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## Pairing a Q study with participatory decision-making around orchard workplace safety: A case in Washington's tree fruit industry

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### Abstract

Tenets of participatory decision-making speak to the importance of meaningful participation from diverse stakeholders for improving both process and outcomes. But what participation actually looks like can vary substantially, and constructing a group where all actors can truly speak is often

elusive. In addressing controversies over pesticide safety in tree fruit orchards in Washington State, we used a Q study to identify divergent viewpoints and convened a group to bring these views together. The resulting stakeholder working group was then challenged to both acknowledge their often-opposing viewpoints and to construct a mutually beneficial idea for improving pesticide safety in the tree fruit industry. This paper explores the dynamics of this stakeholder working group, analyzing not only its successes but also its

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challenges and difficulties. Rooted in a mainstream agricultural industry in the western United States, this study highlights the ways in which seemingly simple things like who “shows up” and why can shape processes and outcomes.

### **Keywords**

Q Study, Participatory Action Research, Pesticide Safety, Stakeholder, Farmworker, Migrant, Engagement, Tree Fruit

### **Introduction**

Participatory decision-making asks for meaningful engagement from diverse stakeholders in addressing mutually relevant problems or needs. But the implementation of such processes can vary substantially, and achieving truly *meaningful* participation across viewpoints is typically easier said than done. In this project, we used a Q study, which is designed to systematically identify relationships between participants’ views on a subject (Watts and Stenner 2012), to lay out divergences in viewpoints regarding pesticide safety in Washington State tree fruit orchards. We worked from there to create a process of engagement across divergent views. Our goal was to bring together stakeholders across the tree fruit industry to talk about concerns regarding orchard workplace culture and safety and opportunities for improving it; in other words, our goal was to allow for a more pluralistic form of decision-making in this agricultural industry, whereby stakeholders with different views and different levels of power could interact to solve problems of mutual concern.

### **The Case: Tree Fruit in Central Washington State**

The Washington State tree fruit industry is a US\$7.5 billion industry employing about 187,000 permanent and seasonal workers (Globalwise & Belrose Inc., 2014; U.S. Department of Agriculture, National Agriculture Statistics Service [USDA NASS], 2012; U.S. Department of Labor, 2013; Washington State Farmworker Housing Trust, 2008). Nationally, Washington State has the third largest number of migrant and seasonal farmworkers and the second highest rate of nonfatal farming injuries, with most agricultural injury claims

coming from orchard sectors (Keifer, Salazar, & Connon, 2009; Pelnecke, Forland, & Wines, 2015; U.S. Department of Labor, 2013). As such, questions of health and safety are of paramount importance in the tree fruit industry. One potential health and safety concern is pesticide use.

Orchard crops such as apples typically receive more pesticides per unit area than other crops because the market for high-value fresh products tolerates few blemishes. The use of particularly toxic pesticides has dropped significantly in recent years (USDA NASS, 1998, 2008) due to changes in regulation and the availability of “softer” pest control products; however, many farmworkers, pesticide applicators, and environmental groups remain concerned about pesticide use and the potential neurological, oncological, and developmental risks of pesticide exposure (Alavanja et al., 2004; Arcury, Quandt, & Russell, 2002; Halfacre-Hitchcock, McCarthy, Burkett, & Carvajal, 2006; Lieberman & Augustave, 2010). This is especially important in that workers may not have the resources to advocate for their own workplace safety. Many workers in tree fruit orchards are immigrants of Hispanic origin who face cultural and linguistic barriers. Some lack legal status to work in the U.S. or are financially vulnerable, making them hesitant to complain for fear of being fired or deported (Kandel & Donato, 2009). Many seasonal farmworkers (particularly those who migrate to pick fruit) cite pesticide exposure as one of their top concerns, do not feel adequately trained to work around pesticides, or say that training is done in a format they do not understand (Hofmann, Crowe, Postma, Ybarra, & Keifer, 2009; Hohn, 2010; Mayer, Flocks, & Monaghan, 2010; Rohlman, 2010). And yet, this view of pesticide risk is not shared by all. For example, many farmers feel that they provide pesticide safety training to workers and that, if pesticides are used appropriately, they are fairly safe. Other farmers contend that most migrant fruit pickers are not directly exposed to pesticides at work and that in some cases, more extensive training could worry farmworkers more than protect them (Kandel & Donato, 2009; Quandt, Arcury, Austin, & Saavedra, 1998; Thompson, Coronado, Puschel, & Allen, 2001). These differing viewpoints present challenges to

reducing occupational risk in agriculture, as actors do not agree on the nature of the risk or even on whether a measurable risk exists. This means that improvements remain inconsistent from farm to farm, depending on how individual farms and workers implement safety measures (CDC, 1999).

These differences in viewpoint have practical implications because the tree fruit industry, like many agricultural industries, operates with a strong chain of command; that is, the views of those with more power over workplace practices (typically but not always, orchard owners or head managers) are often different from those with less power (in this case farm employees, including migrant workers) (Holmes, 2013). And yet, this industry is more complex than a meeting of the “powerful” and “powerless.” Most daily orchard operations are run by middle managers, often former migrant farmworkers who have, over time, come to be employed as field supervisors and managers. And most of the orchard acres in the state are managed by operations who employ hundreds of people in roles ranging from (migrant) fruit pickers to pesticide applicators, tractor drivers, tree pruners, supervisors for picking and pruning crews, safety managers, horticultural managers, pest management consultants, mechanics, human resources personnel, head managers, and orchard owners. Cultural differences are also embedded within these hierarchies. For example, Latinos occupy most middle manager roles (e.g., crew supervisor, safety manager, horticultural manager), year-round worker roles (tractor driver, pesticide applicator), and seasonal worker roles (migrant fruit picker, pruner), but they occupy less than 10% of orchard owner roles (NASS, 2015). These divides are changing somewhat as more Latinos become owners and primary managers; nevertheless, they imply a situation where, as individuals at each level of the hierarchy report to those above them and supervise those below them in the chain of command, axes of power, culture, and viewpoint on risk come together and often conflict (Holmes, 2013). In other words, different viewpoints on pesticide safety are embedded in a complex structure of power, needs, and motivations; therefore, the different parties are typically not on equal footing when wrestling with these clashing

viewpoints (Lehrer & Sneegas, 2018).

In particular, research has found that perceptions of risk tend to be lower among white men than among women or people of color for reasons likely related to vulnerability and control (Flynn, Slovic, & Mertz, 1994). Because ethnicity, race, and gender tend to correlate with position in agriculture, when risk mitigation measures are based on the dominant or “expert” (often white male) view, those measures are not necessarily satisfactory in the eyes of other stakeholders (Flynn et al., 1994; Holmes, 2013). In the case of pesticide safety controversies, this can set up a seemingly unresolvable conflict where some stakeholders argue that risk is well managed while others maintain that employees are left vulnerable.

This study asked whether bringing diverse viewpoints on pesticide safety into conversation within a stakeholder process could mitigate some of the challenges that come from these differential power dynamics. We first used Q methodology (i.e., a “Q study”) to identify the differences in views on pesticide safety across the tree fruit industry and to make them more transparent. Second, we brought together individuals with differing viewpoints into a working group. We wanted them to discuss their differences and, if they wished, seek areas of agreement for improving safety in orchards. By allowing views held by stakeholders with less power to be heard alongside views held by stakeholders with more power, we hoped to allow the group to identify improvements that could be made only with input from multiple sectors. Note, however, the importance of the word *views* above; that is, we did not bring together stakeholders from all *jobs* in the tree fruit industry; rather, we used Q methodology to be able to represent the *views* of these diverse stakeholders across their different roles (see further discussion of this distinction in the analysis). Our goals were (1) to create a broader and more equitable representation of groups and viewpoints in defining and addressing issues of pesticide safety and (2) to engage with some of the power imbalances and exclusions in decision-making processes, especially in a highly structured industry like tree fruit in Washington. In doing so, we are responding, in part, to calls from scholars such as Becker (2011) and Slovic (1997)

who argue for democratic processes in dealing with questions of risk reduction to help improve both decisions themselves and promote trust in those decisions.

### **Literature Review: Power and Participation**

Addressing stakeholder participation in decision-making taps into an established literature from multiple disciplines including policy, collaborative governance, organizational psychology, and strategic management (Brugha & Varvasovsky, 2000). While these fields provide useful insights into stakeholder choices and dynamics, they are not always centered heavily on power, a crucial mediator of collaborative decision-making in an industry such as tree fruit. To address power more centrally, we draw from the field of development studies, which has developed a strong and yet contentious relationship with participatory and inclusive decision-making processes. While this literature centers much more explicitly on “elevating the powerless” than did our work, we pull from it because it delves deeply into the almost banal details that often construct power relations (Gaventa & Cornwall, 2006). Even as other frameworks see power as an important consideration and create mechanisms to work with (or around) questions of power (Huxham, 1996), they spend less time with the logistics of what makes power a constructive force (such as time and place of meetings, “real” versus tokenistic inclusion, etc.). Thus, despite some dissimilarities between our study and those typically examined in development studies, we draw on the international development literature for its particularly granular and practical assessment of power as a shaping force.

Participatory processes in the world of international development find their origins in a critique of “top-down” development projects. They seek greater inclusion of stakeholders in decision-making such that they would not only be included in, but would also share control in the research process, assessments, and the translation of research into practice (Chambers, 1997; Impey & Overton, 2013; Lilja & Bellon, 2008; Sen, 1999). Fiorino (1990) notes that this kind of participation belies an ethical commitment to involving people in issues that concern them and also functions as a

more effective way to make better decisions (see also Carr, 2002; Chambers, Kenton, & Ashley, 2004; Escobar, 1995; Morissey, Clavin, & Reilly, 2013; Smith, 2008). Reid (2000), as described by Caretta and Riaño (2016), notes that while one cannot really create a level playing field across demographic and social inequalities, collaborative processes can lead to both greater shared power and new scientific insights.

