



SESSION 1 - Facilitator - Mr Andries Theron

Speaker 1: Dr Leandro Eugenio Cardamone Diniz - EMBRAPA

- Biologist with a PhD in Genetics and Plant Breeding.
- Postdoctoral fellowships in Molecular Biology (IRD, France) and Biotechnology (KUL, Belgium).
- Researcher at Embrapa since 2007, currently at Embrapa Soybean since 2022.
- Expertise in plant genetic transformation, gene editing (CRISPR), genetic diversity analysis, functional characterisation of microorganisms, and bio-input development.
- Published over 45 international papers and book chapters.
- Holds nine patents in Biotechnology innovation.
- Currently, he serves as the international liaison for Embrapa Soybean.



OPDT/OAC

Brazilian Soybean Production: From Farmers to Industry

Leandro Diniz, PhD

Embrapa Soybean researcher /
International Affairs Officer

Pretoria/Bothaville, 29-31/07/2025



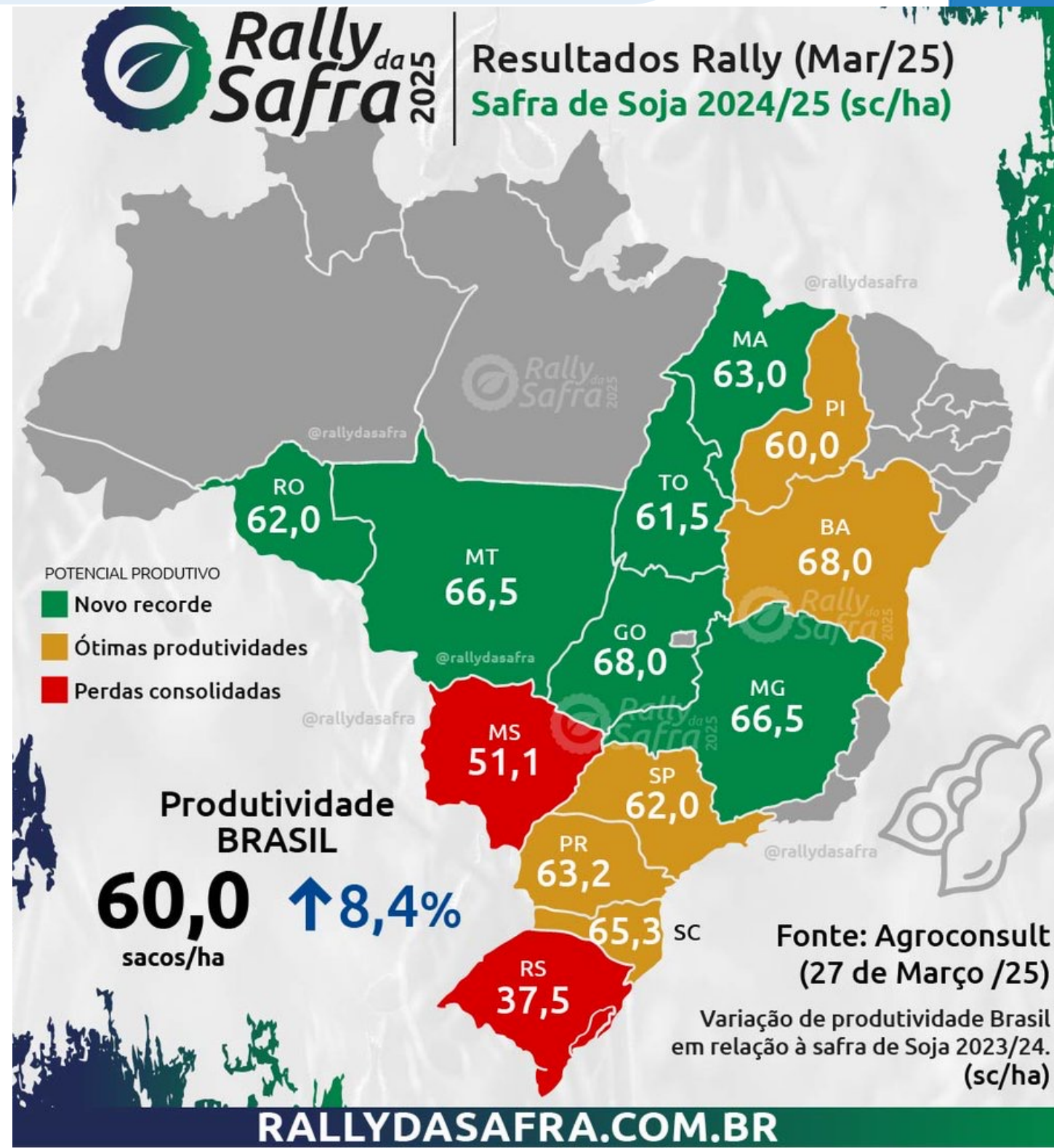
MINISTÉRIO DA
AGRICULTURA E
PECUÁRIA



BRAZIL

Harvest 2024/2025*

* estimated



Soybean in numbers

Area: 47,5 Mha

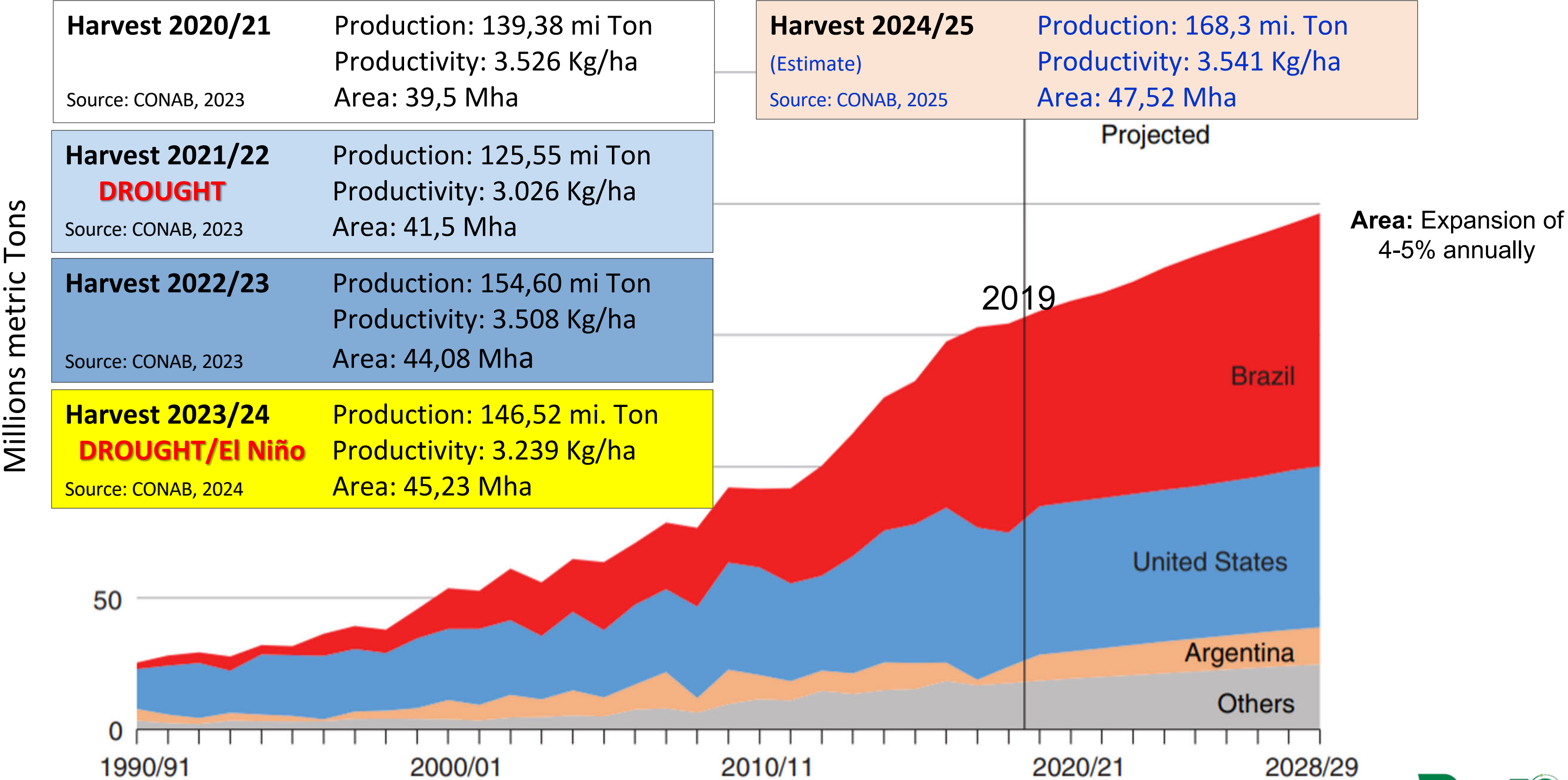
Production*: 168,3 mi ton.

Productivity*: 3.541 Kg/ha

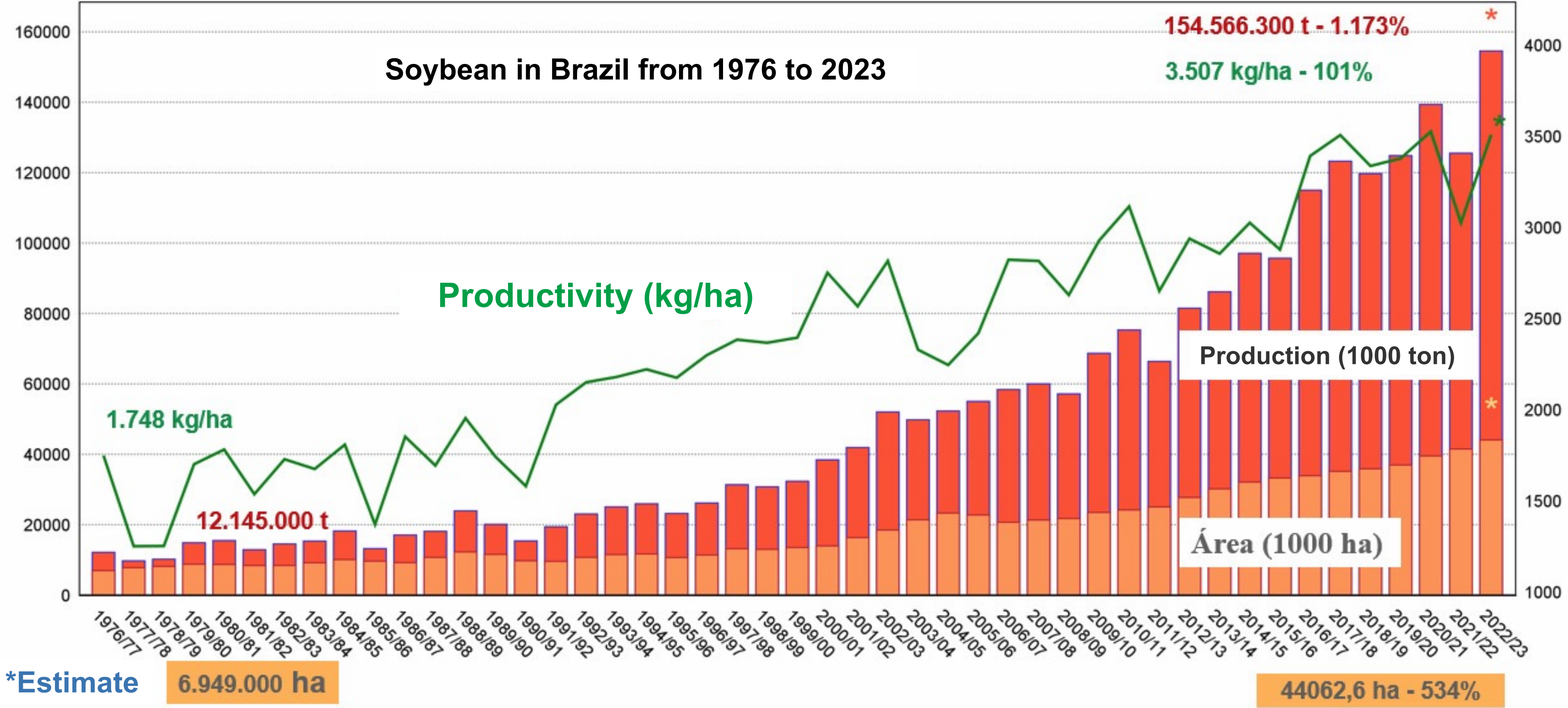
Grain Production estimated

2025: 330 mi ton.

