

Expanding Educational Resources for Apprentices in the Organic Vegetable Farm Manager Apprenticeship Program

by

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Introduction

The Organic Vegetable Farm Manager Apprenticeship Program (OVFM) was registered in 2017 and started with one apprentice in 2018 (Jessee, 2018). Since then, the program has gained 22 farmer educators and brought on 24 apprentices, 6 of whom have graduated and 18 who are actively pursuing their certification (Ugoretz, S.J., 2022). For the 2023 season, there are currently 10 first-year apprentices enrolled. Since COVID the program has received increased interest from both expert farmers and new and beginning farmers. Apprentices along with their farmer mentors follow a training handbook (job book) and are highly encouraged to add comments and updates during the training process. These two factors sparked interest within FairShare to review the curriculum taught in the program and evaluate where support staff could provide more instruction to assist apprentices and farmer educators.

The following project was formed to help FairShare with these two objectives. I spent the first year reviewing the curriculum of classes offered to apprentices during the OVFM program as well as the curriculum for the Beginning Market Growers' Program and Organic Production Systems class taught at UW-Madison. This information was compiled and cross-referenced to the duties and tasks listed in the apprenticeship job book.

To address the second objective of providing more instruction, workshops were developed to supplement the current curriculum. The first step in this process was to identify which skills would be incorporated into the workshops. We hosted a workshop development meeting to talk with farmers and apprentices about which topics they felt needed more instructional support. This meeting used a participatory method, a World Café, and encouraged farmers and apprentices to share their experiences and suggestions. The meeting produced a prioritized list of topics to integrate into workshops. The following months consisted of planning

and creating a tractor safety and equipment maintenance workshop which was held in the spring of 2023.

In the following chapters, I will discuss the project's process in greater detail in addition to a final reflection. Chapter 1 will examine the work and outcome of the curriculum review. Chapter 2 will explore the workshop development process, and in Chapter 3 I will discuss the tractor safety and equipment maintenance workshop event. Finally, Chapter 4 will provide a brief statement of student positionality and an in-depth reflection on the project's process.

Chapter 1: Curriculum Review

Apprentices learn the skills of vegetable farming in two ways, on-farm with their farmer educator and by taking classes through Northeast Wisconsin Technical College (NWTC). The on-farm skill-building comprises 90% of an apprentice's time in the program. Learning through hands-on work aided by a farmer educator is integral to the practicality of OVFM. Apprentices follow the job book while on-farm to ensure they complete all competencies. The in-class teaching encompasses 10% of their time in the program and provides essential information on why things are done the way they are on the farm as well as critical business and marketing management skills. FairShare expressed interest in understanding how well the curriculum aligns with the duties assigned in the job book. They also wanted to review the UW Center for Integrated Agricultural Systems (CIAS) Beginning Market Growers Program, which had recently ended, and an Organic Vegetable Production class co-taught by Julie Dawson and Claire Strader to see if they could integrate some of the content into the apprenticeship classes.

Apprentices take three courses through NWTC: Farm and Business Management and Marketing, Organic Farm Systems, and Production-related Farm Management. These courses are taught in the winter and early spring months to avoid scheduling conflicts during the growing season. To review these courses, I was given access to the course syllabi, but was not able to access the Blackboard (course delivery software) course sites due to security policies. I was also given access to all the content associated with the Beginning Market Growers Program and the Canvas (course delivery software) course site for the Organic Vegetable Production class. The content from the Beginning Market Growers Program included the program outline, readings, helpful charts, and additional resources given to students. The Canvas site for the Organic

Vegetable Production class encompassed weekly lectures and readings, course projects and problem sets, and videos interviewing organic farmers about various business topics.

I created an Excel spreadsheet that cross-references the duties and tasks in the job book to the competencies listed on each of the tech colleges' syllabi as well as the content found in the additional market program and organics course. If a task was covered in the NWTC classes, I indicated in which competency or lecture it was taught. For the Beginning Market Growers Program and the Organic Vegetable Production class, if a task was covered, I indicated in which document or unit it could be found. I then went through and highlighted the tasks that are not covered in any of the courses and programs as well as the tasks not covered in the apprenticeship classes (Appendix A).

Table 1: Depicts how many tasks in each duty listed in the job book are covered in the NWTC classes and the additional courses. The additional courses category includes the Beginning Market Growers Program and the Organic Vegetable Production class. Orange box = all tasks within duties are covered, Blue box = tasks within duty are extensively covered, Green box = no tasks within duty are covered. Extensively means more than half of the tasks within the duty are covered.

Duties	Tasks included in NWTC classes	Tasks included in additional courses
Manage fields	2 of 12	8 of 12
Propagate transplants	16 of 16	16 of 16
Seed and transplant crops	3 of 6	6 of 6
Maintain crops	8 of 11	10 of 11
Control weeds	5 of 5	5 of 5
Control pests and diseases	10 of 10	10 of 10
Harvest crops	3 of 6	6 of 6
Perform post-harvest handling	7 of 11	11 of 11
Operate farm equipment and tools	0 of 3	3 of 3
Maintain farm equipment and tools	3 of 9	4 of 9

Review farm production plan	7 of 7	7 of 7
Assist with managing employees	3 of 13	12 of 13
Perform marketing and customer service	2 of 5	5 of 5

The NWTC classes teach at least a portion of each duty except for operating farm equipment and tools (Table 1). Four out of thirteen duties are covered entirely, two out of thirteen duties are covered extensively, and one of thirteen duties are not covered at all. Duties were also classified by whether course material appeared to cover the associated tasks extensively or only partially. Extensive coverage means over half of the tasks are included in the course. The additional courses reviewed teach a portion of all the duties listed in the job book (Table 1). Nine out of thirteen duties are covered entirely and three out of thirteen duties are covered extensively. It is interesting that the duty not covered by the NWTC classes is operating farm equipment and tools because this was the topic for our first workshop. This indicates that the farmers and apprentices have a clear understanding of what is missing from their program. The table indicates the additional courses teach all the tasks in operating farm equipment and tools. However, I want to clarify the learning is not hands-on instead they provide written materials about operation techniques.

