



# Planting Habits:

## An Ergonomics Initiative

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# Executive Summary

Transplanting Traditions Community Farm is a non-profit organization in Chapel Hill, NC, with the mission of providing refugee adults and youth access to land, healthy food, and agricultural and entrepreneurial opportunities. The organization supports “a cultural community space for families to come together, build healthy communities, and continue agricultural traditions” (Transplanting Traditions, n.d.). Transplanting Traditions currently offers access to land and opportunities to learn about farming to at least 18 farmers, serving a community of 155 refugee adults and children. They also partner with a number of community organizations, including Carrboro United Methodist Church and the UNC Division of OS/OT. The farm is fully operational, and farmers run their own businesses with some assistance from staff through Grower’s School. However, the staff expressed that farming is difficult on the farmers’ bodies, and there is concern about their ability to continue farming as they age. In addition, some community members have been unintentionally excluded from the farm due to the physical inaccessibility of the environment.

The proposed program, *Planting Habits*, will address these needs and work to promote long-term participation for aging farmers. We have created an Ergonomics Curriculum PowerPoint to be incorporated into Transplanting Traditions’ “Grower’s School” class and follow-up workshops. This curriculum addresses body mechanics and ergonomic equipment that are effective in eliminating pain and strain while farming (NIOSH, 2001; Chapman & Myers, 2001). *Planting Habits* will also create a participatory ergonomics team, an evidence-based and CDC-recommended strategy for supporting the implementation of ergonomic techniques into farmer education, buy-in, and sustainability (Kogi, et al., 2005; NIOSH, 2001; van Eard et al., 2010). Furthermore, *Planting Habits suggests* establishing partnerships to support the creation of an age-friendly, accessible space at the farm in order to promote long-term participation for farmers.

*Planting Habits* will take place over the course of approximately 2 years, although partnerships created during the program will hopefully support continued change beyond this time. It will be implemented in 4 stages: Ergonomics Project Preparation, Ergonomics Project Initiation, Ergonomics Management, and Creating Age-Friendly Accessible Space. Ergonomic equipment, educational materials, and overhead are expected to cost approximately \$727.00 and implementation will require about 125 hours of staff time.

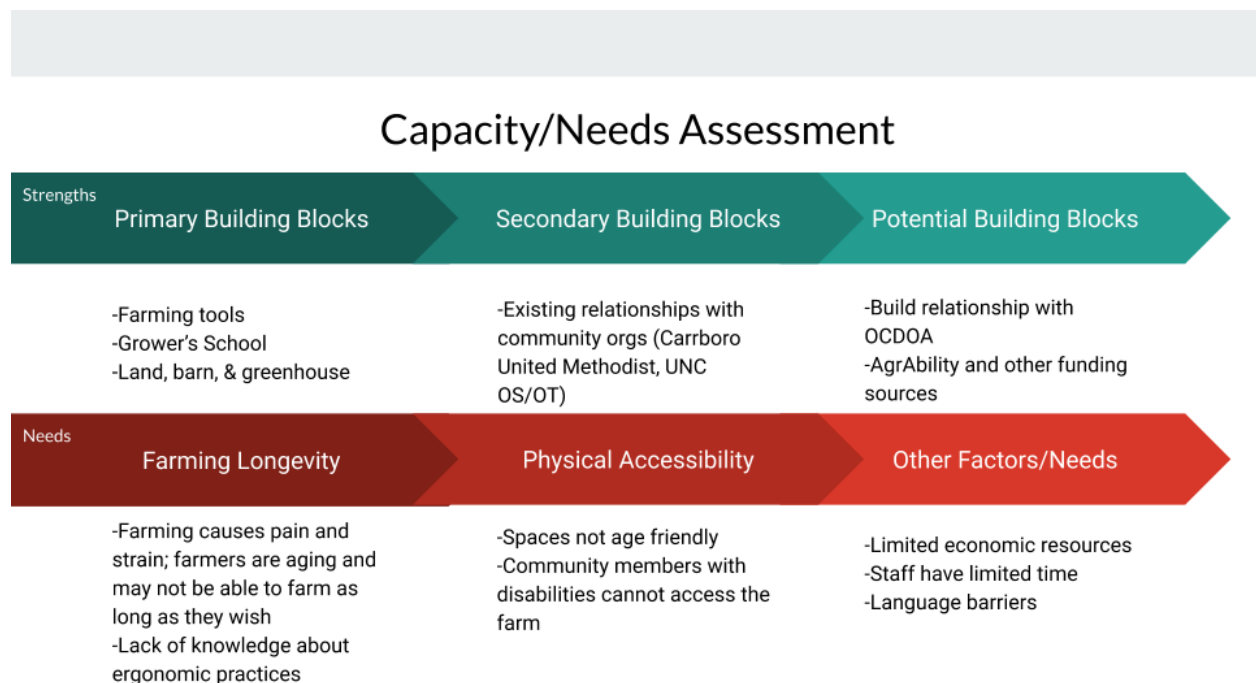
The Program Evaluation Plan aims to measure 1) decreased pain/strain for farmers through improved Wong-Baker pain scale scores from "pretest" to "post-test" surveys, 2) increased farmer knowledge of ergonomic strategies and tools through staff-administered "learning checks" at Grower's School and workshops, 3) increased and more efficient use of ergonomic strategies and tools from "pretest" to "post-test" surveys, and 4) increased relationship and partnership with OCDOA through emails, meetings, and conversation.

The following organizations support local causes relevant to aspects of TTCF’s work and may contribute to funding for ergonomic equipment and construction of age-friendly, accessible spaces: Walmart, Duke Energy, Orange County Department on Aging, Carol Woods, Carolina Farm Credit, Farmers Market Promotion Program, Strowd Roses, Inc., Lowe’s, Wells Fargo, and Lovett Foundation. Finally, an organization called AgrAbility may connect TTCF to potential funding sources if any aging farmers develop any health limitations in the future.

# Capacity/Needs Assessment

Before determining the ways in which this program could benefit TTCF, it was important to conduct a capacity/needs assessment. Staff at Transplanting Traditions expressed an overall need to make both their physical space and their programming and farming opportunities more accessible. Their goal is for aging farmers to be able to farm as long as they wish and for community members with disabilities to be able to access the space and engage with the larger farming community. We utilized the Strengths-Based and Capacity Building in Community Development Model in order to consider assets already present at the individual and organization levels as well as assets outside of the organization that might be leveraged. We chose this model because TTCF already has many assets, including available enterprises, capital in the community, economic development, entrepreneurs, and leverageable skills on which a program could build in order to achieve the organization's goals.

Next, we identified needs, as identified by staff and farmers, including needs of aging bodies, lack of knowledge about ergonomic strategies, and lack of physical accessibility of the farm, which our program will address. We also considered factors that will need to be considered in order to create a feasible and sustainable program, including language barriers, differing cognitive capacities and educational backgrounds of farmers, limited staff time, and limited funds. We wish to assess these factors to identify areas that can be strengthened so that TTCF will be able to function at full capacity and farmers can continue to farm as they age.



## What are TTCF's current strengths?

TTCF has multiple assets and capacities within its community that are largely controlled by its members. These “**primary building blocks**” are explored below (McKnight & Kretzmann, 2012).

