

# High Tunnel Management Perspectives from Underserved Emerging Populations from Attendants at the 12th Annual Immigrant and Minority Farmers Conference in St. Paul, Minnesota

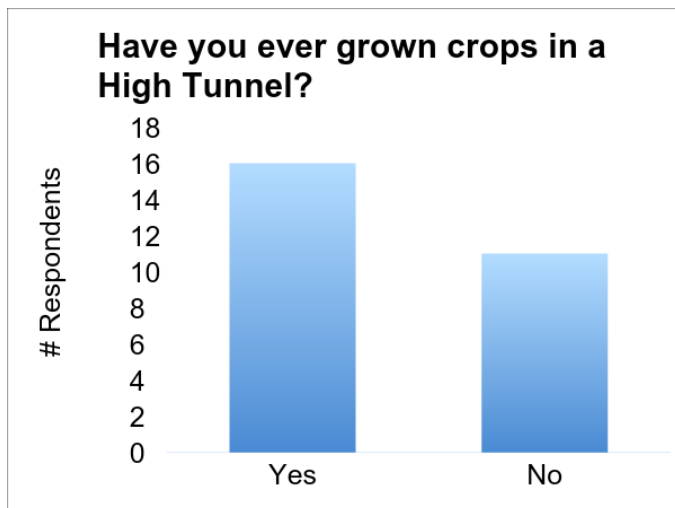
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## **Abstract:**

Places with extreme climate conditions and short growing seasons, such as the Upper Midwest region of the United States, limit farmers' total output. Many Farmers are learning new techniques that allow them to extend the growing season, increase crop productivity, and subsequently, profitability. In recent years, high tunnels, also known as hoop houses, have been increasing in popularity as a season extension tool (Carey et al., 2009). High tunnels are plastic-covered structures with metal poles over bare ground. They are commonly maintained with no or minimal external heat. The Natural Resources Conservation Service (NRCS) Environmental Quality Incentive Program (EQIP) is a federal program designed to assist farmers in implementing conservation practices. Cost share funding through EQIP supports the construction of high tunnels to farmers as conservation practice. Historically, underserved populations such as socially underrepresented or emerging farmers applying for EQIP funds receive higher funding assistance in addition to consideration in high priority funding categories. Few from these populations seek funding, so they may face unknown barriers in accessing EQIP support awareness. The objective of this research was to learn from current and potential growers how to improve the reach of government assistance programs such as EQIP to serve underserved emerging farmers. A verbal and written survey was conducted at the 12th Annual Minority and Immigrant Farmer Conference on January 2017 at the University of Minnesota. The survey indicated the majority of survey respondents are utilizing the NRCS program, and similar resources like it, but have been running into various challenges.

Agriculture has always been an evolving practice that changes accordingly based on the benefit it provides to the community at hand. Farmers are learning more and more about new approaches of agriculture, as local food and crops are becoming more preferred food systems (Connor et al., 2009) and buying local are evolving. Places with extreme climate conditions (e.g. the Midwest of United States) don't get to engage typical farming practices during the winter months. However, farmers are eager to implement new technologies aimed at extending the growing season (Carey et al., 2009). The main strategy for growing crops beyond the normal seasons in these demanding climates has been growing in greenhouses. Greenhouses are typically structures with walls and a roof made primarily of transparent material like glass that traps heat to recreate the climatic conditions for growing crops.

However, greenhouses usually require elaborate heating and cooling systems that are often expensive and impractical for most emerging farmers. Fortunately, the agricultural sector has developed an alternative method, called high tunnels. These are simple, greenhouse-like structures over bare ground, but without the elaborate heating and cooling systems of green houses. High Tunnels are a cost-effective alternative to greenhouses in regions with short growing seasons. According to Sustainable Agriculture Research and Education (SARE), "Commercial high tunnel production has increased rapidly in recent years because these structures promote increased crop quality and productivity, and extend the growing season" (W.J et al., 2003). Unfortunately, the conversation about it has been taking place with a mostly homogenous population of farmers. This has been perpetuated through the



**Fig 1.** This figure should illustrate those farmers who have used high tunnels in the past with those that have not used high tunnels in the past.

movements’ discourses and practices that singularly targeted to a specific demographic (Alkon and McMullen, 2010) within agriculture.

