From Forage to Fashion New Innovations in Wool

Brent Roeder

MSU Extension Sheep and Wool Specialist/Montana Wool Lab Supervisor

February 13, 2023-Society for Range Management, Boise ID

You know you're getting old, when you cease to be amazed.

- For at least 10,000 years, sheep, humans, dogs and rangelands have lived in a symbiotic, transhumance system that sustainably produces milk, meat and wool when managed correctly.
- Sheep eat grass and convert it into wool, what's your superpower? Think about that, slowly….

Wool Amazing? Seriously How Much Hemp Have You Been Smoking?

- Absorbs 40% of its weight in water
- Self extinguishing
- Natural moisture wicking
- Insulating
- Natural resistance to compression
- 50% atmospheric carbon
- Odor resistant

Wool Good for the Environment?
What about all those sheep farts?

- A 14% increase in new methane production in the US by domestic livestock since European settlement. (Hristov 2012, JAS 90:1371)
- US sheep industry is 0.023% of US GHG emissions. (US EPA data)

Products from the Greatest Generation

Pro's

- Mostly USA grown and sewn
- Huge supply, government encouraged production
- Helped win several wars
- Army blankets and sweaters
- Military uniforms, gloves and socks
- Navy Pea Coat

Con's

- Meant to keep people warm
- Treated with insecticide for moths
- Made from coarse wool and itchy
- Hard to clean and care for
- Heavy and bulky

Products for the Millennial Generation

Pros

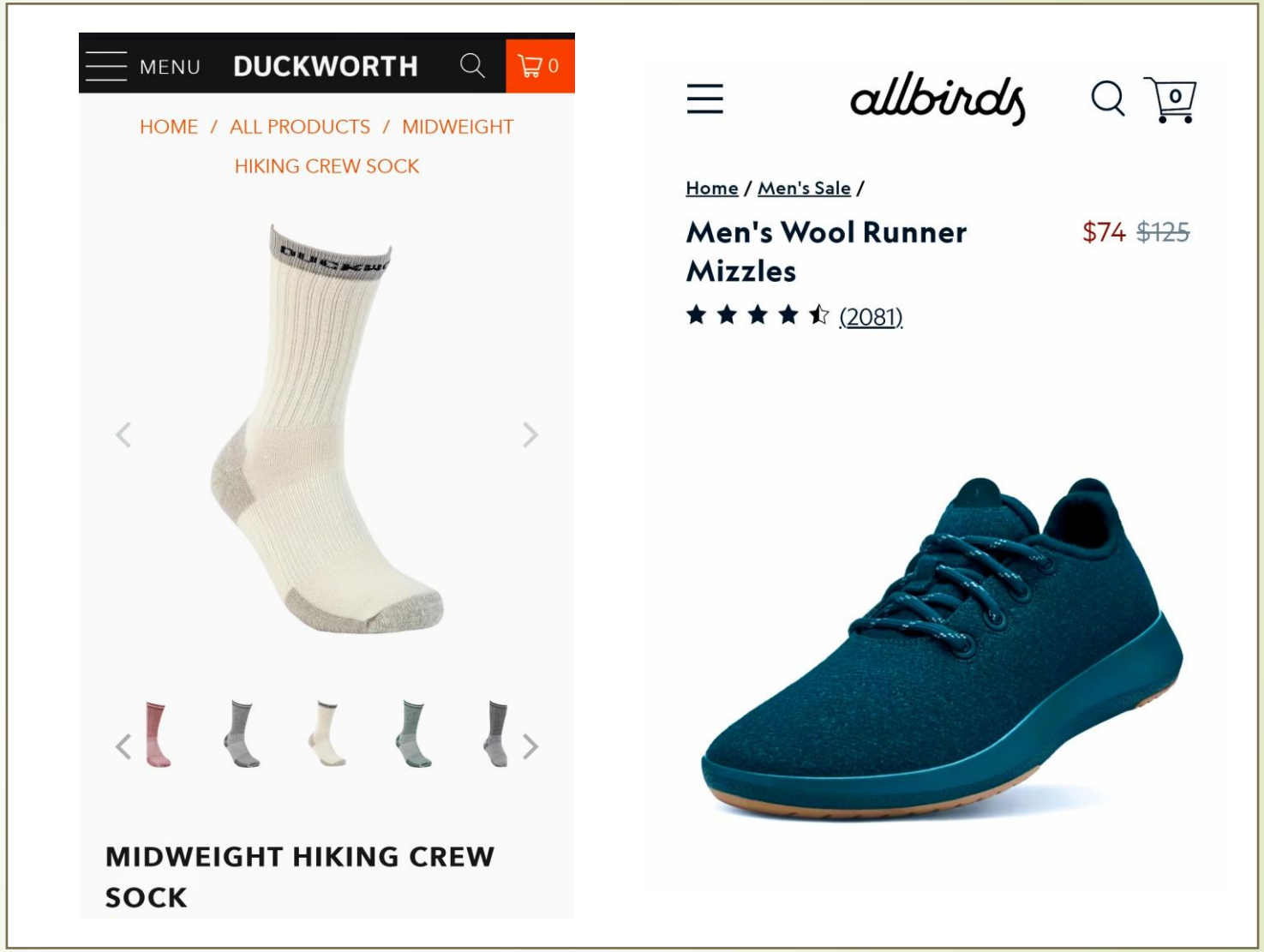
- Made with superfine Merino
- Lightweight next to skin comfort
- Treated for easy care
- Environmentally friendly
- Outdoor and athletic wear
- Cold and hot climate military applications
- Designed for cold and hot climates