- Individual
  - Farming knowledge (traditional Burmese)
    - There are currently about 18 farmers at TTCF. Farmers have vast agricultural skills, and are practiced at adapting their traditional agricultural practices to the distinct context of North Carolina. This skill and knowledge can be utilized to help integrate evidence-based ergonomic techniques with traditional farming practices and ultimately implement farming techniques that are feasible, culturally relevant, and ergonomic.
  - Staff knowledge
    - Staff also have a wealth of knowledge about farming and business practices as well as running a non-profit organization. They are aware of some physical and accessibility needs (discussed below) and are motivated to address them. They are also experienced in working, collaborating, and organizing with farmers, as well as in applying for grants and funding.
    - Moo-Kho, who is both a farmer and the Assistant Farm Manager at TTCF, has all of the strengths above. She also serves as a translator between farmers and staff when needed, a strength we hope she might offer in the implementation of interviews and classes in the proposed program to ensure full communication.
  - Farming tools
    - Tools that farmers already own can be modified as required. We can suggest affordable ways to adapt the tools that farmers already have to make them easier to use as they age.
  - Personal income
- Organizational
  - Working, smoothly functioning farm
  - CSA (Community Supported Agriculture)
    - This program is completely farmer-run, and they sell their produce at local farmer's markets.
  - Teen programming
    - This is a youth-led program which has worked on projects to promote the farm, including interviewing several older adults about their experiences. There is potential for intergenerational programming between teens and older adults.
  - Farmer education programming (Grower's School)
    - This is an incredible, well-developed system that the farm has to disseminate information about farming. We plan to leverage this strength by offering a PowerPoint/training with the ergonomic strategies we have researched for the Grower's School curriculum next winter.
  - Farmer manager program

- Farm managers have formal leadership roles on the farm. They might be able to use their current leadership positions to participate in or endorse a participatory ergonomics team, which would promote the sustainability of continuing to inform farmers about ergonomic farming practices.
  - Organizational income
    - TTCF (Transplanting Traditions Community Farm) receives funding through grants, donations, and tours of the farm. It is possible they would be able to offer knee pads or other ergonomic tools at low cost to the farmers using this income, but we hope not to rely on it.
  - Physical/natural resources
    - Land
      - TTCF owns 8 acres of farmland spread across 2 main tracts, with different plots dedicated to individual farmers. Currently, the plots closest to the greenhouse are the most physically accessible because it is possible to drive right up to them.
    - Produce
    - Barn (not yet winterized)
      - The barn contains the produce washing basins, 1 of the coolers, and several picnic tables used for packing CSA boxes. The area in and around the barn can be used as a communal gathering space.
    - Greenhouse
      - The greenhouse is directly attached to the barn and is currently the only indoor space on the farm. It is managed by one of the farm managers and arranged in a way to maximize space.

TTCF also has assets located within the community that are largely controlled by outsiders. These “**secondary building blocks**” are explained below (McKnight & Kretzmann, 2012).

- Private and nonprofit orgs
  - UNC, NC State
    - Ties to the universities, especially the UNC OS/OT division which has an established partnership with TTCF, might be used to maintain the most up-to-date information about best ergonomic practices in the future.
  - UNC Hospitals, Orange County Health Department and Refugee Health Coalition
    - Representatives from the Orange County Health Department and Refugee Health Coalition might be involved in the process of creating an age-friendly space at the farm.
  - Other nonprofit organizations
- Faith organizations
  - Carrboro United Methodist Church
    - This church allows TTCF to use a classroom for free for their Grower’s School. It is possible to use this classroom to implement a module on ergonomic farming practices during Grower’s School.

These “**potential building blocks**” contain several resources originating outside of the organization and may be utilized in the implementation of the program (McKnight & Kretzmann, 2012).

- Orange County department on Aging: May have some resources or funding for older adults, since the farm is situated within Orange County.
- Public assets/resources for refugee population: for first 8 months here <https://www.dshs.wa.gov/esa/community-services-offices/refugee-cash-assistance>
- AgrAbility: AgrAbility staff use alternate funding sources, such as vocational rehabilitation systems, which provide equipment, modifications and training to help keep people with disabilities employed.
- Funding sources for physical items to support farming into older age, such as hoop houses, raised beds for the crops, and various adaptive equipment to protect against strain
  - North Carolina is one of twenty states with AgrAbility Projects funded by the USDA. AgrAbility does not give grants for AT but seeks alternate funding sources such as those listed below.
  - Vocational rehabilitation systems - provides equipment, modifications and training to help keep people with disabilities employed
  - State Assistive Technology Act programs and private foundations to help with acquiring needed equipment (<http://www.agrability.org/funding-assistance/>)
  - The Toolbox AT Assistive Technology Database Online ([www.thetoolbox.info](http://www.thetoolbox.info)), which provides information on over 1,250 assistive products, including supplier contact info.

### **What are TTCF’s current needs?**

Below are current needs and complexities mentioned by staff and farmers that exist on an individual, organizational, and systemic level. As mentioned above, we hope to address needs prioritized by staff for our program while taking other complexities (such as language barriers and limited funding) into consideration to create a sustainable and feasible program.

- **Individual factors for which the farm and/or our curriculum hope to adapt to support.**
  - **Our curriculum plans to address these needs/concerns:**
    - *Aging bodies, pain, and wear on bodies from farmwork:* As Betsy (Farm Manager) said, “Farm work is bad for the body but good for the soul.” Most of the farmers range in age from their 30s-50s and want to continue farming for at least the next 10-15 yrs, but they are aging. Many have health challenges that might also impact their ability to continue farming. They are trying to support those farmers here on the farm but also in their homes.
    - *Lack of knowledge about or use of ergonomics:* According to a staff member, farmers definitely have some knowledge about what they “should” be doing, but she mentioned equipment like knee pads she “wished she had known about 5 years ago.” Farmers are not actively

*doing* ergonomic techniques, whether this is out of habit, lack of knowledge of techniques, or a belief that they will not actually help with farming. In some cases, making these changes will make farming less efficient. Any future suggestions made through this program will need to be intentional in considering these complexities. Our priorities will be to offer ergonomic techniques that prevent injury while saving or at least not adding significant time to the farming process.

