



Materials Market Report

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About this report

Welcome to the 11th edition of Textile Exchange's annual Materials Market Report.

The Materials Market Report was launched in 2013 and is a comprehensive, annual publication that provides **unique data and insights into global fiber and raw materials production**, helping the industry to measure and make progress towards its goals. We believe that climate action starts at the source of the materials we choose.

The Materials Market Report shares **best available data** on global fiber and material production volumes alongside program-specific volumes and other insights such as the number of certified sites. For the purpose of this report, leather, rubber, and down are considered non-fiber raw materials and are therefore included separately from the section and charts on 'global fiber'.

It's important to note that the compilation of global market data for fibers and raw materials is challenging and the quality of available data is often limited. The collection of primary data from suppliers is beyond the scope of this report so we **rely on secondary data** from industry associations, international organizations, governmental organizations, standard setters, and research institutes. While Textile Exchange has collected, analyzed, and compiled this information in all good conscience and has cross-checked it wherever possible, **the report is intended for general guidance and information purposes only**. Data gaps and inconsistencies are common in global market data, so modeling has often had to be applied.

For many years, Textile Exchange has worked on improving data quality and increasing transparency in the industry. However, there is a lot more work to be done, and we want

to encourage the industry to **help us further improve the quality and accessibility** of global fiber and raw materials production data. Only through collaboration and joint efforts can we measure our progress and achieve our goals.

We would like to say a huge thank you to all those who have contributed data or information to this report for making its production possible.

Important note about the scope of data included in this report:

Please note that this report covers total fiber and raw materials production volumes, irrespective of whether they are used for apparel, home textiles, footwear, or any other application. Textile Exchange is aware of the interest in the breakdown of volumes going into different product groups, for which data is currently very limited, and plans to work on improving this data.

In the meantime, as a starting point and to aid interpretation of the data included in this report, Textile Exchange has included very rough estimates of the sector breakdown per fiber and material category in the Methodology section of this report.

Where to find information on companies' commitments and targets:

Information about the Material Challenges can be found in the [Material Challenges Dashboard](#).

Where to find an assessment of different programs and standards systems:

It is not within the scope of this report to assess the sustainability and governance attributes of programs or standards and therefore the information should not be used or considered as advice or recommendation in any direction. Those looking for an assessment of different programs and standards systems may wish to refer to Textile Exchange's [Preferred Fiber and Materials Matrix](#) (PFMM) – an interactive tool launched in 2023 that uses a holistic set of quantitative and qualitative criteria to consistently assess what is included in various standards systems. We recognize that, for some materials, the information in the PFMM is currently limited; in the future, it will be built out to be inclusive of additional material types as well as branded materials and other sustainability programs alongside standards.

Where to find supplier-related information:

Textile Exchange continues to provide information about suppliers, production sites, and branded materials. Previously included in this report, the information now resides online in Textile Exchange's [Materials Directory](#) (beta version) where we share information on suppliers around the world in the form of interactive maps and a filterable database. With your help, we are working to continuously improve this tool. The development of the Materials Directory is part of Textile Exchange's tools harmonization process, which will merge previously existing fiber- and material-specific tools into one. Further alignment of Textile Exchange's tools is planned for the coming years.

Executive summary

The global fiber market

Global fiber production increased from around 116 million tonnes in 2022 to a record 124 million tonnes in 2023. Since 2000, when production was 58 million tonnes, global fiber production has more than doubled and it is expected to grow to 160 million tonnes in 2030 if business as usual continues.

While the industry has made commitments to align with the 1.5°C pathway, trends we are seeing—such as the industry’s reliance on virgin fossil-based synthetic materials and the limitations of textile-to-textile recycling—threaten to undermine the industry’s commitments to its climate goals.

The combined share of all recycled fibers slightly decreased in 2023, from around 7.9% to 7.7%, mainly due to an increase in the production of fossil-based polyester, which had lower prices than recycled polyester. Fossil-based synthetics production increased from 67 million tonnes in 2022 to 75 million tonnes in 2023. **Meanwhile, less than 1% of the global fiber market came from pre- and post-consumer recycled textiles.**



Cotton

Global cotton fiber production decreased slightly between 2021/22 and 2022/23, from 25.1 to 24.4 million tonnes. After polyester, cotton is the second most widely produced fiber, accounting for 20% of global fiber production.

The cotton from programs that shared data for this report accounted for an estimated 29% of total cotton production in 2022/23, the same as in 2021/22. The market share has fluctuated over the years due to factors such as weather variations, program changes, market

conditions, and socio-political challenges.

Better Cotton, including its equivalents Responsible Brazilian Cotton (ABR), Agro-2, Cotton made in Africa (CmiA), Israel Cotton Production Standard System (ICPSS), and myBMP (Best Management Practices) accounted for 22% of all cotton in 2022/23, and thus made up the majority of the 29% of cotton covered by the programs featured in this report.

Better Cotton without its equivalents accounted for around 8%, ABR for around 11%, CmiA for around 2%, MyBMP for around 2%, Agro-2 for 0.4% and ICPSS for 0.1% of all cotton in 2022/23. All other featured cotton programs (including Climate Beneficial™, e3® Sustainable Cotton, Fairtrade, ISCC, organic, REEL Cotton Code, REEL Regenerative Cotton Code, Regenerative Organic Certified™ (ROC), and the USCTP) had a combined market share of around 7% of all cotton in 2022/23.



Polyester

Polyester fiber production increased from 63 million tonnes in 2022 to 71 million tonnes in 2023, accounting for 57% of global fiber production, meaning that polyester continues to be the most widely produced fiber.

Globally, recycled polyester fiber production increased from around 8.6 million tonnes in 2022 to around 8.9 million tonnes in 2023. However, due to the increase in virgin polyester production, there was a **decrease in the overall market share of recycled polyester** from around 13.6% of global polyester production in 2022 to around 12.5% in 2023.

Systems for polyester textile-to-textile recycling are in development but are only estimated to account for around

2% of all recycled polyester. The interest in, and use of, ocean or ocean-bound plastic is increasing, but overall market shares remain very low and make up less than 0.01% of all recycled polyester. Recycled polyester is still primarily made from plastic bottles (98%).

The market share of biobased polyester fiber remained very low at around 0.01% of the polyester fiber market—mainly due to issues around price, availability, and questions about the sustainability of currently available biobased polyester.

New innovations are also mentioned in the report, such as fibers made from captured CO₂.



Polyamide (Nylon)

Polyamide (nylon), which is the second most used synthetic fiber, made up 5% of the global fiber market in 2023, with 6.7 million tonnes produced globally. **Due to technical recycling challenges and comparatively lower prices for new virgin fossil-based polyamide, recycled polyamide only makes up 2% of the total polyamide market share.** Most recycled polyamide is made from pre-consumer waste or materials such as discarded fishing nets and carpets, but there is also a lot of potential for post-consumer textiles to be used as feedstock.

The market share of biobased polyamide fibers in 2023 remained low, at around 0.5% of the global polyamide fiber market. Similar to the reasons for the low uptake of biobased polyester, price, availability, and questions about the sustainability of biobased polyamide dampened growth in the market.

Executive summary

[Manmade Cellulosic Fibers](#)

Production of manmade cellulosic fibers (MMCFs) including viscose (rayon), lyocell, modal, acetate, and cupro increased from 7.4 million tonnes in 2022 to 7.9 million tonnes in 2023, with MMCFs accounting for 6% of the global fiber market.

MMCFs covered by FSC and/or PEFC had an estimated market share of about 60–65% of all MMCFs in 2023.

The market share of MMCFs made from recycled feedstocks increased from an estimated 0.5% in 2022 to 0.7% in 2023. These volumes are expected to increase in the coming years thanks to ongoing research and development. With organizations such as bluesign® and Zero Discharge of Hazardous Chemicals (ZDHC) introducing standards at the pulp and fiber level, change is also likely at these stages of the supply chain.

[Wool](#)

Global sheep wool production remained relatively unchanged, at around 1 million tonnes of clean wool fiber in 2023, accounting for 0.9% of the global fiber market.

The market share of wool produced according to the Responsible Wool Standard (RWS), ZQ, SustainaWOOL™ (GREEN and GOLD), Sustainable Cape Wool Standard (SCWS), and Climate Beneficial™ increased from around 4.2% in 2022 to 4.8% in 2023. In some apparel wool-producing countries/areas, RWS-certified wool had considerable market shares in 2023. Most significantly, in terms of both volume and market share, 43% of all wool produced in South Africa was RWS-certified.

Recycled wool continued to account for around 6% of the global total wool market in 2023.

[Mohair](#)

Approximately 4,570 tonnes of greasy mohair fiber were produced globally in 2023. **47% of all mohair produced in 2023 aligned with the Responsible Mohair Standard (RMS)**, which launched in March 2020 and covers both animal welfare and responsible land use criteria. RMS increased its market share to 84% of total mohair production in South Africa and 55% of total mohair production in Australia in 2023.

[Alpaca](#)

Global alpaca fiber production was around 6,200 tonnes in 2023. **The market share of the Responsible Alpaca Standard (RAS) reached 7% in 2023, up from 3% in 2022.**

[Cashmere](#)

Global cashmere production totaled around 25,611 tonnes of greasy fibers in 2023. The market share of the cashmere programs—AVFS, Good Cashmere Standard®, Responsible Nomads, and Sustainable Fibre Alliance (SFA) Cashmere Standard – combined increased to 47% of all cashmere produced worldwide in 2023, up from 35% in 2022.

Other fibers

Other fibers—from hemp to elastane—are starting to gain traction in the industry. Beyond the fibers already mentioned, this report also covers other plant-based fibers (jute, coir, flax, hemp, sisal, abaca, kapok, ramie, and agave fibers), other animal fibers (angora rabbit, camel, guanaco, llama, vicuna, and yak hair) and other synthetic fibers (polypropylene, acrylics, and elastane).



Photo: Carl van der Linde

Executive summary

Other raw materials

[Leather](#)

Leather, measured in terms of fresh hides of cattle, sheep, goats, and buffalo, had a global production volume of around 13.4 million tonnes in 2022 (the latest year for which data are available). Cattle hides were the most used type of hide with an estimated 9.4 million tonnes produced, followed by sheep hides at 2.0 million tonnes, goat hides at 1.3 million tonnes and buffalo hides at 0.7 million tonnes.

For leather, most standards cover the processing stage. While multiple standards cover animal welfare for meat production, only a few small supply chains currently manage to maintain traceability of the hides of certified animals through to finished leather goods.

[Down](#)

Global down production was estimated at around 0.63 million tonnes in 2023, up from 0.60 million tonnes in 2022. The market share of the Responsible Down Standard (RDS) slightly increased to 3.3% of the total down market in 2023. Downpass had a market share of around 1.2% in 2021 but, due to the war in Ukraine, which is a significant producer, data for 2022 and 2023 are not available. RDS and Downpass are primarily animal welfare standards.

[Rubber](#)

Global natural rubber production totaled around 15 million tonnes in 2023. The market share of rubber forest covered by the Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC) increased slightly in 2023, from around 2.9% to 3.0%

Sites certified to Textile Exchange standards

The number of sites certified to Textile Exchange's portfolio of standards significantly increased in 2023, from 60,321 to 75,173. This includes sites certified to the Global Recycled Standard (GRS), Organic Content Standard (OCS), Recycled Claim Standard (RCS), Content Claim Standard (CCS), Responsible Down Standard (RDS), Responsible Wool Standard (RWS), Responsible Alpaca Standard (RAS), and Responsible Mohair Standard (RMS).



Photo: Danilo Arenas

The Global Fiber Market

Global fiber market trends

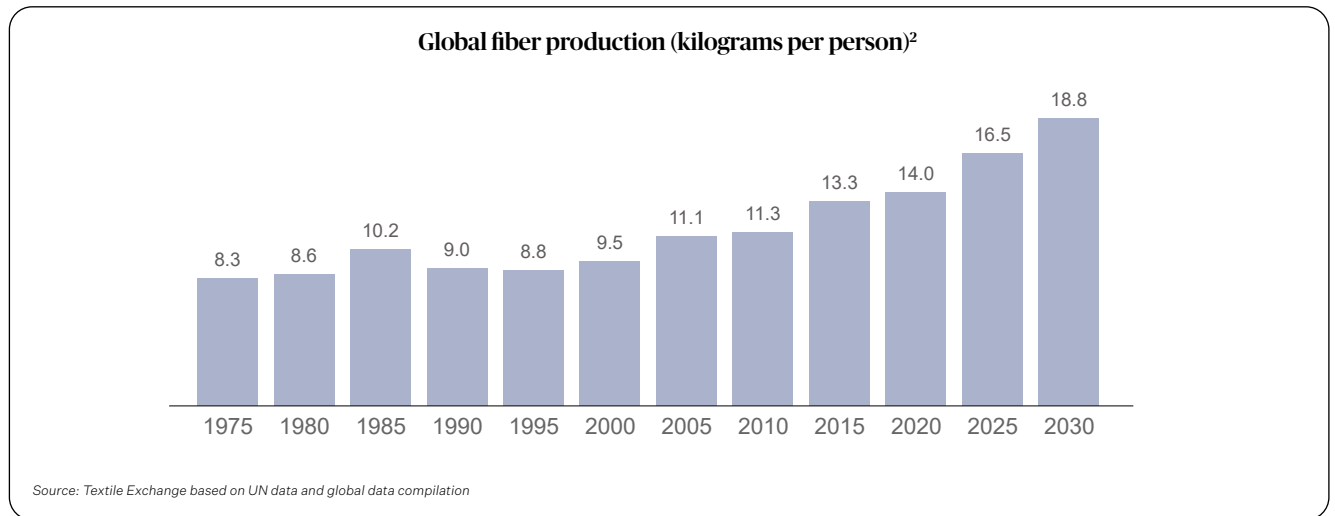
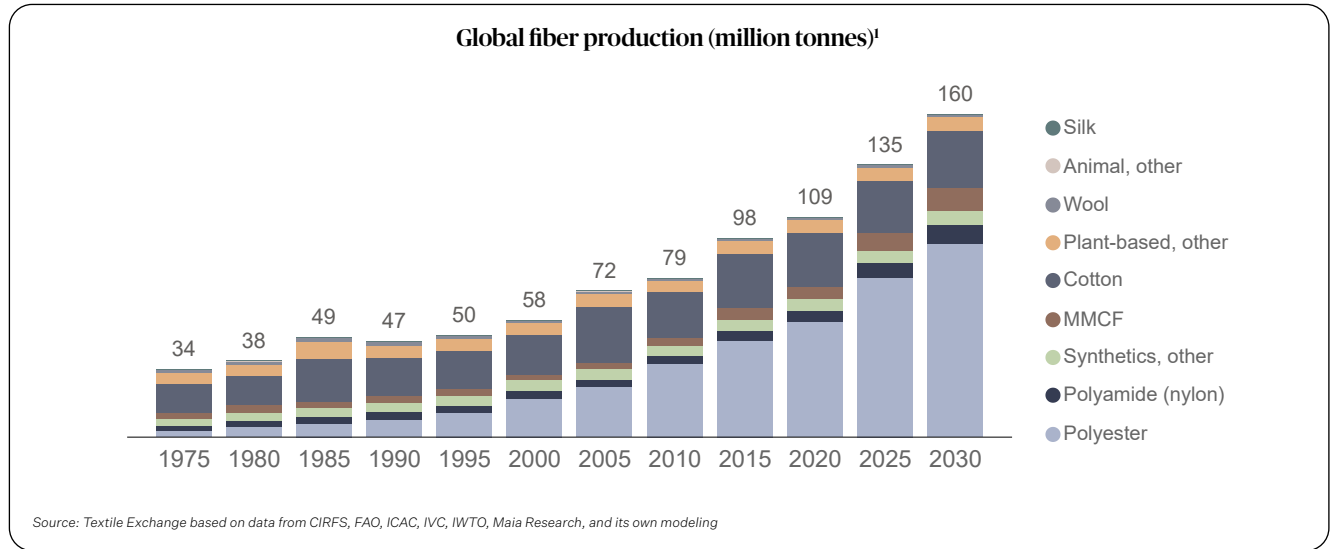
Global fiber production increased to a record 124 million tonnes in 2023, up from 116 million tonnes in 2022.¹ Since 2000, when production was 58 million tonnes, global fiber production has more than doubled and is expected to grow to 160 million tonnes in 2030 if business continues as usual.

Polyester has contributed most significantly to this growth, replacing cotton as the most widely used fiber in the world since the mid to late 2000s.

Global fiber production per person has also increased significantly, growing from 8.3 kilograms per person in 1975 to 15.5 kilograms per person in 2023.² This figure is expected to rise to 18.8 kilograms per person by 2030 if business continues as usual.

¹ Textile Exchange compilation based on data from ICAC, FAO, IWTO, Mohair South Africa, CIRFS, IVC, Maia Research, and its own modeling. Volumes of certain minority fibers such as PTT, carbon, aramid, PLA, PBS, and PEF are not included. Cotton production volumes are collected in accordance with the harvest year used by ICAC, which runs from August 1 to July 31, with volumes allocated to the later year (for example, 2022/23 cotton production volumes are allocated to the 2023 calendar year) with the exception of Brazil, for which harvest year data is allocated to the earlier calendar year (i.e. 2023/24 data is allocated to 2023) as per the methodology of ICAC and USDA, updated in 2023. MMCF and synthetic fiber volumes include staple fiber and filament. Please note that the percent market shares may differ from other sources due to 1) our overview including other plant fibers, other wool, and silk—all of which are often excluded from global statistics—and 2) different cotton year allocations. In general, all global figures are estimates.

² Textile Exchange based on [UN Population Division, 2022. World Population Prospects 2022](#). And volume data as specified in footnote (1).



The global fiber market 2023

Synthetic fibers

[Synthetic fibers](#) have dominated the fiber market since the mid-1990s. At around 84 million tonnes, this fiber category made up approximately 67% of global fiber production in 2023.

[Polyester](#) alone had a market share of around 57% of global fiber production in 2023, with approximately 71 million tonnes produced.

[Polyamide \(nylon\)](#), the second-most used synthetic fiber, accounted for 6.7 million tonnes and approximately 5% of the global fiber market in 2023.

[Other synthetics](#) — polypropylene, acrylics, and elastane—had a combined market share of 5% in 2023, with a total production volume of 6.1 million tonnes.

Plant fibers

[Plant fibers](#) had a market share of around 25% of the global fiber market in 2023, with a combined production volume of 31.4 million tonnes.

[Cotton](#) is the second-most important fiber globally in terms of volume. At about 24.7 million tonnes, it had a market share of approximately 20% of global fiber production in 2023.

[Other \(non-cotton\) plant-based fibers](#) (including hemp, flax, jute, coir, other bast

fibers, sisal, manila, kapok, agave, and ramie) had a combined market share of about 5%, with 6.7 million tonnes produced in 2023. At around 0.4 million tonnes, flax had a market share of around 0.3% of global fiber production in 2023 while hemp, with 0.2 million tonnes produced, had a market share of around 0.2%.

Manmade cellulosic fibers

[Manmade cellulosic fibers](#) (MMCFs) had a market share of around 6% in 2023, with a global production volume of around 7.9 million tonnes.

[Viscose](#) (rayon) accounted for the majority of this at 6.3 million tonnes, accounting for around 5% of global fiber production.

[Other MMCFs](#) (including acetate, lyocell, modal and cupro) had a combined market share of 1.3%.

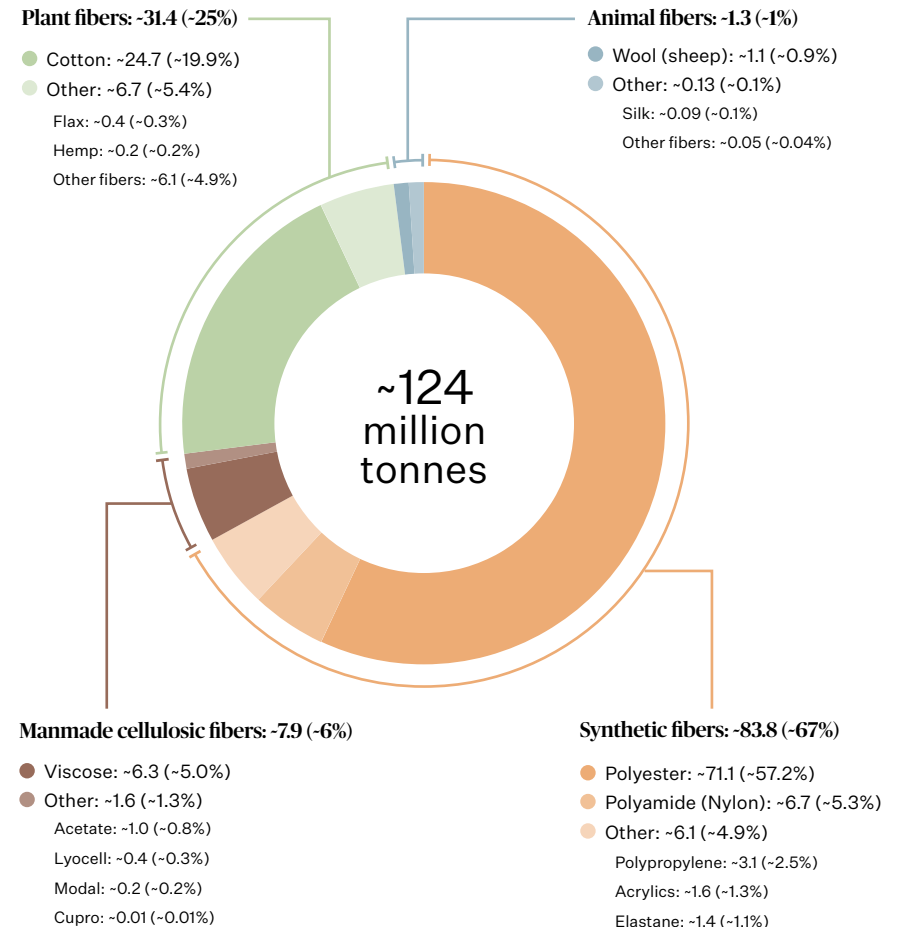
Animal fibers

[Animal fibers](#) had a combined market share of 1.0% in 2023.

[Wool](#) made up the majority of this, with global clean wool production totaling around 1 million tonnes and accounting for 0.9% of global fiber production.

[Other animal fibers](#) (beyond wool) had a market share of 0.1%, with silk making up the majority of this at 0.07%.

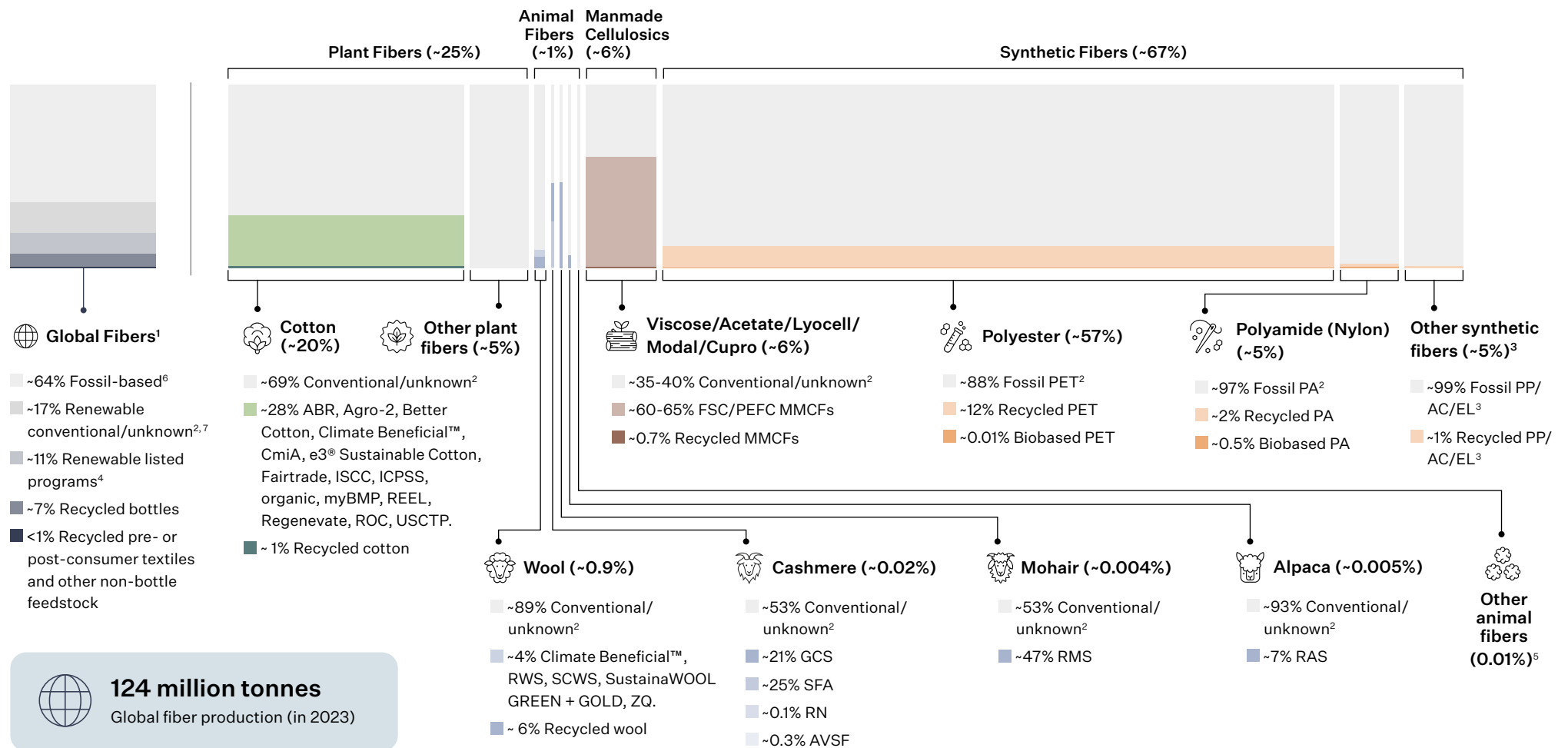
Global fiber production in 2023
(in million tonnes and % of global fiber production)



Source: Textile Exchange based on data from CIRFS, FAO, ICAC, IVC, IWTO, Maia Research, and its own modeling.