Brazil: Biggest World Producer of Soybean



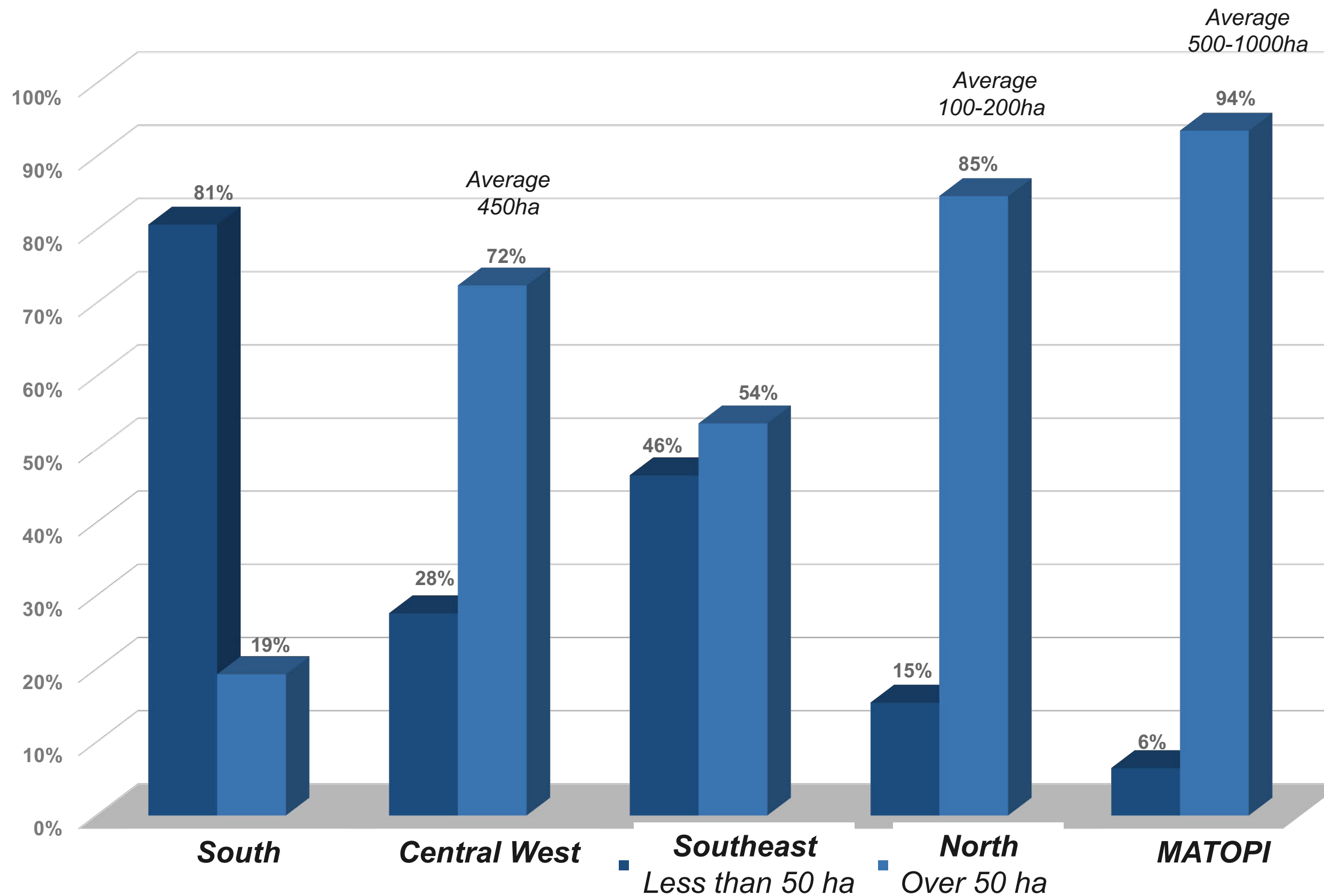
Evolution of soybean production in Brazil





Brazilian Farmers profile

Percentage of agricultural establishments that grow soybean according to the size of the harvested area (less than and over 50 ha)

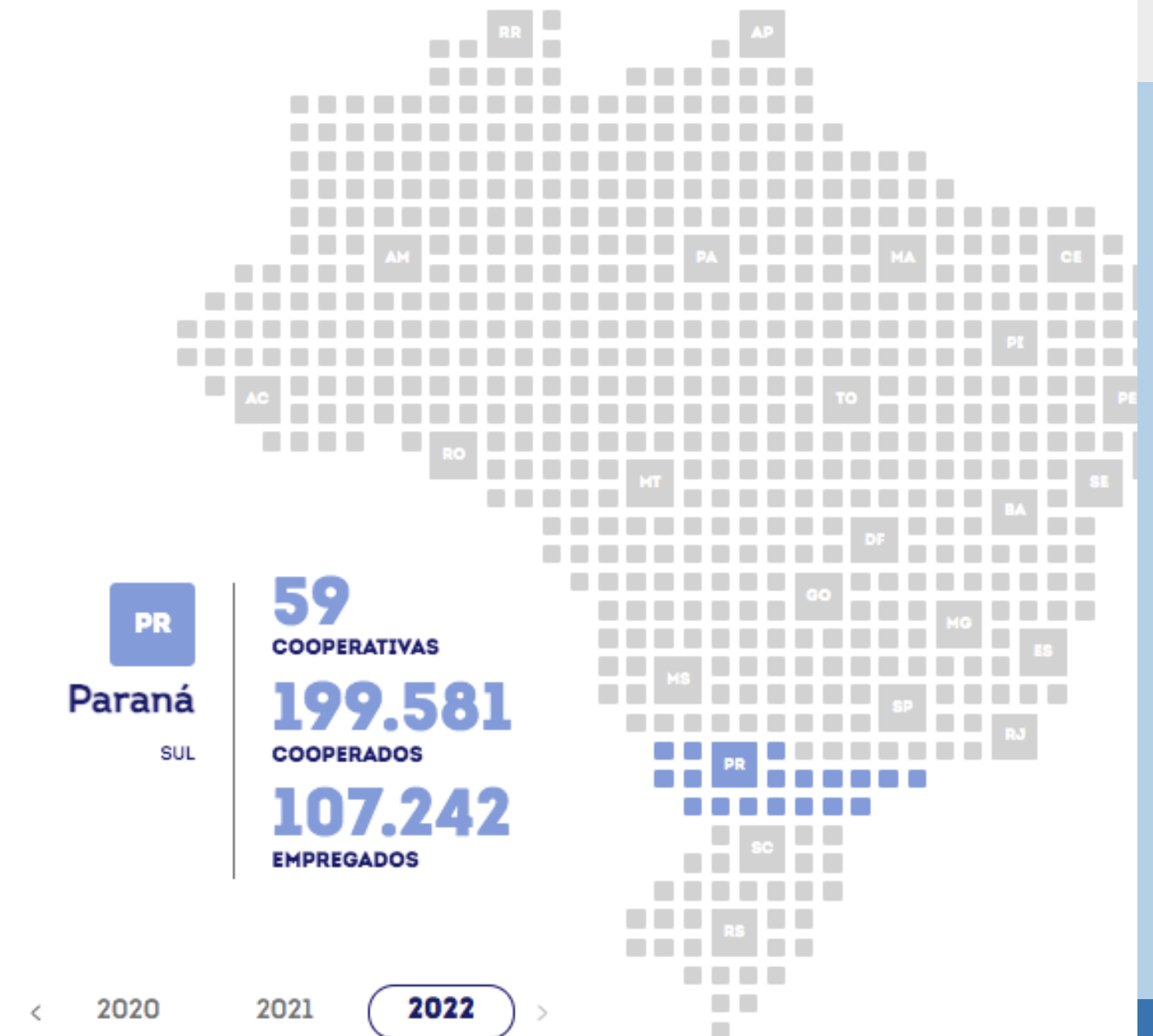


Brazilian Cooperative Organization

- Farmers are organized in Cooperatives, specially in South Region
- Cooperatives: **farmer members' organizations** dedicated to the production of food and raw materials for the production of energy and renewable fuels.
 - Adding value: Agro-industries
- Brazil has a strong cooperative system:
 - OCB**: Association representing all cooperatives (OCB)
 - OCEPAR** - States representation



Panorama do Cooperativismo Agropecuário no Brasil



A Coamo



Foundation

28/novembro/1970
(por 79 Cooperados)

Nb Cooperative members

+ de 32.000

Nb Employees

+ de 10.500

Area of Operation

PR, SC e MS

Area of Operation

76 cities

COAMO Units

(warehousing, customer service, and receiving)

116 units

Nb Direct Dependents

140,000 people
(Cooperative members, employees, and
Family members)

Extension Area

5,0 Mha of cultivated area





Cooperative System in Brazil

Brazilian Cooperative Organization

- **Cooperatives bring together small and medium-sized farmers**

- Collectively purchase inputs
- Share resources
- Market their products more effectively

- **Training Program**

- Cooperatives often provide members with technical assistance
- Access to better agricultural practices, technology, and training
- Improved crop yields and farmer income.
- Negotiate better prices with buyers, including domestic and international markets
- Provide quality control and certification services, ensuring that soybean meet industry standards.
- Credit and Financing farmers

Cooperatives:
Strong collaboration with Embrapa to develop and promote the adoption of innovative farming practices and technologies among their members