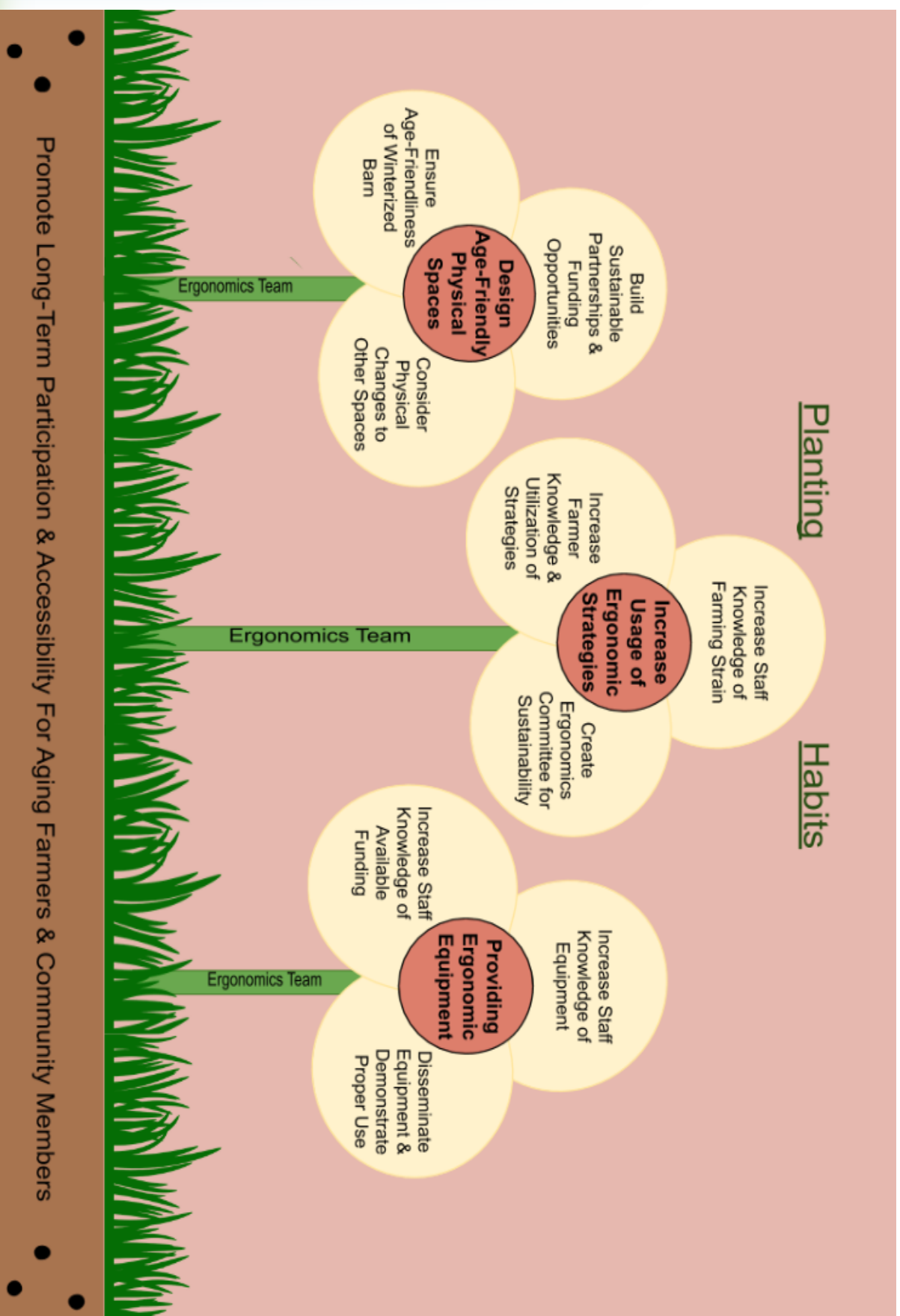
- **Our curriculum considers these complexities:**
  - *Language barriers, differing cognitive capacities, and different educational backgrounds:* Many farmers have limited spoken English and/or English literacy. Images will be more helpful than written words or speaking in English when creating curriculum content, even with the assistance of a translator. Information distributed around the farm needs to be accessible to everyone regardless of language/education/cognitive skills. We will address this by providing pictures of ergonomic strategies and suggesting ergonomic tools to use to prevent injury/strain.
  - **The farm staff introduced these other concerns:**
    - One community member (daughter of two farmers) who is in a wheelchair is unable to engage significantly with the farm. Staff would like to identify ways to involve her because she is often limited to sitting in the car or staying at home.
    - The staff also expressed concern for the mental health of the farmers, given that they have experienced significant hardship as refugees. However, due to cultural and language barriers, this concern is not within the scope of our program.
- **Organizational needs and complexities**
  - *Limited economic resources:* Program and initiative components should either be low-cost, or have a potential external form of funding. The organization will not be able to pay to implement our program.
  - *Limited staff capacity:* Transplanting Traditions does not have the capacity for a program that will take up significant staff time. Therefore, this program was developed so that it can be integrated into already existing routines/programs run by the staff at TTCF. We have created curricula/class content for the “Grower’s School.” The staff member who runs Grower’s School has said that it would be feasible to introduce/teach our content through this program. An additional advantage of this approach is the staff have a well-established trust with the farmers on which the education about these strategies can be built.
  - *Lack of accessibility:* The environment of the farm is currently limited in accessibility, and staff are concerned that both current community members and others (friends, family, wider community members, etc.) are not able to access the physical space but also the community and programming.



- **Land/natural resource/physical space/environment challenges**
  - *Need for more space, especially in hoop houses.* Aisles are narrow (both in and out of hoop houses), which restricts how farmers can hold their bodies as they farm. According to staff, aisles are narrow in order to preserve space, so suggesting wider aisles is unlikely to be successful.
  - While the “naturalness” of the farm, dirt paths, green space, etc. allow for farming to occur in the way it needs to, especially walking paths are bumpy, muddy, and unpaved. A community member with a wheelchair is unable to engage with the farm in addition to more trip and fall hazards.
  - Wash basins make the process of washing vegetables require a significant amount of leaning over that is difficult on the back.
  - The farm is working to obtain a winterized barn to optimize winter farming and to produce year-round income for farmers. This project is still in process and the organization needs to raise another \$10,000 before starting construction.
  
- **Outside/systemic factors to consider:**
  - Farmers are unable to fully support themselves financially on the money they make farming. Farming is an occupation that brings great joy, and farmers have expressed significant interest in having full-time positions.
  - The majority of the farmers work as custodial staff overnight at UNC to supplement their income. Farm work during the day and custodial work at night is highly taxing on the body.
  - It is important to remember that although staff attempt to give the farmers as much independence as possible, background preparation and information is primarily filtered through main staff members. Both staff members and refugee farmers have their own experiences and ideas that inform the way they interact and do together.
  - The farmers’ position as refugees might give them access to governmental funds or financial support from other organizations potentially

After considering TTCF’s various assets, capacities, and strengths to be leveraged as well as the current identified needs of the organization, we have constructed a program plan that is detailed below. Our perspective of occupational longevity has provided a basis for promoting the participation of farmers as they age.

# Program Overall Description and Rationale



Promote Long-Term Participation & Accessibility For Aging Farmers & Community Members

## Mission and Goals

The **mission** of *Planting Habits* is to promote long-term participation and accessibility on the farm for aging farmers and community members. The program addresses three goals and related objectives for each goal:

1. To promote longevity of participation in farming by increasing farmers' use of ergonomic strategies.
  - Objective 1.1: Increase staff knowledge about specific needs/strain experienced from farmers while farming
  - Objective 1.2: Increase farmer knowledge and utilization of ergonomic strategies that would be useful in adapting farming activities that are difficult or creating strain
  - Objective 1.3: Create an "ergonomics committee" in order to sustain use of ergonomic strategies and address ongoing needs
2. To minimize the risk of chronic strain from farming by providing aging farmers with ergonomic equipment.
  - Objective 2.1: Increase staff knowledge about what ergonomic equipment might be useful to farmers and funding available for this equipment
  - Objective 2.2: Purchase and disseminate needed ergonomic equipment to farmers and increase knowledge about appropriate use
3. To increase overall accessibility of the farm by creating age-friendly accessible physical spaces.
  - Objective 3.1: Build sustainable partnerships and funding opportunities, including the Orange County Department on Aging (OCDOA) that will assist in building an age-friendly community
  - Objective 3.2: Ensure age-friendliness of winterized barn during construction
  - Objective 3.3: Begin considering physical changes to other farm spaces (such as adding more hoop houses) through partnerships with OCDOA

By working to achieve these objectives, the program aims to serve older adult refugee farmers, adult farmers who can still take preventive measures in order to farm into older adulthood, and family and community members who have been unable to access the farm in the past.

## Why this program?

According to the CDC, work-related musculoskeletal disorders (like sprains, strains, and back pain) are a leading cause of disability for people in their working years (NIOSH, 2001). For farmers, these injuries are *the* most prevalent work-related medical problem (Fathallah, 2010). Backaches and pain in shoulders, arms, and hands are the most common symptoms that farmers report (Fathallah, 2010; NIOSH, 2001), with back pain among agricultural workers historically as high as one and a half times higher than among workers in US industry as a

whole (Guo et al., 1999). Injuries are most commonly caused by chronic exposure to stresses including lifting heavy loads, repeated full body bending (stoop), forceful gripping, twisting, kneeling, squatting, and vibrating equipment (Fathallah, 2010; NIOSH, 2001), which are all regular elements of farmwork. These injuries can make it impossible for farmers to continue farming and working their other jobs, decreasing income and profits for farmers as well as the meaningful experiences they enjoy at Transplanting Traditions. Clearly, if we are to promote long-term participation for aging farmers, these stressors and the injuries they cause must be addressed.