Note: This chart includes recycled fibers. Other animal fibers included here are alpaca, angora, camel, cashmere, guanaco, llama, mohair, vicuna, and yak. Other plant fibers included here are jute, coir, sisal, abaca, ramie, kenaf, kapok, and agave. Leather, down, and rubber are not included as they are considered non-fiber raw materials for the purpose of this report.

The global fiber market 2023: Program overview



1 This graph aims to inform the industry about global total fiber production volumes and the shares covered by different programs.

2 'Conventional/unknown' includes volumes of programs for which data is not accessible or available.

3 Other synthetic fibers include polypropylene (PP), acrylics (AC), and elastane (EL).

4 Renewable listed programs include here all the programs listed in this chart apart from the recycled fibers.

5 Other animal fibers include here angora, camel, guanaco, llama, vicuna, yak, and silk.

6 Fossil-based is calculated as the synthetics total excluding recycled and biobased synthetics.

7 Renewable conventional/unknown is calculated as the global fiber total excluding fossil-based, the renewable listed programs, recycled bottles and recycled pre- or post-consumer textiles and other non-bottle feedstock.

The global recycled fiber market

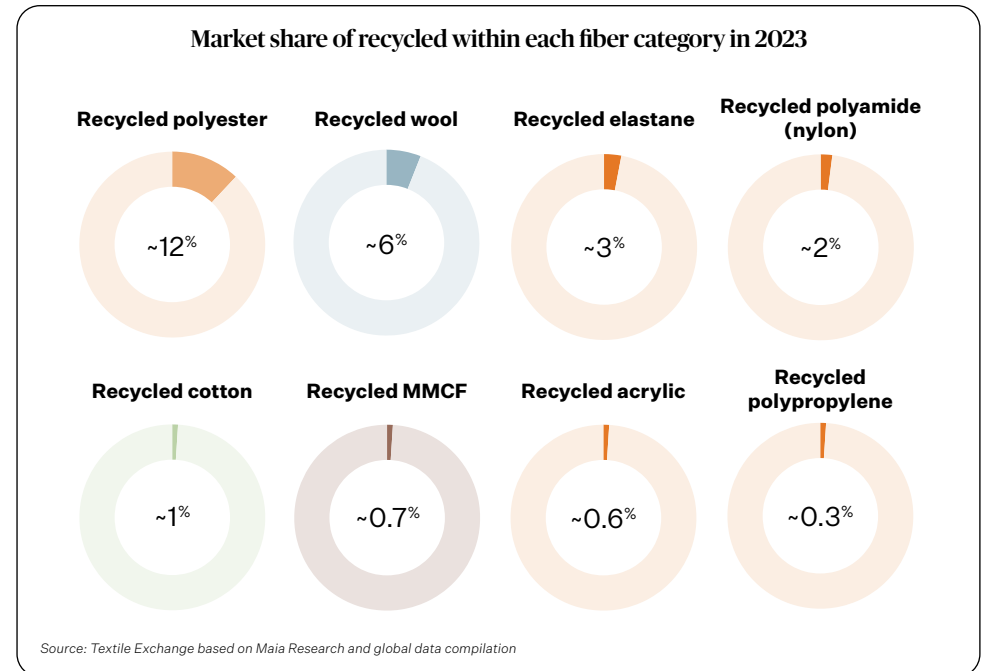
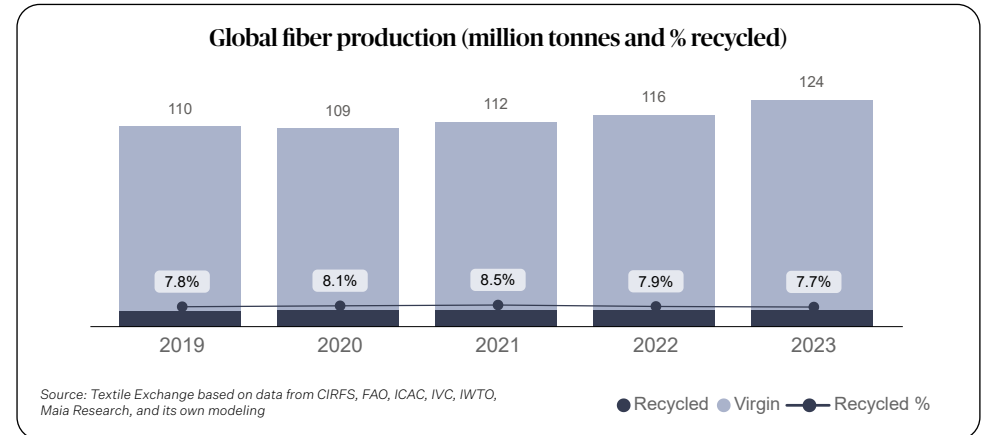
After years of growth, the market share of recycled fibers decreased from 7.9% in 2022 to 7.7% in 2023. 7.0% of all fibers produced were recycled polyester made from plastic bottles. Overall, less than 1% of the global fiber market was from pre- and post-consumer recycled textiles in 2023.

Virgin fiber production volumes increased from 107 million tonnes in 2022 to 115 million tonnes in 2023, primarily driven by the increase in new virgin fossil-based fibers from 67 million tonnes in 2022 to 75 million tonnes in 2023.

Polyester continued to have the highest proportion of recycled fibers in 2023, at around 12.5%. Although this represents a decline from 2022, when the market share of recycled polyester was around 13.6%, absolute recycled polyester production volumes increased slightly. Around 98% of recycled polyester came from PET bottles in 2023. It is estimated that recycled elastane made up around 3% of total elastane production in 2023, while recycled polyamide (nylon) made up around 2%, recycled acrylic around 0.6%, and recycled polypropylene around 0.3% of their respective fiber volumes. Wool had the second-highest recycled fiber share in 2023, at about 6%, while the market share for recycled cotton was estimated to be roughly 1% of total cotton production. The market share of recycled MMCFs is expected to increase in future years but accounted for only around 0.7% of all MMCFs in 2023.

Recycling fibers from blended textiles

The proliferation of textiles made from fiber blends—such as cotton and polyester or elastane—poses significant challenges when it comes to recycling post-consumer textile waste. This is due to the labor-intensive separation process of the different fiber types and different conditions required for chemical and mechanical recycling. Chemical recycling technologies can help overcome complications associated with mechanical recycling of textiles and there are some innovative startups working on solutions to make high-value fiber blend recycling possible.



The Global Fiber Market

Cotton

Virgin cotton

Global cotton production

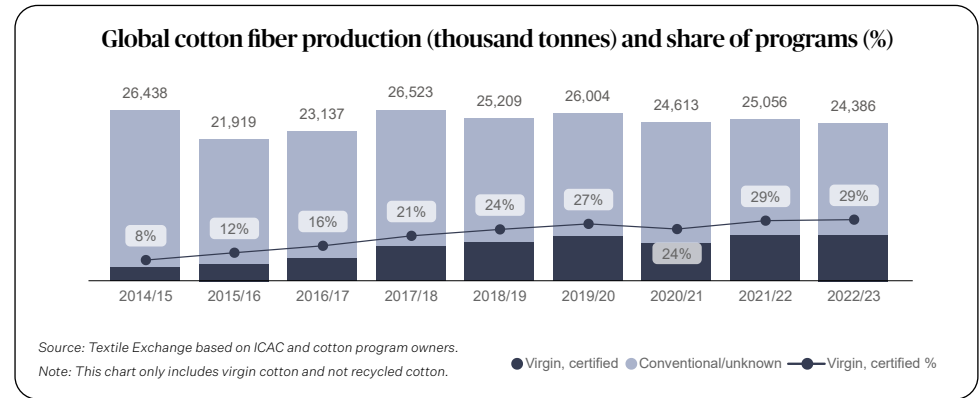
Globally, the production of virgin cotton fiber decreased from 25.1 to 24.4 million tonnes between 2021/22 and 2022/23.¹

The market share of virgin cotton covered by the programs that shared data for this report² remained at an estimated 29% in 2022/23, with a combined production volume of around 7.1 million tonnes.³

Better Cotton, including its equivalents⁴ ABR, Agro-2, CmiA, ICPSS, and myBMP made up the majority of this 29%, accounting for around 22% of all cotton

grown globally in 2022/23. Better Cotton without its equivalents accounted for around 8%, ABR for around 11%, CmiA⁵ for around 2%, myBMP for around 2%, Agro-2 for 0.4% and ICPSS for 0.1% of all cotton in 2022/23.

All other cotton programs, including Climate Beneficial™, e3® Sustainable Cotton, Fairtrade, ISCC, organic,⁶ REEL Cotton Code, REEL Regenerative Cotton Code, Regenerative Organic Certified™ (ROC), and the USCTP, had a combined market share of around 7% of all cotton in 2022/23.



1 ICAC, 2024. [World Cotton Statistics](#). Downloaded on July 4, 2024.

2 The programs included for virgin cotton include Agro-2, Better Cotton, Cleaner Cotton (for historical data since discontinued in March 2020), Climate Beneficial™, Cotton made in Africa (CmiA), e3® Sustainable Cotton, Fairtrade, Israel Cotton Production Standard System (ICPSS), International Sustainability and Carbon Certification (ISCC), myBMP, organic, REEL Cotton, Regenerative Organic Certified™ (ROC), Regenerate, Responsible Brazilian Cotton (ABR), and the U.S. Cotton Trust Protocol (USCTP). The figures presented here are specific for virgin cotton and do not include recycled cotton. Please see the chapter [Recycled Cotton](#) for more information on recycled cotton.

3 Textile Exchange based on source (1) and cotton program data received by email. Overlaps of programs excluded.

4 Better Cotton, including equivalents, as reported by Better Cotton. It slightly differs from the aggregate of the data provided by the individual programs because minor parts of their volumes are not accounted as Better Cotton equivalent and due to somewhat differing data collection and reporting methodology.

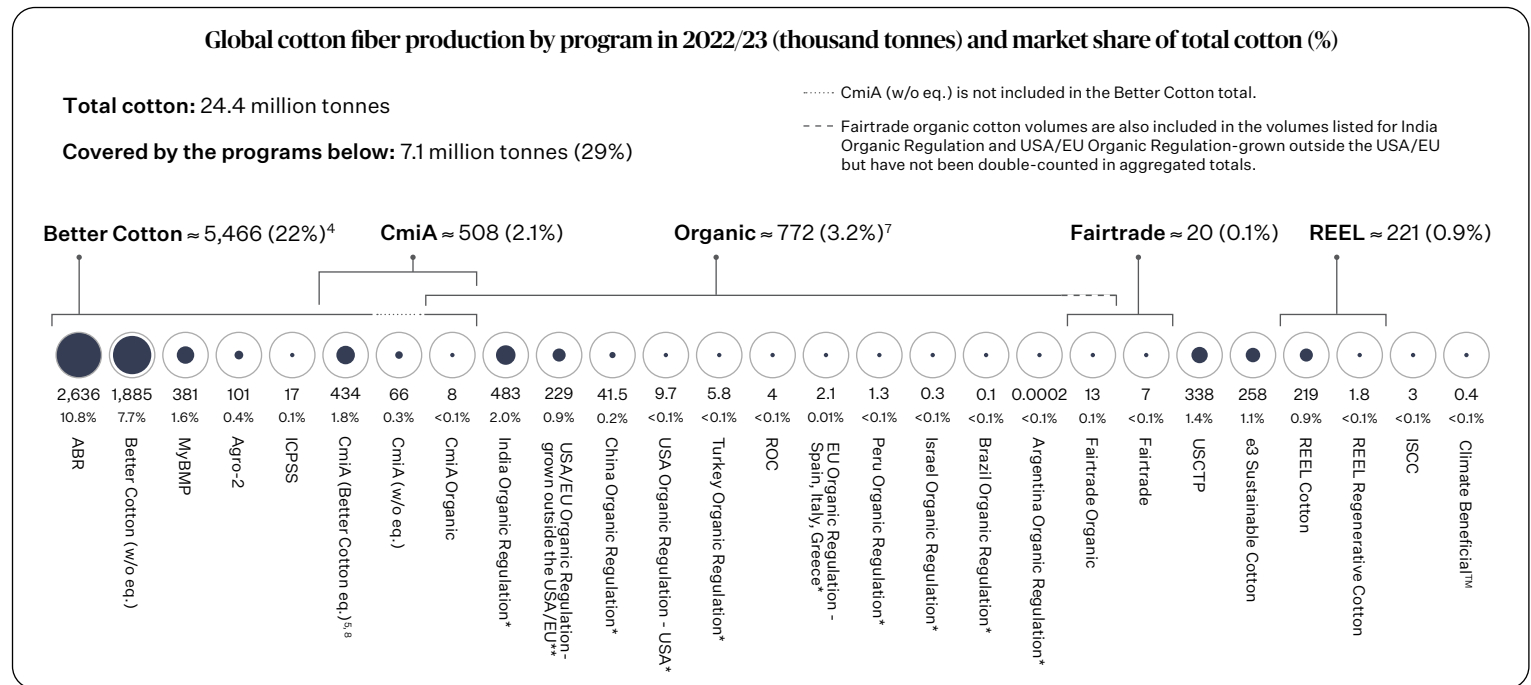
5 The equivalency agreement between CmiA and the Better Cotton Standard System (BCSS) ceased at the end of 2022, but cotton produced in the 2022/23 season was still covered by the agreement.

6 This includes organic cotton certified to Regenerative Organic Certification (ROC), and supplier-specific programs such as bioRe®.

7 Please see source information and footnotes on the organic cotton pages for more information.

8 This figure includes some cotton fiber that is licensed to both CmiA and Better Cotton (as two separate licenses rather than via an equivalency agreement)

9 The term "certified" includes various programs with different verification and chain of custody models.



Virgin cotton

A closer look at the cotton programs

[Agro-2](#) cotton production, recognized as equivalent to the Better Cotton Standard System since 2020, increased from 54,256 tonnes in 2021/22 to 100,549 tonnes in 2022/23. It accounted for 33% of cotton grown in Greece and 0.4% of cotton grown worldwide in 2022/23.

[Better Cotton](#) (including equivalents) represented around 22% of all cotton produced worldwide in 2022/23. Global Better Cotton production increased slightly, from around 5.4 million tonnes in 2021/22 to 5.5 million tonnes in 2022/23, though production in Pakistan declined significantly due to the devastating floods in 2022, which severely impacted the country's cotton harvest.¹ Better Cotton (without its equivalents) made up around 34% of all Better Cotton produced in 2022/23. The remaining 66% of Better Cotton was produced according to the Better Cotton equivalents ABR, Agro-2, CmiA,² ICPSS, and myBMP.

[Cleaner Cotton](#) production was discontinued in March 2020 when the funding for the regular farm program ended. We still include the chart with previous years' data in this report since they are part of historical data.

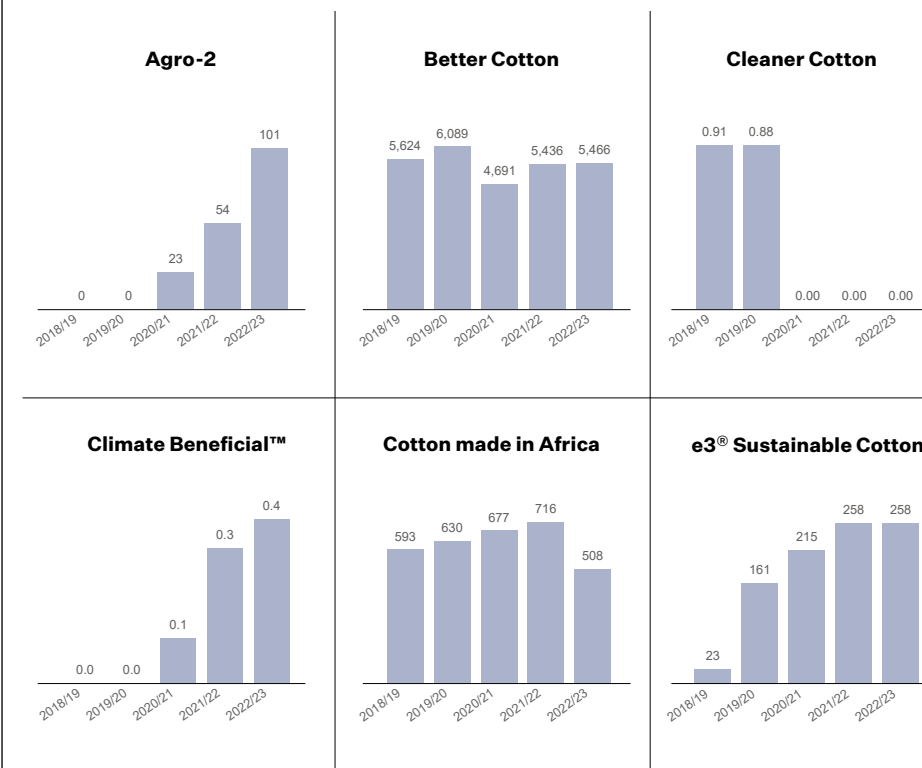
[Climate Beneficial™](#) cotton production increased from 324 tonnes in 2021/22 to 394 tonnes in 2022/23. All Climate Beneficial™ cotton was produced in the United States.

[Cotton made in Africa](#) (CmiA) production decreased from 716,397 tonnes in 2021/22 to 508,145 tonnes in 2022/23 due in part to the negative effects of climate change (droughts and heavy rains), as well as a severe pest infestation that particularly affected production in West Africa.⁴ CmiA accounted for 2% of all cotton produced in 2022/23 and around 30% of all cotton produced in Africa that year. The equivalency agreement between CmiA and Better Cotton ended in 2022 but 2022/23 production was still covered by the agreement, with 85% of CmiA's 2022/23 cotton production recognized as Better Cotton equivalent. In Tanzania and, for the first time, Benin, some CmiA cotton production was also certified to an organic standard – 1,301 tonnes in Benin and 6,920 tonnes in Tanzania.

In November 2023, the Regenerative Cotton Standard® (RCS) was launched by the Aid by Trade Foundation. It was not active in the 2022/23 harvest period covered by this report and therefore is not included in the data.

[e3® Sustainable Cotton](#) production data for 2022/23 were not available at the time of reporting so 2021/22 data (which are expected to be similar) are used as proxy. In this period, production totaled 258,240 tonnes, accounting for approximately 8% of all US cotton production and around 1% of all cotton grown worldwide.

Global cotton production by program (thousand tonnes)³



1 Better Cotton. Email correspondence, July 2023.

2 The equivalency agreement between CmiA and the Better Cotton Standard System (BCSS) ceased at the end of 2022, but cotton produced in the 2022/23 season was still covered by the agreement.

3 Program data is based on information from program owners, received through email correspondence or from their websites. The production volumes reported here include the total volume produced per program including equivalents and overlaps with other standards.

4 CmiA. Email correspondence, March 2024.

Virgin cotton

A closer look at the cotton programs

[Fairtrade](#) cotton production increased from 18,255 tonnes in 2021/22 to 20,414 tonnes in 2022/23, accounting for 0.1% of all cotton produced in 2022/23. Approximately 65% (13,269 tonnes) of Fairtrade cotton was also certified to an organic standard in 2022/23.

[International Sustainability and Carbon Certification \(ISCC\)](#) cotton production decreased significantly from 128,629 tonnes in 2021/22 to 2,944 tonnes in 2022/23. The reason for this decrease was not explained. ISCC now accounts for 0.01% of global cotton production, down from 0.5% in 2021/22. Most of the ISCC-certified cotton continued to be produced in Greece in 2022/23. Small volumes of ISCC-certified cotton was also produced in Tanzania for the first time in 2022/23, while the production in Kenya that began in 2021/22 did not continue in 2022/23.

The [Israel Cotton Production Standard System \(ICPSS\)](#)—Israel Cotton Production and Marketing Board (ICB)’s new standard, developed in 2018—has been recognized as a Better Cotton equivalent since 2020. ICPSS production increased significantly, from around 5,166 tonnes in 2021/22 to an estimated 17,303 tonnes in 2022/23, accounting for 0.1% of all cotton produced worldwide and 99.6% of all cotton grown in Israel.

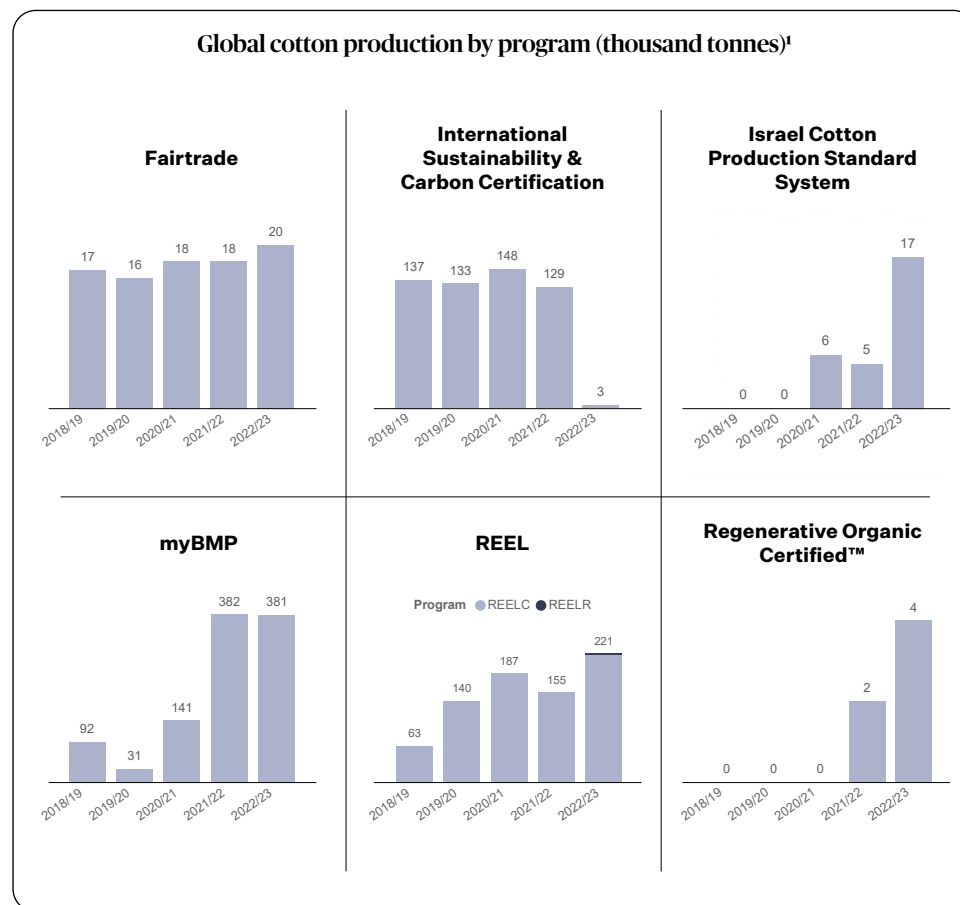
[myBMP](#) cotton production decreased from 382,263 tonnes in 2021/22 to 381,401 tonnes in 2022/23, accounting for around 30% of all cotton grown in Australia and 2% of all cotton produced worldwide. Since 2014, myBMP has been recognized as a Better Cotton equivalent.

[REEL](#) Cotton Code (‘REELC’ in the chart opposite) production increased from 155,449 tonnes in 2021/22 to 219,443 tonnes in 2022/23, now accounting for 0.9% of all cotton produced worldwide. This growth is a result of REEL expanding its programs in India, Bangladesh, and Pakistan, although the severe floods in Pakistan in 2022 meant that the country’s production actually decreased that year despite the expansion.

CottonConnect also piloted its new REEL Regenerative Cotton Code (‘REELR’ in the chart opposite) for the first time in 2022/23, producing a total of 1,777 tonnes between the pilot programs in India, Bangladesh, and Pakistan.

[Regenerative Organic Certified™ \(ROC\)](#) cotton, which was produced in India and Peru in 2022/23, increased production from 1,975 tonnes in 2021/22 to 4,041 tonnes in 2022/23, accounting for around 0.02% of all cotton produced worldwide.

Global cotton production by program (thousand tonnes)¹



¹ Program data is based on information from program owners, received through email correspondence or from their websites. The production volumes reported here include the total volume produced per program including equivalents and overlaps with other standards.

Virgin cotton

A closer look at the cotton programs

Production of [Responsible Brazilian Cotton \(RBC\)](#)—ABRAPA's Algodão Brasileiro Responsável (ABR)—increased from 2.0 million in 2021/22 to around 2.6 million tonnes in 2022/23, accounting for around 11% of all cotton grown worldwide.¹

[Regenerate](#), a program launched by USB Certification in 2022, had 2,067 tonnes of cotton production certified to the standard in Turkey in 2022/23, its first season of operation. This accounted for 0.2% of cotton grown in Turkey and 0.01% of cotton grown worldwide.

[U.S. Cotton Trust Protocol®](#) cotton decreased from 367,390 tonnes in 2021/22 to 338,188 tonnes in 2022/23. This accounted for around 11% of all cotton produced in the US in 2022/23, and around 1% of all cotton produced worldwide. The environmental performance of U.S. Cotton Trust Protocol cotton is measured and analyzed at the field level using [Field to Market's Fieldprint Platform](#), and is verified by Control Union Certifications.

Global cotton production by program (thousand tonnes)^{1,2}

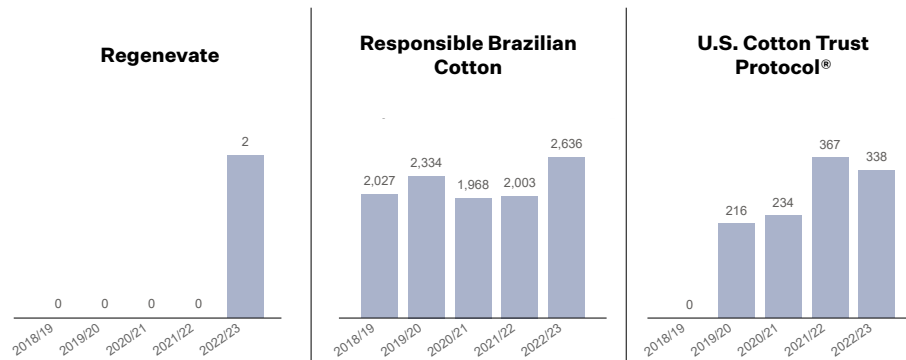


Photo: Anass Ouaziz

¹ While in general we align with ICAC's reporting year, in order to align with the global Better Cotton volumes for 2022/23 reported by Better Cotton, the volumes reported here for ABR cotton grown in Brazil are based on Brazil's National Supply Company's (CONAB) reporting cycle and cover cotton grown in the 2023 calendar year, whereas total cotton figures for Brazil included in this report follow the approach taken by ICAC which (for Brazil only) has recently shifted to cover cotton grown in the 2022 calendar year. See Methodology for more detail.