There have been many successes reported in such participatory development projects (Dreyer, 2000); however, there have also been critiques of development practitioners adopting the language of participation without its commitment to empowerment and self-representation—an attempt to implement top-down projects that are framed as “bottom up” (Evans et al., 2004; Few, Brown, & Tompkins, 2007; Parfitt, 2004; Sinwell, 2008). Though Pimbert and Pretty (1996) note that participation can legitimately range from being informed of decisions or being allowed to comment to taking part in joint analysis and decision making, Cooke and Kothari (2001) argue that participation can easily become a form of tyranny where external facilitators maintain control, powerful members of a community dominate, and efforts focus on using specific tools recommended for participatory processes rather than ensuring that those tools actually facilitate a participatory and inclusive process. As such, some argue that participatory processes themselves can be quite dangerous, as they can neutralize political opposition through a superficial nod to inclusion (Ellis, 2011; Janes, 2016; Kapoor, 2005). And yet, proponents and critics of participatory processes alike continue to seek out broad participation in research, decision-making, and project design. In seeking to develop a participatory process that is meaningful, scholars have noted several attributes of importance:

1. **Inclusion:** This includes knowledge of the factors that might limit participation, including the time and location of meetings, financial constraints, literacy and language, gender and ethnicity, and internal power dynamics that might make some more or less likely to speak while others are there

(Williams, 2004). It also includes recognizing that the assumption that people necessarily want to participate is flawed; rather, in deliberative democracy, people will get involved in decisions if they are interested in them. The choice to participate (or not) can vary across time, topic, or group and is rarely static or easily defined (Few et al., 2007; Hauptmann, 2001; Warren, 1996).

2. **Tools and measures:** Knowing that stakeholder processes can reproduce power inequalities even in the name of inclusion, Mitchell (1997) suggests structures and exercises for creating a space of trust, transparency, and openness. This involves making sure each person is encouraged to talk if they wish, using cooperative decision-making tools, small group work, and visual or ranking exercises (see also Brown, Tompkins, & Adger, 2002; Brown, Few, Tompkins, Tsimplis, & Sortti, 2005; Few et al., 2007; Renn, 2006; Stirling & Meyer, 2001). In other words, scholars note that an attention to *how* participation is operationalized matters.
3. **Understanding power:** This attribute involves accepting power as a constructive force. Even when seeking to create a space outside of normal hierarchies, the dynamics of who participates and who does not, and how that participation unfolds, remain. And presuming to take decision-making outside of the normal power dynamics of society fails to recognize that the implementation of such decisions must take place within society. But while this makes power a crucial force to consider, it does not necessarily make stakeholder work impossible; rather, acknowledging divergent viewpoints and community heterogeneity can be a bridge to working together in such spaces (Berman & Phillips, 2000; Cooke & Kothari, 2001; Dudley, 1993; Few, 2001; Godfrey & Obika, 2004; Mattessich, Monsey, & Corrinna, 1997; Muria, 2000).
4. **Alternatives to consensus:** This attribute involves acknowledging the limits of consensus and foregrounding the idea that

perhaps consensus is not the goal. Deliberating together does not always produce consensus; rather at times, it can heighten conflicts when the interests and values of participants clash (Few et al., 2007; Owens, Rayner, & Bina, 2004; Pugh & Potter, 2003). Mouffe (2005) suggests that, instead of seeking to avoid antagonism, groups can work to transform it into agonism—where stakeholders recognize the legitimacy of differing views even while acknowledging that there may not be a solution. In contrast, an excessive focus on consensus can eliminate needed space for disagreement (Korf, 2010; Mouffe, 2005; Tsouvalis & Waterton, 2012).

5. **Time:** The process of engaging appropriate people, avoiding control by dominant groups, building trust to recruit participants, and having people speak for themselves rather than for others all takes time (Brown et al., 2002; Cooke, 2001; Grimble, Aglionby, & Quan, 1994; Mohan, 2001; Townsend, 2013). Funding and project timelines can create incentives to reduce a participatory process to simple consultation; instead, to really include stakeholders in a process, they need to help construct the process (Fox, 2013; Jamal, 2004). Furthermore, having stakeholders who are committed to being involved over a long, often extended period of time can be crucial to the survival of a participatory process (Small, 2004).

These attributes—which focus on inclusion, tools to build trust and transparency, an active understanding of power and alternatives to consensus, and the investment of time—are useful not only in development, but also in this case—a study of a different set of stakeholders in the U.S. They are also useful in light of fact that, in the literature on agriculture and sustainability, power is at times not thoroughly addressed and at other times treated more as an assumed hierarchy of inequity and injustice rather than a complex and ever-shifting matrix (Alkon & Agyeman, 2011; Gottlieb & Joshi, 2010).

In this study, we pull from the literature on participatory processes in exploring the dynamics of a stakeholder group process on pesticide safety and workplace culture in Washington State. One difference here compared to the literature is that we do not define stakeholders primarily by their role (e.g., migrant fruit picker or head manager) but rather by their view of certain issues (as categorized by our Q study). At times, however, we map those views onto an analysis of the people who hold them. In this paper, we will share our successes and especially our concerns and questions about this process. We also explore how this case study might reflect, and also offer insights for scholars and practitioners of, participatory decision-making processes.

## Methods

Knowing the limits and challenges to implementing participatory processes, our goal was to provide, to the extent we could, *more* equal voice to the members of our stakeholder group. The group was convened based on a Q study conducted in 2012-2013 which classified divergent views surrounding barriers to pesticide safety in Washington State orchards. Q methodology is a tool developed by William Stephenson that uses inverted factor analysis to find correlations between participants' views on a subject. Designed to draw out differences and similarities among stakeholder views, it can reveal commonalities in beliefs among participants. These differences and similarities can be illuminating, especially when working through high conflict issues. Key to the use of Q methodology is the contention that views do not always correlate with roles (Brown, 1980; Watts & Stenner, 2012). For example, in our case, one tractor driver may hold similar views on workplace safety to another tractor driver, or s/he may hold views closer to those of someone who performs a different role, such as a migrant fruit picker or middle manager. Thus, Q is used first to identify and systematize viewpoints across a broad diversity of participant roles and positions. It is also used to explore how these viewpoints map back onto various stakeholder roles. Data are collected in the form of a Q sort, where participants sort a collection of statements compiled ahead of time by researchers to

encompass the many views surrounding a subject. For our study, these statements were based on published and unpublished research on perceptions of pesticide safety. They were also based on 18 interviews and focus groups from 2012 that were conducted in Spanish and English with a total of 34 individuals, including pesticide applicators, orchard managers, growers (farmers), pest management consultants, health care workers, researchers and extension personnel, educators and trainers, migrant fruit pickers, lawyers, pesticide safety activists, and government conservation specialists (Lehrer & Sneegas, 2018).

Q study participants were selected using purposive and snowball sampling methods to represent stakeholders from all types and levels of positions in the tree fruit industry. This included those along the full chain of command within the industry as well as those working in positions that support, regulate, or critique the tree fruit industry. Participants were recruited at migrant worker housing camps, classes for tree fruit supervisors and middle managers, occupational health and safety conferences, tree fruit industry conferences, and through contacts from the first author's prior work in agricultural research and extension in central Washington State. Ultimately, half of the Q study participants worked inside the tree fruit industry (industry representatives, pest management consultants, growers, managers and supervisors, pesticide applicators, and migrant fruit pickers). The other half worked in roles of support, regulation, or critique (researchers, educators and trainers, public health professionals, conservation professionals, legal advocates on migrant worker rights, and migrant farmworker health advocates).

Participants received 45 laminated cards, each containing one Q statement (see Appendix A for a list of these Q statements). They could use a card deck printed either in Spanish or in English and could either read the cards themselves or have the researcher read them aloud, so as to minimize any obstacles of language or literacy. Participants were instructed to place each card onto a sorting grid, with the left-most column labeled "least like my view," the right-most column "most like my view," and "neutral" as the central column. Each participant sorted the statements according to their

opinions and also completed a post-sort questionnaire about the process. In this way, the results yielded a snapshot of their views on the topic being studied. The sorts were then analyzed using factor analysis to determine groupings of shared perspectives (Watts & Stenner, 2012). The goal was to systematically identify stakeholder perspectives or viewpoints and make them transparent to participants so that they could be used by our multi-stakeholder group to negotiate pesticide safety and risk mitigation measures. A total of 41 Q sorts, completed by individuals with a stake or interest in the tree fruit industry—from migrant farmworkers and year-round orchard employees to orchard owners, industry consultants, farmworker advocates, researchers, and educators—were analyzed using the PQMethod 2.33 statistical software (Schmolk, 2013). Our participant demographics are found in Table 1, arranged by grouping or perspective (see the section on Q study results for a further explanation of these groupings). See Lehrer & Sneegas (2018) for more detail on this Q study and how it was conducted, including more information on the Q statements, the sorting process and analysis, and the participants.

All individuals who participated in the Q study were invited to join the subsequent working group process to delve into these different perspectives and use them to identify and perhaps pursue a mutually acceptable path to resolving pesticide safety concerns. Of the 41 Q study participants, 24 expressed an interest in participating, and each

received a formal invitation to do so. Table 2 shows the breakdown of the participants who wished to participate in the working group and those who did not (as well as which of these actually attended any working group meetings). This information is arranged according to their position inside or outside of the tree fruit industry (for a further analysis of the contours of participation and non-participation, see stakeholder group results).

Of the 24 participants who were, given their expressed interest, formally invited to participate in the working group, three replied that they were no longer interested (but did not give a reason); eight said they were still interested but could not make the first meeting; five said they “might” attend (but did not); and eight attended the first meeting. Of those eight attendees, two were educators, two worked for government or extension, one was a farmworker health advocate, one worked for a tree fruit industry association, one was a pest management consultant, and one was a year-round pesticide applicator and crew leader. In total, five half-day meetings were held. Four of them were held during 2014—February (eight attendees), March (four attendees), May (six attendees), August (five attendees)—and one was held in July 2016 (five attendees). Each meeting was run by a professional facilitator, and the first two were simultaneously interpreted in Spanish and English by a professional interpreter (at the last three meetings, all participants were comfortable in English).