Soybean Seed Market

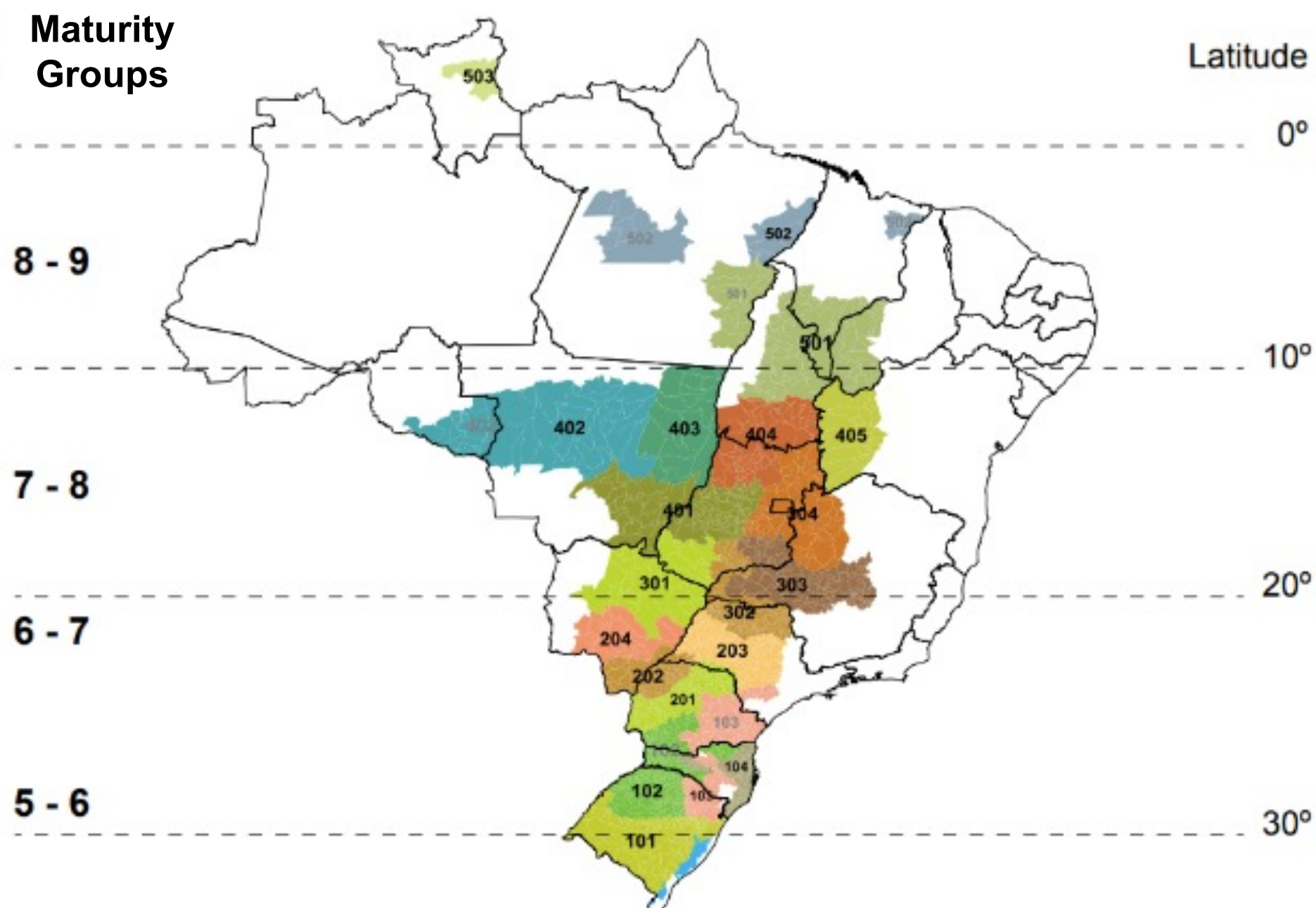
Soybean Seed Market

Cultivar indication by soil and climate region

- Diversity of ecosystems
- Soil and climate characteristics (latitude and altitude)
- Group of maturity

Allowed regionalization of VCU tests (Value for Cultivation and Use)

- Five soybean macro-regions (MRS)
- 20 soil and climate regions (REC)





Soybean Genetics Platform

Soybean Seed Market



- Develop cultivars for all Brazilian regions, with different partners
- Focus on high yield with resistance to major diseases
- Special characteristics:
 - Genetic resistance to stinkbugs (only germoplasm company with this technology)
 - Genetic resistance to soybean rust
 - Nematodes





Soybean Genetics Platform

Soybean Seed Market

Commercial Seed Brands (with Genetic Breeding Programs)



- 87% Licensed Brands: multipliers and dealers producing and selling certified seeds
- 13% Vertical Branded: the company verticalizes the production and sell by own efforts

Source of farm supply – Seed Market



41% Dealers
24% Cooperatives
23% Seed Multipliers
8% Direct Sales
4% Buyers Club

Return to investments in Seed Industry

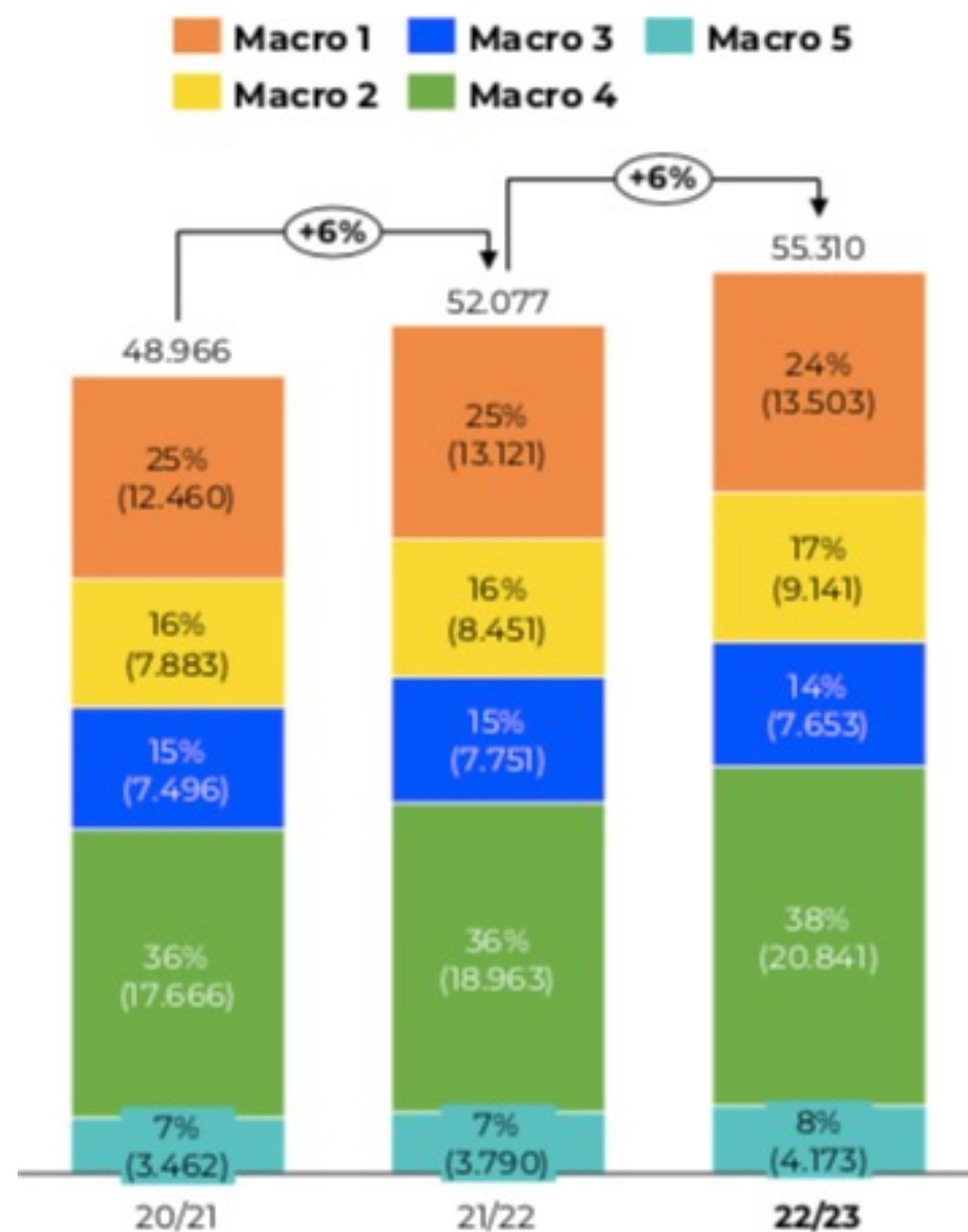
- The germplasm company receives royalties for the germplasm
- Based on Cultivar Protection Law



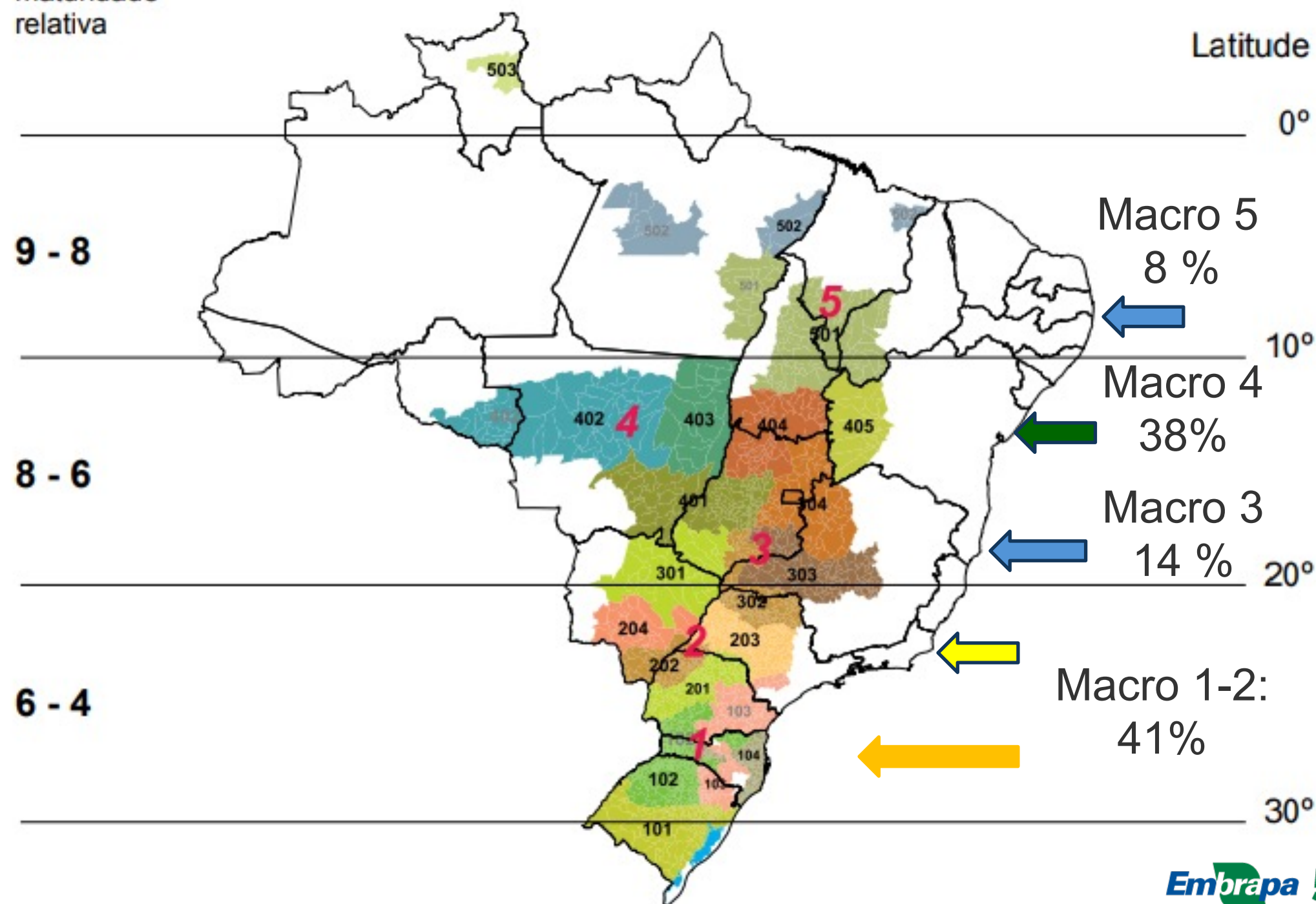
Soybean Genetics Platform

Soybean Seed Market

Maturity Group – Seeds Certified Market



Grupos de maturidade relativa





Soybean Genetics Platform

Soybean Seed Market

Brazil Seed Market

**91%
Certified
Seed**

**9%
Saved
Seed**

The price of soybeans depends on the technology used and the treatment applied to the seeds. However, it can vary between R\$ 350-800 (1100-2500 ZAR) per 200,000 seeds/bag.

Certified seeds: purchased by the farmer directly from licensed sales channels. The farmer receives the industry volume at the time of purchase, as they have already paid for the use of the technology (the production expectation is calculated automatically so that there is sufficient volume at the time of delivery of the product for sale).

Saved seeds: the farmer must notify the MAPA and the industry system about the process of saving seeds for their own use and pays for the intellectual property rights of the declared area. Once payment has been made, the expected production is automatically calculated so that there is sufficient volume when the product is delivered for subsequent sale.