² Program data is based on information from program owners, received through email correspondence or from their websites. The production volumes reported here include the total volume produced per program including equivalents and overlaps with other standards.

Virgin cotton

Organic cotton

Certification of organic cotton production is a highly complex landscape, with 15 farm-level organic standards/programs (different to organic chain of custody standards, which use these as inputs) known to be used for cotton in 2022/23. Some of these farm-level standards are specific to just one country while others are used in many countries; some are governmental regulations while others are private standards; and some have equivalency agreements with other standards while others do not. In addition, aggregating organic cotton volumes at the global level is made particularly difficult by the fact that organic cotton is often certified to more than one standard, and not all standard owners publish data.

IFOAM-Organics International publishes a list of farm-level organic standards that it endorses in its [IFOAM Family of Standards](#). In 2022/23, this list included 52 standards, nine of which were known to be used for the certification of cotton – eight governmental standards and one private standard. Three of the governmental standards – the India Organic Regulation, USA Organic Regulation, and EU Organic Regulation (which are often used in combination with each other or with other farm-level organic standards) – were estimated to account for around 94% of all certified organic cotton in 2022/23.

In addition, there were six organic standards/programs not included in the IFOAM Family of Standards but known to be used for cotton in 2022/23. These include Brazil Organic Regulation (a governmental regulation also recognizing the Participatory Guarantee System), Peru Organic Regulation (a governmental regulation), Ecocert Organic Standard (a private standard), the Demeter Biodynamic Standard (a private standard), Regenerative Organic Certified™ (ROC) and the Organic Cotton Accelerator (OCA).

Participatory Guarantee System (PGS) initiatives are not included in the IFOAM Family of Standards either but are supported by IFOAM-Organics International as an alternative and complementary tool to third-party certification within the organic sector. PGS is used for cotton in Brazil (as part of Brazil Organic) and Thailand (as Thai PGS Organic Plus), although no volumes were certified in Thailand in 2022/23 due to drought.

IFOAM Family of Standards – Governmental Regulations

India Organic Regulation: The majority of organic cotton produced globally is estimated to have been grown in India and certified according to the India Organic Regulation, also known as India's National Programme of Organic Production (India-NPOP), as reported by India's Agricultural and Processed Food Products Export Development Authority (APEDA). In 2021/22 (the most recent year for which data were available at the time of reporting and therefore used as a proxy for 2022/23), APEDA reported that 482,602 tonnes of cotton fiber were certified to the India Organic Regulation.¹ While all organic cotton grown in India is certified to the India Organic Regulation, most of it is also certified to the USA and/or EU Organic Regulation, and some is covered under non-governmental standards and programs such as ROC or OCA.

USA Organic Regulation: Cotton certified to the USA Organic Regulation, also known as the United States National Organic Program (US-NOP), is grown not only in the US but also in many other countries worldwide. In the US, the United States Department for Agriculture (USDA) reported that 9,726 tonnes of organic cotton fiber were certified to the USA Organic Regulation in 2022/23.² Complete data for non-US countries certifying to US-NOP is not currently published by the USDA, so volumes have

been estimated based on data from other sources (such as organic cotton producers, certification bodies, and gins). These can be found in the accompanying chart, grouped with volumes certified to the EU Organic Regulation produced in non-EU countries.

EU Organic Regulation: Within the EU, cotton certified to the EU Organic Regulation was grown in Greece, Spain, and Italy in 2022/23 (Italy being certified for the first time that year). In **Greece**, the Ministry of Rural Development and Food (MDRF) reported that 2,048 tonnes of cotton fiber were certified to the EU Organic Regulation in 2020/21 (the most recent year for which data was available at the time of reporting and therefore used as a proxy for 2021/22 and 2022/23).³ In **Spain**, according to the Ministry of Agriculture, Fisheries and Food (MAPA), 23 tonnes of cotton fiber were certified to the EU Organic Regulation in 2022/23.⁴ In **Italy**, the National Information System for Organic Farming (SINAB) established by the Ministry of Agriculture, Food and Forestry reported that 33 tonnes of cotton fiber were certified to the EU Organic Regulation in 2022/23.⁵

1 India's Agricultural and Processed Food Products Export Development Authority (APEDA). "Organic Agriculture Statistics at a Glance." Note: APEDA reports volumes of seed cotton. These were converted to cotton fiber using India's average ginning outturn as per ICAC's [Cotton Production Data Portal](#).

2 United States Department for Agriculture (USDA). "Annual Organic Cotton Market Summary." Note: USDA reports cotton volumes in bales. These were converted into tonnes using the 'Bale Shape and Size' Annexure of [ICAC's Cotton Production Data Portal](#).

3 Greek Ministry of Rural Development & Food. "Statistics of Biological Products of Plant & Animal Origin."

4 Spain's Ministry of Agriculture, Fisheries and Food (MAPA). "Organic Production."

5 Italy's National Information System for Organic Agriculture (SINAB). "Annual Report." Note: SINAB only reports land area (hectares) so a yield estimate was used to convert this to tonnes of fiber. The yield estimate applied was based on the assumption that organic cotton yields are, on average, 80% those of conventional cotton (Ponti et al., 2012. [The crop yield gap between organic and conventional agriculture](#)). Spain's conventional cotton yield as per ICAC was used as a proxy since data on Italy's was unavailable. Please note that ICAC's Cotton Production Data Portal reported no cotton output from Italy in 2022/23. We are trying to better understand this discrepancy between ICAC and SINAB data.

Virgin cotton

Organic cotton

The EU Organic Regulation is also used to certify cotton in **many countries outside of Europe**, but the EU does not currently publish data on this. Therefore, volumes certified outside the EU to the EU Organic Regulation have been estimated based on data from other sources and are included in the accompanying chart, grouped together with volumes certified to the USA Organic Regulation grown outside the US.

Argentina Organic Regulation: In Argentina, the Argentina Organic Regulation applies for the cultivation of organic cotton. The Ministry of Economy of Argentina publishes organic agriculture data but does not provide a breakdown by cotton, so we report data from other sources such as organic cotton producers and certification bodies. Based on this, 0.2 tonnes of cotton fiber was certified to the Argentina Organic Regulation in 2021/22 (the most recent year for which data was available at the time of reporting, and therefore, used as a proxy for 2022/23).

China Organic Regulation: Organic cotton sold on the domestic market in China must be certified to the China Organic Regulation (China National Organic Product Standard). According to China's State Administration for Market Regulation (CNCA), 41,548 tonnes of organic cotton fiber were certified to the China Organic Regulation in 2022/23.⁶ Organic cotton sold for export from China is often also certified to the EU Organic Regulation and/or US-NOP.

Turkey Organic Regulation: A relatively small share of the organic cotton fiber grown in Turkey is certified to its national standard, the Turkey Organic Regulation, with the Ministry of Agriculture and Forestry reporting 5,821 tonnes certified in 2022/23.⁷ Most of Turkey's organic cotton is certified to the USA/EU Organic Regulation. Volumes for

this⁸ are aggregated in the accompanying chart, grouped together with other volumes certified to the USA/EU Organic Regulation grown outside of the USA/EU.

Canada Organic Regulation: While cotton is not grown and certified to organic standards in Canada itself, the Canada Organic Regulation (COR) is sometimes used to certify cotton grown in other countries. It is often used in combination with national standards. For example, some of the cotton grown in India may be certified to both the India Organic Regulation and COR. Volumes of cotton certified to COR were not available for 2022/23.

Israel Organic Regulation: In Israel, The Israel Cotton Board reports that 305 tonnes of cotton fiber were certified to the Israel Organic Regulation in 2022/23.⁹ This figure includes cotton also certified to the USA/EU Organic Regulation.

IFOAM Family of Standards – Private Standards

IBD Organic Guidelines: A relatively small share of the organic cotton fiber grown in Brazil is certified to the IBD organic guidelines. Most of Brazil's organic cotton is certified to the Brazil Organic standard (see below).

Other (non-IFOAM) organic standards used for cotton

Brazil Organic Regulation: The Brazil Organic Regulation is a governmental regulation that also recognizes the Participatory Guarantee System (PGS). In 2022/23, 143 tonnes of cotton fiber were certified to the Brazil Organic regulation. This figure includes cotton also certified to the USA/EU Organic Regulation.

Peru Organic Regulation: In Peru, the Ministry of Agrarian Development and Irrigation (MINAGRI) reports that 1,318 tonnes of cotton fiber were certified to the Peru Organic Regulation (a governmental regulation) in 2022/23.¹⁰ This figure includes cotton also certified to the USA/EU Organic Regulation and/or other standards such ROC.

Thai PGS Organic Plus: In Thailand, no organic cotton was certified in 2022/23 due to drought severely affecting harvest. In previous years, organic cotton grown and harvested in Thailand has been certified to Thai PGS Organic Plus, a collaborative network of organizations in Thailand working on the Participatory Guarantee System (PGS).

Demeter: Demeter is a biodynamic farm standard used to certify cotton in Egypt in combination with the USA/EU Organic Regulation. Specific volume data for Demeter-certified cotton was not available at the time of reporting but is covered under the volumes reported for 'USA/EU Organic Regulation-certified cotton grown outside the USA/EU.'

6 China's State Administration for Market Regulation (CNCA). "[National certification and accreditation information public service platform.](#)"

7 Turkish Ministry of Agriculture and Forestry. "[Crop Production - Statistics.](#)"

8 Turkish Ministry of Agriculture and Forestry. "[Presentation on Organic Cotton, February 17, 2022.](#)" Please note that 2021/22 data on Turkey's organic cotton production certified to the EU Organic Regulation and/or US-NOP is used as a proxy for 2022/23 as 2022/23 data were unavailable at the time of reporting.

9 The Israel Cotton Board Ltd. Email correspondence, May 2024.

10 Peru's Ministry of Agrarian Development and Irrigation. "[Organic and in-transition area statistics.](#)" Note: The Ministry only reports land area (hectares) so a yield estimate was used to convert this to tonnes of fiber. The yield estimate was calculated by assuming that organic cotton yield was 80% of Peru's national average cotton yield for that year as per [ICAC's Cotton Production Data Portal.](#)

Virgin cotton

Organic cotton

Ecocert Organic Standard (EOS): EOS is a private standard implemented by ECOCERT SA that has equivalency with the EU Organic Regulation. Specific volume data for EOS-certified cotton was not available at the time of reporting but is covered under the volumes reported for the EU Organic Regulation.

Regenerative Organic Certified™ (ROC): ROC is an agricultural standard that builds on the USA Organic Regulation, meaning entities must first be certified to the USA Organic Regulation or a formally recognized international equivalent. See previous section on ROC for production data.

Organic Cotton Accelerator (OCA): OCA is not an organic standard but operates on top of the existing certification system, covering criteria beyond the current scope of organic certification. In 2022/23, OCA was active in India and Pakistan, with a combined production total of 29,230 tonnes of cotton fiber.¹¹ Pilots are planned in Turkey for 2024.

¹¹ OCA, 2023. [Farm Programme Impact Report 2022-2023](#). Note: OCA reports volumes of seed cotton. These were converted to cotton fiber using India's average ginning outturn as per [ICAC's Cotton Production Data Portal](#).

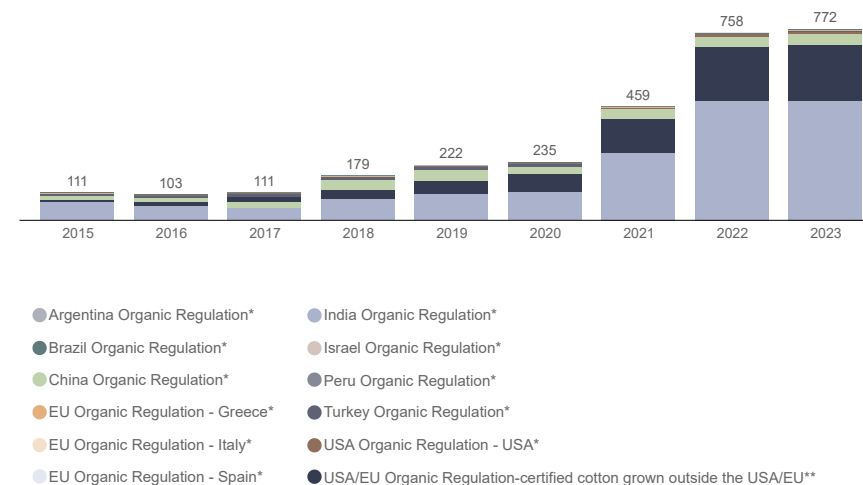
Global estimate

Due to the complex landscape of organic certification accurately calculating global organic cotton production volumes is extremely challenging. Organic cotton is often certified to multiple standards, complicating the aggregation process. Moreover, significant data gaps exist, necessitating the use of modeling and proxies in several countries, including India, the world's largest organic cotton producer. As a result, global data should be considered very rough estimates and should only be used as such.

The accompanying chart includes data from each national or governmental organic standard or program where cotton production data were available at the time of reporting.

Based on this, in 2022/23, approximately 772 thousand tonnes of cotton were estimated to have been certified to one or more of the 15 farm-level organic standards or programs known to be used for cotton production that year, representing 3.2% of global cotton production. This is an increase from the 758 thousand tonnes of cotton estimated to have been certified to one or more of these standards in 2021/22, which accounted for 3.0% of total cotton production that year.

Organic cotton production by program (thousand tonnes)



Source: Textile Exchange based on India's APEDA, the US' USDA, Greece's MRDF, Spain's MAPA, Italy's SINAB, China's CNCA, Turkey's MinAF database and presentation, Israel's ICB, Peru's MINAGRI, and other data sources such as ICAC, organic cotton producers, and certification bodies. For some countries, conversion factors were applied to calculate fiber volumes and/or proxies were used due to data for the latest year(s) not being available at the time of reporting, most significantly for India. Please see the cotton section of Textile Exchange's 2024 Materials Market Report for more detail.

* Includes cotton volumes that are also certified to the EU Organic Regulation and/or USA Organic Regulation and/or any other programs such as ROC, OCA, or supplier-specific programs such as bioRe®.

** Includes cotton certified to the USA Organic Regulation and/or the EU Organic Regulation grown outside of the USA/EU, respectively, but excludes cotton that is also certified to a national standard as this is listed separately.

Virgin cotton

Equivalency agreements¹

[Agro-2](#) became recognized as equivalent to the Better Cotton Standard System (BCSS) in 2020.

The [ICPSS](#) cotton standard became recognized as equivalent to the BCSS in 2020.

[CmiA](#) became recognized as equivalent to the BCSS in 2012. This agreement ended at the end of 2022.

[myBMP](#) became recognized as equivalent to the BCSS in 2014.

[ABR](#) became recognized as equivalent to the BCSS in 2014.

Discontinued cotton programs

[Cleaner Cotton™](#) was discontinued in March 2020, when the funding for the regular farm program ended.

[Field to Market](#) continues to be used as a tool but it is no longer considered a standalone program. Most of the cotton that uses Field to Market's Fieldprint Platform to measure and analyze environmental performance on the field is also enrolled in the U.S. Cotton Trust Protocol (USCTP), as Field to Market enrollment is a condition of the USCTP. Cotton that is part of Field to Market but not part of the USCTP is not otherwise certified or verified.

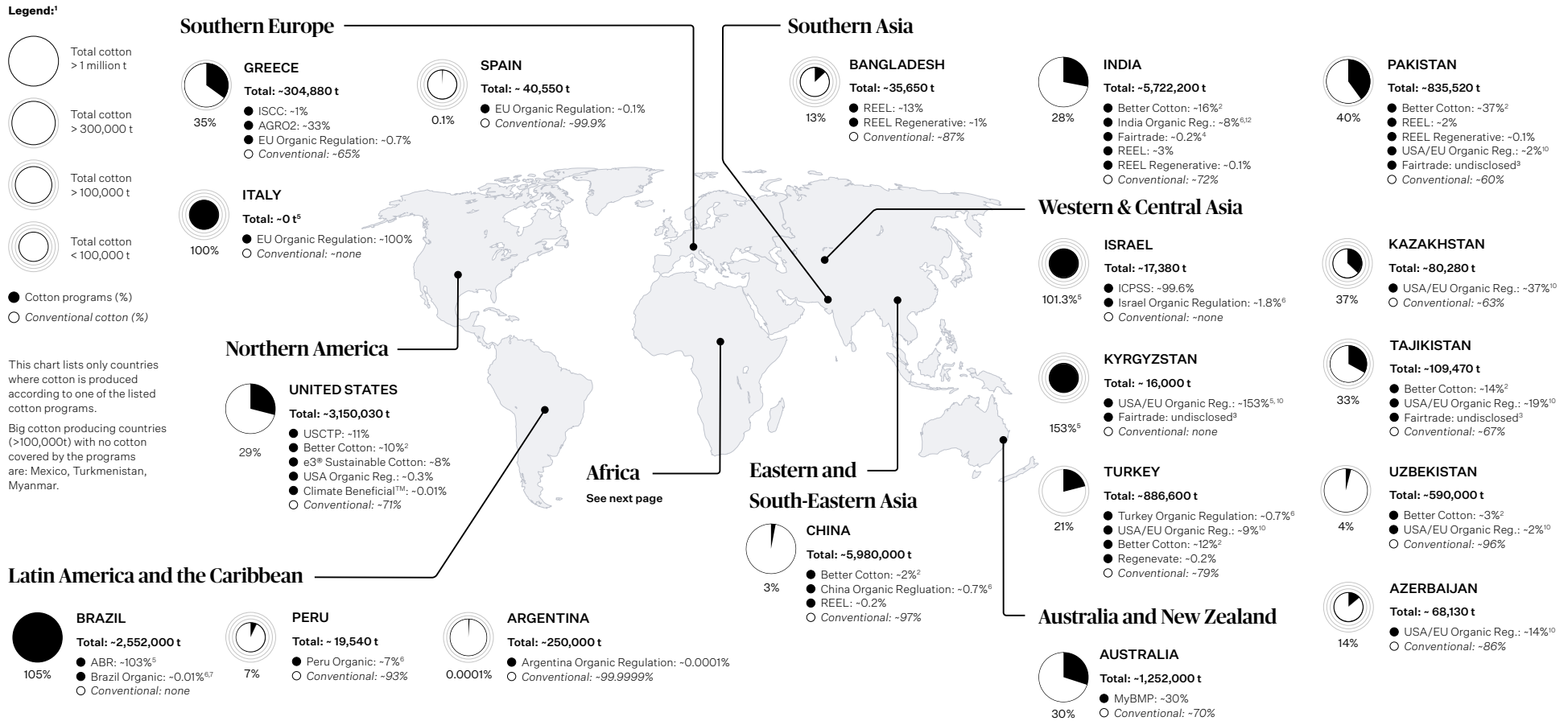
¹ Not including equivalency agreements with organic certification.

Cotton programs timeline

1996	<i>IFOAM– Organics International set first international organic standard</i>	2014	<i>ABR became recognized as equivalent to the BCS</i>
1996	<i>Sustainable Cotton Project (SCP) / Cleaner Cotton founded</i>	2018	<i>Regenerative Organic Certified™ (ROC) launched</i>
1997	<i>MyBMP founded</i>	2019	<i>U.S. Cotton Trust Protocol started</i>
2004	<i>Fairtrade standard for seed cotton established</i>	2020	<i>Climate Beneficial™ cotton first grown</i>
2005	<i>Better Cotton founded</i>	2020	<i>Agro-2 became recognized as equivalent to the BCSS</i>
2005	<i>Cotton made in Africa (CmiA) founded</i>	2020	<i>ICPSS became recognized as equivalent to the BCSS</i>
2009	<i>ABRAPA's Responsible Brazilian Cotton Program (ABR) started</i>	2020	<i>Cleaner Cotton™ discontinued</i>
2010	<i>CottonConnect's REEL cotton program started</i>	2020	<i>QAI Transitional program discontinued</i>
2010	<i>International Sustainability and Carbon Certification (ISCC) started</i>	2021	<i>Field to Market no longer considered a standalone program</i>
2012	<i>CmiA became recognized as equivalent to the Better Cotton Standard System (BCSS)</i>	2022	<i>CmiA and BCSS end equivalency agreement at the end of 2022</i>
2013	<i>Bayer CropScience launched e3® Sustainable Cotton Program (now BASF e3®)</i>		
2013	<i>Field to Market launched</i>		
2014	<i>myBMP became recognized as equivalent to the BCSS</i>		

Virgin cotton

Where to find cotton programs across the globe¹



1 Cotton program-specific data were collected from the programs and are reported in this map as share (%) of the country's total global cotton production volume in 2022/23. Total cotton production data is from ICAC (ICAC, 2024. World Cotton Statistics. Downloaded July 4, 2024.). Conventional cotton volumes are calculated by Textile Exchange. Volumes are reported in metric tonnes (t). Recycled cotton is not included in this map.

2 Better Cotton refers here to Better Cotton excluding equivalents. Better Cotton equivalents are listed separately. In the case of Mozambique, Better Cotton volumes that are also certified to CmiA are included under CmiA and excluded from Better Cotton's total for Mozambique.

3 Fairtrade data are not disclosed for on a per-country level due to confidentiality reasons. The volume for all programs in this country does

not include Fairtrade cotton and is thus actually slightly higher.

4 The total Fairtrade cotton production in India was 10,784 tonnes in 2022/23, including around 7,010 tonnes of Fairtrade organic.

5 The percentage of a country's total cotton that is covered by the cotton programs that shared data for this report is derived from the difference between the aggregated cotton volumes of these programs in that country (as shared by the respective program owners) and the overall cotton production of that country as reported by ICAC. For some countries, there is a discrepancy between the two, and the resulting percentage is over 100%. Both ICAC and Textile Exchange rely on secondary data, and there are sometimes discrepancies between the data sources used, for example for a country's total cotton production as reported by ICAC, USDA, and

national governments. We are trying our best to understand more about these discrepancies. You can learn more about Textile Exchange's data collection methodology [here](#), and about the sources of ICAC's cotton statistics [here](#).

6 This includes cotton volumes that are also certified to the EU Organic Regulation and/or USA Organic Regulation and/or any other programs such as Regenerative Organic Certification (ROC), the Organic Cotton Accelerator (OCA), or supplier-specific programs such as bioRe[®].

7 Brazil Organic is not part of the [IFOAM Family of Standards](#) and is not a governmental standard.

8 CmiA organic production volumes are included under both CmiA organic and USA/EU Organic Regulation but have only been counted once in this

figure to avoid double counting.

9 Includes Demeter-certified cotton.

10 'USA/EU Organic Reg.' refers to cotton certified to the USA Organic Regulation and/or the EU Organic Regulation grown outside of the USA/EU, respectively. It excludes cotton that is also certified to a national standard as this is listed separately.

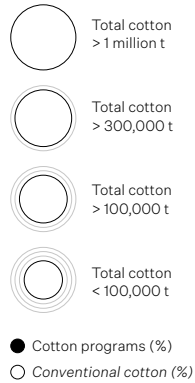
11 CmiA-certified production in Mozambique is also certified to Better Cotton (not under an equivalency agreement but under two separate licenses).

12 Some India-NPOP-certified cotton is also certified to Canada Organic Regime (COR).

Virgin cotton

Where to find cotton programs across the globe¹

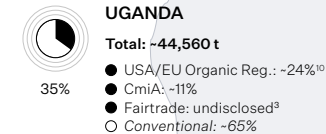
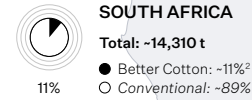
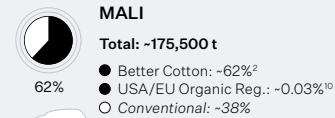
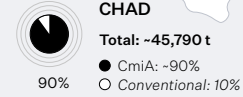
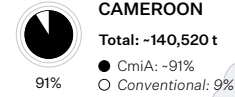
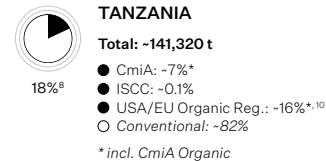
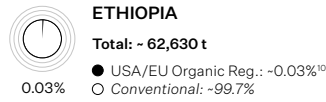
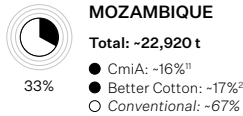
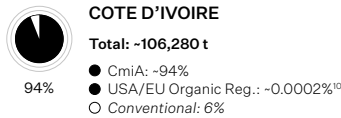
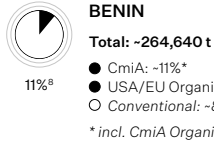
Legend:¹



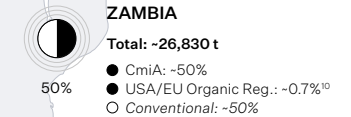
This chart lists only countries where cotton is produced according to one of the listed cotton programs.

Big cotton producing countries (>100,000t) with no cotton covered by the programs are: Mexico, Turkmenistan, Myanmar.

Sub-Saharan Africa



Northern Africa



¹ Cotton program-specific data were collected from the programs and are reported in this map as share (%) of the country's total global cotton production volume in 2022/23. Total cotton production data is from ICAC (ICAC, 2024. [World Cotton Statistics](#). Downloaded July 4, 2024.). Conventional cotton volumes are calculated by Textile Exchange. Volumes are reported in metric tonnes (t). Recycled cotton is not included in this map.

² Better Cotton refers here to Better Cotton excluding equivalents. Better Cotton equivalents are listed separately. In the case of Mozambique, Better Cotton volumes that are also certified to CmiA are included under CmiA and excluded from Better Cotton's total for Mozambique.

