COTTON

Review of the World Situation

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CONTENT

ABOUT US

International Cotton Advisory Committee

The International Cotton Advisory Committee (ICAC) is an organization of currently 20 member countries that share an interest in cotton and the textile value chain. Formed in 1939, it is the only intergovernmental body for cotton producing, consuming, and trading countries and is one of only seven International Commodity Bodies recognized by the United Nations.

ICAC acts as a catalyst for positive change in the cotton and textile value chain by helping member countries and stakeholders support and improve the global cotton economy. ICAC accomplishes its mission by providing transparency to the world cotton market by serving as a clearinghouse for technical information and analysis on cotton production, consumption, and trade and by serving as a forum for discussing and addressing issues of international significance.

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The SouABR Program and the Sou de Algodão Movement's Contribution to Changing Fashion Consumer Behavior in Brazil

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Abrapa's Strategic Vision

The Brazilian Cotton Growers Association (Associação Brasileira dos Produtores de Algodão — Abrapa), founded in 1999, organizes Brazil's cotton production sector around four pillars: Sustainability, Traceability, Quality, and Promotion.

Over its history, Abrapa has developed programs that deliver value to domestic and international clients and improve the competitiveness of Brazilian producers.

One of the first initiatives was the Abrapa Identification System (Sistema Abrapa de Identificação — SAI), which has recorded traceability at origin since 2004. Through SAI, each bale of cotton ginned in Brazil provides transparency on origin, socio-environmental certifications, and quality data at a level unmatched elsewhere: geolocation; producer and farm name; ginnery and press; sustainability certificates; and High Volume Instrument (HVI) results for 14 intrinsic and extrinsic characteristics. After more than 20 years of continuous improvement, in 2023 SAI also began to provide quality certification under the Brazilian Cotton Quality Program (Programa de Qualidade do Algodão Brasileiro — PQAB), developed with the Ministry of Agriculture and Livestock (MAPA), the federal authority that at-

tests to the authenticity and accuracy of HVI results.

In 2012 Abrapa launched its sustainability program, Responsible Brazilian Cotton (Algodão Brasileiro Responsável — ABR), a protocol that fully reflects Brazil's labor and environmental legislation and includes production standards and best practices. It is applied by third-party auditors with international accreditation on farms that seek certification each season. Criteria such as prohibitions on forced, child, or degrading labor; environmental protection; and formal labor contracts are part of an extensive questionnaire updated regularly. In the 2024/25 season, 81% of production was ABR-certified, demonstrating growers' engagement with responsible production.

In the same vein, in 2013 Abrapa became an implementation partner for the Swiss NGO Better Cotton, and incorporated the mandatory Better Cotton checkpoints into the ABR questionnaire. After certification under ABR, the grower may opt for Better Cotton licensing. In the most recent season, the share of licensed farms also reached 81%.

In 2020, ABR was extended to the ginning stage, certifying gins under the same criteria; and in 2023 it included port-adjacent terminals, the last stage involving the production chain, to ensure that socio-environmental responsibility is present from planting through export.

Under the Quality pillar, Abrapa structured testing to international standards and in 2016 inaugurated the Brazilian Reference Center for Cotton Analysis (Centro Brasileiro de Referência em Análise de Algodão — CBRA), a state-of-the-art laboratory certified by ICA Bremen and one of only 12 certified labs globally. In addition, Abrapa trains personnel and monitors calibration in the state HVI labs, standardizing testing methods under the Standard Brasil HVI (SBRHVI) program.

Finally, under the Promotion pillar, in 2016 Abrapa launched Sou de Algodão ("I'm with Cotton"), a movement that unites the entire value chain — from growers and Brazil's textile industry to consumers — to promote responsible fashion and conscious consumption, with Brazilian cotton and socio-environmental responsibility at the center. In less than 10 years the movement has brought together more than 1,800 brands, from small entrepreneurs, artisans, and designers to major spinners, weavers, knitters, and retailers, creating partnerships and visibility through content and activities in fashion weeks, universities, and targeted industry actions.

This relationship with textile companies was essential to open space and a pathway for a high-value program for brands that connect with consumers and for a society that increasingly demands transparency about who makes their clothes.