**Table 1. Demographics of Q Study Participants**

<i>Attribute</i>	Skeptics	Acceptors	Incrementalists
Gender	Both women and men	All men	All men
Culture/language	Both Spanish- and English-speakers	All English-speakers, one bilingual in Spanish	All Spanish-speakers, one bilingual in English
Mean age	43 years	52 years	40 years
Jobs	Orchard managers, orchard employees (year-round and seasonal/migrant), educators, farmworker advocates, public health	Consultants, growers, researchers, industry representatives	Growers, orchard managers, orchard employees (year round and seasonal/migrant), educators
Direct experience with pesticides	Little	A lot	A lot
Percent with any years of college or above	58%	60%	33%



**Table 2. Interest and Participation in Working Group among Q Study Participants (Sorters)**

Participation in working group from within tree fruit industry		Participation in working group from outside tree fruit industry	
Sorters who said they wanted to participate (# who did attend)	Sorters who said they did not wish to participate	Sorters who said they wanted to participate (# who did attend)	Sorters who said they did not wish to participate
5 pest management consultants (1 attended)	2 pest management consultants	3 farmworker or health advocates (1 attended)	2 farmworker advocates
3 growers or managers (0 attended)	2 growers or managers	3 government or extension (2 attended)	5 government (public health) workers
3 year-round orchard workers (1 attended)	2 year-round orchard workers	1 researcher (0 attended)	1 researcher
2 industry representatives (1 attended)	3 migrant farmworkers	4 educators (2 attended)	
Total: 13 (3 attended)	Total: 9	Total: 11 (5 attended)	Total: 8

Participants filled out evaluation forms after each meeting to help improve subsequent meetings. All procedures were approved by the Institutional Review Boards at Washington State University and the University of Washington.

## Results

Although not the primary focus of this paper, an overview of the Q study results is presented here first so as to illuminate how they informed the stakeholder group process.

### Q Study

The Q study that served as the base for our stakeholder working group found three different viewpoints (or factors) regarding pesticide safety in Washington State tree fruit orchards. The first view, referred to as the “Skeptic,” was held by individuals who are concerned about the environmental and human health impacts of pesticides and who do not see current regulations as sufficient protection from pesticide exposure. The second worldview, the “Acceptor,” agreed that there is risk in pesticide use, but believed this risk to be small, well understood, and under control. The third worldview, the “Incrementalist,” focused primarily on opportunities to make human capital and technology improvements in the workplace. Like the

Skeptic, the Incrementalist worries about human health but agrees with the Acceptor that solutions lay in improved communication rather than regulatory or structural changes. For a basic outline of these three worldviews, see Table 3. For more detailed results, see Lehrer & Sneegas (2018).

As suggested by the literature on risk (Flynn et al., 1994), the three factors identified in the Q study match a pattern of risk assessment that lines up with gender, cultural differences, and, slightly less so, age, education, and employment (see Table 1). All the women participating in the study (15 of 41) were classified by their Q sorts as Skeptics, while Acceptors and Incrementalists were all men (although it is worth noting that this split also correlated with employment). Nine of 10 Acceptors were English-only speakers (one was bilingual), whereas Incrementalists were all native Spanish speakers, and 15 out of 22 Skeptics were bilingual or Spanish-only speakers. Acceptors were slightly older than the other groups, Skeptics and Acceptors were both highly educated, and Incrementalists had less formal education (33% had some college, as compared to 58% and 60% of the other groups). While there were growers and/or head managers in all three factor categories, the majority of Acceptors tended to work in higher level tree fruit industry positions or industry-

**Table 3. Summary of Q Study Views**

<i>Q Study Worldview</i>	Skeptics	Acceptors	Incrementalists
What concerns you?	Environment Human health	Cannot produce fruit without pesticides	Human health
Why does it concern you?	Human knowledge of risks insufficient	Pesticides well understood Part of reality	Inherent risk of pesticide use
What is working well?	Not clear from Q study*	Benefits are important and risks are mitigated	Existing system protects workers as well as it can
What more can help?	Regulation Enforcement Training	Communication Training	Training Communication Technological innovation Industry funding Labels in Spanish
What are the obstacles?	Lack of will to address safety	Language barriers People are afraid because they don't understand agriculture	Funding
What would <i>not</i> help?	Industry self-regulation	More regulation	More regulation
Who don't you trust?	Industry Government	Emotion	Not clear from Q study*
Who do you trust?	Not clear from Q study*	Science Industry	Government Industry
What complicates this?	Uneven implementation of safety	Uneven implementation of safety	Knowledge of work force and abilities
How safe is pesticide use in orchards?	Not very safe	Quite safe (esp. vs past) Inherent risks well managed	As safe as can be, given system

\* "Not clear from Q study" indicates a field where researchers were not able to pull a clear and consistent response from the Q sorts of participants who loaded on that factor; for example, while Skeptics' and Acceptors' Q sorts and comments were explicit in terms of who or what they did not trust to adequately protect workers' health, there was less clarity and consistency from Incrementalists in that regard. While the data (and subsequent working group discussions) certainly provide some indication of the positions around these issues, we did not wish to speak for anyone when their views were not explicitly clear.

support positions. Some orchard managers, farmworkers (both migrant/seasonal and year-round employees), and educators were categorized as Skeptics, and others loaded as Incrementalists; but, none as Acceptors. The remaining Skeptics were government representatives, public health employees, lawyers, and other migrant farmworker advocates. These differences suggest that, as supported by the literature, demographic differences account for part (but not all) of the differences and similarities among the three groups' perspectives on pesticide safety.

Worth noting as well is the finding that Acceptors were more likely to have direct experience working with pesticides—slightly more than Incrementalists and significantly more than Skeptics (Lehrer & Sneegas, 2018). This self-reported lack

of interaction with pesticides among Skeptics can be attributed to the fact that many Skeptics work either outside the tree fruit industry or in positions with little direct interaction with pesticides (in the tree fruit industry, pesticides are sprayed by year-round orchard employees. The use of pesticides is banned during the weeks prior to picking, which is when migrant farmworkers, for example, typically enter the fields; this is not to suggest that migrant farmworkers do not run the risk of pesticide exposure while living and working in and around orchards, but rather that they rarely interact with pesticides or pesticide application as a part of their jobs. Therefore, migrant farmworkers participating in this study typically asserted that they had little direct interaction with pesticides). Many of the managers, educators, and researchers that loaded as

Acceptors and Incrementalists—i.e., those who one might not presume to have significant experience with pesticide applications—had spent years prior to their current positions working as pesticide applicators and year-round employees in orchards or had current responsibilities related to pesticide safety training.

### *Stakeholder Group*

Those attending the stakeholder working group meetings comprised a subset of the larger group of Q study participants. They differed from one another by their factor, the strength of factor loading (how strongly they aligned with their factor, with higher numbers (closer to one) indicating closer alignment), their role in the tree fruit industry, and their demographics (see Table 4; the four participating Skeptics are coded as S1, S2, S3, and S4; the Acceptors are coded as A1 and A2; and the Incrementalists are coded as I1 and I2). Notably, the makeup of the stakeholder working group changed over the course of the project. Of the eight attendees at the February 2014 meeting, only four returned in March. Two were unable to attend because of scheduling conflicts (A2 and I2), and two dropped out of the group because the group was leaning towards an area of less interest for them (S3 and S4). A2 returned for the May 2014

meeting, but I2 was not able to attend because his work kept him busy during the growing season. A1 dropped out after May 2014 for similar seasonal work-related reasons. In addition, the group invited several additional stakeholders from regulatory agencies and farmer organizations to the May and August 2014 meetings who had expertise in the area the group chose to pursue. The final meeting, held almost two years after the fourth meeting to accommodate the group's interest in a related research question (see below for more details), was similar in composition to the group that attended the second and third meetings (S1, S2, I1); the meeting was also attended by representatives of a newly formed tree fruit industry association that replaced A2 upon his retirement. The additional stakeholders who attended the August 2014 meeting did not return for the July 2016 meeting; because they were not original members of the working group and did not attend more than one meeting, they are not included in the table below. Note that all participants and potential participants continued to be invited to each meeting.

During the first stakeholder meeting, in February 2014, researchers presented preliminary results of the Q study for discussion. Participants aired thoughts and concerns, commented on how the results resonated with their experiences, and

**Table 4. Stakeholder Working Group Participants**

Participant	Job/role	Gender	Language spoken	Factor	Loading score	Meetings attended
S1	Safety educator	Female	Bilingual (native Spanish)	Skeptic	0.72	Feb, Mar, May, 2016
S2	Extension	Female	Bilingual (native English)	Skeptic	0.65	Feb, Mar, Aug, 2016
S3	Government	Female	English	Skeptic	0.79	Feb
S4	Health educator	Female	Bilingual (native Spanish)	Skeptic	0.83	Feb
A1	Pest management consultant	Male	Bilingual (native English)	Acceptor	0.66	Feb, Mar, May
A2	Industry representative	Male	English	Acceptor	0.77	Feb, May, Aug, replaced for 2016
I1	Safety educator	Male	Bilingual (native Spanish)	Incrementalist	0.48	Feb, Mar, May, 2016
I2	Pesticide applicator	Male	Spanish	Incrementalist	0.62	Feb

suggested the names Skeptic, Acceptor, and Incrementalist for the three factors. The majority of the three-hour session was spent exploring the differences among these three clusters of viewpoints. Near the end of the meeting, participants brainstormed a list of projects for improving pesticide safety in orchards that they thought might be mutually acceptable to members of all three of these clusters, despite their acknowledged differences in viewpoint.

During the second meeting, participants selected one of those ideas—a training certificate program for supervisors who supervise crews of other workers such as migrant fruit pickers—and began discussing what might be needed to pursue it. The thought was that a large part of orchard safety, particularly for migrant and seasonal farmworkers, depends on supervisors—how they set the tone for work, what resources they provide, and how effectively they communicate (both with their own supervisors and with their employees). Participants noted that many supervisors are promoted to such roles because they are seen by their supervisors as “good workers,” but may lack the skills or training necessary to manage employees. Supporting their navigation of hiring and firing, communications, ethics, safety, leadership, and motivation was seen as a way to improve safety and engage workers.

During the third meeting, participants developed a proposal for a comprehensive series of courses that supervisors could complete as part of this training certificate (see Appendix B for training topic outline) and brainstormed potential institutional partners. They also asked the lead researcher to investigate other existing and potentially overlapping training opportunities in the tree fruit industry and to report back to the group at the next meeting.

During the fourth meeting, having explored existing training courses, the group decided that, rather than develop a new training program right away, they needed to learn more. As such, they asked researchers to go back and study what tree fruit companies and tree fruit supervisors already had in terms of supervisory training to decide whether a training certificate program would be needed, of interest, or of use in the industry.

During the fifth meeting, researchers presented the results from this study of tree fruit company representatives and supervisors, and the group decided to proceed with the certificate program. As of this writing, members of the group have been meeting and working with representatives of a continuing education program at a regional community college interested in housing the certificate with support from the tree fruit industry.

## Analysis and Discussion

### *Contours of Participation*

Looking at the trajectory of this working group process, we assess it against the literature’s recommendations to consider the role of inclusion, power, tools, consensus, and time in designing a participatory process.