Many consider musculoskeletal disorders (i.e. pain) to be an inevitable part of farming, but they are not (Chapman & Myers, 2001). These injuries are, by and large, preventable, and evidence suggests that the greatest barrier to their implementation is simply awareness that they exist (Chapman & Myers, 2001; Fathallah, 2010). Once taught to farmers and staff, the cost-effective strategies and equipment outlined in the attached resources can make a big difference in reducing this strain, ultimately allowing farmers to continue farming as long as they wish (NIOSH, 2001; Chapman & Myers, 2001).

Creating an age-friendly, accessible built environment on the farm is another way to promote long-term participation for farmers. Principles of Universal Design benefit people of all abilities, including aging adults and community members with disabilities (Crews & Zavotka, 2006; Carr et al., 2013; Plouffe & Kalache, 2010). Increased engagement and participation of community members in desired occupations due to more accessibility is also linked to improvements in both health and quality of life (Zur & Laliberte Rudman, 2013). By designing an age-friendly environment, Transplanting Traditions can further address its mission of building healthy communities (Transplanting Traditions, n.d.).

The overarching structure of *Planting Habits* involves the creation of an ergonomics team that will manage the program going forward. We suggest this consist of 1-2 staff members and at least some interested farmers, who will be identified during Grower's School. This is a CDC-recommended method supported by research that can help increase sustainability, acceptability, and buy-in from farmers (Kogi, et al., 2005; NIOSH, 2001, van Eard, et al., 2010). Through participation on this team, farmers, as crucial members, can contribute their wealth of cultural and agricultural knowledge, ensuring these are considered throughout implementation and traditional practices are not compromised (Fathallah, 2010). Through this process, some farmers will also become "experts" on ergonomic strategies and can support integration of these strategies with current practices by other farmers. Lastly, the farmers, as experts on their own bodies and the farming process, can continue to bring new physical challenges to the team to be addressed. With that knowledge and the included resources, staff and farmers combined can troubleshoot these issues and identify new strategies to address them.

## Program Plan

The plan will be implemented in 4 stages and will take approximately 2 years to implement.

- Stage 1: Ergonomics Project Preparation.** This phase can begin this spring and summer (2020) while the farm is at its most active, and involves staff conducting stakeholder interviews with farmers. These interviews will allow staff to determine what aspects of farming processes are actively causing strain and pain for farmers, what aspects of processes farmers may be amenable to changing, and what already present injuries may qualify farmers (and the farm as a whole) for funding sources that may provide ergonomic equipment. Information about these funding sources together with possible areas for change we have identified will be outlined below, but further discussion with farmers is needed. During this time, staff should also educate themselves on possible ergonomic strategies that might be implemented at the farm using resources provided. At the end of this phase, staff may begin to apply for funding sources below in order to fund subsequent stages.
- Stage 2: Ergonomics Project Initiation.** This phase will begin next winter (2020 - 2021) while Grower's School is in session and involves educating farmers about ergonomic strategies and tools, along with initiating their use on the farm. During this time, ergonomic equipment may also be crafted and purchased so that it may be utilized as new strategies are trialed. Strategies and equipment should continue to be trialed through spring and summer of 2021.
- Stage 3: Ergonomics Project Management.** This phase should begin during Fall 2021 and involves the creation of a participatory ergonomics team of farmers and staff to address ongoing physical challenges.
- Stage 4: Creating Age-Friendly Accessible Space.** This stage is listed last as it may be completed outside of the timeline of the first 3 steps. However, it should be initiated **within the next 3 months** so that construction of the winterized barn may take information learned about accessibility into account.

### **Stage 1: Ergonomics Project Preparation.**

Action Item	Details	Person Responsible	Expected Timeline
Conduct stakeholder interviews with farmers	<ul style="list-style-type: none"> <li>Based on our observations and limited interviews, we have identified the following activities that may be causing strain or pain:               <ul style="list-style-type: none"> <li>Washing vegetables before packing</li> <li>Carrying and reorganizing heavy boxes during packing and CSA process</li> <li>Stooping over tables during packing and farmers' market</li> <li>Kneeling, squatting, or stooping</li> </ul> </li> </ul>	Betsy and/or Moo Kho	September 2020

	<ul style="list-style-type: none"> <li>○ while weeding, picking, and planting</li> <li>○ Carrying and/or transporting heavy loads around farm</li> <li>● Interview farmers (with translation when needed) to find out primary areas of concern. This may occur informally while farming and should not take up too much extra staff time, but is important both so that the most painful or physically stressful activities are addressed first and to increase farmer buy-in by focusing on the areas that matter to them most.</li> <li>● Interviewers should ask farmers <ul style="list-style-type: none"> <li>○ If they experience pain or strain during each of these activities</li> <li>○ If there are any other activities that hurt or are especially tiring for their bodies</li> <li>○ If any of these activities feels “good” and what they do to make it feel good</li> <li>○ What activities they would prioritize changing/what hurts the most</li> </ul> </li> <li>● Because AgrAbility can connect TTCF to funding sources if farmers have or develop any disabling conditions, interviewers should also survey farmers to ask:</li> <li>● a) Do you have any of the following disabling conditions? <ul style="list-style-type: none"> <li>○ Arthritis</li> <li>○ Impairments of the back, vision, hearing, or respiratory system</li> </ul> </li> <li>● b) Please let staff know if you ever develop any of these conditions or get any of these injuries, as you may qualify for certain funding. <ul style="list-style-type: none"> <li>○ Arthritis</li> <li>○ Impairments of the back, vision, hearing, or respiratory system</li> <li>○ Injuries to the spinal cord, brain or head</li> <li>○ Amputations</li> <li>○ <i>Conditions include but are not limited to these</i></li> </ul> </li> </ul> <p><a href="http://www.agrability.org/about/program/">http://www.agrability.org/about/program/</a></p>		
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<p>Staff conduct self-education on ergonomic strategies and tools using provided resources</p>	<ul style="list-style-type: none"> <li>● Review included resources about ergonomic strategies and equipment</li> <li>● Consider what strategies may fit best within your program, and which strategies may be most helpful given the challenges frequently identified by the farmers during stakeholder interviews</li> <li>● Make a plan to use included resources to teach identified strategies during Grower's School</li> </ul>	<p>Betsy</p>	<p>By start of Grower's School</p>
<p>Apply for funding for ergonomic equipment (and for construction/physical accessibility changes)</p>	<p>Use the above information to apply for the following grants:</p> <ul style="list-style-type: none"> <li>● Walmart Local Community Grants (\$250-\$5000)</li> <li>● Duke Energy Powerful Communities Local Impact Grant (&lt;\$5000)</li> <li>● Orange County Department on Aging (OCDOA) <ul style="list-style-type: none"> <li>○ Funds AT for older adults &amp; possible connections to other relevant private grants</li> </ul> </li> <li>● Carol Woods (No formal grants, but history of nonprofit donations)</li> <li>● Carolina Farm Credit (up to \$5000/year per org)</li> <li>● Farmers Market Promotion Program (FMPP)</li> <li>● Strowd Roses, Inc. (\$5k-\$10k)</li> <li>● Wells Fargo</li> <li>● Lovett Foundation (\$2700 avg)</li> <li>● AgrAbility: offers connections to state/federal grants if farmers develop any health conditions</li> <li>● Lowe's: Community Partners Grant Program (\$10k-\$25k) and Small Grants Program</li> </ul>	<p>Kelly and Elly</p>	<p>Varies according to timelines of the different grants and loans</p>

*A note on the grants: (More detail provided in Appendix A)*

- Lowe's Community Partners Grant Program specifically mentions that it can be used for "building renovations and upgrades" and "grounds improvements." So, this may include construction of hoop houses, winterized barn, and physical accessibility improvements.
- Other grants appear more likely to apply to ergonomic equipment, but many sources do not specify how funds can be allocated; rather, they name areas that they are likely to fund, such as, "QOL and agriculture in rural NC, community and economic development, and causes related to seniors, immigrants, and the environment."

