

AgrAbility Harvest

An ingathering of
helpful information
on disability in
agriculture

2015

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Inclusion is a popular word these days. To be *included* essentially means to *belong*. Inclusion can result in a group, organization, or community being richer because of the diversity that its members contribute.

Inclusion is more than a buzzword with AgrAbility – it's at the heart of our mission. AgrAbility's central goal is to make sure that all who want to be are included in agriculture, no matter their physical limitations.

Apart from the obvious emphasis on inclusion of people with disabilities, the vision of AgrAbility encompasses inclusion in other areas. During the past year, the National AgrAbility Project (NAP) and several state and regional AgrAbility projects (SRAPs) have made significant strides in cultivating inclusion and diversity.

Through supplemental USDA funds and a generous gift from the CHS Foundation, the NAP hired a farmer veteran AgrAbility coordinator and a special populations outreach coordinator. (You can read more about them on p. 5). The former is coordinating activities related to veterans with disabilities who are involved or interested in agriculture. This position is co-funded by the Farmer Veteran Coalition (FVC), a close collaborator with the NAP. FVC is also working with several SRAPs to expand services to veterans in their states and establish state branches of FVC.

The special populations outreach coordinator focuses on working with traditionally underserved groups, such as the historically black 1890 and Native American 1994 land-grant institutions and Hispanic/Latino farmworkers. This work has resulted in new networking opportunities for AgrAbility and participation by underserved groups at the AgrAbility National Training Workshop (NTW).

While AgrAbility focuses on agricultural workers in the U.S., we recognize that we increasingly live in a global village. As Secretary of Agriculture Vilsack has pointed out, world food demand is expected to grow by more than 50% between 2005 and 2030. Given that AgrAbility's expertise and resources can benefit agricultural workers around the globe, Project Leader Bill Field has made visits to India, Ireland, Sweden, and Finland during the past year to share the AgrAbility vision and to encourage the development of similar programs in those countries. The www.agrability.org website continues to receive visits from a wide range of nations, making a wealth of resources available with a few mouse clicks.

If you would like to be more "included" in AgrAbility's mission, consider attending the AgrAbility National Training Workshop on April 13-16 in Rochester, NY (see p. 8). It's a great way to network with others around the country, and the world, to develop relationships and discuss important topics relevant to disability in agriculture.



 **AgrAbility**

Cultivating Accessible Agriculture

A Closer Look

PROSTHETICS AND AGRICULTURE: A Marriage of Necessity

Amputations are closely associated with agriculture—so closely, in fact, that one of the most widely used arm prostheses, the Dorrance #7 device, is commonly known as the ‘farmer’s hook.’ According to the National Safety Council, one in ten agricultural workers suffers some type of amputation. The Bureau of Labor Statistics notes that most of these amputations are parts of fingers, but estimates that 5-6% are major amputations, generally a hand, arm, or leg.

Given the dangerous nature of agricultural work, there are numerous potential sources of limb loss. Corn pickers, combines, and balers have taken many hands, arms, and legs over the years. Unguarded PTO shafts are another contributor, as are the augers found on various machines and in grain handling structures. Like the rest of the population, agricultural workers suffer amputations as a result of vehicular collisions, and some combat veterans returning to agriculture have also experienced limb loss.

Resources for agricultural workers with amputations have been available for some time. One of the first technical reports produced by the Breaking New Ground Resource Center was *Prosthetic and Worksite Modifications for Farmers with Upper Extremity Amputations* in 1986. That was followed a decade later by *Farming with a Lower Extremity Amputation*. In 2005, Justin Metcalf completed his thesis on farmers with upper extremity amputations and their use of prostheses and other assistive technology. Also, Mississippi AgrAbility produced a video on farming after an amputation.

NUPOC’s Prosthetics Study

Recently, staff at the Northwestern University Prosthetics-Orthotics Center (NUPOC) undertook a multi-year study to identify key issues related to



agricultural workers and prostheses. Among those issues: the types of prostheses being used, work activities helped or hindered by prostheses, and problems with components of prostheses.

Study Methodology. An initial step in NUPOC’s research was to interview both agricultural workers with amputations and prosthetists who work with such clientele. These discussions uncovered several recurring themes, such as the durability and cost of prostheses; the importance of the environment in which they’re used; the necessity of “adapting” things, such as routines, attitudes, and equipment; and the prosthetists’ level of knowledge about agriculture and the training they are providing agricultural workers. Based on the interview results, NUPOC developed a survey, which they distributed nationally for more than a year. After excluding invalid responses, 28 were accepted for analysis. These reports represented a variety of amputation types and several kinds of agricultural enterprises.