### *Inclusion*

When we formed the stakeholder group, its make-up was, intentionally, quite diverse—in gender, primary language spoken, and viewpoint (based on the Q study). At the first meeting, we had four men and four women; four native Spanish speakers and four native English speakers (of whom five were bilingual); and four Skeptics, two Acceptors, and two Incrementalists. However, the group was not as diverse in their jobs as the original range of Q participants had been. While the goal was again to represent all *views* from the Q study rather than all *jobs*, this makeup is worth analyzing, as it has implications for how participation affected working group outcomes. Finally, while similar numbers of participants working inside versus outside orchards were invited, attendees included a greater proportion of those who worked outside of the industry or in industry support roles (see Table 5).

There are several reasons for this. First, we invited everyone who expressed an interest in the process to participate in the stakeholder working group; however, “interest in participating” is complicated in and of itself. In particular, several things are important to note; first, none of the migrant farmworkers who participated in the Q study said they wished or were able to participate in the working group (see further analysis below); second, all the educators who participated in the Q study also

**Table 5. Attendance at First Stakeholder Meeting, by Factor and by Job**

<i>By Factor</i>	Indicated interest	Attended
Skeptics	12 (out of 22 in Q study)	4
Acceptors	7 (out of 10 in Q study)	2
Incrementalists	4 (out of 6 in Q study)	2
Confounded (i.e., loaded on more than one factor)	1 (out of 3 in Q study)	0
<b>Total</b>	<b>24</b>	<b>8</b>
<i>By Job</i>	Indicated interest	Attended
Those who worked in support roles	11	5
Farmworker or health advocates	3	1
Government/research/extension	4	2
Educators	4	2
Those who worked directly in tree fruit	13	3
Consultants	5	1
Growers/managers	3	0
Workers	3	1
Industry representatives	2	1
<b>Total</b>	<b>24</b>	<b>8</b>

wished to participate in the working group (and half did); and third, proportionately fewer of the Q study participants from within the tree fruit industry who said they wished to participate in the working group (growers, consultants, year-round orchard employees) actually attended meetings. In other words, the choice to participate not only reflects the level of participant interest, but is also a function of the particular structure and nature of this project and the groups involved (for example, had working group meetings been held only during the summer and located at migrant housing camps, participation of migrant workers could have been higher; had they been held only in winter and located at orchard workplaces, participation of growers and year-round employees could have been higher).

Given these trends and choices, educators, government workers, and extension professionals were disproportionately present at working group meetings, likely because they could attend meetings as a part of their job; a grower, pesticide applicator, or migrant fruit picker, on the other hand, would have to take time away from orchard work to come to meetings. This difference also manifested itself seasonally—that is, people in tree fruit support

positions were busier in winter (training season) and more available in summer, while orchard personnel were busier in summer (growing season) and more available in winter. This affected participation as the series of meetings progressed from winter into summer. Third, participants whose jobs had to do with education, research, or outreach were likely more drawn to this type of work—analyzing research and brainstorming solutions—than those involved in other aspects of the industry; this aspect of the makeup of the group likely also shaped the solutions that were proposed (see further discussion below).

Fourth, the tree fruit industry spans the entire north to south axis of central Washington. Meetings were held in Wenatchee, the center of the region, travel expenses were reimbursed, and stipends were provided; however, those living farther away, who might have to drive up to three hours each way to attend a meeting, faced more obstacles to attending. Similarly, and particularly relevant to the development literature cited earlier, migrant fruit pickers in particular took part in the Q study but not in the working group. When asked during their Q study participation if they were interested in participating in the working group, most migrant

workers said no; those who said yes noted that in the winter they would likely be back in Texas, California, or Mexico and would be unable to participate. In addition, while many returned each year to Wenatchee to pick fruit, they were paid by the amount of fruit picked, and the stipend offered for attending meetings did not compensate for losing a half-day's pay in a limited work season. While we would have preferred to have these workers form a key part of stakeholder meetings, we chose to accept their decision not to participate and sought other ways of keeping their views present (particularly through the analysis of Q study perspectives).

Of course, choice and structure are intertwined. Had we chosen to prioritize the inclusion of migrant farmworkers above other criteria, we could certainly have designed meetings to take place, for example, at migrant worker housing camps during off-hours at particular times of the harvest season. This could have boosted migrant participation, but also would likely have decreased the participation of industry representatives, government personnel, researchers, growers, and year-round employees with differing schedules. Holding meetings instead at orchard workplaces, as noted earlier, might have boosted representation from these latter stakeholders. However such a location could easily compromise the ability of migrant workers, year-round employees, and even middle managers to speak freely and comfortably.

Instead we chose to hold meetings at a relatively centrally located research center. To help foreground the needs of migrant workers, we relied on migrant farmworker support professionals, several former migrant workers (now employed in different roles) who were part of the group, and data from the Q study where migrant farmworkers had participated more fully. Most relevant to a Q method approach is actually the fact that all three *factors* or *worldviews* (in turn derived from a Q set and participant list that included migrant farmworker views, as well as those of other stakeholders who also did not attend working group meetings) were represented. In fact, we suggest that using Q methodology may be a way to achieve more diverse representation in a working group in cases where the participation of individuals may wax and wane. By focusing on the need to ensure

adequate representation of a handful of aggregated viewpoints rather than dozens of individual role-based stakeholders, Q methodology may be able to help ensure some measure of broader representation even in a small group. This could be the case even when details and process logistics exert strong influences on working group participation. That said, we very much understand that these choices were and are necessarily imperfect and are worthy of debate, as their implications for inclusion and exclusion are complex and fraught.

### *Tools*

Given (and despite) these contours of inclusion and participation, one of our goals in the working group meetings was to address the inherent power dynamic that exists among different players in the tree fruit industry (*e.g.*, with consultants or industry representatives having more power in the typical chain of command than pesticide applicators, migrant farmworkers, or health educators). Even without all levels of the hierarchy present in the working group, this power structure certainly would have affected how free each participant might have felt to speak out at meetings. As such, we sought to minimize the reach of those larger power dynamics in the working group meetings (even while acknowledging that full success in this regard would be impossible). We did this through highly trained professional facilitation, team-building activities, structured exercises, and a combination of small group work with individual and full group work. For example, participants worked in groups of two to three individuals; together, they tried to brainstorm a comprehensive and wide-ranging list of efforts to improve pesticide safety. All ideas were then posted on a "sticky wall" where support (or concern) for each idea could be indicated confidentially with colored sticker dots. Once ideas were discussed and narrowed down, small groups were asked to discuss which ideas might face support or opposition from each of the Q factor viewpoints. They were also asked to think about what costs and benefits might accrue to which stakeholders from implementation of each idea and which stakeholders they might affect. In each of these processes, we made use of simultaneous interpretation, where all participants

(English and Spanish speakers alike) were asked to wear headsets so that conversation could proceed with greater fluency across the two languages. This followed best practices from Highlander Center trainings on “interpreting for social justice” attended by researchers and facilitators prior to their participation in this project.<sup>1</sup>

According to the anonymous evaluations from the meetings, the tools used during working group meetings helped create a sense of teamwork and a willingness to engage with other group members (see direct quotes from evaluations in Lehrer & Sneegas, 2018). They also helped decrease, to some extent, the power differential not just among participants, but also between researchers and participants. The researchers and facilitators designed the structure and trajectory of meetings; yet, participants routinely interjected to change the flow of an individual meeting or even a series of meetings. For example, participants would repeatedly assign the researchers new information gathering tasks to help them make decisions. Again, this is not to suggest that these tools and measures created an even playing field for participants, but rather to note that they were designed with an understanding of power in mind.

#### *Power*

While the tools used to structure meetings were somewhat helpful in addressing the extant power structure, their limits also illustrated some of the difficulties outlined in the literature on participatory processes. For example, one participant, who had loaded very strongly on factor 1 (Skeptic) and worked mostly with migrant farmworkers from a position outside the tree fruit industry, said she felt uncomfortable at the first meeting because many of the solutions proposed focused on supervisors rather than on the more vulnerable migrant workers. Other participants, some of whom worked closely with migrant farmworkers, felt that, because other statewide and regional programs focused directly on migrant worker-driven organizing and advocacy rather than supervisory skills training, a focus on supervisors through this project could provide a missing link for improving working

conditions across the entire tree fruit industry. As the idea of a supervisor-oriented project gained momentum among a majority of the group, the participant at hand chose not to attend future meetings. The momentum of the group did not address her concerns adequately, and she presumably did not feel that she could, should, or wanted to persist as a minority voice.

Besides illustrating how participation is affected by group dynamics and choices, this may also be an indication that a stakeholder process that chooses to seek common ground is more likely to attract and retain stakeholders attracted to that premise as well. In contrast, those who load most strongly on their factor (Skeptics, Acceptors, or Incrementalists) may be less inclined to value or more concerned about what is lost by focusing on, an explicitly compromise-oriented process. While those who participated in the working group were not quantitatively more “moderate” in their factor loadings than those who did not, our strongest factor exemplar was the only one, as far as we know, who felt disempowered by or uninterested in the direction of the group and dropped out of the process in discontent (rather than for scheduling reasons). This then strengthened the role of those interested in educational rather than advocacy solutions (see more on consensus and inclusion below). It also speaks to Mouffe’s (2005) concern that a consensus-oriented process can lose some of the productive agonism that might be found in a process that sits longer in its areas of tension.

In another example of the contours of power and participation, one participant, a pesticide applicator, came to the meetings with another participant (in a higher level position) from the company where he worked. As an applicator, he was unable to participate during the busy summer season, and he was also less likely to come without his supervisor/colleague, in part because their orchard was two hours away. In addition, he was perhaps less likely to be outspoken with his supervisor/colleague present, thus providing presumably imperfect information and imperfect participation; yet, having the two come together was likely the only way we could garner his input in the first

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<sup>1</sup> See <https://www.highlandercenter.org/interpreting-for-social-justice-highlander-workshop/>

place. We opted for his possibly guarded presence over the alternative of him not participating at all.

