



2021

# PRODUCE SAFETY PROGRAM REPORT

*A look at program data  
and stories from the  
produce growing  
community*



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## LETTER FROM THE COMMISSIONER

In 2021, Minnesota produce farms showed strength, perseverance, and adaptability to change. A significant drought, increase in supply costs, and labor shortages are only some of the challenges farmers faced as they continued to provide fresh produce for local markets.


Throughout the year, the Produce Safety Program at the Minnesota Department of Agriculture worked to support produce farms as they weathered these changes and implemented on farm food safety practices to ensure the safety of their product and the health of their customers.

Through our annual data collection, we helped farms identify their status and requirements under the Produce Safety Rule. An additional benefit of this data collection is that it allows us to share the information we collect through this annual report. In the last four years the data we have collected has helped us better understand who produce farms are, what they grow and where they are selling their crops. We continue to be grateful for the willingness of farms to share information through the annual Grower Questionnaire as it has provided us with the ability to tell a story about this diverse and unique farming community.

We hope you enjoy reading this report and we thank you again for your continued support of this program.

A handwritten signature in black ink that reads "Thom Peterson".

Thom Peterson, Commissioner of Agriculture

A close-up photograph of several garlic bulbs with their long, thin stems, resting on a wooden surface. The lighting is soft, highlighting the texture of the garlic skin.

# STATE OF THE PRODUCE SAFETY PROGRAM

## **Desired Outcome of the Produce Safety Program (PSP)**

All produce from Minnesota is safe to eat and all Minnesota produce farmers receive the resources and support they need to grow safe food while meeting any regulatory requirements that apply to their farms.



# STATE OF THE PRODUCE SAFETY PROGRAM

The Produce Safety Rule (PSR) establishes science based minimum standards for the safe growing, harvesting, packing, and holding of fruits and vegetables grown for human consumption. The goal of these standards is to ensure that farms that are required to comply with the rule reduce the risk of potentially dangerous bacteria from entering the food supply. The goal of the Minnesota Department of Agriculture's (MDA) Produce Safety Program (PSP) is to work in tandem with Minnesota growers to prevent illnesses caused by contaminated produce while providing the necessary food safety resources for farms to be successful in this mitigation.

The PSP continues to support Minnesota farms through opportunities such as the Produce Safety Mini- Grant, PSR grower trainings, continued education and dedication to working with all farms, regardless of their requirements under the rule. We believe that providing tools to build on-farm food safety systems is a critical component to providing safe agricultural products to consumers and markets.

The program plans to continue using the inventory and inspection data to better serve and grow farm food safety frameworks. Data collection and evaluation of farm activities also help with compliance efforts as farms are more equipped to understand their PSR requirements, giving our program a better understanding of who farms are and the resources they need to implement on-farm food safety.

## Key Challenges

Despite progress made in the last five years, there are still many challenges facing produce farms and our ability to support them in our goals.

- Funding for produce farms in general is very limited and funding to support on-farm food safety is virtually non-existent.
- Lack of food safety resources and continuing education opportunities beyond the PSR grower training. All produce farms need resources and education, but providing training and resources suitable for all farms regardless of their status under the PSR is critical.
- Maintaining accurate inventory of produce farms and their activities within the state is difficult as farm operations change each year and PSP staff lack of supportive technology.

## Recommended Actions

- ▶ Increase funding for opportunities like the PSP Mini-Grant to provide farms the opportunity to explore alternative or innovative on farm food safety systems.
- ▶ Support ongoing engagement and outreach with produce farms that can help identify how to cater education to meet unique needs.
- ▶ Provide and promote food safety educational webinars, newsletters and other resources catered and designed to support farms regardless of their status under the PSR.
- ▶ Evaluate inspection data to drive educational needs and further develop on farm food safety intervention resources for covered farms.
- ▶ Further develop inventory technology and engagement capacity to continue building relationships with farms to support data informed program development.



# INSPECTIONS

The goals  
of PSR  
inspections in  
Minnesota  
are to

- ▶ Create an efficient and consistent regulatory system to encourage compliance with the PSR
- ▶ Educate and support farms to improve their food safety program and maintain a safe and healthy food supply

# INSPECTIONS

In March of 2021, 56 produce farms in Minnesota were eligible for an inspection based on previous farm status. After reverification of each farm's status, 69% of eligible farms were inspected during the 2021 growing season.

Figure 1 breaks down the number of routine and initial inspections completed in 2021 and Figure 2 shows the most frequently cited orders from all inspections completed in 2021.



Figure 1: Total number of inspections by type

## Most Frequently Cited Observations on Covered Farms



Figure 2: Most frequently cited orders from inspections

In March of 2021, 56 produce farms in Minnesota were eligible for an inspection based on previous farm status. After reverification of each farm's status, 69% of eligible farms were inspected during the 2021 growing season.