Towards More Transparent Fashion

According to a 2021 survey by Instituto Locomotiva, 86% of Brazilians are interested in sustainability, 45% believe fashion brands should take a position on the issue, and 60% would stop buying from companies with ethical problems.

In this context, Abrapa — through the Sou de Algodão movement — launched a full-traceability program built on the chain of custody for ABR-certified cotton, together with leading retailers in the domestic market.

Only by combining traceability (via SAI), the sustainability assurance of ABR certification, and Sou de Algodão's partnerships with brands was it possible to develop a program that delivers transparency from the field to the final product.

The technology chosen to ensure security and reliability for participating companies is blockchain, widely used in finance. With blockchain, the data recorded by each actor in the traced chain become immutable, ensuring authenticity and enabling the level of transparency consumers want.

The program operates like a chain, connecting each link and cumulatively building physical traceability of the product. It starts with the retailer, which generates demand for its supplier base by registering the purchase orders to be controlled under the program's rules. From there, all suppliers involved in manufacturing the garments commit to collaboratively building product traceability.

Spinners, weavers, knitters, and garment makers connect to the program and carry out the required controls to comply with the rules: the final product must contain at least 50% cotton, and 100% of that cotton must be ABR-certified.

Every stage has responsibilities, but the spinner is the most critical link. The spinner must ensure that all bales used have the required certification and prevent any mixing with bales from non-certified farms; otherwise, the entire lot becomes invalid for SouABR-traceable production.

The system performs data queries and validations and records the final information at each step, reconciling inputs and outputs and closing the traceability loop. The garment maker is the last link to participate. Once this stage is recorded, the platform confirms the accumulated data from all steps and enables the QR code — printed on the brand's hangtag that accompanies the traced product — to be read.

Recognition and Market Uptake

The first traced T-shirts were launched on 7 October 2021 — World Cotton Day — by Reserva, a men's fashion brand from Rio de Janeiro.

In 2022, retailer Renner launched its first traced jeans on International Jeans Day (20 May), opening the women's segment, which

represents the largest share of Brazil's fashion market.

The program's traction drew interest from other brands that began developing collections. Almagrino, a small brand from Mato Grosso, started producing traced T-shirts on an ongoing basis in 2022. C&A expanded its women's jeans offer with a limited collection in 2023 and returned in 2025 with basic jeans and T-shirts. Its participation earned recognition at the Amcham Eco Awards (products and services) for combining technology and sustainable practices.

Multinational brands with rigorous sustainability guidelines also saw in the program a concrete way to meet their goals. Calvin Klein launched its first traced T-shirts in 2024 and soon expanded to other product lines such as men's shirts and jeans; in 2025 it added underwear.

Also in 2024, Döhler — a traditional home-textiles company — launched Brazil's first traced towels, a release that was celebrated and won multiple innovation and sustainability awards, including Campeãs da Inovação (Grupo Amanhã) and the Prêmio Expressão Ecologia, a prize certified by Brazil's Ministry of the Environment. The entire

Marrocos towel line was produced under SouABR controls and principles.

In 2024, Veste S.A. Estilo — one of Brazil's ten largest fashion groups, with five prominent brands — joined the program. Starting with the Dudalina and Individual labels, traced products now include men's and women's shirts and jeans.

Over four years, the program has gained traction with the adhesion of additional companies, increasing both the number of items and the variety of products whose raw material and supply chain are traceable to certified origin.

To date, the program has involved 23 companies across the four links in the chain — spinning, weaving/knitting, garment making, and retail — namely:

- 8 spinners
- 5 weavers
- 5 knitters
- 11 garment makers; and
- 7 retailers (some companies operate in more than one link).

	2021	2022	2023	2024	2025	total histórico
produtores		25	54	32		
fazendas		32	60	40		
fardos		12.606	8.884	41.647	37.835	100.972
fiação		1.192.605,08	1.016.083,73	1.764.793,51	3.037.575,60	7.011.057,92
tecelagem		24.207,11	14.669,45	163.149,90	429.227,70	631.254,16
malharia		51.130,78	41.313,77	136.310,20	26.596,91	255.351,66
confecção		107.217	52.493	206.086	225.484	591.280
varejo	4.989	59.114	68.311	194.066	256.639	578.130

As of September 2025 the program has reached significant scale and continues to add value for companies that want to offer transparency to shareholders and increasingly demanding consumers.