³ Fairtrade data are not disclosed for on a per-country level due to confidentiality reasons. The volume for all programs in this country does

not include Fairtrade cotton and is thus actually slightly higher.

⁹ Includes Demeter-certified cotton.

¹⁰ 'USA/EU Organic Reg.' refers to cotton certified to the USA Organic Regulation and/or the EU Organic Regulation grown outside of the USA/EU, respectively. It excludes cotton that is also certified to a national standard as this is listed separately.

¹¹ CmiA-certified production in Mozambique is also certified to Better Cotton (not under an equivalency agreement but under two separate licenses).

Recycled cotton

Market overview

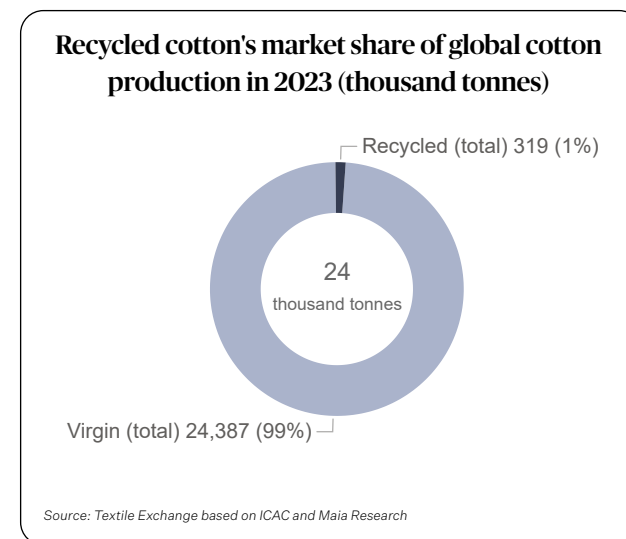
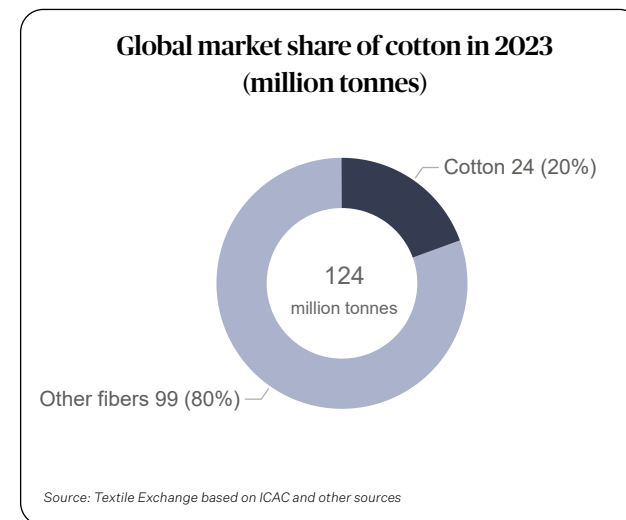
Recycled cotton had an estimated production volume of 319,000 tonnes in 2023 (compared to 24.4 million tonnes of virgin cotton), giving it a market share of approximately 1% of total cotton production.¹ This share is expected to grow significantly in the coming years.

An analysis by the Circular Fashion Partnership, a cross-sectoral initiative to support the development of effective circular fashion systems, revealed in its [Scaling Circularity Report](#) the significant value of utilizing textile waste more efficiently. It highlighted research by Reverse Resources that found that Bangladesh alone produces approximately 330,000 tonnes of 100% pure pre-consumer cotton waste in its ready-made garment (RMG) and fabric mills per year, out of which only 5-7% are currently recycled.²

Please note that the data presented here refers to mechanically recycled cotton. Chemically recycled cotton is covered in the chapter on manmade cellulosic fibers since the result is a “manmade cellulosic” fiber, not “cotton.”

Key standards

Textile Exchange’s [Global Recycled Standard](#) (GRS) and [Recycled Claim Standard](#) (RCS) are key third-party standards used for recycled cotton. Read more on the page about [supply chain standards](#).



¹ Calculated by Textile Exchange based the following sources:

i. ICAC, 2024. [World Cotton Statistics](#). Downloaded July 4, 2024.

Link: Note: For the virgin cotton production volume in 2023, the ICAC harvest year data from the 2022/23 season are applied.

ii. Maia Research, 2024. [Global Recycled Cotton Market 2023](#) (commissioned report).

² McKinsey & Company and Global Fashion Agenda, 2021. [Scaling Circularity Report](#).

The Global Fiber Market

Other Plant-based Fibers

Other plant-based fibers

Global overview

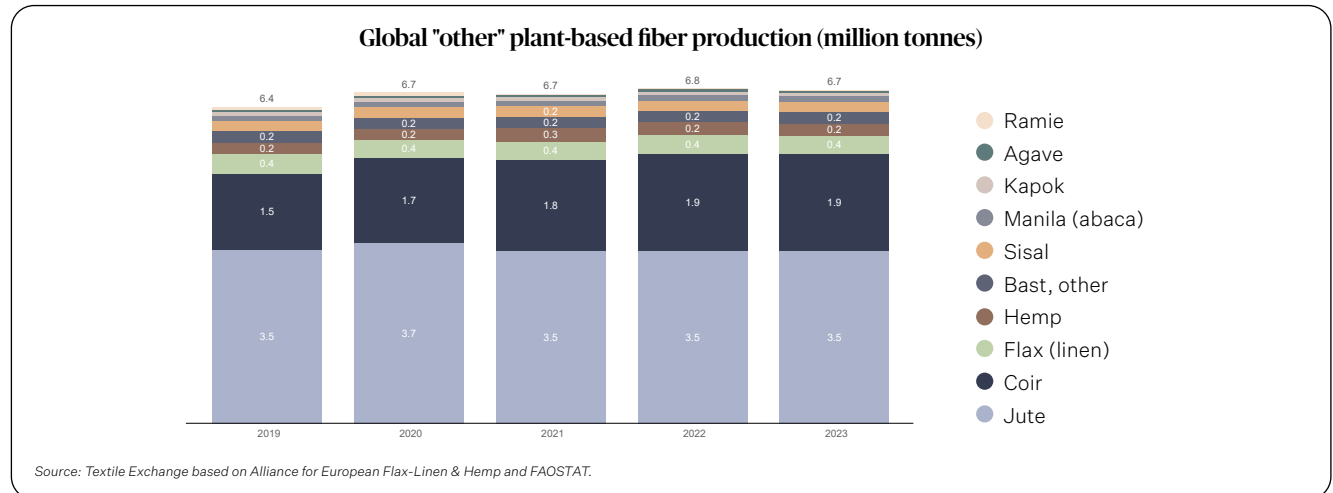
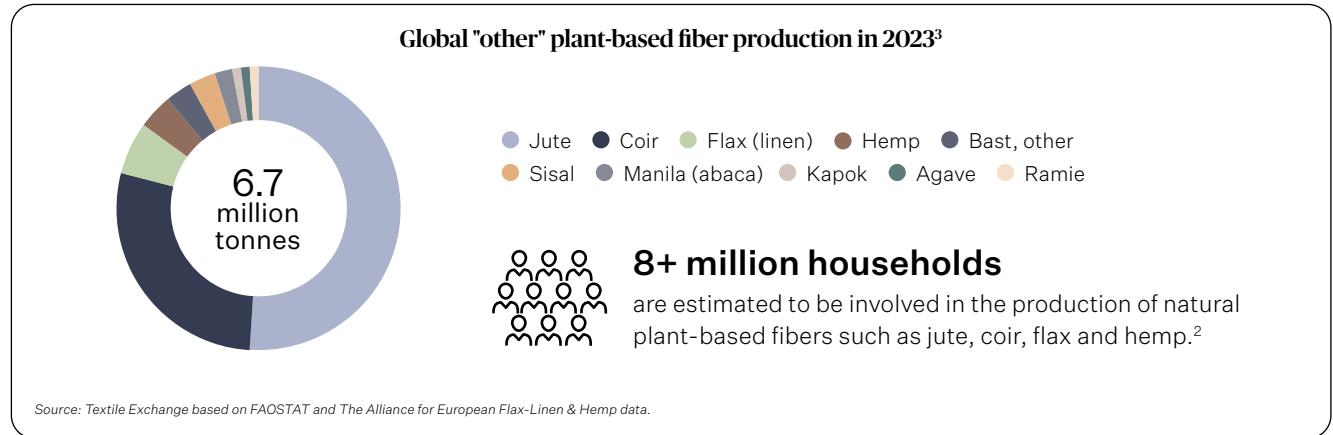
Besides cotton, there is a diversity of other plant-based fibers such as jute, coir, flax, hemp, sisal, abaca, kapok, ramie, and agave.¹ It is estimated that more than eight million households are involved in the production of these natural, plant-based fibers.²

With a global production volume of around 6.7 million tonnes, these other (non-cotton) plant-based fibers had a combined market share of approximately 5% of global fiber production in 2023.³

Jute had the largest market share of all non-cotton, plant-based fibers in 2023, accounting for around 52%.⁴ Similar to hemp, flax, and ramie, jute is a bast fiber derived from the strands surrounding the “hurd,” or woody core, of the stem. It is used to make twine, rope, matting, packaging material, and home textiles such as curtains and carpets.

Coir had the second-largest market share, accounting for approximately 29% of all non-cotton, plant-based fibers produced in 2023.⁴ Coir is the fiber extracted from the husks of coconuts and is used to produce home textiles such as floor mats, doormats, brushes, and mattresses.

Flax fiber production data is not easily accessible at the global level, but it is estimated that around 0.4 million tonnes were produced worldwide in 2023, including short and long staple fibers.⁵ This means that flax accounted for around 6% of the non-cotton, plant-based fiber market and 0.3% of the global fiber market in 2023.³ Processed flax, also called linen, is used for various products including home textiles and apparel. Around 64% of the flax used for fiber in 2023 was grown in Europe, with France being the largest producer. European flax is cultivated in a broad coastal band stretching from northern France through Belgium and the Netherlands. Other key flax fiber-producing countries are Belarus, Russia, Ukraine, and China.⁵



1 For FAO's fiber definitions, use the [FAOSTAT query tool](#) (select 'Definitions and standards' then 'Item' and type the fiber name).

2 DNFI, 2020. Press release “40 Million Households Produce Natural Fibres” published on 20 April 2020.

3 Textile Exchange based on [FAOSTAT](#), Alliance for European Flax-Linen & Hemp, and total global production volumes compiled by Textile Exchange (see [Global Fiber Market](#)).

4 Textile Exchange based on [FAOSTAT](#). 2022 figures, the latest available data, are used as a proxy for 2023. Please note that the data quality of these other plant-based fibers is limited. Data adjustments are regularly made also for historical data and data gaps exist for some countries.

5 Textile Exchange flax data and information are based on Alliance for European Flax-Linen & Hemp. Email correspondence, March-April 2024. 2022 figures, the latest available data, are used as a proxy for 2023.

Other plant-based fibers

Global overview

[European Flax™](#) is the Alliance for European Flax-Linen and Hemp's traceability standard for flax fiber grown in Europe. The revised European Flax™ Standard Version 3.0 was released on July 18, 2023, and took effect February 17, 2024. MASTERS OF LINEN™ is the Alliance's registered trademark indicating linen that is 100% made in Europe, from field to fabric.

Organic flax — grown according to one of the [IFOAM Family of Standards](#) — is produced at a very small scale.

CottonConnect is piloting the [REEL Linen Code](#), which builds on the REEL Cotton Code. The REEL Linen Code of Conduct consists of two parts: farming and processing (scutching and spinning). It outlines practices in management, social, and environmental areas.

Hemp fiber production data is not easily accessible at a global level. With an estimated 0.2 million tonnes of fiber hemp grown worldwide in 2023, hemp accounts for around 4% of the non-cotton, plant-based fiber market, or around 0.2% of the global fiber market.¹ A bast fiber, hemp is used in various industries including home textiles and apparel.

Hemp production is not yet legal worldwide, but governments are increasingly authorizing farmers to grow the crop. According to data from the Food and Agriculture Organization Corporate Statistical Database (FAOSTAT), 20 countries grew fiber hemp in 2023: Australia, Austria, Chile, China, Czechia, Democratic People's Republic of Korea (North), France, Greece, Italy, Japan, Lithuania, Netherlands, People's Republic of Korea (South), Poland, Romania, Russian Federation, Spain, Turkey, Ukraine, and United States. France accounted for almost half of global hemp fiber production in 2023, followed by

China, Democratic People's Republic of Korea (North), Netherlands, Australia and the United States.²

The Responsible Hemp Standard-Textiles (RHS-Textiles) is a farm-level certification program developed by Colorado-based INCCert, which focuses on the production of industrial hemp fiber for the textiles market.

For more information about hemp fiber, please read Textile Exchange's 2023 report "[Growing Hemp for the Future](#)."

Research into hemp and jute as feedstock for composite materials and manmade cellulosic fibers is currently underway. See the [Manmade Cellulosic Fibers](#) chapter for more information.

Nettle, kapok, lotus, and other plant-based fibers are also receiving increasing interest from the apparel and textiles industry, as well as fibers from agricultural residues such as rice straw, pineapple leaves, banana tree trunks, and sugar cane bark. If these plants are dissolved into pulp, they are listed in the chapter on [Manmade Cellulosic Fibers](#). If polymerization is used to process them, they are listed as Biosynthetics.

¹ Textile Exchange flax data and information are based on Alliance for European Flax-Linen & Hemp. Email correspondence, March-April 2024. 2023 data were not available at the time of reporting and therefore 2022 data are used as a proxy.

² Textile Exchange based on [FAOSTAT](#) and total global production volumes compiled by Textile Exchange (see [Global Fiber Market](#)). 2023 data were not available at the time of reporting and therefore 2022 data are used as a proxy.



Photo: Cecilie Nicoline Rasmussen

The Global Fiber Market

Wool

Virgin sheep wool

Production facts and figures

With an annual production volume of approximately 1 million tonnes of clean wool fiber (or 1.98 million tonnes of greasy wool fiber), sheep wool is the most widely used animal-based fiber.¹

While global wool production has been declining over the years, the market share of wool programs is increasing.

The market share of wool produced according to the Responsible Wool Standard (RWS) or the wool programs Climate Beneficial™, Sustainable Cape Wool Standard (SCWS), SustainaWOOL GREEN, SustainaWOOL GOLD, ZQ, and ZQRX increased from an estimated 82,685 tonnes (~4.2% of total greasy wool production) in 2022 to 94,037 tonnes (~4.8%) in 2023.

The RWS (including equivalents) accounted for approximately 85% of this 4.8% market share in 2023, equaling 4% of the global greasy wool market. Climate Beneficial™ accounted for 0.003%, SCWS farm audit for 0.2% (with a further 0.6% being certified under both RWS and the SCWS shearing module), ZQ (including equivalents) for 1%, and SustainaWOOL GREEN and SustainaWOOL GOLD together accounted for 0.5%.³ Due to the double certification of around 1.7% of global greasy wool production, around 4.8% (and not 6.4%) was certified according to these programs.

¹ IWTO, 2024. Market Information. Edition 19.

² 'Conventional/unknown' includes the volumes of wool programs for which data were unavailable or inaccessible at the launch of the report.

³ SustainaWOOL production volumes were not available for 2023 at the time of reporting and 2022 data have therefore been used as a proxy.

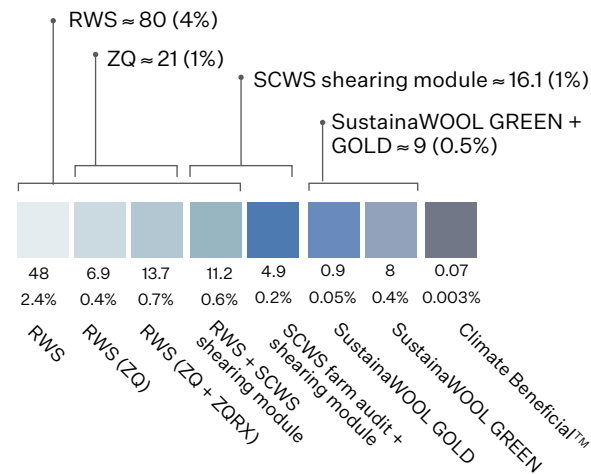
Data on 2023 production were not available at the time of reporting for the following programs covering sheep, which were developed for the food sector but from which wool might have been an output: Certified Humane®, Land to Market, organic, Pasture for Life, Global Animal Partnership (G.A.P) Animal Welfare Certified, and A Greener World.

Global greasy wool production by program in 2023 (thousand tonnes) and share of total greasy wool (%)

Total wool: 1.98 million tonnes of greasy wool

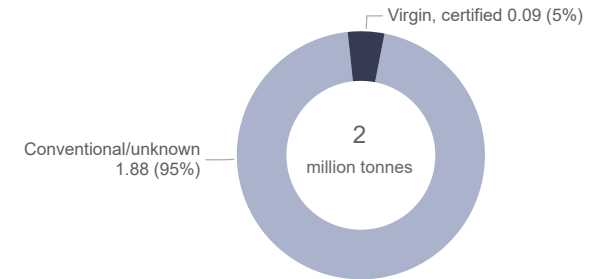
Covered by the programs below:

94 thousand tonnes of greasy wool (5%)



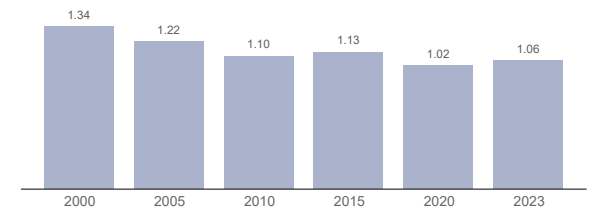
Source: Textile Exchange based on IWTO and program owners

Global wool programs' greasy wool market share in 2023²



Source: Textile Exchange based on IWTO and program owners

Global clean wool fiber production (million tonnes)



Source: Textile Exchange based on IWTO

Note: This chart covers virgin clean wool and not recycled wool

Virgin sheep wool

Production facts and figures

Greasy wool production certified under the [Responsible Wool Standard](#) (RWS) increased from 71,083 tonnes (3.6% of global greasy wool production) in 2022 to 79,939 tonnes (4.0%) in 2023.

To date, most RWS-certified wool is Merino wool. The release of the Communal Farmer Group Certification model has broadened access to certification, now including farmers with no or limited land tenure, such as nomadic and semi-nomadic farmers. Further adaptations to this model are being piloted as part of the Materials Matter Standard development, aiming to improve accessibility for these farmers.

The RWS has also seen strong adoption through the supply chain, particularly in key apparel wool-processing countries like Italy and China. With the release of the RWS 2.0, the supply chain certification for RWS, the Responsible Mohair Standard (RMS), and the Responsible Alpaca Standard (RAS) were integrated into a single scope under the Responsible Animal Fibers (RAF) certification.

The primary goal of the RWS (along with RMS and RAS) is to help farmers realize and achieve high standards of animal welfare, particularly for animals raised in extensive grazing systems. This is ensured through audited standards covering all aspects of the animal care, evaluating farm practices to ensure they meet high welfare criteria. By the end of 2023, approximately 22.6 million sheep were under RWS certification. In addition to animal welfare, the RWS also addresses land management. With the launch of RWS 2.0 in March 2020, Textile Exchange introduced new biodiversity requirements and a module focused on social welfare on farms. By the close of 2023, over 28 million hectares of land were certified under RWS .



Photo: Kin Chan Coedel

Virgin sheep wool

Production facts and figures

[Climate Beneficial™](#) greasy wool production was around 65 tonnes in 2023, down from 91 tonnes in 2022. All Climate Beneficial™ wool was produced in the United States and, in 2023, involved around 17,900 sheep.

[Certified Humane®](#) wool was produced at small scale on two farms in the United States in 2023, but production data were not available at the time of reporting. Textiles made from this wool were not labeled Certified Humane® as some parts of the supply chain could not be audited.

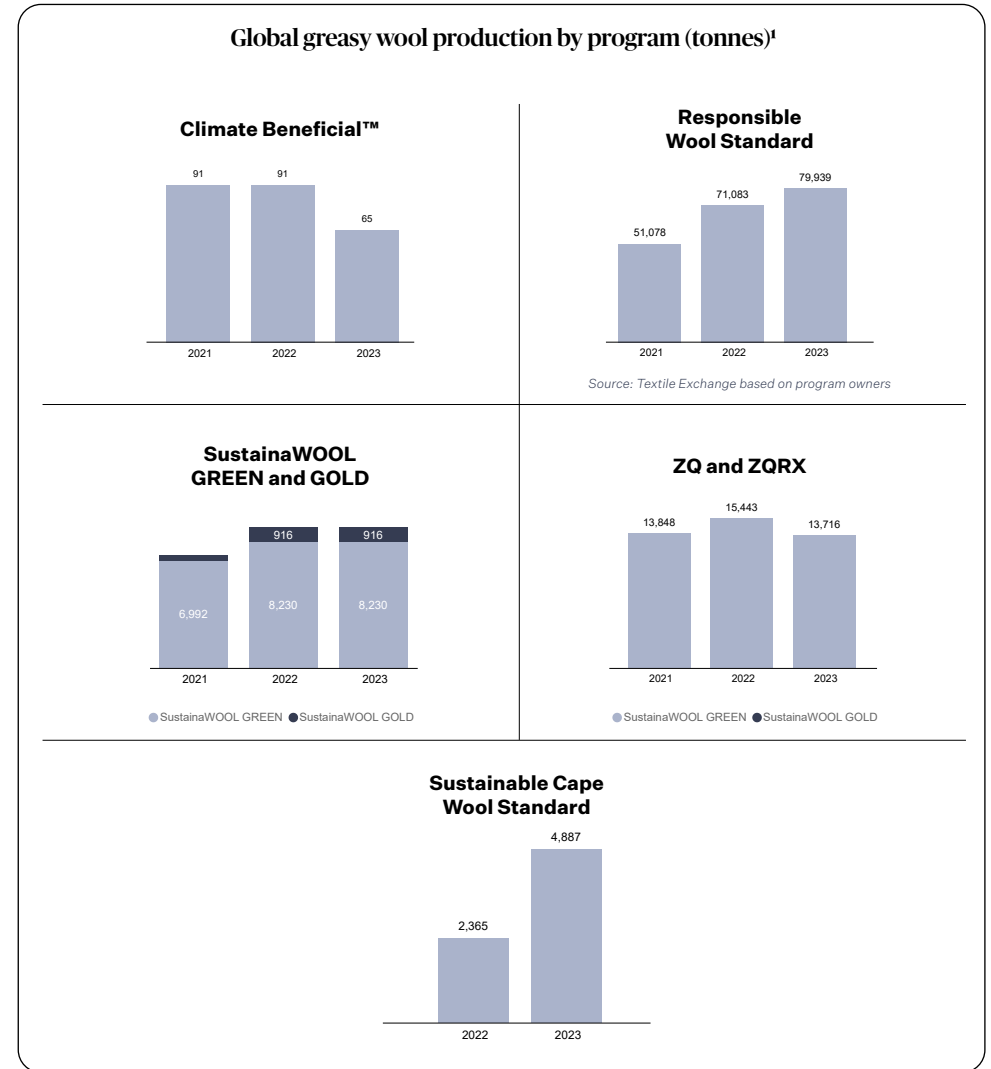
[Pasture for Life \(Pfl\)](#) wool was produced from around 23,000 sheep in 2023, but production volumes were not available at the time of reporting.

[Sustainable Cape Wool Standard \(SCWS\)](#), developed by Cape Wools SA, had a total of 4,887 tonnes of greasy wool certified under its farm audit in 2023, up from 2,365 tonnes in 2022. In addition, 11,246 tonnes of RWS-certified greasy wool was certified under the SCWS shearing module.

[SustainaWOOL](#) production volumes for 2023 were not available at the time of reporting and 2022 data have therefore been used as a proxy. SustainaWOOL GREEN greasy wool production volumes were 8,230 in 2022, while SustainaWOOL GOLD volumes were 916 tonnes. All SustainaWOOL is produced in Australia.

[ZQ](#)-certified greasy wool (New Zealand Merino) production was around 20,663 tonnes in 2023, similar to 2022, and accounted for around 1% of global sheep wool production. All ZQ wool produced in 2023 was also RWS-certified. ZQ wool is produced in New Zealand and Australia. Additional regenerative outcome measurement according to ZQRX was carried out for around 66% of all ZQ wool produced in 2023.

Information on the market share of non-mulesed wool can be found on the [Non-Mulesed Wool Market](#) page.



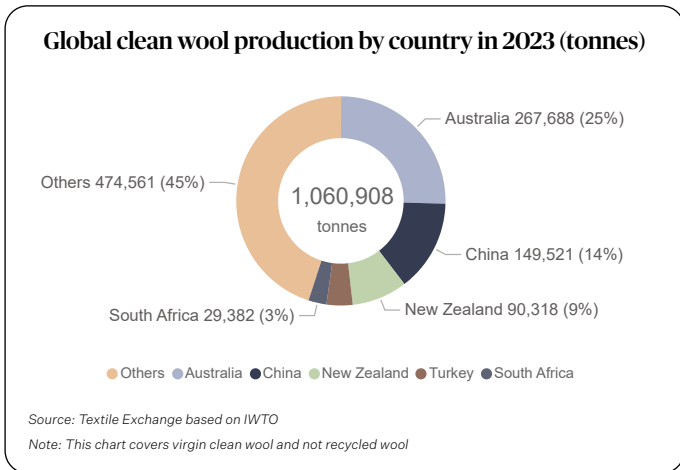
¹ Program data is based on information from program owners, received through email correspondence or from their websites. The production volumes reported here include the total volume produced per program including equivalents and overlaps with other standards.

Virgin sheep wool

Where to find wool programs across the globe

In some apparel wool-producing countries/areas, RWS-certified wool had considerable market shares in 2023. Most significantly in terms of both volume and market share, 43% of all wool produced in South Africa was RWS-certified.¹ This figure was 94% in the Falkland Islands (Malvinas),² 34% in Uruguay, 25% in Argentina, 15% in Chile, 14% in New Zealand, and 6% in Australia.