Figure 1 breaks down the number of routine and initial inspections completed in 2021 and Figure 2 shows the most frequently cited orders from all inspections completed in 2021.

## Key Challenges

- Steep learning curve for behavior change
- Minimizing the risk of pathogens, bacteria and viruses on farms is not easy. In 2021, inspectors focused conversations with farms around the following areas that continue to provide on-farm implementation challenges.
- Cleaning and sanitizing pose significant difficulty. Farms struggle to identify what needs to be cleaned and how to clean and sanitize to adequately minimize risk of contamination.
- Worker training is difficult to deliver and consistently manage during the growing season.
- Record keeping is both a logistical and time-consuming process.
- The cost of adapting farming practices to account for food safety is burdensome for farms.

## Recommended Actions

Based on key challenges observed during the 2021 inspection year, the PSP will focus on continued education about on-farm food safety to support and prepare farms for inspections. The following is a list of priority areas for education and resource development.

- Making accessible handwashing facilities.
- Determining when a food contact surface needs to be cleaned.
- Proper use of gloves to handle food and recognize they are considered a food contact surface.
- Building an on-farm food safety system that includes risk assessment, steps to minimize risk and corrective actions in the event of contamination.
- Recordkeeping and the traceability benefits for process/active managerial control.
- Adding clean breaks and developing a lot system for their post-harvest handling activities.
- Progressive enforcement tools utilized within the MDA to address patterns of non-compliance

## Education to Meet a Need

In September of 2021, staff from University of Minnesota (UMN) Extension, Upper Midwest Agricultural Safety and Health program, the MDA, and Minnesota Farmers Union collaborated on a field day at Maple Ridge Produce in Aitkin, MN. The focus of the event for the 25 participants was on food safety in the pack shed and proper cleaning and sanitizing. Participants also learned how to safely use manure as a soil amendment on vegetable farms.



*Food safety field day at Maple Ridge Produce Farm*

The day began with a tour of the pack shed where attendees participated in properly mixing sanitizers, and cleaned tools, surfaces, and equipment used in postharvest handling and washing vegetables. The group then toured the high tunnel and the vegetable fields. Topics included best practices for reducing risk when using chicken manure and the proper steps and management needed to ensure that manure does not become a contamination risk to the fresh produce.

Jeff Bender, Doctor of Veterinary Medicine, provided an overview of zoonotic diseases and how they can transfer from animal manure sources to fresh produce. Annalisa Hultberg, UMN Extension Educator in food safety, offered an overview of Good Agricultural Practices (GAPs) on the farm and how farms can reduce the potential for contamination of fresh fruits and vegetables when using animal-based soil amendments. Erik Heimark, co-owner of Maple Ridge Produce, talked about how his farm has learned about and implemented GAPs and food safety on their farm to protect their customers and farm.



# PRODUCE SAFETY MINI-GRANT PILOT

## Goal

To help minimize the cost of implementing on-farm food safety, the PSP worked to secure funding to reimburse farms for some of these costs through the USDA Specialty Crop Block Grant. We developed a trial Produce Safety Mini-Grant using these funds.

# PRODUCE SAFETY MINI-GRANT PILOT

The focus of this mini-grant was to reimburse farms for the cost of testing their water for generic. *E.coli*. A key element of this grant was developing a system that not only awarded produce growers, but ensured there was priority funding for emerging farmer communities.

## Eligibility Requirements

- Produce farms selling at least \$5,000 of produce covered by the PSR
- Purchased water testing for generic E. Coli from September 30, 2017 to December 31, 2020

## Funding Priorities

- ▶ Farms who had attended an approved food safety focused training
- ▶ Farms who filled out the MDA Produce Safety Program Grower Questionnaire
- ▶ Farms covered (requiring an inspection) by the Produce Safety Rule
- ▶ Farms which fit the definition of emerging, new, and/or located in urban areas

## Results

13 applications were received



*Figure 3: Percentage of grant dollars awarded through the pilot mini-grant program in 2021*

Of the \$2,800 available, \$2,273.50 was awarded through this pilot mini-grant. Not all of the funds were awarded because of the limited scope of eligible items. This pilot program provided the PSP an opportunity to learn and develop a larger Mini-Grant that offered funds for food safety improvements in addition to water testing.

# FARM INVENTORY DATA

**The goals  
of the  
Produce Farm  
Inventory  
are to:**

- ▶ To identify all produce farms in the state and verify their status under the PSR, which supports the cooperative agreement between MDA and FDA
- ▶ Support the MDA in collecting data that is representative of all produce farms in the state and inform program development for produce farms

# FARM INVENTORY DATA

The PSP's Grower Questionnaire is a tool developed to help farms identify their status under the PSR and assist the PSP in building the Produce Farm Inventory. In 2021, we received 740 valid responses to the Grower Questionnaire.