The Role of the Sou de Algodão Movement

For Abrapa, SouABR has made the Sou de Algodão movement's importance even clearer. More than a domestic promotion program for Brazilian cotton, the movement has worked as a listening channel for consumers and industry — understanding demands, needs, and expectations and building high-value connections.

Among more than 1,850 partner brands, 125 operate in spinning, weaving, and knitting, and 7 are major retailers. Dozens more connect directly with consumers and can make the connection between consumers and supply-chain transparency tangible.

With over 570,000 traced pieces so far — still a small share compared with the millions of items produced annually — participating brands recognize the program's importance

not only to engage a growing segment of consumers who demand transparency, but also to measure efforts and set tangible targets for their ESG commitments.

By showing that transparency is possible, the movement helps educate consumers to value the ABR-certified cotton chain of custody in Brazil's fashion industry and to understand that many steps and people are involved before a product reaches their hands.

Even a simple T-shirt may require cotton from 2, 5, or 20 farms; one spinner; one weaver; one garment maker; and a retail brand — plus subcontractors performing intermediate steps in this network that delivers quality products with growing transparency and socio-environmental responsibility.

Sou de Algodão **continues working for positive change in consumer behavior, and the** SouABR **program is one of the key tools for the future of responsible fashion.**

Argentine Responsible Cotton (ARA): A National Experience in Sustainability and Territorial Development

ALEJANDRO CLOT,
TOMAS MATA

Algodón Responsable Argentino

Cotton has historically been an emblematic crop in northern Argentina. It is not only a key source of income and rural employment, but also a deeply rooted productive identity in the provinces of Chaco, Santiago del Estero, Salta, and Santa Fe (the main producing provinces). In this context, the Argentine Responsible Cotton (ARA) program emerged as a sectoral initiative that seeks to project Argentine cotton into the future by bringing together producers, ginners, the textile industry, and public and private institutions around a common purpose: producing cotton sustainably, traceably, and with added national value.

A Label Driven by Producers and Industry

The ARA label, promoted by the Argentine Association of Cotton Producers (AAPA) together with various stakeholders across the value chain, has become a concrete tool to strengthen the competitiveness, transparency, and reputation of Argentine cotton. More than just a regulation or certification, ARA represents a collective commitment by the sector to continuous improvement, rural development, and responsible production.
The program proposes a sustainability assurance system based on technical, social, and environmental criteria

adapted to Argentina's production realities. Its implementation in the field promotes responsible soil and water management, efficient input use, sustainable crop rotations, biodiversity conservation, safe working conditions, and full traceability from the field to the fiber.

Sustainability and Traceability as Pillars of Value

The ARA framework rests on three main pillars:

Responsible production: Promotes integrated pest management, reduced use of agrochemicals, soil conservation through rotations with grasses and legumes, and documented records of all agronomic practices.

Transparency: Every ARA-certified plot can be tracked from the field to the gin and, in many cases, to the spinning mill or final product. This system builds trust with national and international buyers and sets Argentine cotton apart in increasingly demanding markets.

Territorial development: ARA promotes training for producers and rural workers, formalization of labor, women's inclusion in productive roles, and the adoption of technologies that improve profitability while reducing environmental impact.

Together, these pillars position Argentine cotton as a product with its own identity, able to compete on quality, traceability, and social responsibility.

Concrete Results: From Idea to Reality

Since its creation, the ARA program has grown steadily. Today, more than 200 producers actively participate, covering around 25,000 certified hectares in northern Argentina, with the involvement of more than 20 gins and textile companies that voluntarily adhere to the framework.

One of the most significant milestones has been the adoption of the ARA label by brands that now include it on their garments and finished products, creating a direct con-

nection between the producer's work and the final consumer. This achievement not only raises the visibility of Argentine cotton but also reinforces the value of traceability and transparency throughout the entire chain.
Currently, the program is also working on aligning with international sustainability standards, which will allow Argentine producers to access new markets and global value chains that demand verified and traceable practices.