Integrating content from the Beginning Market Growers Program and the Organic Vegetable Production class would augment the apprenticeship program in many areas. They could help fill the gap in operating farm equipment and tools, in addition to touching on some tasks left out in the other duties. Tasks such as preparing beds in different ways, recording seeding and transplanting, recording fertilizer and pesticide amendments, learning the types of equipment and tools needed, organizing and cleaning spaces, operating various farm equipment,

and all the ins and outs of working with employees could be added from these courses. The job book is geared towards on-farm learning so some of the tasks listed would be hard to teach in a class setting like applying compost and performing tillage. In addition, it is not a goal of OVFM to teach all tasks in a classroom setting because the emphasis lies in on-farm learning. However, we want to ensure the in-class curriculum is complementary to hands-on skill building.

The curriculum review provides a way to cross-reference the competencies and skills in the job book, mostly used on-farm, to the curriculum covered in the classes taught at NWTC. It also provides additional courses - Organic Vegetable Production, and Beginning Market Growers - curriculum so FairShare can pull information as needed to augment classes or develop future workshops. The document covers the additional courses sufficiently because I had access to all the content, however, lacks detail for the classes in the apprenticeship program. It was difficult to gain access to NWTC's curriculum due to Blackboard security policies. All the information recorded for the courses offered at NWTC came from the syllabi, and I was not able to reference course content to be sure all information is covered. For the curriculum document to truly represent what is being taught either access to course content or instructor feedback is needed. The security policies surrounding Blackboard access are understandable, however, I was not able to access information even after reaching out to faculty and support staff, making the job of accurately representing the OVFM curriculum difficult. Because of accessibility difficulties, the document may look like certain topics are covered, when they are not, or may show false gaps in the curriculum content. For future curriculum reviews, access to all course content is integral to providing detailed information on what apprentices are learning.

Chapter 2: Workshop Development

In addition to the curriculum review, creating workshops to supplement on-farm skill-building was another goal of the project. The OVFM apprenticeship program has valued feedback from apprentices and farmer educators since its inception. The Apprenticeship Manager, Janes Ugoretz, conducts regular check-in meetings with all the farmers and apprentices. For two years, participants have shared their insights and have indicated skills taught on-farm needed more support for apprentices to be sufficiently competent in the duties laid out in the job book. In response, FairShare proposed workshops as a solution for providing supplemental instruction.

Support for farm math was requested by apprentices talking to the Apprenticeship Manager, and this is what I worked on during the spring of 2022. Farm math encompasses fertilizer spreading, pesticide spraying, and rates of seeding. Small organic vegetable farms tend to work in bed systems as opposed to contiguous acres. When farmers buy fertilizers and pesticides the containers frequently indicate the rates of spreading or spraying in per-acre amounts. This mismatch in units can lead to confusion because application rates need to be further converted to linear bed feet to adequately provide growth or protection. Seeding rates are variable based on which plant family you are sowing and thus understanding how to set a seeder properly is also an important skill for apprentices to understand.

I created a presentation and a complimentary document to teach apprentices how to work through these problems and properly apply amendments to vegetable beds (Appendix B & C). When sharing the completed presentation with FairShare, it became apparent that there was too much information to cover within a one to two-hour workshop. There were also questions about how best to develop instruction that included a hands-on component to complement the job book

tasks related to field management. This discussion led to a halt in the workshop-building process until we gained a better focus on what content to teach.

During this same time, I was taking a course in the agroecology program which focused on different methods of participatory action research (PAR). This class inspired me to use a participatory method to gather farmer educators and apprentices to discuss what topics they felt needed more support. PAR uses various methods to give a voice to the users of research and provides an opportunity for them to have a say in what is being created (O'Hara, 2021). Additionally, researchers can avoid making assumptions about what people want and instead respond to the needs of people in an intentional and truly helpful way (O'Hara, 2021).

With these research methods in mind, I put together a meeting proposal and outline during the summer of 2022. To encourage discussion and collaboration, I chose to use a participatory activity called the World Café, followed by a prioritization activity. World Café is used in large group settings to promote dialogue among all participants (*World Café Method*, 2019). When meetings host a big audience, this method ensures everyone can share their perspective and be involved in the process of moving forward. It encompasses five components (setting, welcome and introduction, small-group rounds, questions, and harvest) that can be modified to fit any setting or situation. When conducting a World Café, the setting needs to be inviting and enable participants to have small group discussions. The meeting begins with a welcome and introduction period to orient participants to the process and purpose of the activity. Then the facilitator organizes small group discussion rounds where each group begins at a table and focuses on a topic or set of questions presented. Each table should have enough writing utensils and paper for groups to jot down notes from their discussion. Groups converse for a set amount of time and then rotate three to four times. Participants can choose which table they go to

and do not have to rotate as a group. Sometimes a person will stay behind at a table to share what was previously discussed with newcomers. Once the small group rounds are completed, everyone comes together as a full group to share ideas and results from the conversations. These insights are usually recorded visually so everyone can see what is being presented. Following the World Café, a prioritization activity can provide an avenue for acting on the ideas mentioned. Once ideas are written/posted in a place accessible to everyone, participants can vote on which ideas resonate with them and think are most pertinent.

World Cafés traditionally happen in person. In this case, however, the farmers and apprentices chose a virtual meeting so that people could attend throughout the state. I made modifications to fit our virtual setting. The simple model of a World Café lends itself to flexibility for various situations so instead of having tables where people congregate to discuss, we used breakout rooms, created shared documents accessible to everyone, and used a virtual whiteboard to visually document the main themes presented. The shared documents represented the topics for each break-out room and consisted of the 13 duties listed in the job book (Table 2). The duties were separated based on the similarity of topics to promote cohesive conversation in the small groups.

Table 2: Break-out rooms, associated topics, and the main ideas discussed.

Break-out Room	Topics	Main themes
1	Control weeds, control pests/diseases, review farm production plan, operate equipment and tools	Theory of weeding, how to use equipment safely
2	Propagate transplants, seed and transplant crops, maintain crops	Seeding and transplanting different varieties, recognizing common pests and diseases, Cultural care, seasonal flow of weeds
3	Harvest crops, perform post-harvest handling	Harvest sequence and seasonality, post-harvest handling, harvesting efficiency

4	Manage fields, assist with managing employees, perform marketing and customer service, maintain equipment and tools	Difficulties of having apprentices train employees and lead marketing strategies, and maintenance of equipment and tools
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We hosted the workshop development meeting using Zoom on November 22nd, 2022, from 1:00-2:30 pm. We had a total of eight participants: three support staff, two farmer educators, one apprentice, one UW scientist, and me (a graduate student). The turnout was smaller than expected due to the farming season winding down and the fact that people were traveling for the holiday. The break-out rooms were deemed unnecessary in the moment because it was easy to have an open discussion with the small group. We used the shared documents to focus our conversation. I sent out the document links to each participant so they could record their insights during the discussion. We spent 15 minutes on each document, providing us the opportunity to talk about each duty in-depth and pinpoint where more instruction was needed (Appendix D).