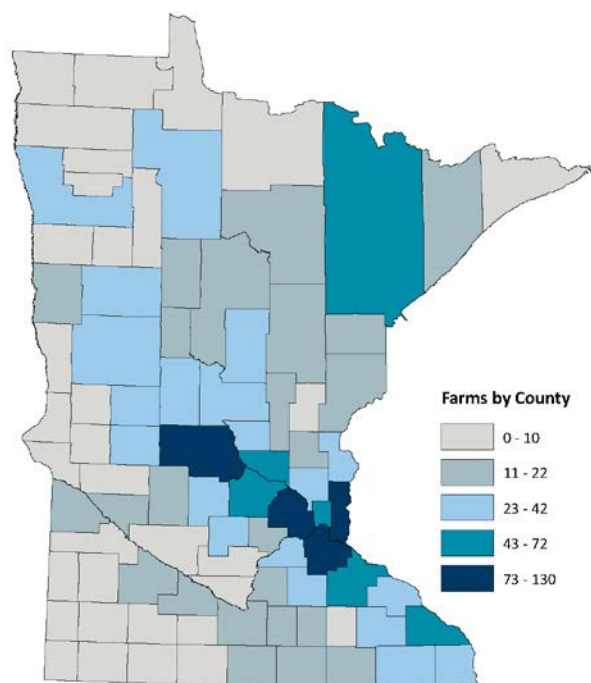
## Farm Status

Farm status determines requirements under the PSR and whether a routine inspection is required. A farm's status can change from year to year based on marketing and sales data. The following data provides a snapshot of who produce farms are with respect to average sales, employment, primary markets, and crops. Key challenges to this area of agriculture are called out through emerging themes in the data.

Table 1 shows the total number of farms verified in 2021 in each of the major PSR statuses as compared to 2017 USDA Ag Census estimates.

**Table 1: Total produce farms: Current MDA data vs. Ag Census data**

Status Requirements		Produce Farm Inventory	USDA estimate	% Verified of USDA estimate
Covered	• Must follow full standards of the rule	51	308	16%
	• Farms are subject to a routine inspection			
Eligible for Exemptions	• Must keep certain records	193	1183	16%
	• Farms are not subject to a routine inspection			
Excluded	• Rule doesn't apply	717	2137	33%
	• Farms are not subject to routine inspection			



*Figure 4: Map of Minnesota showing where produce farms are located by county*

## Job Data Focus

As seen in the 2020 Produce Safety Program Annual Report, total sales vary greatly from farm to farm, though most produce farms in Minnesota sell under \$250,000 in produce sales each year. In 2021, we asked farms to share their job data to help us better understand employment on produce farms. Figures 7 and 8 show an initial look at the relationship between the number of employees and a farm's average annual sales. This is based on 572 responses out of the known 2,000 farms in the inventory so it's a snapshot and not representative of all produce farms.

Number of responses: 572

### Average Number of Employees: 7



Figure 5: Average number of employees on Minnesota farms

### Average Annual Labor Cost: \$29,342

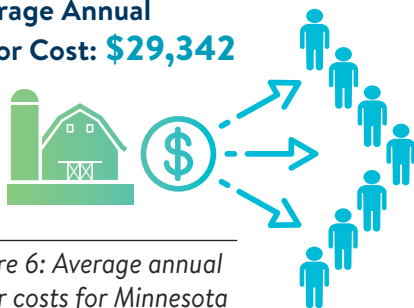


Figure 6: Average annual labor costs for Minnesota farms

## Sales

Produce farmers in Minnesota sell through a wide variety of markets from on-farm sales to wholesale distributors. In 2021, respondents to the Grower Questionnaire shared the top markets through which they sell in addition to initial impacts of the Covid-19 Pandemic. Though this data is not representative of all produce farms, it does provide a baseline understanding of where produce farms are selling their crops and how they are impacted by challenges to the global supply chain. Figure 11 shows the top produce markets across the state based on 757 responses. Respondents selected all the markets they participate in, so the categories are not mutually exclusive. Figures 9 and 10 demonstrates how produce farms were initially impacted by COVID-19.