A Model Developed Locally and Tailored to Producers' Realities

Unlike other global initiatives, ARA was born locally and adapts to the real conditions of Argentine producers. Its approach is pragmatic and progressive, combining verifiable requirements with the possibility of continuous improvement.
The auditing system, carried out by independent entities, ensures compliance with ARA criteria while supporting producers in their evolution. Technical training and field visits focus on knowledge transfer and the adoption of good practices, rather than mere paperwork compliance.
This territorial approach has also encouraged strong public–private collaboration. Provinces such as Chaco, Santiago del Estero, and Formosa have incorporated ARA principles into their cotton promotion policies, recognizing sustainability as a driver of rural development and commercial differentiation.

Economic and Social Impact

ARA seeks not only to certify practices but also to strengthen the entire Argentine cotton value chain. The adoption of good practices has improved productivity and yield stability, reduced long-term costs, and enabled preferential access to markets that value traceability and environmental responsibility.
On the social side, the program promotes labor formalization and better working conditions in rural areas, while also encouraging the participation of young people and women in fieldwork, administration, and management.

Innovation and the Future

ARA is forward-looking. The program is currently working on the incorporation of regenerative agriculture indicators, the measurement of greenhouse gas emissions, and carbon sequestration in soils, in line with new global sustainability requirements.

Digital tools are also being developed to simplify traceability and strengthen the connection between producers, gins, spinning mills, and textile brands interested in communicating the responsible origin of the cotton they use.

In the medium term, ARA aims to consolidate itself as a fully recognized national standard and to expand its certification system to new regions and actors along the chain. The goal is to reach 50,000 certified hectares by 2027, including small and medium producers currently in the process of joining.

A National Pride with International Projection

The ARA case shows that sustainability is not a luxury imported from abroad but a national development strategy born from the producers themselves and from a value chain committed to the future. In today's global context, where transparency and low environmental impact are market conditions, Argentine cotton now has a solid platform to compete with identity and pride.

In short, ARA is a national brand for Argentine cotton: a tool that combines technical rigor with environmental commitment, and that demonstrates to the world that Argentina can produce high-quality cotton that is responsible and deeply rooted in its territory.

The Return of Cotton in the Paraguayan Chaco: The Chortitzer Case

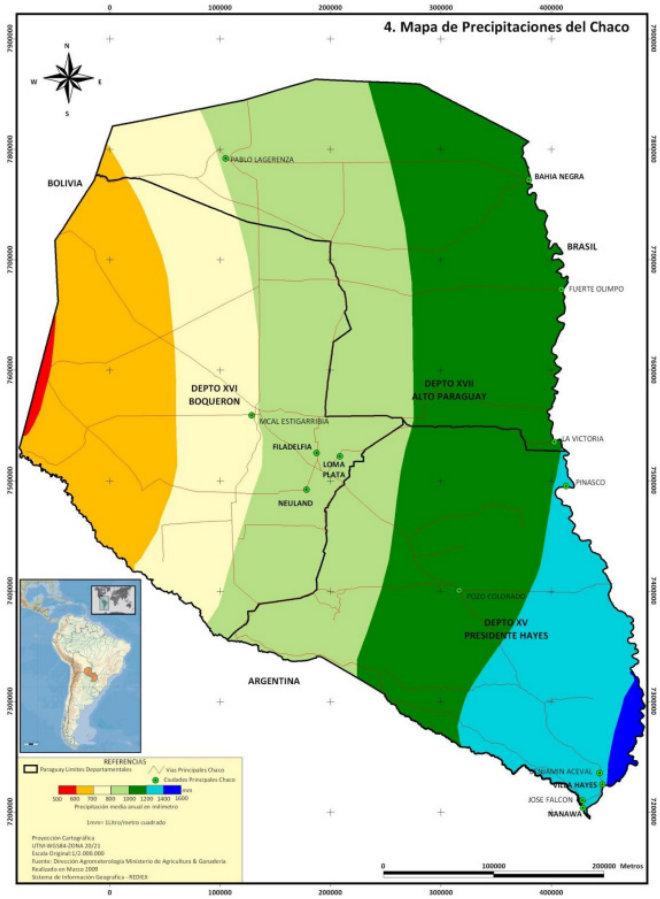
Lorena Ruiz, Economist, ICAC
Oliver Wiebe, Cotton Plant, Chortitzer Cooperative