### *Consensus*

When we brought the stakeholder working group together, initial discussions were energized, civil, and productive. Many (but not all) of the participants knew one another, as the tree fruit industry in Washington is a relatively small community. There was some debate, alluded to above, in terms of whether the focus for safety improvements should be on helping migrant fruit pickers protect themselves or on helping supervisors create a safer and more positive work environment for these (and other) workers. But as a consensus formed, wherein the majority of the group began to focus on the supervisor demographic, the participants less interested in working at that level dropped out. Thus, while the group remained diverse in terms of gender, ethnicity, and Q worldview or factor loading, it became more homogenous in terms of interest in supervisory trainings. In other words, there was a continual process by which the people who attended the meetings shaped not only the process and the outcomes, but also the subsequent makeup of the group. Those who felt that the project focus did not match their areas of interest left the group (Few et al., 2007; Hauptmann, 2001), further solidifying the decision to focus on supervisor training. This example of tension between viewpoints is perhaps the kind of tension that one thinks about as a classic obstacle to joint-decision making among diverse stakeholders—different groups prioritizing different needs and solutions with the ultimate resolution dependent on who holds the most influence in that context.

But what makes this particularly interesting is that the resolution of this tension depended in large part on the banal, often overlooked details of who “showed up.” Power and influence in the context of the working group was constructed via small decisions and situations that are not always registered as expressions of power. In particular, the group that decided to pursue supervisory skills training as a solution for workplace safety concerns was one originally shaped by many seemingly smaller factors. These factors include things like who had the time, interest, and energy for a

working group process (and for how long and under what circumstances); who was able to attend meetings at which time of year and in which locations; who ended up with other commitments (including last-minute trainings at work, doctor appointments, and forest-fire induced crises) that interfered with meeting attendance; how flexible participants’ regular jobs were (and at which times of year); how far they had to travel (including but not limited to their status as full-time residents of the region or migrants); what mechanisms were used to pay participants at work (salaried versus hourly versus piece-rate; in other words, whether or not our meetings “counted” as work for them); relationships among participants (both in terms of supervisory relationships and logistical ones such as a need to carpool to meetings); and basic interest in “problem-solving” projects of this nature. This is not to say that the working group process was haphazard or illegitimate; rather, it is to suggest that the ways in which participants differed in terms of the attributes above not only played into their choice of projects but also their joint decisions on things like when, where, and how to organize future working group meetings. This, in turn, affected who came to subsequent meetings. The Q study was designed to acknowledge stakeholder differences so that these differences would not be ignored in the search for a mutually acceptable project; however, the process of coming to a consensus around a particular course of action through a set of meetings that took place in real time and place, and amidst competing priorities for all members, did function, as in the literature, as an eventual obstacle to broader inclusion.

Eventually, these dynamics, combined with logistical issues such as scheduling constraints (two pesticide educators and one consultant were unable to attend the August 2014 meeting due to commitments that arose last-minute) and the group’s request to invite additional stakeholders interested in supervisory training, caused the makeup of the group to change for the fourth meeting (August 2014). The makeup of the fourth meeting was much more male and Anglo and included a higher proportion of representatives from grower organizations than at previous (or future) meetings. At this meeting, the group



retreated from immediate implementation of the training certificate idea to instead pursue further research on the need for such a certificate. On one hand, it is wise to fully assess the need for a new program before beginning to pursue it; indeed, participants from earlier meetings who had been absent at the fourth meeting but were contacted by phone for their input all supported this idea of further research. On the other hand, as one (Anglo, male, industry-insider) participant later suggested, a more Anglo, male, industry-insider group (like the one at the fourth meeting) might be comfortable with the status quo of the orchard; such a group might be less inclined to pursue quick changes and more inclined to focus on research that, for better or for worse, delays implementation. This dynamic illustrates nicely how the issue of who shows up (and why) can significantly affect a “participatory” process. It also suggests that, while supervisory skills training was perhaps not a direct enough solution for our justifiably discontented Skeptic, it was at the same time much too radical a solution for some industry insiders, who consequently may have sought to delay it (intentionally or not). This again suggests that given the conservative and highly structured nature of the tree fruit industry, developing even compromise-level projects related to social and workplace safety is something that must be approached cautiously. Accordingly, this charge to pursue additional research helped create a long delay between the fourth and fifth meetings.

And yet, at the fifth meeting, where the core stakeholders who had attended most of the meetings were once again present, and the newer (Anglo, male, industry-insider) stakeholders did not return, one participant interrupted the presentation of the research results on the industry’s perceived need for a supervisory certificate to say, “This is all interesting, but we all work in the field, we know from experience that a training certificate is needed.” The other participants agreed, and the group put the new research findings aside and moved back to brainstorming ideas for implementation.

#### *Time*

This stop-and-go trajectory is particularly interesting because the researchers designed this series of

meetings to be held with a consistent stakeholder group and to progress toward the goal of developing a practical project. And yet, due to inter-participant dynamics, the choice of project direction, and simple logistics, the makeup of the working group was not as consistent over time as we had hoped, even though the meetings built on one another. While this made the working group process arguably richer in its inclusion of more stakeholders, it also slowed the work down considerably. It took whittling the group down to a core, then re-whittling it back to that same core after new stakeholders had come and gone, for the group to make steady progress on its chosen task. This points, as the literature on participatory processes suggests, to two things in particular: the need for a long stretch of time to work through such processes with a set of stakeholders deeply committed to the process; and the tension between having a more diverse and deliberative group and a more “efficient” group where some diversity of opinions is lost. Notably, a project that moves more slowly might help reduce barriers to attendance for some marginalized participants; but it might also backfire if participants start to feel that they are not making enough progress for the time they are putting in.

Relatedly, this project moved along a grant-funded timeline. Supported by a five-year grant, the timeframe was adequate for this Q study plus working group process; however, it would not have allowed for significant deviations from the process had participants wanted to pursue additional aims. Researcher goals were fairly open (to develop “some sort of” project to improve orchard health and safety), and almost all working group decisions, from the project choice to the meeting schedule to the speed of implementation, were made by the group; however, it is clear that not all projects would have fit the time and resources at hand, and even the task of pursuing a project at all imposed constraints. As such, the work was guided and shaped by these opportunities and limits. Finally, supporting the continuation of the development of the supervisor certificate after the grant funding ended in 2016 presented new challenges. For example, the group applied for and received a small additional one year grant to help develop the

program curriculum; but, they ended up returning the seed money after six months due to the difficulty of making adequate progress in a one-year timeframe. Instead, the group is seeking a community college credential and sponsorships as well as more flexible grant-funding to be able to develop and pilot the project within a timeframe that better fits the group and the perceived needs of supervisors, farmworkers, and employers.

### *Project Outcomes*

Ekboir (2003) suggests measuring the effectiveness of participatory projects by multiple metrics: research outputs (what came out of it), outcomes (how people used the outputs), impacts (how those outcomes affect end-users' lives), and mutual learning for participants and researchers. Here we adopt that framework to assess our stakeholder project.

In terms of outputs, the choice of an educational solution to a pesticide safety problem is worth analyzing. On one hand, focusing on the supervisor's ability to help maintain a culture of safety in orchards seems reasonable. Rather than focusing on migrant workers, for whom risk mitigation measures are crucial but frequently not under their control, or on upper management, who have less contact with workers, supervisors have access both to policies from the top and worker behavior and resources down the chain of command. On the other hand, training programs are often solutions that appeal to trainers, who were over-represented in our group from the very start (and in particular at the second meeting where the final decision to pursue a training certificate was made). Previous research in Washington State noted that educators tend to lean toward educational solutions to problems, even as other stakeholders prefer other solutions. For example, a series of surveys and interviews in 2007–2009 addressed the issue of inadequate hand-washing on farms and its implications for pesticide exposure. Pesticide handlers attributed a lack of hand-washing to missing soap or towels; some orchard managers attributed it to workers ignoring regulations; and health and safety professionals attributed it to inadequate training (even though handlers contended that they already knew how to

mitigate risk and therefore did not need more training) (UW-PNASH, 2010; WSU, 2010).

Even so, a solution focused on training is not surprising, given the project goals and the map of worldviews developed from the Q study. In the Q study, both Skeptics and Acceptors (the most diametrically opposed groups) mentioned training as an important solution. Incrementalists also saw a role for improvements to the orchard environment rather than, say, new regulations (which were supported by Skeptics but opposed by Acceptors and Incrementalists) (see “What more can help?” and “What would *not* help?” in Table 3). In this way, the choice to focus on training did not solely represent a solution of interest to those group members whose job flexibility, location, travel constraints, and other commitments allowed them to be present; it also represented a solution that is at least moderately palatable to each of the three viewpoints represented. In other words, a proposal for training most likely represents an area of consensus. As such, it is the kind of pragmatic solution that would result from this type of process. The way in which the group designed the training program was quite innovative (hands-on, skills-based, creative), but the very fact that a training program was chosen as a solution is not particularly out-of-the-box.

On the other hand, while the initial solutions proposed by the group in our brainstorming process included small adjustments in particular areas (improved pesticide label information in Spanish, or a more appropriate use of re-entry signs for orchards as highlighted explicitly by Q study consensus results), the training idea was a much more comprehensive, big picture approach to improving workplace culture in orchards. And in many ways, this kind of solution illustrates the point of using the Q methodology in a stakeholder process—to find common-ground solutions in a contentious field and to focus on what divergent groups have in common rather than trying to problem-solve at a more detailed level from polarized positions. While there is an important role for polar positions, conflict, and advocacy in change-making, the goal here was to seek out mutually acceptable (in this case, “safe” and unassailable) solutions and overcome the

roadblocks associated with having friction among viewpoints. But, importantly, this working group sought a consensus that was not based on erasing differences among diverging views, but rather on acknowledging those differences and choosing to work in areas where consensus could be productive rather than oppressive. While not all voices were clearly heard, as some participants dropped out, others entered, and still others never had the power or opportunity to come to the table at all, this process provides an interesting case for assessing the tradeoffs among the democratic attributes of participatory processes.

In considering outcomes, or how people used the research outputs, this stakeholder process did not particularly upend existing power dynamics in the tree fruit industry; that is, it ended up promoting supervisor training as a relatively palatable way to indirectly improve pesticide safety rather than tackling any issues of inequity or power head-on. But on the other hand, this kind of middle-of-the-road solution is likely the only kind of solution upon which the group assembled could have agreed. In other words, using Q methodology to circumvent solutions favored only by those who hold greater power in the tree fruit industry does not imply that solutions favored only by *other* groups will be adopted; rather, it implies that the solutions adopted will have to be acceptable to all groups, including (but not limited to) those that are more powerful or influential. This is in contrast to some of the literature on participatory development, which focuses primarily on elevating the voices of the least powerful. Instead, in this case, the combination of the Q methodology with a stakeholder working group helped forestall a situation where the dominant perspective became *the* answer; it instead looked for acceptable solutions for a multiplicity of viewpoints.