The purpose of this research is to better understand and assess the perspective of one of the government assistance programs that favors underserved emerging and the untargeted farmer population. This program is called Environmental Quality Incentive Program (EQIP), and it was developed by the Natural Resources Conservation Service, with the primary goal of promoting conservation programs along with implementing financial assistance to qualifying farmers. One of appeals of EQIP is that it provides agricultural producers across the nation with both financial and technical assistance from NRCS experts (Cattaneo, 2003). This study aims to determine the efficacy of the EQIP program from the perspective of underserved farmers and to explore potential improvements for EQIP and other similar programs. The high tunnels that are being built through NRCS funding provide a subsidy-like program referred to as ‘cost sharing’. This program incentivizes emerging farmers from this demographic to qualify from the high tunnels in the long term as they have a chance for higher subsidy along with priority over other applicants. Primarily, EQIP is designed to reduce water use (Wallander and Hand, 2011) and conserve ground and surface water supplies. In order to better understand the perspectives of emerging farmers a survey was informally conducted to capture the experiences of underserved emerging farmers’ with the High Tunnel System as well as to learn from current and potential farmers how to improve current governmental assistance programs such

as EQIP.

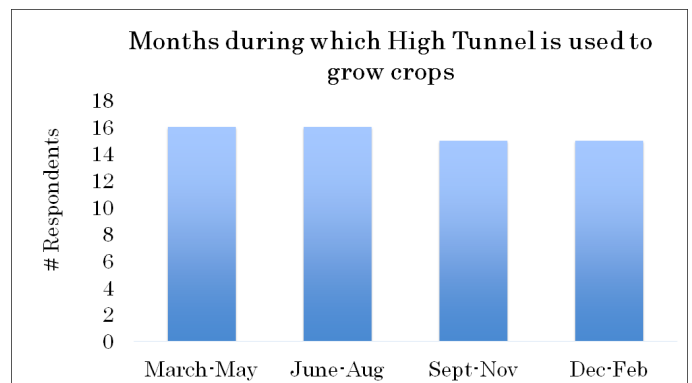
## Methods

### Participants

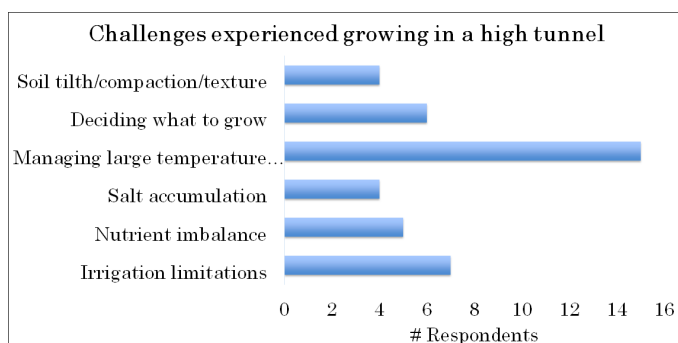
Farmers (N = 29) at the 12th Annual Minority and immigrant Farmer Conference of January 2017 volunteered to complete a survey regarding their efficacy of the EQIP program. The conference was held at the University of Minnesota campus. The participants of the survey consist a majority of men, a few women and generally middle-aged persons between the ages of 35-50. The majority of participants spoke Hmong and Spanish as their first language (65 percent), while the rest of the participants spoke English as a first language (less than 20%). Due to experimenter error, participants were not asked to identify their ethnicity.

