AMERICAN WOOL

Rebuilding Markets for American Wool: Findings of a U.S. Wool Industry Stress Test

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Executive Summary

- The American Wool Council (AWC), a division of the American Sheep Industry Association (ASI) retained Market Solutions LLC to conduct this research on rebuilding markets for American Wool.
- **Project Objectives .** ASI requested that the project: examine the current situation and future prospects for first stage processing/scouring, carding, combing/top making in the U.S.; consider options and costs vs. international customers and competitors; and provide insights into developments in U.S. spinning, textiles and apparel markets for wool, including commercial and government market opportunities. It then asked for suggestions for an Action Agenda to support rebuilding markets for American wool and identification of resources that could potentially support the effort.
- In undertaking this assignment, Market Solutions LLC appreciates insights and guidance provided by ASI and a broad cross section of the American and international wool supply chains. It is not Market Solutions LLC's intent to share business confidential information through this report. Where information on individual businesses has been included, we have attempted to limit disclosures to information that is available in the public domain. Mention of individual companies does not constitute an endorsement by Market Solutions LLC.
- **Challenges Facing the Wool Market**. American Sheep produced 22.7 million lbs. of greasy wool in 2023, a difficult year after several years of rebuilding carryover stocks in the U.S. and worldwide. After strong markets for wool and strong prices in 2019, the entire fiber, yarn, textile and apparel supply chain has faced five years of volatility. Use of wool fiber declined with shifts in work and dress habits during the COVID pandemic and has not yet recovered. The rise in athleisure and outdoor uses of wool for next to skin and year round wear has the potential to help rebuild demand. Technologies like Superwash and Mercerization make wool garments washable and make wools feel finer for a given micron level, increasing potential markets.
- **Opportunities from Global Fiber Demand.** While wool fiber use has not yet recovered, fiber use has actually increased sharply since 2020, use of cellulosic, cotton and synthetic fibers has increased 5.4 million metric tons (mmt) worldwide. This is six times total global wool use of 0.9 mmt (1.984 billion lbs. on a clean weight basis). Developing new wool uses and more competitive processing and supplies would have to capture only a small fraction of this growth to have a major impact on the profitability of American wool production and the incentive to rebuild supply and demand.
- **Factors to Drive Wool Demand.** There is growing interest in natural fibers and knowing where textile fibers come from. As with local foods, some consumers are willing to pay for local, traceable and independently verified apparel and home product supply chains with positive stories about the farmers and ranchers who supply fibers, their livestock, land and labor management practices, climate impacts and other factors. For others, what is important will be the performance benefits of American wool in a range of specific products. Identifying potential target consumers and understanding what motivates their wool-based preferences and purchases can help guide American Wool Council (AWC) market development strategies and activities to educate retailers, brands, designers, makers and manufacturers.

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- **Segmenting the U.S. Market for Genuine American Wool**. **AWC support can help market the wools that producers have, and support efforts to produce the wools that markets want and will pay more for**. It will be useful to consider market opportunities and approaches to five different market segments:
  - **Approachable Luxury**. Fine fibers, yarns, textiles, apparel and accessories with a story.
  - **Great Outdoors and Sports.** Performance that is worth paying for.
  - **Military Grade**: Defenders and First Responders. Berry Amendment and beyond.
  - **Home and Industrial Goods**. Bedding, Decorative goods, Dryer Balls and Pellets, but also insulation, upholstery, carpets.
  - **Small Scale/Craft.** Scoured, Carded wool, Yarns, Knitting, Weaving, Apparel and Home Goods supporting local and regional farmers, ranchers, mills, artisans and craft groups.
- **U.S. Wool Exports**. The United States is a net exporter of greasy wool and also a net exporter of wool yarns, some of which go to countries with which the U.S. has Free Trade Agreements (FTAs). These agreements often require use of U.S. or local yarn in textiles and apparel imported to the U.S. under preferential tariffs.
- U.S. greasy wool exports are heavily dependent upon sales to China at a time when renewed trade conflicts and tariffs seem likely. Exports accounted for 72% of U.S. wool use in 2024, but fell to only 37% in 2020 during the last China trade war and the economic downturn related to COVID and supply chain disruptions. This contributed to large carryover stocks that continue to depress prices. AWC's export program has been working to help diversify export markets. Export market development is limited to customers who can process raw wool because of challenges of first stage processing costs and quality in the U.S.
- **U.S. Apparel Imports.** Despite volatility, the U.S. remains the largest single country importer of apparel in the world. While the fashion industry creates many jobs in the U.S., its manufacturing has shifted to cut and sew and knitting operations in countries with low cost labor. Prior to COVID there were some expectations that modern technology, competitive electricity and increased flexibility to respond to market changes could offset higher cost U.S. labor, so that some reshoring of yarn, textile and apparel manufacturing was beginning.
- **Shifts in Apparel Sourcing.** Findings of the U.S. Fashion Industry Association's (USFIA) 2024 Benchmarking Study indicate that Apparel Retailers and Brands based in the U.S. are more concerned than previously about forced labor in their supply chains; shipping delays and supply chain disruptions; political risks related to sourcing; and protectionist U.S. trade policy. This is leading to more effort to understand supply chains, including the sources of fibers and yarns used in their finished products and other options for sourcing.
- While all of those surveyed still manufacture some products in China, they are diversifying their sourcing. Almost all fashion companies with more than 1,000 employees say they are sourcing from ten or more countries. The biggest increase in sourcing is from **India**, but **Guatemala, Mexico and Egypt** joined the top ten for the first time in 2024.

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- **Western Hemisphere Sourcing**. More than half of retail and fashion brand buyers surveyed plan to increase sourcing from members of the **Central America- Dominican Republic Free Trade Agreement with the U.S. (CAFTA-DR).** However three out of four said that sourcing textile raw materials, including wool, is usually a bottleneck limiting manufacturing in the Western Hemisphere, including in the U.S. Two thirds of respondents source from **Mexico and Canada**, up from 40% in 2019-20.
- **U.S. Sourcing and Re-Shoring**. Almost one in ten say they expect to increase their U.S. sourcing over the next two years. Four out of ten fashion companies say they source 1% to 10% of their apparel from the U.S. One in three sources yarn from the U.S. Only 15% source fabrics from the U.S., down from 24% in 2023.
- When asked to rate the **strengths and weaknesses of the U.S. and other sourcing origins**, the U.S. is top rated on speed to market, minimum order requirements, risks of labor and social requirements, environmental requirements and geopolitical risk. U.S. manufacturing is rated average on flexibility and agility, and weakest on sourcing cost and vertical integration. These are factors on which China is rated most highly.
- **Challenges and Opportunities Due to China.** While Fashion Brands and Retailers say they plan to shift manufacturing to other Asian markets from China to reduce risk, most of the companies they plan to shift to rely heavily on China for the yarns and fabrics they use.
- For example, Vietnam, which together with China accounts for 39% of U.S. apparel imports, relied on China for 70% of the textiles and 66% of the yarn they used in 2022. Vietnam also imported almost 10,000 mt (22 million lbs.) of wool top from China. Vietnam has two new wool yarn spinners slated to come online in 2025, which will double their wool top requirement.
- **First Stage Wool Processing in the United States**. The U.S. has one remaining large scale commercial wool scouring plant (Bollman Industries, San Angelo, TX) and one large scale commercial wool comber and top maker (Chargeurs (USA), Jamestown, SC). There are several medium sized scouring plants, including Mountain Meadow Wool (Buffalo, WY) and a new Clean Fleece (NY) plant that opened in 2023. There are about 80 other small plants that scour and card wool. One fourth to one half also spin yarn, weave, knit and/or felt. Commercial processors are currently running below capacity, but together with small and medium mills, could potentially scour 15-16 million lbs. of greasy wool annually.
- **Constraints in first stage processing, and the risk that one or both of the large scale commercial processors might break down, or decide to shut down, represent a significant threat to the rest of the U.S. wool yarn, textile, apparel and home goods supply chain.**
- **Comparative International Scouring and Top Making Costs.** Costs of scouring and top making at U.S. commercial mills are high by international standards due to low volumes, old equipment and high costs. Costs at small and medium sized processors are much higher, leading some to send wool to commercial facilities for scouring and top making so that they can operate their spinning, dyeing, knitting and weaving at higher volumes.

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- **Wool scouring costs on a commercial basis in the U.S.** depends on the quantity scoured, yield, preparation and various other factors. It is reasonable to assume that costs of scouring and top making are in the $.50 to $1.50 range per lb. of greasy wool. This means that scouring and top making cost about $1.00 to $3.00 per clean lb. Minimum order sizes are in the 1,000 lb. to 25,000 lb. range. In comparison, for small and medium sized mills, minimums are usually in the 10 to 50 lb. range, but scouring costs are much higher, generally $4.00 to $8.00 per lb. of greasy wool.
- **Wool scouring in Europe** has been sharply reduced by environmental concerns, but when available, cost has been in the $0.46 to 0.75 per lb. of greasy wool range, depending on the yield, according to ASI. The European Union (EU) has trade agreements with Mediterranean countries, so that some wool and top making is taking place in **Egypt and Tunisia**, and then imported duty free into EU countries. Costs have been about $0.10-.15 per lb. of greasy wool, or $.23 to $.40 per lb. of clean wool. Scouring costs in **China and New Zealand** are reportedly sharply lower, $.06 and $.08 per lb. of greasy wool respectively, and $.09- $.11 per lb. of clean wool. NZ wool tends to have higher yields due to low vegetable matter (VM).
- **Australian Strategies.** With China export market disruptions as a result of trade conflicts, power shortages and the COVID pandemic, followed by concerns over potential impacts should there be a Foot and Mouth Disease (FMD) outbreak, wool growers in Australia became concerned that they were overly reliant on China as a market for greasy wool and started to discuss options and alternatives. In 2022 and 2023 WoolProducers Australia obtained over $US 1.1 million from Australia's Ministry of Agriculture and other sources for two studies: one examined whether first stage processing could be brought back to Australia; the second looked at how to diversify markets. They are following up to examine investments in scouring, carding and combing in Australia plus opportunities in Bangladesh, India, Indonesia and Vietnam.
- **Potential Costs of New Scouring and Top Making Facilities.** Industry sources placed the cost of building one new greenfield scouring plant with 66 million lbs. in annual greasy wool scouring capacity in Australia at about $US 19 million for land, building and machinery and access to energy, water, logistics and labor. It was estimated that a companion 22,000 lb. combing plant would costs about $US 31 million, and be necessary to capture opportunities for wool top in markets other than China.
- Fibershed explored the feasibility of building an integrated scouring, combing, spinning and textile manufacturing plant in California back in 2014. The expected cost for that plant was $US 26 million, with production beginning with a throughput of 1.5 million lbs. of wool, rising to 5 million lbs.. They concluded that brands would need to be willing to pay a 30-40% premium for fabric for the plant to be viable.
- Market Solutions LLC research found that there are substantial economies of scale in building large wool scouring and combing plants and running them at close to capacity. After a $US28 million investment in upgrades in early 2024, WoolWorks scouring facility in New Zealand can scour 220 million lbs. of greasy wool per year at a cost of about $US 0.08 per lb., though for high yielding, low VM wool.

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- **Potential Role of Small and Medium Mills.** In undertaking this assignment, one question asked was whether small and medium mills could potentially fill the gap left by the decline of large scale commercial wool processing.
  - Small and medium mills play an important role in providing services and market outlets for local sheep producers, and an opportunity to add value to wool and generate income locally.
  - Small and medium mills play an important role in the American wool supply chain. Working with state and local sheep and wool associations, groups like Fibershed, spinning and weaving groups, educational organizations, designers, makers, wholesalers and retailers, they could potentially play a more important role in adding value to American wool.
  - Technical and marketing support can potentially help small and medium mills to grow in volume and profitability. Working with a large number of small and medium mills will be relatively staff and resource intensive, however. As discussed further below, a number of small and medium mills have already been very creative in effectively mobilizing Federal, state and local government resources, along with Foundation and commercial funding, to help them invest and grow. Some receive technical support from partnerships with Universities and extension programs.
- **Realistically, small and medium mills can only be one part of a solution for rebuilding the market for American wool. Based on the average amount of greasy wool scoured by the small and medium sized mills surveyed by ASI, it would take over 1,600 small and medium mills to scour the recent annual U.S. wool clip.**
- **Commercial and Military Markets for American Wool**. Domestic commercial and military markets use about 8 million lbs. of American wool annually, based on ASI estimates that domestic commercial use accounts for 19% of the American wool clip, and domestic military use is about 15% of the total.
- **Commercial Markets and Opportunities.** The U.S. is a net exporter of greasy wool, and also a net exporter of wool yarns. More competitive world class quality and cost competitive wool scouring and top making could potentially contribute to commercial market growth for American wool.
- The clothing and household goods market has been seeing an increase in demand and supply of **niche premium clothing and apparel brands, some featuring American wool,** and often focusing on a brand story including social, climate, farmer, animal welfare, and/or labor stories along with various certifications and traceability options.
- ***For all of the certification and verification programs, getting Brands to sign on and offer a consistently available line of products has remained a challenge. Both the Textile Exchange Responsible Wool Standard (RWS) and Fibershed/Climate Beneficial program have staff designated to coordinate with Designers, Brands, Makers and Manufacturers to get them to commit to featuring wool and other fibers certified by their programs. One consistent finding as Market Solutions LLC looked at Brands that are featured by the programs is that many offer very limited ranges of products featuring the certified or branded wool, and do not offer them on a consistent basis. The challenge is to build on these "capsule collections," to expand the range of products offered and get featured wool products to become more regular offerings.***

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- One important potential commercial opportunity is in the market for **American manufactured wool yarns, and potentially textiles, that can be exported to cut and sew and knitting operations in countries that have free trade agreements with the United States**. The terms of those agreements generally specify that in order to get access to import preferences when garments and other products are imported into the U.S., materials from the yarn forward must originate in the U.S. or the partner country.
- **Military Markets and Opportunities.** ASI has long worked to maintain sales of American wool domestically through military dress uniforms, blankets, pea coats, socks, berets and other items. ASI estimates that military procurement represents about 15% of American wool use, or 3.4 million lbs. on a greasy wool basis in 2023.
- There have also been benefits in the commercial apparel market to ASI work with the U.S. military on product development. Superwash and Mercerized wool development have benefitted from military research support and interest. For example:
  - Work on Superwash led to a commercial investment by ASI's Sheep Venture Company and Chargeurs and sales in both military and commercial markets, especially for socks and knitwear.
  - The U.S. Army has invested in supporting Mercerized wool development and is reportedly interested in purchasing one million lbs. of Mercerized wool assuming that commercial spinning can be perfected.
  - Military funded research to develop stronger, fire resistant wool blend yarns have contributed to sales to the military and commercial applications for sports and outdoors markets.
- Purchases by the U.S. government are governed by several standards, the most important for American Wool has been the Berry Amendment, which requires that all U.S. Military textiles and apparel to use U.S. sourced fibers. According to the Congressional Research Service (CRS), Department of Defense (DOD) purchases of textile and apparel articles amounted to $2.3 billion in FY2021, representing 43% of the Department's total Berry-applicable purchases. Purchases subject to the Berry Amendment represented 5% of the $49 billion of textile and apparel shipments from U.S. mills in 2021.
- **Threats to Continued American Wool Use by the U.S. Military.** Under the Berry Amendment, if a domestic source for an item "cannot be acquired when needed in satisfactory quality and sufficient quantity at U.S. market prices," a **Domestic Non-Availability Determination (DNAD)** can be requested by the prime contractor to the Defense Logistics Agency (DLA) Clothing and Textile Troop Support Unit. There have been several recent instances of DNADs affecting worsted wool and wool blend fabrics for military uniforms. In those cases ASI has worked to try to ensure that any imported fabric still used American wool.
- **America's Wool Top Challenge.** All worsted wool spinners and worsted textile manufacturers in the U.S. are dependent upon Chargeurs (USA) in South Carolina for wool top using American wool to be Berry Amendment compliant. If Chargeurs were to break down or close, there would not be a backup source of Berry Amendment compliant wool top to meet the needs of DLA or commercial customers.

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- **Upgrading First Stage Processing and Building Demand For a More Competitive Wool Supply Chain**. The entire wool supply chain is dependent on wool scouring and top making to survive. Investment in upgrades to world class, premium quality and cost first stage processing could help to preserve the military and commercial markets that currently exist for American wool.
- **Potential Options.** Chargeurs' combing plant could be upgraded to world class quality and cost standards; Bollman's scouring facility could be upgraded and potentially add wool combing capacity; and/or a new combing plant could be constructed at a location close to major wool production with access to water, power, waste treatment and labor.
- **All would require a major companion effort to ensure consistent demand so that they could operate cost effectively and profitably**. A cost and quality competitive plant could reliably meet the needs for wool top for Berry compliant yarns and fabrics for the military. It could also help to make U.S. wool and top more competitive in yarns and fabrics for other government and commercial customers and for exports to international markets.
- **Market Opportunities**. This could also likely make American wool more competitive in other domestic and export markets:
  - U.S. manufactured yarn and textiles could become more competitive in commercial and military markets that currently exist.
  - U.S. yarns and textiles could become more competitive in domestic applications such as worsted wool and wool blends for agencies covered under the Kissell Amendment and Buy American requirements, which do not require use of U.S. fibers.
  - U.S. yarns and textiles could potentially become more competitive for export to markets where cut and sew and knitting industries benefit from trade agreements with the U.S.
  - U.S. scoured wool and wool top could potentially be more competitive in markets from which the U.S. imports textiles, apparel and home goods that currently source scoured wool, top, yarns and fabrics from China.
- **Demand Challenge.** Large scale first stage processors currently have sharply underutilized capacity that potentially threatens their continued operations. Investments in technology upgrades alone will not resolve this problem.
- **ASI/AWC leadership will be required to help ensure demand to pull products through the supply chain and justify needed investment in becoming world class competitive so that downstream spinning, textile and apparel manufacturing can be more profitable and contribute to on shoring and near shoring**.
- **A Steering Group including representatives of the entire supply chain** will be required, including wool producers, warehouses and merchants, first stage processors, spinners, textile and apparel manufacturers, brands and retailers.

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- **What Will Be Required?**
  - A plan for next steps.
  - Options to Build Demand and Cost and Quality Competitive First Stage Processing.
  - Partnerships along the supply chain to make it work, including with brands and retailers.
  - Resources, including ASI staff and funding to develop and manage a domestic market development program.
- **Resources to help Maintain and Rebuild Markets for American Wool are discussed further in the report, including:**
  - Wool Research, Development and Promotion Trust Fund.
  - Agriculture Wool Apparel Manufacturers Trust Fund.
  - National Sheep Improvement Center Sheep Production and Marketing Grant Program.
  - USDA Grants and Loans: Value-Added, Climate Smart and other Rural Development Programs.
  - State and Local Funding Support.
  - Wool Innovation Support.
  - Other Potential Financing Sources: Commercial loans, Foundations, Venture Capital, Sheep Venture Company, Checkoffs, USDA/FAS Export Programs: MAP, FMD, QSP, RAPP.
  - ASI/AWC Activities and Resources to Support Rebuilding American Wool Markets.

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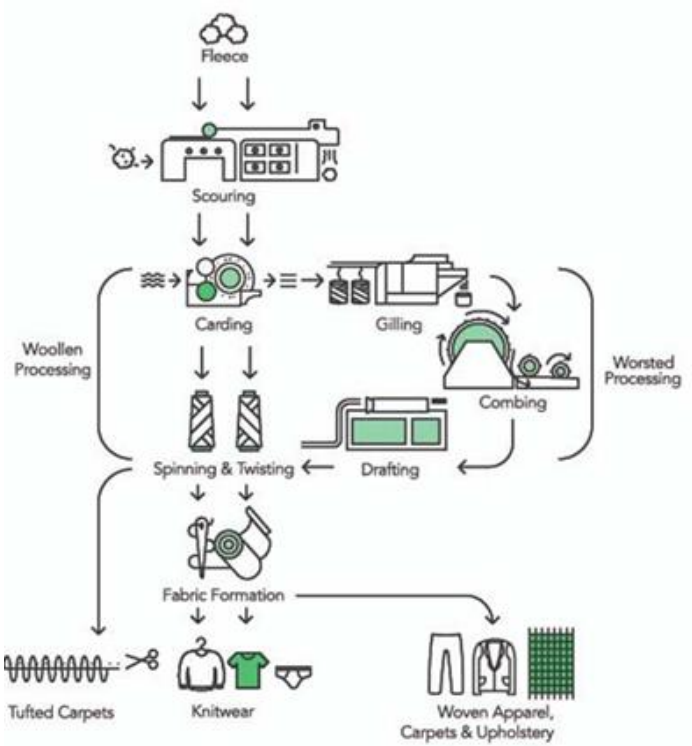
Introduction
Background and Project Objectives

- The American Wool Council (AWC), a division of the American Sheep Industry Association (ASI) retained Market Solutions LLC to conduct a strategic analysis/stress test to learn more about the U.S. wool industry, its current capacity and recommended investments for the future.
- **Project Objectives**
  - Examine current situation and future prospects for first stage processing/scouring, carding, combing/top making in the U.S.
    - Options and costs vs. international customers and competitors.
  - Developments in U.S. spinning, textiles and apparel markets for wool, including commercial and government market opportunities.
  - What might the American Wool Council (AWC) do to support rebuilding the domestic market for American wool?
  - Where might resources come from?
- **A U.S. Wool Industry Stress Test**: Evaluate the resilience of the U.S. wool value chain. Threats and opportunities under different scenarios.
- *In undertaking this assignment, Market Solutions LLC appreciates insights and guidance provided by ASI and a broad cross section of the American and international wool supply chains. It is not Market Solutions LLC's intent to share business confidential information through this report. Where information on individual businesses has been included, we have attempted to limit disclosures to information that is available in the public domain. Mention of individual companies does not constitute an endorsement by Market Solutions LLC.*

The Wool Value Chain



Source: IWTO

Project Objectives

- The American Wool Council (AWC) originally requested a proposal for a strategic analysis/stress test to learn more about the U.S. wool industry, its current capacity and recommended investments for the future in October, 2023, based on a motion approved at AWC's July 2023 meeting. Market Solutions LLC's original October, 2023 proposal was considered by ASI's Executive Board in January, 2024. A revised proposal was requested in May, 2024 and accepted in August, 2024. AWC asked for a report and proposed "Action Agenda" in time to be considered at ASI/AWC's January, 2025 Board Meeting.
- The original objectives for the assignment include to:
  - Develop an overview of the U.S. wool industry from production through processing, including consumer trends.
  - Investigate strengths, weaknesses, opportunities and threats facing U.S. processing and manufacturing, including commercial and small or niche scale mills; and
  - Provide a strategic assessment of current and potential domestic markets for U.S. wool, including declining and emerging markets, opportunities and priorities for market development, costs and requirements for success.
- AWC requested that the approved project scope be limited to focus more sharply on:
  - Investigating large, medium and small first stage wool processing (scouring, carbonizing and top making) in the U.S. and;
  - **Ways to increase the competitiveness of American wool with domestic textiles and mills** (spinners, weavers, dyers and knitters) **and apparel manufacturers and brands**.
- ASI's Board and Steering Committee asked that the project focus on increasing competitiveness in the United States market to be able to **take better advantage of interest in featuring local fibers in yarns, textiles and apparel.**
- During the initial project planning meeting, the AWC Stress Test Steering Committee also asked that the project **explore competitive scouring costs in other markets**.
- Market Solutions LLC believes that progress in strengthening first stage wool processing options in the U.S. also has the potential to strengthen the competitiveness of American wool and grower returns in some export markets. Although this was removed from the project scope of work at the AWC's request, the topic should be examined further.
- **Approach.** Market Solutions LLC assembled and reviewed market data and analysis, and used a mix of approaches to collect information from more than 200 companies, organizations and other resources The field work has involved in-depth interviews and other research with a sample of representatives of U.S. manufacturing. This includes scouring, top making, spinning, knitting, weaving, apparel and home goods manufacturing, and others along the value chain. Other sources with expertise on consumer, environmental and health trends and regulatory requirements and market development were consulted, including a sample of key producers, buyers and exporters.

Background

- With a **U.S. sheep and lamb flock of 5.03 million head entering 2024**, **including 3.22 million sheep and lambs shorn** in 2023, U.S. wool production in 2023 was 12 million lbs. on a clean wool basis (22.7 million lbs. on a greasy wool basis) and exports were 6 million lbs. on a clean weight basis according to USDA/ERS and NASS data.
- Mill use of clean wool in the U.S. has recovered since the height of COVID-19, but remains half of 2009-11, now 10 million clean lbs. annually. Mill use of domestic and imported wool in the U.S. is down 75% since 2005 and 87% since 2000.
- U.S. shorn wool production has declined by half since 2000, much less rapidly than mill use. U.S. wool scouring capacity has also declined sharply, limiting market opportunities for domestic wool with manufacturers who can work only with clean wool or wool top.
- *During 2022 and 2023, the U.S. imported 4-6 million lbs. annually of clean wool and 700,000 to 1.2 million lbs. annually of wool tops. This project has explored opportunities, strategies and required investments to make U.S. wool more competitive for part of this import competition, especially with users who might take advantage of interest and willingness to pay for locally sourced fibers.*
- With current limitations and declines in commercial scale wool scouring and top making capacity in the U.S., exports remain critically important to the economic health of the American sheep industry. With strong prices and strong export demand from China, U.S. wool exports reached 11.5 million lbs. of greasy wool in 2018, representing 89% of production, and reducing carryover stocks to 12.6 million lbs., the lowest level in two decades.
- **With trade conflict with China, and then COVID, exports to China and other markets dropped sharply. As a result, carryover stocks grew in the U.S. and other markets. These continue to weigh down international wool market prices.**
- The average price per lb. paid to U.S. producers for shorn greasy wool dropped 19 percent between 2019 and 2022 and has continued to fall, increasing grower interest in this project. A strategic assessment of the market from scour to finished products, with a special focus on large, medium and smaller first stage processing, is intended to provide one part of a potential solution by helping to better understand and take advantage of niche opportunities for local fibers in the domestic market. Australian sources expect global wool prices to bottom out and begin to recover in 2025. The project is intended to explore ways to ensure that American wool is positioned to best benefit from any recovery.