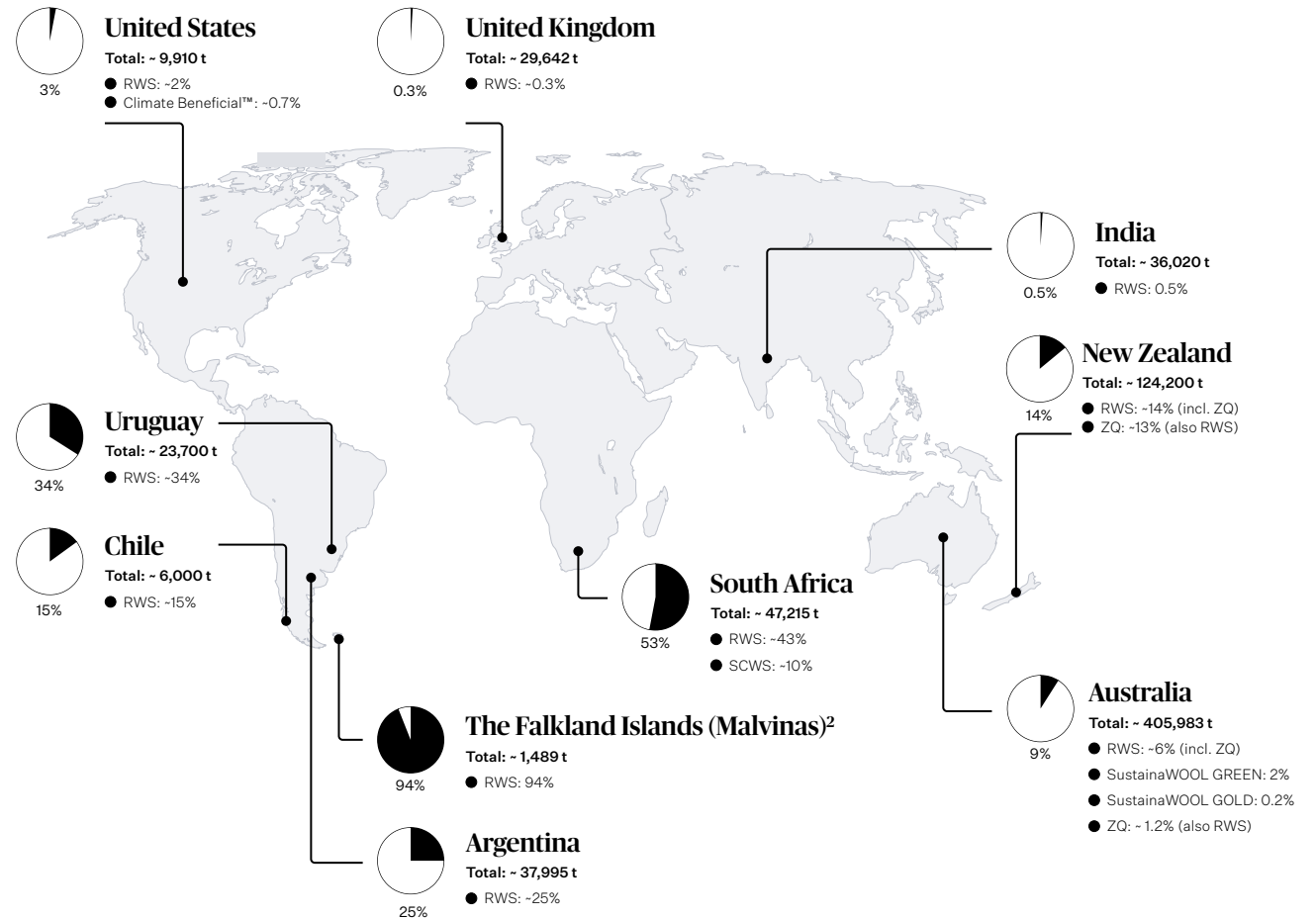
Climate Beneficial™ had a market share of 0.7% in the US. ZQ (which is also RWS-certified) had a market share of 12.7% in New Zealand and 1.2% in Australia. SustainaWOOL had an estimated market share in Australia of 2% for its GREEN program and 0.2% for its GOLD program.⁶ In South Africa, the SCWS farm audit had a market share of 10%.



1 The percentage of RWS wool in South Africa is lower than previously stated due to updated IWTO data on South Africa's total wool production, some farmers dropping out of certification owing to the low global price for wool and a reduction in premiums, and the discovery of some double counted volumes. For 2022 (when their system first started collecting RWS volumes for South Africa) and 2023, Textile Exchange is using Cape Wools SA data for RWS production in South Africa. Cape Wools SA is the official wool data collection body in South Africa and collects data on total wool production as well and for wool programs such as SCWS, RWS, and Abelusi.

2 A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

Market share of wool programs by country/area ^{3,4,5}



3 IWTO, 2024. Market Information. Edition 19.

4 Only wool producing countries with production according to the following programs are displayed: RWS, Climate Beneficial, SCWS, SustainaWOOL GREEN, SustainaWOOL GOLD, ZQ and ZQRX. Data were not available at the time of reporting for the following programs covering sheep that were developed for the food sector but from which wool might be an output: Certified Humane®, Land to Market, organic, Pasture for Life, Global Animal Partnership (G.A.P) Animal Welfare Certified, and A Greener World.

5 Market shares are given in percentages compared to overall wool production based on ITWO data as mentioned in (3). Total wool production figures per country are for greasy wool.

6 SustainaWOOL production volumes were not available for 2023 at the time of reporting and 2022 data have therefore been used as a proxy.

Virgin sheep wool

The non-mulesed wool market

Mulesing, defined as the removal of wool-bearing strips of skin from between the hind legs (the “breach” area), tail skin folds, or tail skin wrinkles of sheep to prevent flystrike, remains a key issue in wool production.

Since New Zealand banned mulesing in 2018, Australia, which holds around 25% of the global clean wool market, is now the only country where the practice continues.¹ Therefore the risk of sourcing wool produced with mulesing practices remains high without a traceability system to ensure the wool is mulesing-free.

It’s important to recognize that different forms of mulesing exist: traditional mulesing using shears, freeze mulesing (steining) with liquid nitrogen, and the use of rubber rings, commonly employed for tail docking or castration, to remove loose skin from the breach area. In September 2019, Four Paws and Humane Society International opposed freeze mulesing due to the severe pain it causes sheep. Both organizations, along with Textile Exchange, oppose any form of breach mutilation or modification.

The definition of mulesing typically includes all forms of breach mutilation or modification, including steining. However, the Australian Wool Exchange (AWEX) only included the removal of skin from the breach and/or tail of a sheep using mulesing shears. As a result, before July 2022, wool sold as non-mulesed under AWEX definition could still have been produced using freeze mulesing (steining). With Version 9.3 of its National Wool Declaration (NWD), effective July 2022, AWEX expanded its definition of ‘non-mulesed’ to exclude steining and introduced a new labeling category for wool produced using liquid nitrogen (LN). See box opposite for a summary of the key changes made in NWD V9.3. While the first

LN lots of wool were offered in 2022, AWEX only began reporting LN volumes in 2023 due to small initial volumes.

Certification such as the [Responsible Wool Standard](#) (RWS), ZQ, and SustainaWOOL GREEN and GOLD ensure their wool is sourced from non-mulesed sheep. Organic wool certified under the [Organic Content Standard](#) (OCS) must also be non-mulesed or from farms with a ceased-mulesing status as per the latest revision (OCS 3.0) launched in April 2020. Additionally, the [Global Organic Textile Standard](#) (GOTS) 6.0, introduced in March 2020, includes mulesed wool in its list of prohibited fibers.

Australian National Wool Declaration (NWD) definitions until July 2022² with details of key changes since previous version in brackets:

M Mulesed: “Sheep in this mob have been mulesed without the use of an analgesic &/or anaesthetic product registered by APVMA.”

AA Analgesic/Anaesthetic: “Sheep in this mob have been mulesed with the use of an analgesic &/or anaesthetic product registered by APVMA.”

LN Liquid Nitrogen: “Sheep in this mob have been treated with liquid nitrogen.” (this is a new category added in NWD V9.3)

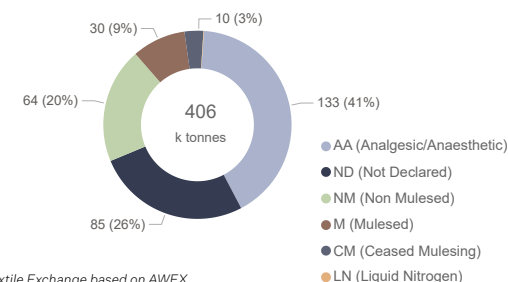
ND Not Declared

CM Ceased Mulesing: “No lambs born on this property in the last 12 months have been mulesed. No mulesed (or AA) ewes or wethers have been purchased in the last 12 months.”

NM Non Mulesed: “No sheep in this mob has been mulesed or treated with liquid nitrogen.” (previously “No sheep in this mob have been mulesed.”)

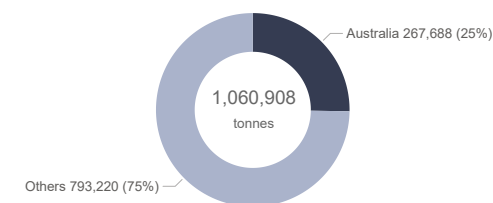
Mulesing definition adopted by AWEX: “The removal of skin from the breach and/or tail of a sheep using mulesing shears.” (Source: Australian Animal Welfare Standards and Guidelines for Sheep prepared by Animal Health Australia, V1.0 2016.)

Market share of greasy wool in Australia in 2023 (thousand tonnes and %)



Source: Textile Exchange based on AWEX

Market share of clean wool in Australia in 2023 (tonnes)



Source: Textile Exchange based on IWTO

¹ IWTO, 2024. [Market Information. Edition 19.](#)

² National Wool Declaration (NWD) V9.3. Business Rules for MS. [Issue: 1.](#)

Recycled sheep wool

Production facts and figures

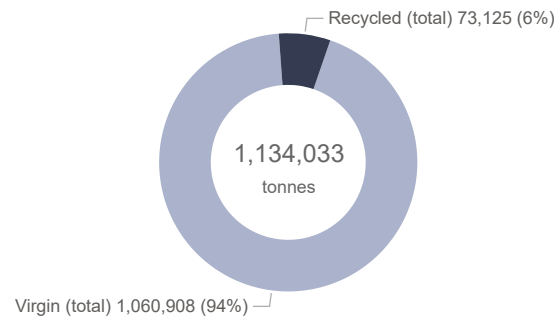
Wool recycling has a long history. Accounting for around 6% of the global wool market, recycled wool had an estimated production volume of 73 thousand tonnes in 2023, which is similar to the previous year.^{1,2}

The Italian district of Prato is a major producer of recycled wool, producing approximately 30,000 tonnes of the fiber in 2023.³ Other major production centers for wool recycling are China and the Indian city of Panipat.

Recycled standards

The key standards for recycled wool are [the Recycled Claim Standard \(RCS\)](#), [Global Recycled Standard \(GRS\)](#), and [Cardato Recycled](#) for recycled wool from Prato, Italy.

Global recycled wool market share 2023 (tonnes)



Source: Textile Exchange based on IWTO and Maia Research

1 Maia Research, 2024. Global Recycled Wool Market Report 2023. Commissioned report.

2 IWTO, 2024. Market Information. Edition 19.

3 Manteco. Email correspondence, May 2024.



Photo: Christian Velcich

The Global Fiber Market

Other Animal Fibers

Virgin mohair

Production facts and figures

Mohair is the hair of the Angora goat (not to be confused with the Angora rabbit, which produces Angora wool). In 2023, around 4,570 tonnes of greasy mohair fibers were produced globally. Just over half of the world's mohair (2,470 tonnes) was produced in South Africa. The remaining mohair came from Lesotho with 710 tonnes (16%), Argentina with 360 tonnes (8%), Turkey with 350 tonnes (8%), the United States with 230 tonnes (5%), Australia with 90 tonnes (2%), New Zealand with 30 tonnes (1%), and other countries with 330 tonnes (7%).¹

The South African mohair industry has been governed by its own Sustainable Mohair Production Guidelines since 2009. These industry guidelines have been developed and regularly revised by the South African Mohair Growers Association.

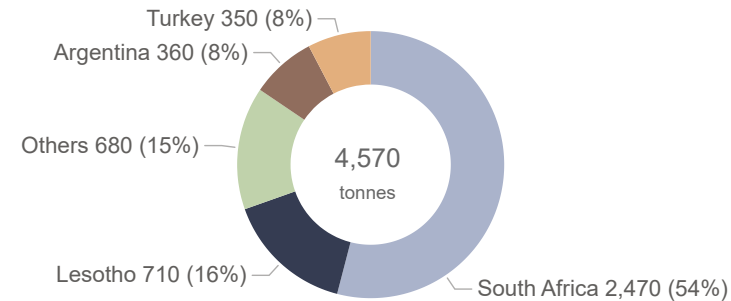
The Responsible Mohair Standard (RMS) was the evolution of the increasing importance of – and demand for – an independent, third-party audited, international standard.

Textile Exchange launched the RMS in 2020 in response to requests from stakeholders. Along with the Responsible Alpaca Standard (RAS) it aligns with RWS in terms of content covering animal welfare, land management, and people. The latest version, RMS 1.2, was released in 2021.

The market share of RMS mohair increased from 42% of all mohair produced worldwide in 2022 to 47% in 2023.

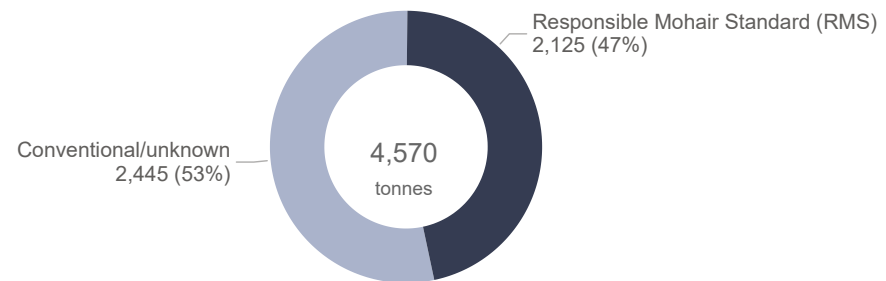
RMS fibers were produced in South Africa and Australia in 2023, with production totaling 2,125 tonnes. The RMS market share reached 84% of all greasy mohair produced in South Africa and 55% of total mohair production in Australia in 2023.

Global greasy mohair fiber production by country in 2023 (tonnes)



Source: Mohair South Africa

Global market share of Responsible Mohair Standard (RMS) in 2023 (tonnes)



Source: Textile Exchange based on Mohair South Africa and RMS

¹ Mohair South Africa. Email correspondence, May 2024.

Virgin cashmere

Production facts and figures

Cashmere is the hair of the cashmere goat. Around 25,611 tonnes of greasy cashmere fibers were produced globally in 2023.¹ Around 69% of the world’s cashmere was produced in China.²

The global market share of cashmere produced according to the listed programs³—[Agronomes et Vétérinaires Sans Frontiers \(AVSF\)](#), [THE GOOD CASHMERE STANDARD® \(GCS\)](#), [Responsible Nomads \(RN\)](#), and [Sustainable Fiber Alliance \(SFA\)](#) – increased from ~35% (around 9,319 tonnes) in 2022 to ~47% (11,949 tonnes) in 2023.⁴

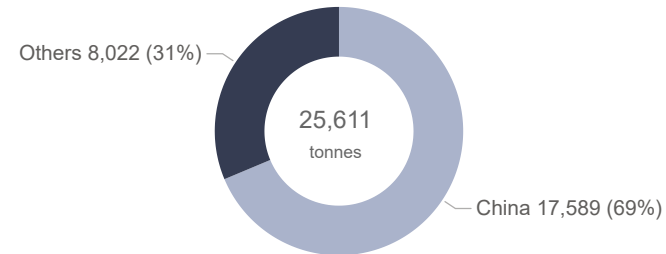
1 [IWTO, 2024. Market Information. Edition 19.](#)

2 Textile Exchange based on “[National Bureau of Statistics of China, 2024.](#)”

3 The Wildlife Conservation Society (WCS) program that was previously included in this report has gone through a substantial review and now focuses on the scientific research and monitoring required for verifying practices, transitioning away from direct engagement with the community and cashmere sale processes. The South Gobi Cashmere Program cooperatives are now managed by the Good Growth Company, one of the projects selected by Regenerative Fund for Nature in 2021. Since the project focuses on a landscape-based approach rather than a certified product approach, we aim to include it in the Materials Directory going forward, rather than listing it here as standard system.

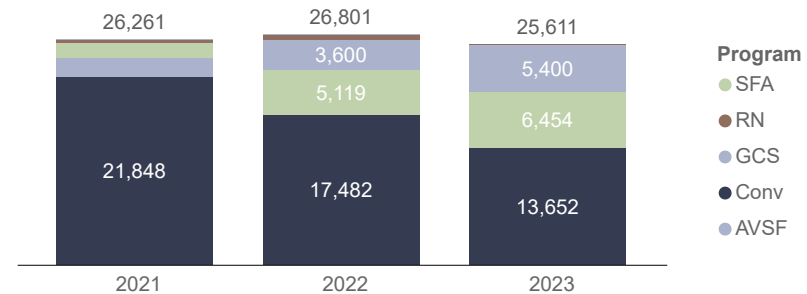
4 Textile Exchange compilation based on data provided by the program(s): AVSF, GCS, RN, and SFA. Please note it is possible that there is overlap in the production volumes reported for the different programs.

Global cashmere production by country in 2023 (tonnes)



Source: Textile Exchange based on IWTO and NBS: National Bureau of Statistics of China

Global cashmere production by program in 2023 (tonnes)



Source: Textile Exchange based on AVSF, GCS, IWTO, RN, and SFA

Virgin cashmere

Production facts and figures

[Agronomes et Vétérinaires Sans Frontières](#) (AVSF) produced 70 tonnes of greasy cashmere fiber in Mongolia in 2023 from around 199,000 goats, accounting for 0.3% of all cashmere produced worldwide.¹

[THE GOOD CASHMERE STANDARD®](#) (GCS), developed by the Aid by Trade Foundation (AbTF) in 2019, produced 5,400 tonnes of greasy cashmere fiber in 2023 from around 4.3 million goats in China, representing a large increase from 2022 when 3,600 tonnes of fiber were produced. As a result, GCS accounted for around 31% of all cashmere produced in China in 2023, and around 21% of all cashmere produced worldwide.^{1,2}

The [Responsible Nomads](#) (RN) program, previously referred to as Green Gold and Animal Health program,³ adopted a new certification scheme in 2023. Only cashmere produced under the new scheme is included in the volumes reported for 2023, which is why its certified greasy cashmere production dropped from 530 tonnes in 2022 to 35 tonnes in 2023.

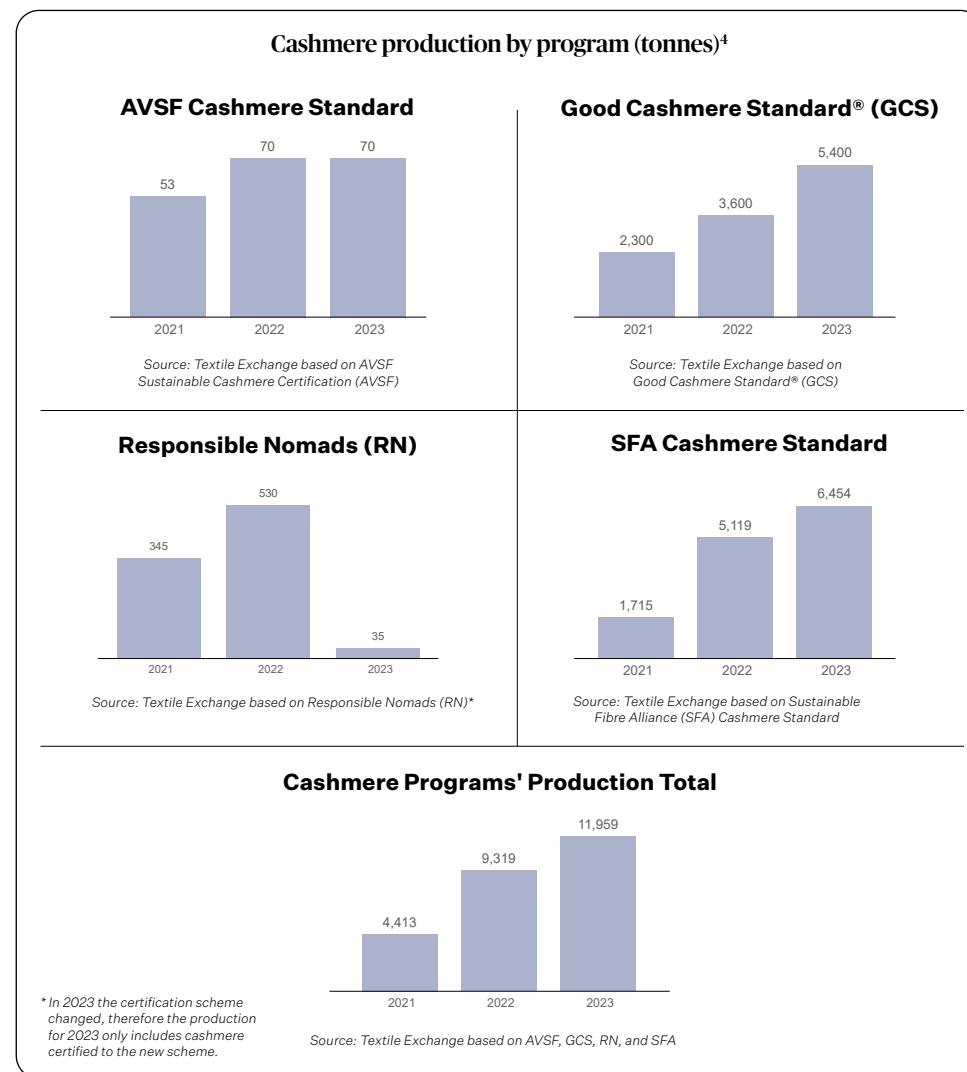
The [Sustainable Fiber Alliance](#) (SFA), with its SFA Cashmere Standard, produced 6,454 tonnes of greasy cashmere fiber in 2023, up from 5,119 tonnes in 2022.

¹ [IWTO, 2024. Market Information. Edition 19.](#)

² [Textile Exchange based on National Bureau of Statistics of China, 2024.](#)

³ Responsible Nomads: The Green Gold and Animal Health Project of the Swiss Agency for Development and Cooperation (SDC) and Mongolian National Federation of Pasture User Groups of Herders (MNFPUH) have partnered in the development and implementation of this program.

⁴ Program data is based on information from program owners, received through email correspondence or from their websites. The production volumes reported here include the total volume produced per program including equivalents and overlaps with other standards. It is therefore possible that there is overlap in the production volumes reported for the different programs.



Virgin alpaca

Production facts and figures

Alpaca fiber is the hair gathered from alpacas, a species of South American camelid native to Peru. Historically, alpaca fiber was reserved for royalty due to its fine micron range.

Today, most alpacas still reside in the highlands of Peru, at altitudes ranging from 11,000 to 16,000 feet (3,500 to 5,000 meters). About 4 million alpacas live in Peru, with a small percentage in other countries like Bolivia, Australia, the UK, and the US. The vast majority (95%) belong to the Huacaya breed, with the remaining 5% classified as Suri.

Huacaya fleece is the primary variation used in textile and knitwear production. The current supply chain is centralized in Peru, where around 90% of the processing is handled by two main suppliers with vertically integrated operations. Additionally, several smaller producer groups operate independently.

More than 90% of the fiber produced in Peru comes from smallholder farmers who typically own around 45 animals. Currently, alpaca fiber is collected and sold by middlemen before being processed by the two large processors.¹

Global alpaca fiber production reached approximately 6,200 tonnes in 2023.²

Key standards

The Responsible Alpaca Standard (RAS), launched in April 2021, is a voluntary global standard that addresses the welfare of alpacas, the land they graze on, and social welfare at the farm level.

¹ Minagri, 2019. [Potencial Productivo y Comercial de la Alpaca](#).

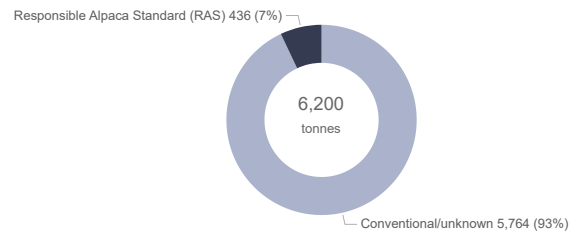
² IWTO, 2024. [Market Information](#). Edition 19.

In 2023, the market share of RAS-certified alpaca fiber grew to 7% (436 tonnes), up from 3% (192 tonnes) in 2022. Most of the certified fiber is already committed to specific supply chains, and it will take time to increase the volume available on the open market.

Alpaca farming in Peru is based on extensive grazing and free-ranging husbandry systems, with animals adapted to their environment.

The RAS was developed at the request of stakeholders to verify that alpaca fiber comes from responsible sources covering farm-level animal welfare practices, land management, and social welfare. Chain of custody certification ensures that fiber from certified farms is properly identified and tracked. The RAS is part of the Responsible Animal Fiber (RAF) framework, along with the Responsible Wool and Mohair Standards.

Global market share of Responsible Alpaca Standard (RAS) in 2023 (tonnes)



Source: Textile Exchange based on IWTO and RAS



Photo: Angela Ponce

Virgin silk

A global overview

Silk is another animal-based fiber¹, though its share of the overall fiber market is small. Approximately 300,000 households are involved in raw silk production.²

In 2021, global raw silk production was around 85,415 tonnes (the most recent year that FAOSTAT data were available at the time of reporting and therefore used as a proxy for 2022 and 2023 in this report), down from 94,081 tonnes the previous year.³

China and India together account for about 95% of global silk production, with China contributing 55% and India 40% in 2021.³

While global silk production more than doubled between 1990 and 2015, it decreased by around 54% between 2015 and 2020.⁴

Silk programs include organic standards like the India Organic Regulation, the Organic Content Standard (OCS), and the Global Organic Textile Standard (GOTS). Other standards include Certified Wildlife Friendly® and the World Fair Trade Organization (WFTO). For recycled silk, the Global Recycled Standard (GRS) and the Recycled Claim Standard (RCS) are applicable.

