

NATURAL RUBBER REPORT (*Hevea brasiliensis*)

Natural rubber includes rubber produced on plantations and rubber extracted from trees in the Amazon rainforest ([ESTADÃO AGRO, 2023](#)). Natural rubber is sold in three forms: Latex -> Liquid; Cernambi Virgin Pressed (CVP) and Liquid Smoked Leaf (FDL) ([GONÇALVES et al., 2021](#)).



Latex (natural rubber)



Liquid Smoking Sheet (FDL)



Rubber tree

SUBPRODUCTS

Rubber allows the production of multiple products for different uses: gloves, tires, tubes, auto parts, household appliance parts, hoses, shoes, bandages, insulation sheet, there are more than 40,000 products for the most diverse applications ([GONÇALVES et al., 2021](#); [GARCÍA et al, 2022](#)).

CURRENT MARKET SIZE

The world natural rubber production in 2020 was 13.1 million tons (mt). In 2021, this number rose to 13.8 mt, which continued to rise in 2022, reaching 14.6 mt ([STATISTA, 2024](#)). The global natural rubber market size in 2022 was around USD 16.5 billion ([SPHERICAL, 2023](#)).

During the period 2021 to 2022, the consumption of natural rubber in the final form of tires and tubes was estimated at 904.6 thousand tons worldwide. During this period, the consumption of rubber in general made from natural rubber was estimated at more than 333.4 thousand tons worldwide ([STATISTA, 2024](#)).

In Brazil, natural rubber production was 416,964 tons in 2022, adding a total production value of BRL 1.8 million (≈ USD 346.9 thousand). A subproduct of this production was coagulated latex, of which 1,057 tons were produced, generating BRL 9.4 million (≈ USD 1.7 million) in the same period ([IBGE, 2022](#); [IBGE, 2023](#)).

PROJECTED FUTURE MARKET SIZE

The Global Natural Rubber Market Size is expected to reach USD 25.2 Billion by 2032, at a CAGR of 4.3% during the forecast period 2022 to 2032 ([SPHERICAL, 2023](#)).

PRICE TRENDS

The average price of rubber at the Singapore Commodity Exchange (SICOM) in 2023 was 1.58 U.S. dollars per kilogram. Between 2010 and 2023, the average price of rubber reached a high in 2011 of 4.82 U.S. dollars per kilogram. In 2023, the highest monthly price of rubber was in November, at 1.67 U.S. dollars per kilogram ([STATISTA, 2024](#)).

In Brazil, in February 2022, the reference price for importing natural rubber was BRL 13,91/kg (≈USD 2.62/kg), indicating a drop of 8.37% compared to the previous month ([IEA, 2022](#)).

HISTORY

Species of the genus *Hevea* occur naturally in the Pan Amazon (Brazilian, Peruvian, Bolivian and Venezuelan), in addition to Colombia, Ecuador, Suriname and Guyana (WIMMER, 2010). *Hevea brasiliensis*, the main species responsible for the Asian production, occurs naturally almost exclusively in the Amazon rainforest and especially along the main trunk of the Amazon River and along its southern tributaries (BARHAM & COOMES, 1994). Charles Marie de La Condamine is credited with introducing samples of rubber to the scientific community in 1736. Over the next few decades a number of useful discoveries were made that opened the way for wider uses of rubber (DIDEUS, 2017). The major discovery that gave it a key role in the later stages of the industrial revolution was the discovery of rubber vulcanization by Charles Goodyear (US) and Thomas Hancock (UK) which improved its resistance and elasticity at low temperatures (COSTA et al., 2003). Two major changes in transportation first the bicycle craze and later the rise of the automobile, associated with the industrial revolution (1769-1840), transformed rubber into one of the key materials of the modern economy. In 1876 Henry Wickham smuggled 70,000 seeds from Brazil to Kew Gardens, England, from where seedlings were sent to India, Sri Lanka and Indonesia, Singapore and Malaysia. Over the next few decades plantation production steadily grew. Rubber reached a great peak in 1910, but due to excess supply on plantations and technological advances in the development of tires, which now had greater durability, there was a decline in rubber throughout the world in the 1920s. In Brazil, the 1st rubber cycle ended in 1912 (1879-1912) (PRESCOTT, 2020; LOPES).

