New Mechanizations with Ergonomic Advancements: Best Fit For Women

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Women in Agriculture

- In 2012 Ag Census women farm operators represented 30% of total farm operators.
- Women principal operators were 14% of all principle operators.
- While total principal operators decreased between 2007 and 2012 the number of women age 65+ who are principal operators increased by 3%.
- Number of women who have been on their present farm for 10+ years increased by 6%.
Women & Farming

- Women farms tend to be:
  - Smaller, few acres, lower sales... but, WOMEN are inheriting large farms in record numbers, and running large cattle, diary, and crop operations
Women & Farming

- Women farms tend to be:
- more diversified: raising sheep for wool, harvesting honey from beehives, and selling goods (vegetables, flowers, eggs, or goat cheese) at farmers’ markets
Women & Farming

- Women farms tend to be:
  - less mechanized...
  - limited resources
  - lack experiences
  - afraid to try
  - sustainable / organic
Women & Farming

- Assumption: Women don’t work in dangerous professions
  - Women farm; farming is dangerous occupation
  - Tend to be older than male operators
  - Tend to perform multiple roles in the family:
    - Homemaker,
    - Child care,
    - Caregiver,
    - Off-farm job,
    - Farm chores
  - Stress impacts health
Making Everything Equal

- Society today is pushing to “make men and women equal”
- In the business world this is great BUT, what about down on the farm??
Women’s Bodies are Different

- Because of our differences; a tool that works well for a man generally won’t work as well for a woman.
- Virtually all tools and equipment are designed for men.
  - Some tools may work better for us than others.
  - We are using less-than-optimum tools and equipment.
  - Sometimes this puts us at increased risk of injury or disability.
- We make do with what’s available, we can do even better with tools & equipment that fit us.
- Women play a huge role in food production worldwide, the need for appropriate tools and equipment is greater than ever.
Women’s Bodies Are Different

- Women’s bodies are significantly different from men’s; we’re not less than, but we are different. Women tend to have:
  - 40 - 75% less upper-body strength
  - 5 - 30% less lower-body strength
  - Smaller stature
  - More adipose tissue
  - Narrower shoulders
  - Wider hips
  - Proportionally shorter legs & arms
  - Smaller grips
Ergonomics

- Ergonomics is finding the best “fit” between the worker and her job conditions.
- Goal is to create a safe, comfortable environment for the worker so she can be productive.
- Usually accomplished by redesigning tools or the work process.
- “Make the tool fit the person”
Ergonomic Tools

- Tools and equipment help make our lives easier on the farm.
- Ergonomics is not an inherent attribute of tools.
- Equipment and tools designed for men are not necessarily comfortable, safe, efficient, and easy to use for women!
But if they don’t fit, tools & equipment can also make our lives harder, by causing or contributing to injuries and disabilities – including chronic problems such as musculoskeletal disorders (MSDs).
Ergonomic Tools

To be “ergonomic” a tool must:

- Fit the user
- It’s easy to use
- Improve comfort
- Improve performance (including health and safety)
Ergonomics Solutions For Women

- All this means is that we need to find different ways to approach doing certain chores.
- Use the right-size tool and equipment.
- We need to know our limits and to adjust our posture and work habits to keep our body healthy and safe.
Mechanics easier and safer

- Women farmers are making progress with using technology: mechanized and ergonomic equipment to:
  - conserve energy,
  - easy labor efforts,
  - prevention of injuries
Mechanization & Ergonomics

- Technology has changed the FACE of agriculture
- Agriculture has become a field where using your head is more than using brawn
- Technology has increased production in crops
- Advancements in equipment have made livestock production less labor intensive
- Agriculture today is less about your strength and endurance and more about brain power.
Mechanization & Ergonomics

- We need to put a lot of thought into purchasing equipment. Basic criteria we might use to make an informed decision for purchasing equipment:
  - Does it enhance human health and safety?
  - Does it reduce labor hours for a given task, particular repetitive tasks that are done frequently?
  - Will it improve my profitability and over what time frame?
  - Will it help you increase production volume in any appreciable way?
  - In solving one problem, does it create others? Will those other problems undermine its value and utility?
  - Is it in line with your holistic goals?
Work Smarter, Not Harder
Female operators can efficiently work for longer periods of time due to the mechanization and ergonomic features.
Feeding Livestock

University of Missouri Extension
Handling Livestock
Handling Livestock
A good tractor quick-hitch that allows the driver to stay in the tractor seat while connecting and disconnecting implements, for example, is in a sense ergonomic for everyone.
Added Comfort and Stability
The Ride...