Historical Development and Production Trends

Cotton has a long history in the Paraguayan Chaco and has been one of the oldest and most relevant cash crops for the region's development. Mennonite settlers introduced the crop in 1928, just one year after their arrival, with an initial planting of 24 hectares. In the absence of a ginnery in the Chaco, that first crop was sold as seed cotton in Asunción. The following year, construction began on the first ginnery, which came into operation in 1930 at Campo Esperanza with a processing capacity of about 700 kilograms of seed cotton per hour. In 1938 the settlers acquired this plant and moved it to Loma Plata, where cotton ginning continues to this day.

Over the decades, the Chortitzer Cooperative supported the crop's growth with successive expansions of its ginning capacity: in 1953 it installed a Murray Mitchel ginnery rated at 2,000 kilograms per hour, and in 1980 it incorporated a third gin stand and additional cleaning equipment in response to the mechanization of harvesting that was being introduced at that time. With continuous improvements, the Loma Plata plant processed cotton until 2018, and was subsequently modernized in 2019 and 2022 to support the crop's new upswing.

Cotton in the Chaco has seen boom and bust years. In 2007, production fell to a historic low with only two



growers in the colony, who harvested 905 tonnes. However, beginning in 2015 a steady recovery took hold, driven by crop rotations, stronger lint prices, new technologies, and the cooperative's support through technical services, affordable credit, and provision of inputs and machinery.

Today, more than 100 Chaco producers grow cotton, with farm sizes ranging from under 100 hectares to 5,000 hectares. In 2023/24, around 22,000 hectares were planted, compared with an initial plan of 28,000.

Planting in the Chaco generally takes place between the second half of December and late January, depending on soil moisture. In some seasons, moisture constraints can push planting into February. With a cycle of roughly five to six months, harvest begins in May and peaks in June; when planting is delayed, picking can shift into July and, in specific cases, even September.

The recent recovery has been notable. After hitting a historic low of just 4,160 tonnes of lint in 2020, cotton production in Paraguay has recorded several consecutive seasons of sustained growth. In 2024/25, cotton area reached 60,000 hectares, with production above 20,000 tonnes of lint—another milestone in the crop's revival.

Processing and Industrial capacity

In 2023, the Chortitzer Cooperative inaugurated a new cotton processing plant after investing more than USD 12 million in the first stage. The plant is located 14 km from Loma Plata and 18 km from the Bioceanic Route, within an industrial corridor that facilitates logistics.

Maximum processing capacity is 60 bales per hour, equivalent to 800–900 tonnes of seed cotton per day. This volume corresponds to roughly 11 containers of lint and 13–14 truckloads of seed per day. For the current season, the cooperative expects to process about 50,000 tonnes.

Approximately 70% of the crop is harvested with stripper machines and 30% with picker machines.

Exports and Markets

The crop's expansion has repositioned Paraguay in international markets. In 2024, lint exports generated around USD 48.5 million, with principal destinations in Germany, Türkiye, Bangladesh, Indonesia and Viet Nam. New markets are also opening, such as Portugal.

Chortitzer has also become a pioneer in exporting cottonseed for animal feed. Containers bound for Qatar are loaded with 28 tonnes of seed; other markets, such as Japan,

require 25 tonnes per container due to destination regulations and logistics. Seed pricing reflects supply–demand dynamics; in the domestic market it is also adjusted by protein content given its use in feed rations.

The cooperative works with international brokers, including Stonex Switzerland, Nulzara Trading, Devcot, ICT Cotton and Otto Stadtlander, to place both lint and seed on global markets.

Classing and Export Logistics

Classing at origin is done mainly by visual inspection (color and leaf/cleanliness). Although High Volume Instrument (HVI) systems are widely used internationally, in Paraguay their use is not yet systematic; buyers verify quality at destination. Bales are wrapped with cotton covers produced by a local company in Paraguay.

Bales are loaded directly into containers at the gin. Each container typically carries 110 bales (approximately 25 metric tonnes, depending on density). From Loma Plata, containers are trucked 470–480 km to river

terminals in the Asunción/Villeta area and then moved by barge along the Paraguay–Paraná waterway to ports in Argentina and Uruguay, where they are transshipped to ocean vessels.