After discussing all the duties, we recorded the main themes on the whiteboard in Zoom. Farmer educators and the apprentice then voted on which topics were more pertinent using the stamps in Zoom (Figure 1). This process helped support staff prioritize topics for workshop creation and we decided to make tractor safety and maintenance our top priority, followed by the theory of weeding. The workshop development meeting ended with a new focus and a better understanding of what support staff can work on to supplement on-farm skill building.



Figure 1: Whiteboard with main topics. Participants voted using Zoom stamps on which topics were most pertinent to them.

I sent a survey out to participants after the meeting to gauge how they felt about the discussion. The results indicated participants felt the meeting was collaborative and useful. Furthermore, they would come to additional meetings using a participatory activity. They also shared some critiques such as liking the Zoom format but having trouble keeping track of the various documents and not being able to see them all at once, especially when using the whiteboard. In the future, finding a way to have all ideas visible would make a virtual meeting easier for participants.

At the start of this project, the idea for a farm math workshop came to the fore and I created a workshop presentation. However, after running through the content we recognized a need to step back and check in with farmer educators and apprentices about what they wanted out of these workshops. This type of place-based community forum strategy for building educational resources is recognized by Niewolny & Lillard and furthermore, recommended as a best practice for educators in the agricultural field (2010). This approach also allowed researchers to acknowledge the power relations between the creator and user of educational content and redistribute power imbalances to allow the receivers of information a chance to

direct what is being taught (Niewolny & Lillard, 2010). Redirecting our efforts to include apprentice and farmer voices in the development process resulted in a new workshop topic and a better sense of which skills to focus on in the future. This discussion shifted my focus from farm math to tractor safety and maintenance. I began researching information on these topics and looking into potential instructors and space for hosting the workshop. In the following chapter, I will discuss the process of creating and conducting the workshop as well as how it was perceived by the participants.

Chapter 3: Compact Tractor Safety and Maintenance Workshop

The ability to use a tractor and its various implements is critical to running a farm. Yet, for many this knowledge is difficult to acquire. For some, they are able to find a mentor with enough practice and risk tolerance to teach them. For others, they must be self-taught through a slow and mistake-ridden process. Farming is in the top three most dangerous jobs in the U.S., due to the rate of annual accidents and fatalities (Tormoehlen, 2021). Understanding safety concepts is not just a good idea but an important way to reduce the number of hazards associated with farming. With these statistics in mind, in addition to the outcome of our development meeting, we decided that providing a workshop on tractor safety would be the best next step for the apprenticeship class offerings. The planning and organizing for the tractor safety and maintenance workshop began in January 2023 with our priorities being to find an instructor, research what educational content already existed, and settle on a place for hosting.

Surprisingly, given that equipment use is an integral part of farming there is little information available on general equipment safety and maintenance. While browsing the internet I found most knowledge is specific to a brand or model and hard to come by without access to a manual. However, I did come across two universities, Penn State, and Purdue, which have created a farm safety and maintenance class for teenagers (Murphy, 2002; Tormoehlen, 2021). This information is publicly available or provided through extension and is used by many colleges to teach young farm workers. The courses take an in-depth approach to farming hazards and focus on conventional large-scale farming. Our intention for the workshop is to focus on small-scale organic vegetable farming for people who are at least 18 years old. Even though the information in these courses is robust, it does not quite fit our learning objectives. Therefore, I

switched my focus to finding a safety instructor in Wisconsin and identifying a location for hands-on instruction on this topic.

Janes Ugoretz, the Apprenticeship Manager, provided a connection to Trevor Frank, a garden-to-market instructor at Northcentral Wisconsin Technical College (NTC) as a potential connection for finding an instructor. When I reached out to inquire, he enthusiastically replied that their agricultural station provides a tractor safety class in the fall, and that the instructor, Chris Pietz, was happy to teach and host the workshop at their station which had all the needed equipment. We decided to put on a full-day workshop with an in-class morning portion learning about safety and maintenance concepts and an outside afternoon portion with hands-on activities using compact tractors, tillers, and implements. I created a flyer and sent it out for registration (Figure 2). We opened registration for apprentices first as they were our main audience, and then released it to other interested parties through the FairShare host farmers email list and the agroecology and essa listservs through UW-Madison.



Figure 2: Flyer for the Compact Tractor Safety and Maintenance Workshop

We hosted the Compact Tractor Safety and Maintenance Workshop on April 14, 2023, at the NTC Agricultural Center of Excellence in Wausau, Wisconsin. I handed out a pre-survey to participants to record their employment type and gauge their understanding of safety concepts, tractor/implement use, and maintenance knowledge (Appendix E & Table 3). Seven OVFM apprentices, two farm employees, and one hobby farmer participated in the workshop. Six of the participants rated themselves 5 or lower on all questions, meaning they have little to no understanding of safety, use, and maintenance. Four of the participants rated themselves 5-7 on all questions, meaning they have a moderate understanding of safety, use, and maintenance. No one rated themselves higher than a 7.

In the morning, Chris led participants through two modules titled “General Farm and Ranch Safety” and “Tractor Component Basics”. These modules are part of the Tractor Safety Course produced by Purdue University, Gearing Up for Safety (Appendix F). The first module covered general hazards on the farm, situations that contribute to injuries, characteristics of a safe operator, and laws and regulations which apply to agricultural workplaces. The second module went over tractor systems, controls, instruments, symbols, and universal hand signals. In the afternoon Chris and Alex, the farm operations manager, taught participants where to find the oil and hydraulic dipsticks, where to pour new oil and hydraulic fluid in, main engine components, and battery basics on a compact tractor (Figure 3). They demonstrated how to hook up a rotary mower to a three-point hitch and what hazards to be aware of (Figure 3). Participants were given an opportunity to hook up a power take-off (PTO) shaft to develop an understanding of how it gets locked on and how to take it off. In addition, the instructors went through all the safety concepts concerning PTOs. The instructors ended the afternoon session by going over the

basics of starting and running a rototiller and then opening the floor to participant questions (Figure 3).