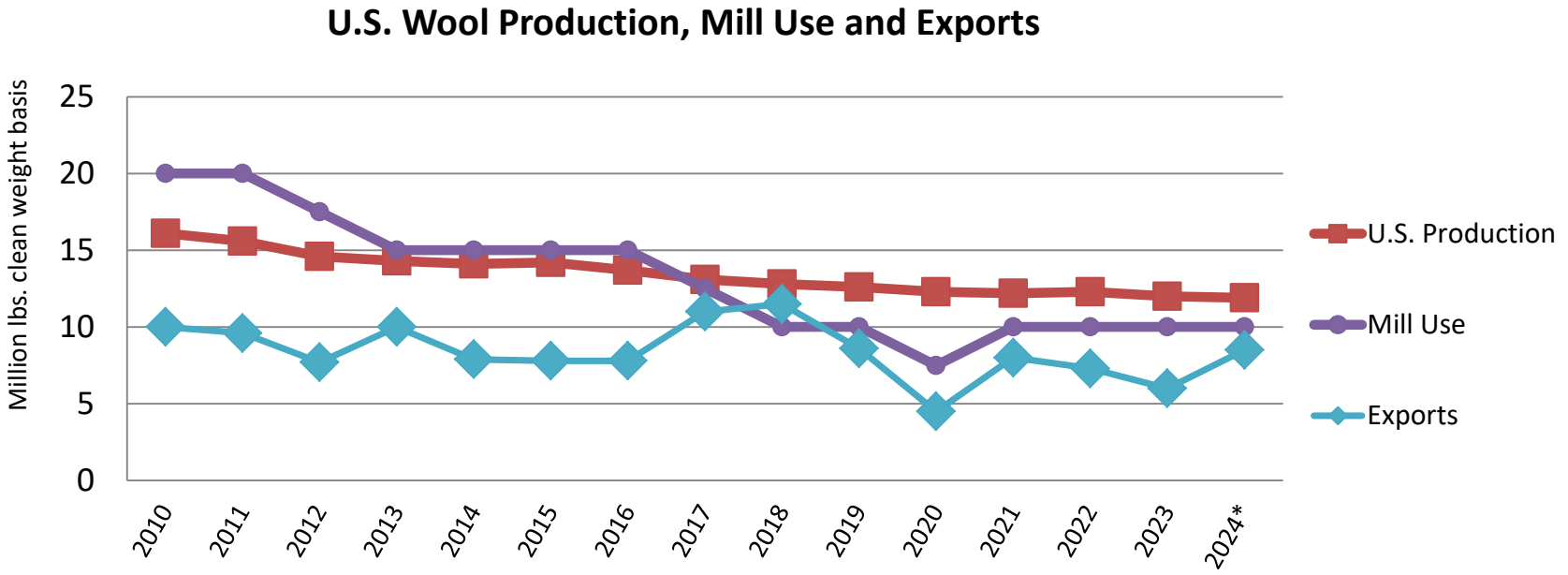
Background

- Market Solutions LLC's previous experience examining international market opportunities for U.S. wool has made clear that first stage processing constraints also limit export market competitiveness and returns. **ASI has tried to promote exports of American scoured wool and top in the past, but costs have not been competitive. Although exports of greasy wool remain the most important market for U.S. wool, the immediate priority for this assignment is to explore potential opportunities and challenges in the domestic market**. It makes sense for the American wool industry to develop an updated strategic assessment of strengths, weaknesses, opportunities and threats (SWOT) that could potentially help make American wool more competitive and profitable in both domestic and export markets.
- Over the last several years there has been **new interest in rebuilding U.S. textile and apparel industries using local raw materials**. For example, Fibershed's Regional Fiber Manufacturing Initiative examined challenges to using U.S. wool in manufacturing sweaters, blankets and felted bags in the Western United States. It concluded that although wool scouring capacity exists nationally, it is located so far from major production areas that the economic and environmental costs of using it are very high. This affects domestic market opportunities, but also limits export market opportunities.
- ASI's global export strategy is to expand exports of U.S. wool and sheepskin products by identifying niches in which U.S. products are best qualified to compete. Once niches are identified, ASI's strategy is to work one-on-one with targeted companies in international markets to carry out education, product trials and relationship-building. The key tactic is to match U.S. exporters and international customers, educating the international buyers about U.S. wool/sheepskins and learning how U.S. products can fit into the buyer's end products. Trial purchases are also encouraged. ASI provides technical assistance in order to show international customers how to best process and blend U.S. wool products.
- **Financial Support for AWC International and Domestic Marketing.** For international marketing, ASI uses funds from USDA Foreign Agricultural Service (FAS) programs including the Market Access Program (MAP), Foreign Market Development (FMD), the Quality Samples Program (QSP), the Regional Agricultural Promotion Program (RAPP) and other sources.
- AWC domestic marketing funding is part of about $2.25 million annually that ASI receives from the Agriculture Wool Trust Fund to support efforts in quality improvement, market research and promotion, producer communications, strategy and program development, wool producer planning and administration.

American Wool Supply, Demand and Supply Chains

U.S. Wool Production, Mill Use and Exports

- USDA estimates that mill use of wool in the U.S. declined by half from 2010 to 2018, and has been flat, at 10 mmt annually since that time, except for a drop in 2020 due to COVID related plant closures. With fewer USDA resources devoted to tracking the sheep, lamb and wool market, these estimates may not reflect losses of wool manufacturing capacity in 2024.
- With the U.S.-China trade conflict resulting in retaliatory duties, together with the impact of COVID-19 on businesses, exports fell sharply to only 4.5 million lbs., or 37% of production on a clean weight basis for 2020.
- Exports recovered to 8 million lbs. for 2021, and were 7.3 million lbs. in 2022; 6 million lbs. in 2023; and are forecast to recover to 8.5 million clean lbs. in 2024. This represents 71% of the 2024 wool clip. On average, exports accounted for 62% of the U.S. wool clip for 2021-24.

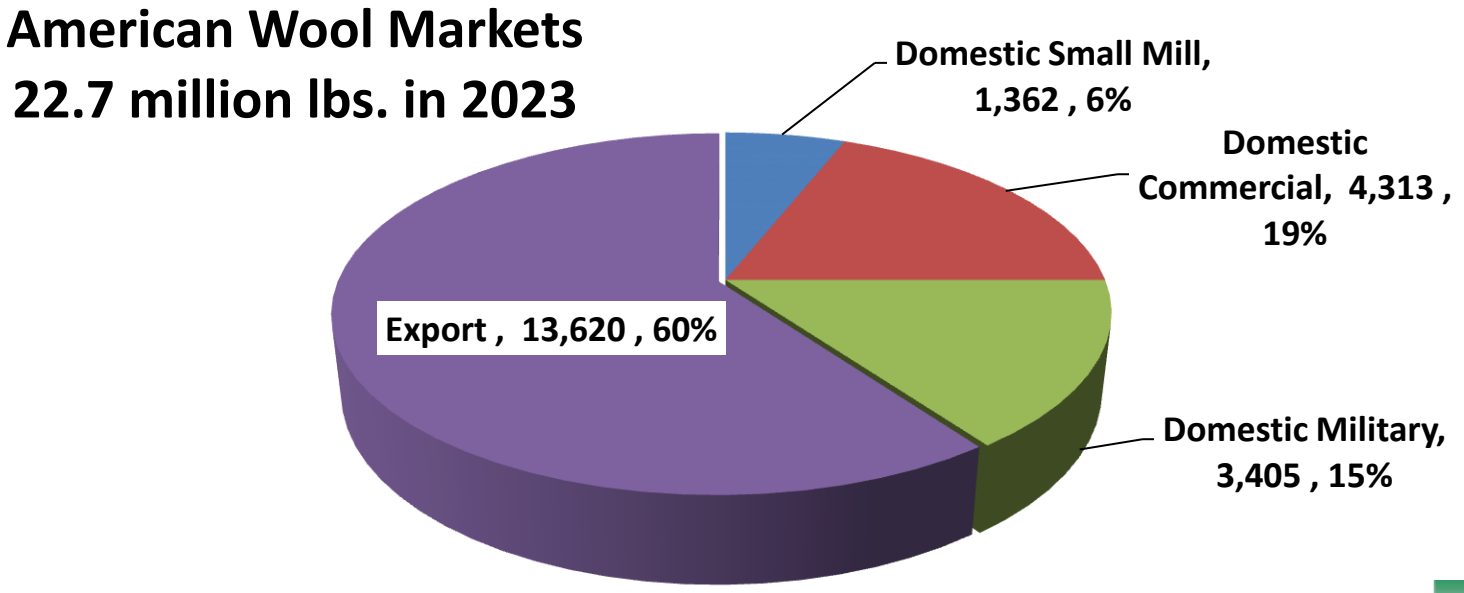


Source: USDA ERS and NASS data, December, 2024. Market Solutions LLC analysis

Markets for American Wool

- Based on ASI estimates of American wool usage by market segment, about 9.1 million lbs. of greasy wool would need to be scoured domestically in 2023 in order to meet domestic commercial and military market requirements and the needs of domestic small mills.
- Another 13.6 million lbs. of greasy wool would need to be exported as greasy or scoured wool, or top. As noted above, **exports accounted for 62% of American wool production for 2021-24, but only 37% in 2020 due to trade conflicts and COVID. The unsold wool contributed to carryover stocks that continue to depress market prices.**
- **Processors and exporters interviewed indicate that there is sufficient large scale processing capacity to scour the available American wool clip. However costs are higher than available internationally. Larger volumes and investments in plant and equipment upgrades could potentially help make American wool more competitive for yarn, fabric and home goods in the U.S. and for export of scoured wool or top.**

Estimated American Wool Use by Market Segment

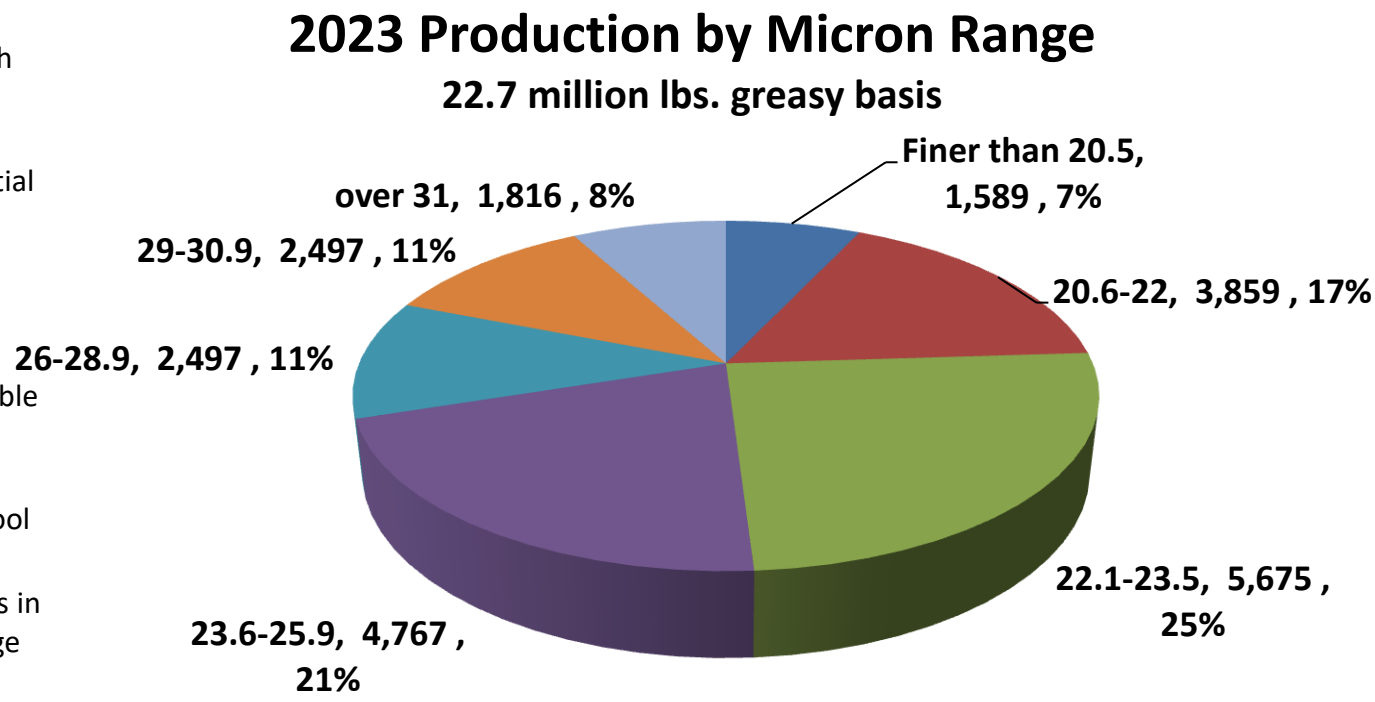


000 lbs. greasy wool basis
Source: USDA data and ASI share estimates, 2024

Estimated American Wool Supply by Micron Range, 2023

- It is frequently noted that the U.S. has a very limited supply of finer wools suitable for year round and next to skin applications, for which 18.5 micron wool is ideal.
- Mercerization and other technologies may have the potential allow more American wool to be used for these uses.

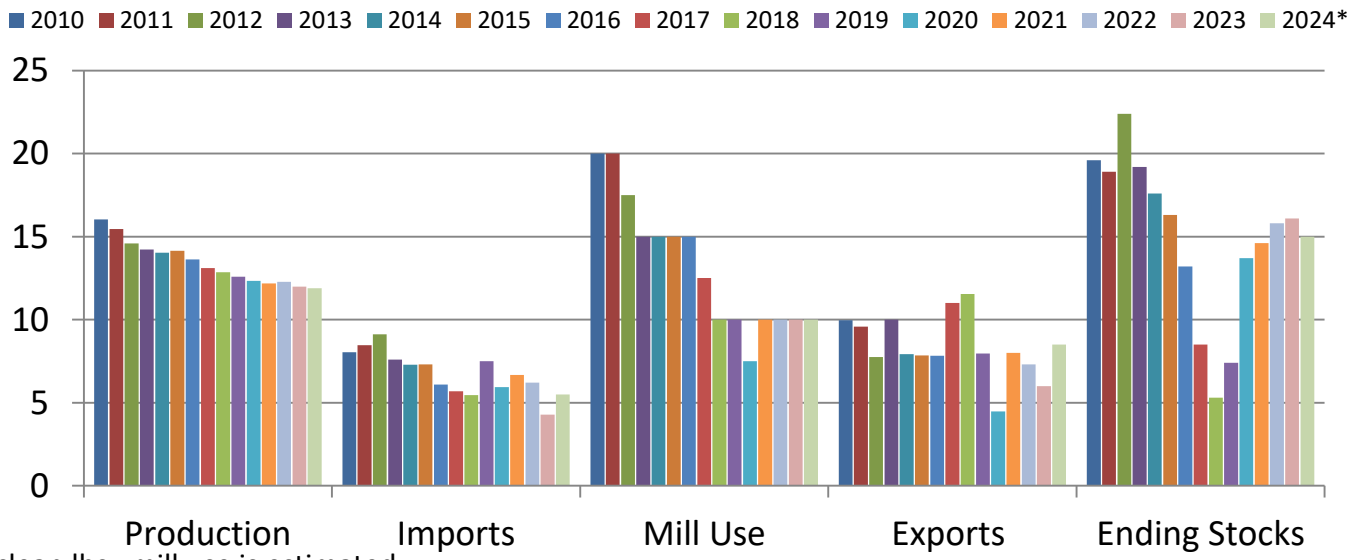
- Based on the most recently available estimates from AWC, the U.S. produces:
  - 1.6 million lbs. of greasy wool finer than 20.5 microns.
  - 9.5 million lbs. of fine wools in the 20.6 – 23.5 micron range
  - 4.8 million lbs. in the 23.6-25.9 micron range; and
  - 6.8 million lbs. that are 26 microns or coarser.



000 lbs. raw wool
Source: Market Solutions LLC estimates based on USDA and AWC Fast Facts 2021

U.S. Wool Production, Imports, Mill Use, Exports and Carryover Stocks, 2010-2024

- U.S. wool production has continued to decline slightly since 2010, with the 2024 clip estimated at 11.9 million metric tons (mmt) on a clean weight basis (22.7 mmt on a greasy weight basis).
- **U.S. wool exports are forecast to reach 71% of production, 8.5 mmt in 2024, contributing to a slight reduction in carryover stocks, which have been growing since 2020.**
- Imports of wool and wool top are forecast to recover to 5.5. mmt in 2024, the second lowest level since 2010.
- **Carryover stocks grew from 7.4 million lbs. on a clean wool basis, to 13.7-16 million lbs. during 2020 to 2023. With increased 2024 exports, year end stocks are forecast at 15 million lbs..**
- **Carryover Stocks continue to weigh on prices**, underscoring the urgency of finding solutions to help move more American wool in both domestic and export markets.

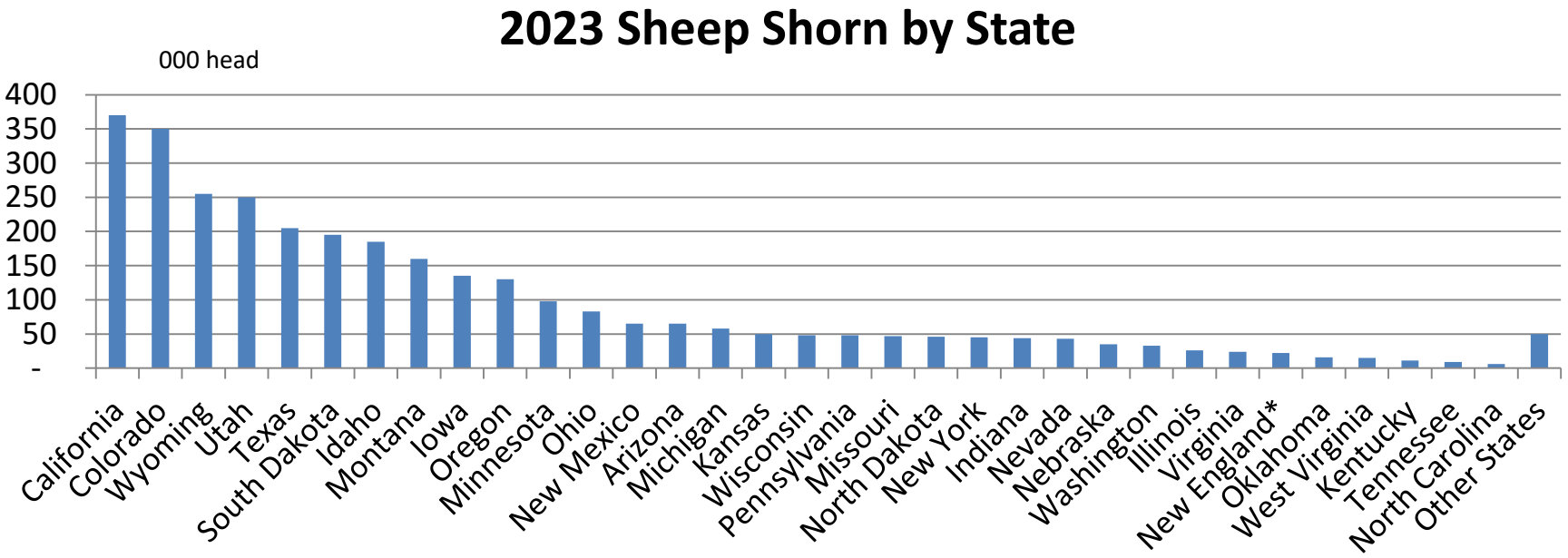


Million clean lbs., mill use is estimated

Source: USDA ERS using data from NASS and U.S. Dept. of Commerce, , December 2024. Market Solutions LLC analysis

Sheep Shorn by State

- **California, Colorado, Wyoming, Utah and Texas were the top five states by number of sheep shorn in 2023**. **South Dakota, Idaho, Montana, Iowa and Oregon rounded out the top ten, accounting for almost 70%** of the 3.22 million sheep sheared in the U.S. during 2023.
- The top 20 states by number of sheep shorn in 2023 also include Minnesota, Ohio, New Mexico, Arizona, Michigan, Kansas, Wisconsin, Pennsylvania, Missouri, North Dakota and New York. These account for about 90% of the U.S. total.



2023 sheep shorn in 1,000 head 3.22 million head total

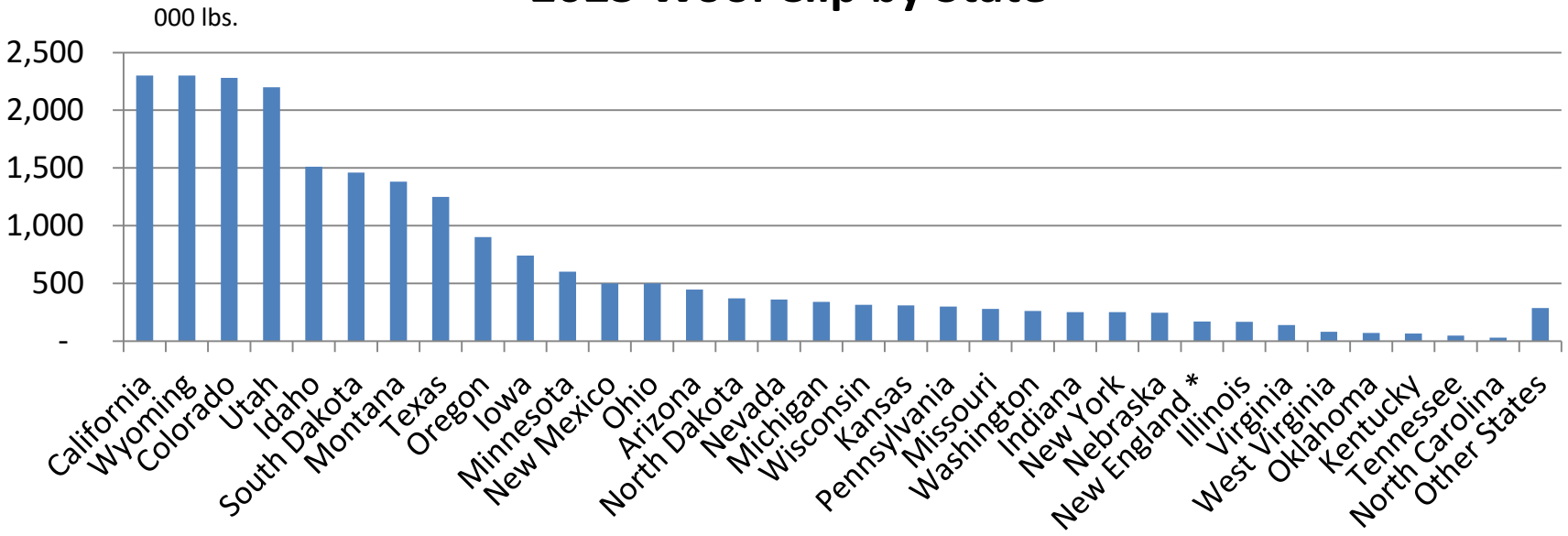
*New England includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

Source: USDA NASS Sheep and Goats annual, January 2024, Market Solutions LLC analysis

U.S. Wool Clip by State

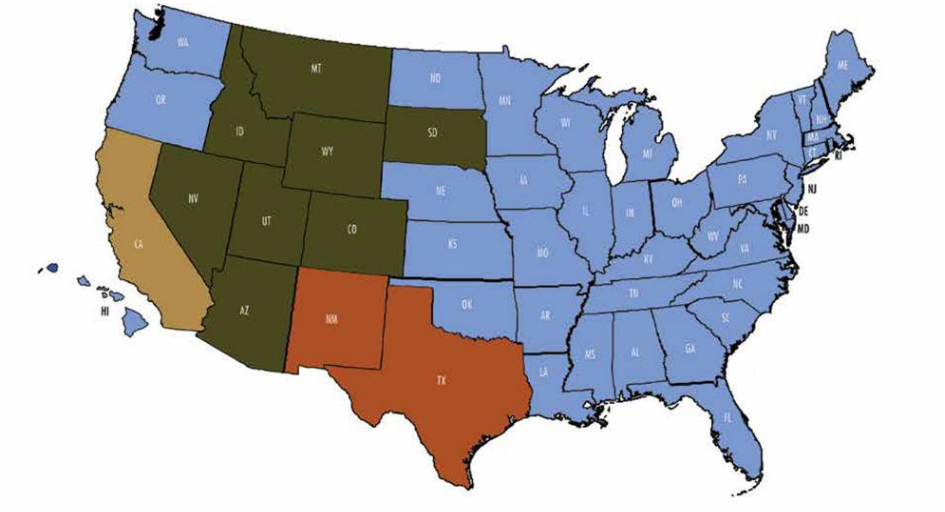
- **The U.S. wool clip was 22.7 million lbs. in 2023 on a greasy basis, down slightly from 23.3 million lbs. in 2022,** according to USDA statistics. There were 3.2 million sheep shorn in 2023, down from 3.3 million the year before.
- **California, Wyoming, Colorado, Utah, Idaho, South Dakota, Montana, Texas, Oregon and Iowa were the top ten wool producing states, accounting for 74% of the total national clip.**
- Minnesota, New Mexico, Ohio, Arizona, North Dakota, Nevada, Michigan, Wisconsin, Kansas and Pennsylvania filled out the top 20 wool producing states, which accounted for 90% of the national total.

2023 Wool Clip by State



2023 wool clip in 1,000 lbs. greasy basis. 22.7 million lbs. total
*New England includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. Source: USDA NASS Sheep and Goats annual, January 2024, Market Solutions LLC analysis.