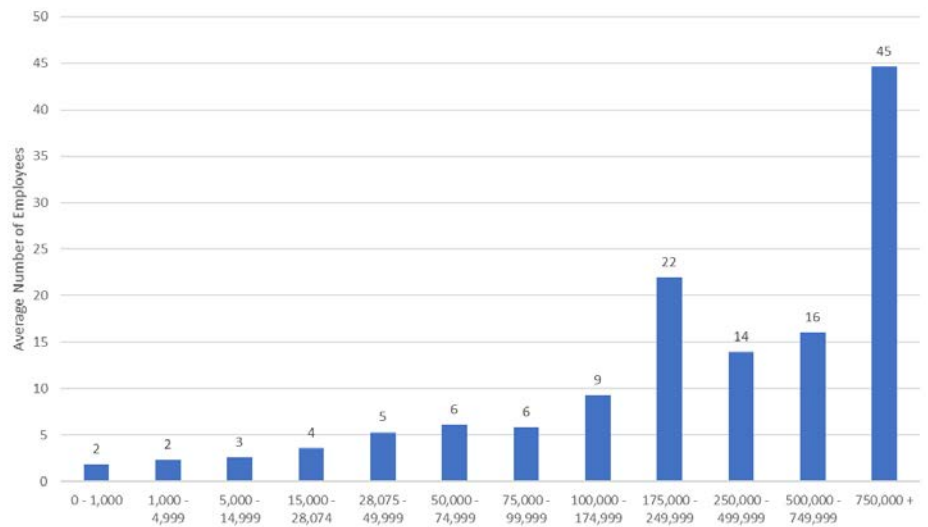


Figure 7: Average number of employees by farm sales

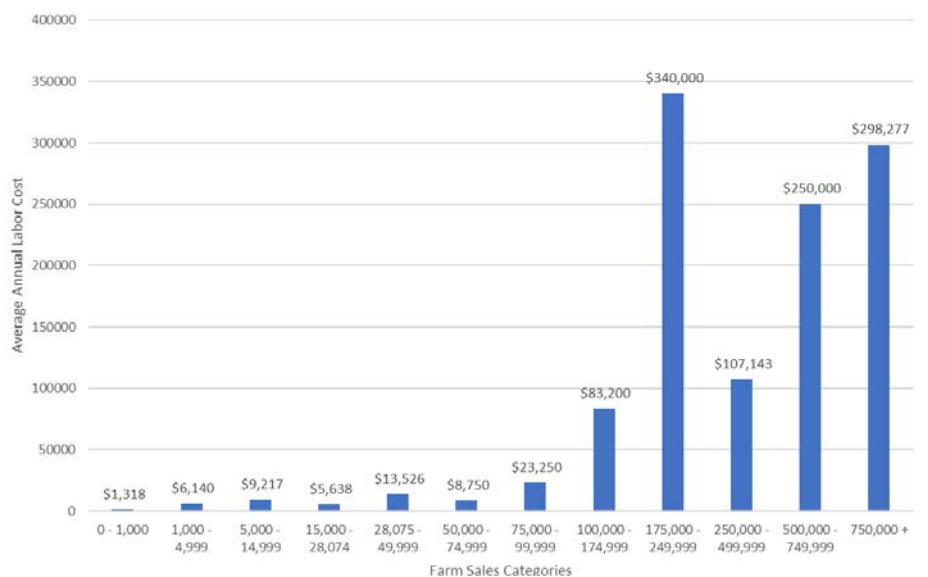


Figure 8: Average annual labor costs by farm sales

## Research to Meet a Need

In an attempt to get a better sense of local and regional market data and support the development of a more resilient food system, the MDA and the UMN launched an initiative in 2020 called the [Statewide Cooperative Partnership for Local and Regional Markets](#). This Cooperative Partnership is made up of 40+ organizations across the state that will gather data about local and regional supply chains to create a baseline understanding of what is happening in these markets and identify ways to develop market opportunities for small and emerging farmers across the state. More information can be found on the Partnership website linked above.

## Impact of COVID-19 on produce farmers in Minnesota

Did your markets change due to the Covid 19 pandemic?



Figure 9: Determining if COVID-19 had an impact on Minnesota farms market sales

Were these market changes positive, negative, or neutral?