Challenges

International cotton prices are currently not particularly encouraging, but all crops experience ups and downs. For example, in 2022 lint prices exceeded USD 1.00 per pound, which strongly encouraged more producers to plant cotton. Growth in cotton production faces significant challenges. Infestation by the boll weevil is recurrent. Unlike Brazil, which applies preventive schemes, Paraguayan producers often respond reactively, raising costs and increasing variability in yields.

Technical Assistance

Within the cooperative's crop portfolio, cotton is considered one of the most technical. It requires specialized equipment and agronomic support. Chortitzer provides technical assistance through a mixed system of individual farm visits and group field tours. In these sessions, groups of about 15 growers, from beginners to experienced, visit fields with agronomists to analyze planting density, pest control and crop architecture. This approach has enabled faster knowledge transfer and collective problem-solving.

Energy and Infrastructure

One of the main constraints on industrial growth in the Chaco is electricity supply. The cooperative invested in two 2.5 MW solar plants in 2024 and began construction of a third 3 MW plant in 2025. As Chortitzer distributes electricity within its area of influence, it encourages customers to install solar panels on homes, businesses and industries. Members who generate surpluses can inject them into the local grid, and the cooperative pays a fair price. Despite these advances, the regional grid remains saturated: only one 220 kV line reaches the area, with an expan-

sion to 300 kV planned. During summer peaks, cooperatives coordinate grid operations and resort to diesel generators to avoid voltage drops, at considerably higher operating costs.

Policy and Institutional Framework

Paraguay does not maintain a minimum support price for cotton, unlike some other countries. Between 2018 and 2020 there was a temporary program that provided free seed to smallholders in the Eastern Region, but it was discontinued. The cooperative sources seed through agreements with Bayer and INTA, with delinting services at plants in Caaguazú and Filadelfia. There are also some mechanical and artisanal delinting practices among small producers.

It is important to emphasize the need for farmers to use certified seed, since seed production systems in the area are not fully defined and there are currently no new biotech events available. This is a key aspect to develop in the future if the planted area continues to expand.

Together with other Chaco organizations and the environmental authority, the cooperative is working on environmental compliance plans (buffer strips, area regeneration and land-use planning), focusing on holdings opened in the 1990s–2000s and the regularization of practices in line with current regulations.

Outlook

According to Olivier Wiebe, Chortitzer's cotton program focuses on consolidating processing capacity and opening new markets for both lint and seed. The cooperative is also closely following debates in Europe on the carbon footprint of natural fibers and underscores that Chaco cotton is produced under rainfed conditions—without irrigation—and within cooperative structures that ensure traceability and technical assistance.

The resurgence of cotton in the Chaco reveals both the opportunities and constraints of Paraguay's agricultural frontier. Further expansion will depend on continued investment in industrial capacity, pest control, energy infrastructure, the availability of new varieties, and market access.

Fundación IDEAGRO (IDEAGRO Foundation): Applied Research and Technical Support in the Paraguayan Chaco

Instituto de Desarrollo Agropecuario (IDEAGRO). (2025, September). Guía de producción sostenible para cultivos extensivos [PDF]. Retrieved from https://ideagro.org.py/wp-content/uploads/2025/09/Guia-de-Produccion-Sostenible-para-Cultivos-Extensivos.web .pdf

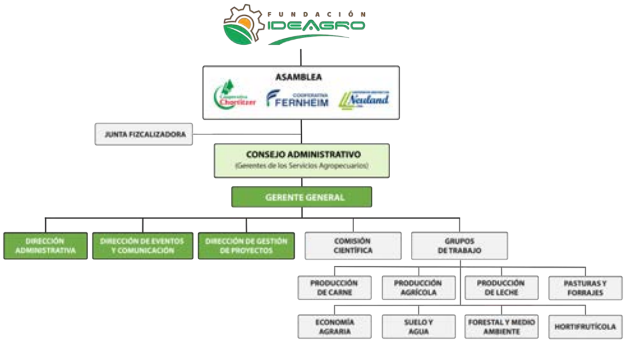
Fundación IdeaAgro (IDEAGRO Foundation) was established in 2021 by agreement of the Chortitzer, Fernheim and Neuland cooperatives to coordinate applied research, technology transfer and laboratory services in the Chaco. The structure separates project coordination from field execution. The foundation sets priorities and methodological standards. The technical teams of each cooperative conduct trials and support producers on their farms, so that results are generated and validated under local rainfed conditions.