- Advancements
  - Steps for easier access
  - Railings to reduce falls
  - Lights
Mechanization and Ergonomics incorporated to improve operator comfort and farmer safety.
Hands-Free Assisted Steering System

GPS Auto Steer Technology
Producers are constantly looking to improve productivity in the field with less stress and fatigue on the operator, and these challenges are driving an increase in adoption of technologies, with automated guidance providing an entry level solution.
An unmanned aerial vehicle, also known as a drone, is an aircraft without a human pilot on board. Its flight is controlled either by computers in the vehicle or under the remote control of a pilot on the ground or in another vehicle.

Farmer holding an unmanned aircraft that she built. This home-made drone equipped with up to four cameras to “scout” her 1,500 acres of wheat and cow pasture.

Drones For Agricultural Crop Surveillance

- Using drones for crop surveillance can drastically increase farm crop yields while minimizing the cost of walking the fields or airplane fly-over filming. You can view composite video showing the health of your crops.

**Benefits of Drones in Farming**

- Increase Yields
  - Find potentially yield limiting problems in a timely fashion.
- Save Time
  - While all farmers know the value of scouting their crops few actually have time to cover the acres on foot.
- Return on Investment
- Ease of use
- Integrated GIS mapping
- Crop Health Imaging
- Failsafe - The Drone Flies Home
Water Conservation

- A tomato farmer uses drones to detect water leaks.
- Estimated he could save enough water for 550 families of 4, for one year.

Intelligent Bin Dog

- Developed at Washington State University
- Delivers empty bins and picks up full bins in orchards
- Currently controlled remotely by an operator with a joystick

http://www.goodfruit.com/wsu-showcases-orchard-technology/
Robotic Apple Picker

- Using technology so that the fruit is not bruised or crushed

Fitbits for Cows

- Can track:
  - Health
  - Estrous cycles
  - Activity levels

- [http://www.gadgette.com/2016/02/22/fujitsu-have-made-a-wearable-for-cows/](http://www.gadgette.com/2016/02/22/fujitsu-have-made-a-wearable-for-cows/)
Farmbots

- Robot farmers “farmbots” are the future of agriculture.
- A robot used in vineyards and corn fields.
- Benefits: an end to some of the most back-breaking jobs around the farm.
- “Farmbots” are being developed and capable of finicky and complex tasks that have not been possible with the large-scale agricultural machinery of the past.
  - “wine bot” trundles through vineyards pruning vines.
  - “lettuce bot” is capable of hoeing away ground weeds from around the base of plants.
- Other “bots” are under development to remotely check crops for their growth, moisture, and signs of disease.

http://modernfarmer.com/2013/08/5-robots-on-the-farm/
OH, THE THINGS THEY CAN DO!
Take-Home Messages…
Work Smarter, Not Harder

- Use the right-size equipment. For example, don’t use small equipment for big tasks or giant-sized equipment for small tasks. These behaviors are hard on your equipment, hard on your land, and can be dangerous too.

- Before buying used, do a thorough inspection.
  - If you buy used, you may want to be a decent mechanic, or at least willing to tinker. Otherwise, you could end up spending more $$ at the local mechanic’s shop.

- Avoid thinking you need every piece of equipment right away; be patient and build your business over time.
  - You want your income to exceed your debt load.

- Ask yourself if you can rent or borrow. Think hard about how often you will need that piece of equipment. Also, will you need it at the same time as everybody else in your region, making renting or borrowing next to impossible.

- Talk to others before you invest in a piece of equipment.
Solutions For Women

- Sharing – Discussing
  - Do you have solutions that are working for you?
  - How are you searching for tool or equipment solutions that “fit your agricultural needs”
Questions

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