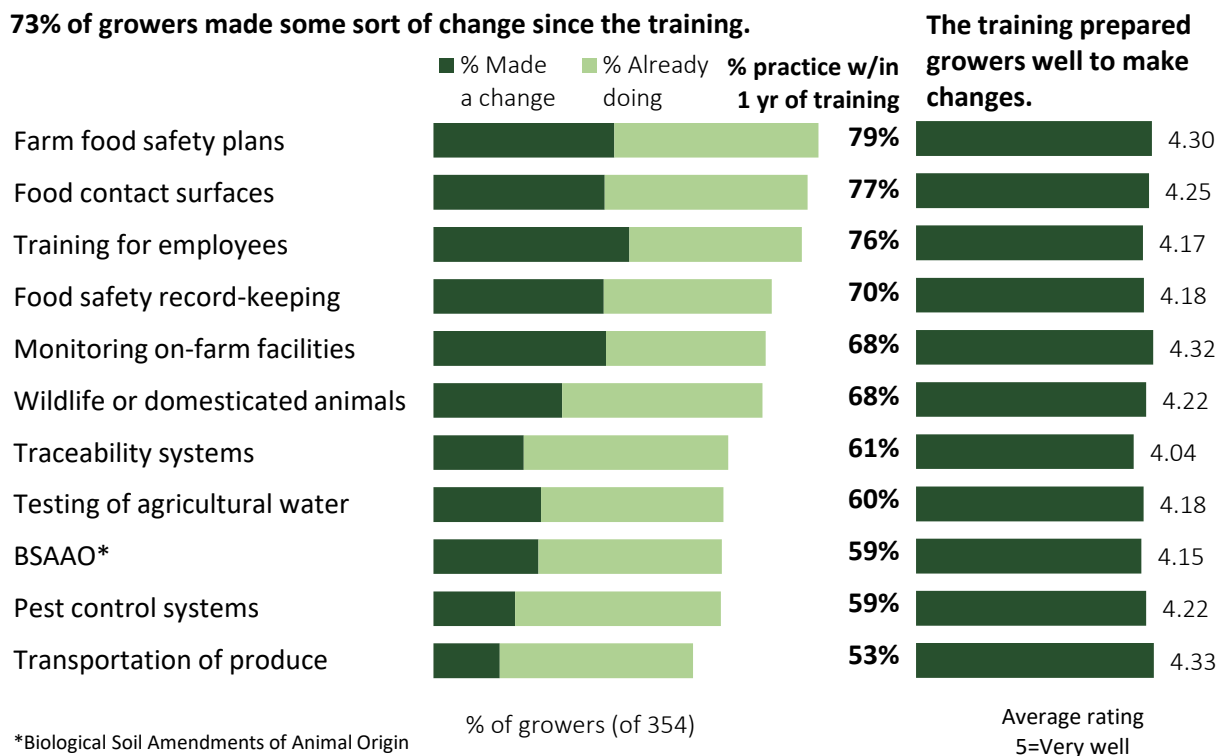
Figure 8 shows which changes growers made, as well as which practices they already had in place prior to the training (and, therefore, did not need to change). It is an aggregate of data from 2016-17 and 2017-18. The percentage was calculated as the number of growers with a practice in place out of the total to whom that practice applies. For example, Biological Soil Amendments of Animal Origin (BSAAO) applied to 296 growers; 63 indicated they do not use BSAAO.

The most common practices in place by growers within one year of the training were **farm food safety plans** and **methods for cleaning or sanitizing food contact surfaces**, with approximately three of four growers indicating they put these practices into place since the training or already had them in place.

**Implementing new or different training for employees on food safety/hygiene** protocols was the most common change made since the training, with 40 percent (134 of 332) of growers making the change since the training.

Added to that, 42 percent of respondents (149 of 354) already had an adequate farm food safety plan and pest control systems prior to the training, showing that growers were already doing many things well. While the food safety plan is not required by FSMA, it is a useful way for growers to organize their food safety protocols.