About U.S. Wool



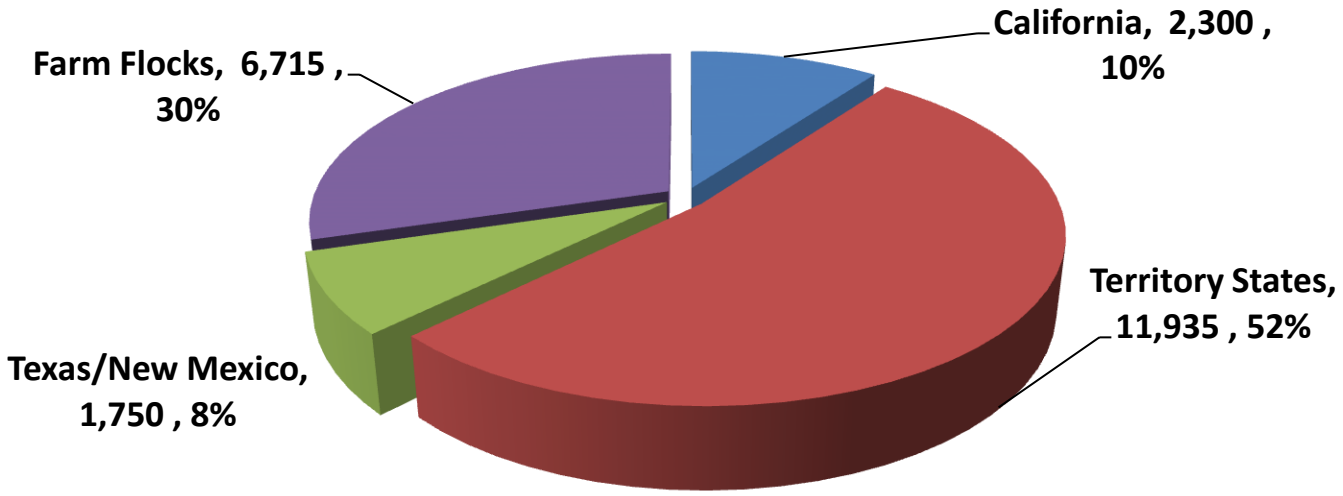
- CALIFORNIA WOOLS:
  - Variable flock size
  - Wool is sold through warehouses
  - 21-24 microns
  - Staple length: 65-80 mm
  - Good to average color
- TERRITORY STATES WOOLS:
  - Medium to large flocks
  - Wool is sold through private treaty, cooperatives and warehouses
  - Good to average wool-clip preparation
  - 21-25 microns
  - Staple length: 75-90 mm
  - Good to average color with low colored fiber counts
- TEXAS/NEW MEXICO WOOLS:
  - Medium to large flocks
  - Wool is sold through warehouses
  - Good to average wool-clip preparation
  - 19-22 microns
  - Staple length: 65-90 mm
  - Good to average color with low colored fiber counts
- FARM FLOCK WOOLS:
  - Small flocks
  - Wool is sold through cooperatives, warehouses and wool pools
  - 25 microns and coarser
  - Staple length: 60-90 mm
  - Value type wools – colored fibers

Source: ASI

U.S. Wool Production by Region

- **The U.S. wool clip was 22.7 million lbs. of greasy wool from 3.22 million sheep shorn in 2023, down 2% from 2022. More than half of wool production is in Territory States. California and Texas/New Mexico contribute another 20% of production. The remaining 30% of production is from states with primarily farm flocks.**
- During 2023, the wool clip was stable in California, and off by 1% from 2022 in the Territory States and Farm Flock states. Texas and New Mexico reported a 17% drop in wool production, which ASI attributes to fewer sheep due to droughts and more hair sheep that do not need to be sheared.
- The AWC reports that Texas and New Mexico generally offer the finest wools 19-22 microns, while Territory States, California and South Dakota generally produce wools in the 21-25 micron range, and Farm Flocks generally produce a variety of wools, often 25 microns and coarser.

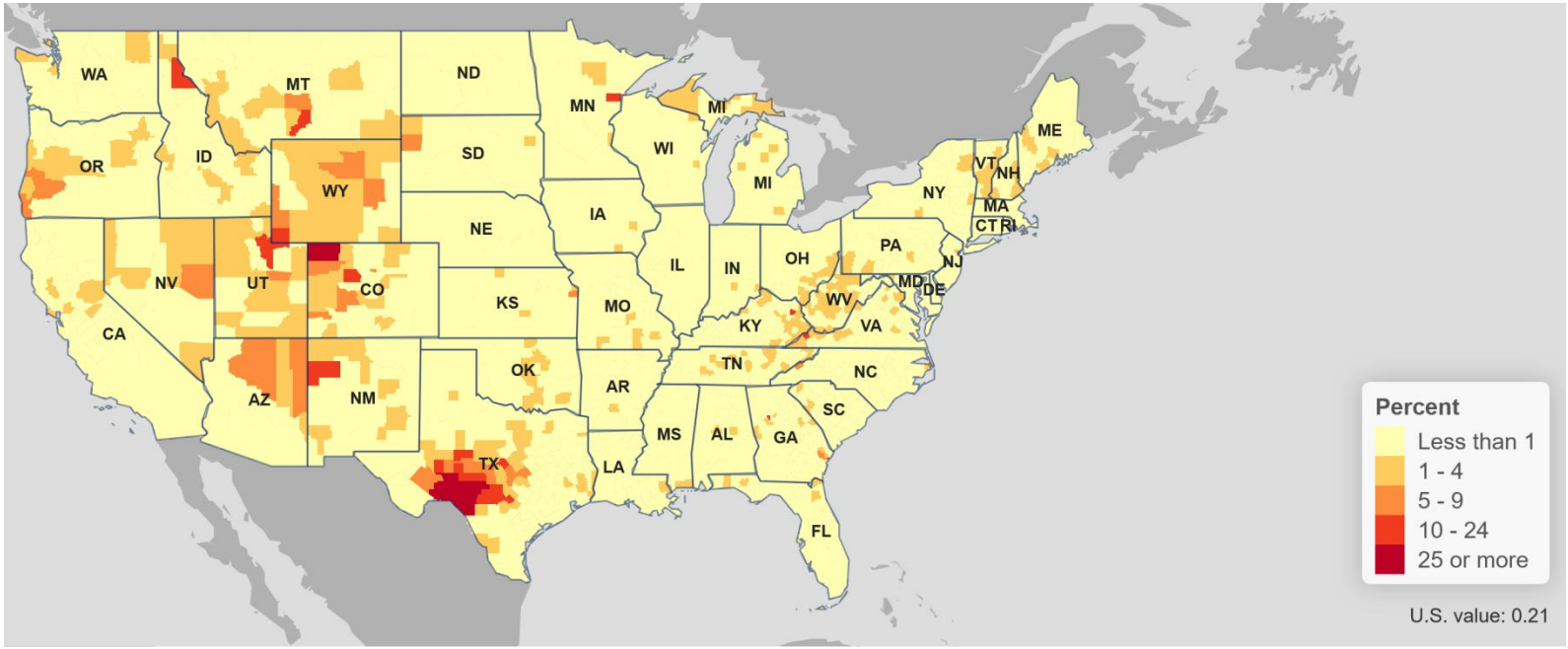
U.S. Shorn Wool by Region, 2023



Source: USDA/NASS data, Market Solutions LLC analysis

Importance of Sheep, Wool to the Value of Agricultural Products Marketed

- **USDA 2022 Census reporting shows the value of Sheep, Goats, Wool, Mohair, and Milk Sold as Percent of Total Market Value of Agricultural Products Sold in 2022.**
- There are 5 categories. Darker colors represent higher percentages. The darkest category is 25 percent or greater. Counties with higher values are in Texas, Colorado, Arizona, Nevada, Utah, and Wyoming. United States: 0.2 percent.

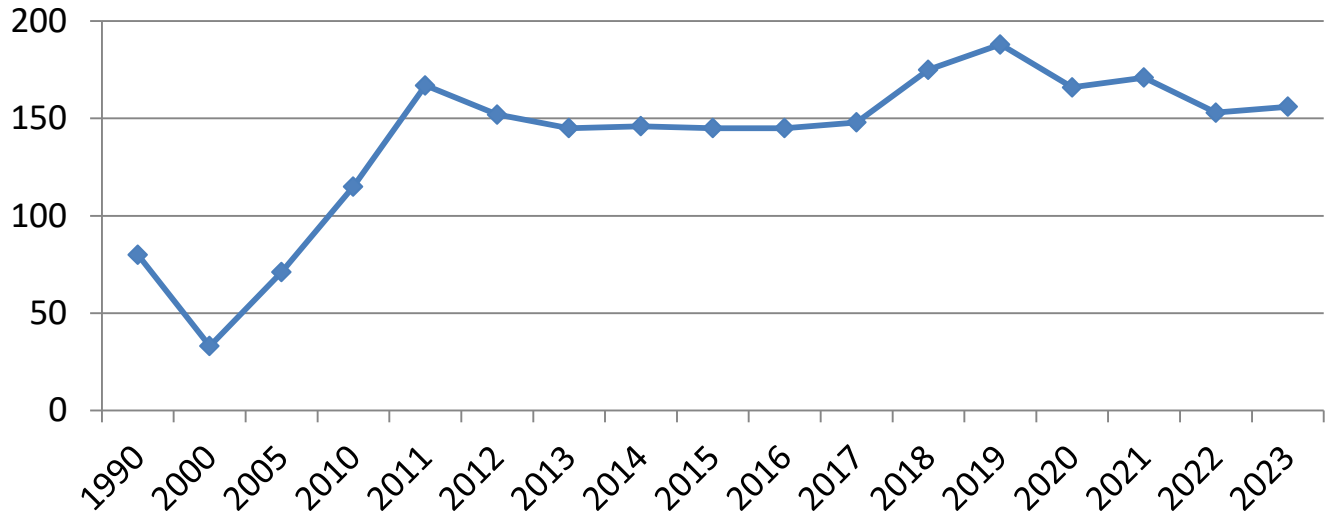


Source: USDA 2022 Census of Agriculture

Average Farm Prices for American Wool

- **USDA reports that the average price paid to U.S. producers for shorn greasy wool sold in 2023 was $1.56 per pound for a total value of $35.3 million dollars, down 1 percent from $35.5 million dollars in 2022.**
- The average producer price per lb. paid for wool dropped 19 percent between 2019 and 2022. Although there was a slight recovery in 2023, the market remains depressed, contributing to interest in potential opportunities to rebuild wool demand in the domestic market. Some Australian sources expect global wool prices to bottom out and begin to recover in 2025. Others report concern that trade conflicts and tariffs could disrupt markets, putting further pressure on wool prices. This project has explored potential ways that American domestic demand can help contribute to a recovery.
- Average farm prices for wool do not reflect the sharp price differences in prices received for fine, medium and coarser wools, or price reductions due to yield differences, less accurate skirting, paint, vegetative matter (VM) and other foreign material.

Average Farm Price U.S. Wool, Greasy Basis



Average U.S. cents per lb on greasy wool basis

Source: USDA ERS using data from AMS and NASS, December 2024. Market Solutions LLC analysis

Wool Market Price Examples by Micron

- USDA's weekly National Wool Review reports domestic greasy wool sales volumes when trades can be confirmed. It also reports prices on the Australian Wool Exchange (AWEX) by micron and U.S. dollar value.
- USDA/AMS reports that prices in the range of 75% to 85% of Australian values provide an indication of the market value of clean domestic wool fob warehouse.
- **As seen in the example, the finest wools, 17-19 microns, sell for 4 to 5 times the prices of coarser wools 28 microns plus.**

ASI's Market Commentary Example:

- U.S. sheep producers continue to struggle with low wool prices.
- American wool is dependent on exports and has not fully recovered from the impacts of the trade tariffs and the global pandemic.
- Coarse wool is struggling to find a valuable market; often, the cost of shearing sheep outweighs the income from the wool.
- Reductions in processing and consumer markets is further adding to the devastation of the American raw wool industry.
- **Increasing the value of coarse wool is important to sheep producers and the U.S. wool industry's viability**.
- Source: ASI Wool Market Update, Oct 22, 2024

Australian Wool Exchange (AWEX) and Indicative U.S. Wool Prices

Micron/Grade	U.S.$	75-85% of AUS Value
17 (US > 80s)	5.28	3.96 - 4.48
18 (US 80s)	4.81	3.61-4.09
19 (US 70-80s)	4.45	3.34-3.78
20 (US 64-70s)	4.15	3.11-3.53
21 (US 64s)	4.05	3.04 - 3.44
22 (US 62s)	3.90	2.93 - 3.32
23 (US 60-62s)	3.75	2.81 - 3.18
24 (US 60s)*	3.47	2.60 - 2.95
25 (US 58s)	2.31	1.73 - 1.96
26 (US 56-58s)	1.96	1.46 - 1.66
28 (US 54s)	1.32	0.99 - 1.12
30 (US 50s)	1.18	0.89 - 1.01
32 (US 46-48s)	1.03	0.77 - 0.88

Australian wool prices quoted in $US per lb clean basis, delivered to Charleston, SC
Source: USDA AMS National Wool Review, Oct 18, 2024,
* based on 10/4/24

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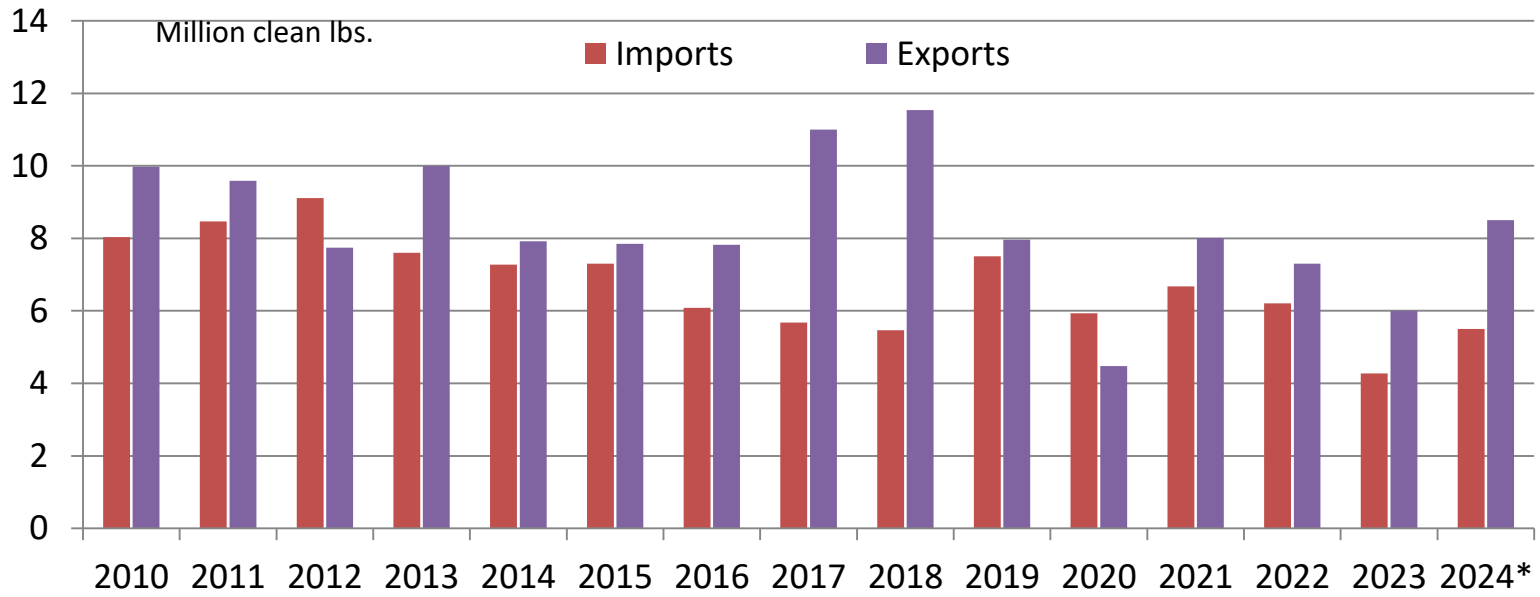
America's Wool Trade Balance
Exports and Imports

U.S. Wool Trade Balance: Exports and Imports, 2010-2024

- The U.S. is a fairly consistent net exporter of wool, with exports, primarily greasy wool, generally exceeding imports which include wools that are finer and coarser than those most widely available in the U.S. and some wool top.
  - **U.S. wool exports are forecast to reach 71% of production, 8.5 mmt in 2024**, contributing to a slight reduction in carryover stocks, which have been growing since 2020.
  - **Imports of wool and wool top are forecast to recover to 5.5. mmt in 2024, the second lowest level since 2010.**

U. S. Wool and Top Exports and Imports, 2010-2024



Source: USDA ERS using data from U.S. Dept. of Commerce, *December 2024 forecast. Market Solutions LLC analysis

American Wool Trade Balances

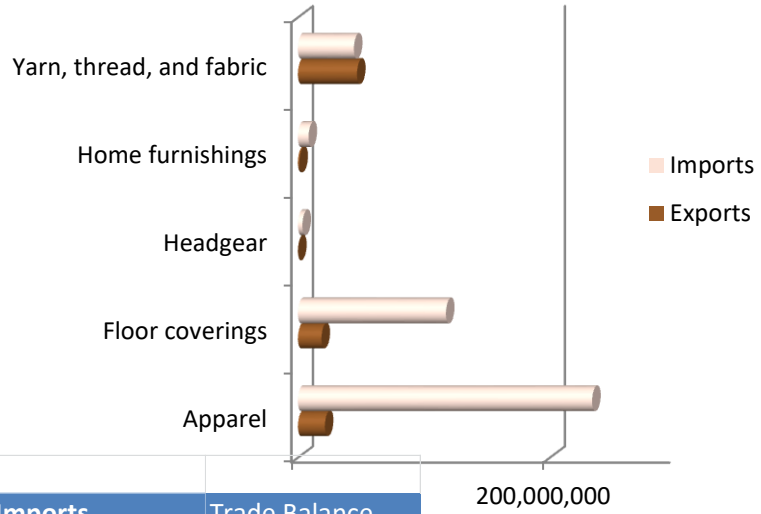
- **U.S. raw wool exports** for January – October 2024 were 7.7 million lbs. on a clean basis, up from 5.5 million lbs. during the same period in 2023. China, India, Uruguay, Mexico, Bulgaria and the United Kingdom were the largest 2023 export destinations.
- **U.S. wool top exports** were 295,000 lbs. during the first ten months of 2024, down from 359,000 lbs. during the same period in 2023 and 757,000 lbs. during 2022. Mexico has been the primary destination for U.S. wool tops, with perhaps a truckload shipped to Canada annually.
- **U.S. raw wool imports** for January – October 2024 were 4.3 million lbs. on a clean basis, up from 3.8 million lbs. during the same period in 2023.
- **U.S. wool top imports** were 447,000 lbs., down from 530,500 lbs. during the same period in 2023 and 1.2 million lbs. during 2022. The United Kingdom and Uruguay are the largest recent suppliers. Spain, New Zealand, Australia, the Czech Republic, Turkey, Italy , Malaysia and China are sometimes reported as suppliers.
- **America's Wool Trade Balances**
- ***While the U.S. is a relatively consistent net exporter of raw wool, it has generally been a net importer of wool top, some of which may be exported as raw wool and reimported as top.***
- ***In considering potential opportunities to rebuild U.S. demand for American wool, it is useful to also look at wool that is imported and exported in yarn, textiles, apparel, home and industrial goods.***
- ***As explained below, the U.S. had a 319 million lb trade deficit in wool imported through textiles, apparel and home goods in 2023. It had a 2.5 million lb surplus in wool exported through yarn.***

U.S. Wool Textile Trade Balance, 2023

319 million lbs. raw wool equivalent trade deficit

- **The U.S. has a 2.5 million lb trade surplus in wool yarn, thread and fabrics.**
- **The largest wool equivalent trade deficits are 212 million lbs. in apparel and almost 100 million lbs. in floor coverings.**
- There are also deficits in home furnishings, 7 million lbs. of raw wool equivalent, and headgear, 3.4 million lbs..

Wool Textile Exports and Imports



U.S. Wool Textile Trade Balance, 2023

Item	Exports	Imports	Trade Balance
Apparel	21,390,575	233,535,581	(212,145,006)
Floor coverings	18,730,934	117,495,863	(98,764,929)
Headgear	170,983	3,590,830	(3,419,846)
Home furnishings	1,174,081	8,434,590	(7,260,509)
Yarn, thread, and fabric	46,911,933	44,451,423	2,460,510
Total	88,378,506	407,508,286	(319,129,780)

lbs raw wool equivalent
Source: USDA, Economic Research Service using U.S. Department of Commerce, Bureau of the Census data, Market Solutions LLC analysis

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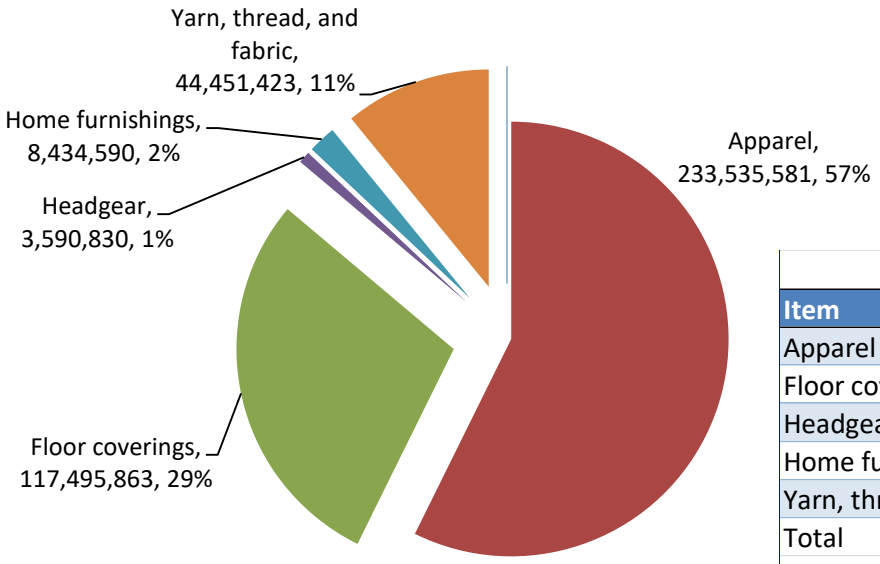
U.S. Wool Textile Imports, 2023

408 million lbs. in raw wool equivalent

- The U.S. imported the equivalent of 408 million lbs. of raw wool though apparel, floor coverings, yarn, thread and fabric, home furnishings, and headgear in 2023. While imports have recovered from 369 million lbs. in 2020, they are still down 20% from 504 million lbs. in 2018.
- **In considering a strategy to rebuild the U.S. market for American wool, it is important to consider that using American wool in only one percent of these imports would potentially double domestic commercial wool use.**



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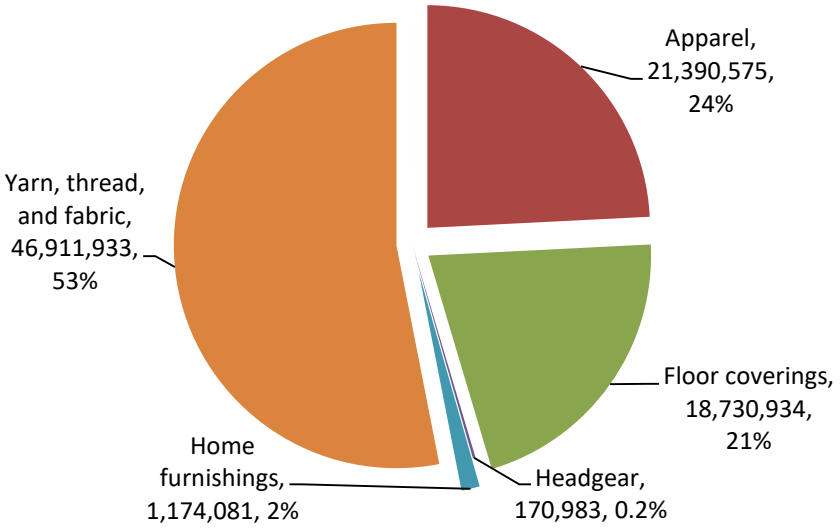
Total	407,508,286
lbs raw wool equivalent	
Source: USDA, Economic Research Service using U.S. Department of Commerce, Bureau of the Census data, Market Solutions LLC analysis	

U.S. Wool Textile Exports, 2023

88 million lbs. in raw wool equivalent

- The U.S. exports the equivalent of 88 million lbs. in raw wool equivalent of yarns, threads and fabric, apparel, floor coverings, home furnishings and headgear, as seen below.
- Some of these exports represent raw materials to produce apparel, home furnishings and headgear items that are then imported by the U.S. under free trade agreements. The agreements often require Made in USA or local yarn, thread and fabric to benefit from agreement preferences.
- **This is a growth opportunity for domestic use of American wool, that can potentially be supported using export promotion funding resources that the American Wool Council receives from USDA's Foreign Agricultural Service (FAS) under various programs, including new RAPP funding.**



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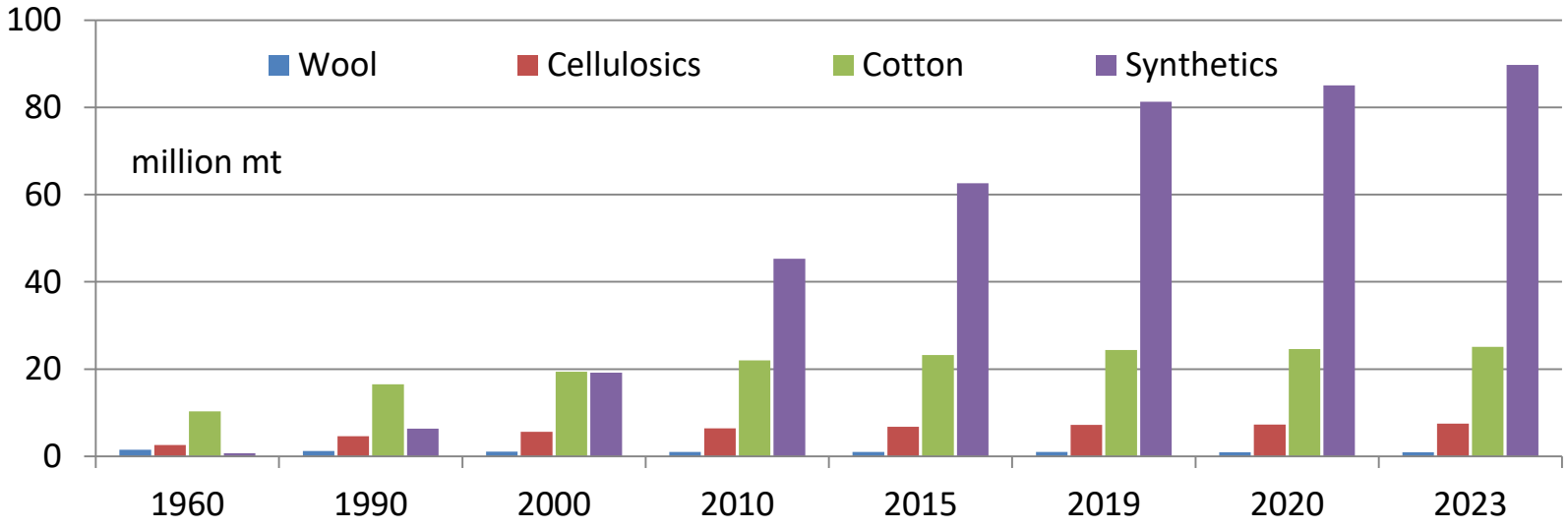
lbs raw wool equivalent Source: USDA, Economic Research Service using U.S. Department of Commerce, Bureau of the Census data, Market Solutions LLC analysis	