¹ Raw silk is defined by the FAO as "Obtained by reeling the filaments from cocoons. Not thrown."

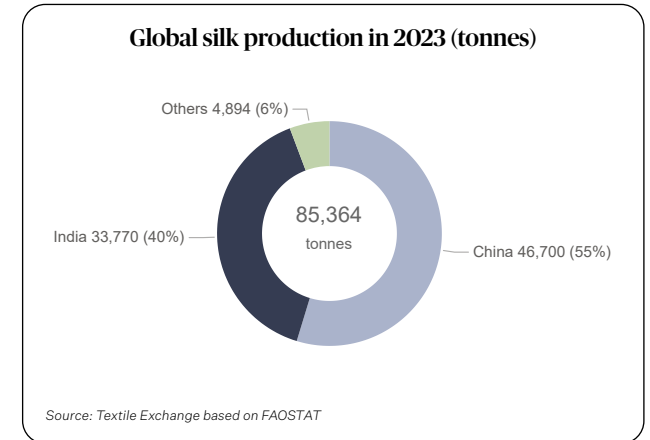
² DNFI, 2020. "40 Million Households Produce Natural Fibers".

³ FAOSTAT, 2024. 2021 data was the latest available at the time of reporting and is therefore used in this report as proxy for 2022 and 2023 in charts and aggregated volumes.

⁴ Please note that historical FAOSTAT data on silk production has been revised a number of times by FAOSTAT. We will always report based on the latest FAOSTAT data available at the time of reporting.



Photo: Andrew Urwin



Other virgin animal fibers

Production facts and figures

Additional animal fibers beyond sheep wool, cashmere, mohair, and alpaca include those from yaks, camels, llamas, vicunas, guanacos, and angora rabbits.

Yak fiber, primarily sourced from the Himalayas and regions of Mongolia and Central Asia, has been used in the Himalayan region for over a thousand years and has recently gained recognition as a premium fiber in the international fashion industry. In 2023, approximately 3,465 tonnes of yak hair were produced.¹

Camel hair is sourced from camels, with major suppliers including Mongolia, Tibet, Afghanistan, Iran, Russia, China, New Zealand, and Australia. In 2023, around 4,060 tonnes of camel hair were produced.¹

Llama, vicuña, and guanaco, all camelids native to South America, also provide valuable fibers. While llamas are domesticated, guanacos and vicuñas are wild camelids related to llamas and alpacas, living in the high alpine areas of the Andes. Their extremely fine wool is highly valuable. In 2023, around 2,800 tonnes of llama wool, seven tonnes of vicuña wool, and two tonnes of guanaco wool were produced.¹

Angora wool comes from Angora rabbits (distinct from mohair, which is sourced from Angora goats). In 2023, around 500 tonnes of angora wool were produced.¹

¹ | [IWTO, 2024. Market Information. Edition 19.](#) Volumes reported are the greasy weight.



Photo: Angela Ponce

The Global Fiber Market

Manmade Cellulosic Fibers

Virgin manmade cellulosic fibers

Production facts and figures

With an annual production volume of around 7.9 million tonnes in 2023, manmade cellulosic fibers (MMCFs) – including viscose (rayon), acetate, lyocell, modal, and cupro – had a market share of around 6% of global fiber production.¹

Global MMCF production has more than doubled since 1990, when annual production was around 3 million tonnes, and is expected to continue growing in the coming years.¹

Viscose (rayon) makes up the majority of the global MMCF market (80%), with a total production volume of around 6.3 million tonnes in 2023.¹

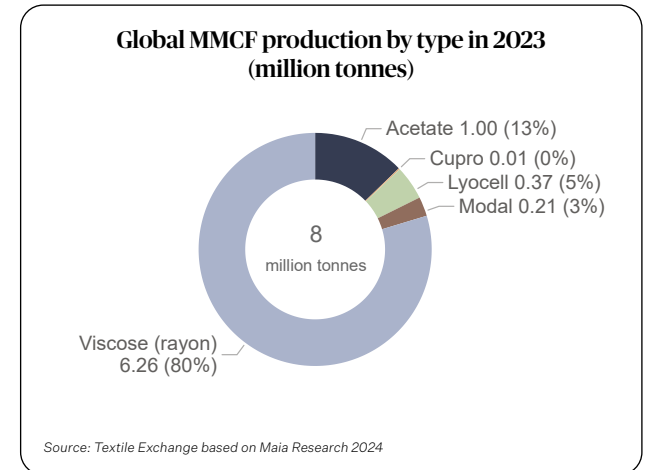
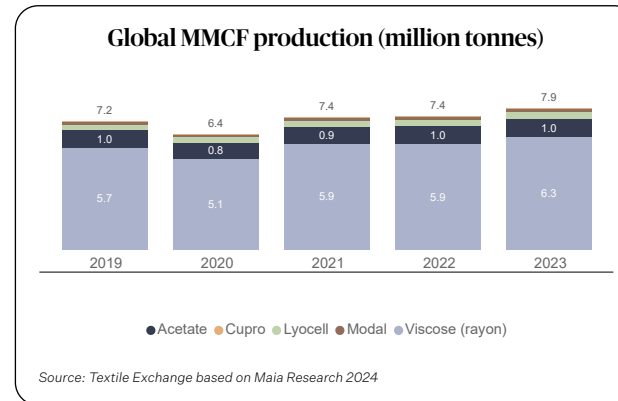
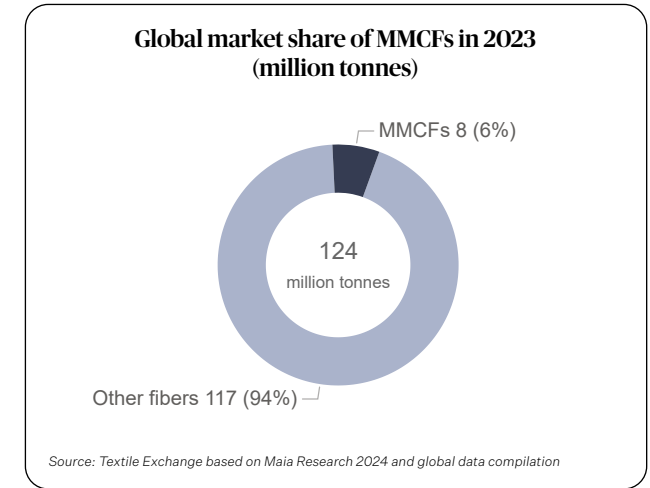
Acetate has a market share of around 13% of all MMCFs in 2023, with a production volume of approximately 1.0 million tonnes,¹ but is mainly used for non-textile applications.²

Lyocell was the third-most used MMCF type in 2022, after viscose and acetate. It had a market share of around 4% of all MMCFs with a production volume of around 0.3 million tonnes.¹

Modal had a market share of around 3% of the total MMCF market in 2022 with a production volume of around 0.2 million tonnes.¹

Cupro had a market share of around 0.2% of the total MMCF market. There was only one supplier of cupro producing around 0.01 million tonnes in 2022.

Manmade cellulosic fibers are currently primarily produced from wood. Less than 1% of the global market is currently made from recycled or other alternative feedstocks.



¹ Maia Research, 2024. Global Manmade Cellulosic Fiber Market Report 2024 (commissioned report).

² More information on the applications by fiber is available in the Methodology section.

Virgin manmade cellulosic fibers

Standards for feedstock

MMCFs covered by FSC and/or PEFC had an estimated market share of around 60–65% of all MMCFs in 2023.¹

The Forest Stewardship Council (FSC), founded in 1993, is an international member-led organization that sets standards for responsible forest management and chain of custody. The first textile products with consumer facing FSC labels hit the market in 2020.²

The Programme for the Endorsement of Forest Certification (PEFC), founded in 1999, is a global alliance of national forest certification systems and is the largest forest certification system worldwide. Brands and retailers first started using consumer-facing communication for PEFC textiles in 2022.²

Overall, the share of global forest area covered by FSC and/or PEFC declined from around 11.2% in 2022 to around 8.7% in 2023. This was due, in part, to the ban on timber from Russia, Belarus, and occupied Ukrainian territory, called “conflict timber”, in March 2022.^{3,4,5,6}

1 Textile Exchange estimates based on publicly available information and its own supplier mapping.

2 Information received from FSC and PEFC per email.

3 FAOSTAT, 2024. [Database](#). 2022 and 2023 figures not yet available at the launch of this report and therefore 2021 figures used as proxy.

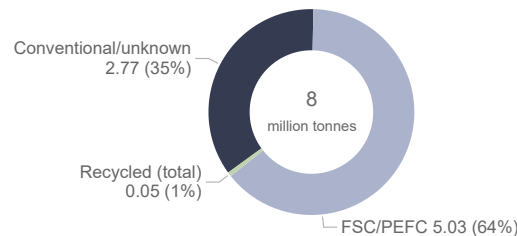
4 Based on FSC and PEFC press releases from [June 2024](#), the [FSC Database](#), the [PEFC Database](#), and email correspondence with FSC, PEFC and SFI.

5 [FSC, 2022](#). No FSC Material from Russia and Belarus until the Invasion Ends.

6 PEFC, 2022. Timber from Russia and Belarus Considered “[Conflict Timber](#)”.

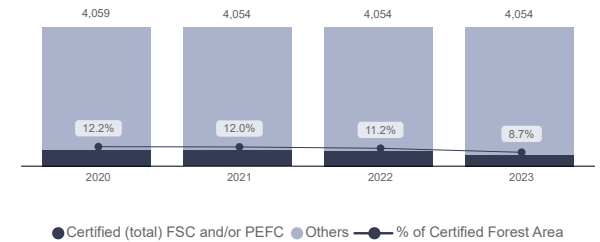
In total, around 7.3% of all certified forest was covered by PEFC and its equivalents in 2023, with roughly half of this covered by Sustainable Forestry Initiative (SFI). SFI is a key PEFC-endorsed forest certification system operational in Canada and the United States. Approximately 3.9% of all forests were covered by FSC in 2023. Due to the double certification of around 1.5% of all forests, 9.6% (and not 11.2%) of all forests were covered by FSC and/or PEFC in 2023.^{3,4}

Global MMCF production by feedstock in 2023 (million tonnes)



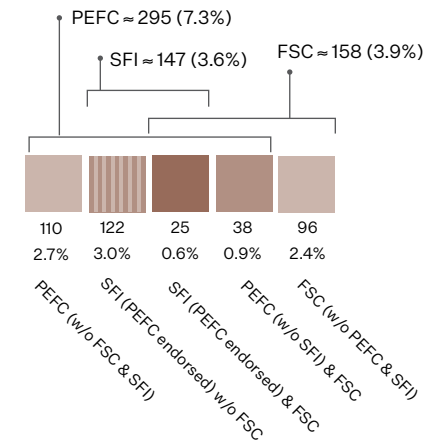
Source: Textile Exchange based on Maia Research, CanopyStyle audit reports, and other additional sources

Forest programs (million ha) and % of forest area covered by the programs



Source: Textile Exchange based on FAO, FSC, PEFC, and SFI. Volumes include both “certified” and “controlled” volumes.

Forest programs in 2023 (million hectares) and share of total forest area (%)



Virgin manmade cellulosic fibers

Standards for feedstock

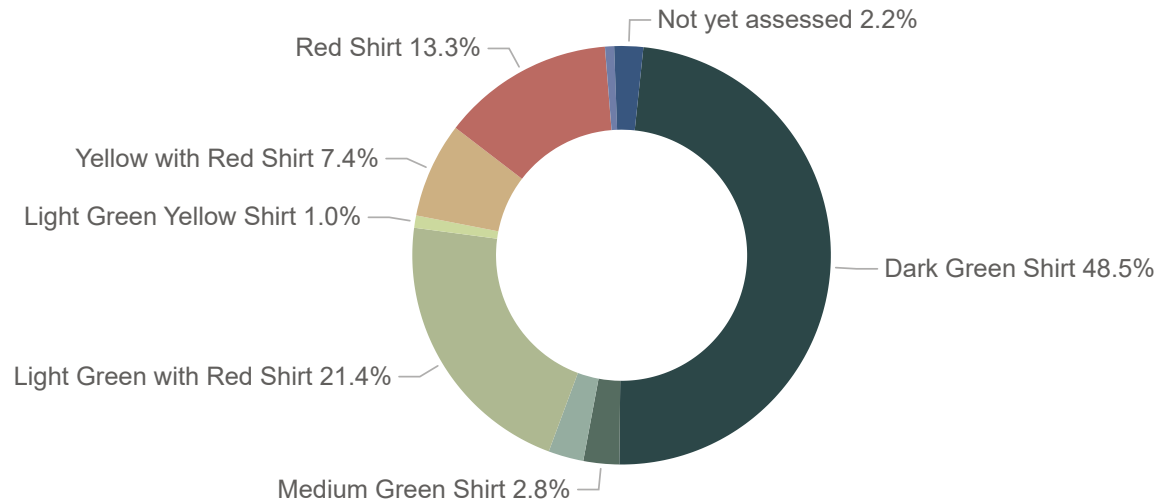
The [CanopyStyle Audits](#) have become the leading assessment of MMCF suppliers on their raw material sourcing practices since their start in 2017. The results of the audits are fed into Canopy's annual [Hot Button Report](#), which compares the performance of MMCF producers across several impact categories.

In 2023, 54% of the global MMCF production was awarded "green shirts", up from 53% in 2022 and 50% in 2021.¹ These producers have been audited and assessed as being at low risk of sourcing MMCFs from ancient and endangered forests or have taken substantive action to eliminate known risks in their supply chains.

As of 2023, 89% of MMCF producers are engaged with Canopy either by having a sourcing policy in place or through dialogue.

¹ Canopy, 2024. [CanopyStyle Hot Button Report 2023](#).

Global market share of MMCF production capacity with CanopyStyle Shirts in 2023



Source: Textile Exchange based on Canopy Hot Button Report 2023

Virgin manmade cellulosic fibers

Standards for pulp and fiber

Pulp and fiber

Bluesign® has developed specific criteria for fiber production that was added in the annex “[Fiber Manufacturing](#)” to its “bluesign® CRITERIA for production sites” in March 2020. These criteria are applicable to the manufacturing of MMCFs and synthetic fibers, such as polyester and polyamide (nylon). Criteria for MMCFs address areas including feedstock, pulp, and fiber production. One MMCF supplier has already become a bluesign® SYSTEM PARTNER and produces bluesign® APPROVED fibers.

[ZDHC](#) expanded the scope of its work to cover fiber production in 2020. It released guidelines, initially focused on viscose (rayon) and modal, to provide MMCF suppliers with unified criteria for measuring output indicators as well as an aligned approach for the recovery of sulfur compounds, part of the inputs, and by-products generated during the production process. Fiber producers are expected to engage in a continuous improvement roadmap defined by three levels of progress: foundational, progressive, and aspirational. In December 2022, ZDHC [released V2.0 of its Man-Made Cellulosic Fibres Guidelines](#). The most up to date version is [Man-made Cellulosic Fibre \(MMCF\) Guidelines V2.2](#), released in August 2023. The guidelines have expanded scope to now include lyocell, cupro, and acetate. They also include revisions to the criteria for responsible fiber production, wastewater, and air. In the upcoming V3.0, it is planned that chemical requirements for converting wood to dissolving pulp will be incorporated.

Further standards that can be used at the pulp and/or fiber level include [Cradle to Cradle Material Health Certificate Standard, STeP by OEKO-TEX®](#), and the [EU Ecolabel for textile products](#).

Another option is production in compliance with the [EU BREFs \(BAT Reference Documents\)](#).

For standards related to MMCFs made from recycled feedstocks, see the chapter on [recycled manmade cellulosic fibers](#).



Photo: Constance Mariena

Recycled manmade cellulosic fibers

Supplier updates

The market share of MMCFs made from recycled feedstocks (which include MMCFs made from any recycled raw material, not only MMCF-to-MMCF recycling) increased from an estimated 0.5% in 2022 to 0.7% in 2023.¹ However, amid ongoing research and development, it is expected to increase significantly in the coming years.

Canopy estimates that recycling just 25% (5 million tonnes) of global pre- and post-consumer cotton textile waste, plus 25% (1.6 million tonnes) of MMCF textile waste, could replace all wood fiber currently used to manufacture dissolving pulp.²

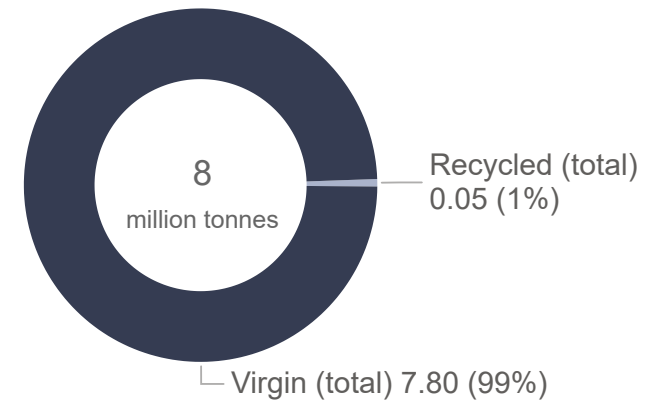
Many MMCFs made from recycled feedstocks are still in development. The first commercially available MMCFs that are partially or wholly made from recycled materials use mainly cotton linter or pre-consumer cotton textile residues as feedstock. The share of MMCFs created from post-consumer textiles is still low but expected to grow.

For MMCFs made from recycled materials, the Recycled Claim Standard (RCS), Global Recycled Standard (GRS), and SCS Recycled Content Certification can be used. The first suppliers of MMCFs made from recycled feedstocks have been RCS-certified.

¹ Textile Exchange based on Maia Research, 2024. Global Recycled Manmade Cellulosic Fiber Market Report 2023 and Global Manmade Cellulosic Fiber Market Report 2023.

² Canopy, 2020. [SURVIVAL. A Plan for Saving Forests and Climate: A Pulp Thriller.](#)

Global MMCF production in 2023 (million tonnes)



Source: Textile Exchange based on Maia Research 2024 and global data compilation

The Global Fiber Market
Polyester

Recycled polyester

Production facts and figures

Polyester is the most widely used fiber worldwide. With an annual production volume of around 71 million tonnes, up from around 63 million tonnes in 2022, polyester had a market share of approximately 57% of global fiber production in 2023.¹

Globally, recycled polyester fiber production increased from around 8.6 million tonnes in 2022 to around 8.9 million tonnes in 2023². However, due to the increase in virgin polyester production, there was actually a decrease in the overall market share of recycled polyester from around 13.6% of global polyester production in 2022 to around 12.5% in 2023.³

Feedstock types

Recycled polyester is predominantly made from PET plastic bottles, which make up an estimated 98% of all recycled polyester feedstock.² Recycled polyester can also be made from other post-consumer plastics such as ocean waste, packaging waste, and discarded polyester textiles, or from pre-consumer processing residues such as fabric scraps.

Amid increasing demand for post-consumer bottles within the bottle industry, as well as the wider packaging industry and other sectors, competition for post-consumer bottles is increasing. Textile-to-textile recycling is an important strategy to ensure future feedstock supply for the recycled polyester textile industry.

Recycling types

Most recycled polyester is currently recycled mechanically. Key challenges associated with chemical and biological recycling include cost and investment, technological challenges, access to suitable and consistent feedstocks, and energy use. With new operations starting commercial production of chemically recycled polyester, and other companies in the research and development phase, the market share of chemically recycled polyester is expected to grow in the coming years.

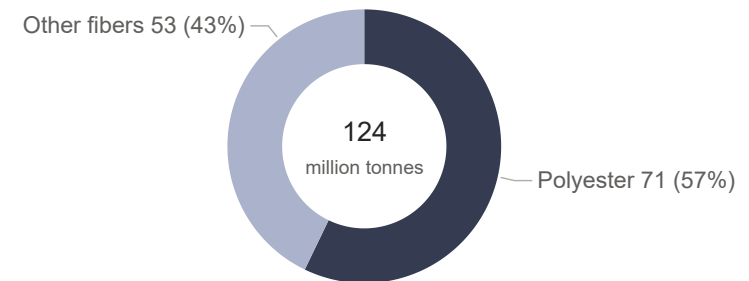
For more information, please see Textile Exchange's 2024 report [The Future of Synthetics](#), which dives into the technologies and infrastructure that will facilitate the substitution of new virgin fossil fuel-derived synthetic materials.

1 Maia Research, 2024. Global Polyester Fiber Market Report 2023. Commissioned report.

2 Maia Research, 2024. Global Recycled Polyester Fiber Market Report 2023. Commissioned report.

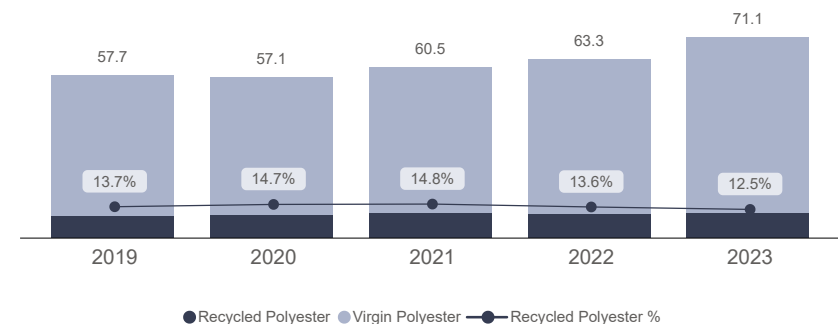
3 Textile Exchange, 2024. Based on sources listed in footnote (1) and (2).

Global market share of polyester in 2023 (million tonnes)



Source: Textile Exchange based on Maia Research 2024 and global data compilation

Global polyester production (million tonnes) and share of recycled (%)



Source: Textile Exchange based on Maia Research 2024 and global data compilation

Recycled polyester

Production facts and figures

Standards

The main standards used for recycled polyester include the Global Recycled Standard (GRS), the Recycled Claim Standard (RCS), and the SCS Recycled Content Standard. For further information, see the chapter on [Supply chain standards](#).

Ocean-bound plastic

More than 8 million tonnes of plastic end up in the oceans every year.¹ An increasing number of initiatives are working on the collection of ocean-bound or ocean plastic as feedstock for recycled polyester.²

Zero Plastic Oceans launched the [Ocean Bound Plastic \(OBP\) Certification](#) in 2020 in collaboration with the certification body Control Union. The OBP Certification Program is designed to encourage the removal of ocean-bound plastic from the environment by adding value to the effective collection and treatment of plastic before it reaches the ocean.

¹ IUCN, 2021. [Website](#).

² Ocean-bound plastic is generally defined as abandoned plastic waste located within the range of 50km from shore. Source: Ocean Bound Plastic (OBP) Certification, 2024. [Website](#).

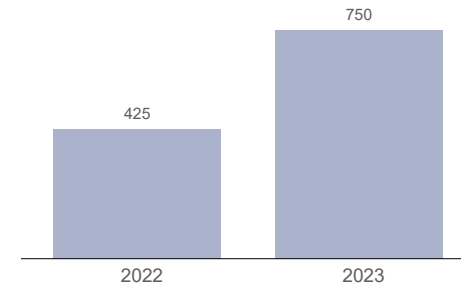
³ Zero Plastic Oceans, 2024. Email correspondence, April 2024.

A total of 750 tonnes of recycled polyester fibers were OBP-certified in 2023, up from 425 tonnes in 2022. 69% of this came from Indonesia, 20% from China, and 11% from India.

However, the volumes of recycled polyester fibers from OBP-certified feedstock that were not yet certified at the fiber level were much higher, at around 5,052 tonnes. The reason is that only parts of the supply chains were certified.³

In terms of OBP-certified feedstock, in 2023, 34% came from Malaysia, 29% from India, 20% from Indonesia, 9% from Thailand, and 8% from China. Small amounts also came from Pakistan, Australia, New Zealand, the USA, Taiwan, Japan, South Korea, and Holland.³

Ocean Bound Plastic fiber production (tonnes)



Source: Ocean Bound Plastic 2024



Photo: Madeleine Brunmeier

Biobased and CO₂-based polyester

Emerging materials

All synthetic fibers can, in theory, be made from new virgin fossil-based feedstocks, recycled feedstocks, biobased feedstocks, or CO₂-based feedstocks. Biobased and, more recently, CO₂-based feedstocks are emerging materials of growing interest.

Biobased polyester

The market share of biobased polyester is estimated at around 0.01% of the total polyester production.¹

Many biosynthetic materials that exist on the market today are partially biobased. Further development of feedstocks is needed to provide the industry with innovative solutions to drive the uptake of biobased polyesters.

While many sustainability standards for biobased feedstocks exist, the scale and adoption of these standards for biosynthetics are still limited. Key standards for biomass certification are the Roundtable on Sustainable Biomaterials (RSB), International Sustainability & Carbon Certification (ISCC) Plus, and Bonsucro.

For more information, please see Textile Exchange's 2022 [Sustainability of Biosynthetics report](#) and its 2024 report [The Future of Synthetics](#).

¹ Estimate based on nova-Institute, 2024. [Bio-based Building Blocks and Polymers: Global Capacities, Production and Trends 2023 – 2028](#). Maia Research, 2024. Global Polyester Fiber Market Report 2023. Commissioned report.

CO₂-based fibers

A few companies are exploring innovative approaches to directly capture carbon dioxide (CO₂) from the air and use the carbon element as feedstock for textiles. The carbon can be processed into the chemical building blocks that are used in the production of synthetic fibers such as polyester. Carbon Capture and Utilization and Storage (CCUS) and Direct Air Capture (DAC) are new technologies in development. Their energy usage is currently very high, but if technological challenges are overcome and the process is powered by renewable energy, it will have potential as an alternative to new virgin fossil feedstock. Solutions in development today are partially derived from captured carbon.