**Figure 8: Nearly four in five growers had a farm food safety plan in place within one year of training.**



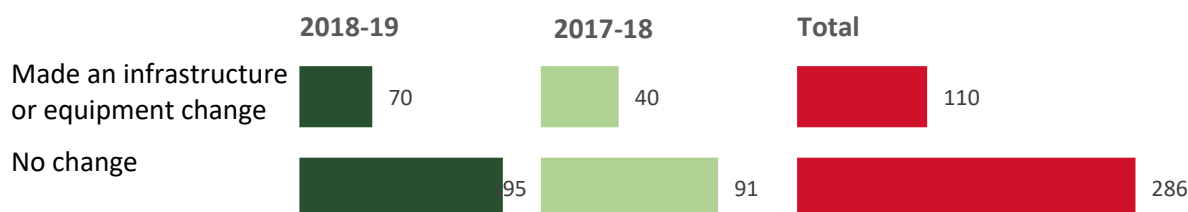
## How well did the PSA Grower Training prepare growers to make such changes?

Overall, the PSA Grower Training prepared participants well to make changes to improve on-farm food safety. Figure 8 (previous page) also shows how well the PSA Grower Training prepared farms to make changes. (Respondents only answered this question for those areas in which they made a change following the training.) The training received high ratings for all types of changes, with ratings ranging from an average of 4.33 (food contact surfaces) to 4.04 (wildlife or domesticated animals). The training did the best job of preparing growers to make changes to sanitizing or cleaning food contact surfaces (average score 4.33) and testing agricultural water (4.32). The training distinguishes between cleaning and sanitizing, which some growers may not have understood before. It also introduces which water tests are required by FSMA, which has been a source of much confusion, but these results indicate the training has provided some clarity regarding water testing. However, through open-ended comments one respondent said the training could do more to make it clear which water tests are required by FSMA and how to conduct them.

## What kinds of infrastructure or equipment changes have growers made to improve on-farm food safety?

Approximately one in four growers made changes to infrastructure or equipment to improve food safety practices since taking a training in the last two years (Figure 9). This demonstrates that they made not only practice changes, but systems changes to support food safety, which is a higher level of change.

Figure 9: 28% (110 of 396) of growers made a change to infrastructure or equipment since the training.



Changes included the following:

35 growers upgraded or added **hand-washing stations**.

21 growers built new or upgraded existing **buildings or packsheds**. For example, one built a shed that keeps all harvest equipment separate from tools, wheelbarrows, etc. which may have come in contact with animal byproducts; another updated a garage to a clean area for washing and packing vegetables.

21 growers added new equipment or changed their **washing/packing line**. For example, one upgraded the packing line to stainless steel.

18 growers upgraded or added new **restrooms**. One relocated them within ¼ mile of farm fields so workers can reach them within a five-minute walk.

11 growers changed their **irrigation system**.

6 growers added **fencing or other barriers** to keep wildlife or domesticated animals away from production areas.



6 growers made changes to how they **transport produce**; dedicating a vehicle for produce was a common change.

5 growers created **physical separation** between cleaned and uncleaned produce or between produce and chemicals.

4 improved or bought new **coolers**.

4 changed their **water source** to a safer source. For example, one switched from using rain water to wash root crops to using tap water.

3 growers changed their **harvest crates**, such as switching from wood to plastic.

2 improved **food contact surfaces** by upgrading to stainless steel or FDA-approved plastics.

2 growers put up new food safety-related **signage**.

Other infrastructure and equipment changes included a new cider mill, a new tractor, shatterproof glass, improved field drainage, replacing wood pallets with plastic and performing adenosine triphosphate (ATP) water testing.