However, during World War II (1939-1945), the demand for natural rubber rose again. The United States government made an agreement with the Brazilian government to extract latex in the Amazon to meet North American demands. The 2nd rubber cycle then occurred in Brazil (1942 and 1945) (LOPES).

Today more than 40,000 products have some rubber content (GARCÍA et al, 2022).

PRODUCTION SYSTEMS

Until 2005, in the Brazilian Amazon, most rubber production was still extractive, involving more than 100 thousand people. The rubber tree is considered a rare species in the forest. In Acre, only 0.7 to 3 individuals occur per hectare. However, in rubber tree plantations, 250 to 600 plants are used per hectare, reaching up to 700. In recent years, rubber tree plantations have increased. In 2022, native rubber production from the Brazilian Amazon rainforest was just 0.3% of total production (CARNEIRO, 2024; SHANLEY & MEDINA, 2005).

MATURITY TIME

In rubber tree plantations, rubber tree seedlings take 4 to 6 months to be ready to go to the field. From there, the tree can reach up to 30 m in height, and 6 - 7 years after planting, it begins producing latex (rubber). A good plantation allows latex production for up to 35 years (CropLife, 2020).

PRODUCER PROFILE AND SOCIAL IMPACTS

According to the Confederation of Agriculture and Livestock of Brazil (CNA), until 2005, the Brazilian productive sector of natural rubber and its derivatives, generates more than 100,000

direct jobs in the field and with that, income for countless families that live from the activity ([SHANLEY & MEDINA, 2005](#)).

Currently there are more than 93,000 families involved in the collection and initial processing of rubber, rubber production takes place in a family system and the communities of rubber families are composed of a set of settings. Historically, placement income has been very low and rubber tappers were among the poorest and most marginalized populations in Brazil with low educational levels and equivalent health conditions.

This situation began to change in the 1990s with the conquests of the forest peoples movement, specifically in this case the rubber tappers movement with the creation of extractive reserves of different types, government investments in education and health, payment programs for environmental services, such as the Bolsa da Floresta program and various types of subsidies included in the price of latex harvested by rubber tappers. In this new system of sustainable exploitation of the Amazonian forests by traditional and indigenous communities, the rubber tree has a central role as one of the main sources of income.

PRODUCTION ISSUES

The main production issues are related to the challenge of extracting latex from isolated groves of wild trees dispersed throughout the forest. The quality of latex extracted from groves of wild rubber trees is a major problem. Exposure to the sun, excessive use of coagulants, dirt, delays in collection and other incorrect procedures degrade the latex.

Another major problem is the high cost of labor costs. The government of Acre has created financial incentives that significantly increase the price paid to tappers. The stimulus reached approximately 7 thousand families of rubber tappers and increased the production of wild rubber to around 5 thousand tons/year, reactivating plants and rubber extraction throughout the State of Acre. However, this type of incentive alone is not sufficient to further increase production and ensure the sustainability of the sector.

In the last fifteen years there has been a significant improvement in the quality of rubber processed in Brazil, mainly due to the demands of rubber industries. The current market imposes rules that must be met by agribusinesses and the quality of the rubber must be guaranteed from the rubber grove to processing.

SUPPLY CHAIN ISSUES

The full integration of wild rubber in the Amazon bioeconomy depends on the transformation of all links in the chain. The work of collection, initial processing, storage and disposal to local industries is quite onerous and the necessary labor is secured in the rubber plantation through significant economic and social subsidies. To make the sustainable exploitation of wild rubber economically and socially viable, there is a need to invest in modern technology that progressively increases the productivity of labor in rubber extraction. Significant improvements have been made in local processing. During the last 15 years production area has increased five-fold and productivity has doubled. Furthermore, Brazil has the technology to further leverage these numbers and achieve significant gains in competitiveness ([ABRABOR, 2017](#)).