**Stage 2: Ergonomics Project Initiation.**

Action Item	Details	Person Responsible	Expected Timeline
Staff educates farmers on ergonomic strategies and tools	PowerPoint slides on ergonomic farming strategies will be integrated into the Grower's School curriculum and taught to the farmers. The material will be marketed as a means of encouraging the longevity of farming to increase participant buy-in.	Betsy and Moo Kho	Winter 2020-2021
Ergonomics team created by the farmers and staff	<p>The farmers and staff will create an ergonomics team based on those interested after Grower's School. Some of the ergonomic equipment will be made available for use by the ergonomics team which will serve as an incentive for those considering membership.</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> <li>- Ensuring ergonomic practices on the farm and addressing ongoing physical challenges that arise</li> <li>- Determine the frequency with which meetings should occur and whether they will provide hands-on workshops on ergonomic strategies &amp; equipment</li> <li>- May also wish to lead stretches demonstrated in the Ergonomics Strategies PowerPoint/curriculum as an opportunity to build community buy-in. This could happen at whatever point deemed appropriate (i.e. if a group of farmers arrives or leaves at the same time).</li> </ul>	Farmers and staff	Winter 2020
Staff or ergonomics team prints, laminates and hangs visual reminders of ergonomic strategies	Print pictures from the Ergonomic Strategies PowerPoint used for Grower's School to provide visual reminders of ergonomic body positioning and stretches to counteract strain. Hang up in the central space, hoop houses, winterized barn, etc.	Betsy and Moo Kho; ergonomics team	Winter 2020-2021
Ergonomic tools are distributed	The provided funding sources will be contacted and utilized to purchase ergonomic tools and materials for the ergonomics team's use and for farmers to try them out. Some materials will also be purchased for communal use (i.e.	Betsy and Moo Kho or farmers; ergonomics team	Before planting season (late winter 2021, early



	mesh bags to be kept at wash stations). Staff may also use funds to purchase ergonomic tools and sell them to farmers at a discounted rate once the farmers have tried the farm's tools (the farm does this often with other farming materials). For shared ergonomic tools, staff may wish to organize them into labeled boxes to streamline equipment storage.		spring 2021)
The farmers incorporate new ergonomic strategies and tools into farming	Staff and ergonomics team will work with farmers to incorporate learned material into farming practices by demonstrating proper usage of tools and body mechanics. Staff and/or ergonomics lead will teach 3 hands-on workshops on the farm, and farmers will be required to attend at least 1 workshop. Workshop leaders will enlist a teach-back strategy to ensure understanding of new techniques and equipment. The ergonomic strategies and tools will become a part of the farmers' habits.	Betsy and Moo Kho; ergonomics team	Early spring 2021

**Stage 3: Ergonomics Project Management.**

Action Item	Details	Person Responsible	Expected Timeline
Staff members and ergonomics team check in with farmers to ensure ergonomic practices	The ergonomics team and/or staff will ensure the continuation of ergonomic strategies by completing observations and answering farmers' questions. This role will not be time-consuming and can be completed 3x the first week of implementation, 2x the second week, and so on until the staff member(s) see ergonomic strategies performed correctly and habitually.	Designated staff member(s); ergonomics team	Early spring 2021

**Stage 4: Creating Age-Friendly Accessible Space.**

Action Item	Details	Person Responsible	Expected Timeline
<p>Partner with OCDOA (Orange County Department on Aging)</p>	<p>Contact OCDOA via email to seek their interest in a partnership with the goal of making the farm age-friendly. Schedule a meeting to discuss the history of the farm, future goals, and the benefit of making the space age-friendly. Also mention how there is a space being constructed (the winterized barn) that can be an intentional space designed for age-friendliness.</p> <p>Reach out to OCDOA staff (contact info below) to discuss partnership and set up meetings. In initial email, point out your common goals and perhaps include some background on the farm:</p> <p><i>Sample email draft:</i></p> <p>“Both OCDOA and the Transplanting Traditions Farm share a common goal of increasing physical accessibility for aging populations. Our farmers hope to continue to farm into their older adult years, and to enable that, we need to begin now to provide them with ergonomic tools and physically accessible spaces to promote participation in farming well into their later years. Working together would be an opportunity for the OCDOA to help make T.T. age-friendly, both for aging farmers and older community members. Would you be willing to consult and collaborate with us about how to make our space more age-friendly?”</p> <p>Also discuss the possibility of funding ergonomic equipment or any resources OCDOA has that might aid purchasing ergonomic/adaptive equipment.</p> <p><i>Contacts:</i></p> <ul style="list-style-type: none"> <li>● <b>Janice Tyler</b> - director of OCDOA jtyler@orangecountync.gov &lt;<a href="mailto:jtyler@orangecountync.gov">jtyler@orangecountync.gov</a>&gt;;</li> </ul>	<p>Staff</p>	<p>Within the next 3 months</p>




	<ul style="list-style-type: none"> <li>● <b>Susan Clifford</b> - Social Worker in health dept of Orange County runs refugee and immigrant health coalition (won't do accessibility, but health services)</li> <li>● <b>Myra Austin</b> - representative to the refugee organization - contact her before Janice. maustin@orangecountync.gov &lt;<a href="mailto:maustin@orangecountync.gov">maustin@orangecountync.gov</a>&gt;</li> <li>● <b>Marie Dagger</b> (OT at OCDOA)</li> <li>● May copy OT <b>Ryan Lavalley</b> on emails &lt;<a href="mailto:rlava@email.unc.edu">rlava@email.unc.edu</a>&gt; (professor of UNC OT students and employee of OCDOA)</li> </ul>		
Construct age-friendly winterized barn	Using the resources and expertise from the partnership with OCDOA, design and construct an age-friendly winterized barn that will allow people of all ages to participate.	Staff, OCDOA	
Construct additional hoop houses (specifically requested by farmers)	Using the resources and expertise from the partnership with OCDOA, purchase needed materials to construct additional hoop houses, which provide many ergonomic benefits to farmers that promote longevity of participation for aging farmers (such as temperature-controlled spaces)	Staff, OCDOA	
Contact organizations for additional funding needs	Contact organizations (list provided by our group) for additional funding needs and qualifications.	Staff, various organizations	

### Budget and Materials Needed

\*Based on our conversations with organization staff, the items below are for the farm to invest in for communal use. They may be used by the ergonomics team and trialed by farmers. This list does not include enough materials for all farmers to use long-term or to own personally, based on the organization's policy that such items be purchased from Transplanting Traditions by the farmers. However, some items (i.e. mesh bags) may be used communally long-term.