### What types of changes have non-growers made since the training?

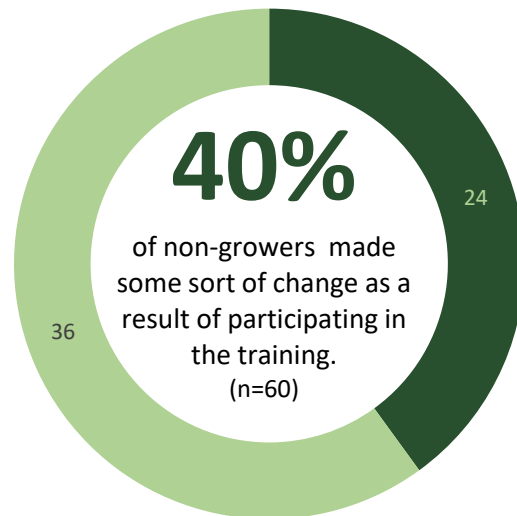
In the 2017-18 survey only, respondents who identified as working in any occupation other than farming were asked what, if any, changes they have made since participating in the training.

Forty percent (24 of 60) of non-grower respondents indicated that they had implemented some sort of change related to food safety in their work since the training (Figure 10). The most common change was sharing new or different information with clients (5 respondents). For example, one respondent said, "I am better able to describe or explain how FSMA can impact [my clients'] farms regarding safety, markets and practices."

Three respondents indicated that they used information from the training to create or update written materials (3 respondents). One respondent said, "I worked on fact sheet documents to assist growers in my field to understand how FSMA affects them."

Two respondents indicated they improved hygiene practices when growing or handling vegetables. These respondents are not farmers but grow produce for educational or non-profit purposes. For example, one said, "We now expect more handwashing from Master Gardeners who glean crops."

Figure 10

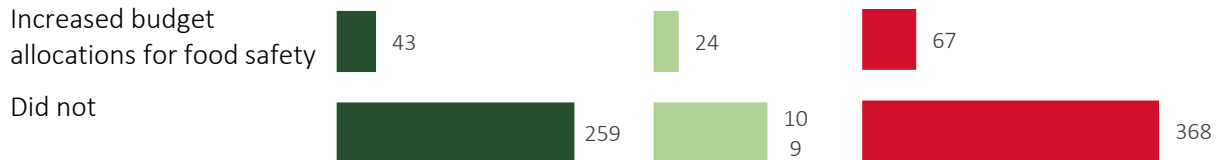


## What other changes have respondents made since the training?

First, growers have invested money in food safety and FSMA compliance since participating in the PSA Grower Training. Fifteen percent (67 of 435) of respondents have increased their budget allocation for food safety and/or FSMA compliance, as shown in Figure 11. While it is encouraging that respondents are willing to invest in food safety, it also demonstrates that FSMA compliance may affect profitability of some produce farms.

Related to this, a few respondents to the 2016-17 survey shared comments related to the financial cost of complying with FSMA, demonstrating concern that small and mid-sized farms may not have the resources to upgrade facilities or equipment. For example, one said, “[FSMA] is a real headache with no return of revenue for midsize and small farms.” This may indicate a need to help growers think through how they can make no-cost or low-cost changes to bring them into compliance with FSMA. Growers may also need help thinking through the cost of a foodborne illness outbreak traced to their farm versus the perceived benefit of not making food safety changes.

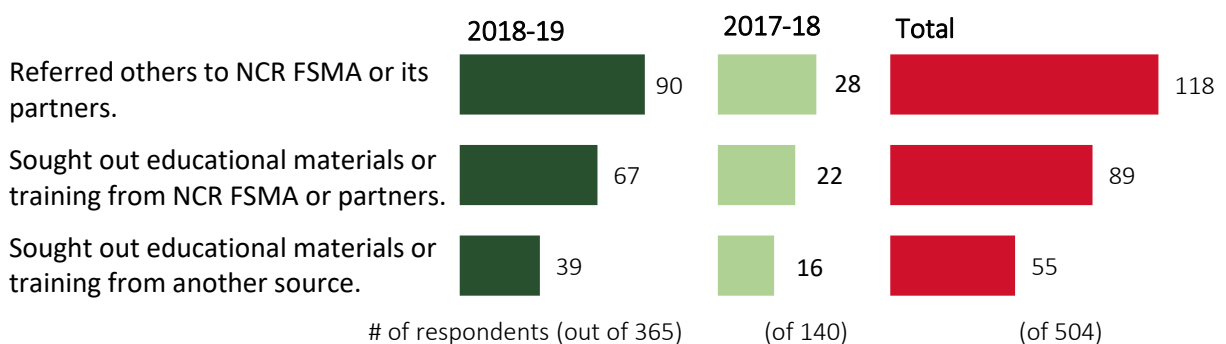
**Figure 11: Some growers have increased budget allocations for food safety.**