World Textile Fiber Use and Fashion Industry Yarn, Textile and Apparel Supply Chains:

Perspectives on Market Opportunities and Competition

World Consumption of Wool and Other Major Textile Fibers

- **Global wool fiber consumption fell by one third from 1.5 million metric tons (mmt) in 1960, to 1.0 mmt in 2010, as use of cotton doubled, use of cellulosic fibers almost tripled and use of synthetic fibers increased 64 times.**
- **Wool consumption remained stable through 2019, and with COVID, dropped another 10% in 2020 to .9 mmt (1.984 billion lbs. clean weight) and has remained stable since.**
- During 2020 -2023, use of synthetics increased 4.7 mmt to 89.7 mmt; use of cotton increased .5 mmt to 25.1 mmt; and use of cellulosic fibers increased .2 mmt, to 7.5 mmt.
- The market for wool fiber has not recovered since COVID reduced demand for worsted wool suits, dresses and other office wear. However, **total world textile fiber use has increased by 5.4 mmt since 2020, six times total wool fiber use. This suggests potential demand to be developed for wool in new applications discussed in more detail in this report.**



Sources: CIRFS, The Woolmark Company, ICAC, Fibre Organon, Market Solutions LLC analysis

Volatile U.S. Markets for Yarn, Textiles and Apparel

- Over the period from 2013 to 2019, **U.S. apparel imports** grew about 1% annually, from $80.4 billion to $86 billion. With the arrival of COVID-19, imports fell 20% in 2020, to the lowest level since 2011. They then **jumped to $99.9 billion in 2022,** the highest level ever recorded, before dropping again in 2023.
- The U.S. imported apparel valued at $79.3 billion during 2023, below the level of imports ten years earlier, but still making it the largest single country importer of yarns, textiles and apparel worldwide. China and Vietnam together accounted for 39% of these imports.
- In 2024, Congress asked the U.S. International Trade Commission (USITC) to examine development in textile and apparel manufacturing in other Asian countries, including Bangladesh, India, Indonesia, Cambodia and Pakistan, which together supplied more than $20 billion in U.S. apparel imports. Mexico, Honduras and Italy rounded out the top ten suppliers of U.S. apparel imports in 2023 (USITC, 2024).
- Prior to the pandemic, the USITC produced a working paper entitled, **"Is the U.S. Textile and Apparel Industry on the Road to Recovery?"** The 2018 report indicated that U.S. and foreign-owned textile firms appeared to be investing in the United States to increase existing domestic capacity or add new manufacturing, and that in the apparel industry, some limited re-shoring of textile and apparel production appeared to be taking place.
- A number of **case examples of new investments were provided**. Factors linked to attracting new investments included benefits of lower energy prices compared to Asian markets and potential to increase productivity using automation. These reportedly helped to offset much higher U.S. labor costs**. State economic development grants linked to job creation and support for training and maintenance in South Carolina, North Carolina, Georgia and Arkansas was mentioned as encouraging these private investments.**
- Rules of origin in various **U.S. Free Trade Agreements (FTAs) often include a "yarn forward" requirement** that yarn and fabric used to produce apparel given duty free access to the U.S. have to be manufactured in the U.S. or the partner country. The USITC report found that the **FTA yarn forward rule meant that 74% of U.S. textile export value was to Western Hemisphere FTA partners in the year before the report**. Prior to COVID, 21% of retailers and brands responding to the 2017 U.S. Fashion Industry Association (USFIA) benchmarking study indicated plans to increase U.S. sourcing during 2018-19, while 10% suggested that they might further decrease U.S. sourcing.
- Such opportunities continue to influence investments in the U.S. For example, in October, 2024, a California spinning company was purchased by a Korean company which announced that the purchase would allow it to supply yarn to Central American manufacturing facilities to take advantage of benefits of the Central America – Dominican Republic Free Trade Agreement (CAFTA-DR).

U.S. Fashion Industry Perspectives and Sourcing of Yarns, Textiles and Apparel

- The U.S. Fashion Industry Association (USFIA) 2024 Fashion Industry Benchmarking Study found that after several years of volatility, major fashion retailers, brands and importers based in the U.S. are looking at a variety of ways to diversify their global sourcing in Asia, the Western Hemisphere and the U.S.
- Among the **top five business challenges reported by Fashion companies in 2024**, the U.S. economic outlook, and concern with forced labor in their supply chains remained the top two concerns, while shipping delays and supply chain disruptions; managing political risks related to sourcing; and concern with a protectionist U.S. trade policy agenda rounded out the top five concerns, all more important than in 2023.
- **Fashion company sourcing is highly diversified**. Almost all Fashion Industry companies with more than 1,000 employees sourced from at least ten different countries in 2024. Survey findings indicate that the fashion industry sourced from more countries than previously during 2024, and nearly 80 percent plan to continue to source from the same number or more countries through 2026.
- More than **90 percent of respondents said they are "making more effort to map and understand their supply chains, including the sources of fibers and yarns contained in their finished products**," This was a jump from only 40 percent in previous years. About 45 percent said they are "actively exploring sourcing destinations beyond Asia…"
- Sourcing from China remains important. All respondents still source some products from China, but a record 43 percent of survey respondents said they sourced less than 10 percent of their apparel products from China in 2024. Sixty percent say they no longer use China as their top supplier, compared to 25-30 percent before the pandemic. Nearly 80 percent said they plan to reduce their China sourcing further over the next two years through 2026.
- The survey found increased sourcing from developing Asia and the Western Hemisphere with the biggest increase in respondents sourcing from India; and Guatemala, Mexico and Egypt entering the top 10 sources of supply.
- **More than half of Fashion companies surveyed plan to expand sourcing from members of the Central America – Dominican Republic Free Trade Agreement (CAFTA-DR) over the next two years. However, three out of four said that "lack of sufficient access to textile raw materials" including wool, is a bottleneck, that usually limits manufacturing in the Western Hemisphere, including the U.S..**
- **Since the U.S. Mexico Canada Trade Agreement (USMCA) replaced NAFTA in 2020, 65 percent of Fashion Industry respondents reported sourcing from Mexico and Canada, up from 40 percent in 2019-2020.**

U.S. Fashion Industry Sources of Imported Apparel

- Sourcing from China remains important. All respondents still source some products from China, but a record 43 percent of survey respondents said they sourced less than 10 percent of their apparel products from China in 2024. Sixty percent say they no longer use China as their top supplier, compared to 25-30 percent before the pandemic. Nearly 80 percent said they plan to reduce their China sourcing further over the next two years through 2026.
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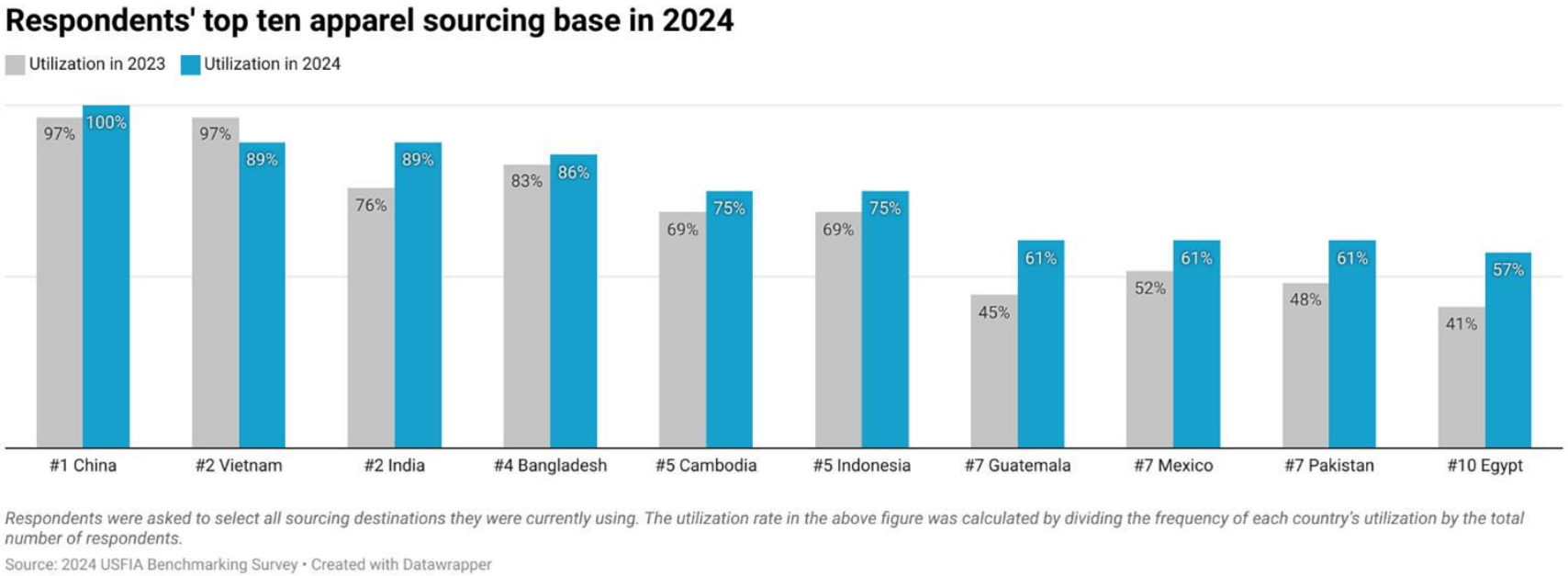

Respondents were asked to select all sourcing destinations they were currently using. The utilization rate in the above figure was calculated by dividing the frequency of each country's utilization by the total number of respondents.

Source: 2024 USFIA Benchmarking Survey • Created with Datawrapper

U.S. and Western Hemisphere Sourcing for Fashion Brands' Yarns, Textiles and Apparel

- Fashion company sourcing practices mean that **a strategy to rebuild the U.S. market for American wool can potentially succeed by capturing targeted niche opportunities in the domestic market, and for products featuring American wool, yarns and textiles in products manufactured in international markets.**
- **Four out of ten fashion companies surveyed in 2024 report sourcing 1 to 10 percent of their apparel from the United States,** while almost six out of ten say they do not source from the U.S. **The U.S. is a yarn source for almost one third of those surveyed, and a fabric source for 15%, down from 24% in 2023.**
- **Among Fashion companies surveyed, 9% expect to increase their USA sourcing over the next two years, while 4% expect it to decrease**. More than half expect to increase CAFTA-DR sourcing and one in four expects to increase Mexico sourcing through 2026.
- In 2024, fashion companies were asked to rate the strengths and weaknesses of the U.S. and other sourcing origins on eight factors using a five point scale. **The U.S. is top rated on speed to market, minimum required order quantities, risk of labor and social compliance; environmental compliance and geopolitical risk. It is rated average on flexibility and agility, and weakest on sourcing cost and vertical integration.**
- Although China is rated most highly on vertical integration, sourcing cost and flexibility and agility, it is rated lowest based on threats from geopolitical, labor and environmental risks. Fashion companies report that as a result of concern over trade tensions with China, they plan to sharply reduce China sourcing to reduce risk, while shifting to other Asian suppliers. However other Asian countries are highly dependent on China for the yarn and fabric they use.
- For example, **Vietnam, the second largest U.S. supplier to U.S. fashion companies, relied on imports from China for 70% of the textiles and 66% percent of the yarns it used in 2022. This is similar to other Asian markets.**
- **Vietnam imports almost 10,000 mt of wool top from China each year. With two new wool spinning plants slated to open in 2025, this demand could double**. Australian wool producers have recently been exploring potential to ship scoured wool or top to Vietnam for spinning and textile manufacturing to help reduce that dependence.

Strengths and Weaknesses of the U.S. vs Other Suppliers of Imported Apparel

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Region	Sourcing destination	Speed to market	Sourcing cost	Flexibility and agility	Minimum order quantity (MOQ)	Vertical integration	Risk of labor and social compliance	Risk of environmental compliance	Geopolitical risk
Western Hemisphere	USA	4.0	1.5	3.0	4.0	2.5	4.0	4.0	4.0
	Mexico	4.0	3.0	3.5	3.0	3.0	3.0	3.0	3.0
	CAFTA-DR	4.0	3.5	3.0	2.5	3.0	3.0	3.0	3.5
	Colombia	3.5	3.0	3.0	3.5	3.5	3.0	3.0	3.5
Asia	China	3.5	4.0	4.0	3.5	4.5	2.0	2.0	1.5
	Vietnam	3.0	3.5	3.5	3.0	3.0	3.0	3.0	3.0
	Bangladesh	2.0	4.0	3.0	2.5	3.0	2.5	2.5	3.0
	Indonesia	2.5	3.5	3.5	3.0	2.5	3.0	2.5	3.5
	India	2.5	3.5	3.5	3.0	4.0	2.5	2.5	3.5
	Sri Lanka	2.0	3.5	3.5	3.0	2.5	3.0	3.0	3.5
	Cambodia	2.5	3.5	3.0	2.5	2.5	2.5	2.5	3.0
Rest of the world	Europe	3.5	2.0	3.0	3.5	3.0	4.0	4.0	4.0
	Türkiye	3.0	3.0	3.5	3.0	4.0	3.0	3.0	3.0
	AGOA	1.5	4.0	2.5	2.5	1.5	3.0	2.5	3.0
	Egypt	3.0	4.0	3.0	2.5	3.0	3.0	3.0	3.0

Note: The figures in the table reflect respondents' average rating for each country on a scale of 1 (much lower performance than the average) to 5 (much higher performance than the average). In the table, ● means strength as a sourcing base (rating score between 5.0-4.0); ▲ means average performance (rating score between 3.0-3.9); ◆ means weakness as a sourcing base (rating score between 1.0-2.9). However, the results do NOT reflect the author's evaluation of each country's competitiveness.

Source: USFIA 2024 Benchmark Survey

World Production of Wool and Other Fibers

- Globally, wool production was 1.1 million metric tons in 2023, accounting for 3.4% of natural fiber production and .94% of total fiber production including synthetics. The chart below shows a breakdown of different available fibers.

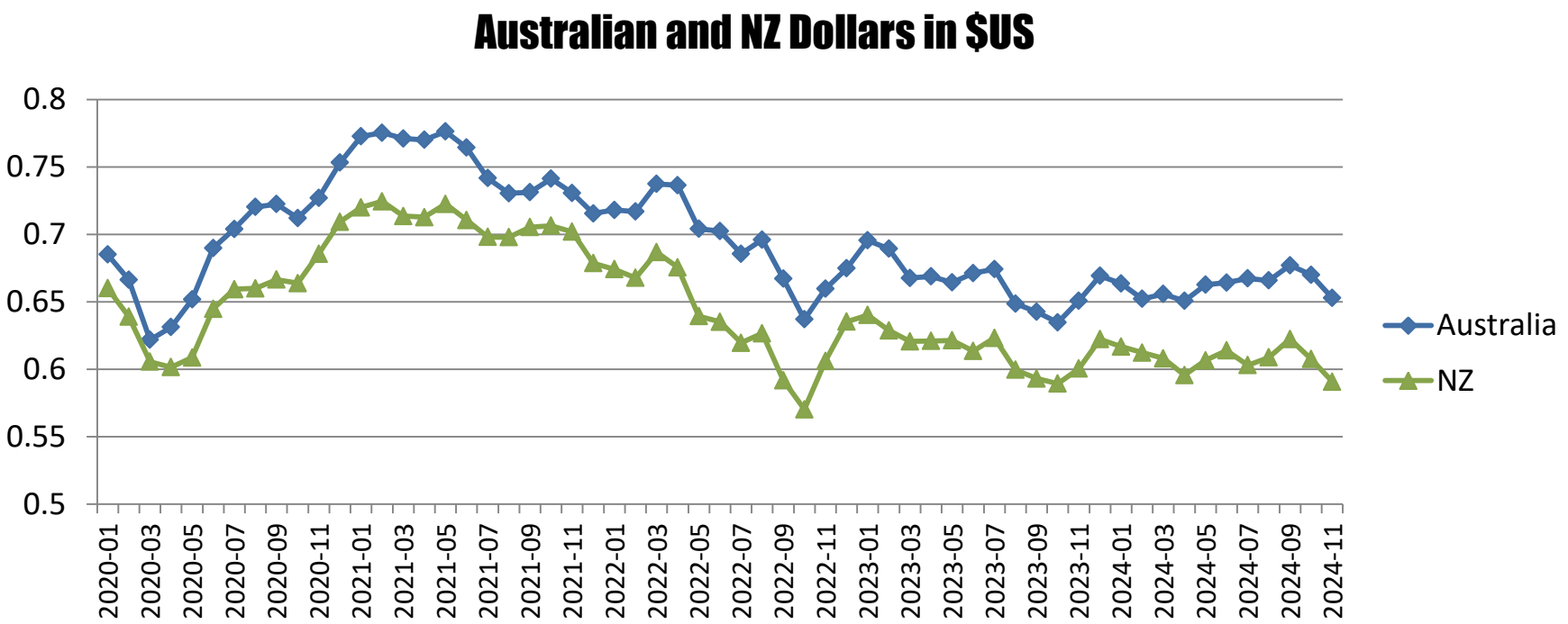
World Fibre Production December 2024	2021	2022	2023, pre. Metric Tonnes	Pct of total fibres in 2023	Pct of natural fibres in 2023	2024, for.
Abaca	83.700	76.900	62.000	0,05%	0,2%	58.000
Agave Fibres	40.656	40.639	41.000	0,04%	0,1%	41.000
Coir, without pith	1.099.000	1.105.700	1.136.000	1,01%	3,6%	1.166.000
Cotton Lint	24.931.417	25.295.014	24.609.188	21,78%	78,1%	25.295.014
Other Fibre Crops, raw, n.e.c.	572.945	554.146	622.000	0,55%	2,0%	583.000
Flax, Long Fibre	180.000	152.000	140.000	0,12%	0,4%	140.000
True Hemp, raw or retted	274.894	247.073	267.000	0,24%	0,8%	287.000
Jute, Kenaf & Allied Fibres	3.264.500	3.349.000	3.050.000	2,70%	9,7%	2.818.000
Kapok fibre	75.472	77.000	76.000	0,07%	0,2%	76.000
Ramie, raw or retted	8.166	7.625	8.000	0,01%	0,0%	8.000
Sisal, Henequen and similar hard fibers	297.400	276.000	286.000	0,25%	0,9%	272.000
Silk, raw	86.311	91.319	93.986	0,08%	0,3%	96.000
Wool, clean	1.036.000	1.059.730	1.060.908	0,94%	3,4%	1.045.606
Other animal fibres, dehaired	23.000	24.000	23.000	0,02%	0,1%	23.000
Total Natural Fibers	31.973.461	32.400.000	31.500.000	27,88%	100,0%	31.900.000
Cellulosic	7.155.000	7.195.000	7.576.000	6,7%		
Synthetics:	73.079.000	72.444.000	73.897.000	65,4%		
Polyester	60.369.000	59.769.000	60.854.000	53,9%		
Polyamide (includes Nylon)	6.035.000	6.065.000	6.368.000	5,6%		
Acrylic	1.345.000	1.325.000	1.259.000	1,1%		
Polyproylene	3.885.000	3.850.000	3.966.000	3,5%		
Other Synthetic	1.445.000	1.435.000	1.450.000	1,3%		
Synthetic Filament	53.029.000	52.684.000	53.787.000	47,6%		
Synthetic Staple	20.050.000	19.760.000	20.101.000	17,8%		
Total Manmade Fibers	80.234.000	79.639.000	81.473.000	72,1%		
Total Fiber Production	112.207.461	112.039.000	112.973.000	100,0%		

Discover Natural Fibres Initiative DNFI.org

Source: Discover Natural Fibers Initiative December, 2024

Exchange Rates Affect American Wool Competitiveness vs Australia and New Zealand

- A stronger U.S. dollar means that a given wool price in Australian and New Zealand dollars is worth less in U.S. dollars.($US). This provides and incentive to use imports from Australia or New Zealand rather than American wool, or requires a lower $U.S. price to make American wool competitive for purchase by customers in the U.S. or internationally.

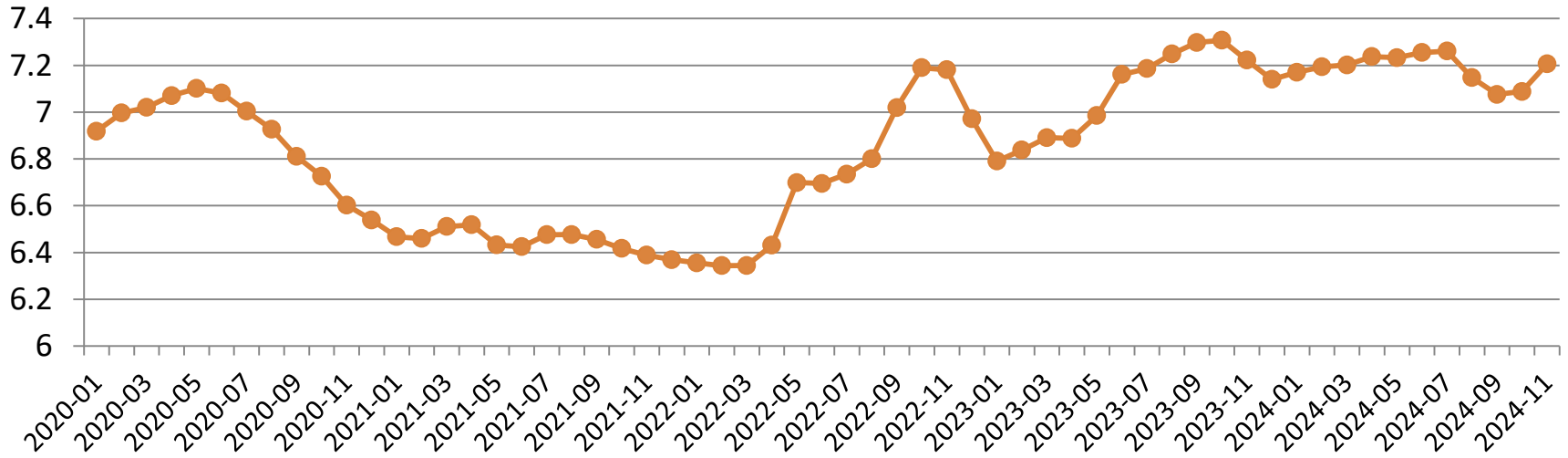


Source: Fed Reserve of NY Exchange Rate data, Market Solutions LLC analysis

Exchange Rates and Trade Conflicts Affect China Trade

- A stronger U.S. dollar means that a given $US wool price, Chinese buyers have to pay more in Chinese currency (RMB) than they did when the U.S. dollar($US) was weaker. The stronger $US also makes imported goods from China cost less in $US.
- One experience during the last trade conflict with China was that China allowed its currency to weaken (more RMB per $US) to offset some of the increased cost of tariffs on goods imported from China.
- While China also imposed tariffs on imports from the U.S., these were sometimes waived. Nonetheless, U.S. wool exports fell sharply due to the combination of the trade conflict and the economic slowdown caused by the pandemic.
- **One lesson learned by U.S. agriculture during the last trade conflict was that China has further diversified its suppliers to make it less vulnerable to tariffs and other actions. This makes it important for all U.S. exporters to develop strategies to reduce risks by developing other markets and customers both at home and abroad.**

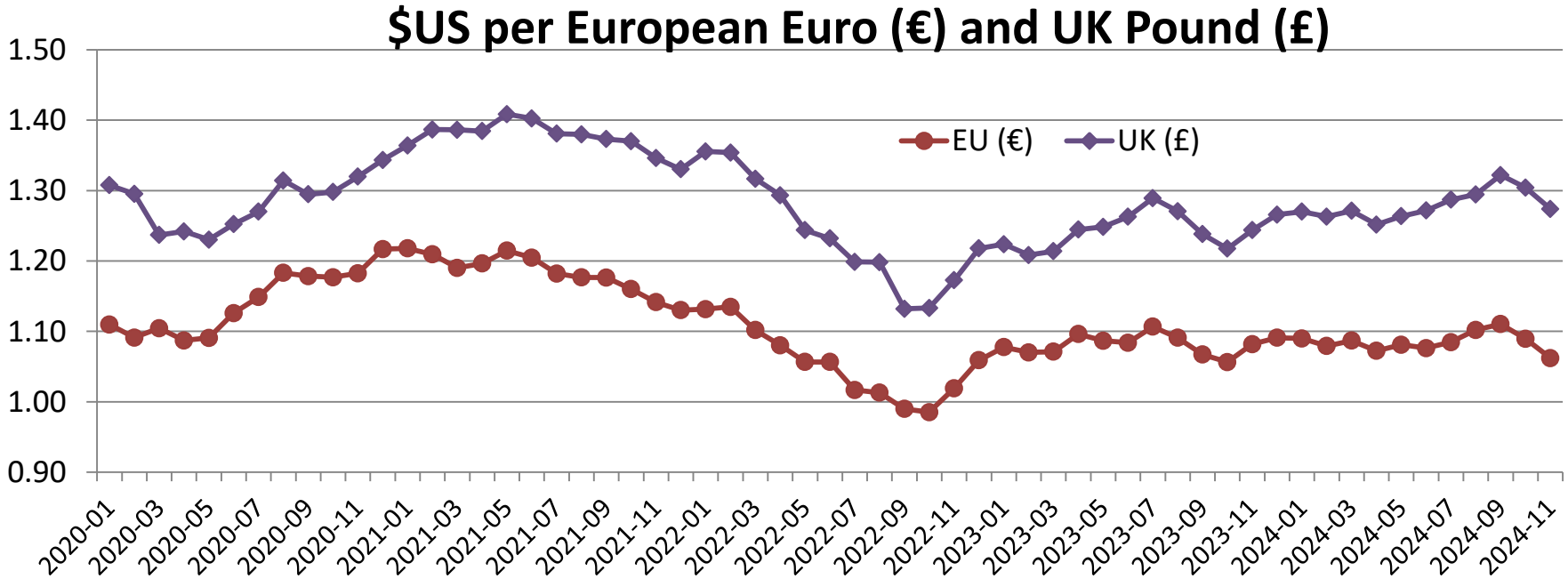
Chinese RMB per $US 1



Source: Fed Reserve of NY Exchange Rate data, Market Solutions LLC analysis

Exchange Rates Affect European Union (EU) and United Kingdom (UK) Sales and Purchases

- A stronger U.S. dollar means that at a given $US wool price, European buyers have to pay more in Euros (€) and UK buyers pay more in pounds (£) than they did when the U.S. dollar($US) was weaker.
- Likewise, American imports from the EU and UK cost less when the $US is stronger. Tariffs have the potential to help offset this advantage, though the EU has a track record of targeting U.S. agriculture for retaliatory tariffs as well.