Ergonomic Equipment					
Item	Description	Picture	Cost per Item	Qty	Item total
Ergonomic Kneeler/Seat	Reduces knee and back pain caused by long-term kneeling on the ground and facilitates standing from kneeling. Can be adjusted to both kneeling and seat height		<a href="#"><u>\$39.99</u></a>	4	\$159.96
Knee Pads	Reduces knee pain from kneeling		<a href="#"><u>\$12.49</u></a>	9	\$112.41
Mesh Net Bags	Optimizes produce washing by reducing back pain from frequent bending; less chance of leaf crushing, and less time with hands in cold water		<a href="#"><u>\$3.99</u></a>	6	\$23.94

<p>Foam Pipe Insulation</p>	<p>For making built-up handles on garden tools (supports ergonomic grip and reduces strain on hands)</p> <p>(Adaptation instructions: <a href="https://wimastergardener.org/2016/03/16/big-handles-for-comfortable-grips/">https://wimastergardener.org/2016/03/16/big-handles-for-comfortable-grips/</a>)</p>		<p><a href="#">\$2.27</a> for 6 ft of piping</p>	<p>1</p>	<p>\$2.27</p>
<p>Duct Tape</p>	<p>For securing foam pipe insulation when making built-up handles on garden tools</p>		<p><a href="#">\$4.99</a></p>	<p>1</p>	<p>\$4.99</p>
<p>Silicone Grip Wrap ("Tommy Tape")</p>	<p>Silicone grip wrap for built-up handles</p>		<p><a href="#">\$9.99</a> for 60 in.</p>	<p>1 roll</p>	<p>\$9.99</p>
<p>Compression Wrap/Athletic Tape</p>	<p>Alternative option to Silicone Grip Wrap. Both compression wrap and silicone grip are included to trial and choose based on farmer preference</p>		<p><a href="#">\$10.95</a> for 6 pack</p>	<p>1</p>	<p>\$10.95</p>
<p>Adjustable high folding table--1</p>	<p>For use during farmers' market and packing to adjust work-load to appropriate height and to avoid stooping--adjusts to recommended height for heavy and light work</p>		<p><a href="#">\$152.61</a></p>	<p>1</p>	<p>\$152.61</p>

Adjustable folding table-2	Smaller budget option 2nd table for farmers market/CSA shares. Still adjusts higher to reduce stooping but does not meet CDC guidelines for recommended workstation height for men		<a href="#">\$39.98</a>	1	\$39.98
<a href="#">Long-handled tools</a> (e.g. "Narrow Collinear Hoe")	Broadforks, forks and spades, hoes, rakes, seed bed rollers, tillers, tithers, weeders and cultivators and wheel hoes all come with long handles so that the farmer can stand up straight and avoid stooping  Narrow Collinear Hoe for weeding while standing up is included as an example	 	Prices vary with avg costs between \$45-65  Narrow Collinear Hoe is <a href="#">\$47.84</a>	2 to trial	Approx \$100.00

**Total Ergonomic Equipment Materials Cost: \$617.10**

**Other Materials & Educational Costs**

Item	Description	Cost
Laptop and Projector for teaching ergonomic strategies	To use during Grower's School to teach farmers about ergonomic techniques	\$0--already have
Printed Color Signs	To label equipment and to post reminders for farmers to remember ergonomic strategies.	<a href="#">\$11.51 for 10 printed color pages</a>
Contact Paper	To laminate/weatherproof signs	<a href="#">\$3.49</a>
Rent Cost of Grower's School Space	For 1 week	\$0.00

**Total Other Materials Cost: \$15.00**

Personnel & Indirect/Overhead		
Item	Description	Hours
Betsy's time	-Interviews -Self-education and planning -Grower's School -Ergonomics Team Creation & Meetings -Follow-Up/Hands On Workshops -Purchasing, making, and distributing - ergonomic materials and signs -Attending meetings with OCDOA	35 hrs (2% FTE)
Moo Kho's time	Participating in all of the above and translating when needed	35 hrs (3% PTE)
Administration & Grant Writing (Elly & Kelly's Time)	-Grant Writing (involves applying for at least 4-5 grants @ 6-8 hrs/grant) -Forming partnership with the OCDOA (emails and meetings)	55 hrs total (About 1-2% FTE x 2)
Indirect/Overhead	15% of total cost (inflated to include staff costs, based on organization's request)	\$94.86
<b>Total Personnel &amp; Indirect/Overhead Cost: 125 hrs + \$94.86</b>		

**Total Cost: \$726.96 + 125 hrs of staff time**

\*\*Cost of making accessibility changes to physical space is still unknown and will be based on future consultation/partnerships.

## Program Evaluation Plan

Outcomes & Impacts	Indicator(s)	Source of Data	Method of Data Collection	When Data will be Collected	Person Responsible for Collecting Data
1. Decreased pain and strain for farmers	Improved Wong-Baker pain scale scores; Improved Survey scores	Farmers' answers to Survey questions 1-3 (below)	Verbally administered survey w/ translation	Qs 1-2 at beginning of Grower's School class, Qs 1-3 at 1 week, 6 months, and 1 year post Grower's School class	Betsy, Moo Kho, & Ergonomics Team
2. Increased farmer knowledge of ergonomic strategies & tools	Farmers can correctly demonstrate ergonomic farming practices.	Staff observation of hands-on "learning check"  Ergonomics team observation during farming	Observation and "Learning Checks"	At the end of the Grower's School ergonomic farming class; after each hands-on follow-up workshop; 6 months & 1 year post Grower's School class	Betsy (@ Grower's School and workshops)  Ergonomics Team (6 months & 1 year post)
3. Increased (and efficient) use of ergonomic strategies and tools	Farmers regularly incorporate ergonomic practices into farming routines; Improved survey scores	Farmers' answers to survey questions #4-6 below	Verbally administered survey with translation and staff documentation	1 week, 6 months, and 1 year post Grower's School class	Betsy & Moo Kho (@ Grower's School)  Ergonomics Team (Post Grower's School)
4. Increased relationship and partnership with OCDOA	At least one meeting is held with OCDOA.  At least two ways are	Emails; meetings & conversations	Staff observation	Within the next 3 months	Staff administration (Elly, Kelly) or Betsy



	<p>identified that OCDOA can support TTCF in supporting aging farmers.</p> <p>Potential funding sources through OCDOA are identified and applied for.</p> <p>Supports and funding sources are followed up on and ultimately completed</p>				
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**“Pre-Test” Sample Survey Sheet**

1. When I'm farming, my body hurts:

Wong-Baker FACES Pain Rating Scale



From Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: Wong's Essentials of Pediatric Nursing, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby, Inc. Reprinted by permission.

2. In general, over the last week, my body has hurt:

Wong-Baker FACES Pain Rating Scale



From Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: Wong's Essentials of Pediatric Nursing, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby, Inc. Reprinted by permission.

## **“Post-Test” Sample Survey Sheet**

1. When I'm farming, my body hurts:

### Wong-Baker FACES Pain Rating Scale



From Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: Wong's Essentials of Pediatric Nursing, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby, Inc. Reprinted by permission.

2. In general, over the last week, my body has hurt:

### Wong-Baker FACES Pain Rating Scale



From Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: Wong's Essentials of Pediatric Nursing, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby, Inc. Reprinted by permission.

3. The ergonomic strategies are making farming easier on my body (Strongly disagree, disagree, neutral, agree, strongly agree).
4. I am able to farm 1) less well than I used to, 2) as well as I used to, 3) better than I used to.
5. I use the strategies (ergonomic equipment or body mechanics) I used in Grower's School/see in the pictures posted (Never, Rarely, Sometimes, Often, All the time)
6. I can work as quickly and efficiently as I used to with the new strategies and equipment (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree).