In turn, this kind of “indirect” solution is less likely to provoke direct opposition from groups able to stall it. While it does not change existing power dynamics, it likely does help build and strengthen working relationships among groups. This supports the contention from the literature that a strong participatory process should acknowledge power differentials without presuming to erase them (Few, 2001; Mouffe, 2005). In other

words, the goal was not simply to include under-represented voices in decision-making (in fact some of the more underrepresented voices were not fully incorporated in the working group, although their Q factors were); rather, it was to achieve a concrete improvement that could help both marginalized and mainstream participants alike. By that criteria, this working group process was at least somewhat successful in producing an output that would be used by various stakeholders.

By explicitly acknowledging (and understanding in a concrete manner through the Q study) the differences in perspective that existed in the field of tree fruit pesticide and workplace safety, the stakeholder group could work together in a way that respected those differences but was not held hostage to them. This is appropriate in that the group was not designed, really, to change participants’ perceptions of risk; rather, it was designed to improve workplace safety *despite* differences in perspective by first focusing on areas of divergence and then dropping those in favor of more mutually palatable solutions. Based on this experience, we argue that using a stakeholder process on the heels of a Q study will not necessarily upend the fundamental power dynamics that raise concerns in the literature on participatory processes; rather, it has the potential to open additional doors to mutually acceptable solutions that might have been missed or blockaded if only the dominant perspectives on risk were addressed.

What we notice and highlight in this paper are the ways in which power and voice significantly affected outcomes within the working group, in particular through the logistical and granular details of process and participation. In other words, the working group’s process and outcomes were driven, in part, by who showed up, and the dynamics of power and voice within the group (which at times mirrored those of the larger tree fruit industry and at times diverged from them). Those dynamics, in turn, affected the contours of participation (i.e., who continued to show up) and influence all across the process. Our contention is that such granular details, which can at times go unnoticed, help enable and constrain particular outcomes in participatory work. As noted in parts of the development literature, they are key factors

to study and consider.

After all this discussion of process, however, we are still left asking whether supervisory training, as the mutually appealing solution chosen by this working group, will help improve pesticide and workplace safety in orchards. In other words, we are curious about the impacts of this project. While the creation of a supervisory skills training program does not guarantee an improvement in pesticide safety, it could help create the conditions that would promote such an improvement. A workplace culture where workers are respected because supervisors have acquired the tools to better manage work crews may easily become a safer workplace, even for the most vulnerable. If nothing else, we would argue that the pursuit of a training certificate, supported by industry personnel, advocates, and educators alike, represents a different approach to the sometimes more adversarial debates around pesticide safety risks; at the very least, it provides one strategy (among many) for broadly improving the health and safety of agricultural workers.

Finally, the core group's continued interest in pursuing this project does indicate some level of satisfaction, if not explicitly Ekboir's "mutual learning" for participants and researchers. At the time of this writing, both industry insiders and industry outsiders remain highly supportive of the project, as do some Skeptics, Acceptors, and Incrementalists. Although industry outsiders were more heavily represented early in the working group process, the inclusion of new and influential industry insiders at the last meeting (to replace a retired industry representative), has meant that the supervisory training project retains strong support from multiple communities. This broad base of support may be helpful in ensuring that this project continues.

## Conclusions


In this paper, we shared results from a participatory process of stakeholder engagement around issues of pesticide and workplace safety in Washington State's tree fruit industry. Rooted in the literature on participatory development, we designed a Q study plus stakeholder working group process that would employ some "best practices" of participatory engagement to attempt a shared

power environment and improve practice, as suggested by Reed (2000) and Caretta and Riaño (2016) among others. Pulling from authors such as Smith (2008), we sought to avoid pitfalls including tokenism in participation, mistakenly viewing the community as a cohesive entity, providing inadequate resources, or inexperienced facilitation. We found that, despite seriously addressing questions of inclusion, appropriate tools, power, consensus, and time, there were certain structural constraints we experienced—from incidental things that prevented some members of the group from attending certain meetings, to the role of geography and distance in making the use of technologies such as emails necessary for coordination (but which can privilege the written word). As such, many aspects of our process reflected what has been found in the literature. A participatory process can easily fail to alter power dynamics inherent in an industry and can run the risk of replicating such dynamics even as it attempts to address them. Nevertheless, enhancing participation in decision-making while acknowledging the complex dynamics of a particular case can yield new insights and facilitate collaboration on improvements and solutions.

Our experiences with this stakeholder working group also highlighted the self-reinforcing nature of ideas, where the projects chosen were shaped by the makeup of our working group, and where those choices in turn shaped the evolving group makeup. While our stakeholder process did strive to address power inequities, it was still in large part driven by who showed up—an aspect which, itself, is a product of structure, decisions, and chance in addition to differential interest, power, and access. Decisions, and participation in those decisions, were influenced not only by an interest (or lack thereof) in certain kinds of orchard-based programs, but also by logistical issues—such as whether participants had to drive two hours or ten minutes to get a meeting, whether they had a medical urgency come up the morning of a meeting, or whether one participant was busier at work in summer while another was busier in winter. In other words, we learned that, in addition to design and implementation, logistics can matter a lot for the trajectory of a participatory process. Finally, we learned that part of a participatory process may

entail allowing participants to define their own roles. Despite researchers' goals, many participants chose not to participate at all or to come and go; these choices are reflective both of the participants' ability to access the process and the nature of their jobs and circumstances, and also their preferences for prioritizing meetings (or not) based on how relevant these meetings seemed to them. While we do not pretend to have had the full participation of all stakeholders who might have had an interest in the topic, nevertheless we contend that much can be accomplished even with imperfect participation, as long as the limits and boundaries of that participation are made clear. In our case, the development of a supervisor training certificate program would probably not have emerged without the broad participation of stakeholders. We suggest here that using a Q study to capture stakeholder representation across multiple views can be a useful approach, especially where representation by jobs or roles may prove more elusive.

In reflecting on this process and on how it draws from and potentially adds to the literature on participatory development, it is important to note that much of the literature we pulled from focuses on incorporating the views of powerless groups into research and action. Although our group included many individuals with limited power and always included representation from all three Q factors (derived from a broad array of stakeholders across the spectrum of power and position), those stakeholders with the least power in the system (presumably migrant farmworkers) were not a

central part of the working group process itself. Instead, the mixed-power nature of our group made it easier to mitigate power dynamics between researchers and participants; but, it was perhaps more difficult to mitigate power dynamics among participants. We come away from this process noting that it requires work and thought to "do" participation. Even with such work and thought, certain imbalances will affect project outcomes. In our case, as researchers and participants, we chose to follow the outcomes of our working group process in the directions they led, even as we acknowledge their shortcomings. Inspired by Walmsley (2009), we use the critiques of and lessons learned from participatory processes as a productive challenge for continuing to democratize research and social change. We also reiterate the need to continue to address, in granular detail, power differentials as a key component of equity and justice in agriculture, sustainability, and food systems. 

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### References

- Alavanja, M. C., Dosemeci, M., Samanic, C., Lubin, J., Lynch, C. F., ... Blair, A. (2004). Pesticides and lung cancer risk in the agricultural health study cohort. *American Journal of Epidemiology*, 160(9), 876–885.  
<https://doi.org/10.1093/aje/kwh290>
- Alkon, A. H., & Agyeman, J. (Eds.) (2011). *Cultivating food justice: Race, class, and sustainability*. Cambridge, MA: The MIT Press.
- Arcury, T. A., Quandt, S. A., & Russell, G. B. (2002). Pesticide safety among farmworkers: Perceived risk and perceived control as factors reflecting environmental justice. *Environmental Health Perspectives*, 110(S2), 233–240.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1241168/>
- Becker, P. (2011). Whose risks? Gender and the ranking of hazards. *Disaster Prevention and Management*, 20(4), 423–433.  
<https://doi.org/10.1108/09653561111161743>
- Berman, Y., & Phillips, D. (2000). Indicators of social quality and social exclusion at national and community level, *Social Indicators Research Journal*, 50(3), 329–350. <https://link.springer.com/article/10.1023/A:1007074127144>