The territory is organized into zones. Each group includes producers with different levels of experience. Field tours with agronomists are used to compare planting arrangements, soil and water decisions, and pest-monitoring criteria. The discussion is supported by measurements taken in commercial plots and by the records that technicians consolidate each season.

A central part of the work focuses on comparative networks. In soybean, corn and sorghum, IDEAGRO Foundation coordinates a network that evaluates commercial materials from different breeders and publishes seasonal reports with yield, stability and plant-health performance in Chaco environments. That information is used to decide combinations of hybrids and varieties, plant populations and operational dates for each rotation. In cotton, the foundation and the cooperatives' teams have prioritized

generating management data as the area expands, so that recommendations are based on local time series rather than only external references.

In cotton, the row spacing most frequently reported by technicians is 0.90 m; on more fertile soils, 0.765 m is being evaluated. The commercial seed rate is adjusted to the row configuration used. In narrow rows the per-hectare rate is higher than in solid pattern (without skips), while single-skip schemes reduce linear density. The choice between stripper or picker harvesting shapes crop architecture and inter-row management from establishment through canopy closure. Weed control is planned with chemical fallows adapted to the previous rotation. The operational objective is to arrive at planting with low infestation and a plan to close the inter-rows consistent with the chosen configuration. Fiber quality at the gin intake depends on the moisture and impurity level of seed cotton, so tracking those variables is integrated into each field's monitoring scheme. In pests, the boll weevil is the principal insect. Interventions are threshold-based, with application sequences at short intervals during the critical phase. Pheromone traps are used for monitoring, whose effectiveness depends on access and replenishment of inputs. Incidence of caterpillars, aphids and whitefly is also recorded. Monitoring frequency and timing are adjusted to crop phenology and to the levels of fruiting-structure retention.



Fertility trials show response to nitrogen within urea ranges that vary by site and yield goal. Phosphorus, potassium, magnesium and gypsum are applied based on soil analysis. Growth regulation is dosed using indicators of height, apical elongation and vegetative vigor, to balance boll load and fiber characteristics. On seed, the general guidance to producers is to use certified seed. Constraints remain for incorporating new biotech events and discussions continue on royalties and release processes. If cotton area expands, organizing supply and broadening varietal availability become operational priorities.

IDEAGRO Foundation does not centralize, exclusively, the statistics on cotton area, production and yields in the Paraguayan Chaco. Sectoral surveying is conducted with the Chaco producers' association based on reports from each cooperative. The foundation uses this information to set research priorities, avoid duplication and direct resources

to the questions with the greatest impact on field results.

Funding comes mainly from the three founding cooperatives. Governance relies on jointly setting R&D lines and allocating resources. Each season, technical reports and event materials are published that document practices, plant populations, treatments, trial results and management considerations. This record makes it possible to trace a history and, when appropriate, to support traceability requirements requested by some markets.

In the short term, priority lines in cotton are: maintaining and auditing boll-weevil monitoring and control protocols with updated inputs; adjusting row spacings and plant populations to site fertility and the harvest system; ensuring the use of certified seed across the production base; and standardizing and consolidating management and results documentation. These actions strengthen local evidence to compare materials and practices under the Chaco's rainfed conditions and sustain a consistent program of technical recommendations at field level.

HM Seeds in the Paraguayan Chaco: Quality, Local Adaptation, and Traceability to Revitalize Cotton

HM Semillas. (n.d.). HM Semillas. Retrieved October 14, 2025, from https://hmsemillas.com.py/

Background

In the Paraguayan Chaco, cotton production has been shaped by the quality problems of imported seed, the presence of unregistered materials, and poor adaptation to the region's agro-ecological conditions. In several cases, imported lots showed low germination rates and a high level of impurities. Although unregistered seed can be cheaper per bag, it raises final costs due to excessive seeding densities and lower yields. There is also a persistent risk of varietal contamination when ginning takes place without rigorous controls.