Source: Fed Reserve of NY Exchange Rate data, Market Solutions LLC analysis

First Stage Wool Processing

First Stage Wool Processing in the U.S.

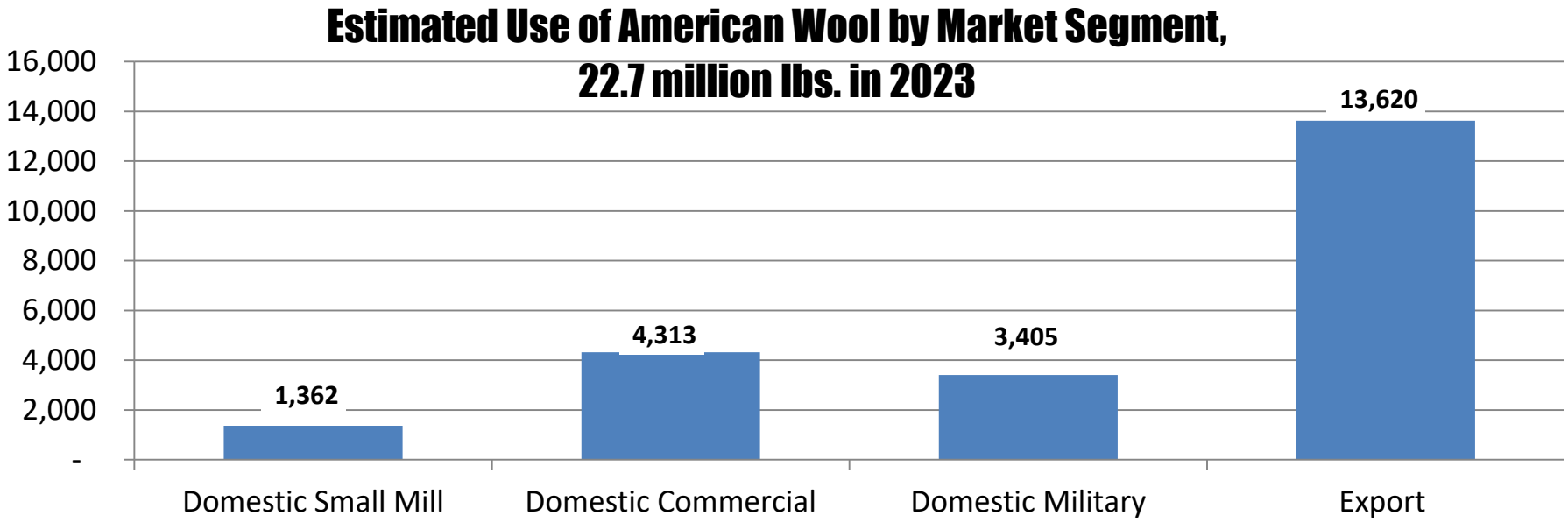
- While U.S. wool production declined slightly to 22.7 million lbs. on a greasy wool basis in 2023, there have also been declines on the demand side. The COVID pandemic changed demand for suits and dress clothes using wool. It also contributed to new demand for "local" and "sustainable" fashion and outdoor, active wear and other apparel and products where wool is an attractive option. The pandemic also disrupted international supply chains, increasing interest in domestic fiber, yarn, and textile use and U.S. manufacturing.
- *After Chargeurs (40,000 lbs./day, 10 million lbs. annual capacity) and Bollman (17,000 lbs./day, 4 million lbs. year capacity), it appears that the next largest first stage processors may be Mountain Meadow, that handles 60,000 lbs. per year (and hopes to double that), making it "the largest wool mill in the West" and the new in 2023 Clean Fleece NY facility (700 lbs./week, 35,000 lbs. annual capacity). Based on ASI survey finding and its estimate that small mills with limited scouring capacity account for 6% of wool use, that would be 1.4 million lbs. scoured in 2023, and probably 1.5-2 million lbs. total annual capacity. This suggests 15-16 million lbs. total annual U.S. scouring capacity, with somewhat less top making capacity.*
- **U.S. first stage wool processing capacity is often under used and operating below capacity.** This leads to increased costs of scouring, top making, yarn, spinning and textile manufacturing. With a number of recent spinning plant closures, and changes in yarn, textile and apparel manufacturer ownership, declining demand presents a threat to businesses that remain. Some might also represent potential opportunities that lead to new investment and can help rebuild demand.
- Market Solutions LLC has examined **scouring costs of small, medium and large mills. While transportation costs of getting raw wool to large facilities are high, these often are more than offset by lower operating costs**. **At the same time, large scale, scouring costs in the US are higher than those available internationally. This has continued to limit the international competitiveness of clean U.S. wool and top on international markets, limiting exports to greasy wool.** This in turn limits the ability to sell American wool and top to international spinners and textile manufacturers, and makes it more difficult to build an American wool brand with designers, apparel and home goods manufacturers.
- **In a world of fast fashion, one competitive advantage of American wool is likely to be in a premium niche based on using "local" fiber, yarns, textiles and apparel.** In a world where transportation of fiber, yarns, textiles, garment manufacturing and retail distribution are reported to contribute to "25,000 mile sport coats" from farm to consumer, some of the domestic transportation that is required to "Make in America" is still considered preferable to imports by some buyers.
- At the same time "Local" and "Made in USA" currently mean widely different things to different players along the supply chain. Even products labeled as “wool” use a surprising array of blends. Unlike food regulations requiring that ingredients be listed in order of use, we found examples of “Made in USA Wool Socks” with only 15% wool, competing at much lower price points with socks made with 100% American wool.

Current U.S. Scouring and Top Making Capacity

- The U.S. currently has one remaining large scale commercial scouring, carding, combing, top making facility, Chargeurs (USA) in Jamestown, SC and one large scale scourer, Bollman Industries in San Angelo, TX.
- Chargeurs reports that it is capable of scouring 40,000 lbs. of greasy wool per day, with 10 million lbs. in annual capacity.
- Bollman is capable of scouring 17,000 lbs. of greasy wool per day, with 4 million lbs. annual scouring capacity. At one time, they scoured 9 million lbs. annually.
- Among medium size first stage processors, Mountain Meadow Wool in Buffalo, WY, claims to be "the largest wool mill in the West." They currently scour 60,000 lbs. per year, with plans to double that capacity, to 120,000 lbs. annually. They also scour for some smaller mills, and assemble and send some wool for scouring and top making at larger processors.
- Clean Fleece New York, opened in 2023, is the newest medium sized scouring mill in the country. Its new Kiwi Scour equipment is able to scour 700 lbs. of greasy wool per week in 2 shifts, or about 35,000 lbs. per year. After their first year of operation they are looking at options for expanding their capacity to be able to meet the demand they already have. Their customers are also sending greasy wool for scouring and purchasing wool top from large commercial processors.
- ASI has developed a list of about 100 small and medium first stage wool processors nationwide. More than eight out of ten of these offer wool scouring and carding services to customers. One fourth to one half offer spinning, dyeing and/or felting according to findings of an ASI survey. Most are relatively small, but on average they report processing almost 14,000 lbs. of greasy wool each, suggesting total capacity of 1.5 to 2 million lbs. annually.

First Stage Processing: Some Threats

- Based on ASI estimates of American wool usage by market segment, about 9.1 million lbs. of greasy wool would need to be scoured domestically in 2023 in order to meet domestic commercial and military market requirements and the needs of domestic small mills.
- *Processors and exporters interviewed indicate that there is sufficient large scale processing capacity to scour the available American wool clip. However, costs are higher than available internationally. Import tariffs in export destination countries may also favor greasy wool exports over exports of scoured wool, top, yarn or fabrics.*
- ***Nonetheless, key players interviewed along the wool supply chain point to the high level of risk involved in the current situation for commercial scouring and top making in the U.S. Both are operating sharply below capacity and likely below the volumes required for sustainable profitability. The owners of both processors have other options to meet the needs of their other businesses. Bollman Industries no longer makes felt for its hats in the U.S. Chargeurs has other scouring and top making facilities that are more modern and cost effective to operate. Without them, worsted spinners and textile manufacturers would not be able to supply the Berry Amendment military business or other U.S. commercial businesses.***
- **Larger volumes and investments in plant and equipment upgrades could potentially help make American wool more competitive for yarn, fabric and home goods manufactured in the U.S. and for exports of scoured wool or top.**



000 lbs. greasy wool basis

Source: USDA data and ASI share estimates, 2024

AMERICAN WOOL™

Market Solutions LLC
Insight for Action

First Stage Processing Options for the U.S.

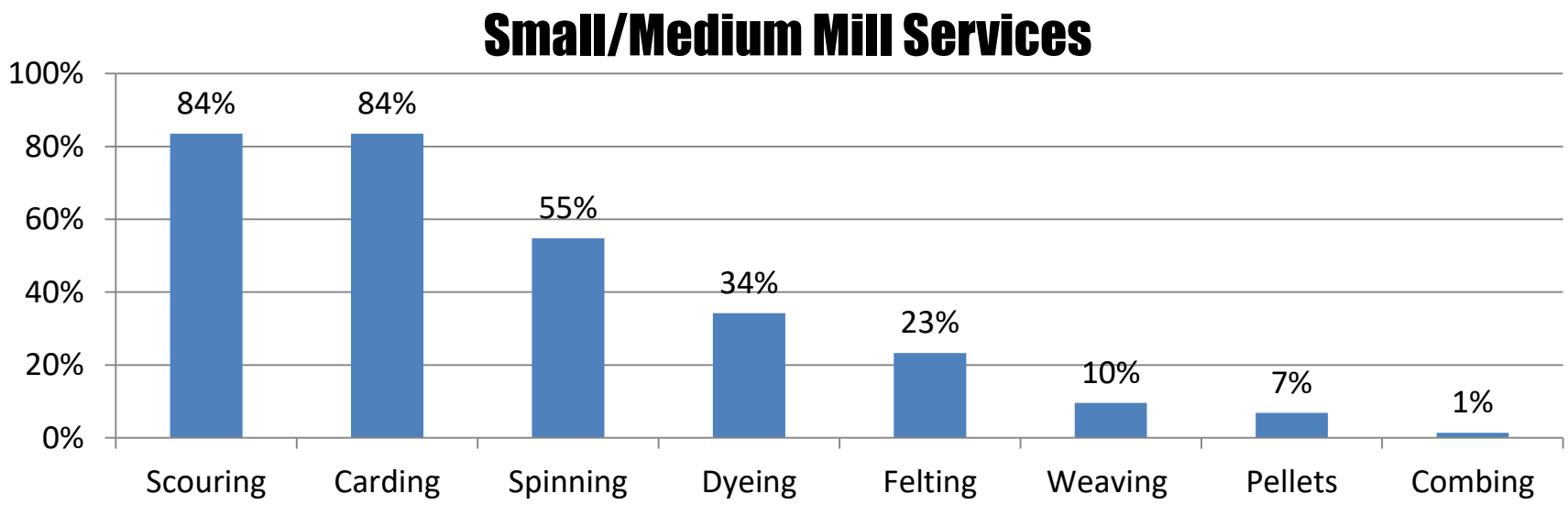
- With 15-16 million lbs. total scouring capacity and 22 million lbs. of greasy wool shorn in the U.S. in 2023, this is more capacity than required given recent export levels. If the market for scoured wool and top in the U.S. and international markets can be expanded, Chargeurs and Bollman could potentially work additional days and shifts to expand their capacity. Bollman has scoured as much as 9 million lbs. in a year previously.
- **Both Bollman and Chargeurs indicate that they are working below capacity. This complicates the case for exploring construction of any new large scale scouring or top making facility. It also underscores the potential serious risk to the industry if either Chargeurs or Bollman were to stop operating.**
- Scouring cost at smaller facilities is $4 - $8 per lb greasy wool weight or higher, more than 10 times Bollman's scouring cost for 1,000 lb minimum. This is a factor of the technology being used and scouring small lots. For small and medium sized mills that are integrated forward to spinning, knitting and weaving, Market Solutions LLC found that scouring often remains a bottleneck. While many offer custom scouring to producers, there is often a 4-12 month lead time to return scoured wool. Some small mills send wool to medium sized mills or consolidate with others to ship to the large commercial facilities.
- **With U.S. scouring, top making, spinning and textile mills operating below capacity, high fixed costs must be covered by smaller volumes, and average costs are higher than they would be with more demand. This potentially threatens the continued viability of the remaining operations, meaning that doing nothing to rebuild domestic demand is potentially high cost to wool producers.** Some U.S. spinners, textile and apparel manufacturers report that challenges from *de minimus* tariff exemptions on fast fashion imports make this problem even worse.
- Part of ASI/AWC's **"Action Plan to Rebuild the Market for American Wool"** will need to **focus on working with Brands, Retailers and Manufacturers to increase the pull of demand for American wool through the system.** While Climate Beneficial, RWS, Nativa Regen and AWA have developed some partnerships with major brands in the U.S., they appear to be most successful with smaller premium niche designers and maker brands.
- The **growing number of small scouring plants/ mini mills and some plant closures.** These are able to process small lots, especially for woolen fiber and yarns. Costs are very high however. Some smaller mills are looking to medium sized regional mills for first stage processing. This allows some medium sized mills to increase volume and lower average processing cost. At the same time, for several medium sized mills, even with transportation costs, it has made economic sense to ship several truck loads of greasy wool per year to Chargeurs for scouring, carding and combing to return top for blending and use in their worsted spinning and knitting business, rather than scouring, combing and carding everything in their own facility.

Importance of Small and Medium Mills As First Stage Wool Processors

- ASI/AWC conducted a survey of 113 small and medium sized mills during 2023 in preparation for this assignment. Responses were received from 72 mills, 65% of those surveyed. This includes 86% of the medium sized mills and 61% of the smaller mills included in AWC's directory, available online.
- On average, respondents reported using 13,794 lbs. of greasy wool annually. If this applies to all of those surveyed, then a total of 1.559 million lbs. of greasy wool, or 7% of the total annual clip was processed by small and medium mills. This is slightly larger than the 6% share that ASI has estimated previously.
- Among mills responding to ASI's survey that scour wool, more than eight out of ten scour less than 10,000 lbs annually on a greasy basis. Almost 10% scour 10-50,000 lbs annually, with the balance scouring more than 50,000,00 lbs. (Heather Pearce, 2024).
- As seen on the following charts, small and medium mills are most likely to provide wool scouring and carding for their own use and as service providers to others. Spinning yarn, dyeing and felting are provided by one fourth to half of these mills.
- **In undertaking this assignment, one question asked was whether small and medium mills could potentially fill the gap left by the decline of large scale commercial wool processing. Market Solutions LLC found that:**
  - Small and medium mills play an important role in providing first stage processing services and market outlets for local sheep producers, and an opportunity to add value to wool and generate income locally.
  - Small and medium mills play an important role in the American wool supply chain. Working with state and local sheep and wool associations, groups like Fibershed, spinning and weaving groups, educational organizations, designers, makers, wholesalers and retailers, they could potentially play a more important role in adding value to American wool.
  - Technical and marketing support can potentially help small and medium mills to grow in volume and profitability. Working with a large number of small and medium mills will be relatively staff and resource intensive, however. As discussed further below, a number of small and medium mills have already been very creative in effectively mobilizing resources to help them invest and grow. Some receive technical support from partnerships with Universities and extension programs.
  - **Realistically, small and medium mills can only be one part of a solution for rebuilding the market for American wool. Based on the average amount of greasy wool scoured by the small and medium sized mills surveyed, it would take over 1,600 mills to scour the recent annual U.S. wool clip.**

Services Provided by Small and Medium Mills

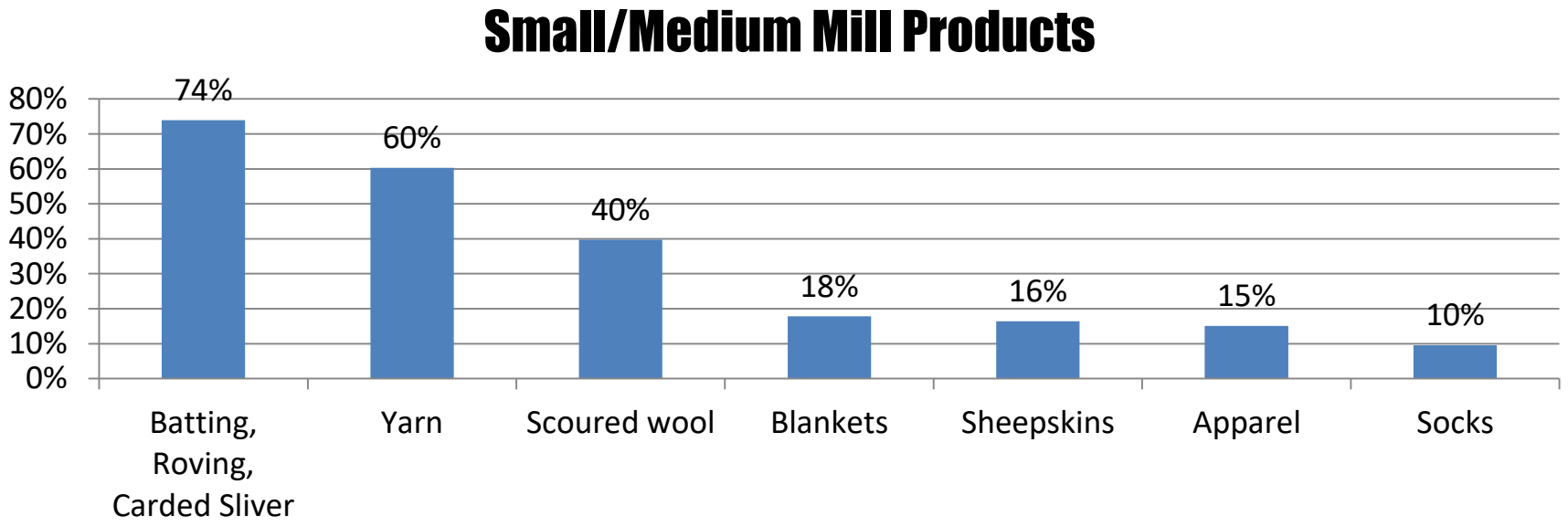
- Based on ASI/AWC's 2023 survey of small and medium fiber mills, 84% scouring and/or carding services.
  - More than half provide spinning.
  - One third provide dyeing.
  - One in four provide felting.
  - One in ten provides weaving.
  - Pelletizing wool for fertilizer is offered by 7% of those surveyed.
  - Only one reports providing combing, though several report pin drafting for semi-worsted yarns.



Source: ASI/AWC Small and Medium Mill Survey data, 2023

Products Sold by Small and Medium Mills

- While ASI's survey found that 84% of small and medium mills surveyed scour wool as a service, only 40% of them actually sell scoured wool. The majority sell carded wool products and/or yarn.
  - Three out of four sell batting, rovings or carded sliver.
  - Six out of ten sell yarn.
  - Fewer than one out of five report selling other value-added products, such as blankets, sheepskins, apparel and/or socks.



Source: ASI/AWC Small and Medium Mill Survey, 2023

Key Findings from Small and Medium Mills

- Market Solutions LLC explored developments in first stage processing and other services provided by a sample of small and medium sized mills included in ASI's directory through a combination of interviews, visits and other research. We have also taken advantage of ASI's survey findings. Key findings related to the impact and potential of small and medium sized mills as sources of first stage wool processing include:
  - Local and regional markets and the wool industry benefits from the 80-90 small and medium sized mills that offer custom scouring and carding services.
  - While many mills offer custom processing for a single fleece, or minimum quantities of 50 to 100 lbs., ASI's survey found that on average nationwide, mills scour close to 2,000 fleeces annually. Many mills scour significantly less, and a few mills scour the equivalent of 10-12,000 fleeces annually.
  - Interviews and other research findings suggest that scouring is a bottleneck for many small and medium mills. The time between delivery of fleeces for scouring and delivery of scoured wool or combed products is often reported as 4 to 18 months with a 12 month turnaround time fairly common.
  - Scouring costs at small and medium sized mills are generally high, in part because it is labor intensive to scour in small lots, and also due to limitations on equipment. Because wool yields vary widely, pricing is generally based on the weight of greasy wool received. Those seeking services are encouraged to skirt fleeces carefully before shipping to reduce cost and get a better product.
  - Custom scouring cost per lb. of greasy wool varies widely, with most in the $5-8 per lb. range, and the lowest being about $4 per lb. and the highest as much as $16 per lb. Some mills price scouring in combination with carding, spinning and other services, and in addition, charge hourly for time spent skirting and picking, and for fleeces requiring extra washing.
  - As a result, some smaller mills look to medium and large scale commercial mills to provide scouring and/or top making, so that they have the clean wool or top needed to meet demand for their spinning, dyeing and other services.

Key Findings from Small and Medium Mills

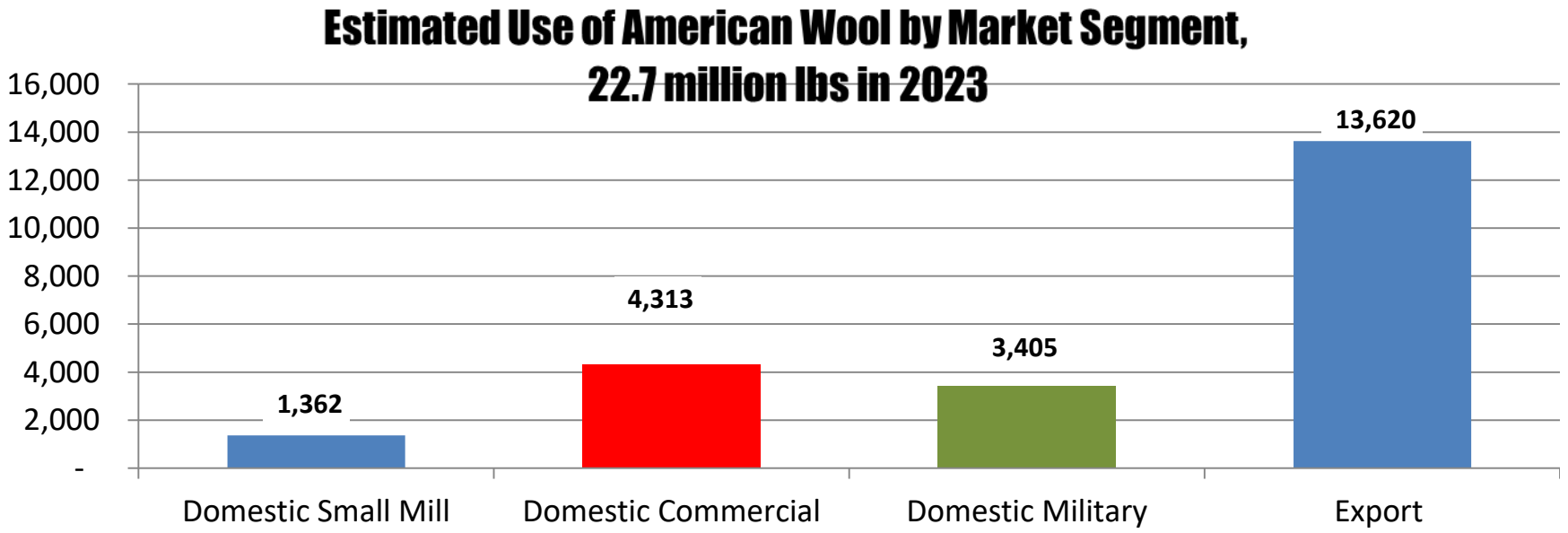
- **Transportation costs** are also high for moving small quantities of greasy and scoured wool to and from the mills. Because commercial scouring and top making costs are much lower, even if not competitive by international standards, it can pay to ship wool across the country and back to small and medium sized mills.
- Transportation costs are much lower when full truckloads (40-45,000 lbs.) can be assembled and shipped to larger commercial facilities in Texas or South Carolina. ASI, Warehouses, Wool Pools and Wool merchants could potentially play a role in **helping to plan and coordinate shipments to achieve lower transportation costs.**
- One of the challenges in making this work is the **wide variation in fleece preparation**, especially from small flocks. In addition to skirting challenges, issues with paint and brands, and with vegetable matter (VM) are frequently mentioned as challenges with sourcing wool regardless of mill size.
- An initial objective in undertaking this assignment was to understand whether small and medium sized mills could potentially provide an alternative to large commercial scouring and top making as part of rebuilding demand for American wool.
  - Small and Medium sized mills play an important role in developing local and regional markets, and are providing a valuable service to producers, and to local spinners, dyers and weavers, often in cooperation with State wool groups, Fibershed projects that help to coordinate communication and create market opportunities.
  - Research findings suggest that nationwide, small and medium mills have the capacity to scour 1.5-2 million lbs. of greasy wool annually. They also add value in other important ways. Some of their value added activities benefit from services provided and sourcing from large commercial mills, so that the have the quantities and qualities of scoured wool they need to both blend and operate at cost effective volumes.
- The following provides examples of some of the small and medium mills that play a role in the supply chain for American wool.