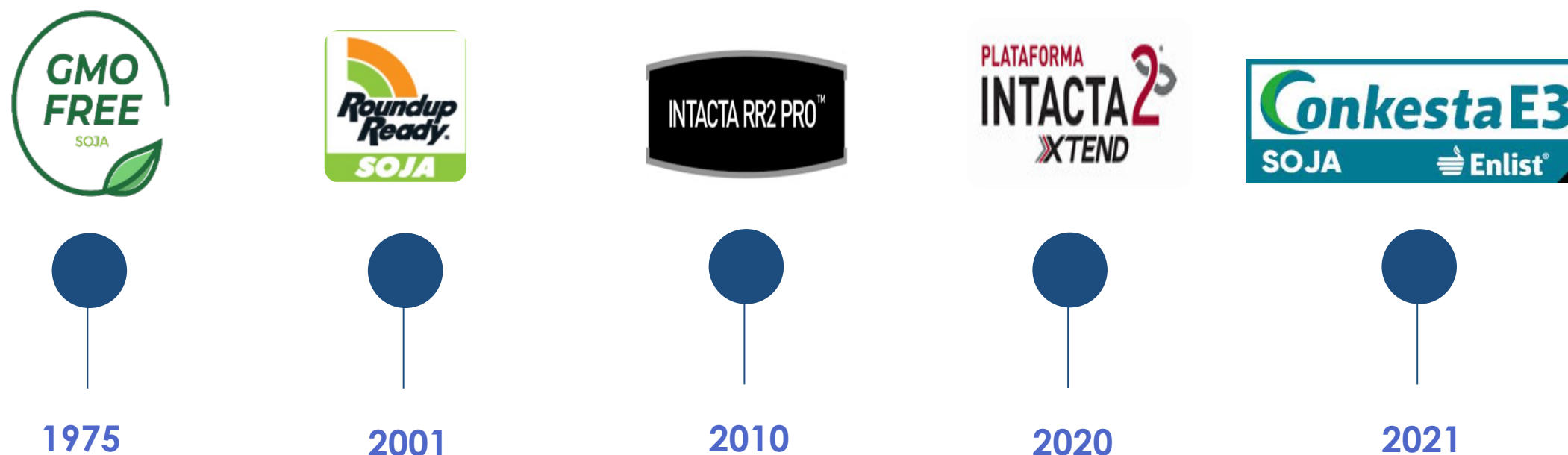
UF	PA	TO	MA	PI	BA	MT	MS	GO	DF	MG	SP	PR	SC	RS
Volume indústria (scs/ha)	67	67	67	67	74	71	71	71	72	72	70	72	70	66

Intacta RR2 PRO®	R\$ 249,40 / ha	790 ZAR / ha
Intacta2 Xtend®	R\$ 262,50 / ha	830 ZAR / ha
Xtend®	R\$ 198,40 / ha	630 ZAR / ha
Conkesta®	± R\$ 240,00 / ha	760 ZAR / ha

Kynetec / 2022-23

Soybean Seed Market

Technological Plataforms



CULTIVE BIOTEC

Traits royalties tracking system in Brazil

Bayer
Corteva
BASF
Syngenta



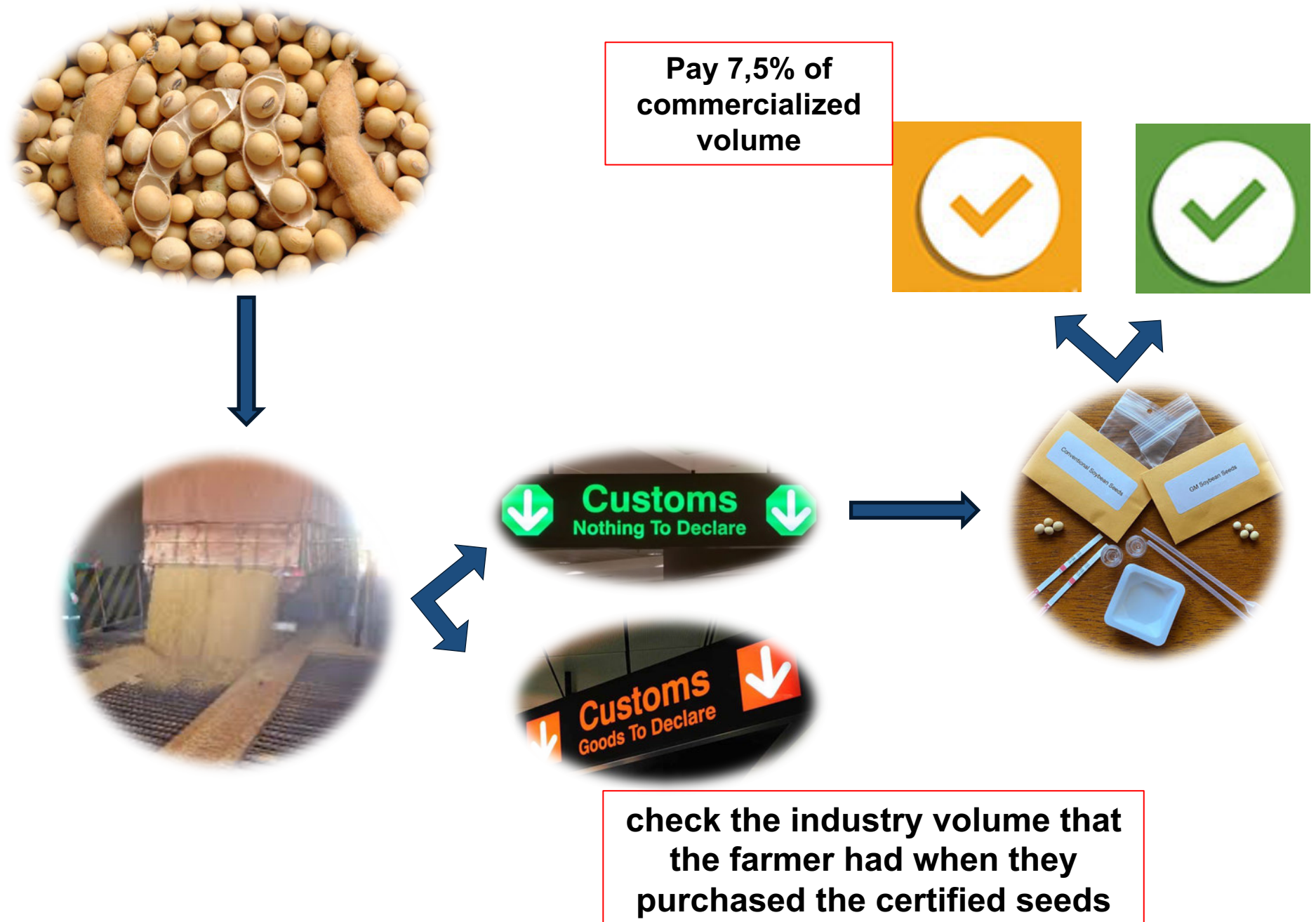
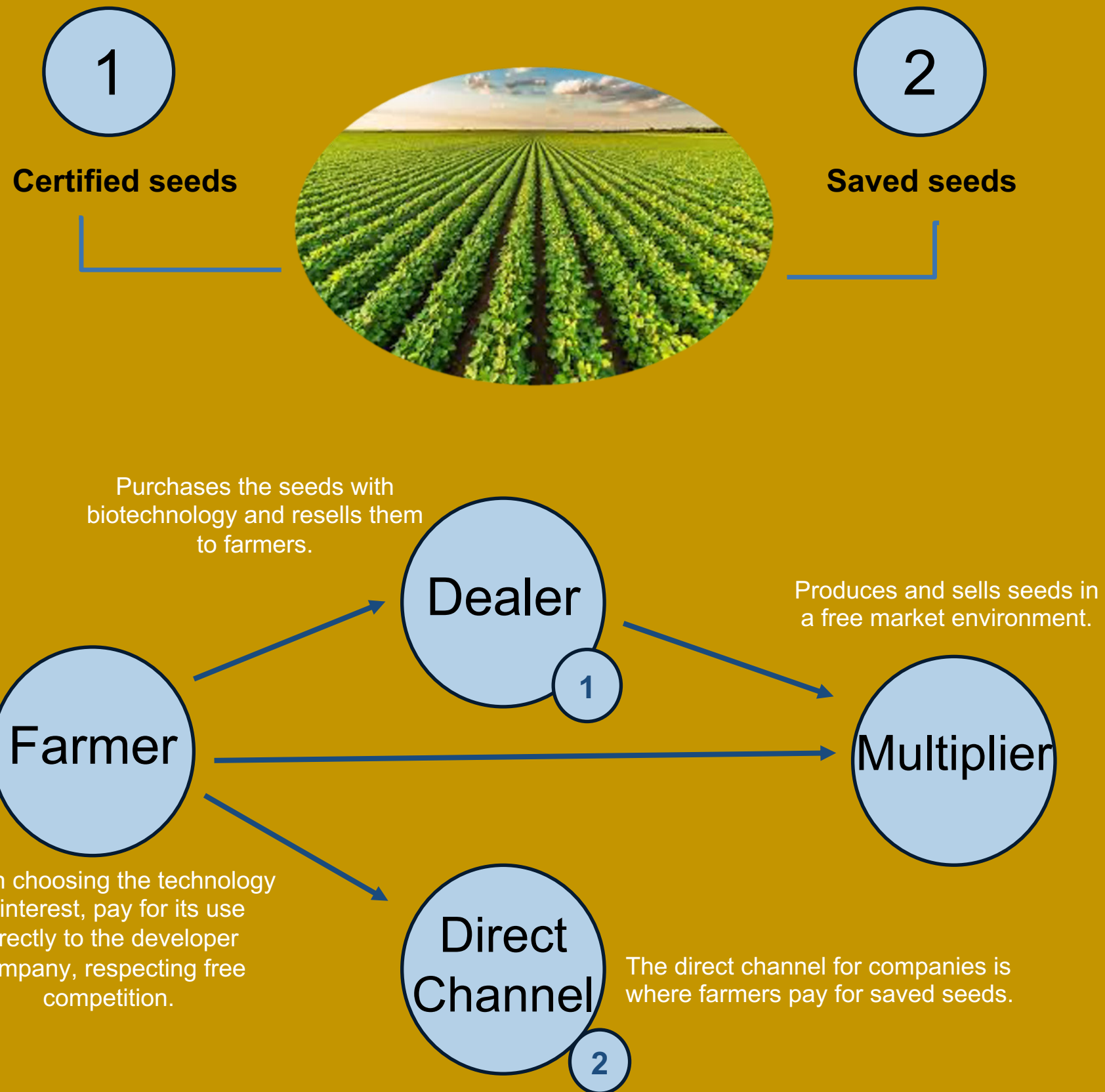
Collective Management of IP rights
Open to new companies
Focus on Brazilian Market
Track the use of traits during comercialiaization phases
'easy' to use to farmers



End point royalty or payment by producers for Bayer & Corteva technology

Payment for the technology must be made each time the producer uses the biotechnology platform.