- Brown, K., Few, R., Tompkins, E.L., Tsimplis, M., & Sortti, M. (2005). *Responding to climate change: Inclusive and integrated coastal analysis*. Tyndall Centre Technical Report 24, Norwich, UK.
- Brown, K., Tompkins, E. L., & Adger, W. N. (2002). *Making waves: Integrating coastal conservation and development*. London: Earthscan.
- Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science*. New Haven, CT: Yale University Press.
- Brugha, R., & Varvasovsky, Z. (2000). Stakeholder analysis: A review. *Health Policy and Planning*, 15(3), 239–246. <https://doi.org/10.1093/heapol/15.3.239>
- Caretta, M. A., & Riaño, Y. (2016). Feminist participatory methodologies in geography: Creating spaces of inclusion. *Qualitative Research*, 16(3), 258–266. <https://doi.org/10.1177/1468794116629575>
- Carr, A. (2002). *Grass roots & green tape: principles and practices of environmental stewardship*. Sydney, AU: Federation Press.
- Centers for Disease Control (CDC). (1999). *Framework for program evaluation in public health* (Report No. RR-11). Retrieved from <https://www.cdc.gov/mmwr/PDF/rr/rr4811.pdf>
- Chambers, R. (1997). *Whose reality counts? Putting the last first*. London, UK: Intermediate Technology. <https://doi.org/10.3362/9781780440453>
- Chambers, R., Kenton, N., & Ashley, H. (2004). *Participatory learning and action 50: Critical reflections, future directions*. London, UK: IIED.
- Cooke, B. (2001). The social psychological limits of participation? In B. Cooke & U. Kothari (Eds.), *Participation: The new tyranny?* (pp. 102–121). London, UK: Zed Books.
- Cooke, B. & Kothari, U. (Eds.) (2001). *Participation: The new tyranny?* London, UK: Zed Books.
- Dreyer, L. (2000). *Disappointments of participation: Finding the correct role for community participation*. Pretoria, SA: Lynette Dreyer and Associates. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.526.966&rep=rep1&type=pdf>
- Dudley, E. (1993). *The critical villager – Beyond community participation*. London, UK: Routledge.
- Ekboir, J. (2003). Why impact analysis should not be used for research evaluation and what the alternatives are. *Agricultural Systems*, 78(2), 166–84. [https://doi.org/10.1016/S0308-521X\(03\)00125-2](https://doi.org/10.1016/S0308-521X(03)00125-2)
- Ellis, R. (2011). Whose participation? Whose sustainability? A critical analysis of initiatives for urban sustainability in India. *Scottish Geographical Journal*, 127(3), 193–208.
- Escobar, A. (1995). *Encountering development: The making and unmaking of the third world*. Princeton, NJ: Princeton University Press.
- Evans, E. P., Ashley, R., Hall, J., Penning-Rowsell, E. C., Saul, A., Sayers, P., Thorne, C., & Watkinson A. (2004). *Future flooding scientific summary: Volume I, future risks and their drivers, foresight, flood and coastal defence project*. Office of Science and Technology, London. <https://www.gov.uk/government/publications/future-flooding>
- Few, R. (2001). Containment and counter-containment: planner/community relations in conservation planning. *Geographical Journal*, 167(2), 111–124. <https://doi.org/10.1111/1475-4959.00011>
- Few, R., Brown, K., & Tompkins, E. L. (2007). Public participation and climate change adaptation: Avoiding the illusion of inclusion. *Climate Policy*, 7(1), 46–59. <https://doi.org/10.1080/14693062.2007.9685637>
- Fiorino, D. J. (1990). Citizen participation and environmental risk: a survey of institutional mechanisms. *Science Technology Human Values*, 15(2), 226–243. <https://doi.org/10.1177/016224399001500204>
- Flynn, J., Slovic, P., & Mertz, C. K. (1994). Gender, race, and perception of environmental health risks. *Risk Analysis*, 14(6), 1101–1108. <https://doi.org/10.1111/j.1539-6924.1994.tb00082.x>
- Fox, R. (2013). Resisting participation: Critiquing participatory research methodologies with young people. *Journal of Youth Studies*, 16(8), 986–999. <https://doi.org/10.1080/13676261.2013.815698>
- Gaventa, J., & Cornwall, A. (2006). Challenging the boundaries of the possible: Participation, knowledge, and power. *Institute of Development Studies Bulletin*, 37(6), 122–128. <https://doi.org/10.1111/j.1759-5436.2006.tb00329.x>
- Globalwise & Belrose Inc. (2014). *The Washington apple industry: Updated evaluation of contributions to the state economy and the important role of exports*. Retrieved from <https://wstfa.org/wstfa-assets/uploads/Economic-Impact-Study.pdf>
- Godfrey, S., & Obika, A. (2004). Improved community participation: Lessons from water supply programmes in Angola. *Community Development Journal*, 39(2), 156–165. <https://doi.org/10.1093/cdj/39.2.156>



- Gottlieb, R., & Joshi, A. (2010). *Food justice*. Cambridge, MA: The MIT Press.
- Grimble, R. J., Aglionby, J., & Quan, J. (1994). *Tree resources and environmental policy: A stakeholder approach*. UK: Natural Resources Institute (NRI).
- Halfacre-Hitchcock, A., McCarthy, D., Burkett, T., & Carvajal, A. (2006). Latino migrant farmworkers in lowcountry South Carolina: A demographic profile and an examination of pesticide risk perception and protection in two pilot case studies. *Human Organization*, 65(1), 55–71. <https://doi.org/10.17730/humo.65.1.6cc5wqtpw5xku4j>
- Hauptmann, E. (2001). Can less be more? Leftist deliberative democrats' critique of participatory democracy. *Polity*, 33(3), 397–421. <https://doi.org/10.2307/3235441>
- Hofmann, J. N., Crowe, J., Postma, J., Ybarra, V., & Keifer, M.C. (2009). Perceptions of environmental and occupational health hazards among agricultural workers in Washington State. *American Association of Occupational Health Nurses Journal*, 57(9), 359–371. <https://www.ncbi.nlm.nih.gov/pubmed/19715263>
- Hohn, E. (2010). Survey of residents of northwest orchard community shows high levels of perceived pesticide risk and lack of pesticide training. *MCN Streamline*, 16(4), 4–5.
- Holmes, S. (2013). *Fresh fruit, broken bodies*. Berkeley and Los Angeles, CA: University of California Press.
- Huxham, C. (Ed.) (1996). *Creating collaborative advantage*. London, UK: Sage Publications.
- Impey, K., & Overton, J. (2013). Developing partnership: The assertion of local control of international development volunteers in South Africa. *Community Development Journal*, 49(1), 111–128. <https://doi.org/10.1093/cdj/bst016>
- Jamal, T. (2004). Conflict in natural area destinations: A critique of representation and 'interest' in participatory processes. *Tourism Geographies*, 6(3), 352–379. <https://doi.org/10.1080/1461668042000249656>
- Janes, J. E. (2016). Democratic encounters? Epistemic privilege, power, and community-based participatory action research. *Action Research*, 14(1), 72–87. <https://doi.org/10.1177/1476750315579129>
- Kandel, W. A., & Donato, K. M. (2009). Does unauthorized status reduce exposure to pesticides? Evidence from the national agricultural workers survey. *Work and Occupations*, 36(4), 367–399. <https://doi.org/10.1177/0730888409347599>
- Kapoor, I. (2005). Participatory development, complicity and desire. *Third World Quarterly*, 26(8), 1203–1220. <https://doi.org/10.1080/01436590500336849>
- Keifer, M., Salazar, M. K., & Connon, C. (2009). An exploration of Hispanic workers' perspectives about risks and hazards associated with orchard work. *Family and Community Health*, 32(1), 34–47. <https://doi.org/10.1097/01.FCH.0000342815.49649.46>
- Korf, B. (2010). The geography of participation. *Third World Quarterly*, 31(5), 709–720. <https://doi.org/10.1080/01436597.2010.502691>
- Lehrer, N., & Sneegas, G. (2018). Beyond polarization: Using Q methodology to explore stakeholders' views on pesticide use, and related risks for agricultural workers, in Washington State's tree fruit industry. *Agriculture and Human Values*, 35(1), 131–147. <https://doi.org/10.1007/s10460-017-9810-z>
- Liebman A. K., & Augustave W. (2010). Agricultural health and safety: Incorporating the worker perspective. *Journal of Agromedicine*, 15(3), 192–199. <https://doi.org/10.1080/1059924X.2010.486333>
- Lilja, N., & Bellon, M. (2008). Some common questions about participatory research: A review of the literature. *Development in Practice*, 18(4/5), 479–488. <https://doi.org/10.1080/09614520802181210>
- Mattessich, P., Monsey, B., & Corrinna, R. (1997). *Community building – What makes it work, a review of factors influencing successful community building*. Saint Paul, MN: Fieldstone Alliance
- Mayer, B., Flocks, J., & Monaghan, P. (2010). The role of employers and supervisors in promoting pesticide safety behavior among Florida farmworkers. *American Journal of Industrial Medicine*, 53(8), 814–824. <https://doi.org/10.1002/ajim.20826>
- Mitchell, B. (1997) *Resource and environmental management*. Harlow, UK: Longman.
- Mohan, G. (2001). Beyond participation: Strategies for deeper empowerment. In B. Cooke & U. Kothari (Eds.), *Participation: The new tyranny?* (pp. 153–167). London, UK: Zed Books.
- Morissey, J., Clavin, A., & Reilly, K. (2013). Field-based learning: The challenge of practicing participatory knowledge. *Journal of Geography in Higher Education*, 37(4), 619–627. <https://doi.org/10.1080/03098265.2013.794333>

- Mouffe, C. (2005). *On the political*. London, UK: Routledge.
- Muria, A. (2000). Divisions of homeownership: Housing tenure and social change. *Environment and Planning Journal*, 23(3), 349–370. <https://doi.org/10.1068/a230349>
- Owens, S., Rayner, T., & Bina, O. (2004). New agendas for appraisal: reflections on theory, practice, and research. *Environment and Planning A: Economy and Space*, 36(11), 1943–1959. <https://doi.org/10.1068/a36281>
- Parfitt, T. (2004). The ambiguity of participation: A qualified defence of participatory development. *Third World Quarterly*, 25(3), 537–556. <https://doi.org/10.1080/0143659042000191429>
- Pelnecke, D., Forland, C., & Wines, J. H. (2015). *2013 Agricultural workforce*. Washington State Employment Security Department. Retrieved from <https://fortress.wa.gov/esd/employmentdata/docs/industry-reports/agricultural-workforce-report-2013.pdf>
- Pimbert, M., & Pretty, J. (1996). Parks, people and professionals: putting ‘participation’ into protected area management. In K. Ghimire & M. Pimbert (Eds.), *Social change and conservation* (pp. 297–330). London, UK: Earthscan.
- Pugh, J., & Potter, R. B. (Eds.) (2003). *Participatory planning in the Caribbean: Lessons from practice*. Aldershot, UK: Ashgate.
- Quandt, S. A., Arcury, T. A., Austin, C. K., & Saavedra, R. M. (1998). Farmworker and farmer perceptions of farmworker agricultural chemical exposure in North Carolina. *Human Organization*, 57(3), 359–368. <https://doi.org/10.17730/humo.57.3.n26161776pgg7371>
- Reid, C. (2000). Seduction and enlightenment in feminist action research. *Resources for Feminist Research Journal /Revue de documentation sur la recherche féministe*, 28(1–2), 169–188. <https://www.oise.utoronto.ca/rfr/>
- Renn, O. (2006). Participatory processes for designing environmental policies. *Land Use Policy*, 23(1), 34–43. <https://doi.org/10.1016/j.landusepol.2004.08.005>
- Rohlman, D. (2010). *Neurobehavioral assessment of pesticide exposure in children*. Unpublished data from pesticide survey, Hood River, OR.
- Schmolck, P. (2013). PQ Method software (2.33). General Public License, Munich, Germany. Retrieved from: <http://schmolck.userweb.mwn.de/qmethod/>
- Sen, A. (1999). *Development as freedom*. Oxford, UK: Oxford University Press.
- Sinwell, L. (2008). Using Giddens’s theory of ‘structuration’ and Freirean philosophy to understand participation in the Alexandra renewal project. *Development Southern Africa*, 25(3), 245–258. <https://doi.org/10.1080/03768350802211776>
- Slovic, P. (1997). Public perception of risk. *Journal of Environmental Health*, 59(9), 22–24.
- Small, M. L. (2004). *Villa Victoria: The transformation of social capital in a Boston barrio*. Chicago: University of Chicago Press. <https://doi.org/10.7208/chicago/9780226762937.001.0001>
- Smith, J. L. (2008). A critical appreciation of the “bottom up” approach to sustainable water management: Embracing complexity rather than desirability. *Local Environment*, 13(4), 353–366. <https://doi.org/10.1080/13549830701803323>
- Stirling, A., & Mayer, S. (2001). A novel approach to the appraisal of technological risk: A multicriteria mapping study of a genetically modified crop. *Environment and Planning C*, 19(4), 529–555. <https://doi.org/10.1068%2Fc8s>
- Thompson, B., Coronado, G., Puschel, K., & Allen, E. (2001). Identifying constituents to participate in a project to control pesticide exposure in children of farmworkers. *Environmental Health Perspectives*, 109(S3), 443–448. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240563/>
- Townsend, A. (2013). Principled challenges for a participatory discipline. *Educational Action Research*, 21(3), 326–342. <https://doi.org/10.1080/09650792.2013.815038>
- Tsouvalis, J., & Waterton, C. (2012). Building ‘participation’ upon critique: The Loweswater care project, Cumbria, UK. *Environmental Modelling and Software*, 36, 111–121. <https://doi.org/10.1016/j.envsoft.2012.01.018>
- U.S. Department of Agriculture, National Agriculture Statistics Service [USDA NASS]. (1998). *Agricultural chemical usage – 1997 fruits summary*. United States Department of Agriculture.
- USDA NASS. (2008). *Agricultural chemical usage – 2007 field crop summary*. United States Department of Agriculture National Agricultural Statistics Service.
- USDA NASS. (2012). Table 35: Specified fruits and nuts by acres: 2012 and 2007. 2012 census of agriculture. United States Department of Agriculture. Retrieved from [http://www.agcensus.usda.gov/Publications/2012/Full\\_Report/Volume\\_1\\_Chapter\\_1\\_State\\_Level/Washington/st53\\_1\\_039\\_039.pdf](http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1_Chapter_1_State_Level/Washington/st53_1_039_039.pdf)



