

**WANTED**  
**GRADUATE RESEARCH ASSISTANT**  
**DEPARTMENT OF BIOLOGICAL SYSTEMS ENGINEERING**  
**VIRGINIA TECH, BLACKSBURG, VA.**

**Position Description**

The Department of Biological Systems Engineering at Virginia Tech is seeking a graduate student to join a team of professionals working on a Virginia AgrAbility project. The primary goal of this project is to rehabilitate disabled farmers in Virginia and allow them to continue their farming responsibilities without risking secondary injuries. While the incumbent may participate in all aspects of the project, the research focus will be on the application of assistive technologies for bringing the disabled farmers back to the work force. He/She will be responsible for either adapting existing or developing new assistive technologies to help the disabled farmers in Virginia while pursuing a Masters Degree program in Biological Systems Engineering.

**Qualifications:**

In order to qualify for this position, the incumbent must have a B.S. in Engineering or equivalent and keen interest in working with mechanical systems. An appreciation of machines used in agricultural production is desired but not required.

**Benefits:**

The individual selected will receive a full assistantship of \$18,852 per annum for a period of 18-24 months depending on the progress towards the degree program. In addition, the department will pay the tuition of \$7,361 per annum for all students receiving full assistantship

**Contact:**

Interested candidates may contact: Dr. Robert Grisso, Professor, Department of Biological Systems Engineering, Blacksburg, VA 24060, Phone: (540) 231-6538, email: [rgrisso@vt.edu](mailto:rgrisso@vt.edu) AgrAbility Virginia website: <http://www.agrability.ext.vt.edu/>

## **Conceptual Ideas for AgrAbility Virginia Project**

Pressure sensitive clothing: From interactions with clients at National AgrAbility Conference, it was determined that agriculture can have an increased occurrence of secondary injury from individuals transferring from wheel-chair to tractor or industrial cabs. These cab environments are usually noisy along with vibrations and current cab designs can rub and wear skin from muscle and flesh. From these observations over 50% of the males have had testicle(s) removed from damage from pinching of organs during working and operating farm equipment. It is desired that an assistive technology be developed that would alert operator when circulation and other bruising is occurring to their bodies. Other desirable elements are temperature control, protection of paralyzed limbs, safety apparatus for proper seating, nonstick materials for transfer (sliding), and easy to put on.

Design suit: One of the modifications often required for a disabled farmer is tractor seat modification to accommodate his injury and to allow comfort and stability while in the seat. Often these modifications restrict the use of the tractor by other members of the family or farm crew. It is desired to develop a suit that is modified to help the farmer while being seated in a variety of conditions without modification of a typically ergonomically designed seat or chair. Desirable elements of the suit can be adjusted for any configurations of seats/chairs, temperature control, protection of paralyzed limbs, add stress relief of the abdominal area or back protection, safety apparatus for seat stability, and easy to get into. Since the muscles often degrade, some ideas include air-inflated bladders that are adjustable to better fit the person to seats, materials to absorb impact and vibrations or rubs from tractor controls. The concept may look like a "batman suit" where the suit and material add stability to lacking or unmoving limbs.

Other consideration – while these have applications to farming occupations, those using devices could find more comfort during travels, moving in and out of vehicles, more stability during seat positions and possible in other positions. Of course, cost effectiveness will be a consideration for wide acceptance.

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