To this end, there are two ways for producers to comply with the law:

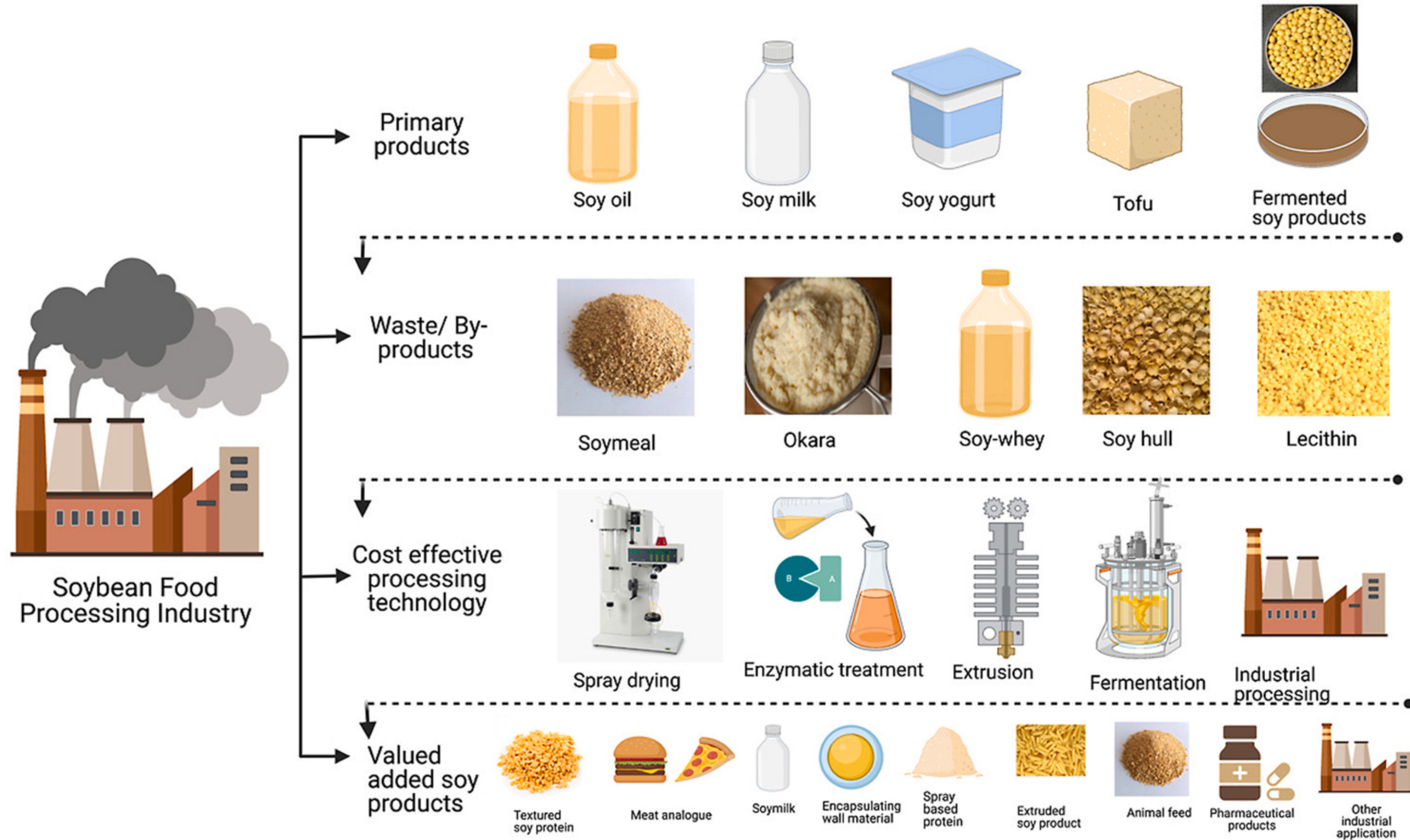




Soybean Industry and Exportation

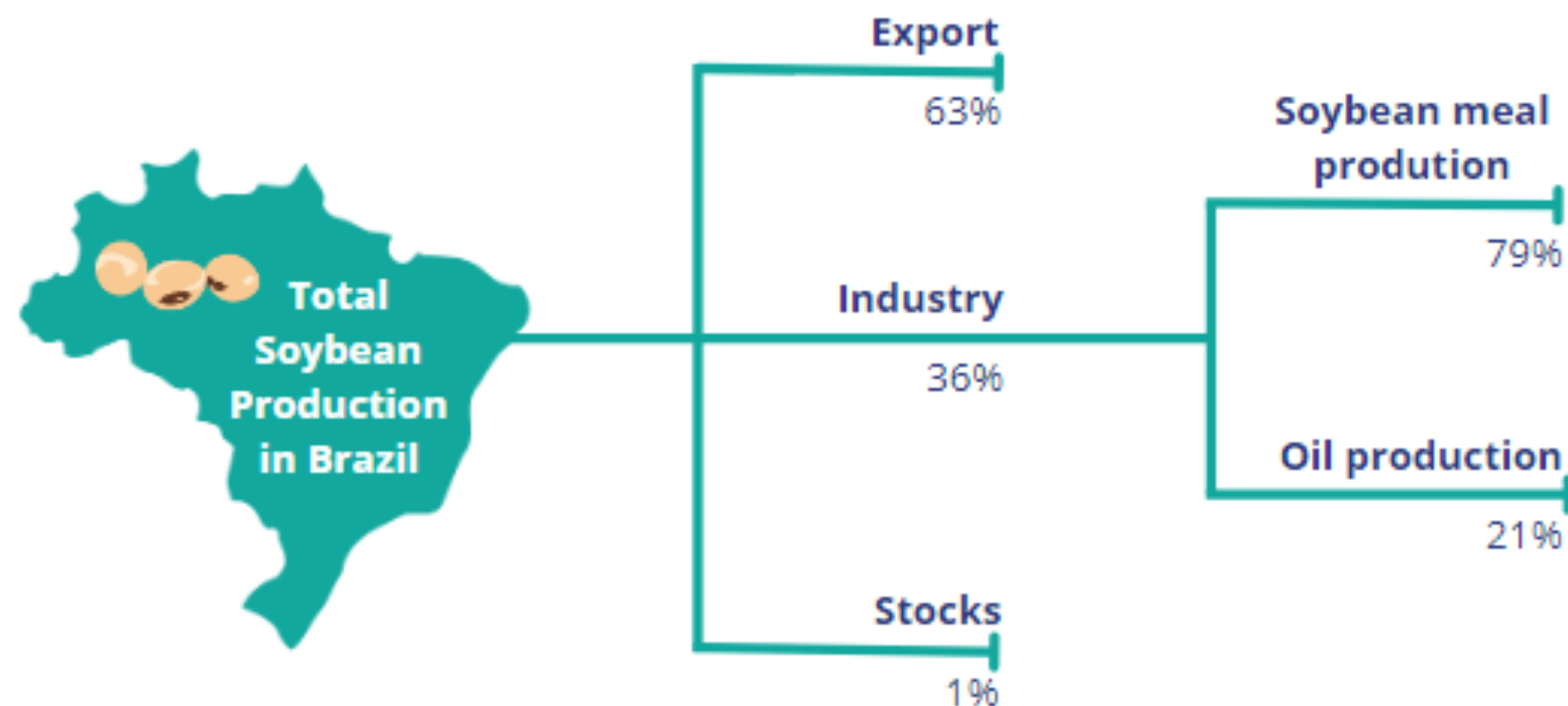


Soybean Processing Industry



Soybean exportation in numbers

How is Soybean Production in Brazil distributed?



- Distribution of Brazilian soybean 2023/2024:

- **Soybean (grain):** 63% exported (97,3 Mton), 36,1% consumed internally.
- **Soybean meal** (43,1 Mton): 53% exported (22,8 Mton), 47% consumed internally (20,3 Mton).
- **Soybean oil** (11,0 Mton): 10,4% exported (1,15 Mton), 87,9% consumed internally (9,85 Mton).

- The importance of soybean exports for Brazil:

- Soybean are the main export product of Brazilian agribusiness.
- The soybean complex (grain, meal, and oil) represents a significant portion of Brazilian agribusiness exports (US\$ 53,9 bi / 164,4 bi), with a 32.8% share in 2024.

Brazilian Biofuel production

BRAZILIAN BIOFUEL PRODUCTION GROWS, REACHING A HISTORICAL RECORD

Biofuel production has reached
a historic record for the last **10 years**

PRODUCTION OF ANHYDROUS AND HYDRATED ETHANOL

BILLION LITERS

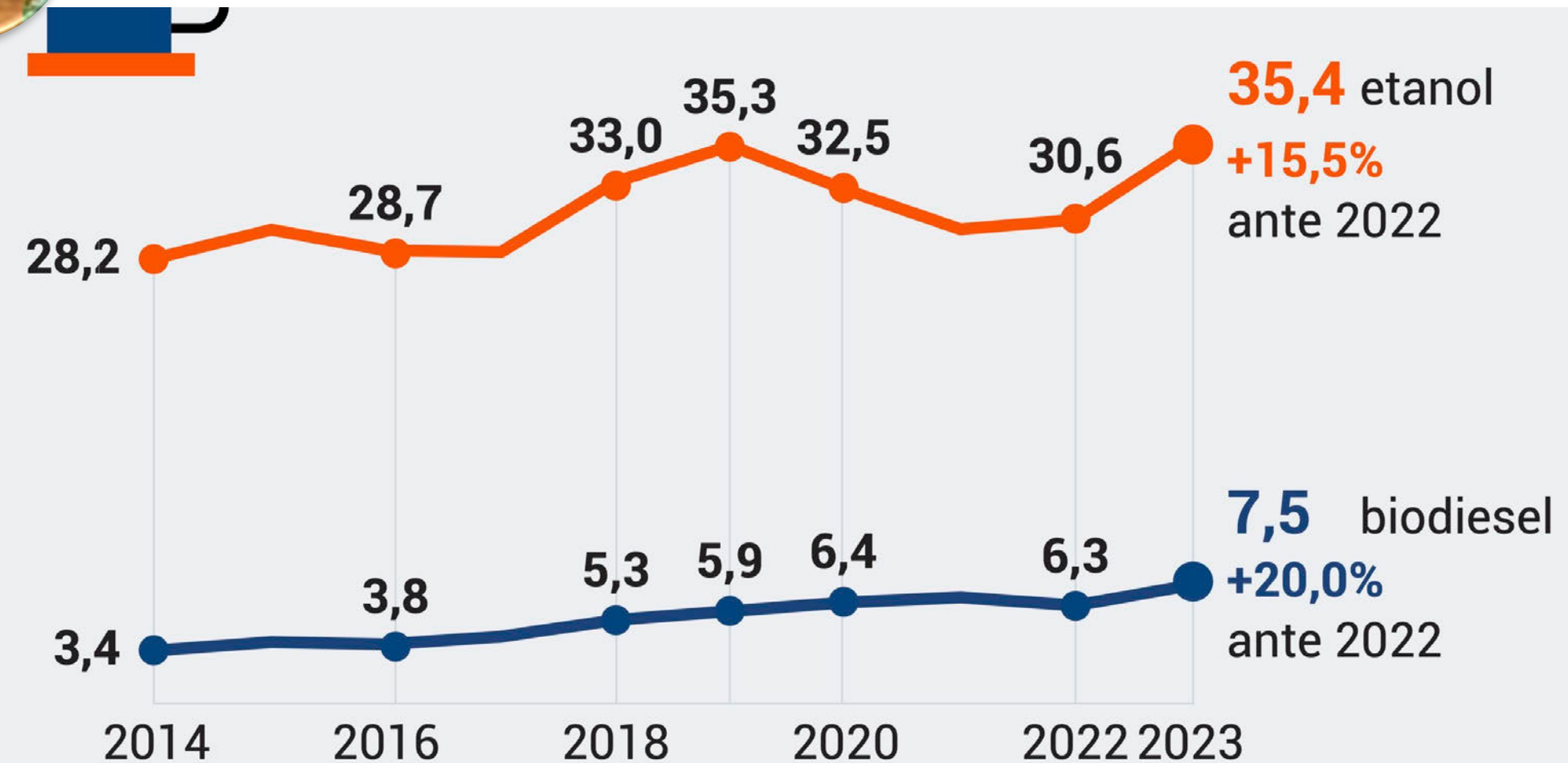


Ethanol and Biodiesel
combined totaled almost
43 billion liters produced.