### Materials

For this research, we constructed a survey aimed to address the experiences of underserved emerging farmers growing in high tunnels and the High Tunnel System cost-share program available through the EQIP from the NRCS. The survey included three sections and included verbal and written portions. The first section was titled “High Tunnel Experience and Management” and asked respondents about their experience growing crops in a high tunnel (Appendix A). The second portion of the survey asked about growers’ experiences with EQIP or other government assistance programs (Appendix B). The last section was a basic demographics questionnaire (Appendix C). Participants’ responses in part determined which questions they were asked. For example, if respondents indicated that they used high tunnels, they would be asked “during which months do you grow crops in a high tunnel” in order to determine the frequency of their high tunnel usage.



**Fig 2.** A figure that illustrates the distribution of seasons farmers grow in their high tunnels



**Fig 3:** A figure to show farmers' challenges with growing in high tunnels

### Procedure

The survey was administered at the 12th Annual Immigrant & Minority Farmers Conference (IMFC) in St Paul, Minnesota, and most of the attendees were either new or emerging farmers who have a history of being underserved in the agricultural community, according to an informal interview of the participants. Survey participants were informally asked simply if they would like to participate in the survey that will potentially show the success of several agricultural incentivizing programs including EQIP. At every workshop, there was also an announcement made about the survey and the reasoning behind it to better engage farmers at the conference that fall within the demographic of interest.

### Results

A total of 27 people began the survey. Under the category of "past high tunnel experience and management", the 27 farmers responded to the question of whether they have ever grown crops in a high tunnel. Of these 27 farmers, 16 had grown crops in high tunnels before and 11 had not, additionally two surveys were left blank- it was unclear whether they declined to answer or they misunderstood the questions (Figure 1). When asked if they had used EQIP funding for a high tunnel, from a total of 26 respondents, 16 people responded "yes", 10 people responded "no", and nine reported that they had used the program to construct their own high tunnel.

The next part of the survey looked at the different crops that are grown in high tunnels for those farmers who have used them in the past. The results showed that an over 60 percent of the crops grown in high tunnels are a mix of leafy vegetables and fruits.

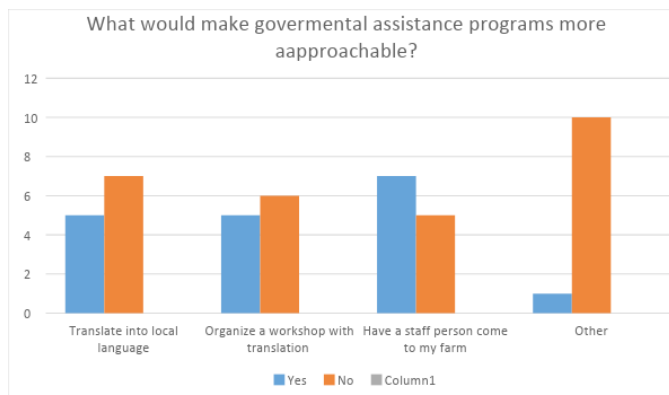
The next question of the survey addressed the core of this research: the challenges that farmers have experienced from growing in high tunnels. The respondents were provided five options to choose from (they could choose either one or more options that aligned with

their own challenges in using high tunnels in the past). The choices consisted irrigation limitation, nutrient imbalance, salt accumulation, managing large temperature fluctuations, deciding what to grow and finally soil tilth or compaction. Most of the survey participants chose more than one challenge, as high tunnels can be costly, difficult to manage, and vulnerable to extreme climate conditions. These results are summarized in Figure 3.