Examples of Small & Medium Mills

- Examples of some of the small and medium mills that play a role in the supply chain for American wool:
- Mountain Meadow Wool (WY),
- Crescent Woolen Mills (WI)
- Frankenmuth Woolen Mill (MI)
- Bartlett Yarns Inc (ME)
- Battenkill Fibers Carding & Spinning Mill (NY)
- Clean Fleece NY, an initiative of **Hudson Valley Textile Project**
- Sterling Wool Mill, (PA)
- Bear Creek Felting/Shepherd Industries (ND)
- Coastal Wool Washing (RI)
- Mitchell Wool Co (MI)
- Brown Sheep Company (NE)
- Ewetopia Fiber Mill (WI)
- The Wool Mill, Belgrade (MT)
- The Montana Wool Barn (The Barn) (MT)
- Sugar Loaf Wool Carding Mill LLC (MT)
- Wild Valley Farms (UT)
- Mendocino Wool and Fiber Inc. (CA)
- Blackberry Ridge Woolen Mill (WI)
- Head Spring Fiber Mill (WV)
- Edwards Woolworks (KY)
- New Liberty Wool Pellets (CO)

Commercial and Military Markets for American Wool

- Domestic commercial and military markets use about 8 million lbs. of American wool annually, based on ASI estimates that domestic commercial use accounts for 19% of the American wool clip, and domestic military use is about 15% of the total.
- The project examined examples of domestic commercial and military use of American wool through a combination of interviews and other research on designers, brands and manufacturers featuring American wool in product lines or capsule collections, and with spinners, textiles, apparel and home goods manufacturers.
- To understand the military market, some examples of rules and procurement were examined, along with the supply chain from first stage wool processor to spinners and textile manufacturers.



000 lbs. greasy wool basis
Source: USDA data and ASI share estimates, 2024

Commercial Markets and Opportunities for American Wool

- As discussed above, the U.S. is a net exporter of greasy wool, and also a net exporter of wool yarns. One important potential commercial opportunity is in the market for **American manufactured wool yarns, and potentially textiles, which are exported to cut and sew and knitting operations in countries that have free trade agreements with the United States**. **The terms of trade agreements generally specify that in order to get access to import preferences when garments and other products are imported into the U.S., materials from the yarn forward must originate in the U.S. or the partner country. With competitive world class quality and cost competitive wool scouring and top making, this could potentially become a more important commercial market for American wool.**
- The clothing and household goods market has been seeing an increase in demand and supply of **niche premium clothing and apparel brands**, some featuring American wool, and often focusing on a brand story including social, climate, farm/ranch, animal welfare, and/or labor stories and certifications:
  - In Europe, this began with Brands featuring non-mulesed wool and organic cotton. This has progressed to Certifications and claims such as the Responsible Wool Standard (RWS), Climate Beneficial, Circular economy, Regenerative, and others. Of special interest in promoting American wool is development and expansion of the Shaniko Wool Company brand, which was the first RWS certified wool in the U.S., and now has an exclusive U.S. market licensing agreement with Chargeurs for Nativa Regen.
  - The Textile Exchange and Fibershed have launched efforts including third party verification along the entire supply chain, from farm to consumer, and succeeded in fairly significant, though still small sign-ups along the fiber supply chains for wool, cotton and some other fibers. The Textile Exchange estimates that about 5% of wool sold was accompanied by some sort of certification in 2023. November 2024 market reports from BKB South Africa indicate that **RWS certified wool was sold at a 2.5% to 4.3% premium to non-certified wool.**
  - ASI/AWC launched the American Wool Assurance (AWA) program as an alternative to other certifications. ASI reported that there were 7 Verified or Certified operations by the end of 2023, and 300,000 pounds (greasy) of AWA Verified or Certified wool sold.
  - One major Brand that tried using AWA wool over three years reported that the premiums it was willing to offer were not sufficient to motivate farmers/ranchers to commit to the certified level. Among the small sample of larger growers interviewed, those who adopted AWA have also gotten certified for RWS and/or Climate Beneficial.
  - Merchants and Processors have also developed their own branding and certification programs, such as Nativa Regen from Chargeurs and Authentico from Schneider. In some cases, even before these programs, some growers had developed their own standards for growers selling wool through their programs. For example Pozzi Wool.

Designer, Brand, Maker and Manufacturer Use of American Wool

- ***For all of the certification and verification programs, getting Brands to sign on and offer a consistently available line of products has remained a challenge.***
- ***Both RWS and Fibershed/Climate Beneficial have staff designated to coordinate with designers, Brands, Makers and Manufacturers to get them to commit to featuring wool and other fibers certified by their programs. Some examples are shown below.***
- ***One consistent finding as Market Solutions LLC examined products from featured Brands is that many offer very limited ranges of products featuring the certified or branded wool, and often those that are offered are for a single season or not on a consistent basis. The challenge is to build on these "capsule collections," to expand the range of products offered and get featured wool products to become more regular offerings.***
- Despite important successes in product launches featuring certified wools in the U.S. market, with large wool carryover stocks and a volatile apparel market since 2020, it has been hard to sell all of the American wool with various certifications in the domestic market. This has led to some important export sales as greasy wool, and reported interest in future purchases.
- While brands report interest in American wool and made in USA, most of their manufacturing is still offshore, with a trend toward supporting "ethical manufacturing." in China, Hong Kong, Vietnam and other origins.
- As discussed above, the broader U.S. fashion industry is taking a new look at sourcing and supply chains, and making efforts to diversify sourcing to limit risks. There are broad concerns with geopolitical and trade conflicts, vulnerabilities on labor and environmental issues.
- On-shoring and near-shoring production of yarns, fabrics and apparel products in the U.S., CAFTA-DR, Mexico and Canada is gaining renewed interest. Though this will not replace Asian sourcing, niche opportunities can potentially be stimulated for American wool in top, yarn and textiles, especially if U.S. first stage processing can become more reliable and cost and quality competitive.

Examples of Certification/Traceability Programs

- ASI/AWC launched the **American Wool Assurance (AWA) program** as an alternative to other certifications. ASI reports that there were 7 Verified or Certified operations by the end of 2023, and 300,000 pounds (greasy) of AWA Verified or Certified wool sold (136 mt).
- Certified wools with traceability, such as **RWS and Climate Beneficial wools, or ZQ** from New Zealand or **SUSTAINawool** from Australia represent about 5% of world wool production according to the Textile Exchange, developer of RWS, with 94,000 mt of certified, traceable wool available worldwide (207 million lbs) out of 1.98 mmt of wool available worldwide (4.36 billlion lbs).
- Production of Greasy Wool by Certification Program in 2023 is estimated as:
  - Climate Beneficial 65 mt (143,000 lbs)
  - Responsible Wool Standard (RWS) 79,939 mt (176 million lbs).
  - SustainaWool Green and Gold 8,146 mt (18 million lbs)
  - ZQ+ ZQRX 13,716 mt (30 million lbs)
  - Sustainable Cape Wool Standard (SCWS) 4,887 mt (10.8 million lbs)
- There is some overlap, because both ZQ and ZQRX are also RWS certified. Some SCWS wool is also RWS certified .
- Some U.S. wool growers interviewed report that they are certified in RWS and Climate Beneficial programs.
- Some wool merchants also have their own certification programs. For example NATIVA™ Regenerative Agriculture from Chargeurs Luxury Fibers and Authentico® by Schneider, both of which are attempting to launch in the United States.
- The challenge from the wool grower perspective is how to make it pay to go through the paperwork and other requirements of different programs. On the brand and retailer side, certifications and traceability are ways to reduce risks associated with their supply chains, and also an opportunity to make verifiable claims that some consumers are willing to pay for.
- **The volume of wool certified using various standards is important in that it helps ensure that once a brand or retailer commits to using a certification, there will be adequate wool supplies at competitive prices to meet their needs.**
- **Third party verification or certification along the supply chain is also considered important because it shifts the burden for some potential risks to the Certifying organization and the independent auditors.**
- **As various certification programs are revised and expanded to cover other fibers, it will be useful for the AWC to contribute to the discussions and ensure that U.S. producer perspectives are considered.**

AWA AMERICAN WOOL ASSURANCE

CLIMATE BENEFICIAL™ VERIFIED

RESPONSIBLE WOOL STANDARD R·W·S CERTIFIED

SustainaWOOL™ INTEGRITY SCHEME

AMERICAN WOOL™

Market Solutions LLC
Insight for Action

AWC Promotion of Designers, Brands, Makers and Manufacturers Featuring American Wool

- The American Wool Council features 64 designers, brands, makers and manufacturers of apparel, accessories, home goods, yarn and other products featuring American wool at www.americanwool.org/shop/. The search function on the web site identifies three of these companies using the American Wool Council (AWC) certification mark: Brooklyn Tweed (OR), OmniWool Tactical (Crescent Sock Company, TN) and North Bay Fiber (MI).

MADE IN AMERICA WITH AMERICAN WOOL

- The full list of companies featured (listed in order displayed) also includes Duckworth ranch to apparel makers (MT), Pendleton blankets and apparel (OR, WA), Faribault Mills blankets (MN), WeatherWool outdoors clothing (NJ), Bailey Hat Co., Checkroom made to order coat maker (IL), Frankenmuth Woolen Mill bedding (MI), Ramblers Way apparel (MA), American Woolen Company textiles, apparel and home goods (CT), Wigwam socks (WI), Molly Mutt bedding(CA), DarnTough socks (VT), Kentwool Performance socks (SC), Holy Lamb Organics bedding (WA), Loohoo dryer balls (ME), Voormi outdoors apparel (CO), WeissMade knitwear (CA), Wild Valley Farms wool pellets (UT), Abundant Earth Fiber yarns (TN), Appalachian Baby Design yarns (WV), Bartlett Yarns Inc. (ME, NH), Herd Supply lanolin and soaps (MA), Imperial Yarn (OR), Hoof to Hanger yarn (MI), Janessa Leone hats and apparel (CA), Kestrel Ridge Pellet Co (NE), Lake Superior Woolen Co blankets (MI), Lani's Lana Wool yarn and fabrics (NV,CA), Lindsey Thornburg apparel (NY), Mairin knitwear (MT), Maker's Way Fiber Mill yarn and felt (SD), Medocino Wool and Fiber yarns (CA), Montana Wool blankets (MT), Battenkill Fibers Carding and Spinning yarns (NY), Cece's Wool yarn and bedding (NY), Cestari Sheep and Wool Co yarn (VA), Colorado Wool Co yarns and household goods (CA), Coyuchi bedding (CA), DeFeet socks (NC), Driftless Goods (WI), Fishhook Sock Co. (SD), Freia Fine Handpaint yarns (MA), Full Circle Wool apparel (CA), Get Benz Farm yarns (MN), Green Mountain Spinnery (VT), The Shepherd's Studio fabric and apparel (KS), Woolets wool pellets (WI), Wooltribe apparel (NC), Wool & Pallette yarns, Mountain Meadow wool (WY), New Liberty Wool Pellet (CO), Moorit Hill Farm and Fiber yarns (ME), Red Hill Fiber yarns and apparel (IN), Rodger Family Farm rovings and yarn (OR), Shenandoah Fiber and Mill (VA), Bear Creek Felting (ND), Shepherds's Dream bedding (OR), Skagit Woolen Works rovings (WA), Shepherd's Lamb blankets (NM), and Sonoma Wool Co bedding (CA and MA).
- While there is no search for companies offering certified Climate Beneficial Wool or RWS wool, this is mentioned on some of the individual company web sites. The AWC also offers American Wool Assurance (AWA) program certification which could potentially be featured.

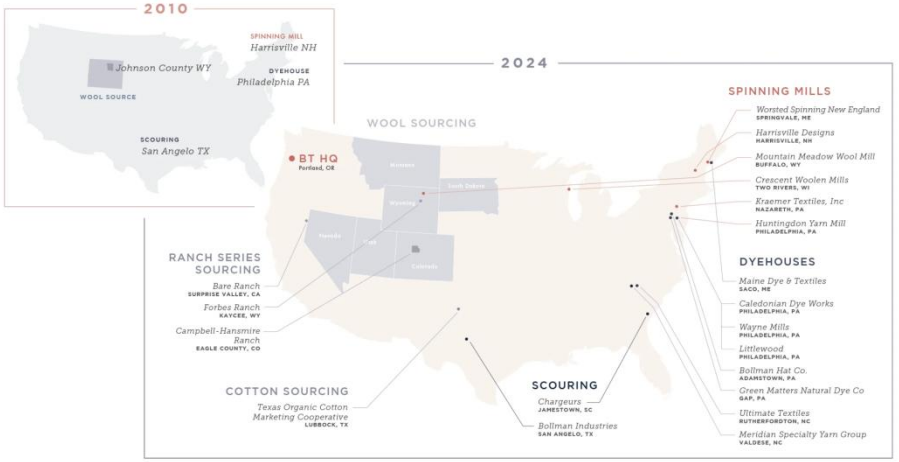
Supply Chains for American Wool Brands

- A number of “Made in USA with American Wool” brands feature their supply chains as part of the story they market to their customers. Examples from Duckworth apparel (MT) and Brooklyn Tweed yarns (OR) are of potential interest, as they demonstrate both the opportunities and challenges of crossing the nation from ranch to scour and/or top maker, to spinner for yarns, and to textile mill and cut and sew and knitted apparel manufacturer:
- **Duckworth**: “SHEEP TO SHELF. We don’t source wool, we grow it on our ranch in Montana. We carefully manage every step of the process, from fiber to finished garment.”
- **Brooklyn Tweed,** featuring breed specific wool yarns, identifies producers, scouring and top making, dyeing and spinning. They also map the evolution of their supply chain over 14 years.

DUCKWORTH

MONTANA-BORN, AMERICAN-MADE

BROOKLYN TWEED



AMERICAN WOOL™

Market Solutions LLC
Insight for Action

Climate Beneficial Featured Brand Partners

- American Blossom Linens
- COACH
- Seek Collective
- COYUCHI, Home Collection
- HERDERIN
- Imperial Yarn
- Vincent James
- WOL HIDE
- COMMAND
- AIAYU
- SIRKL CLOTHING
- Janie and Jack
- ECOLOGYST
- FRANKENMUTH WOOLEN MILL
- ELIZABETH SUZANN
- The North Face

Coach X Faribault Mill Wool Blanket

https://www.climatebeneficialfiberpool.com/brands-2

Shaniko Wool Company Brand Partners

- NATIVA Precious Fiber
- Ralph Lauren
- Janessa Leone
- DeFeet
- Meridian Mill House
- Knitpicks
- Appalachian Baby
- Driftless Goods
- Mairin Wilson
- Antero Outdoors
- Cece's Wool / American Ewe Yarn
- The Checkroom
- Wool & Palette
- Hand Dyed Diva
- Tumalo Fiber
- Freia Fine Handpaints
- Wool Tribe
- Kentwool and Kentwool Performance
- Red Wing Shoes
- Wol Hide
- https://www.shanikowoolcompny.com/news-stories

RWS Certified Companies based in the U.S.

- Ralph Lauren
- REI
- Stance Inc.
- Abercrombie & Fitch
- American Wool Services, Inc.
- American Woolen Company, Inc.
- Andari Fashion Inc.
- Anodyne Wool Inc.
- Avocado Mattress LLC
- Naturepedic
- Backcountry.com LLC
- Boll & Branch LLC
- Bombas LLC
- Chargeurs Wool (USA) Inc.
- Columbia Sportswear Co
- Company C, Inc.
- Crafts Group LLC
- Crescent Sock Company
- DeFeet International
- Eileen Fisher Inc.
- ELICIT Brands LLC DBA Swiftwick
- Everlane
- Injinji Inc
- Kentwool Yarn
- Meridian Specialty Yarn Group
- Misha and Puff Inc.
- Nester Hosiery LLC
- Patagonia Inc.
- Royal Robbins LLC
- Shaniko Wool Company LLC
- Sock Teck Solutions (DBA Tough Cutie)
- The Echo Design Group Inc.
- The Gap Inc.
- Wool Partners Inc.
- Wooly Clothing Company
- Vuori
- Madison88.inc
- Stio
- WaltUSA LLC

- https://textileexchange.org

American Wool Use by the U.S. Military

- ASI has long worked to maintain sales of American wool domestically through military dress uniforms, blankets, pea coats socks, berets and other items. ASI estimates that military procurement represents about 15% of American wool use, or 3.4 million lbs. on a greasy wool basis in 2023.
- There have also been benefits in the commercial apparel market from ASI work with the U.S. military on product development. Superwash and Mercerized wool development have benefitted from military research support and interest, leading to commercial investment by ASI's Sheep Venture Company and Chargeurs and sales in both military and commercial markets, especially for socks and knitwear. Military funded research to develop stronger, fire resistant wool blend yarns have contributed to sales to the military and potential commercial applications for sports and outdoors markets.
- Purchases by the U.S. government are governed by several standards, the most important for American Wool being the **Berry Amendment**, which requires that all U.S. military textiles and apparel use U.S. sourced fibers. According to the Congressional Research Service (CRS), Department of Defense (DOD) purchases of textile and apparel articles amounted to $2.3 billion in FY2021, representing 43% of the Department's total Berry-applicable purchases. Purchases subject to the Berry Amendment represented 5% of the $49 billion of textile and apparel shipments from U.S. mills in 2021.
- Other government purchases are governed by the **Kissell Amendment** and/or the **Buy American Act**, which are less restrictive in their requirements for American fiber content. As with Free Trade agreements, when "Made in USA" textile and apparel purchases are required, the focus is on yarn forward, not the source of the fiber used. If the quality and cost of first stage wool processing in the U.S. were world class competitive, it is likely that more American wool could be used
- The Kissell Amendment requires the Transportation Security Administration (TSA) to conform to stricter rules requiring purchases from the U.S., though unlike the Berry Amendment, its requirements are generally yarn forward. The U.S. government also has commitments on Government Procurement under the World Trade Organization (WTO) and various free trade agreements to allow imported goods to compete for U.S. government procurement. As a result, other Department of Homeland Security (DHS) agencies, such as Customs and Border Protection or Immigration and Customs Enforcement, which are subject to the Buy American Act can purchase textile and apparel products from 100 countries provided conditions are met (CRS, 2023).
- Burlington Industries, now part of Elevate Textiles, has long been the major supplier of worsted wool fabrics to the military. Other companies have been first and second level providers of yarn, fabric, blankets and other items. American Woolen Company recently received a contract award that will allow it to pursue orders for fabric for military uniforms as well. A number of worsted spinners are able to supply Berry compliant yarns.

Threats and Opportunities: Military Use of American Wool

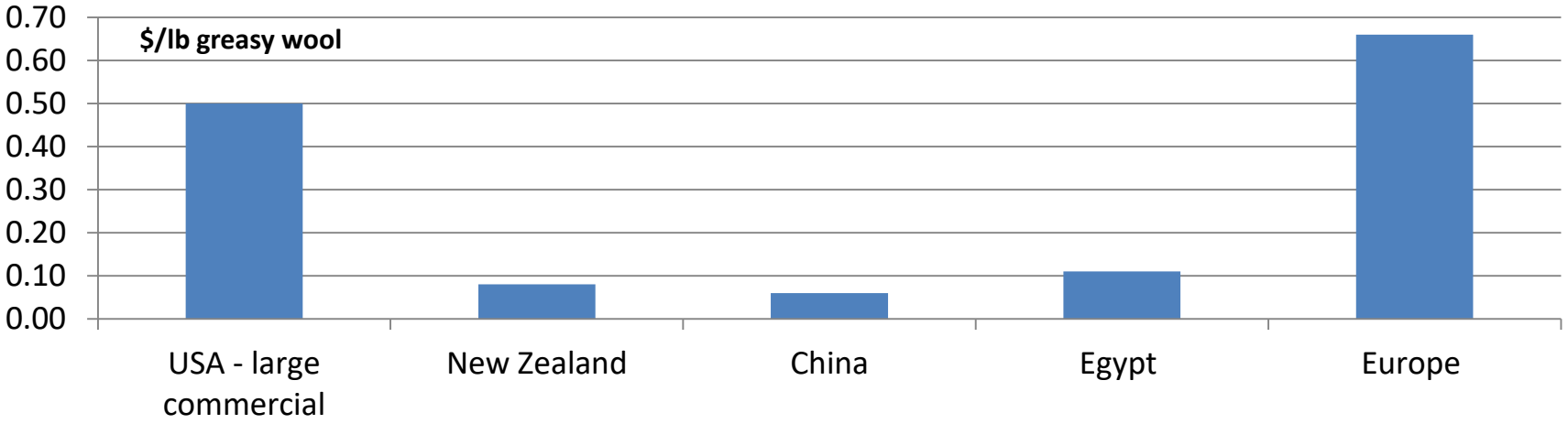
- **Threats to Continued American Wool Use by the U.S. Military.** Under the Berry Amendment, if a domestic source for an item "cannot be acquired when needed in satisfactory quality and sufficient quantity at U.S. market prices," a **Domestic Non-Availability Determination (DNAD)** can be requested by the prime contractor to the **Defense Logistics Agency (DLA)** Clothing and Textile Troop Support Unit.
- There have been several instances of DNADs affecting worsted wool and wool blend fabrics for military uniforms in recent years. In those cases ASI has worked to try to ensure that any imported fabric still used American wool.
- In the most recent case, we understand that the issue related to the consistency of the dye color in fabric, leading to a high level of rejections by DLA, so that only 80% of required fabric could be delivered. Reportedly imported fabric was permitted, and it too had problems with acceptable dye colors.
- Burlington Industries indicates that Elevate Textiles Board has approved a substantial investment in a dye house upgrade at one of their North Carolina facilities, and that once the equipment arrives and is installed, they will be able to satisfy 100% of the required fabric without a DNAD.
- For a previous DNAD, the company was apparently able to supply fabric from its Morelos, Mexico worsted spinning and textile manufacturing plant, using wool top from American wool. However, Elevate Textiles recently converted that plant to another use, so that all of Burlington's worsted wool fabric manufacturing is now in the U.S.
- The Defense Department also has agreements with 27 countries under which each waives their respective "buy national" restrictions and customs duties, and allows the other's contractors to participate, on a competitive basis, in their defense procurements. This poses a potential threat to future Berry Amendment requirements for American wool. It could also create new opportunities if the U.S. could rebuild cost and quality competitive first stage wool processing to be more competitive for manufacturing yarns and fabrics in other country procurement.
- **America's Wool Top Challenge.** All worsted wool spinners and worsted textile manufacturers are dependent upon Chargeurs (USA) in South Carolina for wool top using American wool to be Berry Amendment compliant. If Chargeurs were to break down or close, there would not be a backup source of Berry compliant wool top to meet the needs of DLA or commercial customers.

Key Findings Related to First Stage Processing

- **Upgrading First Stage Processing and Building Demand For a More Competitive Wool Supply Chain**. The entire wool supply chain is dependent on wool scouring and top making to survive. Investment in upgrades to world class, premium quality and cost first stage processing could help to preserve the military and commercial markets that currently exist for American wool.
- **Potential Options.** Chargeurs' combing plant could be upgraded to world class quality and cost standards; Bollman's scouring facility could be upgraded and potentially add wool combing capacity; and/or a new combing plant could be constructed at a location close to major wool production with access to water, power and labor.
- **Building Demand** All would require a major companion effort to ensure consistent demand so that they could operate cost effectively and profitably. A cost and quality competitive plant could reliably meet the needs for wool top for Berry compliant yarns and fabrics for the military. It could also help to make U.S. wool and top more competitive in yarns and fabrics for other government and commercial customers and for exports to their international points.
- **Potential Benefits.** This could also likely make American wool more competitive in other domestic and export markets:
  - U.S. manufactured yarn and textiles could become more competitive in commercial and military markets that currently exist.
  - U.S. yarns and textiles could become more competitive in domestic applications under the Kissell Amendment and Buy American requirements.
  - U.S. yarns and textiles could potentially become more competitive for export to markets where cut and sew and knitting industries benefit from trade agreements with the U.S.
  - U.S. scoured wool and wool top could potentially be more competitive in markets from which the U.S. imports textiles, apparel and home goods that currently source from China.
- Large scale first stage processors currently have sharply underutilized capacity that potentially threatens their continued operations. Investments in technology upgrades alone will not resolve this problem.
- **ASI/AWC leadership will be required to help ensure demand to pull products through the supply chain and justify needed investment in becoming world class competitive so that downstream spinning, textile and apparel manufacturing can be more profitable and contribute to on shoring and near shoring..**
- **A Steering Group including representatives of the entire supply chain will be required, including wool producers, warehouses and merchants, first stage processors, spinners, textile and apparel manufacturers, brands and retailers.**

U.S. and International Greasy Wool Scouring: Examples and Cost Comparisons

- Wool scouring costs on a commercial basis in the U.S. depends on the quantity scoured, yield, preparation and various other factors. It is reasonable to assume that costs of scouring and top making are in the $.50 to $1.50 range per lb of greasy wool. This means that scouring and top making cost about $1.00 to $3.00 per clean lb. Minimum order sizes are in the 1,000 lb to 25,000 lb range.
- In comparison, for small and medium sized mills, minimums are usually in the 10 to 50 lb range, but scouring costs are much higher, generally $4.00 to $8.00 per lb. of greasy wool.
- Wool scouring in Europe has been sharply reduced by environmental concerns, but when available, cost has been in the $0.46 to 0.75 per lb of greasy wool range, depending on the yield.
- The European Union (EU) has trade agreements with Mediterranean countries that permit some wool scouring and top making to take place in Egypt and Tunisia, and then be imported at reduced or not duty nto EU countries. Costs have been about $0.10-.15 per lb of greasy wool, or $.23 to $.40 per lb of clean wool.
- Scouring costs in China and New Zealand are reportedly sharply lower, $.06 and $.08 per lb of greasy wool respectively, and $.09- $.11 per lb of clean wool. NZ wool tends to have higher yields due to low vegetable matter (VM).



Cost estimates based on 50% yield

Source: Industry sources, ASI, Rita Kourlis Samuelson and Jeffrey Losekoot, Market Solutions LLC analysis.