PRODUCTION OF BIODIESEL

BILLION LITERS



Brazilian Biodiesel production

Installed Capacity of the Brazilian Vegetable Oil Industry
(tons/day)

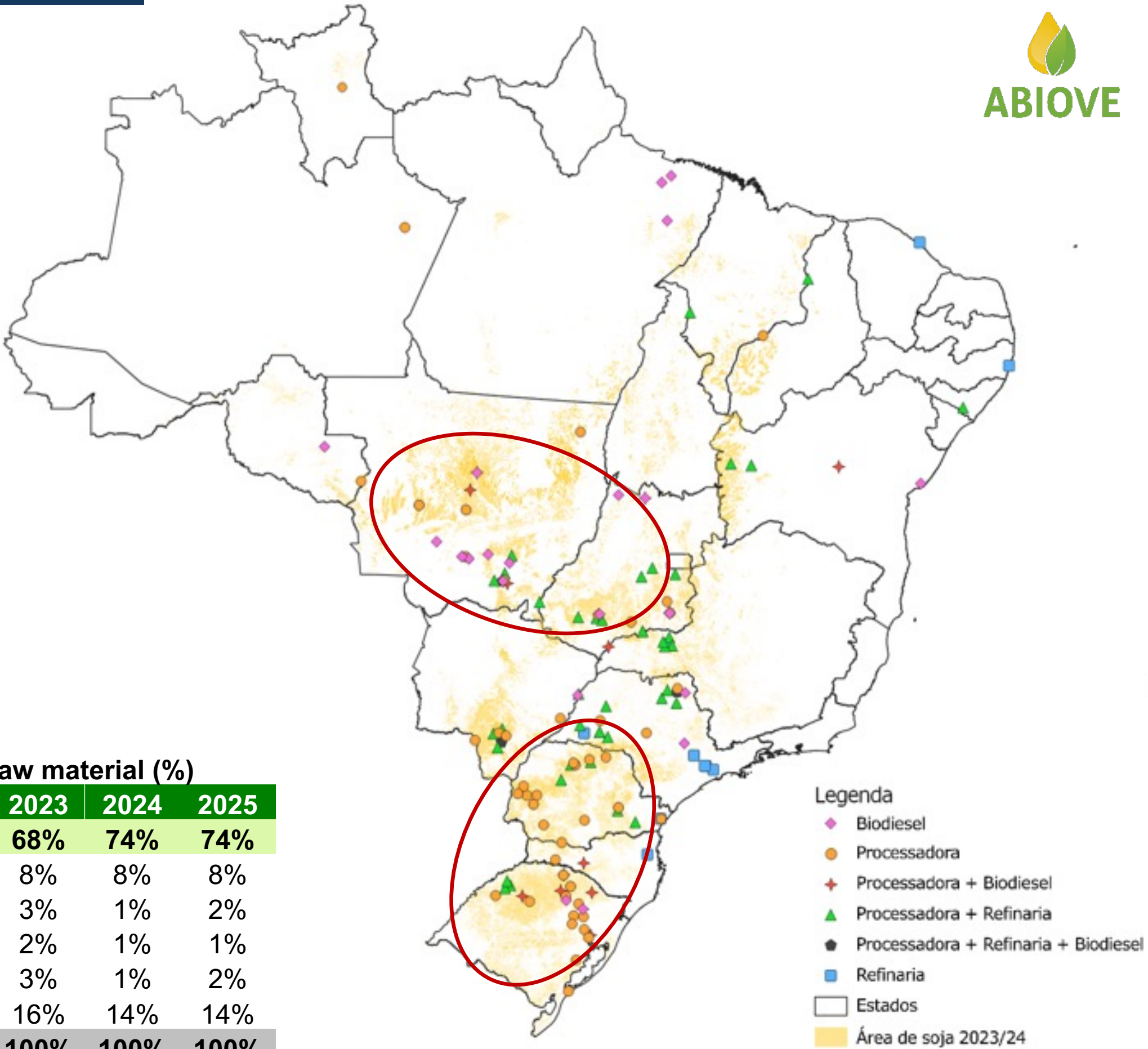


State	UF	Processing		Refining		Packaging	
		Ton/day	%	Ton/day	%	Ton/day	%
Mato Grosso	MT	47.774	21,8%	2.843	12,2%	2.503	18,3%
Paraná	PR	41.188	18,8%	3.725	16,0%	2.495	18,2%
Goiás	GO	30.110	13,7%	3.670	15,7%	2.953	21,6%
Rio Grande do Sul	RS	31.750	14,5%	300	1,3%	50	0,4%
Mato Grosso do Sul	MS	18.080	8,3%	2.334	10,0%	1.295	9,5%
São Paulo	SP	14.485	6,6%	5.140	22,0%	1.535	11,2%
Minas Gerais	MG	9.980	4,6%	2.256	9,7%	1.282	9,4%
Bahia	BA	8.150	3,7%	1.123	4,8%	1.049	7,7%
Tocantins	TO	5.000	2,3%	-	0,0%	-	0,0%
Santa Catarina	SC	4.300	2,0%	550	2,4%	-	0,0%
Piauí	PI	3.350	1,5%	120	0,5%	180	1,3%
Amazonas	AM	2.000	0,9%	-	0,0%	-	0,0%
Maranhão	MA	1.500	0,7%	330	1,4%	330	2,4%
Roraima	RR	1.000	0,5%	-	0,0%	-	0,0%
Rondônia	RO	400	0,2%	-	0,0%	-	0,0%
Ceará	CE	-	0,0%	200	0,9%	-	0,0%
Pernambuco	PE	-	0,0%	753	3,2%	-	0,0%
Total		219.067		23.343		13.673	

Source/Elaboration: ABIOVE.

Biodiesel production by raw material (%)

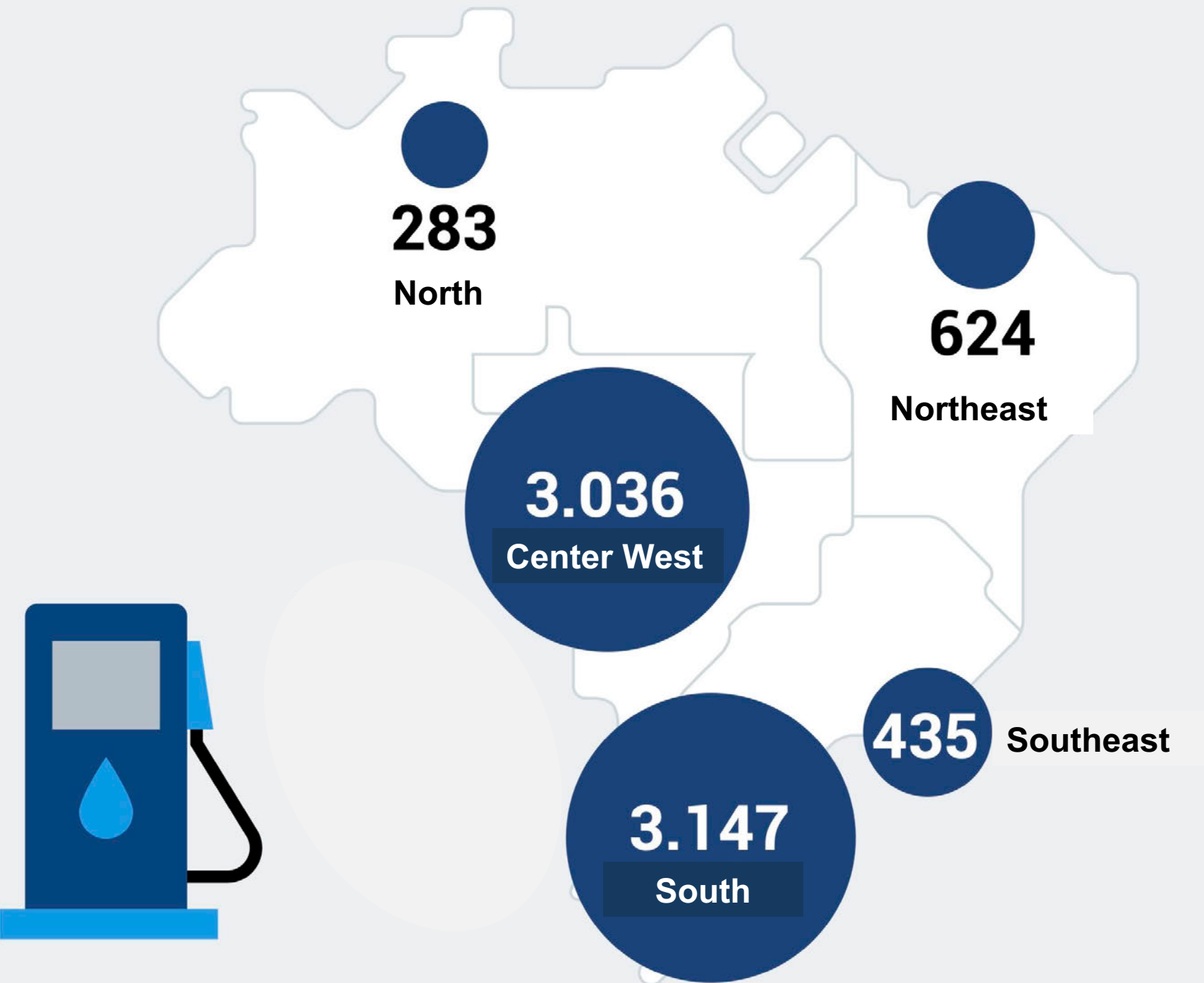
Raw-material	2023	2024	2025
Soybean oil	68%	74%	74%
Animal fats	8%	8%	8%
Cotton oil	3%	1%	2%
Used cooking oil	2%	1%	1%
Various raw materials	3%	1%	2%
Other fatty materials	16%	14%	14%
Total	100%	100%	100%



- Legenda
- ◆ Biodiesel
 - Processadora
 - ★ Processadora + Biodiesel
 - ▲ Processadora + Refinaria
 - ★ Processadora + Refinaria + Biodiesel
 - Refinaria
 - Estados
 - Área de soja 2023/24

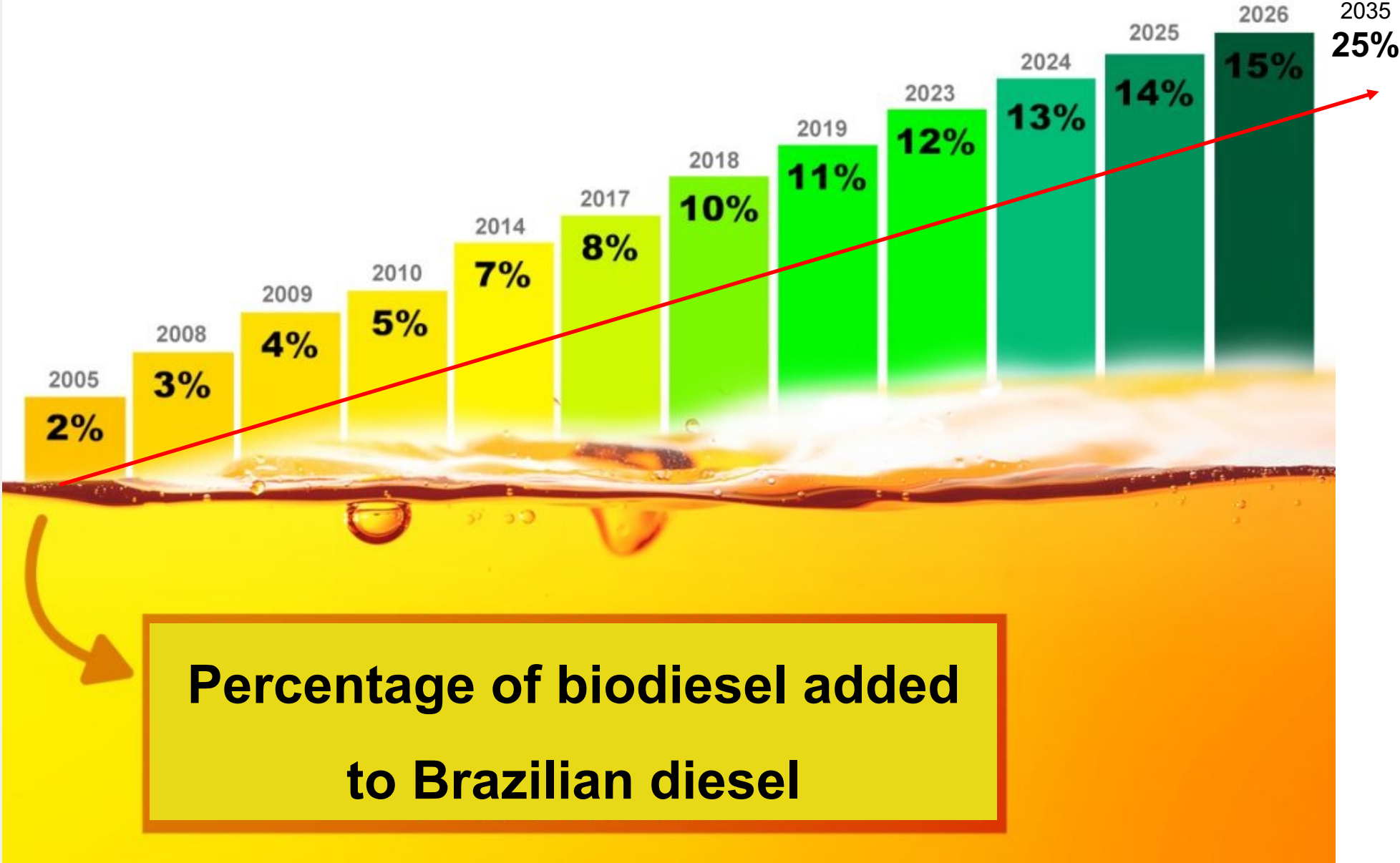
BIODIESEL PRODUCTION BY REGION

(in millions of liters)



fonte: Anuário Estatístico Brasileiro do Petróleo, Gás Natural e Biocombustíveis 2024, elaborado pela ANP (Agência Nacional de Petróleo, Gás Natural e Biocombustíveis)