Figure 10: Determining the impact COVID-19 had on Minnesota farms market changes

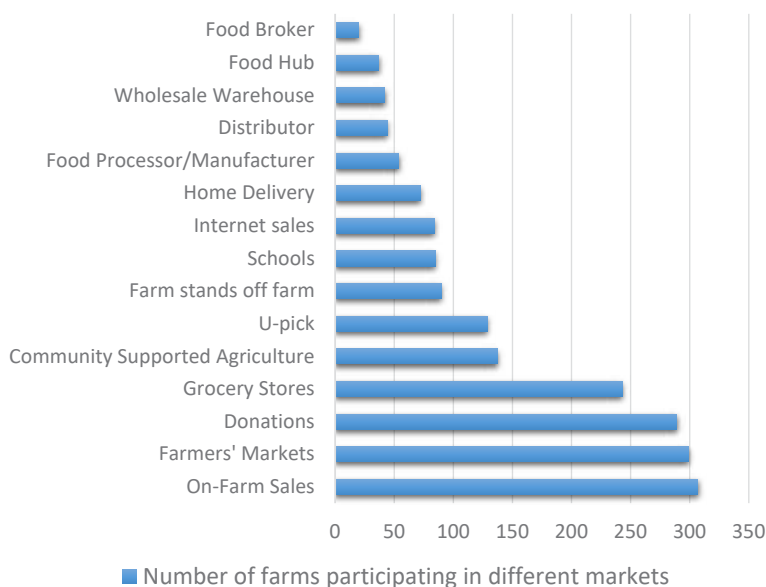


Figure 11: Top markets for produce farms in Minnesota, not mutually exclusive

## Crops

In the last three years we have seen that produce farms grow an impressive variety of crops. The most popular crops have not changed greatly from year to year. These top crops are also all covered under the PSR as they pose a risk to food borne illness. Crops that aren't covered under the rule are not typically consumed raw, for example potatoes and winter squash. Since these crops are cooked, they go through what is called a validated "kill step" which kills off pathogens and minimizes the risk of getting someone sick. Figures 12 and 13 show the top crops grown in 2021 based on 740 responses submitted through the Grower Questionnaire.

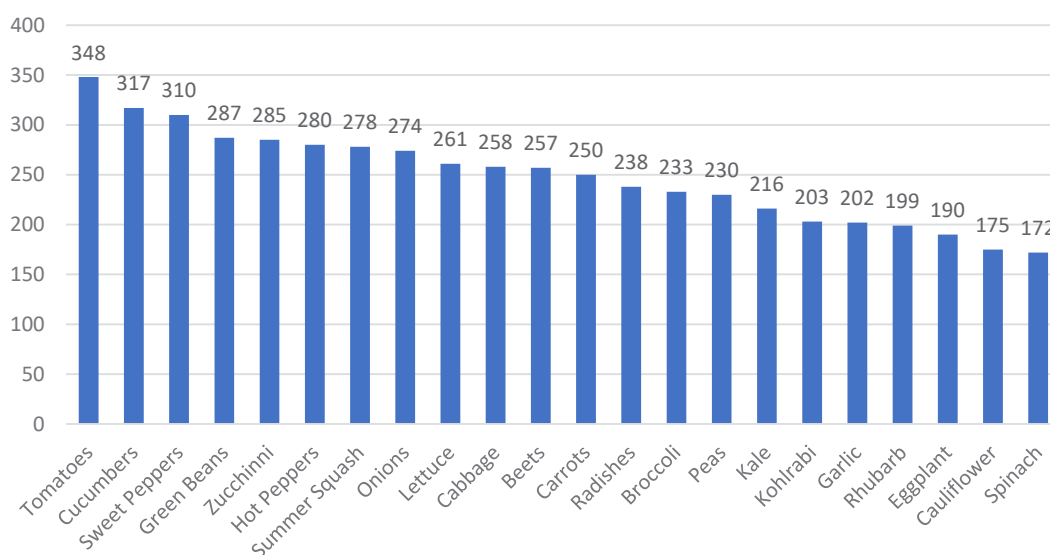


Figure 12: The most popular vegetables grown in Minnesota

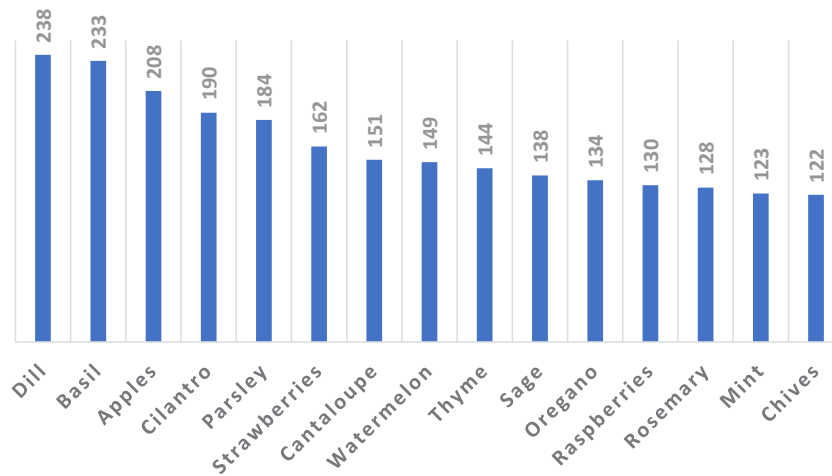


Figure 13: The most popular fruits, nuts, and herbs grown in Minnesota

## Key Challenges

Without data from every produce farm in the state, we lack the ability to paint a full picture of this unique sector of agriculture. In our fourth year of data collection, we can identify some trends that speak to the diversity and challenges these farms face.