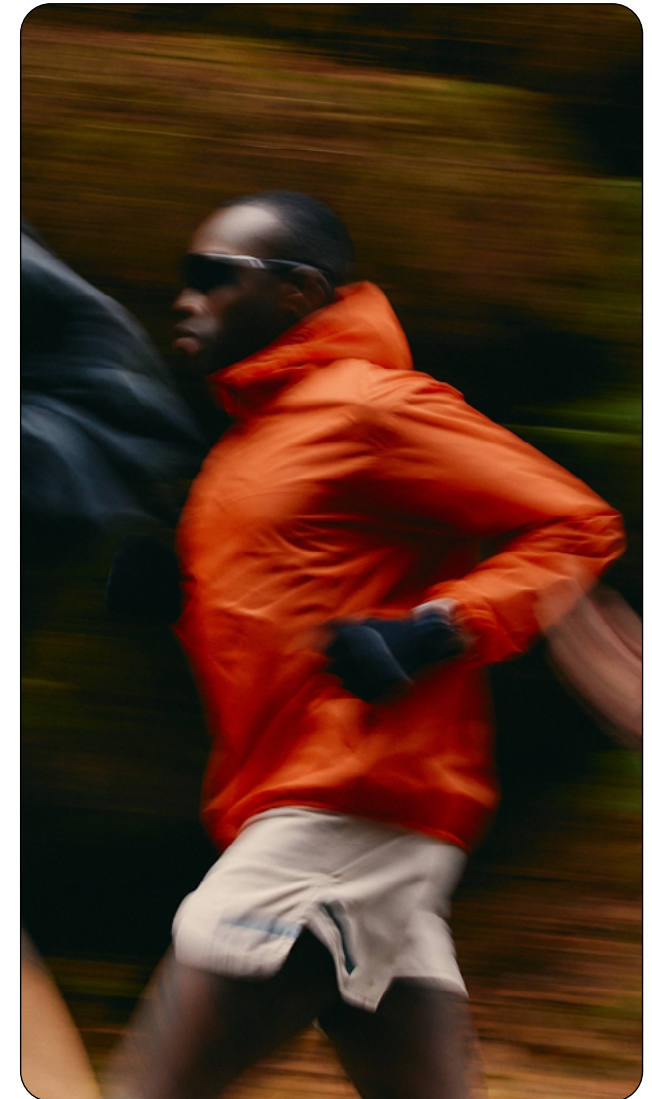


Photo: Daniel Farò

The Global Fiber Market

Polyamide (Nylon)

Recycled polyamide (nylon)

Production facts and figures

Global polyamide (nylon) fiber production increased from 6.2 million tonnes in 2022 to 6.7 million tonnes in 2023 and accounted for about 5% of global fiber production.¹ There has been a steady increase in polyamide production over the last five years, except for 2020 when the COVID-19 pandemic caused a slight decline.²

The recycled polyamide fiber market is growing, but at a slow rate. Around 0.1 million tonnes of recycled polyamide were produced globally in 2023. Due to technical challenges, limitations related to feedstock quality and availability, and investment needs, the market share of recycled polyamide is still very low, accounting for around 2% of all polyamide fiber production.³

Feedstock types

Recycled polyamide can be produced from pre- or post-consumer waste. Pre-consumer waste may include processing scraps, fabric cut-offs, or hard polyamide waste. Post-consumer polyamide is made from materials such as discarded fishing nets, carpets, or other used textiles. The recycling process can be mechanical or chemical.

Standards

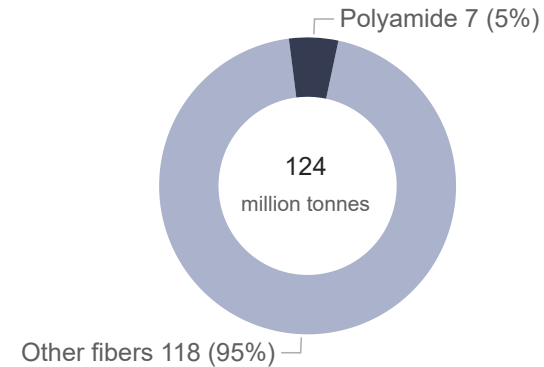
The main standards used for recycled polyamide include the Global Recycled Standard (GRS) and the Recycled Claim Standard (RCS). For further information, please see the chapter on Supply Chain Standards. Recycling polyamide helps to decrease the industry's dependence on new virgin fossil-based raw materials and reduce waste material.

¹ Textile Exchange estimate based on various sources (see [Global Fiber Market](#) chapter).

² Maia Research, 2024. Global Polyamide Fiber Market Report 2023. Commissioned report.

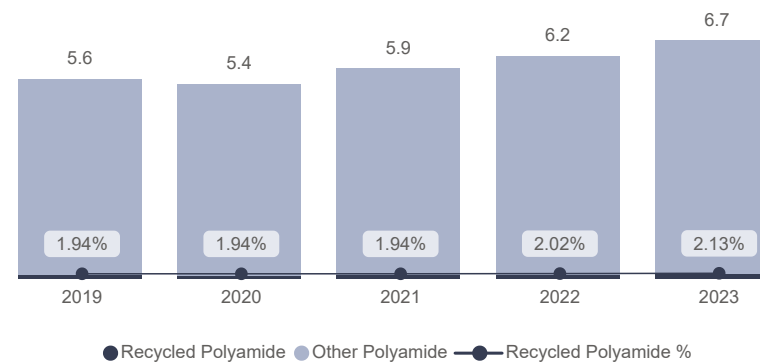
³ Maia Research, 2024. Global Recycled Nylon Fiber Market Report 2023. Commissioned report.

Global market share of polyamide (nylon) in 2023 (million tonnes)



Source: Textile Exchange based on Maia Research 2024 and global data compilations

Global polyamide (nylon) production (million tonnes)



Source: Textile Exchange based on Maia Research 2024 and global data compilations

Biobased polyamide (nylon)

Introduction and supplier innovation landscape

The global production volume for biobased polyamide (nylon) fiber is around 0.04 million tonnes.¹ It is estimated that biobased polyamide fibers make up around 0.5% of the polyamide fiber market.¹

Many biosynthetic materials that exist on the market today are partially biobased. Further development of feedstocks is needed to provide the industry with innovative solutions to drive the uptake of biobased polyamides.

For more information, please see Textile Exchange's [Sustainability of Biosynthetics Report](#) and its 2024 report [The Future of Synthetics](#).

¹ Estimate based on nova-Institute, 2024. [Bio-based Building Blocks and Polymers: Global Capacities, Production and Trends 2023 – 2028](#). Maia Research, 2024. [Global Polyester Fiber Market Report 2023](#). Commissioned report.



Photo: Mickael Samama

The Global Fiber Market

Other Synthetic Fibers

Other synthetic fibers

Production facts and figures

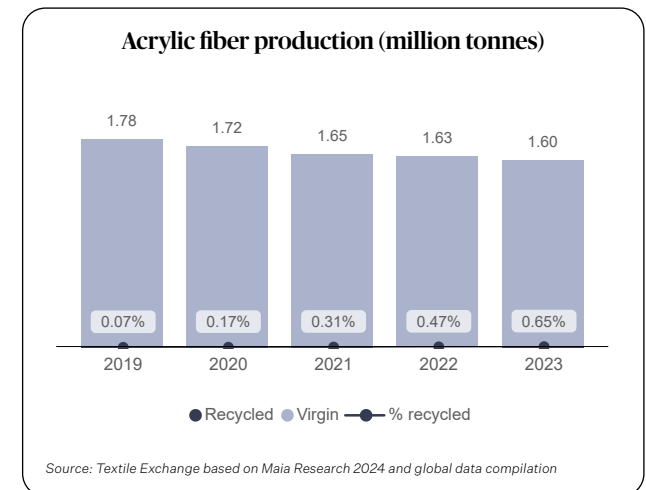
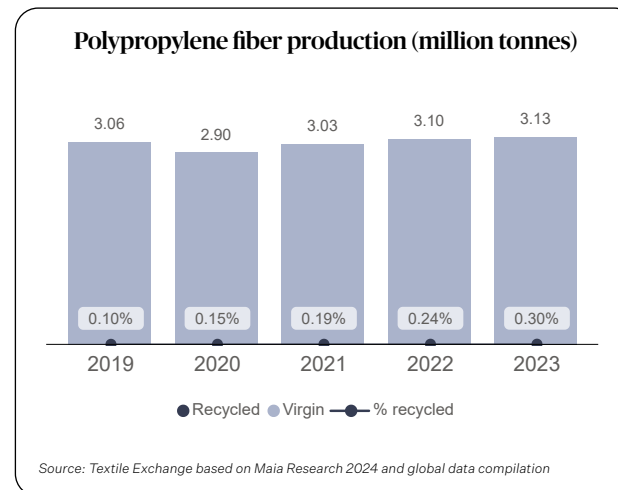
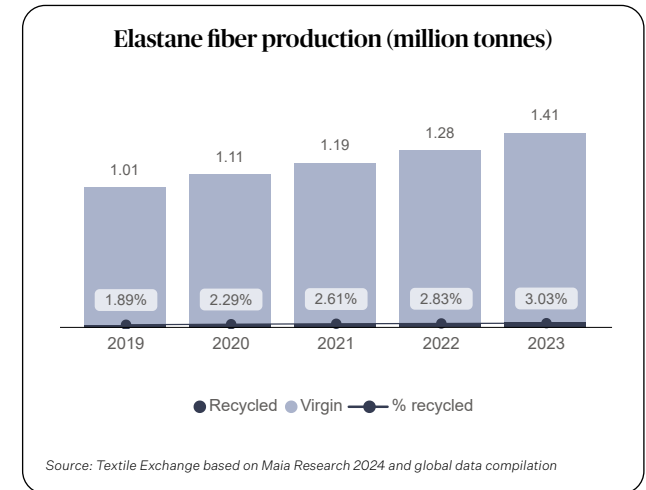
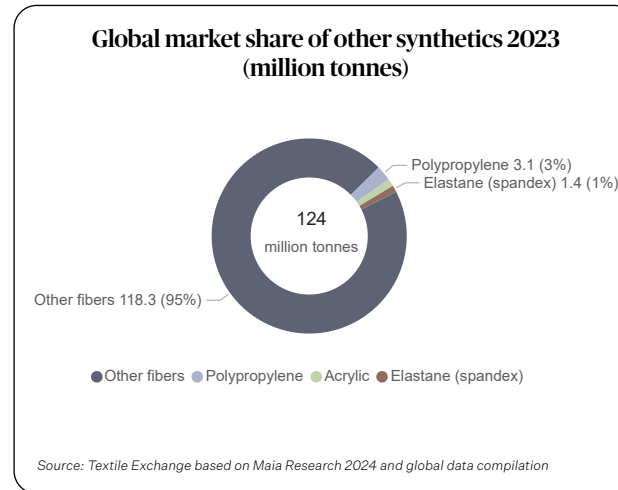
Other synthetics – including polypropylene, acrylics, and elastane – had a combined production volume of 6 million tonnes and a market share of around 5% of the global fiber market in 2023.

Polypropylene had a market share of 2.5%, with fiber production volumes remaining similar to 2022 at 3.1 million tonnes, after a slight decline in 2020 due to COVID-19. It is estimated that about 0.3% of polypropylene fibers are recycled.

Acrylic fibers had a production volume of just under 1.6 million tonnes and a market share of 1.3% of the global fiber market in 2023. Global acrylic fiber production volumes have been declining over the years.¹ The market share of recycled acrylic is estimated at around 0.6% of total acrylic fiber production in 2023.

Elastane fiber production increased from slightly above 1.2 million tonnes in 2022 to almost 1.4 million tonnes in 2023, accounting for a market share of around 1.1% of the global fiber market. The share of recycled elastane was estimated to be 3.0% of global elastane fiber production in 2023.

The production volumes of **other synthetics** such as polytrimethylene terephthalate (PTT), polylactic acid (PLA), and similar materials are very low and currently not included in this annual report.



¹ Maia Research, 2024. Global Other Synthetics Fiber Market Report 2023. Commissioned report.

Other Raw Materials (Non-Fiber)

Other Raw Materials (Non-Fiber)

Down & Feathers

Virgin down

Production facts and figures

Global virgin down and feather production increased from 602,356 tonnes in 2022 to around 626,932 tonnes in 2023. Approximately 85–90% of down comes from ducks, with the remainder mainly from geese.¹

Concerns about the treatment of animals have led to the development of animal welfare standards for down. Key standards include the [Responsible Down Standard \(RDS\)](#) and Downpass.² These standards ensure that there is:

- No live plucking
- No force-feeding
- Broader animal welfare (depending on the standard)

Multi-tier cage farming, increasingly used in China for ducks, is also prohibited by the RDS, as the animal welfare outcomes it describes cannot be delivered by these systems.

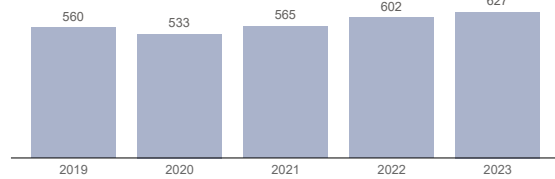
[RDS](#)-certified down production volume increased from 19,233 tonnes in 2022 to 20,639 tonnes in 2023, equaling 3.3% of total virgin down production in 2023.

Downpass had 13% of its certified farms located in Ukraine in 2021, so the program has been affected by the war, and data for 2022 and 2023 were not available at the time of reporting. In 2021, the latest year for which data are available, the global Downpass-certified down production volume was 6,958 tonnes, accounting for an estimated 1.2% of total global down production.

¹ Maia Research, 2024. Global Down and Feather Market Report 2023. Commissioned report.

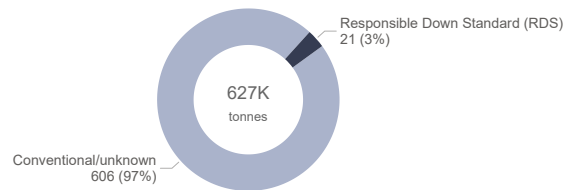
² The Global Traceable Down Standard (TDS) was withdrawn in 2020 and is therefore no longer covered in this report.

Global down production (thousand tonnes)



Source: Textile Exchange based on Maia Research 2024

Market share of down programs in 2023 (thousand tonnes and %)



Source: Textile Exchange based on Maia Research 2024 and standard owners

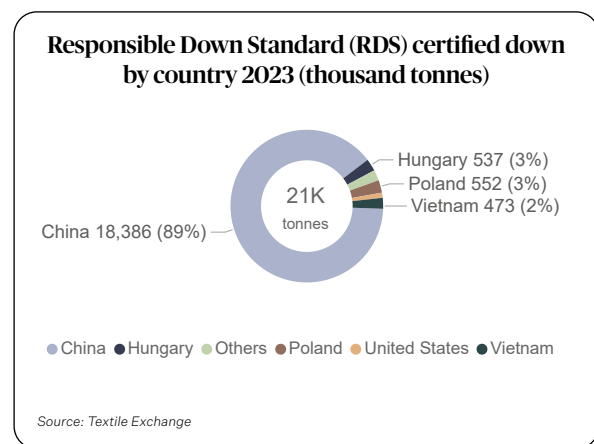


Photo: Krzysztof Bubel

Virgin down

Where to find down programs across the globe

Around 20,639 tonnes of Responsible Down Standard (RDS) down were produced in 12 countries in 2023. Global Downpass data for 2022 and 2023 were not available in time for this report, primarily due to the war in Ukraine. Major production regions for certified down are China and Eastern Europe, including Poland and Ukraine. The war in Ukraine has therefore negatively impacted supply of certified down.



Western Europe

UNITED KINGDOM

RDS: 214 tonnes

IRELAND

Downpass: n/a¹

FRANCE

RDS: 2 tonnes
Downpass: n/a¹

NETHERLANDS

Downpass: n/a¹

GERMANY

RDS: 1 tonne
Downpass: n/a¹

PORTUGAL

Downpass: n/a¹

Eastern Europe

BULGARIA

RDS: 85 tonnes

HUNGARY

RDS: 537 tonnes
Downpass: n/a¹

POLAND

RDS: 552 tonnes
Downpass: n/a¹

RUSSIA²

Downpass: n/a¹

UKRAINE

RDS: 4 tonnes
Downpass: n/a¹

North America

CANADA

RDS: 6 tonnes

UNITED STATES

RDS: 227 tonnes

East and South-East Asia

CHINA

RDS: 18,386 tonnes
Downpass: n/a¹

TAIWAN

RDS: 151 tonnes
Downpass: n/a¹

VIETNAM

RDS: 473 tonnes

Australasia

AUSTRALIA²

Downpass: n/a¹

¹ Downpass had production in this country in 2021 but data for 2022 and 2023 were not available at the time of reporting, primarily due to the war in Ukraine.

² RDS certified down was produced in this country in the past but there was no certified production in 2023.

Recycled down

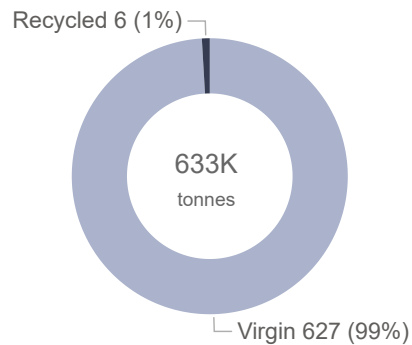
Production facts and figures

While global virgin down production was around 626,932 tonnes in 2023, the production volume of recycled down was roughly estimated to be around 5,798 tonnes.¹ This represents a slight increase in the volume of recycled down compared to the previous year, but considering the increase in down production, the market share of recycled down is still only around 1%.

Key standards

Key standards used for recycled down include the [Recycled Claim Standard](#) (RCS) and the [Global Recycled Standard](#) (GRS). Further information on these standards can be found in the chapter on [Supply Chain Standards](#).

Recycled down market share in 2023



Source: Textile Exchange based on Maia Research 2024



¹ Maia Research, 2024. Global Down and Feather Market Report 2023. Commissioned report.

Photo: Julian Hanslmaier

Other Raw Materials (Non-Fiber)

Leather

Virgin leather

A global overview

Global leather production – measured by the weight of raw hides – was around 13.4 million tonnes in 2022 (the latest year for which data are available), with the hides and skins of nearly 1.5 billion animals used to produce leather.¹

Cattle hides were the most used type of hide, with an estimated 9.4 million tonnes produced, accounting for over two-thirds of total hides production. China was the largest producer of cattle hides, accounting for 17% of global production, followed by the US with 13%, Brazil with 11%, India with 7%, and Argentina with 5%.²

Sheep hides were the second most used type of hide, with production totaling around 2.0 million tonnes. The largest producers were China with 30%, Australia with 8%, and New Zealand with 4% of global sheep hide production.

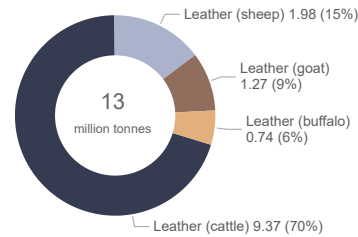
Around 1.3 million tonnes of **goat** hides were produced, with the largest producers being China with 39% of global goat hide production, Pakistan with 10%, and India with 8%.

Around 0.7 million tonnes of **buffalo** hides were produced, with the largest producers being India, which accounted for 39% of global buffalo hide production, China, which accounted for 26%, and Pakistan, which accounted for 21%.^{1,2}

¹ FAOSTAT. Accessed April 2024. Including raw cattle hides, buffalo hides, goat skins, and sheep skins. Other types of hides and skins not included. 2022 data is used as proxy for 2023 in aggregated figures as 2023 data was not available at the time of reporting.

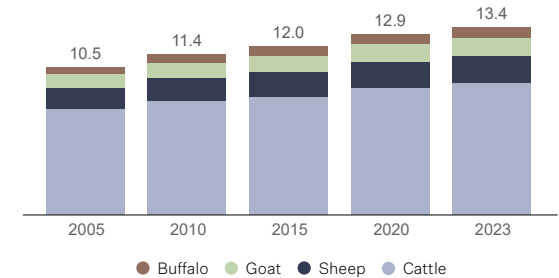
² FAO's hide and skin production volumes for big animals are calculated based on meat production (carcass weight) using conversion factors. In 2023, FAO revised its cattle and buffalo meat production data (and therefore also its hide and skin data) to report all cattle under buffalo for India. Textile Exchange has applied the percentage breakdown between India's cattle and buffalo production in 2021 to 2022 as a proxy.

Global leather production: Raw hides by type in 2022



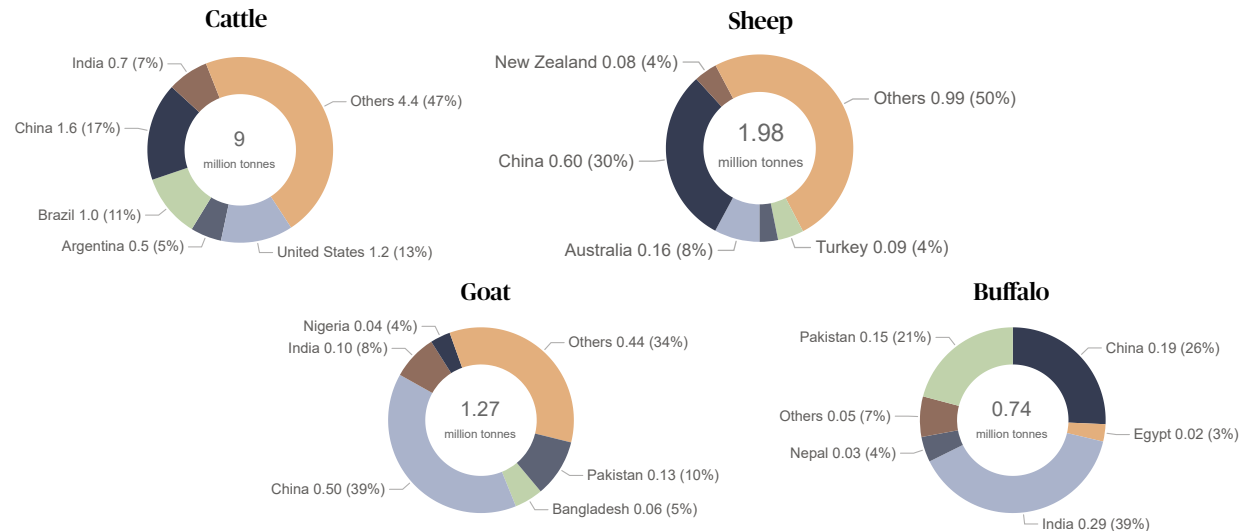
Source: Textile Exchange based on FAOSTAT. 2022 data is used as proxy for 2023.

Global hides production (in million tonnes)



Source: Textile Exchange based on FAOSTAT. 2022 data is used as proxy for 2023.

Raw hides by country in 2023



Source: Textile Exchange based on FAOSTAT. 2022 data is used as proxy for 2023.

Virgin leather

Standards and certification systems

Adopting standards and certification systems helps the leather industry ensure compliance with relevant criteria and acknowledge good industry practice.

Different standards and certification systems vary significantly in terms of their requirements, approach to assurance – ranging from self-declaration to third-party audits – and the degree of traceability and oversight throughout the supply chain. Some are only active in certain regions or markets, while others focus on particular impact areas.

For leather, most standards cover the processing stage. While multiple standards cover animal welfare for meat production, only a few small supply chains currently manage to maintain traceability of the hides of certified animals through to finished leather goods. Aside from animal welfare concerns, the need for brands to know whether leather originates from land where deforestation or conversion of other natural ecosystems takes place highlights the necessity of joined-up and certified supply chains.

Certified Humane®

[Certified Humane®](#) aims to improve the lives of farm animals from birth through slaughter. Certified Humane® hides are currently being used in leather production, but since some parts of the supply chain could not be audited, the Certified Humane® logo is not yet being used on final products.

Global Animal Partnership (G.A.P.)'s Animal Welfare Certified

[Global Animal Partnership \(G.A.P.\)'s Animal Welfare Certified](#) program ensures that animals are raised without the use of animal by-products and that their environment mimics their natural environment to varying degrees as specified on the label. The first companies have started using traceable hides from G.A.P.'s Animal Welfare Certified animals.

Pasture for Life

[Pasture for Life](#) promotes the unique quality of produce raised exclusively on pasture, and the wider environmental and animal welfare benefits that pastured livestock systems represent. The first Pasture for Life hides have now been used in leather production.

Beter Leven

[Beter Leven](#), with its Better Life label, was developed by the Dutch Society for the Protection of Animals (SPA) and uses a star rating system to indicate the living conditions of the animals behind its products. In 2023, the number of certified beef cattle was 27,000 and the number of certified calves was around 7,000. Data on certified hides was not available.

Land to Market™

[Land to Market™](#) is an outcomes-based verified regenerative sourcing solution for raw materials, including leather and wool. Animals are currently certified under Land to Market™, but no data was available at the time of reporting.

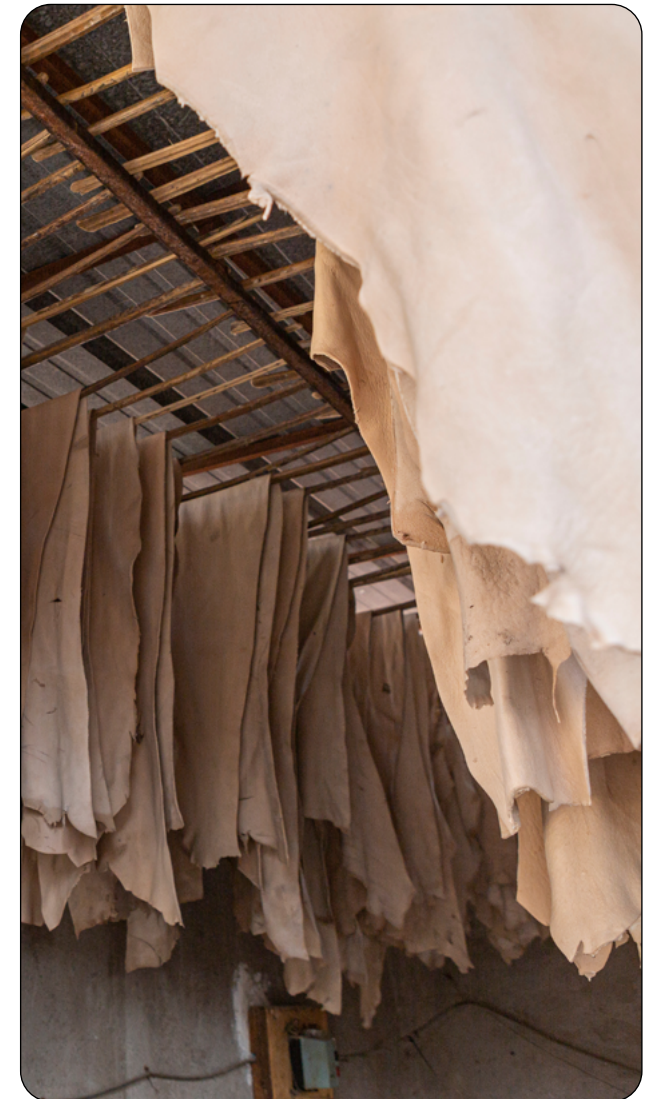


Photo: Pedra Preta

Virgin leather

Standards and certification systems

Responsible Animal Fiber (RWS, RMS, and RAS) for sheep, goat, and alpaca skin and leather

The most recent versions of the RAF standards all include an optional module to apply to slaughtering. Where this module is applied and the chain of custody is maintained, claims about the origin of animal skin and leather can be made.