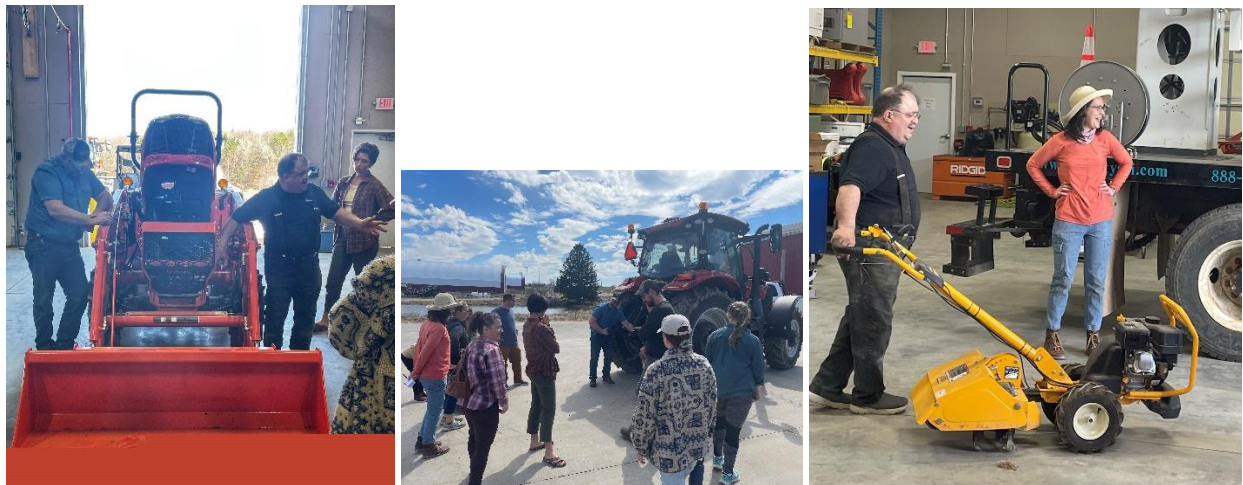


Figure 3: Chris and Alex demonstrating tractor, equipment, and implement use to participants in the workshop, Photo credit: Sarah Janes Ugoretz

I handed out a post-survey to evaluate how the participants felt the workshop went and to gauge how their understanding of safety concepts, tractor/implement use, and maintenance knowledge changed (Appendix E & Table 3). When asked how satisfied they were with the workshop, respondents' ratings ranged from 3-9 with the average being 6.4. Participants liked that they were given lots of information with real-world examples and an opportunity for hands-on tractor learning. They disliked parts of the morning session, noting that the discussion was hard to follow due to the slow pace and organizational flow. In addition, some participants mentioned that some topics were repetitive while others were not covered thoroughly. When asked to rate the workshop instructor many gave a rating higher than 5 with the average being 6.9. Attached to the instructor rating question was a follow-up question asking what was helpful or not helpful. Responses on the question clarified how the participants felt with many noting they liked the instructor and thought he was friendly, funny, and knowledgeable but could have been more time-efficient and focused on topics geared to their type of farming. When asked if

the course content aligned with their expectations most participants mentioned expecting it to be taught at a level for people who already understood basic agriculture safety, and more focused on tractor safety and maintenance as opposed to general farm safety. They also mentioned expecting a more hands-on and interactive afternoon session, including a more in-depth look at the tractors, how to conduct maintenance, and decoupling implements.

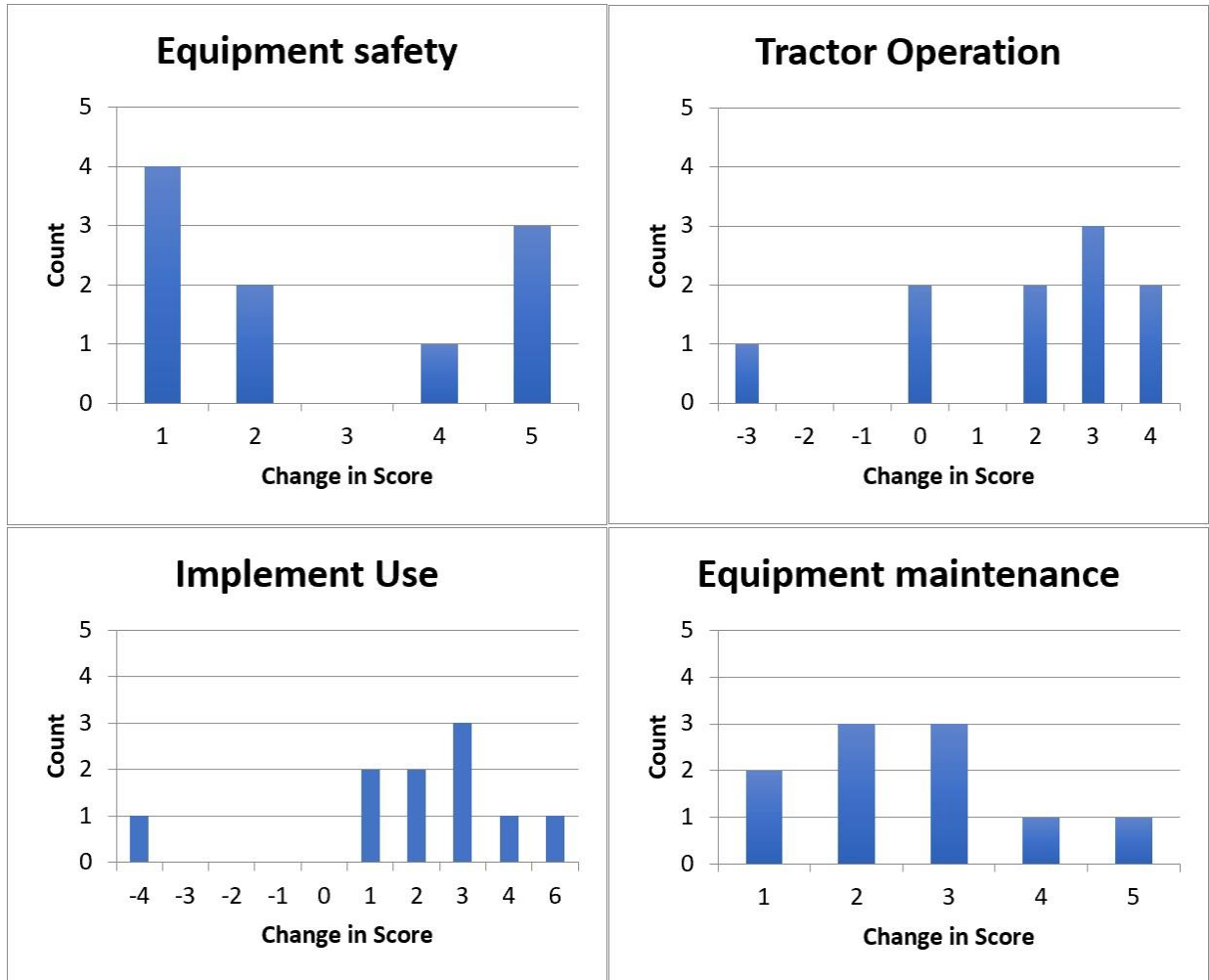


Figure 4: Pre- and post-survey comparison for change in understanding of equipment safety, tractor operation, implement use, and equipment maintenance concepts. The graphs represent how many participants had a particular change in score between the surveys.

