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Breaking New Ground: Assisting Farmers with Disabilities Through the Application of Assistive Technology

With regards to agriculture in much of Eastern Europe and Northern Africa, the significant problem that landmine detonations present to farmers often goes unnoticed. This problem causes careers in agriculture to be labeled as the most hazardous occupations around the world. However, little attention has been given to rehabilitation practices and assistive technology to help those who have been disabled in this line of work. The Breaking New Ground Resource Center at Purdue University is attempting to resolve the problem at hand by providing technical assistance to those who have been impacted by physical disabilities, in hopes that others may be encouraged to do the same.

Introduction

by William E. Field, Ed.D, Purdue University, Department of Agricultural and Biological Engineering

“...for handicaps do not spring from the soil, nor does trouble sprout from the earth...” —Eliphaz’s response to Job

Eliphaz was most likely one of Job’s more urban friends—certainly not a farm boy experienced with stones and weeds.

His observations were also made prior to the invention of landmines and without consideration of the terrible toll that landmines would someday have on those who work the soil for a livelihood. Eliphaz’s perspective is not unique to his time but continues to be the norm for many today.

Through the introduction of extensive mechanization and fossil fuel-intensive production methods, less than five percent of the population in most industrialized nations is now directly involved in agricultural production. Most of those reading a publication such as the Journal of Mine Action can go days or weeks without encountering an individual who walks the land daily, caring for his or her crops and livestock. In some areas, visiting a working farm and meeting a farmer or rancher has become such a novelty that providing them with a free or low-cost solution to secure a means of transportation and processing food, fiber and forestry products. It would also be needlessly impossible for most of them (and their parents) to grasp the impact that landmines have on the lives of millions of farmers, ranchers, livestock herders and others intimately involved with the land.

News accounts are easily passed over and forgotten that include brief mention of how landmines are typically placed in agricultural areas; that four out of five landmine survivors in Lebanon were injured while engaged in daily agriculture-related activities. The bias drawing attention away from the significant impact landmines have on agricultural producers is further reflected in the relative frequency of news coverage. For example, if a car explosion kills ten people in a terrorist attack in Tel Aviv, much of the world learns of it on the same day’s evening news or the front page of tomorrow’s newspaper. However, unintentional landmine detonations that take the lives of hundreds of farmers and shepherds in isolated areas scattered over sparsely populated areas go largely unreported and remain an unshared burden. When the only source of food known for many is the local supermarket, the hazards, terror and injuries experienced by a potato farmer in Canast a or a goat herder in Sudan seem irrelevant.

Common Ground

As odd as it may seem to some, there are numerous commonalities between the hazards faced by farmers and agricultural workers in highly mechanized agricultural workplaces and those encountered by farmers involved in more labor-intensive production practices in regions with a high risk of landmine exposure. In the United States, for example, farming has historically been and remains one of the most hazardous occupations with respect to work-related deaths and disabling injuries. Extreme injuries, including amputations resulting from entanglement in agricultural equipment, impact thousands of farm families each year. An estimated 2.7 percent of all treated farm-related injuries are the result of amputations (Stueland, 1990). Corn harvesting activities in Indiana alone resulted in over 100 hand or arm amputations per year for 25 years following the introduction of the mechanical corn picker in the 1940s (Willkommen, 1986). Amputations are also a primary type of injury resulting from landmine detonation. (Cambodia has an estimated 35,000 amputees as a result of landmines). Other commonalities include:

1. Farmers, ranchers, herders and other agricultural workers have historically exhibited a high level of personal risk-taking behavior and a strong affinity to the physical challenges of farming. This group tends to minimize or rationalize the risk of working with hazards that others would generally find unacceptable. They collectively see the rewards of a good harvest and providing for their families as exceeding the risks associated with exposure to hazards, such as aggressive machines, unstable livestock, bad weather, snakes and landmines. Agriculture remains for many a risk-taking occupation that rewards those willing to risk their life and limb.

2. Agricultural production continues to be a male-dominated undertaking in many regions of the world, especially those most highly mechanized and also those most littered with landmines. Over 95 percent of farmer-related fatalities in North America are male (Purcellwitz, 1990), while over 90 percent of landmine victims are reported as male.

3. Injuries associated with both landmine exposure and agricultural production generally occur in rural or isolated locations with minimal access to rapid emergency medical services (Field, 1999). Delays in the discovery of the injured person, administration of appropriate first-aid and transporting him or her to care, and the lack of high-level trauma care result in survivable injuries often becoming life-threatening.

4. Little attention has been given worldwide to rehabilitation practices and assistive technology that would enable a farmer disabled due to injury or disease to return to work. This void certainly impacts farmers in developed, as well as less-developed, regions.

5. The limited vocational experiences of many farmers, ranchers and herders narrow their window of career opportunities following a disabling injury. Their limitations may be further compounded by their personal desire not to give up the independent lifestyle offered by agriculture or cultural pressures to maintain an agricultural way of life.

6. Even in highly mechanized farm operations, there are a wide range of manual activities that require the use of both hands, eyes and feet. Generally, farm and ranch work is physically taxing and presents significant barriers to individuals with even moderate levels of disability. Attempting to work with a pair of one-handed plows with one only one hand is equally as frustrating as trying to repair a component on a mechanical harvester using sophisticated tools with only one hand.

7. Farm women, though victims of few landmine incidents or farm-related work injuries, are often exposed to considerable hardships following the disabling injury of their husbands. Women in these situations often become pressed into the position of primary caregiver and generally lack the vocational skills to assume the role the husband...
Disabilities resulting from injury or illness. Most of the work has focused on the needs of farmers and ranchers involved in high-powered operations that require modifications and assistive devices that would enable them to continue operating high-way equipment such as tractors, combines and other self-propelled farm equipment. Resources designed specifically for farmers have been developed and widely distributed that address specific disability types, such as upper and lower limb amputations, visual and hearing impairments, arthritis and spinal cord injuries. Each resource is intended to provide encouragement and examples of appropriate forms of assistive technology and modified work practices that enable a farmer to complete essential work-related tasks.

One of the Center’s most significant undertakings has been the identification, documentation, and cataloging of assistive technology and practices into a single resource that could enhance the independence of farmers and ranchers who desire to return to agriculturally related work following a disability. Hundreds of devices have been identified and described in three editions of Agricultural Tools, Equipment, Machinery, and Buildings for Farmers and Ranchers with Physical Disabilities or as it is now known, The Toolbox. Over 2,000 of these manuals have been placed in rehabilitation facilities, vocational rehabilitation offices and rural county extension offices throughout the United States.

A review of the assistive technologies and practices contained in The Toolbox suggest that there is considerable application of many of the ideas to the rehabilitation processes of those disabled due to land mine explosions who require assistance in returning to agriculturally related work. Even the discovery that another farmer on the other side of the globe is still raising sheep or hogs or operating a tractor with a serious disability could be a significant source of encouragement to an individual recently disabled.

Recognizing the barriers caused by language, considerable effort is being made to make the representations of the assistive devices and practices so that they can be eventually shown via the Internet. The intermediate step will be a fully illustrated CD-ROM with high-quality photos and drawings, plus a sampling of video clips of adaptive aids in use. This tool will be designed primarily for rehabilitation professionals and will provide adequate descriptions, when appropriate, for local fabrication.

Attempts to seek collaborative support for this work have yet to spite an essential easy-to-crop include resources that would provide for more rapid rehabilitation of individuals disabled due to injury. This would include resources such as The Toolbox discussed earlier and expanded resources that cover the most basic forms of assistive technology that can be easily fabricated in rural settings.

**References**