Study Findings. For both upper and lower extremity amputees, common concerns were the cost of their prostheses and the problem of sweat causing discomfort and lessening performance. It was found that upper extremity amputees mainly used body-powered prostheses, rather than electric ones. Their major problems included not being able to grip tightly or lift enough weight. Those using myoelectric limbs noted problems with the electrical components getting wet. Lower extremity amputees reported difficulty squatting and kneeling, walking through fields with tall plants, and falls due to tripping, slipping, or stepping on an object. It was also noted that a significant percentage of these respondents used utility vehicles (e.g., John Deere Gators) for mobility around the farm or ranch.

Study Recommendations. Based on the findings, the NUPOC researchers concluded that prosthetists need to better familiarize themselves with the agricultural work environment in order to make proper recommendations and provide appropriate education, training, and peer support for their clients. With regard to the design of prostheses, NUPOC emphasized the importance of simplicity, maintainability, durability, and affordability. Such recommendations can benefit not only agricultural workers but also those who work in heavy industry, such as construction and mining. Likewise, for veterans returning from war with amputations, improvements in things like the durability and affordability of prosthetics would also greatly benefit them.

Other help for farmers and ranchers with amputations comes from companies like Texas Assistive Devices, which produces specialized tools for prostheses. Its N-Abler wrist unit can accommodate a variety of tools for daily living and working, such as eating utensils, mechanic tools, and sporting equipment.

Recently, a student team from Northeastern University in Boston developed the Farm Arm, a prosthetic adapter that allows agricultural workers with amputations to shift tractor levers more easily.

Significant changes have been made in agricultural equipment to improve safety, but agricultural production remains one of the most dangerous industries. Thus, it is not likely that amputations in agriculture will cease in the near future. Organizations like AgrAbility, NUPOC, and Texas Assistive Devices must continue to look for innovative ways to ensure that amputations do not equate to the end of a career in agriculture.



Farm Arm
www.thefarmarm.org



N-Abler wrist unit
www.n-abler.org

A Tribute to Dr. Dudley Childress

On August 6, 2014, Dr. Dudley Childress passed away after a long illness. While perhaps most AgrAbility staff will not recognize the name, nevertheless tens of thousands of farmers and farm workers around the globe have benefitted from his research in the field of prosthetics and orthotics. For four decades, he

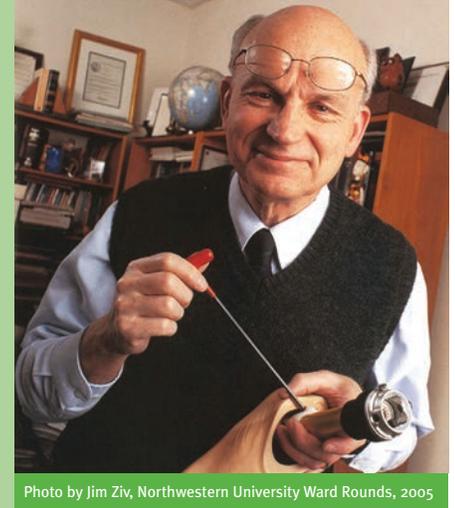


Photo by Jim Ziv, Northwestern University Ward Rounds, 2005

was a key figure in rehabilitation engineering, including development of myoelectric control for prostheses and design and commercial production of the sip-and-puff wheelchair controller for persons with high-level quadriplegia. His research on prosthetic feet led to the Shape-and-Roll Foot, which is a simple, yet highly functional device for use in low-income countries.

Almost everyone who has lost a foot, hand, or arm due to a farm-related injury has directly or indirectly benefitted from Dudley's commitment to enhancing the quality of life of individuals through the use of assistive technology. In one of our conversations, he told me that he would have loved to have been a farmer and grow things. He mentioned that he had converted an abandoned railroad right-of-way into a garden patch and shared the produce with friends and neighbors.

Through the many students he mentored over the years, he will continue to have an impact on the lives of people seeking to live independently. Thank you, Dudley, for living your life well and in service to others.

Bill Field, NAP project director

Super-Duty Wheelchairs

Included in The Toolbox Assistive Technology Database (www.agrability.org/toolbox) are five rugged, outdoor-mobility wheelchairs that have been designed to navigate safely over rugged terrain under most any conditions for work or recreation. Three of them are track-driven, two are wheel-driven.