### Scale of produce farming in Minnesota is small

The number of farms that were verified as covered or eligible for an exemption did not change significantly from 2020 to 2021. However, in 2021 over 200 more farms were verified as excluded from the PSR as compared to 2020. This data shows that though we continue to identify more produce farms, most of these farms are small and do not have any requirements under the PSR, despite interest in education and resources about on-farm food safety. With so many farms excluded from PSR, developing catered education and resources that meets the needs of all farms, regardless of their status under the rule, is a challenge.

### Lack of economic data about produce farms

From the data collected, albeit not representative of all produce farms, we are beginning to see trends to further explore in future data collections. For instance, there is a noticeable shift in average number of employees and annual labor costs specifically when farms cross the \$100,000 threshold. It's not clear through this data, but future analysis could evaluate the number of employees and the type of market channel they sell through to determine if there is a relationship on how produce farms access new market opportunities.

## Market resilience

With the arrival of the COVID-19 pandemic, supply chains and markets changed many times over. From the data we collected about the impact to produce farms, most farms had to make changes to how they sold their products. Anecdotally, the demand for local and regional food increased as consumers sheltered in place and grocery stores struggled to keep shelves stocked. We also witnessed an increase in the use of online retail platforms for farms and farmers markets. Though we can't make any conclusions based on these experiences, the pandemic highlighted the importance of building more resilient local and regional supply chains that can adapt in the face of a crisis and invest in small and mid-sized farms. As farms continuously strive to adapt to changing markets, on farm food safety remains a critical component of ensuring the safety and integrity of the Minnesota food supply.

## Recommended Actions

Dedicated staff time for ongoing outreach and engagement is a critical need. It is only through trusted relationships with produce farms that we can support them in identifying their farm status through the annual Grower Questionnaire and build the Produce Farm Inventory into a more reliable and comprehensive data set. If we know who produce farms are, and we understand their needs, we can use that data to inform program development that supports farms with resources, funding and education to help reduce food safety risks to specialty crops grown in Minnesota and help ensure specialty crops grown in Minnesota are safe for human consumption.

## FARMER SPOTLIGHT

“At Urbanize Farm we are guided by our mission to provide year-round, locally grown and fresh produce to the community. Providing healthy and safe food for our customers is critical, therefore; food safety is of utmost importance at our farm. It is a collective effort from all members of our Urbanize Team, from farming, processing, and delivering to make this happen. Produce safety training programs, to better understand FSMA, have been very helpful to implement these rules and expectations to our team and carry out in our day-to-day operations. We pride ourselves for having dedicated team members that share our vision and mission of providing safe and healthy food to our community.

*Urbanize Farm  
Edina, MN*

*Basil crop at the Urbanize Farm indoor  
growing facility*



# PESTICIDE MISUSES CASES ON PRODUCE FARMS





# PESTICIDE MISUSES CASES ON PRODUCE FARMS

The Produce Safety Program works in coordination with the Pesticide and Fertilizer Management Division at the MDA on pesticide misuse cases that involve food crops. Graph one shows that many cases involve covered and non-covered produce, rather than animal feed or other commodity crops. The breakdown of covered and non-covered produce had some variation between years, but the number of non-covered produce cases increased by a factor of four in FY21 (Figure 14).

Pesticide misuse cases can fall into two categories: drift or misapplication. Drift is caused by spraying near the crop in question, but not direct application to that crop. Misapplication occurs when unapproved chemicals are applied directly to crops by a farm or operation.

All covered produce cases in this timeframe were drift, while several of the non-covered produce cases were misapplication by the farm or operation. The final graph shows the breakdown of actual crops, with most cases occurring in sugar beet and wine grape plantings.