As for the questions gauging an increase in understanding of the topics covered, all but one participant indicated their understanding improved in all categories (Figure 4). These survey questions were generalized and so the answers are based on each participant’s individual

perspective. Because of this, we cannot truly evaluate if people's objective understanding of the topics improved. For this reason, this discussion reports how people perceived their change in understanding. When asked about equipment safety concepts everyone improved from a change in rating from 1 to 5. Regarding tractor operation, the change in rating for one participant went down by three, stayed the same for two participants, and ranged from an improvement of 2-4 for everyone else. Understanding of implement use went down for one participant by 4 but improved by 1-6 for everyone else. Lastly, when asked about equipment maintenance one participant went down by 4 while everyone else indicated an improvement from 1-5.

Participants gave constructive feedback when asked how the workshop could be improved. Three people mentioned moving the in-class portion online or providing the materials to participants for review on their own prior to the hands-on portion. Two people mentioned taking time to go over tractor vocabulary and using beginner-level jargon. One person mentioned teaching a course focused on tractor use/driving and allowing participants to use the equipment. One person mentioned having more commonly used implements available and a more in-depth talk on engines. The feedback we received was much appreciated and will aid in content creation for future workshops. In the following and final chapter, I will reflect on how workshop development and content can be further improved in the future.

Chapter 4: Reflection

Student Positionality

Within academia, there are long-standing and persistent barriers to participation (Elsherif et al. 2022). Students' lived experiences, resources, and backgrounds can affect their time in school, the relationships they build, and how their projects are evaluated by instructors (Elsherif

et al., 2022). It is imperative we acknowledge and share our identity within the institutions and labs we choose to work with as graduate students. Recognizing our identity allows us time to reflect on how our background affects our work and identifies us as researchers. I share my position of privilege within UW-Madison and the Dawson Lab to understand my position as a master's student (Figure 5). The center of the circle represents the most privileged and as you move further from the center privilege decreases. There are 20 categories that make up the circle, the black lines around the bubbles indicate where I fall in each category.



Figure 5: Academic Wheel of Privilege from Elsherif et al. 2022 edited to represent my status of privilege as a graduate student. Circles with black outlines indicate my placement within the category divisions.

Beginning with the circles which represent the most privilege, I indicated 11 out of 20 categories. I am a heterosexual, white, neurotypical, able-bodied, and slim person with a mostly robust state of mental health. I may sometimes struggle with all the tasks I have to complete but I have an extremely supportive family circle and have access to mental health services if needed. My mother has a master's degree in education and my father attended a technical college for information services support. I am a citizen of the United States where I currently live and grew up and speak English as my first language. I do not have the responsibility of caring for anyone except for myself and my partner who is as able-bodied as me and is an equal contributor in our relationship. I graduated high school with high honors and currently have a Bachelor of Science in Biology and Environmental Studies from a private liberal arts college, the University of Richmond. I am finishing a master's degree in Agroecology at an esteemed public research institution, the University of Wisconsin-Madison.

Moving to the second tier of privilege circles, I indicated 8 out of 20 categories. I am a cis-woman and grew up in a middle-class household that was mostly stable. I do believe in energies and spirits but no formalized religions. While I was ridiculed growing up, for my lack of religious belief, my beliefs are now mostly accepted by the people I associate with. I currently live in a house we rent, and we live a low middle-class lifestyle. We both work blue-collar jobs, make less than \$40,000 annually, and fully support ourselves. However, we do have safety nets; we rent from my partner's family and could reach out for financial assistance if needed. My school tuition is covered because I hold a teaching assistant position. However, I still pay student fees and my master's work is not covered by loans or grants. The University of Wisconsin-

Madison is research-driven, however many researchers teach, and graduate students work as teaching assistants when research funding is not available.

Lastly, in the third tier of circles with the least amount of privilege, I indicated 1 out of 20 categories. I have never held a career-type job. Before starting my master's degree, I traveled around and worked in contract positions, some of which were part of AmeriCorps. When I graduate, I will start my career as a farmer, but am a novice in the field. Reflecting on the circles I indicated, I possess a high degree of privilege in my position as a master's student gives me the ability to be present for my project and work with little distraction. I have also had the opportunity to build many connections and receive support when I needed it. I have experienced little adversity, and where I do, I can access services to help navigate these struggles. My hope is that by sharing my position as a graduate student I can provide a clearer picture of what I bring to the projects I work on and how my privilege affects the way I show up in the groups I participate in.

Project Reflection

The project, expanding educational resources, encompassed two main parts, a curriculum review and workshop creation. These two goals provided insight into the skills apprentices are currently learning and where support staff can concentrate their energy to continue augmenting the skill-building process. Even though these priorities were separate tasks, the curriculum review did give us a starting point for workshop development and serves as a reference document for future workshop creation. Additionally, the workshops provide a way to bolster the curriculum for OVFM and can be integrated into a future curriculum review. The curriculum review now serves as a living document that can be edited as OVFM grows, and at least one

workshop has been hosted as an example of how other topics might be addressed. The process of accomplishing these tasks leaves me with the opportunity to share what went well, in addition to areas of improvement for future program work.

Recently we have witnessed a rapid increase in agricultural education programs in the United States because most new and beginning farmers are not coming from a farming background (Niewolny & Lillard, 2010). Various avenues such as apprenticeship programs, workshops, online courses, and field days help with this surge in educational needs (Niewolny & Lillard, 2010). These new programs are filling a gap in agriculture. However, very little research has been done to evaluate these programs thus defining what is beneficial and what needs improvement (Niewolny & Lillard, 2010). Expanding educational resources for OVFM fits within this trend by augmenting the program with topic-specific workshops. Reflecting on the process is imperative to understand how this added value to the apprentice's educational experience while also identifying areas for improvement in future workshop development.