Brazilian Biodiesel production



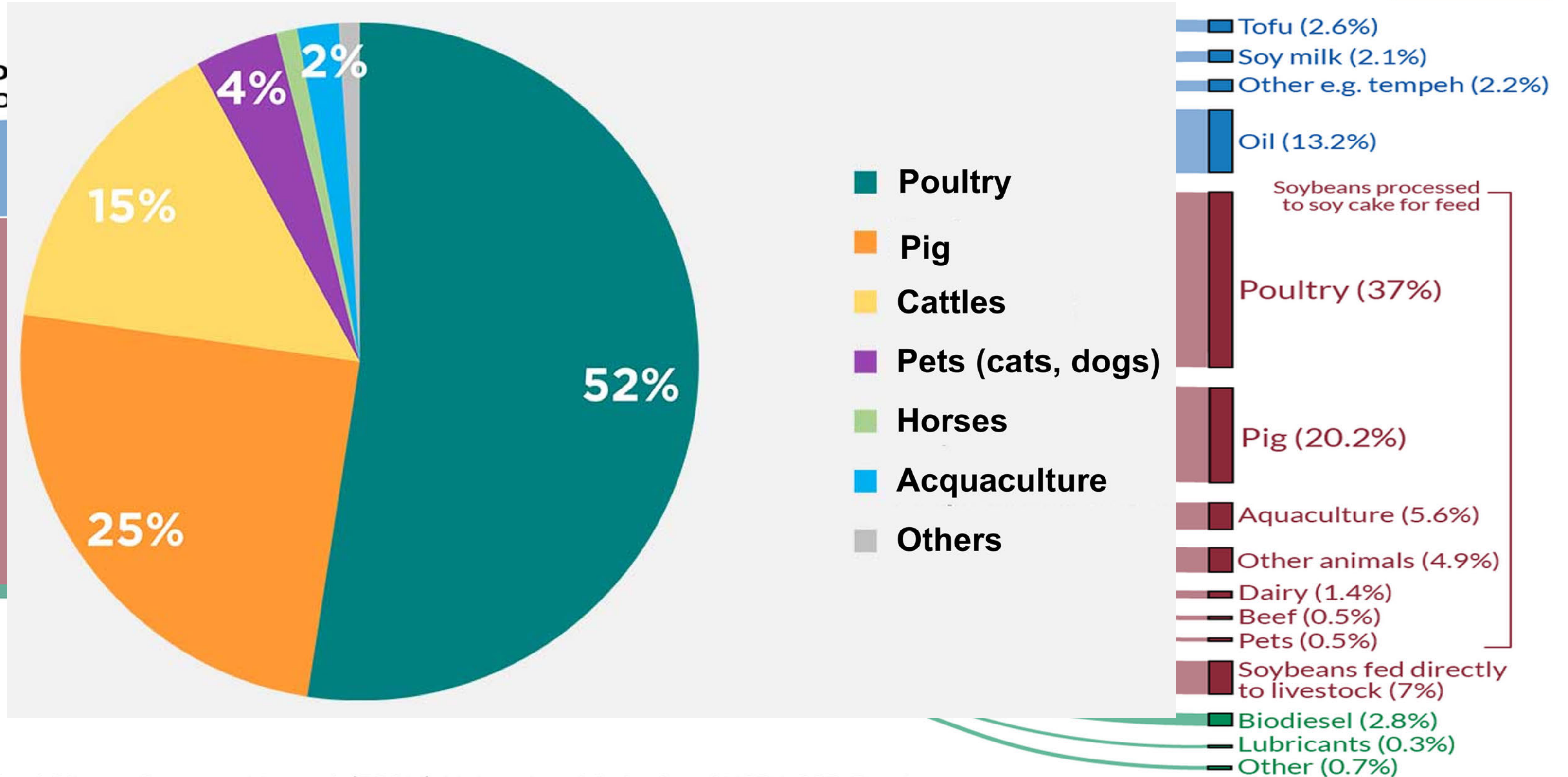
Soybean meal Industry numbers

The World's Soy: is it used for Food, Fuel, or Animal Feed?

Shown is the allocation of global soy production to its end uses by weight. This is based on data from 2017 to 2019.

Our World
in Data

Global soy
production



Data source: Food Climate Resource Network (FCRN), University of Oxford; and USDA PSD Database.
OurWorldinData.org – Research and data to make progress against the world's largest problems.

Licensed under CC-BY by the author Hannah Ritchie.

Animal Feed and Meet production in Brazil



Feed production (millions of tons)

	JAN A SET 2022*	JAN A SET 2023**	%	TOTAL 2022*	TOTAL 2023**	%
Poultry	31,8	32,7	2,7	42,6	43,4	1,8
	26,7	27,5	3	35,7	36,4	2
Pig	5,13	5,18	1	6,9	6,95	0,7
	15,5	15,9	2,4	20,6	20,8	1
Cattle	9,0	8,7	-3,1	12,1	12,1	0,2
	4,50	4,4	-1,1	6,2	6	-2
Cats, Dogs	4,53	4,29	-5,1	5,95	6,1	2,5
	2,76	2,93	6,3	3,72	4	7,5
Horses	0,477	0,481	0,8	0,637	0,643	1
Acquaculture	1,21	1,24	2,8	1,56	1,61	2,8
Fish	1,07	1,1	1,9	1,39	1,42	1,9
Shrimps	0,131	0,144	9,8	0,175	0,193	9,8
Others	0,627	0,661	5,4	0,615	0,62	0,8
Total of feed	61,4	62,6	1,9	81,9	83,2	1,6
Mineral Salt					3,87	-4,5
Total	61,4	62,6	1,9	85,7	86,9	1,3

To meet demand, the industry will use:

- Around 60 million tons of corn (including DDG (Distillers Dried Grains))
- 20 million tons of soybean meal.

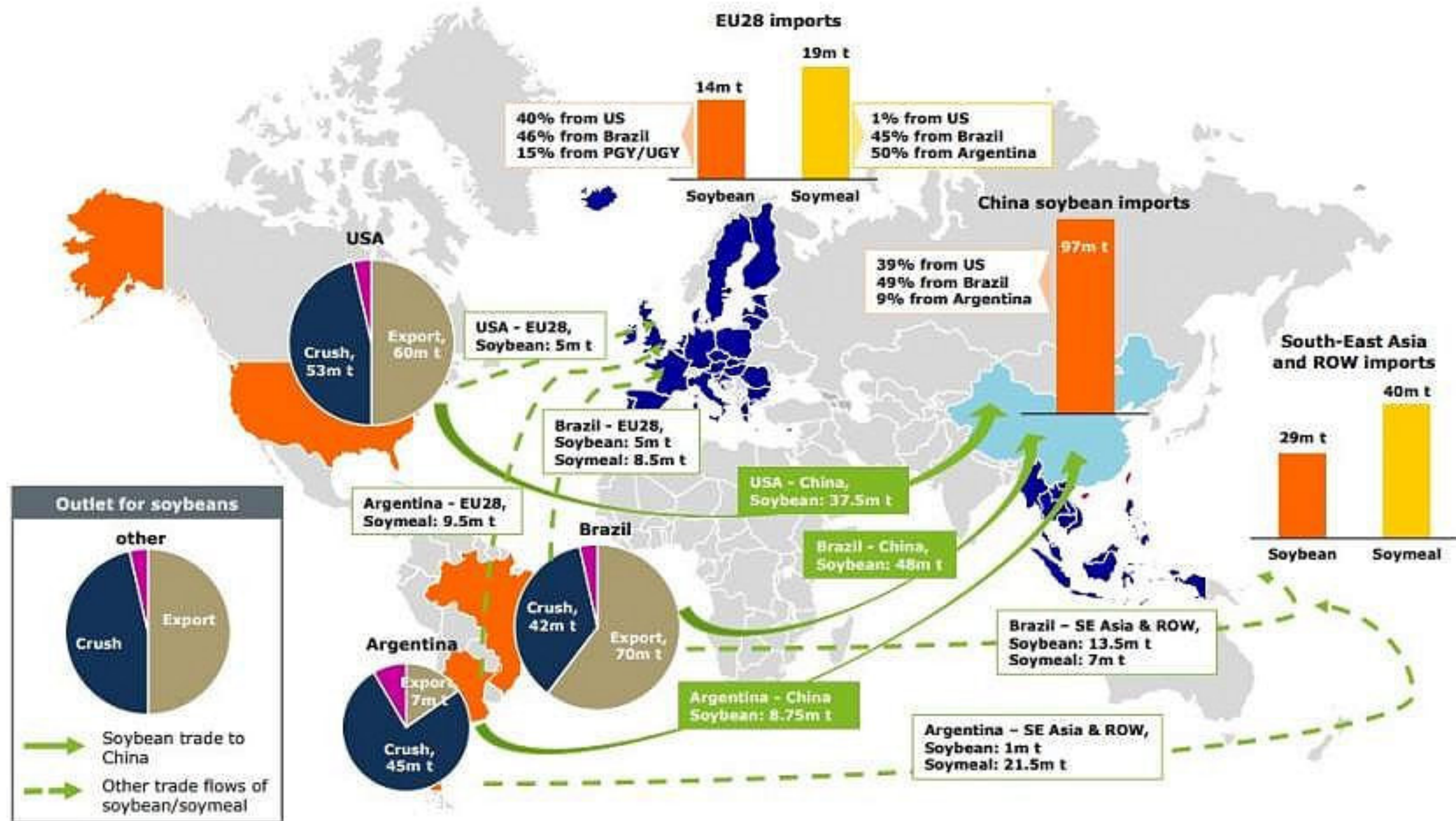
These two inputs account for approximately 70% of the total cost of animal feed in the country.