In addition, 23 percent of respondents (118 of 504) have referred others to NCR FSMA and/or its partners for information or resources related to food safety and/or FSMA (Figure 12). This demonstrates that they trust NCR FSMA and its partners as a reliable source of information.

Similarly, 18 percent (89 of 504) of respondents have sought out additional educational materials or training from NCR FSMA or its partners. In contrast, 11 percent (55 of 504) of respondents have sought them from other sources, showing that respondents were more likely to seek out additional information from NCR FSMA and its partners than from other sources. Other sources of information that respondents have used include: GAP certifiers, Primus Labs, US Department of Agriculture, state departments of agriculture, Cornell University, Michigan Agriculture Environmental Assurance Program, Organic Materials Review Institute, Amish Food Safety Education Team, the Great Lakes Expo, MOSES, the National Farmers Union and state branches, farm management companies and online searches.

**Figure 12: Respondents were more likely to seek out FSMA resources from NCR FSMA and its partners than other sources.**



## How have NCR FSMA partners provided Produce Safety Alliance Grower Training participants with guidance regarding FSMA?

One hundred eighty-six respondents (132 in 2017-18, and 54 in 2016-17) described in their own words how NCR FSMA partners have provided them with guidance regarding FSMA. We changed the wording to the question slightly in 2017-18 to make it clearer who NCR FSMA partners are by writing out the name of the state extension system or state department of agriculture that sent out the survey. Responses were coded for themes:

**Explained the requirements of the FSMA Produce Safety Rule:** Thirty-nine respondents appreciated learning what the FSMA Produce Safety Rule requires. As one said, “It was beneficial to hear from individuals who understood the law.” Another said, “It made our farm aware of where we are failing to comply with FSMA currently, and how to ensure proper compliance going forward.”

**Provided additional resources:** Thirty-two respondents valued the resources that are available to them through NCR FSMA and its partners, including educational resources as well as people to call when they have a question.

**Provided information about food safety practices:** Thirty-one respondents said NCR FSMA partners have introduced participants to new information about food safety practices. This demonstrates that some growers had not already learned this information in other trainings. For example, one respondent said, “They helped detect some minor things that we had missed or didn't know about.”

**Provided the required training:** Eighteen growers said that the greatest value of NCR FSMA and its partners’ work was that they provided a training which growers were required to take.

**Provided on-farm education or conducted an on-farm readiness review:** Nine growers indicated that their state extension or department of agriculture had given on-farm education, either by visiting the grower’s individual farm or offering on-farm field days or trainings.

**Helped write or update farm food safety plans:** Seven growers received help to write or update their farm food safety plan from an NCR FSMA partner. One respondent said, “They helped me to understand how to make a food safety plan that addresses the contamination risks associated with my operation.”

**Hosted other food safety education events:** Six growers said they had attended other food safety education events or trainings offered by an NCR FSMA partner. One respondent said, “A field day was held that was helpful because it was focused on real world implementation.”

**Explained how the FSMA Produce Safety Rule differs from food safety certification:** Six respondents said they were food safe certified, such as through Primus or USDA Good Agricultural Practices (GAP). These growers explained that they already implement good food safety practices and have a good understanding of food safety. For some of these, however, it was helpful to understand how the FSMA Produce Safety Rule differs from GAP certification.

**Clarified which farms are covered by FSMA:** Six respondents indicated that an NCR FSMA partner helped them understand which farm operations are covered by FSMA and which ones are not. One grower said, “We learned we are exempt, but I want to still follow through with new procedures.”

**Provided technical assistance:** Four respondents said NCR FSMA partners provided technical assistance. For example, one said, “I received technical guidance with backflow prevention in irrigation, lab recommendations and assistance with water testing.”