In the book *Workshops: Designing and Facilitating Experiential Learning*, a sequence of steps is provided for organizing a workshop – gathering preliminary information, negotiating a workshop agreement, determining the needs of workshop participants, setting goals and learning objectives, setting a consistent theme, including different types of learning activities, and sequencing learning activities (Brooks-Harris & Stock-Ward, 1999). In addition, they also recommend best practices for directing and facilitating a workshop – beginning the workshop, maintaining a coherent workshop message, pacing and timing, and concluding the workshop. Working through these steps and best practices, I will reflect on where organization and facilitation went well and indicate areas for improvement.

The first step of designing a workshop, gathering preliminary information, was conducted through a participatory development meeting, as described earlier. This strategy proved to be beneficial to workshop design and guided content creation. After identifying what needed to be covered, we moved to the next step of negotiating a workshop agreement. A workshop agreement was made with NTC because they had instructors with tractor safety and maintenance experience. When negotiating a workshop, Brooks-Harris & Stock-Ward (1999) mention two aspects to be covered before agreeing to host. The first is discussing all preliminary information with potential partners. In addition, facilitators should take the role of the consultant before they present. When arranging the tractor safety and maintenance workshop we did share preliminary information with NTC, however, we were never given the opportunity to consult with the instructor. Lacking this opportunity made it difficult to assess whether the facilitator was the best fit, had adequate background knowledge, and had enough time to prepare, which are all critical aspects of choosing a host based on Brooks-Harris & Stock-Ward (1999). When focusing on determining the needs of workshop participants, organizers should first rely on preliminary information and then augment it with pre-workshop assessment surveys or predicting needs based on facilitator experience (Brooks-Harris & Stock-Ward, 1999). The preliminary information gathered gave us some direction in content such as understanding the topics to be covered, the audience we were teaching to, and examples of what equipment to include. However, we did not continue determining needs through the avenues discussed above. The missed opportunities for communication in the previous two steps limited our view of goals and learning objectives. Therefore, even though intentions were set they were not detailed and did not ensure that we covered skills holistically. The last three steps when designing a workshop – creating a consistent theme, including different types of learning activities, and sequencing

learning activities came together well due to our workshop development meeting. Farmers, support staff, and an apprentice helped guide a fluid theme by integrating common topics into one workshop and sharing what types of activities they wanted to experience in a workshop setting. These ideas organized our workshop into two main parts – an in-class concept learning activity and then an afternoon of hands-on learning activities.

After the workshop was designed and organized, we were left with one goal, hosting the workshop. When directing a workshop, incorporating the best practices mentioned above can lead to an effective and successful learning experience. The beginning of the tractor safety and maintenance workshop incorporated these best practices by creating a welcoming environment, providing an overview of the workshop content, and allowing participants a moment to assess their current knowledge (Brooks-Harris & Stock-Ward, 1999). However, the post-surveys indicated the remaining best practices were not integrated into the morning activity session. Many participants acknowledged the difficulty of following along with the instructor for various reasons from not understanding the jargon and a slow lecture pace to a lack of organizational flow. Participants would have preferred more detailed content on topics such as tractor operation, implement use, and equipment maintenance. For the hands-on session, the post-surveys indicate that participants were able to follow along and enjoyed engaging with the equipment provided and learning where to look for certain components on a tractor and how to hook up implements. The pace and timing of the afternoon session picked up and we moved through all the equipment efficiently leaving time for participants to ask questions and delve into topics that interested them. The workshop concluded with participants having an opportunity to assess their experience of the workshop, and knowledge gained, and share improvements for future workshops.

Reflecting on workshop design and process gives us the ability to identify our strengths and weaknesses. As a team, our strengths lie in gathering preliminary information, setting a consistent theme, incorporating different types of learning activities, creating a welcoming environment, and gathering participant feedback. Our weaknesses exist in negotiating workshop agreements, setting goals and learning objectives, maintaining a coherent message, and pacing and timing. The following are some suggestions to grow from our weaknesses and build a stronger workshop for future participants.

In the future, taking the time to have design meetings with all actors will give us the opportunity to create sufficient learning goals geared to the audience. Because we are developing resources for an apprenticeship program, we are aware of our audience and can create pre-assessment surveys to gain a clearer picture of what our audience wants to know. Now that we have hosted a workshop, we understand the limitations of the facilitator and the content they used. We are also more aware of time limitations and can set a realistic schedule for organizing future workshops. This experience along with feedback from the participants allows us to redesign our learning activities. Participants indicated providing the in-class concepts through an online format would be beneficial. Changing the way we deliver safety, equipment, and maintenance concepts allows participants to learn at their pace and have access to the material after the lesson. In addition, the facilitator used publicly available knowledge to teach these concepts meaning current instructors in the apprenticeship program could integrate this information into a class they teach or become a certified tractor safety instructor and teach the workshop themselves. There is an instructor training course available online, it is a 2.5-hour course and when completed provides the trainer with a certificate (Fetzer & Murphy, ND). Working with an instructor within the apprenticeship program provides two benefits: the

instructor already knows the apprentices and their level of knowledge/experience, meaning they have a better understanding of what needs to be covered, and apprentices already know the instructor and may feel more comfortable interacting and learning from them. The collaboration with NTC was beneficial for the hands-on learning activities and can continue to be an avenue for apprentices and other interested parties to acquire knowledge pertaining to tractor components, tractor-implement coupling, and maintenance practices. If the concept portion of the workshop was moved to an online format participants indicated being interested in a full day of hands-on instruction.

If we wanted to incorporate the opportunity for participants to operate equipment, we would need to pursue other locations for the hands-on portion. Institutions such as the University of Wisconsin-Madison are well suited for equipment demonstrations because they have a plethora of field stations in ideal locations, however, rules governing the use of these spaces makes it complex. Insurance policies are a current barrier that would need to be addressed. Another option could be to collaborate with complementary events in the surrounding area that include equipment operation. To avoid issues of insurance with group instruction at an off-farm location, and integrate equipment operation into the on-farm portion of OVFM, support staff could create resources so farmer educators can sufficiently teach apprentices. Tractor operation is similar enough that one protocol could be provided to farmers however, brand-specific component charts and maintenance protocols would need to be developed. The continuation of a tractor safety and maintenance workshop is encouraged by the feedback we received. However, acknowledging the suggested improvements will result in more effective future workshops.