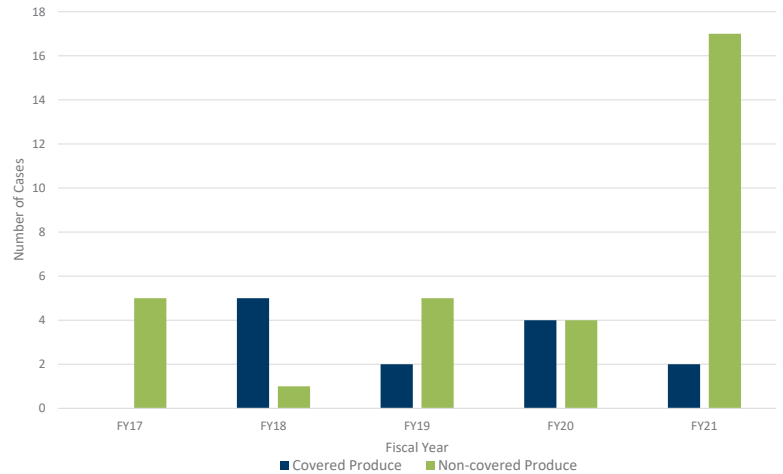


Figure 14: Total number of pesticide drift cases on all food crops

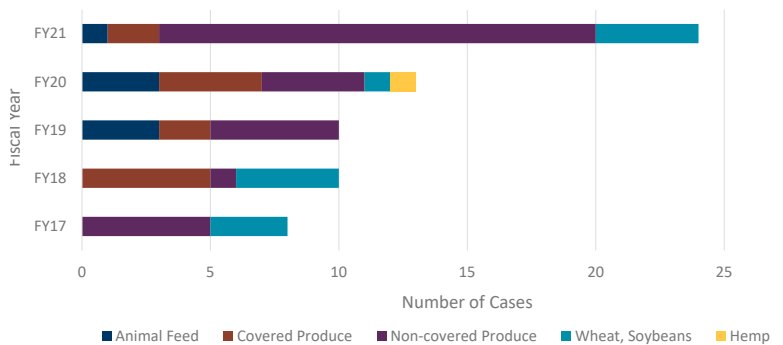


Figure 15: Total number of pesticide drift cases on all produce crops

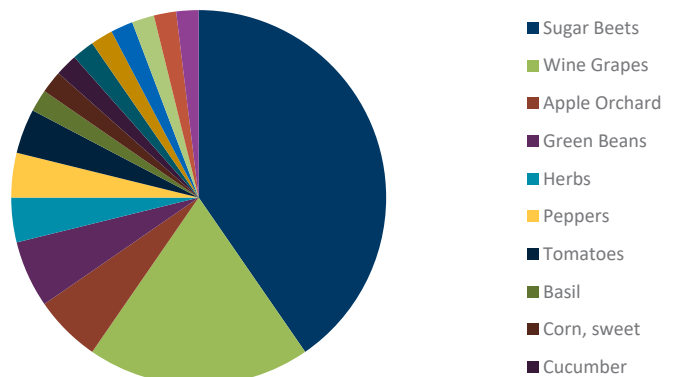


Figure 16: Total number of drift cases by produce crops

A woman with dark hair tied back, wearing a blue short-sleeved shirt, blue jeans, and white gloves, is washing vegetables in a black plastic crate. She is holding a spray nozzle connected to a grey hose, spraying water onto the produce. The crate contains several large orange carrots with green tops, and some purple beets. She is standing on a wooden surface, and a large grey tub is visible in the background. The word "EDUCATION" is written in white capital letters in the top left corner, with a green and blue horizontal bar above it.

EDUCATION



# EDUCATION

We continue to offer PSR Grower Trainings through a collaboration with Annalisa Hultberg, Extension Educator, Food Safety and UMN Extension. Data shown here is a summary of the total number and types of trainings that have been offered to date including who is attending these trainings.

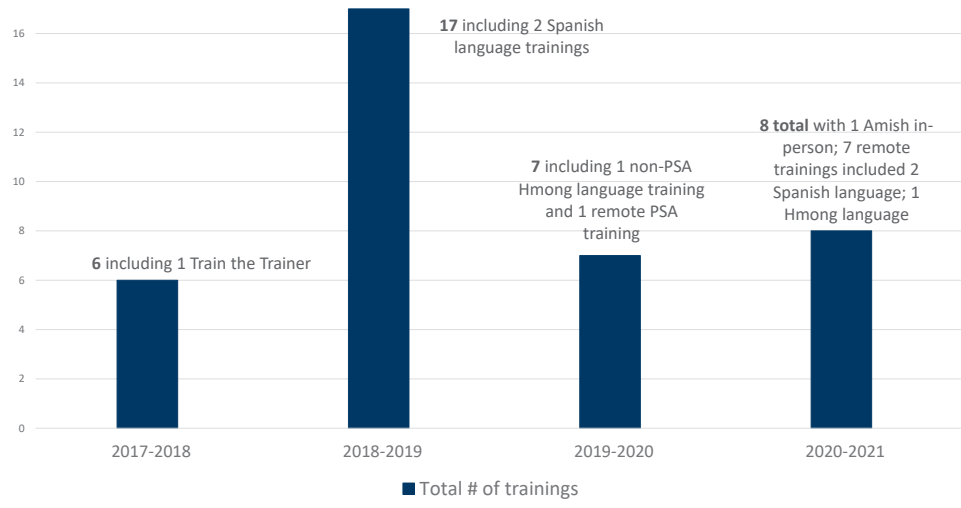


Figure 17: Total number of Produce Safety Rule Grower Trainings held in Minnesota to date

Table 2: Attendees for Produce Safety Grower Trainings

Type of GT attendee (all)	Total Number
Grower	640
Non-grower	118
Unknown	66
Total	824