**Helped growers plan for the future:** Three growers said the training has helped them plan for the future. For example, one grower said, “[The training] helped us better understand what is coming our way. It helped us to think ahead and plan for more food safety progress on our farm.”

In addition, respondents said NCR FSMA partners provided them with reassurance that they are implementing good practices (2 respondents), helped with water testing (2), shared real farm examples of how to implement food safety practices (2) and developed new partnerships (2).

*“I am a small operation so most of the rules do not apply to me, but it did alert me to areas that I can easily add or improve on that fit my circumstances.”*

Grower from Iowa

*“Cal Jamison has been very helpful as a contact when we need to ask questions.”*

Grower from Kansas

*“The print materials and in class teachings helped us develop ideas for our farm plans and safety procedures.”*

Grower from Nebraska

*“Though we have been doing GAP for many years, they educated us on changes we may see when FSMA becomes law.”*

Grower from Missouri

While most respondents found the PSA Grower Training and additional food safety resources helpful, 15 respondents indicated they found them to be unhelpful or not applicable to their situation. A few of these individuals expressed negative feelings or impressions toward FSMA. They described the law as “onerous,” “misdirected,” and “a beaurocracy.”

Similarly, when asked for suggestions, six respondents (four in 2017-18 and two in 2016-17) expressed confusion or anger regarding FSMA and/or the PSA Grower Training. For example, one said, “I was very confused by the training. It was not helpful especially when it comes to where and what water testing is needed.” Another was upset that FSMA has not been harmonized with GAP.

Comments like these demonstrate the difficulty food safety educators may face when educating growers who may be defensive or overwhelmed by the new law.

## **Recommendations and conclusions**

### **How can the NCR FSMA better help produce growers attain FSMA compliance?**

One hundred fifty-four respondents (112 in 2017-18; 42 in 2016-17) shared suggestions for how the NCR FSMA and its partners can help growers attain FSMA compliance. Their responses were coded for themes, shared here:

**Continue to offer food safety education:** Thirty-five respondents suggested NCR FSMA continue to do what it is already doing (provide food safety education), making this the most common theme. Respondents requested that NCR FSMA both continue to offer the Produce Safety Alliance Grower Training and add supplemental trainings. A few respondents indicated that they would attend the course again in the future to keep up to date and refresh their memories, or to train other members of their farm team. Interestingly, three requested a simplified version of the PSA Grower Training for those who are new to food safety, while another requested a more advanced training, implying that the PSA Grower Training is too simple.

**Disseminate information about FSMA whenever it is updated:** Growers want to know if FSMA regulations change, so they can have the most up-to-date information. Twenty-one respondents mentioned this theme.

**Provide clarification on the requirements for water testing:** Eleven respondents requested information or services related to required water testing. Three requested assistance paying for water testing. Two requested help in delivering water tests to the lab, with one suggesting having a day when growers can drop off samples at their local produce auction, which are markets commonly used by Plain growers. This suggests that Plain growers may need additional help in accessing water testing services, because they may not have access to vehicular transportation. Another said, "Understanding the agricultural water initiative is the most challenging part of the program. Clear concise how-to instructions are the most important. We are always looking for a better guidance document which is clear and can provide real on-farm solutions and metrics to monitor."

**Provide mock on-farm audits:** Eight growers requested on-farm audits. One said, "Doing a walkthrough of the farm is a great help to us so we know exactly what is expected of our facility." An on-farm readiness review might fit their needs.

**Create templates of forms growers can use for records required by FSMA:** Eight respondents requested templates that growers can fill out to help them keep records required by FSMA. Specific requests included: a template employee training form based off the minimum Produce Safety Rule requirements vs. PCQI for Human Foods employee training requirements; harmonized documentation that meets FSMA, NOPP and USDA requirements; templates for routine environmental monitoring and swabbing; FSMA-compliant Excel spreadsheets; sample protocol language for emergencies; forms to document employee training and safety manuals; and forms for traceability.