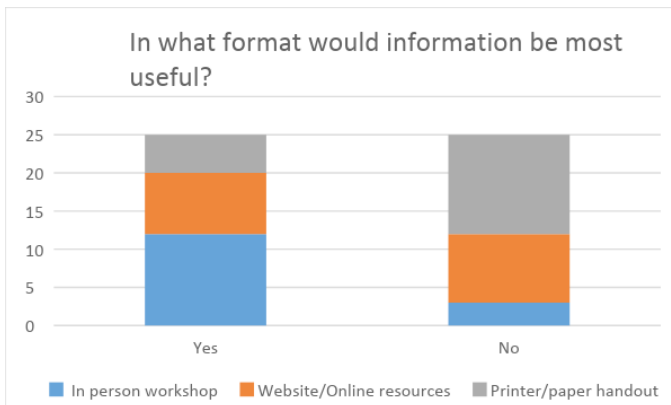
For the last questions, survey participants were asked what about their general feelings about government assistance programs such as the high tunnel initiative. The majority of the survey participants (n = 18) were either completely satisfied or somewhat satisfied with the current information delivery while a minority of the respondents (n = 4) was dissatisfied. Additionally, 17 participants provided responses regarding their overall satisfaction with government assistance programs for minority and immigrant farmers. Of these participants, seven participants were, somewhat satisfied and five were completely satisfied. Only five participants expressed overall dissatisfaction with the available government assistance programs. On figure 4, when asked about what would make governmental assistance programs a lot more approachable, a great deal of the respondents agreed a change in information distribution.

### Discussion

The survey did not include a self-identification option to filter out the responses on the background of the participants to easily categorize them in the "minority or immigrant" demographic. There were a few people who did self-identify as nonimmigrant verbally and were categorized under emerging farmers. This came up when discussing the purpose of the research and the ultimate goal in the survey. Additionally, it's safe to infer from the setting of the survey being an immigrant and minority farmers'



**Fig 4:** This figure illustrates opinions on the format of information that emerging farmers would find most useful



**Fig 5:** This figure shows the preference of format that farmers believe to be effective for information distribution

conference, it's mostly consisting of emerging growers. The shift in the purpose of the research changing was very much dependent upon the framing of the questions on the survey. Prior to the direction change in the research, the primary basis was the efficacy of government assistance programs and their feasibility as well as their reach to marginalized populations. However, the direction of the research currently is the overall efficacy of these agricultural assistance programs for everyone that has used them and has participated in the survey. This made the study much narrower and focused.

Findings from this research indicate that most survey respondents think that language translation would make governmental assistance programs like EQIP more accessible. Given that NRCS currently provides language translation and interpretation for their programs, outreach designed to increase awareness of existing services may make the program more approachable to diverse demographics.

As we were speaking to people throughout the conference, there were people who felt that the definition of minority farmers could extend to gender, sexuality and socioeconomic levels. When the research was initially proposed, the definition of minority was narrower and only extended to marginalization in terms of race and historical/social underrepresentation like Native Americans, first generation immigrants, or other ethnic group that have ancestry elsewhere.

One of the first questions that is both for potential and current emerging farmers is about their expectation or anticipated benefit from growing in a high tunnel. When respondents were asked what drove them to grow in a high tunnel, the answers were diverse. Some said that they chose high tunnels because they allowed them grow new crops in multiple seasons as well as the benefit of being able to harvest crops earlier and indication of extended

season. The next survey question asks the distribution of crops that are grown in the high tunnels for those current growers. This part of survey shows that an overwhelming majority of the crops that grow in the high tunnels are a mix of leafy veggies and fruits which makes sense as majority of minority and immigrant farmers are small vegetable farmers that is not really for commercial use, but rather either for local farmers market or home use.

Next, we also asked in the survey the challenges current farmers have experienced in growing in high tunnels. The top challenges reported were water limitation (irrigation), managing larger temperature fluctuation and soil tilth or compaction. Some of the survey respondents expressed a concern on the lack of knowledge they had when they had worked in a high tunnel, whether it's related to EQIP or not, it was not clear, one respondent said on their survey, that "the water limitation, nutrient imbalance, salt accumulation, managing larger temperature fluctuation, deciding what to grow, soil tilth was all a challenge however, along with needing to take a lot of classes before the use of the high tunnel made the whole process much more challenging."