## Conclusion

As stated above, farming can often be a source of musculoskeletal pain, which can limit farmers' ability to farm as long as they might prefer (NIOSH, 2001). To demonstrate this, a staff member mentioned during our tour that farming is "bad for the body, but good for the soul." The *Planting Habits* Ergonomics Initiative has the potential to reduce farmers' risk of chronic strain and create a space that is accessible for the entire Transplanting Traditions Community. In doing this, farmers may participate as long as they wish in a practice that is good for both the soul AND the body.

# Appendix A: Potential Funding Sources

## Private Grants

### **Walmart Local Community Grants**

- Awarded grants range from \$250-\$5,000 per grant
- Organizations holding a current tax-exempt status under Section 501(c)(3) are eligible
- Program must directly benefit the communities within the service area of the Walmart or Sam's Club facility (which it does)
- There are 8 areas of funding for which an organization can apply. This program aligns most with three areas:
  - "Quality of Life", which includes Improving access to cultural experiences for low income individuals in the community
  - "Education", which includes vocational training for low income individuals in the community
  - Community and Economic Development.
- **Application deadline is Dec 31st, 2020; applications may be submitted at any time during the funding cycle**
- More details can be found at: <https://walmart.org/how-we-give/local-community-grants>

### **Duke Energy Powerful Communities: Local Impact Grant**

- Grants of <\$5,000 to support local strategic impact opportunities in areas served by Duke Energy
- **Deadline: Local Impact grant applications may be submitted at any time, but Workforce Development grant applications are due April 30th** (maybe a possibility next year).
- More details can be found at: <https://www.duke-energy.com/community/duke-energy-foundation/funding-guidelines>

### **Orange County Department on Aging (OCDOA):**

- OCDOA has some funds available to purchase assistive technology for older adults (over 60) in orange county.
- Since this program looks a little different than what they usually fund, this would need to be a conversation with Kim, Marie, & Janice (contact info above) to find out what might be feasible
- Marie (the OT at OCDOA) may also have ideas of other private organizations focused on aging that may be excited to support this kind of project.

### **Carol Woods:**

- Carol Woods donates regularly to community nonprofits. Their focus is on improving the lives of older adults in the community. They do not appear to publicize a formal grant application process, but based on their stated values and resources, they may be a valuable partner.

- To read more about their community involvement and giving: <https://www.carolwoods.org/community-outreach-volunteering>
- Contact information: <https://www.carolwoods.org/contact-carol-woods-retirement-community>

### **Carolina Farm Credit:**

- Carolina Farm Credit supports organizations with grants of up to \$5,000 (per organization per year on an application-based system) to help in their endeavors and to further the future of agriculture in our region of North Carolina.
- The Fund has two main objectives: to invest in the future of agriculture and to enhance and improve the quality of life in rural North Carolina. To be considered for funding, organizations' values and purpose must align with the Fund's mission.
- Grants will be considered for programs only in the 54 counties and geographic areas where Carolina Farm Credit conducts business. TTCF should be able to apply under Orange County.
- **Deadline to apply: June 30, 2020**
- <https://carolinafarmcredit.com/about/community-support/corporate-mission-fund>

### **Farmers Market Promotion Program (FMPP)**

- Funds projects that develop, coordinate and expand direct producer-to-consumer markets to help increase access to and availability of locally and regionally produced agricultural products by developing, coordinating, expanding, and providing outreach, training, and technical assistance to domestic farmers markets, roadside stands, community-supported agriculture programs, agritourism activities, online sales or other direct producer-to-consumer (including direct producer-to-retail, direct producer-to-restaurant and direct producer-to-institutional marketing) market opportunities. A 25% match is required.
- All applicants must be domestic entities owned, operated and located in the U.S. Nonprofits, agricultural businesses and cooperatives, Community Supported Agriculture (CSA) networks and associations, and Food Councils are eligible, among others.
- **Deadline to apply: May 26, 2020** at 11:59 p.m. Eastern time.
- AMS will be hosting webinars for applicants. For dates and registration instructions, visit our webinars page.
- <https://www.ams.usda.gov/services/grants/fmpp>

### **Strowd Roses, Inc.**

- Makes grants to qualified tax-exempt organizations based in Chapel Hill or Carrboro or devoted primarily to benefiting the citizens of those communities.
- Past grants have gone to organizations related to seniors, immigrants and the environment, among others. It has a connection to gardening, as it was critical to funding the Carolina Campus Community Garden.

- As a rule, grants will be made for one year only and will not exceed \$10,000. The median grant size awarded is \$5,000.
- **To be considered in June, deadline is April 30; to be considered in November, deadline is September 30.**
- <http://www.stowdroses.org/>
- See: <http://www.stowdroses.org/portfolio/grant-guidelines-and-procedures/>

### **Lowe's Companies, Inc.**

- Lowe's Community Partners Grant Program: Grants range from \$2,000 to \$100,000, with most projects falling between \$10,000 and \$25,000. Through this program, funding helps build better communities by providing monetary assistance to non-profit organizations and municipalities looking for support of high-need projects such as: **building renovations/upgrades** (*potential funding for the winterized barn and hoop houses*) **grounds improvements** (*potential funding for physical accessibility improvements*), technology upgrades and safety improvements.
- Small Grants Program: The small grants program is an outlet for organizations seeking smaller-scale assistance for non-educational focused projects.
- Eligibility Details: The Foundation funds to 501(c) (3) tax-exempt nonprofit organizations, including local municipalities and K-12 public/charter schools in communities where Lowe's operates stores and distribution centers.
- **Deadline Details**: Lowes has revised its grantmaking approach and no longer has an open application process. **Applications are now accepted by invitation only. Interested applicants should approach their local store to initiate the grant-seeking process.**
- <http://www.communitydevelopmentgrants.info/GrantDetails.aspx?gid=16792>

### **Wells Fargo**

- Supports nonprofits that keep communities strong, diverse and vibrant. Local grants focused on 3 areas seen as critical for economic advancement: small business growth, financial health & housing but also programs in human services, environment & workforce development.
- Suzie Koonce, [suzie.koonce@wellsfargo.com](mailto:suzie.koonce@wellsfargo.com) (local contact person)
- <https://www.wellsfargo.com/about/corporate-responsibility/community-giving/grant-process/>

### **Lovett Foundation**

- Addresses the environment, among other areas (that are less relevant to TTCF).
- Average grant is \$2700.

- Applications must be received via First Class United States Mail ONLY **between May 1 and August 1**. Grants will be made by November 1. The more specific, clear, and concise you can be, the better chance your application has.
- <http://lovettfoundation.org/apply.html>
- <http://lovettfoundation.org/assets/lovettfoundationgrant.pdf>

### **Federal Grants (slight or future possibilities)**

- **Rural Business Development Grant Program (RBDG):**
  - Can apply again in 2022
- **Outreach and Assistance for Socially Disadvantaged and Veteran Farmers and Ranchers (Section 2501) (Federal grant)**
  - *Elly will look into this grant, but it is unlikely that TTCF will be eligible given all the stipulations of federal grants.*
  - <https://sustainableagriculture.net/publications/grassrootsguide/farming-opportunities/socially-disadvantaged-farmers-program/>
- **AgrAbility:**
  - Some federal/state grants apply specifically to farmers who have long-term health conditions. If any TTCF farmers go on to develop any of these conditions, they may qualify for specific funding sources.
  - AgrAbility can connect TTCF with potential funding sources such as the state Office of Vocational Rehabilitation, assistive technology foundations, and other outside funding sources for equipment and modification needs.
  - Grants apply to conditions included but not limited to: arthritis; impairments of the back, vision, hearing, or respiratory system; injuries to the spinal cord, brain or head; and amputations.
  - <http://www.ncagrability.org/our-services/resources/>.