**Specific resources:** Seven respondents shared ideas of specific resources they would like NCR FSMA or its partners to provide, including:

- An app that can take photographs of records for records retention,

- An online library of resource materials and presentation information (informing PSA Grower Training participants of the Northeast Center to Advance Food Safety clearing house might fulfill this request),

- Navigation tools for the myriad of regulations,

- Economic strategies for the small producer towards integration of documentation and policies,

- Local compliance guidelines and non-intrusive implementation impact assessment,

- Composting methodologies and manure management strategies for small scale farmers,

A document with chart of farm size and product categories with administrative requirements, training and inspection, and

Information about upcoming workshops so farm service providers can assist in promotion.

**Outreach to small or underserved farmers and farm workers:** Respondents requested NCR FSMA and its partners make special efforts to reach small and diverse farmers and farm workers. Specific suggestions included connecting with farmers market growers who may be very small producers (3 respondents) and creating training materials in Spanish (2 respondents). One respondent wrote, “Make it a priority to reach, engage, and collaborate with farming communities that experience inequities and are impacted most by structural racism and historical trauma. Make sure they have a central voice in decision making.”

**Share resources on how to meet requirements of both FSMA and food safety certification, such as GAP:** Five respondents requested additional education on the differences between the requirements of the FSMA Produce Safety Rule and GAP certification or expressed a desire that FSMA be harmonized with GAP. One specifically mentioned the differences between requirements for employee training. Two mentioned they would like to be able to write one set of standard operating procedures that meet the requirements of FSMA and GAP.

**Continue to explain how to determine if a farm falls under the Produce Safety Rule:** Two respondents requested additional information on how to determine which rules apply to a farm. One respondent said, “Continue to explain and review how farms determine if they fall under the Produce Safety Rule and PCQI for human food or not.” The fact that 10 percent of grower respondents were not sure of their FSMA coverage status corroborates this result.

**Provide on-farm food safety plan workshops or reviews:** Four respondents requested a workshop during which they can write a farm food safety plan with guidance from experts or asked if an expert can review plans they have already written.

**Provide on-farm trainings:** Four respondents (all from 2017-18) asked that trainings for farmers be held at farms, so they can see good food safety practices in action, or that NCR FSMA partners offer employee trainings at farms.

**Provide food safety education for others in the supply chain and consumers:** Three respondents (all in 2017-18) suggested NCR FSMA and its partners offer food safety education to others along the food chain. Two suggested that consumers need to be better educated on produce handling and preparation, implying that it is pointless for a farmer to produce clean produce if the consumer is going to contaminate it. Another requested food safety information for processors.

**Technical assistance:** Three respondents requested technical assistance, but none of the requests were specific.

**Offer food safety education online:** Two respondents requested that the PSA Grower Training or other food safety trainings be offered online. One requested that if they are live events that they be offered in the evening, when growers are done with field work for the day.

**Be available to answer questions:** Two respondents (both in 2016-17) requested that NCR FSMA and its partners be available to answer growers’ questions. One said, “Provide a way to send in discreet questions and get answers or suggestions on how to find answers.” The online question and answer portal that NCR FSMA is planning to start during the USDA-funded grant cycle would fulfill this request.

## Conclusions

Offering the Produce Safety Alliance Grower Training has been an effective way to inform growers about the new Food Safety Modernization Act as well as about food safety in general. Since taking the training, most growers have made good progress toward implementing new food safety practices.

Some of the additional education and materials requested by Produce Safety Alliance Grower Training participants may already be available. Therefore, we recommend providing participants with guidance on where to find these additional resources. The online FSMA clearinghouse, hosted by the Northeast Center to Advance Food Safety (NECAFS), is one resource to recommend.

Another resource that might help growers would be a fact sheet describing no-cost or low-cost ways to improve food safety on one's farm. North Central Region Center for FSMA Training, Extension and Technical Assistance and its partners may also want to discuss strategies for helping farms save money while meeting FSMA's requirements -- perhaps through cost sharing, equipment sharing, informing them of grant opportunities, or other cost-saving strategies.

For more information about this evaluation please contact:  
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