The next series of questions from the survey concerned the experiences with EQIP or other government assistance programs; according to the survey, a lot of farmers attending the Immigrant and Minority Farmers Conference have heard of the financial support for high tunnels available from NRCS through EQIP. Though the majority of the participants that responded to this question had heard about these financial support programs from IMFC or USDA workshops, there was an overwhelming majority that gave no response to this question. This made it difficult to make any conclusions about the convenience, accessibility, and breadth of these programs as a whole. When asked about what other agriculture government programs they had heard about, the vast majority did not respond. Most participants did not complete the part of the survey addressing past-experience with and suggestions for improved accessibility to EQIP or other government assistant programs for high tunnel use. Although, for those who did answer this question a translation into local language and an organization of a workshop with translation seems to be a common answer. A minority of the survey participants believed that having a staff person come to their farm from these government programs would make them much more approachable. As for the format of information that would be most useful, 17 respondents believed that in-person workshops would be most useful in getting this information on the programs.

## Conclusion and Future Directions

One of the gaps that have impacted the research greatly comes from the demographic questionnaire (Appendix C) as the written portion of the survey did not ask respondents racial background, or whether they identify as an immigrant or minority farmer, so that greatly created an obstacle in making comparisons or drawing conclusions about disparities between immigrant and non-immigrant grower populations. It also made it almost inconsequential to filter out the perspective of the so-called “underserved farmers” into categories that better fit with underrepresented or marginalized communities of farmers.

Findings from this research indicate that most survey respondents reported that language translation would make governmental assistance programs like EQIP more accessible and effective in the long run. NRCS does currently provide language translation and interpretation, however outreach designed to increase awareness of existing services may make the program more approachable to diverse demographics within underserved emerging farmers.

EQIP within the NRCS has one-on-one program to help farmers develop a conservation plan that meet with the farmer’s goals and vision for the land. Along with the funding that is provided by NRCS, it also includes costs for implementing conservation practices for building the high tunnel. While EQIP is a well-intentioned program, its initial attempt to expand agricultural plans for underserved farmers is unfortunately given a backseat for the main objective of this program: conservation. While a positive and, in the long-term, purposeful objective, it does very little to create a space for emerging farmers that are unfamiliar or lacking the opportunity for a program like this one. The gap in the satisfaction rate between the different governmental programs compared to EQIP shows an obvious accessibility difference between programs. Programs such as state grants, SARE funding resources, ATTRA funding, Farm Service Agency and other programs have a difficult eligibility requirements for the underserved emerging farmers. EQIP is a program that caters to a wide pool of farmers with different land eligibility as well as support in funding through separate initiatives.

As we were speaking to people throughout the conference, there were people who felt that the definition of minority farmers could extend to gender, sexuality and socioeconomic levels. However, the research was initially proposed using a narrower definition of minority that focused on marginalization in terms of racial background including Native Americans, people of color who happen to be first generation, or other ethnic group of Americans that have ancestry elsewhere.

A technological development and market integration for the majority of agricultural sector forces change, they will drastically influence the lives of emerging farmers. Programs like EQIP, and most agricultural assistance programs under it, favor the environmental protection part of agricultural more than the profitability of emerging farmers or the inclusion of historically underserved farmers.

Furthermore, if this study were to be redesigned, there are a number of changes that could be made. Most importantly we would go for a mixed methodology in addition to the informal surveying, such as a controlled focus group discussion or more interviews with farmers from the filtered demographic. Additionally, we would add on to the demographic questionnaire with a clean-cut question of ethnic backgrounds that would help flush out the underserved farmer population.