International Wool Scouring Developments

- Michell, Australia's largest exporter of wool fiber has scouring and carbonizing facilities in Australia and China. In 2020 , Michell had the capacity to scour and carbonize 26 million lbs. of wool in Australia, and 13 million lbs. of wool in China. It also had a loose wool superwash line in China. Michell scours their own wool and offers commission processing in Australia and China. David Michell reports that with automation and other technological investments in Michell's Australian plant, it can scour wool at lower cost than in their Chinese plant, which uses much more labor (Australian Broadcasting Co. news).
- With market disruptions as a result of trade conflicts, power shortages and the COVID pandemic, wool growers in Australia became concerned that they were overly reliant on China as a market for greasy wool and started to discuss options and alternatives. In 2022 and 2023 WoolProducers Australia obtained over $US 1.1 million from Australia's Ministry of Agriculture and other sources for two studies to examine whether first stage processing could be brought back to Australia, and how to diversify markets; and then follow up to further examine investments in scouring, carding and combing in Australia plus opportunities in Bangladesh, India, Indonesia and Vietnam.
- The WoolProducers-led project is being guided by a steering committee comprising Australian Wool Innovation (AWI), National Council of Wool Selling Brokers of Australia, Australian Council of Wool Exporters & Processors Inc, Australian Wool Testing Authority (AWTA), Australian Wool Exchange (AWEX) and Austrade. The first stage report, "Ensuring a sustainable future for Australia's wool supply chain," found the economic impact of expanded early-stage processing could increase GDP by $US 1 billion (AUS$1.6 billion), and create nearly 600 full-time jobs.
- After China banned wool imports from South Africa due to a foot and mouth disease (FMD) outbreak in April, 2022, Australian wool growers, handlers and market analysts began to discuss the need to increase Australia's wool scouring capacity as the best way to ensure that in the event of a FMD outbreak, Australia would still be able to export wool. Scouring is the most widely accepted method for FMD deactivation. Press reports of discussion in the industry also pointed out that in addition to helping to ensure market access, scouring would add value, provide higher returns to Australian industry and give the industry greater control over its future.

Australia Looks at First Stage Processing Investments to Manage Risks, Seek Opportunities

- At the time, Australia had 44 million lbs. of annual greasy wool scouring capacity, enough to scour about 6% of the 700 million lb Australian annual greasy wool clip. China has been the export destination for 81% of Australia's greasy wool clip, so losing access due to FMD would sharply reduce sales and market prices.
- At the same time, adding scouring capacity for even half of Australia's wool clip, 350 million lbs., would require a massive investment to increase scouring capacity. **It was estimated that to add one greenfield scouring plant with 66 million lbs. in annual greasy wool scouring capacity would cost about $US 19 million for land, building and machinery and access to energy, water, logistics and labor.**
- In press interviews, David Michell of Michell Wool and Chairman of Wool Industries Australia indicated that that to be commercially viable, investment in new scouring plants would most likely also require investment in combing in order to be able to capture opportunities in markets other than China. **Michel estimated that a 22,000 lb combing plant would costs about $US 31 million (AUS$50 million).** He said that FMD mitigation would be a "cherry on the cake" for a commercial investment, not the justification. Michell indicated that with high and volatile freight costs, there would also be an advantage of shipping 36% less dirt, since Australia's average yield is about 64%.
- As part of the Australian effort to consider the right mix of scouring and combing investment in Australia, the industry has been exploring developments in Vietnam, with on the ground research and a trade team visit in December, 2024. They learned that Vietnam imports 9,850 mt of wool top from China each year, equivalent to 33.4 million lbs. of greasy wool. Two new wool spinning and dyeing projects are expected to come online in Vietnam during 2025 with capacity approaching 10,000 mt, potentially doubling demand for fine wool tops. Australia is looking at potential interest and funding for a top making plant in Vietnam that could potentially import scoured Australian wool.

Economies of Scale in Scouring and Top Making

- In late 2024, investors in Queensland (Australia) Wool Processors (QWool) announced the latest iteration of a $US 41 million ($AUS 65 million) wool scouring and combing project. The goal is to scour 31 million lbs. annually of greasy wool to produce 6.7 million lbs. of clean wool and 13 million lbs. of traceable combed wool tops. The expected clean yield for local greasy wool is 63.5%.
- If the plan goes ahead, and the plant is operational by 2027, the short term goal is for scoured wool and top to be exported to Asia and Europe, with a medium term goal of adding spinning, dyeing, fabric and apparel manufacturing as part of a larger project. Queensland's government has committed $US 588,000 ($AUS 940,000) to support the final stage planning and feasibility study for the project
- Projected marginal costs for a facility handling 22 million lbs. of greasy wool annually are estimated at $US 0.068 per lb of greasy wool for scouring and carbonizing and $US 0.22 per lb for top making.
- The initial project feasibility study examined scouring and top making costs at facilities with various equipment sizes and throughput levels, excluding any return on capital.
- For wool scouring and carbonizing:
  - For a scour with 2.6 million lbs. in annual capacity and throughput, marginal scouring cost would be $US 0.254 per lb.
  - For a scour with 6.6 million lbs. capacity and throughput, marginal scouring cost would be $US 0.126 per lb.
  - For a scour with 10 million lbs. capacity and throughput, marginal scouring cost would be $US 0.085 per lb.
- For carding and combing/top making:
  - For a 4 card line operating at about 2 million lbs. annually, top making cost would be $US 0.482 per lb
  - For a 10 card line operating at about 3 million lbs. annually, top making cost would be $US 0.37 per lb,
  - For the same 10 card line operating at about 8 million lbs. annually, top making cost would be $US 0.25 per lb.
- **These findings are useful in helping to understand the challenges of commercial scale scouring and top making in the U.S., where facilities are operating far below capacity, and with older equipment, at much higher costs than those estimated for state of the art equipment and high volume throughput.**

International Wool Scouring Developments: New Zealand WoolWorks and Others

- In April, 2024, WoolWorks reopened its newly rebuilt Awatoto scouring facility, on New Zealand's South Island. It has the capacity to scour 220 million lbs. of greasy wool per year, making it the world's largest wool scouring facility. The facility scours 50-80% of New Zealand's wool and is the sole service provider for wool scouring in New Zealand. ASI staff had the opportunity to visit the facility as part of the International Wool Textile Organization Congress. Scouring costs are about $0.25 per clean kg,; $0.11 per scoured lb; or $.08 per lb of greasy wool with a 70% yield. After adjusting for wool transportation costs, that makes them competitive with China.
- The New Zealand the Ministry of Agriculture, together with private investors, contributed to the $US28 million (NZ$50 million) rebuilding project. The site was damaged by Cyclone Gabrielle early in 2023. After several mergers, WoolWorks is now owned by David Ferrier and Tanarra Capital Partners.
- The company offers commission scouring services to wool growers, manufacturers and exporters. It offers wool testing, and RWS, GOTS and other certifications.

- Market Solutions LLC has also investigated scouring options in several other countries, including the UK, Egypt, Uruguay, Argentina and China.

Resources to Help Maintain and Rebuild Markets for American Wool

- Resources to Help Maintain and Rebuild Markets for American Wool
  - Wool Research, Development and Promotion Trust Fund
  - Agriculture Wool Apparel Manufacturers Trust Fund
  - National Sheep Improvement Center Sheep Production and Marketing Grant Program
  - USDA Grants and Loans: Value-Added, Climate Smart and other Rural Development Programs
  - State and Local Funding Support
  - Wool Innovation Support
  - Other Potential Financing Sources: Commercial loans, Foundations, Venture Capital, Sheep Venture Company, Checkoffs, USDA/FAS Export Programs: MAP, FMD, QSP, RAPP
  - ASI/AWC Activities and Resources to Support Rebuilding American Wool Markets

Resources to Help Maintain and Rebuild Markets for American Wool

- ASI requested that this report explore potential resources to support efforts to help maintain and rebuild supply and demand for American wool.
- Under past Farm Bills, ASI, the wool industry, and wool apparel manufacturers have benefitted from:
  - The **"Wool Research, Development and Promotion Trust Fund"** that provides $2.25 million annually to support ASI efforts in the U.S. market.
  - The **"Agriculture Wool Apparel Manufacturers Trust Fund,**" with $30 million annually or an amount specified by the Secretary of Agriculture. This fund provides payments to companies involved in yarn, fabrics or manufacturing of men and boys suits based on the situation faced in 1999. The justification for the original fund was to compensate for higher import duties on worsted wool yarns, fabrics than on imported apparel.
  - The Wool Trust Funds were not extended for 2025 as part of the December 2024 extension of the 2018 Farm Bill. They will need to be considered for reauthorization as part of the next Farm Bill, along with the Agriculture Pima Cotton Trust Fund.
  - The Pima Cotton Trust Fund is allocated automatically each year, with 25% to support organizations working on marketing and promotion; 25% to support yarn spinners; and 50% to support textile and apparel manufacturers.
- Under the U.S. House of Representatives' version of a new Farm Bill, passed in 2024, the two Wool Trust Funds would be combined with the Pima Cotton Trust Fund, with $1.75 million in additional funding for the Pima Cotton Trust Fund. In the past two farm bills, the House has made similar proposals, but the Senate bill kept the three separate trust funds, and prevailed in the final law.
- Funding under the **"Wool Research, Development and Promotion Trust Fund**" that supports ASI, has remained at the $2.25 million annual level since it was originally approved in 2000. If funding were adjusted for inflation, as appears to be proposed for Pima Cotton, **the Wool Promotion Trust would be funded at $4.12 million annually.**
- **If the Wool Trust Funds worked the same way as the Pima Cotton Trust Fund, ASI would get $8-8.6 million annually for market development and promotion (25% of $32.25-$34.37 million) and the provisions affecting spinners, textile and apparel manufacturers could potentially be made more neutral in the choice between domestic and imported wool usage.**

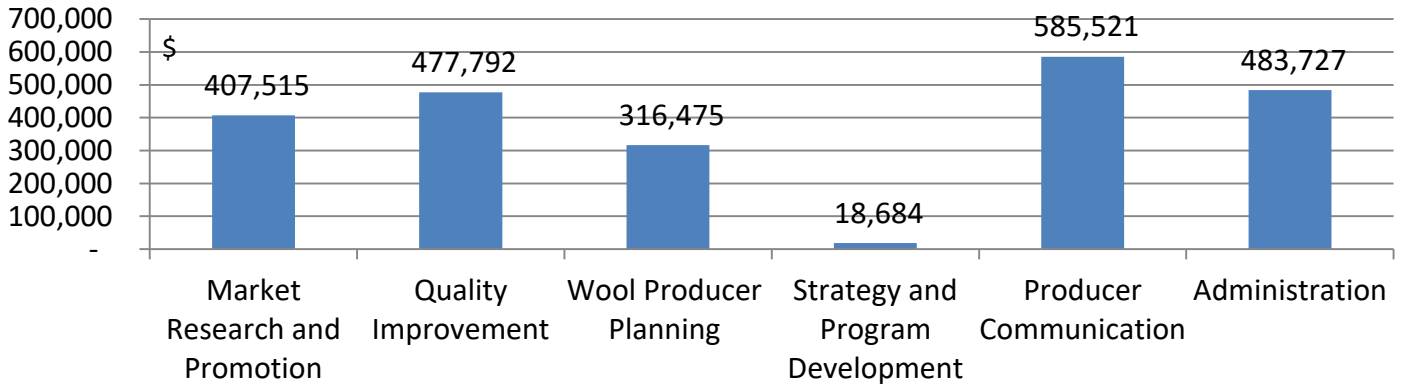
Wool Research, Development and Promotion Trust Fund

- The Wool Research, Development and Promotion Trust Fund provides $2.25 million annually to support ASI efforts in the U.S. market. Through the Trust Fund, the Secretary of Agriculture is authorized to provide grants to a nationally-recognized council established for the development of the United States wool market for the following purposes:
  1. Assist United States wool producers to improve the quality of wool produced in the United States, including to improve wool production methods.
  2. Disseminate information on improvements described in paragraph (1) to United States wool producers generally.
  3. Assist United States wool producers in the development and promotion of the wool market

Source: Trade and Development Act of 2000 PL 106-200 SEC. 506. Wool Research, Development and Promotion Trust Fund

- ASI provides an annual detailed public report on how funds are used. Spending for 2022-23 is shown below:
- Congress did not extend funding for 2025 for either Trust Fund as part of its December, 2024 continuing resolution to extend the 2018 Farm Bill. The issue will need to be addressed as part of a new Farm Bill during 2025.

Wool Trust Fund: 2022-23 Spending



Source: ASI Wool Trust Report 2022-23

Agriculture Wool Apparel Manufacturers Trust Fund

- The Agriculture Wool Apparel Manufacturers Trust Fund was authorized under Section 12315 of the Agricultural Act of 2014 (the 2014 Farm Bill) and reauthorized under Section 12603 of the Agriculture Improvement Act of 2018 (the 2018 Farm Bill) to reduce the economic injury to domestic manufacturers resulting from tariffs on wool fabric that are higher than tariffs on certain apparel articles made of wool fabric. The Agriculture Wool Trust is a mechanism for four types of annual payments:
  - **Payments to Manufacturers of Certain Worsted Wool Fabrics**
  - Payments Under the Monetization of the Wool Tariff Rate Quota
  - Wool Yarn, Wool Fiber, and Wool Top Duty Compensation Payments
  - Refund of Duties Paid on Imports of Certain Wool Products

- **The original goals of the Wool Suit and Textile Trade Extension Act of 2004** were to protect persons who cut and sew men's and boys' worsted wool suites and suit-like jackets and trousers in the U.S. and their successors in interest; and to promote domestic employment. The Act allocates $5.332 million in annual g**rants to manufacturers of certain worsted wool fabrics or their successors in interest based their share of production of those worsted wool fabrics during** 1999-2001

- **Proposed 2024 Farm Bill. House Summary:**
- Creates a new **Agricultural Fiber Products Trust Fund** and establishes baseline at $50 million per year.
  - $30 million per year for wool apparel manufacturers.
  - $17.75 million per year for pima cotton spinners, manufacturers, and promotion activities.
  - $2.25 million per year for wool research and promotion

Sources: USDA, OMB, CRS, U.S. House of Representatives, Market Solutions LLC analysis

2024 Agriculture Wool Apparel Manufacturers Trust Fund Disbursements

- The following claimants received disbursements under the 2024 Pima Agriculture Cotton Trust Fund and 2024 Agriculture Wool Apparel Manufacturers Trust Fund.

- **Total Trust Disbursements of $999,999 or Less**
- Abraham Lees Fine Custom Tailoring
- Ackourey Clothiers, Inc.
- Adrian Jules, Ltd.
- Astro Apparel, Inc.
- Blue Lion Apparel, LLC
- Buhler Quality Yarns Corp.
- Carlo's Tailor Shop
- CC Manufacturing, Inc.
- Cicco Brothers, LLC
- Custom Clothing of Atlanta
- David G. Cotugno, Inc.
- Flor's Tailor Shop, Inc.
- Giliberto Designs, Inc.
- **Kentwool Company**
- Lantal Textiles, Inc.
- Martin Greenfield Clothiers, Ltd.
- Maus & Hoffman
- New England Shirt Co.
- **Pendleton Woolen Mills**
- Rex Furr Custom Clothes, Inc.
- RMO Industries
- Rusgo & Depanicis, Inc.
- Sewell Clothing Company, Inc.
- Vestito D'Oggi, LLC
- Victor Forstmann (Duvaltex)
- **Worsted Spinning New England**

- **Total Trust Disbursements of $1 Million to $2,999,999**
- **American Woolen Company, Inc.**
- Hamilton Shirt Interests, Ltd.
- JA Apparel Corporation
- Parkdale Mills, Inc.
-

- **Total Trust Disbursements of $3 Million or More**
- **Burlington Industries**
- Supima
- Tom James Company
- W Diamond Group Corporation
-

- Note: Between one and two companies submitted affidavits as Yarn Spinners and received payments.
- Source: USDA/FAS

2023 Agriculture Wool Apparel Manufacturers Trust Fund Disbursements

- The following claimants received disbursements under the 2023 Pima Agriculture Cotton Trust Fund and 2023 Agriculture Wool Apparel Manufacturers Trust Fund.

- **Total Trust Disbursements of $999,999 or Less**
- Abraham Lees Fine Custom Tailoring
- Ackourey Clothiers, Inc.
- Adrian Jules, Ltd.
- American & Efird
- Astro Apparel, Inc.
- Blue Lion Apparel, LLC
- Carlo's Tailor Shop
- CC Manufacturing, Inc.
- Cicco Brothers, LLC
- Custom Clothing of Atlanta
- David G. Cotugno, Inc.
- Flor's Tailor Shop, Inc.
- Giliberto Designs, Inc.
- **Kentwool Company**
- Lantal Textiles, Inc.
- Martin Greenfield Clothiers, Ltd.
- Maus & Hoffman
- New England Shirt Co.
- Parkdale Mills, Inc.
- **Pendleton Woolen Mills**
- Renee Bassetti, Inc.
- Rex Furr Custom Clothes, Inc.
- RMO Industries
- Rusgo & Depanicis, Inc.
- Sewell Clothing Company, Inc.
- Vestito D'Oggi, LLC
- Victor Forstmann (Duvaltex)
- **Worsted Spinning New England**

- **Total Trust Disbursements of $1 Million to $2,999,999**
- **American Woolen Company, Inc**.
- Buhler Quality Yarns Corp
- Hamilton Shirt Interests, Ltd.
- Hickey Freeman Tailored Clothing, Inc.

- **Total Trust Disbursements of $3 Million to $4,999,999**
- **Burlington Industries**
- JA Apparel Corporation
- Supima
- W Diamond Group Corporation

- **Total Trust Disbursements of $5 Million or More**
- Tom James Company

- Note: Between one and four companies submitted affidavits as Yarn Spinners and received payments.
- Source: USDA/FAS

2022 Agriculture Wool Apparel Manufacturers Trust Fund Disbursements

- The following claimants received disbursements under the 2022 Pima Agriculture Cotton Trust Fund and 2022 Agriculture Wool Apparel Manufacturers Trust Fund.

- **Total Trust Disbursements of $999,999 or Less**
- Abraham Lees Fine Custom Tailoring
- Ackourey Clothiers, Inc.
- Adrian Jules, Ltd.
- American & Efird
- Astro Apparel, Inc.
- Blue Lion Apparel, LLC
- Calamita Tailoring
- Carlo's Tailor Shop
- CC Manufacturing, Inc.
- Cicco Brothers, LLC
- Custom Clothing of Atlanta
- David G. Cotugno, Inc.
- Duvaltex (America), Inc. – Victor Forstmann, Inc.
- Flor's Tailor Shop, Inc.
- Giliberto Designs, Inc.
- GoshenIF, LLC
- John H. Daniel Company, Inc.
- **Kentwool Company**
- Lantal Textiles, Inc.
- Martin Greenfield Clothiers, Ltd.
- Maus and Hoffman
- New England Shirt Company
- **Pendleton Woolen Mills**
- Renee Bassetti, Inc.
- Rex Furr Custom Clothes, Inc.
- RJ Becht & Son
- RMO Industries
- Rusgo & Depanicis, Inc.
- Sewell Clothing Company, Inc.
- Vestito D'Oggi, LLC
- **Worsted Spinning New England**

- **Total Trust Disbursements of $1 Million to $2,999,999**
- **American Woolen Company, Inc**.
- Buhler Quality Yarns Corporation
- Hamilton Shirt Interests, Ltd.
- Hickey Freeman Tailored Clothing, Inc.
- JA Apparel Corporation
- Parkdale Mills, Inc.
-
- **Total Trust Disbursements of $3 Million to $4,999,999**
- **Burlington Industries**
- Supima
- W Diamond Group Corporation
-
- **Total Trust Disbursements of $5 Million or More**
- Tom James Company
-
- Note: Between one and four companies submitted affidavits as Yarn Spinners and received payments.
- Source: USDA/FAS

Agriculture Wool Trust Funds

- Under NAFTA, now USMCA, Men's apparel manufacturers in the U.S. found that they were disadvantaged compared to Canadian menswear manufacturers because imported apparel faced lower duties than imported wool top, yarn and fabric. The Wool Apparel Manufacturers Trust Fund has provided support for U.S. manufacturing for brands such as Hickey Freeman in Rochester, NY, Hart Schaffner Marx in Chicago (W Diamond), Joseph Abboud (JA Apparel) in MA, and many make to order tailors, the largest being Tom James Company.
- Trust Fund payments were originally intended to help U.S. manufacturers offset higher import tariffs on yarns, fabrics and other materials than on imported garments and to support manufacturing of worsted wool fabrics in the U.S.. As seen in tables below, many of the beneficiaries during 2022-2024 have been custom suit manufacturers that produce in the U.S. rather than shipping orders to garment manufacturers in Asia.
- The Trust Fund supports tailoring and garment making in the U.S., but does not provide an advantage for using American wool. However, some companies that benefit from the trust fund, such as American Woolen Company, Inc., Worsted Spinning of New England, Pendleton Woolen Mills and Kentwool Co. offer products featuring American wool.
- **Action Items.**
  - **Both wool trust funds are up for reauthorization as part of the next Farm Bill**. ASI benefits from the "Wool Research, Development and Promotion Trust Fund." It would be useful if the Wool Apparel Manufacturer's Trust fund could be structured like the Pima Cotton Trust Fund to **provide more marketing and promotion support for "Made in USA with American wool" garments** if this could be achieved without putting the trust funds at risk.
  - Make sure that tailors and apparel manufacturers who benefit from the Trust Fund and other members of the **Custom Tailors & Designers Association** are made aware of yarn and fabric options using American wool.
  - Make sure that beneficiaries of the Trust Fund will not be disadvantaged by using yarn and fabric made with American wool or wool top, rather than imported yarns and fabrics. Ideally, the Wool Apparel Manufacturers Trust Fund would become a **tool for supporting reshoring and nearshoring of wool apparel manufacturing and promote use of American wool, top, yarn and fabric.**
  - **These are all important issues for ASI and the American Wool supply chain to follow closely. They have been discussed in depth with ASI staff.**

National Sheep Industry Improvement Center (NSIIC) Sheep Production and Marketing Grant Program (SPMG)

- The **National Sheep Industry Improvement Center (NSIIC)** received a five year, $1.9 million grant in 2019 from USDA's Agricultural Marketing Service (AMS) to fund the **Sheep Production and Marketing Grant Program** to support projects that develop solutions for practical problems and address the needs of the entire sheep industry, while focusing on measurable benefits for sheep producers, encouraging partnerships among other sheep industry organizations, and reducing duplication of effort among participating organizations. Congress appropriated additional funds for the program in 2024.
- Each year, the center budgets about $300,000 to support projects that accomplish one or more of the following objectives:
  - Strengthen and enhance the production and marketing of sheep and sheep products in the United States through the **improvement of infrastructure, business, resource development and the development of innovative approaches to solve long term problems.**
  - Provide leadership training and education to industry stakeholders.
  - Assist all segments of the industry in addressing sustainable production and marketing of sheep and sheep products.
  - **Promote marketing of sheep and sheep products** through an organized method that can measure tangible results.
  - **Enhance the sheep industry by coordinating information exchange and seeking mutual understanding and marketing within the industry community.**
- The program does not require matching funds. In 2023, $390,000 in grants were awarded. As shown below, a 2023 grant to Bollman Industries helped to purchase new scouring train feeders, their leading cause of scouring plant breakdowns. The grant is intended to contribute to more reliable, higher quality, lower cost scouring at their San Angelo, TX wool scouring plant.
- The average grant awarded by NSIIC's Board is $29,000.

Bollman Industries NSIIC SPM Grant, 2023

- **Bollman Industries**, which operates the only remaining large scale commercial commission wool scouring plant in the U.S. requested a grant to replace the 28 year old feeders which are currently the leading cause of shut downs and are a large annual expense. Upon receiving the grant, the feeders were ordered overseas, arriving late in 2024.
- The application for the grant stated that "the loss of Bollman Industries would have a domino effect on the U.S. wool industry. If Bollman Industries were to close, U.S. textile companies would have to source their scoured wool needs from overseas, using foreign wool, not American wool. Bollman Industries scours the best 12 month wools all the way down to lambs, bellies and pieces. Without a scouring plant in the US, companies like Pendleton, Faribault blankets, Green Mountain Spinnery, and Filson, just to name a few, would no longer use American wool. Machinery breakdowns cause major expense, the plant has to be shut down for repairs and delays deliveries to all our textile companies. The new feeders will feed wool more consistently into the scouring line, which allows for better scouring, With less break downs the entire system runs more efficiently, creating better scoured wool at a lower cost."

Purchase new scouring train feeders to increase efficiency and decrease the leading cause of down time

- The objective of this project is to keep a key market for American wool and American wool growers in the US.
- Having a scouring company in the US is imperative to serve the US with American wool.
- Without the scouring plant this entire sector of the US wool industry will go overseas, eliminating a key market for growers.
- The new feeders will be able to feed wool more consistently into the scouring line, which allows for better service to the industry.

Bollman Industries

Source: https://www.nsiic.org/2024-Presentation.mp4

Other USDA Grants and Loans:

Value-Added, Climate Smart Ag Grants, Rural Development Programs

- **USDA Value-Added Producer Grants (VAPG) from USDA Rural Development** are part of the Local Agriculture Market Program (LAMP) created under the 2018 Farm Bill. The program made $30 million available for planning grants of up to $75,000 and working capital grants of up to $250,000. These grants all have a 100% matching funds requirement.
- As an example, Shaniko Wool Company used a Value-Added planning grant to develop marketing materials that have helped to build awareness of Shaniko Wool as a brand that is gaining widespread awareness. A second Value-Added working capital grant helped to expand the number of ranches working with Shaniko Wool to expand the supply of Shaniko RWS and Nativa Regen wool and top in cooperation with Chargeurs, and also develop some wool exports.
- **USDA recently awarded several Climate Smart Agriculture Grants** that potentially benefit sheep and wool marketing. The National Center for Appropriate Technology(NCAT) and five Climate Beneficial Fiber project partners: Carbon Cycle Institute, Colorado State University Department of Soil and Crop Sciences, Fibershed, Seed2Shirt, and New York Textile Lab, received a grant of up to $30 million to support the expansion of climate-smart wool and cotton production on 135 farms and ranches spread across 2.1 million acres. The project builds on the existing Climate Beneficial™ fiber program.
- Two other Climate Smart Agriculture Grants benefit Sonoma County California and the American Lamb Board. The Lamb Board grant will provide funding for up to 15 sheep producers to develop plans, implement “climate smart” approaches, and measure and report impacts.
- USDA also has a number of other loan and grant programs that may be adjusted as part of the next Farm Bill.

