



Assistive Technologies to Improve Safety & Accessibility on Small Scale Diversified Vegetable Farms & Home Gardens

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AgrAbility Virginia

AgrAbility Virginia promotes safety, wellness, and accessibility on the farm through education, rehabilitative services, and assistive technology. AgrAbility Virginia offers services to farmers at no cost, supports a wide diversity of farmers and farmworkers across all farming communities, and addresses a wide variety of disabling conditions in agriculture. To learn more, you can visit our website by going to www.agrabilityvirginia.org.

Assistive Technologies for Increasing Accessibility & Safety While Farming & Gardening

Assistive technologies are used to improve accessibility and enhance independence. Recommending assistive technology is one way that AgrAbility Virginia supports farmers. Our recommendations can include a lift for a tractor or an added handrail or step to improve access, or a small modification on an existing tool such as adding a horizontal handle to a shovel for better grip strength. Assistive technologies can be highly technological like a robotic glove to help with grip strength or 'low tech' like the utility cart listed below.

The assistive technologies included in this guide are meant to aid people who want to improve safety and accessibility on a small-scale diversified vegetable operation or in a home garden. Conditions such as arthritis, stroke, heart disease, or other illness or

injury can diminish safety on the farm and make access difficult. We have created this infographic to supply resources for people with all types of illness and injury that impact mobility to help aid in making their daily farming activities easier and safer while increasing their overall independence.* The following examples are all readily accessible, either by making them at home (e.g., in the case of the raised keyhole garden beds) or by ordering online. A quick online search will lead you to an array of manufacturers for most of the items listed on the following pages. The examples below are only a starting point. The AgrAbility Virginia program is eager to discuss these and other options in depth to see if they are right for you.

Garden Bed Design

There are many ways to make garden beds more accessible. Here are a few examples:

Raised Keyhole Garden Beds

Raised garden beds—beds that are raised using lumber or metal siding and filled with dirt—decrease back strain and make gardening more accessible and manageable. Keyhole garden beds (Figure 1 (Gardeners Supply Company, n.d.)) are designed to make all parts of the garden easily reachable from a single spot. Raised keyhole garden beds combine the attributes of both raised beds and keyhole gardens to make planting, weeding, and harvesting more comfortable and accessible.



Figure 1 Raised Keyhole Garden Bed

Drip Irrigation System

A simple drip irrigation system (Figure 2 (Gardener's Supply Company, n.d.)) can make watering plants a lot easier and more efficient. Drip irrigation targets water where you need it, without having to move sprinklers and hoses. Drip irrigation makes farming or gardening less labor intensive because it only needs to be set in place once per season and once it is installed, all the user needs to do is turn on the water when the soil is dry.



Figure 2 Drip Irrigation System

Planting & Cultivating

On small-scale operations, planting and cultivating is often done in a bent, stooping, or kneeling position. These assistive technologies improve ergonomics and can make farming or gardening less labor-intensive.

Ergonomic Tools

Ergonomic tools either have handle adaptations (Figure 3 (ArthritisSupplies.com, n.d.) or Figure 4 (Amazon, n.d.)) or they are tools that offer options like a long handle (Figure 5 (Wolf-Garten, n.d.)) that offer the user the ability to stand up to do tasks that would normally be done in a stooping or kneeling position.



Figure 3 Ergonomic Hand Tools



Figure 4 Handle Adaptation for Long Handled Tools



Figure 5 Interlocking Long-Handled Tools

Push Seeder

There are many types of push seeders (Figure 6, Johnny's Selected Seeds, n.d.) available. Push seeders reduce the need to bend and stoop while seeding, minimizing strain on the back and discomfort in the knees. Push seeders are adjustable to accommodate different sizes and shapes of seeds and increase accurate seeding while allowing the user to seed beds from a standing position.



Figure 6 Push Seeder

Tilthers & Rotary Cultivators

Tilthers (Figure 7 (Johnny's Selected Seeds, n.d.)) and rotary cultivators (Figure 8 (Lehman's, n.d)) are walk-behind implements used to incorporate amendments and make uniform seedbeds. Both can make cultivating garden beds stand up work with less strain on the back and knees.



Figure 7 Tilther



Figure 8 Hand Rotary Cultivator

Double Wheel Hoe

The double wheel hoe (figure 9 (Johnny's Selected Seeds)) is an ergonomic alternative to a conventional hoe and offers more stability than a single wheeled hoe. This walk-behind push hoe reduces back strain and is useful for those who have difficulty with balance.



Figure 9 Double Wheel Hoe

Wheelbarrows & Carts

Trips across the farm or yard take time and can be exhausting and uncomfortable for those with arthritis or other mobility challenges. It's important to have a wheelbarrow or cart to take the strain off shoulders and back and to minimize fatigue.

Two-Wheeled Wheelbarrow

A wheelbarrow is a rugged and handy tool for the farm and garden but a one-wheeled wheelbarrow can be challenging to move for those with balance difficulties or osteoarthritis. A two-wheeled wheelbarrow (Figure 10 (Tractor Supply, n.d.)) offers greater balance and better ergonomics than its one-wheeled counterpart with a lower center of gravity and less possibility of tipping.



Figure 10 Two-Wheeled Wheelbarrow

Self-Leveling Bucket Cart

Moving five-gallon buckets of water, soil, stones, or other materials puts strain on the shoulders and back and can also be difficult for people with decreased grip strength. A self-leveling bucket cart (Figure 11 (Broll Tools)) offers a solution to more easily move five-gallon buckets of materials over rough terrain without spilling or tipping. This cart reduces strain on the body and allows the user to move heavy buckets with ease. The Broll model also comes with a bag to convert the bucket cart into a wheelbarrow.



Figure 11 Self-Leveling Bucket Cart

Utility Cart

A utility cart (Figure 12 (Gardeners Edge)) can be used for transporting soil, mulch, or stones across the farm or garden. It can also provide frontloading support by removing the front gate and dumping the contents. Reducing the number of trips needed to complete a task can increase endurance and the ability to work more safely. A utility cart also reduces strain on the shoulders, back, and legs by creating a more balanced load.



Figure 12 Utility Cart

Conclusion

The assistive technologies included in this publication are just a few examples of assistive technologies to aid people who want to improve safety and accessibility on a small-scale diversified vegetable operation or in a home garden.

The National AgrAbility Toolbox offers hundreds of examples of assistive technologies for farmers, gardeners, ranchers, and agricultural workers with physical disabilities. Organized by category, this resource contains real-life examples from farmers across the country and showcases products and adaptations that farmers, gardeners, ranchers, and agricultural workers have used to overcome physical challenges. **Visit the National AgrAbility Toolbox here:** <http://www.agrability.org/toolbox/>

Additionally, the AgrAbility Virginia website highlights the work of AgrAbility Virginia, with success stories, information about the team, and resources that the team has developed for farmers, ranchers, gardeners, and agricultural workers. **Visit the AgrAbility Virginia website here:** <https://agrability.alce.vt.edu/>

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