At the same time, cotton in Paraguay is undergoing a recovery, with roughly 60,000 hectares planted in recent years, concentrated in Boquerón and Alto Paraguay. Cotton has been reintroduced as a profitable alternative and as a complement in mixed crop-livestock systems.

Production, Processes, and Varieties

HM Seeds develops cotton seed entirely in Paraguay, emphasizing adaptation to the Chaco's light, climate and soils. The process includes selection, cleaning, automated phytosanitary treatment, grading and cold-room storage. Seeds with higher specific weight are prioritized for their better tolerance to moisture in the days after planting and their ability to emerge uniformly.

A central element is chemical delinting. The company uses state-of-the-art equipment that removes the linter from the seed completely. This ensures homogeneous seed size, improves flow through planters, facilitates mechanized planting and contributes to a more uniform stand, with high germination and vigor.

At present, HM Seeds offers two varieties: Nu Opal BTRR, with an intermediate-long cycle, and DP 402 BGRR, with an intermediate cycle. Both show good stability and performance under variable climatic conditions.

Strategy, Traceability, and Constraints

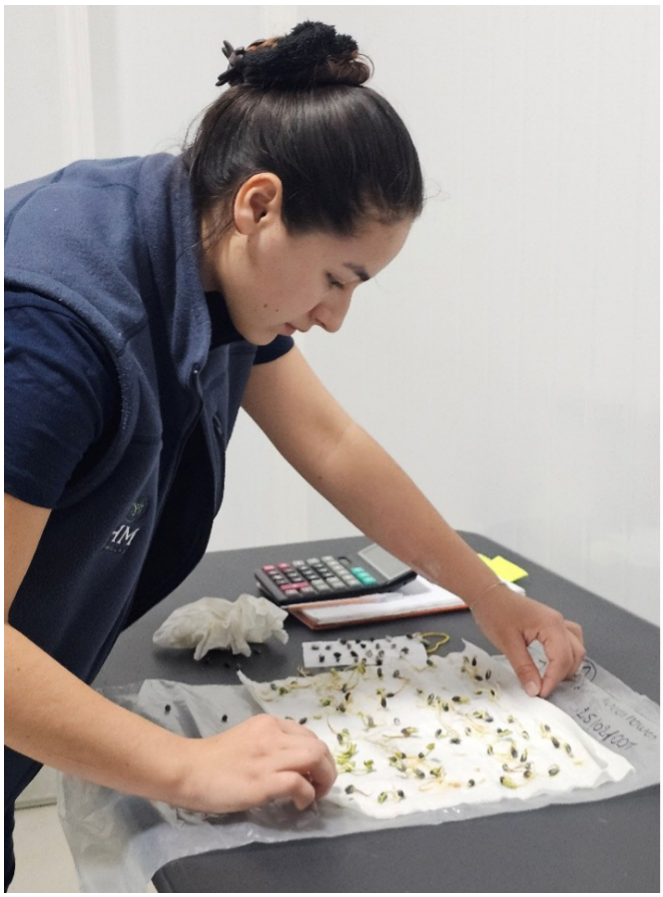
Beyond production and delinting, HM Seeds is working to implement a traceability system that tracks the seed from its origin through to processed fiber. The goal is to ensure varietal purity, reduce the risk of mixing, and meet market demands for transparency.

Key challenges include the persistence of unregistered seed and limited enforcement by authorities, as well as inadequate infrastructure—especially roads and electricity—in the Chaco. There is also limited access to long-term financing in a sector that requires multi-million-dollar investments in modern gins and oil mills.

What Changes if the Model Takes Hold

If local seed production with quality control, industrial delinting and varietal adaptation is consolidated, it will be possible to achieve more uniform planting, greater varietal purity, and a reduction in the use of unregistered seed. This, in turn, would support more stable and competitive yields.

The key shift is cultural: moving from measuring costs per bag to evaluating costs across the entire production cycle. Certified seed may look more expensive at the start, but it lowers overall costs by enabling regular stands, more uniform crops and better yields. Under that scenario, cotton from the Chaco could regain prominence on a quality foundation that begins with the seed.



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