The joystick-operated **Action TrackChair** runs off two 12-volt batteries that feed its 24:1-ratio high-thrust motor. It reportedly has a 5-mph top speed, an 8-mile range, a zero turning radius, and 200-pound load capacity. Standard features include 23-inch-wide seat with 20° tilt, adjustable foot rest, and six accessory holders. Visit www.actiontrackchair.com.

The balloon-tired **HexHog** is a 6x6 all-wheel-drive chair that is designed to handle extreme terrain. Its 36-volt lithium-ion battery-powered motor reportedly delivers a top speed of 8 1/2 mph and range up to 12 miles. Key to HexHog's agility is its flexible chassis, which is designed to ensure that all the wheels maintain contact with the ground. Visit www.hexhog.com.



Powered by two 12-volt gel batteries that drive its four motors, the **Journeyman Scooter** is designed to climb hills, cover rough terrain, and wade through up to 6 inches of water without danger of hanging up, tipping over, or stalling out. It features front suspension, large tires, rust-resistant aluminum body, and 4-inch ground clearance. Visit www.lifeessentiallifts.com.

The **Ripchair 3.0** is a continuous-track vehicle that one accesses and operates from his/her manual or power wheelchair. Once onboard, its access ramp raises up and locks the chair in place. All the controls for driving and carrying out many other functions are designed to be within easy reach. Visit www.trackchairxtreme.com.



In addition to its outdoor-navigation capabilities (e.g., snow, mud, sand, gravel, grass, even curbs), the joystick-steered **TrackMaster Power Chair** is also designed to be used indoors because of its narrow width (only 29 inches) and its omni-wheel retractable-tracks system, which reportedly won't damage flooring. Visit www.track2freedom.com.

* The authors assume no liability in connection with any use of the products discussed and make no warranty (express or implied) in that respect. References to products are not intended as endorsements to the exclusion of others that may be similar.



Partner Updates



A highly diversified company, CHS Inc. (formerly known as Cenex Harvest States) is largely owned by farmers, ranchers, and cooperatives. As one of the largest agriculture-related companies in the world, CHS ranked 62nd on the 2014 Forbes Fortune 500 list of U.S. corporations, as ranked by gross revenue. The company produces and distributes such commodities as crop nutrients, grain marketing services, animal feed, food and food ingredients, along with business solutions including insurance, financial, and risk management services. It operates petroleum refineries/pipelines and manufactures a wide variety of petroleum-related products.

CHS has long demonstrated a strong commitment to philanthropy through the CHS Foundation and other corporate citizenship initiatives. Its main areas of focus include leadership development, safety, community investment, and environmental stewardship.

AgrAbility has been a beneficiary of CHS's generosity for many years. As a primary sponsor of farmer/rancher travel stipends for the AgrAbility National Training Workshop, CHS has directly impacted the lives of farm families living and working with disability. In addition, the company provided \$250,000 to the NAP in 2013 for increasing outreach to traditionally underserved farmers, including African Americans and veterans.

While primary support for AgrAbility comes from the USDA, it is companies like CHS that have allowed for the leveraging of existing resources to produce exponential growth in AgrAbility's influence.

Student Designers

AgrAbility's partners are not always organizations. Some of the programs' significant supporters include college and university students who complete projects that can benefit AgrAbility clients.

Dozens of student projects have been completed over the years, including some of the first prototypes for lifts to get individuals with mobility impairments onto their tractors. Recently, students from North Carolina, Ohio, and Massachusetts have undertaken initiatives with direct application to AgrAbility.

Engineering students at North Carolina State University have developed a variety of AgrAbility-related projects, including a garden scooter for planting and harvesting low-growing crops, an all-terrain wheelchair, and a crane to help load objects into a utility vehicle or similar device.

Working with Ohio AgrAbility, students at the University of Dayton have undertaken a broad range of projects—from modifying a utility glove to designing a gear-shifting wheelchair to devising technologies that help workers with autism feed horses on a daily schedule.

In developing the Farm Arm, pictured on p. 3, the student team at Northeastern University worked with the NAP and Maine AgrAbility to obtain background information on prosthetics in agriculture and to test a prototype of the device with AgrAbility clients.

Innovation and ingenuity are key elements in AgrAbility's success, so we look forward to seeing what creative solutions our student partners come up with next.





USDA leadership gets up-close with AgrAbility

AgrAbility staff members had several opportunities to interact with high-ranking USDA leaders during the past few months. Secretary of Agriculture Tom Vilsack learned more about AgrAbility through a stop at the NAP's National FFA Convention display in October. Secretary Vilsack, along with several other USDA staffers and Kent Schescke of National FFA, visited the NAP booth and visited with the AgrAbility team.