- USDA NASS. (2015). *2012 census of agriculture: Specialty crops* (Vol. 2 part 8). Washington, DC: USDA. Retrieved from [https://www.agcensus.usda.gov/Publications/2012/Online\\_Resources/Specialty\\_Crops/SCROPS.pdf](https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Specialty_Crops/SCROPS.pdf)
- U.S. Department of Labor (2013). *Advisory: Training and employment guidance letter* (No. 23-12). Employment and training administration advisory system, Washington, D.C.. Retrieved from [http://workforcesecurity.doleta.gov/dmstree/tegl/tegl2k12/tegl\\_23-12.pdf](http://workforcesecurity.doleta.gov/dmstree/tegl/tegl2k12/tegl_23-12.pdf)
- University of Washington Pacific Northwest Agricultural Safety and Health Center [UW PNASH]. (2010). *Expert working group data* [Unpublished data set].
- Walmsley, H. L. (2009). Mad scientists bend the frame of biobank governance in British Columbia. *Journal of Public Deliberation*, 5(1), 1–26. Retrieved from <https://www.publicdeliberation.net/cgi/viewcontent.cgi?article=1073&context=jpd>
- Warren, M. E. (1996). Deliberative democracy and authority. *American Political Science Review*, 90(1), 46–60. <https://doi.org/10.2307/2082797>
- Washington State Farmworker Housing Trust. (2008). Key facts: Washington's farmworkers. [Website no longer online.]
- Washington State University (WSU). (2010). *Turning point data from pesticide recertification classes*. Washington State University-Tree Fruit Research and Education Center. Retrieved from [http://pmt.pwsu.edu/downloads/TurningPoint\\_Nov-Mar.pdf](http://pmt.pwsu.edu/downloads/TurningPoint_Nov-Mar.pdf)
- Watts, S., & Stenner, P. (2012). *Doing Q methodology: Theory, method and interpretation*. Thousand Oaks, CA: SAGE.
- Williams, G. (2004). Evaluating participatory development: tyranny, power and (re)politicisation, *Third World Quarterly*, 25(3), 557–578. <https://doi.org/10.1080/0143659042000191438>

## Appendix A

Q statements: Viewpoints were clustered into “factors” around the extent to which participants agreed or disagreed with each of the following statements.

1. I worry that people don’t take the risks of pesticides seriously because they don’t understand the long-term effects of pesticides on their health.
2. I don’t think anybody really knows what all of these pesticides are doing to our environment.
3. Unlike many people, I believe that if there is any possibility of a pesticide harming the environment or human health, that chemical shouldn’t be used even if it’s not yet absolutely proven scientifically to be harmful.
4. I am convinced that people are afraid of pesticides basically because they don’t know enough about the pesticides themselves.
5. It frustrates me that the public simply does not understand how agriculture works today.
6. I don’t know why people get so worried about pesticide use in orchards—there are good systems in place for monitoring pesticide illness and they indicate really low levels of exposure.
7. I don’t trust official assessments of pesticide health risks—they’re measured by exposure to a single chemical, but pesticides are typically used in formulations (mixed with other chemicals).
8. I’m not naïve enough to believe that all pesticides are safe.
9. I can tell by the odor whether or not a pesticide is dangerous.
10. I believe that scientists receiving industry funding tend to be biased towards industry interests even in cases where the industry sponsor does not actively pressure the researcher.
11. I don’t have any questions about which chemicals are safe and which are not—the science of pesticide safety is has been clearly studied.
12. Many of the pesticides we use now are very targeted—they’re not broad-spectrum neurological toxins so short of being a fungus or bacteria, they’re not going to have much effect on you.
13. I am tired of all the regulation around agricultural pesticides.
14. I don’t think it makes sense to worry too much about pesticide drift—pesticides are so diluted by the time they’re used that they’re not going to hurt you.
15. I’m all for workplace safety, but without pesticides, you just can’t produce the safe, nutritious, affordable food that consumers deserve.
16. I worry about children’s exposure to pesticides (even in utero) because it can lower their IQ.
17. It frustrates me that literacy, cultural, time, and language barriers get in the way of appropriate pesticide safety training for workers.
18. No matter what people say, I know that pesticide drift is very common.
19. What pesticide handlers need to be safe in my opinion is more label information in Spanish.
20. I think there should be a program whereby all pesticide applicators, when they go out to spray, are given refresher explanations on what chemicals they are using, what the labels say, and how they should be used.

21. I know that pesticide applicators, because they're spraying all the time, understand pesticide safety—but not everyone else knows what's going on, and that can make things risky.
22. It frustrates me to no end that the health dangers of pesticides are grossly overstated by politicians using the issue as a political vehicle.
23. In my experience, tree fruit workers receive plenty of pesticide safety training.
24. I feel very comfortable with how well pesticide handlers know how to read and follow pesticide labels.
25. I wish managers would do a better job of reminding pesticide handlers about maintaining a safe workplace.
26. If there were clear and open communication within orchards, pesticide safety would be less of an issue.
27. I think growers and managers are generally good listeners, responsive to their workers' concerns—but workers have to be willing to talk to them if they are worried.
28. What I think supervisors need is training in human resource management—how to be more effective and more efficient, with the skills and abilities to communicate things to their employees.
29. I think a big problem in the system is that pesticide safety varies so much by orchard—some enforce safety procedures really well and implement a culture of safety while others don't.
30. I hate when pesticide handlers don't get enough time to decontaminate personal protective equipment.
31. To me it's simple—as long as people follow regulations and don't go into sprayed blocks, there is no safety risk.
32. In my opinion, the tree fruit industry overprotects its workers.
33. I can hardly believe how much safer orchards are now than they were 5–10 years ago.
34. For me, industry self-regulation is the best way to addressing environmental problems like pesticide safety.
35. To me, pesticide handling is only risky when applicators don't wear the proper personal protective equipment.
36. I don't understand why pesticides that can be replaced by less toxic alternatives are still registered.
37. I don't think that growers would train workers on pesticide safety unless it were regulated.
38. In my experience, posting signs for re-entry intervals is not effective—many places keep their signs up all year, so you can't rely on them.
39. I'm tired of this overwhelming focus on pesticide safety—there are simply way more pressing safety issues in orchards today.
40. I trust that the USDA and EPA wouldn't allow pesticides to be used that aren't safe for humans.
41. I believe there's inherent risk involved in working with pesticides, no matter what precautions are taken.
42. Improving pesticide safety is simple—all it needs is for the tree fruit industry to step up and put some money behind it.
43. I believe that true safety comes not from worker protections but from engineering workers out of the loop.
44. I'd like growers to spray less toxic pesticides, but the cost of them is getting out of control, especially for family farmers.
45. To me, pesticide safety has become a non-issue—employers already have to address it for food safety certification.

## Appendix B

Draft outline of proposed training certificate program created by stakeholder working group and designed to provide opportunities for tree fruit industry supervisors to improve some of their workplace safety climate by strengthening supervisory skills.

Proposed Core Training Subjects	Including...
1. Human Resource Management	Hiring/firing/promoting Evaluating employees (informally and formally) Professional communication <ul style="list-style-type: none"> <li>a. Respectful communication around wage rates</li> <li>b. Cross cultural awareness, including terminology changes from orchard to orchard</li> <li>c. Approaches to navigating and explaining rules and their rationale</li> </ul> Respect/ethics <ul style="list-style-type: none"> <li>a. Addressing issues of concern raised by migrant pickers and other employees including favoritism; "culture of retaliation"; "vulgarity"; discrimination and violence</li> </ul> Managing conflict Leadership/motivation
2. Regulations	Specific to: <ul style="list-style-type: none"> <li>a. Tree fruit industry</li> <li>b. Human resources</li> <li>c. Employee safety</li> <li>d. Food safety</li> </ul>
3. General Operations	Safety 101, including: <ul style="list-style-type: none"> <li>a. Safety leadership: modeling, promoting, accident prevention programs</li> <li>b. New employee orientations</li> <li>c. Company safety policies</li> </ul> Economics/Costs 101 (for small and larger operations) <ul style="list-style-type: none"> <li>a. Process, expectations, communicating needs to upper management</li> <li>b. Enhancing productivity</li> </ul>

### Potential Specializations (Tracks)

Managing across languages

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Tractor safety

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Sprayer calibration

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Budgeting

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Literacy

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Respirators and personal protective equipment

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Developing an accident prevention program

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