Community Partner-Institution Relationships

The Wisconsin Idea, inspired by former UW president Charles Van Hise in 1905, is one of the grounding principles at the University of Wisconsin-Madison (Wisconsin Idea, 2023). It encourages researchers to share their work with the community and take their expertise outside of the classroom to benefit the people of Wisconsin (Wisconsin Idea, 2023). Many campus labs and Extension programs have initiated collaborations with community partners to serve this purpose and build stronger connections between the people and the University. The work put in to create and maintain these partnerships is critical to their success and effectiveness. While the Wisconsin Idea is an important way to break the barriers of the Ivory Tower, building and sustaining relationships can be complex. If relationships are conducted without best practices, it can lead to frustration for all involved. I had the opportunity of working with community partners throughout my project and feel the relationships and communication which occurred should be shared and reflected upon. The goal of this reflection is to understand the project process and serve as a learning opportunity for future partnerships.

FairShare and the Dawson lab have worked in partnership since 2016 on the Organic Vegetable Farm Manager Apprenticeship Program. Together they have successfully provided support to local organic farmers and interested beginning farmers. Jointly, they have taken on graduate students pursuing project tracks and mentored them through school and community relations. When the partnership was created the connection was strong and the work produced reflected this. Through time partnerships inevitably shift due to growth in an organization or projects changing/taking next steps. Statham et al. (2000) explain these changes using transition theory and evaluate what these stages look like when working with community partners. The first stage is letting go, faculty begin to take on graduate students to help with the community project and give community partners the space to be experts and have an equal share in the project-

building process. I believe FairShare and the Dawson lab went through this phase when creating OVFM because graduate students helped with communication, survey creation and analysis, and process evaluation. FairShare was also an equal partner in the project helping to identify priorities and facilitate communication with local farmers.

The second stage is the Neutral Zone, where the partners have successfully completed projects together and begin new work. However, this phase can be full of uncertainty due to roles not being established or projects not being fully formed. This project, I feel, falls within this stage. When I came on as a graduate student the purpose of the project was unclear, and all partners were left confused about how to proceed and what to prioritize. Furthermore, decisions were made without clear and constant communication. A summary written by students in a Civil Society and Community Studies course found that a lack of communication between community partners, faculty, and students is an area where partners feel concerned (Tyron et al., 2016). This concern stems from inconsistency on all sides to keep everyone updated and ensure students are the right fit for a particular project. The critical part of this neutral stage is using the struggles and insights from the work to transform the relationship.

The third stage is forging new beginnings. In this phase, partners move forward with a fresh perspective and renewed goals. FairShare has recently undergone a transition in OVFM leadership. Therefore, it is imperative for partners to go back to the drawing board and discuss what this partnership should look like in the future and what structures should be put in place to alleviate confusion and encourage future collaborations. While the goals accomplished for expanding educational resources were undoubtedly beneficial, providing content for current and future apprentices, the partnership encountered struggles through the project process. The struggles resulted in a slower timeline for actionable work and difficulty receiving needed

information. If the goal is to collaborate long-term, best practices for moving forward should be utilized.

A study conducted on non-profit organizations partnering with institutions found for relationships to develop from transactional to transformational collaboration needs to be mutually beneficial for all parties (Bushouse, 2005). Sandy & Holland (2006) recommend partners discuss the benefits and costs associated with taking on a project or student before the work begins. Furthermore, having a proactive view of project logistics and communication expectations may mitigate complexities within relationship building during the process (Sandy & Holland, 2006). When beginning a project, even if it is with an organization that has previously worked with the institution, brushing up on community commitments and recognizing the position of all actors would allow the space for evaluating project success. The University of Wisconsin-Madison has a set of community commitments to use as a reference for this pre-reflection (Morgridge Center for Public Service, 2023). The commitments include ensuring accessibility, engaging authentically, centering community voice, practicing self-awareness, reflecting often, establishing collaborative practices, organizing around community strengths, understanding community history and interests, honoring community knowledge, and maintaining flexibility (Morgridge Center for Public Service, 2023). Ultimately, when building and sustaining partnerships, all parties should think of the relationship as foundational, strive for common ground, hold all actors accountable for showing up, and value access and fairness (Sandy & Holland, 2006). There is potential for continued partnership between FairShare CSA Coalition and the Dawson lab as the apprenticeship program grows. However, discussions surrounding the future relationship are pivotal before initiating new projects.

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Appendix A: Supplementary File: The supplementary Excel file, OVFM Curriculum Review, includes the competencies and tasks in the apprenticeship job book. These are cross-referenced to the curriculum in each of the apprenticeship courses in addition to the organic vegetable production and beginning market growers courses. Competencies that are highlighted indicate workshop topics. Cells highlighted in the course columns indicated a task that is not covered. A key to the highlighted competencies can be found at the end of the Excel file.

Appendix B: Supplementary File: The supplementary PowerPoint File, Farm Math, includes content for the first workshop requested. The presentation covers how to calculate fertilizer amendments, how to calculate proper pesticide application and rates of seeding.

Appendix C: Supplementary File: The supplementary file, Quick Conversions for Farm Math is a complementary document to the Farm Math workshop. Indicates how to convert various measurements and their equivalents.

Appendix D, pg 35-38: World Café Station Documents

Appendix E, pg 39-40: Compact Tractor Safety and Maintenance Workshop Pre and Post Survey Documents

Appendix F: Supplementary Folder: The supplementary folder, Purdue Courses, includes the PowerPoint presentations used in the Gearing Up for Safety Course. The first two modules were covered by the Compact Tractor Safety and Maintenance Workshop Instructor. Additional modules are added as resources for future workshops.

Appendix D: World Café Station Documents

Participants in the Workshop Development meeting recorded ideas and suggestions from each station on the following google documents.

Station 1: Competencies for this station are shown in the table below. Please discuss which skills would benefit from more instruction. Tasks associated with these competencies are listed on the next page for reference.