## Appendix B: Ergonomic Resources

References are included slide-by-slide in the speaker notes of the Ergonomic Farming Strategies Curriculum powerpoint, but listed below are a few of the especially robust resources that staff may wish to delve into in greater detail. Presenters of the curriculum are of course welcome to modify the curriculum according to their needs.

National Institute for Occupational Safety and Health. (2001). Simple solutions: Ergonomics for farm workers (S. Baron, C. F. Estill, A. Steege, & N. Lalich, Eds.). *CDC*.  
<https://www.cdc.gov/niosh/docs/2001-111/pdfs/2001-111.pdf>

Niu, S. & Kogi, K. Ergonomic checkpoints in agriculture (2nd ed). *International Labour Office*.  
[https://www.ilo.org/wcmsp5/groups/public/---ed\\_protect/---protrav/---safework/documents/instructionalmaterial/wcms\\_176923.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/instructionalmaterial/wcms_176923.pdf)

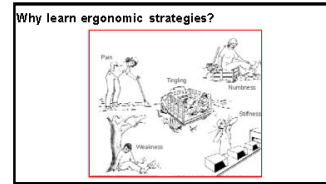
Saenz, S., Liebman, A., & Earle-Richardson, G. *Migrant Clinicians Network*.  
[http://farmworkercliniciansmanual.com/wp-content/uploads/2012/05/Cuidate\\_English.pdf](http://farmworkercliniciansmanual.com/wp-content/uploads/2012/05/Cuidate_English.pdf)

# Appendix C: Ergonomic Strategies Curriculum PowerPoint slides



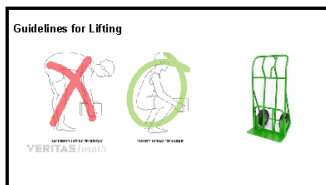
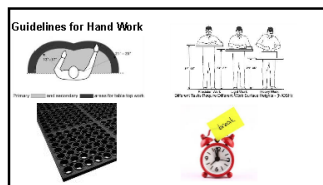
**What is "Ergonomics"?**

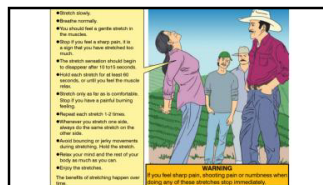
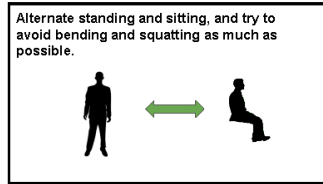
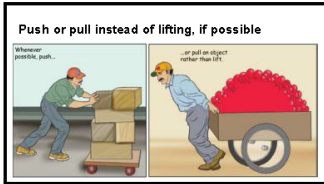
- Ergonomics is about preventing injury by having strategies and proper equipment to move your body in healthy ways.
- It wants to fix factors that can lead to injury, like:
  - Repetitive movements
  - Applying too much force
  - Awkward postures/staying in the same posture for too long
  - Poorly designed tool handles
  - Strong vibration of power equipment
  - Heavy loads
  - Extreme temperatures

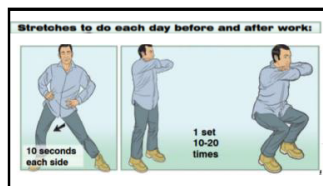
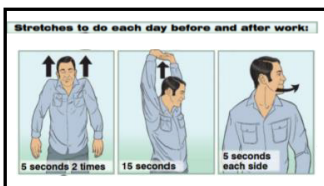
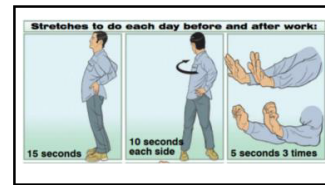
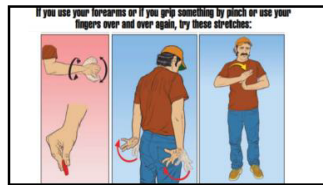
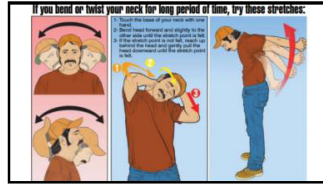
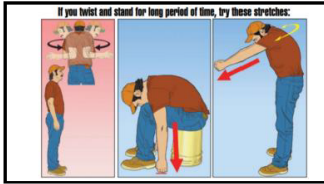


**Why learn ergonomic strategies?**

Ergonomics can prevent these problems, allowing you to farm longer!







## Appendix D: References

- Carr, K., Weir, P. L., Azar, D., & Azar, N. R. (2013). Universal Design: A Step toward Successful Aging. *Journal of Aging Research*, 2013, 324624. <https://doi.org/10.1155/2013/324624>
- Chapman, L., & Meyers, J.M. (2001). Ergonomics and musculoskeletal injuries in agriculture. *National ag safety database*. Retrieved from: <https://nasdonline.org/1830/d001771/ergonomics-and-musculoskeletal-injuries-in-agriculture-recognizing-and.html>
- Crews, D. E., & Zavotka, S. (2006). Aging, disability, and frailty: implications for universal design. *Journal of Physiological Anthropology*, 25(1), 113–118. <https://doi.org/10.2114/jpa2.25.113>
- Fathallah, F.A. (2010). Musculoskeletal disorders in labor-intensive agriculture. *Applied Ergonomics*, 41. 738-743. doi:10.1016/j.apergo.2010.03.003
- Guo, H.R., Tanaka, S., Halperin, W., & Cameron, L.L. (Division of Surveillance, Hazard Evaluations and Field Studies, NIOSH) (1999). Back pain prevalence in US industry and estimates of lost workdays. *American Journal of Public Health*, 89(7), 1029-1035. <https://doi-org.libproxy.lib.unc.edu/10.2105/AJPH.89.7.102>
- Kogi, K., Kawakami, T., Ujita, Y., & Khai, T.T. (2005). Roles of farmer trainers for participatory ergonomics in agriculture. *Journal of the Ergonomics Society of South Africa*, 17(2), 4 - 11
- McKnight, J. & Kretzmann, J. (2012). Mapping community capacity. In M. Minkler (Ed.) *Community organizing and community building for health* (3rd ed.) (pp. 171-186). New Brunswick, NJ: Rutgers University Press.
- National Institute for Occupational Safety and Health (NIOSH) (2001). Simple solutions: Ergonomics for farm workers (S. Baron, C. F. Estill, A. Steege, & N. Lalich, Eds.). CDC. <https://www.cdc.gov/niosh/docs/2001-111/pdfs/2001-111.pdf>
- Plouffe, L., & Kalache, A. (2010). Towards global age-friendly cities: determining urban features that promote active aging. *Journal of Urban Health*, 87(5), 733–739. <https://doi.org/10.1007/s11524-010-9466-0>
- Transplanting Traditions. (n.d.). *Transplanting Traditions Community Farm*. Transplanting Traditions Community Farm: Connecting Cultures Through Farming. Retrieved April 1, 2020, from <https://www.transplantingtraditions.org>

Van Eard, D., Cole, D., Irvin, E., Mahood, Q, Keown, K...& Cullen, K. (2010). Process and implementation of participatory ergonomic interventions: A systematic review. *Ergonomics*, 53(10), 1153-1166, DOI: [10.1080/00140139.2010.513452](https://doi.org/10.1080/00140139.2010.513452)

Zur, B., & Laliberte Rudman, D. (2013). WHO Age Friendly Cities: Enacting Societal Transformation through Enabling Occupation. *Journal of Occupational Science*, 20(4), 370–381. <https://doi.org/10.1080/14427591.2013.805456>