Cons

- Expensive compared to synthetics, due to short supply and US manufacturing
- Hard to find American made
- Not a high government priority

Superior Comfort and Performance

- Naturally odor resistant
- Compression resistant
- Durable and warm



Emphasis on Water Purity

- Microplastic contamination of water from synthetic clothes and pods
- Release up to 4,500 microfibers per gram of clothing washed and 40% pass into our water
- We have now found microfibers in fresh fallen snow in Antarctica and human blood

New Commercial Uses

- Low value wool pelleted as a soil amendment for gardening to regulate soil moisture
- Lanolin used as a natural fat in commercial shrimp feed

Montana State University Wool Lab Mission Statement

The Montana Wool Lab is a resource that supports the wool industry of Montana and the surrounding region through quality, genetic, and fiber testing services for the producer and research communities. The lab supports the industry through education, outreach, and field services.

This will be done by establishing stable funding for a wool lab manager at an appropriate faculty level through a modern, well equipped, teaching and research facility that can accommodate the testing services needed by the industry and research communities.

On-the-Ground Work

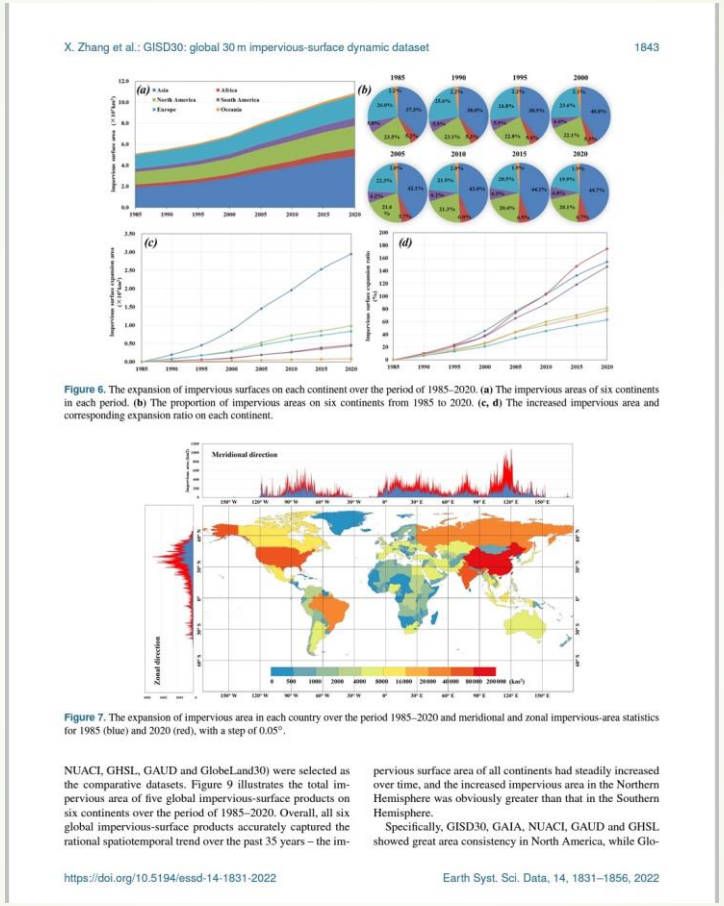
2020-2022: 38,000+ samples for genetic improvement and sorting production lines

2002-2022: Over 2 million pounds of wool collected, sorted, repackaged and marketed through the Eastern Consolidated Wool Pool.

2018-2022: MSU Extension personnel have helped train 39 students in Texas, 74 students in various levels at formal Montana schools and 132 members of multiple Hutterite Colonies across the state.

Rangeland: One of Earth's Most Sustainable Solar Collectors

- We have paved over 142 million acres of earth in the past 35 years.
- Basically, covering Idaho with pavement or concrete every 13 years.
- This is the true environmental disaster of your time.



X. Zhang et al.: GISD30: global 30 m impervious-surface dynamic dataset 1843

Figure 6. The expansion of impervious surfaces on each continent over the period of 1985–2020. **(a)** The impervious areas of six continents in each period. **(b)** The proportion of impervious areas on six continents from 1985 to 2020. **(c, d)** The increased impervious area and corresponding expansion ratio on each continent.

Figure 7. The expansion of impervious area in each country over the period 1985–2020 and meridional and zonal impervious-area statistics for 1985 (blue) and 2020 (red), with a step of 0.05°.

NUACI, GHSL, GAUD and GlobeLand30) were selected as the comparative datasets. Figure 9 illustrates the total impervious area of five global impervious-surface products on six continents over the period of 1985–2020. Overall, all six global impervious-surface products accurately captured the rational spatiotemporal trend over the past 35 years – the impervious surface area of all continents had steadily increased over time, and the increased impervious area in the Northern Hemisphere was obviously greater than that in the Southern Hemisphere.

Specifically, GISD30, GAIA, NUACI, GAUD and GHSL showed great area consistency in North America, while Glo-

https://doi.org/10.5194/essd-14-1831-2022 Earth Syst. Sci. Data, 14, 1831–1856, 2022