Control Weeds	Control Pests and Diseases
<p>effective weeder: get all the weeds everytime</p> <p>Weeding theory - why it is important to weed and how being effective will impact the workers and the farm in the short and long-term</p> <ol style="list-style-type: none"> 1. weed seedbank 2. depth of weed emergence 3. interfering with harvest 4. critical weed free period 5. timing of weeding - weed size <p>(See notes under Station 2 - Maintain Crops and how weed pressure/seasonality comes in)</p>	
Review Farm Production Plan	Operate Equipment and Tools
	<p>Safety: how to use equipment properly</p> <ol style="list-style-type: none"> 1. tractor safety 2. including the theory of safety so that safety can transfer over to new equipment and tractors as well 3. Whatever is covered in the class also needs to be carried into the field, cannot be taught just in the field 4. Part 1: classroom theory on how to operate, rps, pto, etc. 5. Part 2: hands-on including some basic equipment like a rotary mower or tiller 6. tractor safety trainer? 7. eg from Penn State: https://extension.psu.edu/national-safe-tractor-and-machinery-operation-program-nstmop-instructor-training

	8. Possibilities: ag research stations and equipment dealers might be able to provide and/or inform a class
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Station 2: Competencies for this station are shown in the table below. Please discuss which skills would benefit from more instruction. Tasks associated with these competencies are listed on the next page for reference.

Propagate Transplants	Seed and Transplant Crops
<p>Theory behind seed starting mix, how it differs from soil, rationale for seeding depth, etc - the science behind giving plants the best start</p>	<p>Theory behind how seeders work and what the pros and cons are of each choice</p> <p>Theory on seeding depth, and how seeder adjustments affect germination and such</p> <p>Transplant process and how/why for different plant families</p> <p>showing examples of seeders, each part, how its adjusted, the purpose of each part</p> <p>focusing on process, time is used efficiently and effectively</p>
Maintain Crops	
<p>Recognizing common pests and diseases and even when a plant/crop does not look quite right</p> <p>Theory on why trellis, thin, blanch, etc. - the culture of each plant</p> <p>Controlling weeds immediately after transplanting - there is sometimes an emphasis on planting and then the field is left for too long before weeding. The seasonal flow of weed pressure.</p> <p>Concept of time and motion</p>	

Station 3: Competencies for this station are shown in the table below. Please discuss which skills would benefit from more instruction. Tasks associated with these competencies are listed on the next page for reference.

Harvest Crops	Perform Post-Harvest Handling
<p>how the time of day the crop is harvested might have to change with the seasons</p> <p>theory on which things have the most resilience to temp, etc. and thus the order of harvest operations and how that is set up day by day and season by season</p> <p>how to begin the post-harvest process in the field when needed (sometimes based on distance from the pack shed) EX: bringing water to the field to begin hydrocooling</p> <p>Theory on how harvest efficiency may include harvesting some crops that are not wanted or needed in the pack shed, ex: broccoli in flower, beans and peas stopping production when they are not picked because they feel they have succeeded in reproduction; what needs to come to the shed and what should be left in the field</p> <p>sliding standards of maturity/harvest based on field conditions, weather, and market demands</p> <p>training on how to be efficient: examples - think about what needs transporting across the field before crossing the field; get all the stickers, not just one sticker; carry a bucket in each hand, not just one.</p> <p>concept of time and motion, the idea that even small amounts of time add up over the course of the day, and tools on how to move/work efficiently in the field; connecting efficiency to profitability, guides to the labor/profit trade-off</p>	<p>best practices on how each crop should be stored, and how that might compare to the ideal (which might not be available on a specific farm)</p> <p>some post harvest happens in the field and the time between harvest and getting to the pack shed is important</p> <p>theory on grading crops based on field and market conditions and how “the grade” will certainly change based on changing markets and conditions</p> <p>class on “what is marketability”</p>

Station 4: Competencies for this station are shown in the table below. Please discuss which skills would benefit from more instruction. Tasks associated with these competencies are listed on the next page for reference.

<p style="text-align: center;">Manage Fields</p>	<p style="text-align: center;">Assist with Managing Employees</p> <p>difficult to do in a practical sense incorporate managing employees in the class</p>
<p style="text-align: center;">Perform Marketing and Customer Service</p> <p>review and assess a marketing plan, collaborate on developing a marketing plan (rather than “develop marketing plan” - wording of these and other tasks will impact whether farmers see the opportunity to train apprentices)</p>	<p style="text-align: center;">Maintain Equipment and Tools</p> <p>optional maintenance 101 aware of tech college classes near them (small engine repair, welding, etc)</p>

Appendix E: Compact Tractor Safety and Maintenance Workshop Pre and Post Survey
Compact Tractor Safety and Maintenance Workshop Pre-Survey

1. Which of the following categories best describes your employment type?

- 1. Apprentice
- 2. Farm employee
- 3. Farm Manager
- 4. Researcher
- 5. Other: _____

2. How would you rate your current understanding of equipment safety concepts?

No									Proficient
Understanding									Understanding
1	2	3	4	5	6	7	8	9	10

3. How would you rate your current understanding of operating a tractor?

No									Proficient
Understanding									Understanding
1	2	3	4	5	6	7	8	9	10

4. How would you rate your current understanding of implement use with a tractor?

No									Proficient
Understanding									Understanding
1	2	3	4	5	6	7	8	9	10

5. How would you rate your current understanding of equipment maintenance?

No										Proficient
Understanding										Understanding
1	2	3	4	5	6	7	8	9	10	

6. Have you completed any other training regarding tractor safety and maintenance?

Compact Tractor Safety and Maintenance Workshop Post-Survey

1. Which of the following categories best describes your employment type?

1. Apprentice
2. Farm employee
3. Farm Manager
4. Researcher
5. Other: _____

2. Did the workshop content align with your expectations? If so, how, and if not, what were you expecting?

3. How satisfied were you with the workshop?

Highly										Highly
Dissatisfied										Satisfied
1	2	3	4	5	6	7	8	9	10	

What did you like or dislike?

4. How would you rate the workshop instructor?

Not										Very
Helpful										Helpful

1 2 3 4 5 6 7 8 9 10

What did you find helpful or not helpful?

5. How would you rate your current understanding of equipment safety concepts?

No Proficient

Understanding Understanding

1 2 3 4 5 6 7 8 9 10

6. How would you rate your current understanding of operating a tractor?

No Proficient

Understanding Understanding

1 2 3 4 5 6 7 8 9 10

7. How would you rate your current understanding of implement use with a tractor?

No Proficient

Understanding Understanding

1 2 3 4 5 6 7 8 9 10

8. How would you rate your current understanding of equipment maintenance?

No Proficient

Understanding Understanding

1 2 3 4 5 6 7 8 9 10

9. How could the workshop be improved?