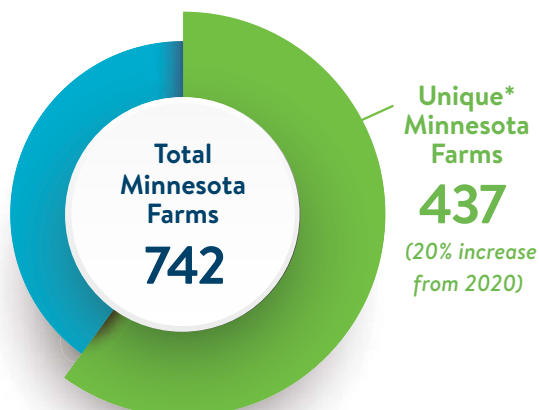


Figure 18: Total number of grower trainings to date

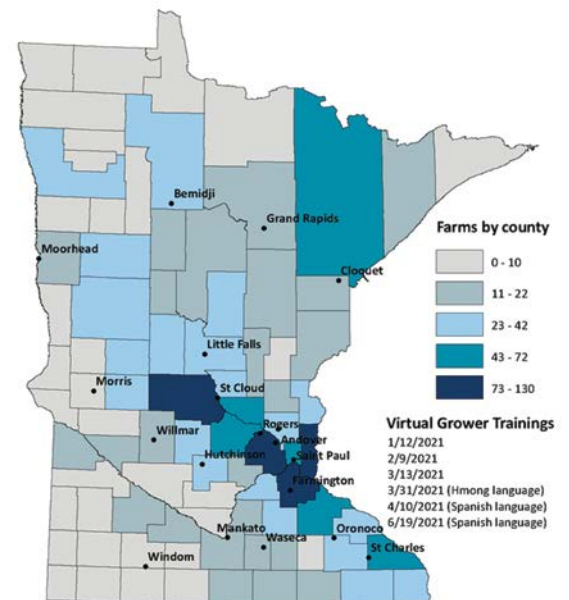


Figure 19: Total number of grower trainings to date by location

## Key Challenges

- Most of the education and resources we offer are for an English-speaking audience and do not accommodate English language learners, non-English speakers and those that don't use technology.
- The demand for education about on-farm food safety is high, but the menu of options is minimal. This is especially true for farms that don't have requirements under the PSR but still want to implement and invest in changes to their farm. As a result, many of these smaller farms are taking the PSR Grower Training multiple times to refresh their knowledge, but these trainings are not designed as a refresher course or to support smaller farms in implementing on-farm food safety.
- Lack of funding for developing and providing scaffolded education that can accommodate all produce farms, regardless of their status under the PSR.

## Funding to Meet a Need

Initial inspection trends and data received from post-grower training surveys indicated a need for additional educational opportunities. The PSP applied for a Specialty Crop Block Grant to fund these educational opportunities. In coordination with the UMN and various partner groups, the grant will be used to create specific deep dives from the grower training curriculum that caters to farm staff development opportunities, current food safety trends in the field, resources for compliance after inspection, webinars and more. These opportunities will be available for use for both covered and non-covered farms.

The PSP plans to track effectiveness of these trainings through continued review of inspection data and possible post inspection surveys.

## Recommended Actions

- ▶ Dedicated funding and staff to support ongoing education and resource development to meet the food safety risk reduction need of covered and non-covered farms around the state. This includes funds for the translation of education documents, interpretation at trainings and additional resources to support offerings in multiple languages.
- ▶ A better platform or inventory to share out new training opportunities to ensure all produce farms have access.
- ▶ Continued work the Produce Advisory Committee and community partners to ensure the education and resources developed are serving the wants and needs as intended.

A close-up photograph of a large pile of fresh, orange carrots. The carrots are covered in dark soil, indicating they are freshly harvested. Some carrots have green tops still attached. A small white tag is visible on one of the carrots. The background is dark and out of focus.

# CONCLUSION



## CONCLUSION

We appreciate the hundreds of produce farmers across the state who responded to the 2021 annual Grower Questionnaire, provided an assessment of our grower trainings, and provided feedback through customer service surveys. We also thank the many partners both within and outside of the MDA who contributed knowledge, stories, and data that are included in this report and continue to influence how we improve our programs and services.

At the close of our first five-year cooperative agreement with FDA, we reflect on the work accomplished in those five years and recognize opportunities for future development. There is still much to be learned to successfully support produce farms in implementing on-farm food safety and achieve the end-result that all Minnesota produce farmers receive the resources and support they need to grow safe food while meeting any regulatory requirements that apply to their farms. We hope these data and recommended actions can help continue advancing the development of programs and services unique to produce farms and bolster support systems for these invaluable members of the Minnesota farm community.