State and Local Funding Support

- State and Local Economic Development Offices have a wide range of grant, loan, tax benefits and technical assistance programs available to help start small businesses, and attract or help expand larger businesses. Some benefits are tied to achieving commitments to job creation and other impacts.
- As mentioned above, state economic programs have provided support for a variety of yarn spinning and textile industry projects. In addition to funding and tax benefits, some have also provided worker training support. Some examples:
  - **Mountain Meadows Wool**, in Buffalo WY has developed a vertically integrated medium scale scouring, spinning and apparel operation featuring wool from local producers. The company was started with local business development planning assistance, and has expanded with other support.
  - **Meridian Specialty Yarn Group** has a spinning plant in Ranlo, NC and built an expanded plant and a new dye house in Valdese, NC that opened in 2020. North Carolina state support helped to encourage family-owned Meridian Industries to make an investment of about $8 million.
  - The **Hudson Valley Textile Project, Clean Fleece New York, and the NY Fashion Innovation Center** have received over $9 million from the State of New York, to provide funding for a new scouring facility, a wool warehouse and marketing program, and to help link New York fashion designers and manufacturers with local sources of wool. Part of the New York State funding is being used to provide annual grants administered by the NY Fashion Innovation Center.
  - **Edwards Woolworks** received support from Kentucky's State Agricultural Development Fund to purchase equipment and wool to launch the state's first wool scouring facility. The project also received support from several county funds, a loan and used personal funds to launch the project intended to give Kentucky sheep producers an economical outlet to process and sell wool and allow local dyers, spinners and weavers to use locally sourced fleeces and yarns.

Wool Innovation Support

- ASI and its Sheep Venture Company (SVC) subsidiary have experience with a number of U.S. Department of Defense Grants and Contracts that have supported cooperation with private industry to develop new uses for wool by the military and also led to commercial uses. Some examples include:
  - Work with Chargeurs to adapt **Wool Mercerization** to permit next to skin and year round use of American wool that is widely available. With funding from the Army, wools can feel about 2 microns finer. The next step is to work with a commercial yarn spinner to test expanded use of the process.
  - ASI and the Sheep Venture Company contracted to evaluate wool fabrics for combat clothing and have worked with yarn spinners and textile manufacturers on wool blends with technical performance applications including **fabric strength and fire resistance**.
  - ASI and SVC contracted with the Natick Soldier Research, Development and Engineering Center (NSRDEC) to explore **shrink-resistant treatments for wool**. The sheep and wool industry then invested its own funds to partner with Chargeurs to purchase and install a manufacturing line with energy-efficient equipment to run the Superwash shrink proofing.
  - ASI/SVC cooperation with the Military has contributed to important American wool yarn and fabric purchases by the Defense Logistics Agency (DLA), and also contributed to important commercial purchases of Superwash wool, especially for socks and knitwear.
  - **After more than a decade, the equipment on the Superwash line at Chargeurs is in need of an upgrade. This would also make it more efficient to use the equipment for mercerization. ASI/SVC should consider this as part of a potentially larger projects directed at ensuring that the U.S. has world class quality and cost competitive commercial scouring and top making facilities to provide a foundation for rebuilding markets for American wool.**
  - **ASI should also explore opportunities to support wool innovation, such other performance wool blends for military, outdoor and athletic uses, and other technologies that have been developed internationally for shrink resistant wool, such as ozone based WoolUp that treats garments and knitwear, available from Spanish company Jeanolgia.**

Other Potential Funding Sources

- There are a range of **commercial funding sources** that can potentially be tapped to support start ups and expansion of businesses. There are also bank loans and mortgages, Small Business (SBA) loans, and resources from various agricultural lenders.
- There are also some **foundations and venture capital sources** that are seeking to support climate smart and/or regenerative agriculture, and have provided support for projects and initiatives. Some examples:
  - The Fibershed Climate Beneficial Wool Pool received working capital from a venture capital fund focused on supporting regenerative agriculture for one year. It then needed to find other funding.
  - Fibershed and the Hudson Valley Textile Project have received funding from several Foundations. They have also raised funds through donations to support their non-profit activities.
- **National and State Sheep and Wool Checkoff Programs**. Lambs and wool are both products of sheep production. The Lamb Research and Promotion Order raises about $2.5 million annually administered through the American Lamb Board for lamb meat promotion. Some states also have checkoff programs that specify support for sheep and wool market development. This was not investigated as part of the current project.
- **USDA Foreign Agricultural Service (FAS) Export Programs.** ASI receives most of its funding for market development from export programs, including the Market Access Program (MAP), Foreign Market Development (FMD), Qualified Samples Program (QSP), and most recently $1.2 million in 2025 funding from the Regional Agriculture Promotion Program (RAPP).
- *While the focus of this assignment has been on the domestic market for American wool, there is high risk if the U.S. does not diversify export markets to avoid over reliance on China. There are also potential opportunities for scoured wool, top, yarn and fabric in other countries that supply apparel imports to the U.S. if the U.S. can develop world class cost and quality competitive wool scouring and top making to be able to compete.*
- *ASI should explore ways that export programs can be part of a strategy to help make American wool more competitive in domestic and international markets. ASI already supports these synergies in some jointly funded efforts. Other ASI and AWC activities and resources to support market development are highlighted below.*

ASI/AWC Activities and Resources to Support Wool Market Development from Sheep to Consumer

- **Wool Production**
- Wool Quality Education
- Wool Classer Training & Certification
- Developing Shearer & Mentor Grants
- Advanced Shearing Schools*
- Shearer Directory
- Shearing educational materials
- American Wool Assurance program
- Wool testing equipment & laboratories*
- OFDA2000 testing equipment
- Wool Warehouse & Buyer Directories
- Market information tools
- Cooperation with USDA LDP program*
- Regulatory & global information
- International trade coordination
- Answering questions & connecting people

- **Wool Mills & Industry**
- Product development
- Technical expertise & assistance
- Superwash & mercerization equipment
- Small and Large Mill Directories (scouring, top making, yarn, fabric manufacturers, etc.)
- Connecting wool mills and customers
- American Wool logo program
- Voice at international organizations
- Answering questions & connecting people

- **Military**
- Connecting military and domestic wool industries
- Industry tours
- Educational courses
- Product research & development
- Cooperation with military agencies
- Lobbying efforts
- Answering questions & connecting people

- **Consumer Promotion**
- Consumer education
- AmericanWool.org
- Videos
- Social media
- American Wool Shop
- Holiday Gift Guide
- American Wool brand
- Answering questions & connecting people

- **ASI actively cooperates on, but does not administer*

- **International Promotion**
- Quality Samples Program (QSP)
- Market Access Program (MAP)
- Foreign Market Development Program (FMD)
- Regional Agricultural Promotion Program (RAPP)
- Trade Missions
- Reverse Trade Missions
- Travel Assistance for International Trade Shows
- Representative and Working Group member at International Wool Textile Organisation (IWTO)
- Technical Expertise
- Develop Global Supply Chains
- Develop New international Export Customers
- Assist in Facilitating Export Sales
- Global Networking & Relationship Building
- Consumer Promotion
- American Wool Brand Development
- Digital Marketing
- Trade Promotion
- Educational Materials
- Market Research
- Market Reports
- Diversify International Markets for American wool
- Processing Trials
- Attend and Represent American Wool at International Textile Fairs

Source: ASI

Conclusions and Recommendations
An Action Agenda to Rebuild Markets for American Wool

- **Challenges Facing the Wool Market**. American Sheep produced 22.7 million lbs. of greasy wool in 2023, a difficult year after several years of rebuilding carryover stocks in the U.S. and worldwide. After strong markets for wool and strong prices in 2019, the entire fiber, yarn, textile and apparel supply chain has faced five years of volatility. Use of wool fiber declined with shifts in work and dress habits during the COVID pandemic and has not yet recovered. The rise in athleisure and outdoor uses of wool for next to skin and year round wear has the potential to help rebuild demand. Technologies like Superwash and Mercerization make wool garments washable and make wools feel finer for a given micron level, increasing potential markets.
- **Opportunities from Global Fiber Demand.** While wool fiber use has not yet recovered, fiber use has actually increased sharply since 2020. Use of cellulosic, cotton and synthetic fibers has increased 5.4 million metric tons (mmt) worldwide. This is six times total global wool use of 0.9 mmt (1.984 billion lbs. on a clean weight basis). Developing new wool uses and more competitive processing and supplies would have to capture only a small fraction of this growth to have a major impact on the profitability of American wool production and the incentive to rebuild supplies and demand.
- **Factors to Drive Wool Demand.** There is growing interest in natural fibers and knowing where textile fibers come from. As with local foods, some consumers are willing to pay for local, traceable and independently verified apparel and home product supply chains with positive stories about the farmers and ranchers who supply fibers, their livestock, land and labor management practices, climate impacts and other factors. For others, what is important will be the performance benefits of American wool in a range of specific products. Identifying potential target consumers and understanding what motivates their wool-based preferences and purchases can help guide American Wool Council (AWC) market development strategies and activities to educate retailers, brands, designers, makers and manufacturers.
- **Segmenting the U.S. Market for Genuine American Wool**. **AWC should help to market the wools that American producers have, and help produce the wools that markets want and will pay more for.** It will be useful to consider market opportunities and approaches to five different market segments:
  - **Approachable Luxury**. Fine fibers, yarns, textiles, apparel and accessories with a story.
  - **Great Outdoors and Sports.** Performance that is worth paying for.
  - **Military Grade**: Defenders and First Responders. Berry Amendment and beyond.
  - **Home and Industrial Goods**. Bedding, Decorative goods, Dryer Balls and Pellets, but also insulation, upholstery, carpets.
  - **Small Scale/Craft.** Scoured, Carded wool, Yarns, Knitting, Weaving, Apparel and Home Goods supporting local and regional farmers, ranchers, mills, artisans and craft groups.

An Action Agenda: Opportunities

- **U.S. Wool Exports**. The United States is a net exporter of greasy wool and also a net exporter of wool yarns, some of which go to countries with which the U.S. has Free Trade Agreements (FTAs). These agreements often require use of U.S. or local yarn in textiles and apparel imported to the U.S. under preferential tariffs.
- U.S. greasy wool exports are heavily dependent upon sales to China at a time when renewed trade conflicts and tariffs seem likely. Exports accounted for 72% of U.S. wool use in 2024, but fell to only 37% in 2020 during the last China trade war and the economic downturn related to COVID and supply chain disruptions. This contributed to large carryover stocks that continue to depress prices. AWC's export program has been working to help diversify export markets. Export market development is limited to customers who can process raw wool because of challenges of first stage processing costs and quality in the U.S.
- **U.S. Apparel Imports.** Despite volatility, the U.S. remains the largest single country importer of apparel in the world. While the fashion industry creates many jobs in the U.S., its manufacturing has shifted to cut and sew and knitting operations in countries with low cost labor. Prior to COVID there were some expectations that modern technology, competitive electricity and increased flexibility to respond to market changes could offset higher cost U.S. labor, so that some reshoring of yarn, textile and apparel manufacturing was beginning.
- **Shifts in Apparel Sourcing.** Findings of the U.S. Fashion Industry Association's (USFIA) 2024 Benchmarking Study indicate that apparel retailers and brands based in the U.S. are more concerned than previously about forced labor in their supply chains; shipping delays and supply chain disruptions; political risks related to sourcing; and protectionist U.S. trade policy. This is leading to more effort to understand supply chains, including the sources of fibers and yarns used in their finished products and other options for sourcing.
- While all of those surveyed still manufacture some products in China, they are diversifying their sourcing. Almost all fashion companies with more than 1,000 employees say they are sourcing from ten or more countries. The biggest increase in sourcing is from **India**, but **Guatemala, Mexico and Egypt** joined the top ten for the first time in 2024.
- **Western Hemisphere Sourcing**. More than half of retail and fashion brand buyers surveyed plan to increase sourcing from members of the **Central America- Dominican Republic Free Trade Agreement with the U.S. (CAFTA-DR).** However three out of four said that sourcing textile raw materials, including wool, is usually a bottleneck limiting manufacturing in the Western Hemisphere, including in the U.S. Two thirds of respondents source from **Mexico and Canada,** up from 40% in 2019-20.

An Action Agenda: First Stage Processing

- **U.S. Sourcing and Re-Shoring**. Almost one in ten say they expect to increase their U.S. sourcing over the next two years. Four out of ten fashion companies say they source 1% to 10% of their apparel from the U.S. One in three sources yarn from the U.S. Only 15% source fabrics from the U.S., down from 24% in 2023.
- When asked to rate the **strengths and weaknesses of the U.S. and other sourcing origins**, the U.S. is top rated on speed to market, minimum order requirements, risks of labor and social requirements, environmental requirements and geopolitical risk. U.S. manufacturing is rated average on flexibility and agility, and weakest on sourcing cost and vertical integration. These are factors on which China is rated most highly.
- **Challenges and Opportunities Due to China.** While Fashion Brands and Retailers say they plan to shift manufacturing to other Asian markets from China to reduce risk, most of the companies they plan to shift to rely heavily on China for the yarns and fabrics they use.
- For example, Vietnam, which together with China accounts for 39% of U.S. apparel imports, relied on China for 70% of the textiles and 66% of the yarn they used in 2022. Vietnam also imported almost 10,000 mt (22 million lbs.) of wool top from China. Vietnam has two new wool yarn spinners slated to come online in 2025, which will double their wool top requirement.
- **First Stage Wool Processing in the United States**. The U.S. has one remaining large scale commercial wool scouring plant (Bollman Industries, San Angelo, TX) and one large scale commercial wool comber and top maker (Chargeurs (USA), Jamestown, SC). There are several medium sized scouring plants, including Mountain Meadow Wool (Buffalo, WY) and a new Clean Fleece (NY) plant that opened in 2023. There are about 80 other small plants that scour and card wool. One fourth to one half also spin yarn, weave, knit and/or felt. Commercial processors are currently running below capacity, but together with small and medium mills, could potentially scour 15-16 million lbs. of greasy wool annually.
- **Constraints in first stage processing, and the risk that one or both of the large scale commercial processors might break down, or decide to shut down, represent a significant threat to the rest of the U.S. wool yarn, textile, apparel and home goods supply chain.**
- **Comparative International Scouring and Top Making Costs.** Costs of scouring and top making at U.S. commercial mills are high by international standards due to low volumes, old equipment and high costs. Costs at small and medium sized processors are much higher, leading some to send wool to commercial facilities for scouring and top making so that they can operate their spinning, dyeing, knitting and weaving at higher volumes.

An Action Agenda: Competitive Costs

- **Wool scouring costs on a commercial basis in the U.S.** depend on the quantity scoured, yield, preparation and various other factors. It is reasonable to assume that costs of scouring and top making are in the $.50 to $1.50 range per lb. of greasy wool. This means that scouring and top making cost about $1.00 to $3.00 per clean lb. Minimum order sizes are in the 1,000 lb. to 25,000 lb. range. In comparison, for small and medium sized mills, minimums are usually in the 10 to 50 lb. range, but scouring costs are much higher, generally $4.00 to $8.00 per lb. of greasy wool.
- **Wool scouring in Europe** has been sharply reduced by environmental concerns, but when available, cost has been in the $0.46 to 0.75 per lb. of greasy wool range, depending on the yield, according to ASI. The European Union (EU) has trade agreements with Mediterranean countries, so that some wool and top making is taking place in **Egypt and Tunisia**, and then imported duty free into EU countries. Costs have been about $0.10-.15 per lb. of greasy wool, or $.23 to $.40 per lb. of clean wool. Scouring costs in **China and New Zealand** are reportedly sharply lower, $.06 and $.08 per lb. of greasy wool respectively, and $.09- $.11 per lb. of clean wool. NZ wool tends to have higher yields due to low vegetable matter (VM).
- **Australian Strategies.** With China export market disruptions as a result of trade conflicts, power shortages and the COVID pandemic, followed by concerns over potential impacts should there be a Foot and Mouth Disease (FMD) outbreak, wool growers in Australia became concerned that they were overly reliant on China as a market for greasy wool and started to discuss options and alternatives. In 2022 and 2023 WoolProducers Australia obtained over $US 1.1 million from Australia's Ministry of Agriculture and other sources for two studies: one examined whether first stage processing could be brought back to Australia; the second looked at how to diversify markets. They are following up to examine investments in scouring, carding and combing in Australia plus opportunities in Bangladesh, India, Indonesia and Vietnam.
- **Potential Costs of New Scouring and Top Making Facilities.** Industry sources placed the cost of building one new greenfield scouring plant with 66 million lbs. in annual greasy wool scouring capacity in Australia at about $US 19 million for land, building and machinery and access to energy, water, logistics and labor. It was estimated that a companion 22,000 lb. combing plant would costs about $US 31 million, and be necessary to capture opportunities for wool top in markets other than China.
- Fibershed explored the feasibility of building an integrated scouring, combing, spinning and textile manufacturing plant in California back in 2014. The expected cost for that plant was $US 26 million, with production beginning with a throughput of 1.5 million lbs. of wool, rising to 5 million lbs.. They concluded that brands would need to be willing to pay a 30-40% premium for fabric for the plant to be viable.
- Market Solutions LLC research found that there are substantial economies of scale in building large wool scouring and combing plants and running them at close to capacity. After a $US 28 million investment in upgrade in early 2024, WoolWorks scouring facility in New Zealand can scour 220 million lbs. of greasy wool per year at a cost of about $US 0.08 per lb., though for high yielding, low VM wool.

An Action Agenda: Target Markets

- **Potential Role of Small and Medium Mills.** In undertaking this assignment, one question asked was whether small and medium mills could potentially fill the gap left by the decline of large scale commercial wool processing.
  - Small and medium mills play an important role in providing services and market outlets for local sheep producers, and an opportunity to add value to wool and generate income locally.
  - Small and medium mills play an important role in the American wool supply chain. Working with state and local sheep and wool associations, groups like Fibershed, spinning and weaving groups, educational organizations, designers, makers, wholesalers and retailers, they could potentially play a more important role in adding value to American wool.
  - Technical and marketing support can potentially help small and medium mills to grow in volume and profitability. Working with a large number of small and medium mills will be relatively staff and resource intensive, however. As discussed further below, a number of small and medium mills have already been very creative in effectively mobilizing Federal, state and local government resources, along with Foundation and commercial funding, to help them invest and grow. Some receive technical support from partnerships with Universities and extension programs.
- **Realistically, small and medium mills can only be one part of a solution for rebuilding the market for American wool. Based on the average amount of greasy wool scoured by the small and medium sized mills surveyed by ASI, it would take over 1,600 small and medium mills to scour the recent annual U.S. wool clip.**
- **Commercial and Military Markets for American Wool**. Domestic commercial and military markets use about 8 million lbs. of American wool annually, based on ASI estimates that domestic commercial use accounts for 19% of the American wool clip, and domestic military use is about 15% of the total.
- **Commercial Markets and Opportunities.** The U.S. is a net exporter of greasy wool, and also a net exporter of wool yarns. More competitive world class quality and cost competitive wool scouring and top making could help to grow commercial markets for American wool.
- The clothing and household goods market has been seeing an increase in demand and supply of **niche premium clothing and apparel brands**, some featuring American wool, and often focusing on a brand story including social, climate, farmer, animal welfare, and/or labor stories and with various certifications and traceability options.
- ***For all of the certification and verification programs, getting Brands to sign on and offer a consistently available line of products has remained a challenge. Both the Textile Exchange Responsible Wool Standard (RWS) and Fibershed/Climate Beneficial have staff designated to coordinate with designers, Brands, Makers and manufacturers to get them to commit to featuring wool and other fibers certified by their programs. One consistent finding as Market Solutions LLC looked at Brands that are featured by the programs is that many offer very limited ranges of products featuring the certified or branded wool, and do not offer them on a consistent basis. The challenge is to build on these "capsule collections," to expand the range of products offered and get featured wool products to become more regular offerings.***

An Action Agenda: Target Markets

- **Domestic Retail and Fashion Brand Sourcing**. One important potential commercial opportunity is in the market for **American manufactured wool yarns, and potentially textiles, that can be exported to cut and sew and knitting operations in countries that have free trade agreements with the United States**. The terms of those agreements generally specify that in order to get access to import preferences when garments and other products are imported into the U.S., materials from the yarn forward must originate in the U.S. or the partner country. Often, design and sourcing decisions for these purchases are made in the U.S., even though garment assembly takes place internationally.
- **Military Markets and Opportunities.** ASI has long worked to maintain sales of American wool domestically through military dress uniforms, blankets, pea coats, socks, berets and other items. ASI estimates that military procurement represents about 15% of American wool use, or 3.4 million lbs. on a greasy wool basis in 2023.
- There have also been benefits in the commercial apparel market to ASI work with the U.S. military on product development. Superwash and Mercerized wool development have benefitted from military research support and interest. For example:
  - Work on Superwash led to a commercial investment by ASI's Sheep Venture Company and Chargeurs and sales in both military and commercial markets, especially for socks and knitwear.
  - The U.S. Army has invested in supporting Mercerized wool development and is reportedly interested in purchasing one million lbs. of Mercerized wool, assuming that commercial spinning can be perfected.
  - Military funded research to develop stronger, fire resistant wool blend yarns have contributed to sales to the military and commercial applications for sports and outdoors markets.
- Purchases by the U.S. government are governed by several standards, the most important for American Wool has been the Berry Amendment, which requires that all U.S. Military textiles and apparel to use U.S. sourced fibers. According to the Congressional Research Service (CRS), Department of Defense (DOD) purchases of textile and apparel articles amounted to $2.3 billion in FY2021, representing 43% of the Department's total Berry-applicable purchases. Purchases subject to the Berry Amendment represented 5% of the $49 billion of textile and apparel shipments from U.S. mills in 2021.
- **Threats to Continued American Wool Use by the U.S. Military.** Under the Berry Amendment, if a domestic source for an item "cannot be acquired when needed in satisfactory quality and sufficient quantity at U.S. market prices," a **Domestic Non-Availability Determination (DNAD)** can be requested by the prime contractor to the Defense Logistics Agency (DLA) Clothing and Textile Troop Support Unit. There have been several instances of DNADs affecting worsted wool and wool blend fabrics for military uniforms in recent years. In those cases ASI has worked to try to ensure that any imported fabric still used American wool.

An Action Agenda: Options, Opportunities

- **America's Wool Top Challenge.** All worsted wool spinners and worsted textile manufacturers in the U.S. are dependent upon Chargeurs (USA) in South Carolina for wool top using American wool to be Berry Amendment compliant. If Chargeurs were to break down or close, there would not be a backup source of Berry Amendment compliant wool top to meet the needs of DLA or commercial customers.
- **Upgrading First Stage Processing and Building Demand For a More Competitive Wool Supply Chain**. The entire wool supply chain is dependent on wool scouring and top making to survive. Investment in upgrades to world class, premium quality and cost first stage processing could help to preserve the military and commercial markets that currently exist for American wool.
- **Potential Options to Achieve World Class First Stage Processing:**
  - Chargeurs' combing plant could be upgraded to world class quality and cost standards;
  - Bollman's scouring facility could be upgraded and potentially add wool combing capacity; and/or
  - A new combing plant could be constructed at a location close to major wool production with access to water, power waste treatment and labor. Options for truck, rail and/or waterborne transportation to customers would also be a consideration.
- **All would require a major companion effort to ensure consistent demand** so that they could operate cost effectively and profitably. A cost and quality competitive plant could reliably meet the needs for wool top for Berry compliant yarns and fabrics for the military. It could also help to make U.S. wool and top more competitive in yarns and fabrics for other government and commercial customers and for exports to their international points.
- **Market Opportunities**. This could also likely make American wool more competitive in other domestic and export markets:
  - U.S. manufactured yarn and textiles could become more competitive in commercial and military markets that currently exist.
  - U.S. yarns and textiles could become more competitive in domestic applications such as worsted wool and wool blends for agencies covered under the Kissell Amendment and Buy American requirements, which do not require use of U.S. fibers, only U.S. manufactured yarn.

An Action Agenda: Opportunities, Process

  - U.S. yarns and textiles could potentially become more competitive for export to markets where cut and sew and knitting industries benefit from trade agreements with the U.S.
  - U.S. scoured wool and wool top could potentially be more competitive in markets from which the U.S. imports textiles, apparel and home goods that currently source scoured wool, top, yarns and fabrics from China.
- **Demand Challenge.** Large scale first stage processors currently have sharply underutilized capacity that potentially threatens their continued operations. Investments in technology upgrades alone will not resolve this problem.
- **ASI/AWC leadership** will be required to help ensure demand to pull products through the supply chain and justify needed investment in becoming world class competitive so that downstream spinning, textile and apparel manufacturing can be more profitable and contribute to on shoring and near shoring. **A Steering Group including representatives of the entire supply chain** will be required, including wool producers, warehouses and merchants, first stage processors, spinners, textile and apparel manufacturers, brands and retailers.
- **What Will Be Required?**
  - A Plan for next steps.
  - Options to Build Demand and Cost and Quality Competitive First Stage Processing.
  - Partnerships along the supply chain to make it work, including with Brands and Retailers.
  - Resources, including ASI staff and funding to plan and manage a domestic market development program.
- **Resources to help Maintain and Rebuild Markets for American Wool are discussed further in the report, including:**
  - Wool Research, Development and Promotion Trust Fund.
  - Agriculture Wool Apparel Manufacturers Trust Fund.
  - National Sheep Improvement Center Sheep Production and Marketing Grant Program.
  - USDA Grants and Loans: Value-Added, Climate Smart and other Rural Development Programs.
  - State and Local Funding Support.
  - Wool Innovation Support.
  - Other Potential Financing Sources: Commercial loans, Foundations, Venture Capital, Sheep Venture Company, Checkoffs, USDA/FAS Export Programs: MAP, FMD, QSP, RAPP.
  - ASI/AWC Activities and Resources to Support Rebuilding American Wool Markets.

For Comments and Questions

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