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## Appendices

### High Tunnel Experience and Management

1. Have you ever grown crops in a high tunnel or hoop house? (CIRCLE ONE: YES / NO)
  - a. Do you currently use high tunnels/hoop houses? (CIRCLE ONE: YES / NO )
  - b. If so, how many? \_\_\_\_\_
  - c. How old are they? \_\_\_\_\_
2. During which months do you grow crops in your high tunnel?
  - d. Fall (Sept-Nov)   b. Winter (Dec-Feb)   c. Spring (Mar-May)   d. Summer (June-Aug)
3. What crops have you grown in a high tunnel?
4. What benefits do you expect from growing in a high tunnel? (CIRCLE ALL THAT APPLY)
  - a. Able to grow new crops in winter/spring/fall
  - b. Able to grow harvest crops earlier
  - c. Higher quality crops
  - d. Cleaner crops (less washing required)
  - e. Reduced disease pressure
  - f. Other
5. What challenges have you experienced growing in a high tunnel? (CIRCLE ALL THAT APPLY)
  - a. Irrigation or water limitations
  - b. Nutrient imbalance
  - c. Salt accumulation
  - d. Managing large temperature fluctuations
  - e. Deciding what to grow
  - f. Soil tilth/compaction/texture
6. What fertilizer do you use in your high tunnels? (CIRCLE ALL THAT APPLY)
  - a. Synthetic   b. Manure   c. Compost   d. Other: \_\_\_\_\_   e. Combination: \_\_\_\_\_
7. Do you use cover crops in the high tunnel? (CIRCLE ONE: YES / NO)
  - a. Which cover crops? \_\_\_\_\_
  - b. During what months/which season? \_\_\_\_\_
    - i. Fall (Sept-Nov)   ii. Winter (Dec-Feb)   iii. spring (Mar-May)   d. summer (June-Aug)

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### Appendix A - High Tunnel Experience and Management

**Experience with EQIP or other government assistance programs**

8. Have you heard of the financial support for high tunnels available from NRCS through the Environmental Quality Incentives Program (EQIP)? (CIRCLE ONE: YES / NO)
- a. If yes, how did you hear about EQIP?
    - i. Workshop (through which organization? \_\_\_\_\_)
    - ii. Conference (which? \_\_\_\_\_)
    - iii. Flyer or handout from NRCS
    - iv. other \_\_\_\_\_
9. Have you personally used EQUIP funding for a High Tunnel? (CIRCLE ONE: YES / NO)
10. Are there any barriers preventing you from building or using a high tunnel? (CIRCLE ONE OR MORE)
- a. Access to NRCS EQIP assistance programs/eligibility
  - b. Not a U.S citizen
  - c. Land tenure
  - d. Unsure how to grow in a high tunnel
  - e. Doesn't fit in my marketing/growing plan
  - f. other \_\_\_\_\_
12. What other agriculture related government programs have you heard about?
- a. Conservation Stewardship
  - b. Cooperative Conservation Partnership Initiative
  - c. On-Farm Energy Initiative
  - d. Organic Initiative
  - e. Other: \_\_\_\_\_
13. What could make high tunnel EQIP support more approachable?
- a. Translate into local language
  - b. Organize a workshop with translation
  - c. Have a staff person come to my farm
  - d. other \_\_\_\_\_
14. What format would information be most useful in? (Circle one or more)
- a. In-person workshops
  - b. Websites/online resources
  - c. Printer/paper handouts
15. What are your general feelings about assistance programs such as the high tunnel initiative?
- a. Completely satisfied
  - b. Somewhat satisfied
  - c. Dissatisfied
- Why? \_\_\_\_\_
16. How would you rate your overall satisfaction with government assistance programs for minority and immigrant farmers?
- a. Completely satisfied
  - b. Somewhat satisfied
  - c. Dissatisfied

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Appendix B- Experience with EQIP or other governmental assistance programs

**Demographic Questionnaire**

What is your age range?

- a. 25 and under
- b. 26-32
- c. 33-40
- d. 40-47
- e. 47+

What is your primary language?

- a. English
- b. Hmong
- c. Spanish
- d. Somali
- e. Other: \_\_\_\_\_

What is your Gender?

- a. Male
- b. Female
- c. Non-Binary
- d. Other: \_\_\_\_\_

Appendix C - Demographic Questionnaire