RECOMMENDATIONS FOR PROCESSING AND SIZING

Some challenges to face:

Reactivate research with rubber trees in the Amazon in plantations and in natural forests, including the development of varieties that are more resistant to the SALB fungus.
Promote the addition of value to extractive rubber: handicrafts, etc.
Associate the image with a green seal/certification of geographic identity.
Protect extractive production through a value supplement, adding subsidy for its social and environmental importance.

CREDIT POTENTIAL/CARBON SEQUESTRATION

A rubber tree has the capacity to neutralize 22 tons of carbon in one year. The main product extracted from the tree is natural rubber, without the need to deforest the area to obtain the product to be processed. Carbon credits are considered by the São Paulo Rubber Producers and Beneficiaries Association (Apabor) and by the Brazilian Rubber Producers and Beneficiaries Association (Abrabor) as an additional resource for rubber growers and sector workers. Highlighting that a rubber tree produces for more than 40 years ([InvesteSP, 2021](#)).

CERTIFICATIONS PROGRAMS

Natural rubber is one of the world's most important commodities, so best practices are crucial to ensure long-term sustainable supply. In July 2017, Brazil had 248,664 hectares, in 3 certified properties ([FSC, 2018](#)). It is an essential condition for supplying the pneumatic industry with ISO 9001:2000 certification. The ABNT 11,597 standard defines the specifications for natural rubber, but the pneumatic industries usually adopt their own specifications to approve suppliers.

RELEVANT INDUSTRIES

Natural Rubber: The 15 greatest companies processing natural rubber in Brazil are located in the State of São Paulo, with 8 of these industries, 4 in the State of Minas Gerais, and 3 in the States of Goiás ([ECONODATA](#)).

Pneumatic Industry: The pneumatic industries usually have their own specifications for suppliers. With the requirement of ISO 9001:2015, the natural rubber supplier must achieve continuous improvements in efficiency and quality. This sector consumes around 70% of the natural rubber on the market ([PUMA BRASIL, 2022](#); [PINOTTI, 2014](#)).

Artifacts Industry: the rubber artifacts industry in Brazil has been growing at a faster rate in the last years ([LEÃO, 2022](#)).

IMPORT/EXPORT AND COMPLIANCE RATES

In 2022, Brazil exported \$7.99M in Rubber, making it the 38th largest exporter of Rubber in the world. In the same year, Rubber was the 638th most exported product in Brazil. The main destinations of Rubber exports from Brazil are: Chile (\$1.57M), Colombia (\$1.37M), Peru (\$1.22M), United States (\$1.1M), and Argentina (\$1.06M). The fastest growing export markets for Rubber of Brazil between 2021 and 2022 were Colombia (\$1.36M), United States (\$896k), and Peru (\$645k) ([OECD, 2023](#)).

BIOCULTURAL PROTECTIONS OF COMMUNITIES OF ORIGIN (NAGOYA/CGEN/ETC. PROTOCOL)

Brazilian adherence to the Nagoya Protocol, Legislative Decree No. 136 of 08/11/2020, ratified by the national executive in March 2021, can leverage the rubber tree production chain due to the use and exploitation of genetic heritage by other countries.

REGULATORY INFORMATION

Harmonized System Code : 4001 1 0

CAS Number : 9006 -046

PS.: For all conversions from Brazilian real (BRL) to US dollar (USD), an average of the values for each year was made (example: sum of the monthly averages for the year 2021, divided by 12. The result was taken with the value dollar average in 2021).

Table with monthly averages:

Year 2009: USD 1 $\approx$ BRL 2,11 (annual average).

Year 2017: USD 1 $\approx$ BRL 3,35 (annual average).

Year 2018: USD 1 $\approx$ BRL 4,02 (annual average).

Year 2019: USD 1 $\approx$ BRL 4,16 (annual average).

Year 2020: USD 1 $\approx$ BRL 5,44 (annual average).

Year 2021: USD 1 $\approx$ BRL 5,90 (annual average).

Year 2022: USD 1 $\approx$ BRL 5,30 (annual average).

Year 2023: USD 1 $\approx$ BRL 5,18 (annual average).

Year 2024 (until April): USD 1 $\approx$ BRL 5,28 (annual average).