Leather Impact Accelerator (LIA)

Textile Exchange has developed the [Leather Impact Accelerator](#) (LIA), which includes Impact Incentives, a tool that allows brands to directly support farmers who are addressing deforestation and land conversion, as well as animal welfare at all cattle farming levels. In 2023, LIA version 1.0 was launched.



Photo: Danilo Arenas

Recycled leather

Overview

Using recycled leather (where the fiber structure remains intact during the recycling process) and recycled leather fiber (where the leather is disintegrated into fibrous particles, small pieces, or powders and combined or not with chemical binding agents, and made into sheets, with a minimum amount of 50% in weight of dry leather fibers) plays a role in curbing the industry's waste output.

Recycled leather fiber materials are mainly made from pre-consumer production scraps, consisting of recycled leather fibers and binders, or recycled leather fibers attached to the surface of a synthetic material.

The European Outdoor Group (EOG) published a [Recycled Leather report](#) in 2019 to support industry professionals in better understanding recycled leather fibers.

Recycled standards

The standards that can be used to certify recycled leather feedstocks are the [Recycled Claim Standard](#) (RCS) and the [Global Recycled Standard](#) (GRS). In November 2023, the RCS and GRS were updated to allow shavings/trimmings from leather tanning, splitting, post-tanning, and finishing operations to be accepted as reclaimed inputs.



Photo: Baloncici

Other Raw Materials (Non-Fiber)

Natural Rubber

Natural rubber

Global natural rubber production was just over 15 million tonnes in 2022 (the latest year data were available at the time of reporting and therefore used as a proxy for 2023).^{1,2}

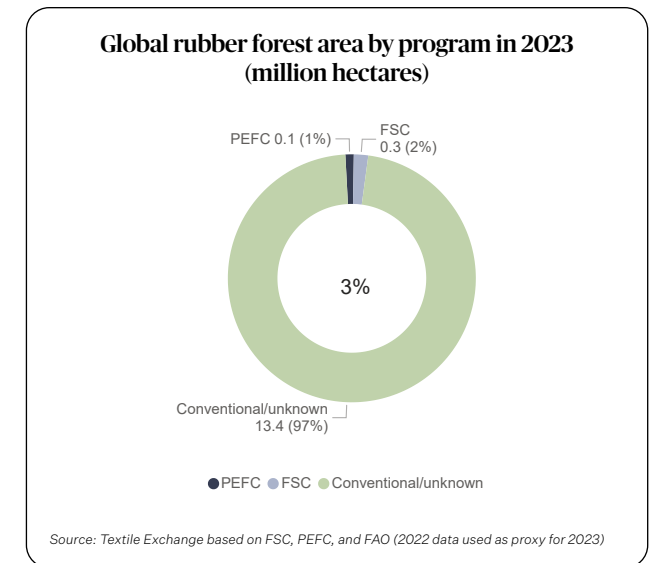
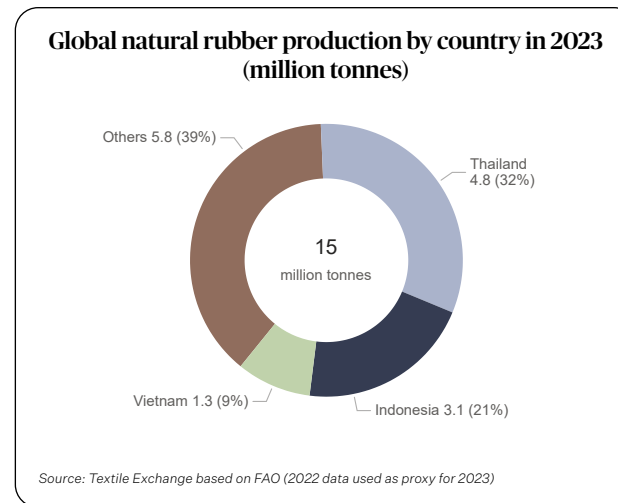
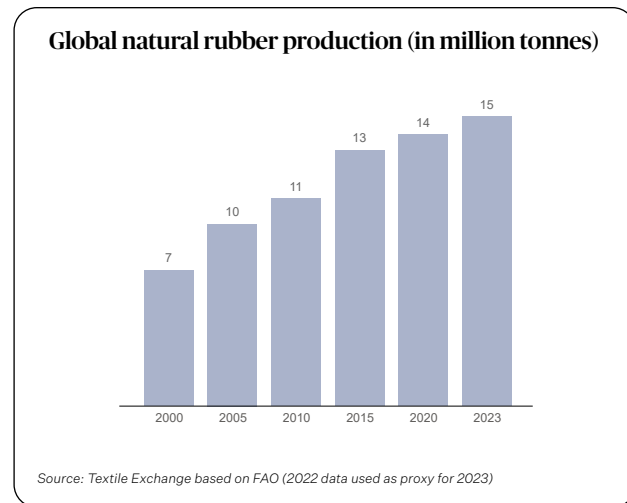
The largest natural rubber-producing countries were Thailand (32% of global production), Indonesia (21%), and Vietnam (9%).¹ It is estimated that around 85% of the natural rubber is produced by smallholders, involving around 10 million farmers.³

The market share of rubber forest covered by FSC and PEFC increased slightly to around 3.0%, up from 2.9% the previous year.^{1,4,5}

Around 0.26 million hectares of rubber forest (out of a total 13.8 million hectares) produced [rubber covered by FSC](#), thus representing a market share of around 2%.^{1,4}

Around 0.15 million hectares of rubber forest produced [rubber covered by PEFC](#), representing a market share of around 1%.¹ The first rubber covered by PEFC was made available in 2021.⁵

FSC and PEFC are founding members of the [Global Platform for Sustainable Natural Rubber \(GPSNR\)](#).



1 FAOSTAT, 2023. [Database](#). 2022 data not yet available at launch and therefore estimated to be similar to 2021.

2 Natural rubber accounts for approximately half of global rubber production, the other half being synthetic. Statista, 2023. [Synthetic rubber global production 2000-2022](#). IRSG, 2023. [IRS Group Release Latest Industry Outlook](#).

3 FSC, 2019. [Responsible Sourcing of Natural Rubber](#).

4 FSC, 2023. Email correspondence. Please note that figures reported for FSC include both "certified" and "controlled" volumes.

5 PEFC, 2024. Email correspondence. Please note that figures reported for PEFC include both "certified" and "controlled" volumes.

Supply Chain Standards

Supply chain standards

Standards that can be used for multiple fiber types

Adopting sustainability standards and chain-of-custody systems can be a helpful tool for brands to meet market demand and regulatory requirements.

While the previous chapters in this report provide an overview of the most important fiber-specific standards covering materials such as cotton, wool, and down, this section includes standards that can be used for multiple fiber types.

As leading supply chain standards for organic textiles, both the Organic Content Standard (OCS) and Global Organic Textile Standard (GOTS) help to manage the chain of custody of fibers that have been certified as organic at the farm level as they make their way through the supply chain to the final product.

Organic Content Standard (OCS)

The Organic Content Standard (OCS) is an international, voluntary standard that sets requirements for the third-party certification of certified organic inputs and chain of custody. The goal of the OCS is to increase organic agricultural production.

Textile Exchange launched the OCS 3.1 in July 2020, with updates including updated manuals, more robust traceability between farm and first processor, GMO testing requirements, and non-mulesing for organic wool. More information can be found [here](#).

The number of OCS-certified sites increased from 12,131 in 2022 to 13,859 in 2023.

Global Organic Textile Standard (GOTS)

GOTS is the leading worldwide textile processing standard for organic fibers, covering ecological and social criteria, backed up by independent certification of the entire textile supply chain.

The GOTS version 7.0 was released in March 2023. The revised version includes, among further updates, stricter criteria for incoming organic material and residue limits. Read more information [here](#).

The number of GOTS-certified sites increased from 13,549 in 2022 to 14,676 in 2023.

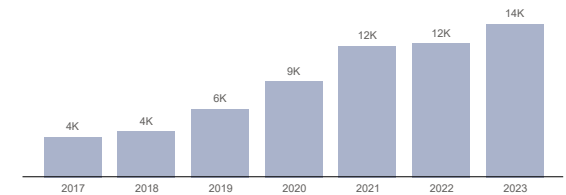
Content Claim Standard (CCS)

The Content Claim Standard (CCS) is the foundation of all Textile Exchange standards. It is a chain of custody standard that provides companies with a tool to verify that one or more specific input materials are in a finished product.

The CCS 3.1 was released in June 2022 and includes an updated certification eligibility section. More information can be found [here](#).

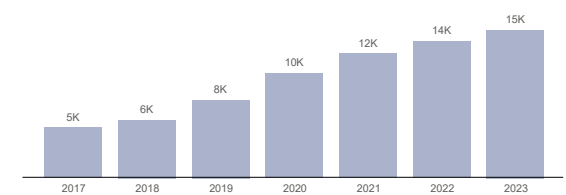
Its use as a foundational standard for the other Textile Exchange Standards (GRS, OCS, RCS, RDS, and RWS) has increased significantly, from 60,321 sites in 2022 to 75,173 in 2023.

OCS: Number of certified sites



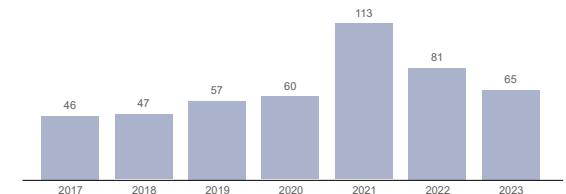
Source: Textile Exchange

GOTS: Number of certified sites



Source: Textile Exchange based on Global Organic Textile Standard (GOTS)

CCS (stand-alone): Number of certified sites



Source: Textile Exchange

Supply chain standards

Standards that can be used for multiple fiber types

The two leading standards for textiles made with recycled materials – the Recycled Claim Standard (RCS) and the Global Recycled Standard (GRS) – are growing too.

Recycled Claim Standard (RCS)

The Recycled Claim Standard (RCS) is an international, voluntary standard that sets requirements for the third-party certification of recycled input and chain of custody. The goal of the standard is to increase the use of recycled materials.

The RCS 2.0 has been in effect since July 2018. In a key update, it introduced the Reclaimed Materials Supplier Agreement, a document that provides more visibility into the suppliers of reclaimed materials.

The number of RCS-certified sites increased from 10,139 in 2022 to 12,869 in 2023.

Global Recycled Standard (GRS)

The GRS, which goes beyond the RCS, includes additional criteria for social and environmental processing requirements and chemical restrictions.

The GRS 4.0 was released in parallel to the updated RCS version and has been in effect since July 2018. A key change was the adoption of ZDHC's Manufacturing Restricted Substance List V1.1 (MRSL), which replaced GRS's previous Prohibited Substance List.

The number of GRS-certified sites increased significantly from 34,178 in 2022 to 43,427 in 2023.

In April 2021, Textile Exchange initiated the early phases of another revision of the GRS and RCS. Soon after, the review

of GRS/RCS criteria was rolled into the development of the Materials Matter Standard. Read more [here](#).

Materials Matter Standard

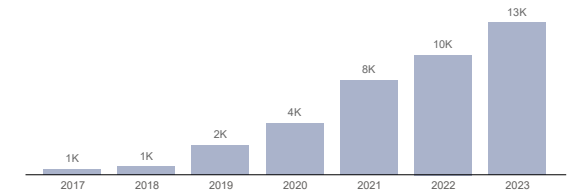
In 2021, Textile Exchange began a sweeping revision of its standards framework with the aim of developing a harmonized system that incorporates outcomes aligned with our climate and nature strategy. Known as “the unified standard” during its development, the Materials Matter Standard Pilot Version V1.0 was released publicly on June 4, 2024. The final version of the standard will be published in 2025, becoming effective in Q1 2026 and mandatory in mid-2026. Learn more about the Materials Matter Standard transition [here](#), and about the pilot [here](#).

Cradle to Cradle (C2C)

Cradle to Cradle Certified® is a globally recognized measure of safer, more sustainable products made for the circular economy.

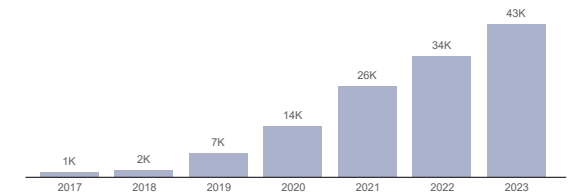
The Cradle to Cradle Certified® Standard Version 4.0, released in March 2021, features new and enhanced requirements in all performance categories, including new frameworks for Product Circularity and Social Fairness that define global best practices, more rigorous requirements for clean air and climate protection that promote urgent action to address climate change, expanded requirements in water and soil stewardship to ensure clean water and healthy soils are available to people and all other organisms, and improved alignment with leading chemical regulations and other standards on material health requirements, including a new Restricted Substances List. Read more [here](#).

RCS: Number of certified sites



Source: Textile Exchange

GRS: Number of certified sites



Source: Textile Exchange

Methodology & Disclaimer

Methodology

Key information shared in the report

The Materials Market Report contains 1) global production volumes of various fibers and materials, and 2) program-specific data such as the number of certified sites or production volumes per program.

Textile Exchange has collected, analyzed, and compiled all this information in all good conscience and cross-checked the data and information wherever possible. A guarantee for all the information is not given. This report is intended for general guidance and information purposes only. It is not the report's intention to be used or considered as advice or recommendation in any direction.

1. Global production volumes

The compilation of global market data is challenging. The collection of primary data from the suppliers is beyond what is possible within the scope of this report, so we rely on secondary data from industry associations, international organizations, governmental organizations, standard setters, and research institutes. We do our best to provide an accurate and reliable picture of the market, but data gaps and inconsistencies are very common for global market data, and modeling must be applied for some data. Specific data sources are directly mentioned on individual pages.

a) Data quality checks and triangulation

Textile Exchange tried to identify the most reliable sources for each fiber category and conducted triangulations with at least two to three sources wherever possible. In general, all global market data are rounded estimates.

b) Production volume scope

The production data in this report cover the total volumes of fibers produced, not differentiating between different uses, and are thus not specific to the apparel industry. The fibers may be used for apparel, home textiles, technical textiles, or other applications.

Minority fibers such as PLA, PTT, and protein fibers are not included.

c) Definition of fiber and materials

The term 'fiber' in this report includes staple fiber and filament. All numbers for manmade cellulosic fibers and synthetics include staple fiber and filament production volumes. The term 'materials' includes fibers and other raw materials such as leather, down, and rubber. Aggregate data on global fiber production does not include leather, down, or rubber. For flax, the term 'fiber' includes both short and long staple fibers.

d) Allocation of years

This report shares data based on the calendar year. Some data sources collect data on a seasonal basis. Cotton production volumes are collected according to the harvest year used by ICAC, running from August 1 to July 31. Spanning two calendar years, it could be allocated to either the earlier or later year. This report allocates it to the later year (e.g., 2022/23 cotton production volumes are allocated to the 2023 calendar year).

The exception to this rule is total cotton data for Brazil, which, in alignment with the methodology of ICAC (revised in 2023 in alignment with the USDA's methodology update for Brazil – see Key Revisions section below), is collected by calendar year rather than harvest year and reflects

production from the first listed year of the split (e.g., 2022 production is allocated to 2022/23).

Note: This is not the case for Better Cotton data for Brazil. While in general we align with ICAC's reporting year, in order to align with the global Better Cotton volumes for 2022/23 reported by Better Cotton, the volumes reported for ABR (a Better Cotton equivalent) cotton grown in Brazil are based on Brazil's National Supply Company's (CONAB) reporting cycle and cover cotton grown in the 2023 calendar year (whereas total cotton figures for Brazil included in this report follow the approach taken by ICAC and now cover cotton grown in the 2022 calendar year).

Where applicable, the International Wool Textile Organisation (IWTO) applies a similar approach for wool as ICAC takes for cotton (i.e. 2022/23 wool production volumes are allocated to the 2023 calendar year).

e) Modeling

To close data gaps, modeling as well as assumptions and inferences are used. For example, country average yields may be applied instead of program-specific yields, or seed cotton volumes may be used to estimate fiber volumes. Where data for a specific year is missing, the previous year's data is used as a proxy.

f) Fiber-specific methodologies

Recycled cotton, wool, and down: As ICAC's cotton data, IWTO's wool data, and Maia Research's down data refer to virgin production volumes, the recycled cotton, wool, and down production volumes were added on top. The total production volumes for cotton, wool, and down are thus higher than the volumes reported by ICAC, IWTO, and Maia Research, respectively.

Methodology

Recycled manmade fibers: In contrast, the total synthetic fiber production volumes reported by Maia Research, CIRFS, and IVC, include the recycled share. Recycled manmade cellulosic fibers are also assumed to be included in the total manmade cellulosic fiber production as reported by Maia Research, CIRFS, and IVC.

Organic cotton: For organic cotton, we collect and report data from governmental sources where possible. For countries without available governmental data, we collect and report data from organic cotton producers, gins, certification bodies, and other sources. However, due to data gaps, modeling and proxies are used, which may result in incomplete data.

2. Program specific data

Program-specific data, such as production volumes or the number of certified sites per standard, are based on publicly available information and on information collected from the programs and initiatives. It is possible that some overlap exists between the production volumes reported for different programs.

Methodological changes, data revision, and comparison to previous years

Textile Exchange continuously improves its data collection and analysis. Some data reported in previous years have been revised or updated as actual data became available for initial estimates or the methodology was improved. A simple comparison between previously reported numbers and data reported this year may not reflect the actual change over time due to these updates. The latest data for the reporting period and previous years are always published in the latest report.

Key revisions from the 2023 to 2024 report

The following methodological changes were applied in compiling this report:

- Backward-adjusted data were provided for the following programs and updated accordingly: U.S. Cotton Trust Protocol[®], PEFC rubber, AVSF, Ocean Bound Plastic, Climate Beneficial™ cotton, and Responsible Wool Standard.
- ICAC cotton statistics were updated, resulting in revisions to previously reported cotton production volumes.
- FAO statistics were updated for other plant-based fibers, rubber, and leather, leading to revisions in previously reported global production volumes for these fibers/materials.
- IWTO statistics for wool and other animal fiber production volumes were updated, resulting in revisions to some previously reported animal fiber production volumes.
- Source data for production volumes of synthetics (including recycled polyester), MMCFs, and down were updated, leading to revisions in previously reported global production volumes for these fibers/materials.
- Given the growth of the organic cotton market and the availability of new data sources, Textile Exchange strategically reviewed its organic cotton data collection and reporting approach in 2023. As a result, organic cotton volume data is now reported by individual organic standard/program wherever possible, and new governmental data sources have been utilized in some cases. This has led to backward adjustments of historical organic cotton production data for countries including India, Turkey, USA, Greece, Peru, China, and Ethiopia.

- In October 2023, the USDA implemented historical revisions going back to 2000/01 to its cotton production data for Brazil, shifting production volumes forward one year.¹ For example, cotton produced in 2023, previously allocated to 2022/23, is now allocated to 2023/24. ICAC, the data source used for total cotton production in this report, has implemented the same shift, and this is mirrored in this report. Backward adjustments have been made to Brazil's total cotton production data, meaning some of the percentages of total preferred cotton shared in this report may differ from those reported previously. Note: There has been no adjustment to Better Cotton production data for Brazil. See section (d) above on Allocation of Years for more information.
- The list of programs included in the Cotton chapter of this report no longer directly mirrors the list of programs included in the 2025 Sustainable Cotton Challenge.
- Down has been removed from global fiber production volume calculations because it is not considered a fiber (leather and rubber were already excluded for the same reason). Backward adjustments have been made accordingly.
- As a result of the fiber-specific revisions listed above, historic global fiber production volumes have been updated and may differ from those previously reported.

¹ USDA, 2023, [Cotton: World Markets and Trade. Historical Revisions to Brazil Production Significantly Lowers Stocks.](#)

Estimating the sector's share of global production

Fibers and materials are used for a broad range of applications. Reliable figures do not currently exist at the global level on the breakdown of fiber and material production volumes by application.

The Materials Market Report covers overall fiber and material production irrespective of their use. The production volumes shared in this report may have been used for apparel, home textiles, technical textiles, or other applications.

To get a rough idea of the sector split by fiber and material category, Textile Exchange conducted desk research and stakeholder consultation. The findings, shared on this page and in the chart opposite, are **very rough estimates**. They are shared only to demonstrate the extent to which the sector split can vary by fiber/material category, and to highlight that only a portion of the fiber and material production volumes shared in this report are used by the apparel and home textiles sectors. Textile Exchange intends to work on further refining this data in the future. In the meantime, due to the very limited data available, only ranges are provided.

It's important to note that there is significant variation by geographic region, and that the breakdowns also change over time.

Global fibers

Cotton is mainly used for apparel, accounting for around 60–70% of the total cotton fiber production. Approximately 20–30% of all cotton is used for home textiles, and about 10% for other products.

Wool is also primarily used for apparel, accounting for around 60–70% of total sheep wool. Approximately 30–40% of all sheep wool is used for home textiles, with the remainder used for other applications.

Other animal fibers such as cashmere, mohair, alpaca, and silk are predominantly used for apparel.

Around 30–60% of **polyester** fibers are used for apparel, 20–35% are used for home textiles, and the remainder used for various other applications.

Polyamide fibers are used in various applications. The percentage estimates range widely, from less than 10% to more than 50% of global polyamide fiber production being used for apparel. A significant share of polyamide fibers is used for home textiles such as carpets, as well as technical and industrial applications.

Manmade cellulosics such as viscose (rayon), lyocell, modal, and cupro are mainly used for apparel, accounting for around 50–80% of their production. An exception is acetate fibers, which are used primarily for cigarette filters, with only a small percentage (about 5%) used for apparel.

Other raw materials (non-fiber)

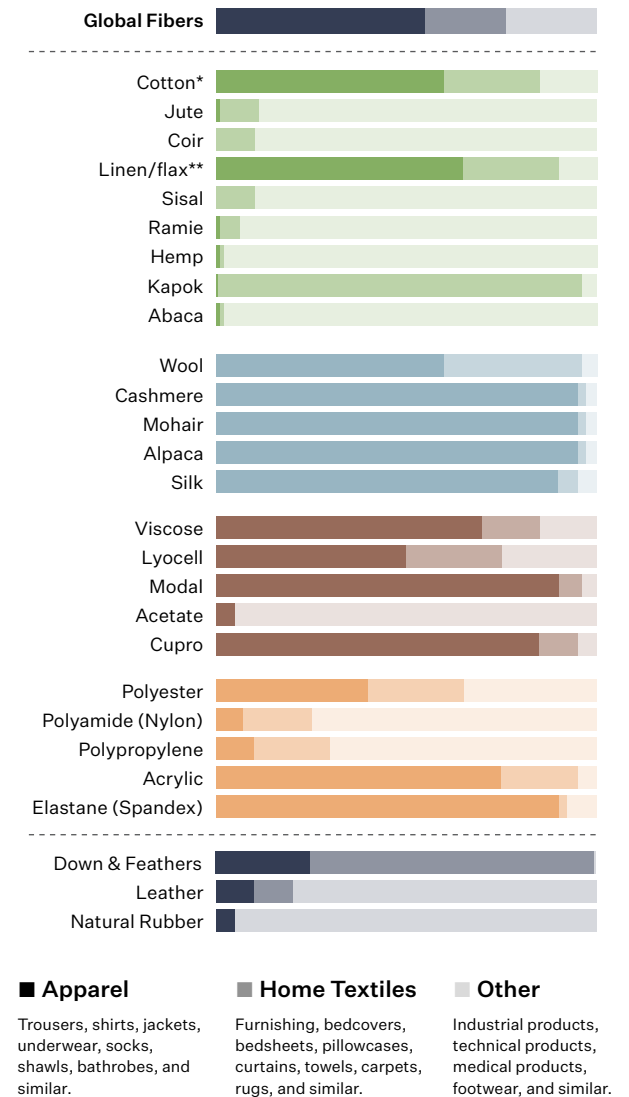
Around 60–80% of **down and feathers** are used for home textiles such as bedding and pillows, with a smaller percentage used for apparel.

Leather is mainly used for footwear, accounting for around 40–50% of its production. Around 5–10% is used for apparel, 10–15% for home textiles, and the remainder for other applications such as leather goods (bags), the automotive industry, or other products.

Natural rubber is primarily used for tires, accounting for around 65–70% of its production, with only a small percentage used for apparel.

1 Please note: Data on the sector breakdown by fiber / material category are extremely limited at present. This chart is based on very rough estimates attained through desk research and email correspondence and is intended for illustrative purposes only. It is included in this report only to demonstrate the extent to which the breakdown can vary by fiber / material category, and to highlight that only a portion of the fiber and material production volumes shared in this report are used by the apparel and home textiles sectors.

Visualization of estimated sector breakdown (based on limited data) by fiber/material¹



Acknowledgements

Acknowledgements

We would like to extend our sincere gratitude to all who have contributed data and expertise to this report. Without this valuable cooperation and support, this report would not have been possible. Textile Exchange discontinued disclosing the names of specific companies as well as the report production team for data protection and privacy reasons. Data sources deemed to be public are listed on the relevant pages. Please see the [methodology](#) section for further information.



Photo: Carl van der Linde