NAP Project Leader Bill Field, Farmer Veteran AgrAbility Coordinator Cindy Chastain, and SRAP staff members from several states had the opportunity to interact with Undersecretary Krysta Harden at the Farmer



Veteran Stakeholder Conference in Des Moines last November. Secretary Harden expressed firm support for veterans engaging in agriculture, and she introduced Karis Gutter as USDA's first military veterans agriculture liaison. NAP staff members are also scheduled to give a presentation to Assistant Secretary for Administration Dr. Gregory Parham and other USDA staff members in April.



New tractor

Mahindra USA has provided the NAP with a new tractor for demonstration purposes. Equipped with a Life Essentials chair lift, the tractor is scheduled for display at numerous public awareness and educational events. Mahindra, headquartered in India, is the top selling tractor brand in the world and has been expanding its U.S. presence.

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NAP reaches out to physical therapists

More than 10,000 physical therapists and related professionals participated in the American Physical Therapy Association's Combined Sections Meeting in Indianapolis in February. AgrAbility was able to raise awareness of disability issues in agriculture by interacting with many attendees during four days of the event. Several commented that this was the first time they had seen a tractor at one of their conferences.

AgrAbility-1890 Workshops

As part of the CHS- and USDA-funded special initiative to underserved populations, the NAP has begun sponsoring AgrAbility awareness workshops at historically black 1890 land-grant universities. The first was held at the University of Maryland Eastern Shore in August. A total of five 1890 universities were represented.

The next workshop is tentatively scheduled for the University of Arkansas at Pine Bluff in May. Check back to www.agrability.org for more details coming soon.

AgrAbility regional workshops completed, coming

AgrAbility Regional Training Workshops are a great way for AgrAbility staff members, rural professionals, and consumers to gather for education and networking. NAP partner Goodwill of the Finger Lakes, in cooperation with state AgrAbility Projects, conducted two such events in 2014. More than 20 participants gathered in Pittsburgh in July, and approximately 40 met in Ft. Collins, Colorado at the end of September. The next regional workshop is slated for Knoxville, Tennessee on August 26-27.

AgrAbility Harvest

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ON THE HORIZON



This year, the AgrAbility National Training Workshop (NTW) travels to **Rochester, New York** on April 13-16. Invited guests include Karis Gutter, USDA's first military veterans agriculture liaison, and keynote speaker Chris Koch, a farmer and motivational speaker who was born without arms or legs. In addition to the traditional breakout and plenary sessions, this year's agenda offers a wide variety of offsite tour choices, including two Monday pre-conference tours, an optional trip to Niagara Falls on Tuesday evening, and four Thursday tour options, instead of the traditional two. Visit www.agrability.org/ntw to get more information, to register, or to book a hotel room at the conference rate of \$105 per night (if booked by March 19). Registration closes April 10, and there will be no on-site registration.

2015

April 13-16	AgrAbility National Training Workshop	Rochester, NY	www.agrability.org
April 16-19	AOTA Annual Conference and Expo	Nashville, TN	www.aota.org
June 3-5	World Pork Expo	Des Moines, IA	www.worldpork.org
June 10-14	RESNA Annual Conference	Denver, CO	www.resna.org
June 21-24	International Society for Agricultural Safety & Health (ISASH) Annual Conference	Normal, IL	www.isash.org
July 23-25	Amputee Coalition National Conference	Tucson, AZ	www.amputee-coalition.org
July 26-29	ASABE Annual International Meeting	New Orleans, LA	www.asabemeetings.org
August 11-13	Empire Farm Days	Seneca Falls, NY	www.empirefarmdays.com
August 8-11	Disabled American Veterans National Convention	Denver, CO	www.dav.org/events
August 24-27	National Arthritis & Agriculture Conference and AgrAbility Regional Workshop	Knoxville, TN	www.agrability.org
September 1-3	Farm Progress Show	Decatur, IL	www.farmprogressshow.com
September 15-17	Husker Harvest Days	Grand Island, NE	www.huskerharvestdays.com
September 22-24	Farm Science Review	London, OH	www.fsr.osu.edu
September 29-October 3	World Dairy Expo	Madison, WI	www.world-dairy-expo.com
October 17-19	APRIL Annual Conference	Virginia Beach, VA	www.april-rural.org
October 20-22	Sunbelt Ag Expo	Moultrie, GA	www.sunbeltexpo.com
October 28-31	National FFA Convention	Louisville, KY	www.ffa.org