Gross value (GV) of Brazilian animal production industry 2023 and 2024

Product	Production			Average price (R\$)				GPV (Billions R\$)		
	2023	2024	VAR.	UN	2023	2024	VAR.	2023	2024	VAR.
Beef (mi/ton)	10,818	11,007	1,7%	@	255,72	237,74	-7,0%	184,423	174,461	-5,4%
Chicken (mi/ton)	15,472	15,583	0,7%	KG	4,89	5,10	4,3%	75,581	79,528	5,2%
Pork (mi/ton)	5,309	5,442	2,5%	@	97,64	95,80	-1,9%	34,558	34,757	0,6%
Milk (bi/liters)	34,636	35,052	1,2%	L	2,47	2,26	-8,5%	85,663	79,154	-7,6%
Eggs (mi/box)	135,970	137,683	1,3%	DZ	5,90	5,66	-4,1%	24,060	23,381	-2,8%
Gross Value of animal production								404,285	391,281	-3,2%

Fonte dos dados básicos: CNA – Elaboração e análise: AVISITE
* Valores reais deflacionados pelo IGP-DI de maio de 2024

China imports 60% of Global Soybean, Europe/Asia – 60% Soymeal



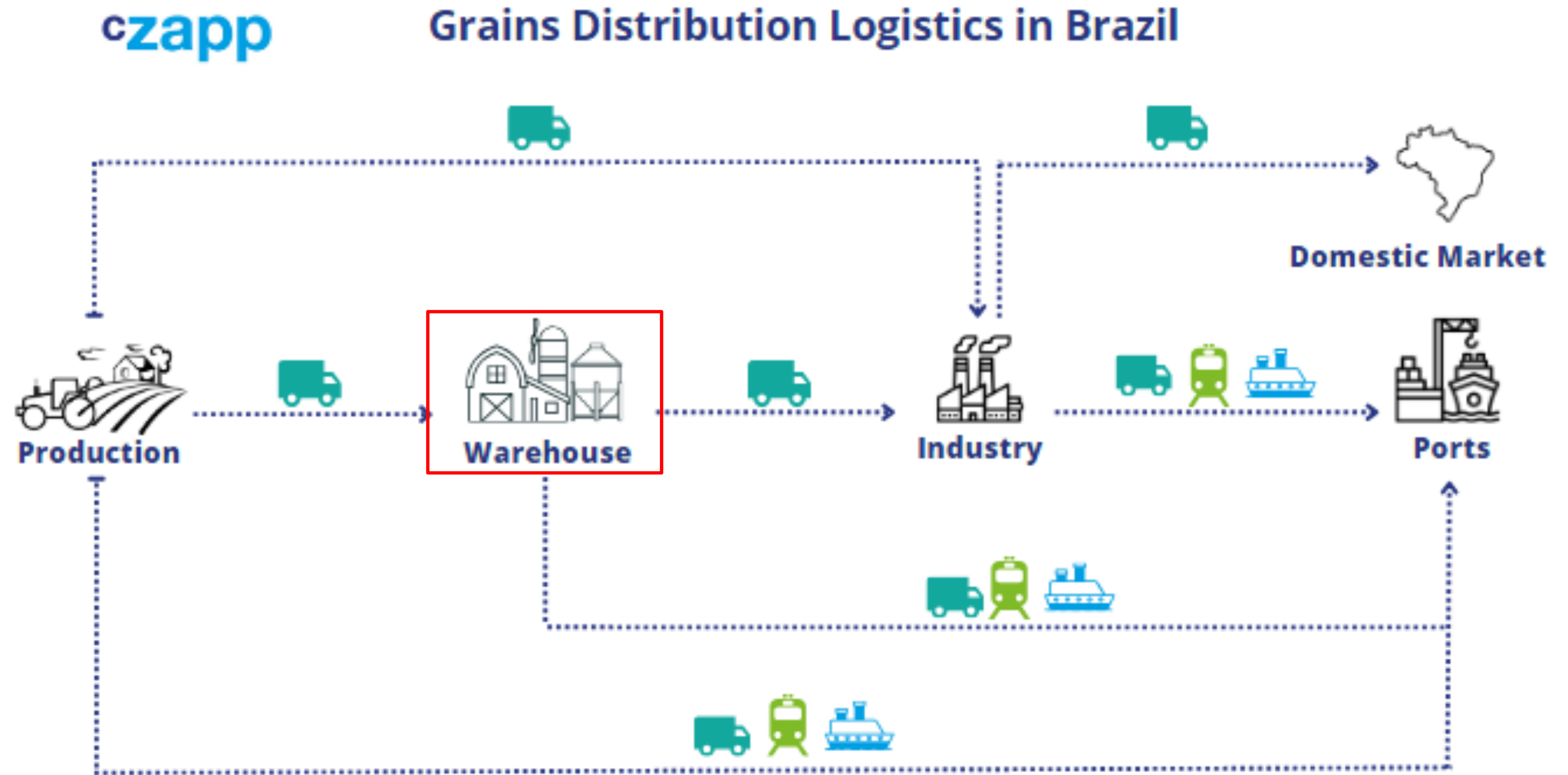


Soybean Logistics



Agribusiness x Logistics

CHARACTERISTICS OF AGRICULTURAL PRODUCTS



(Climatic, biological, etc.)

Grain Production x Static Storage capacity in Brazil

Grain Production X Static Capacity



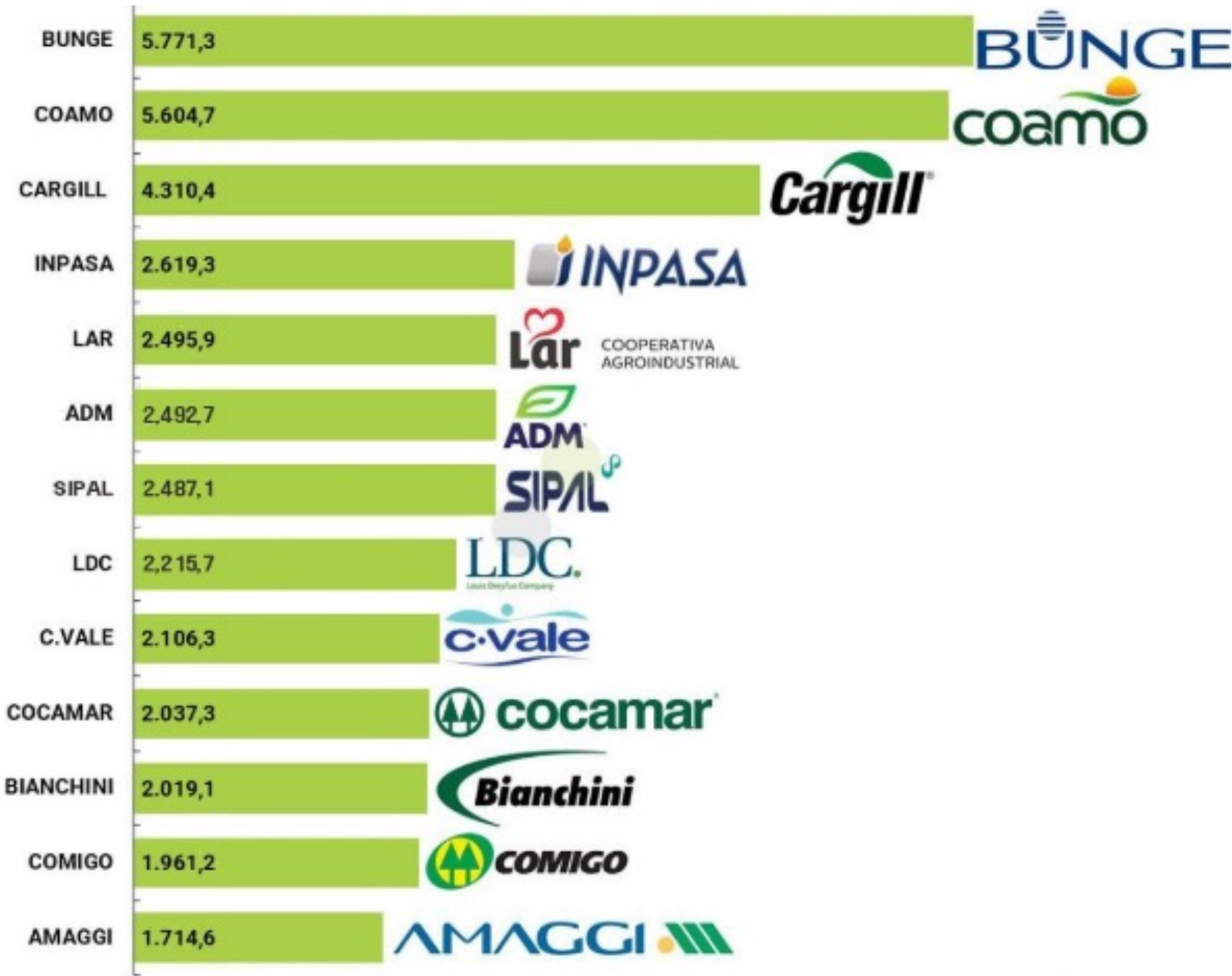
Static Storage in Brazil

Estimated grain production for the 2024/2025 capacity, and storage deficit in 2024, in thousands o

Static storage capacity by company, 2023.
Thousand tons.

Region	Production	Static Capacity
North	19.663,3	8.244,5
Northeast	30.047,5	15.148,9
Center West	159.475,7	87.971,9
Southeast	27.865,0	31.310,0
South	85.373,1	70.685,8
Brazil	322.424,6	207.367,1

Fonte: Conab. Elaborado por Scot Consultoria

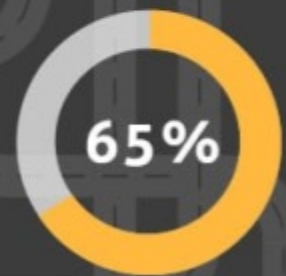


Fonte: AMR

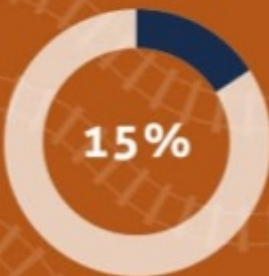
Logistics: Product Transport in Brazil

How Brazil transports?

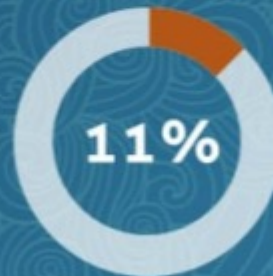
Roadways



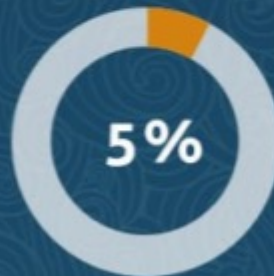
Railways



Cabotage



Waterways



Pipeline



Fonte: Empresa de Planejamento e Logística S.A. (EPL), 2015. Carga transportada em 2017.
Fonte: SPI, Ministério dos Transportes

cs in Brazil

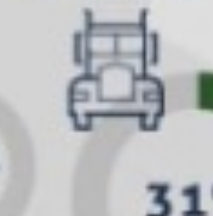
Other countries transport examples

Ferrovário



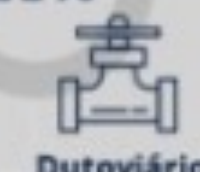
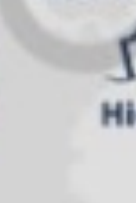
ESTADOS UNIDOS

Rodoviário



Aéreo

Hidroviário



Dutoviário

Rodoviário



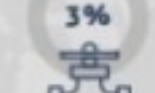
Ferrovário

Hidroviário



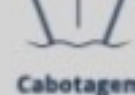
Hidroviário

Dutoviário



Dutoviário

Cabotagem



Cabotagem

UNIÃO EUROPEIA

CHINA

Hidroviário



Ferrovário



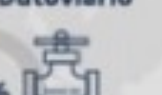
Ferrovário

Rodoviário



Rodoviário

Dutoviário



Dutoviário

Cabotagem



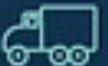
Cabotagem

Logistics: Transport x Costs

Logistics Costs in Brazil

R\$ 811,8 bi (US\$ 146,7 bi)

Product transport in Brazil

	61,1% - Roadway		20,7% - Railway
	13,6% - Waterway		4,2% - Pipeline
	0,4% - Airway		

Roads | **1.735.621 km**

12,3% (212.886 km) paved

78,6% (1.365.426 km) unpaved

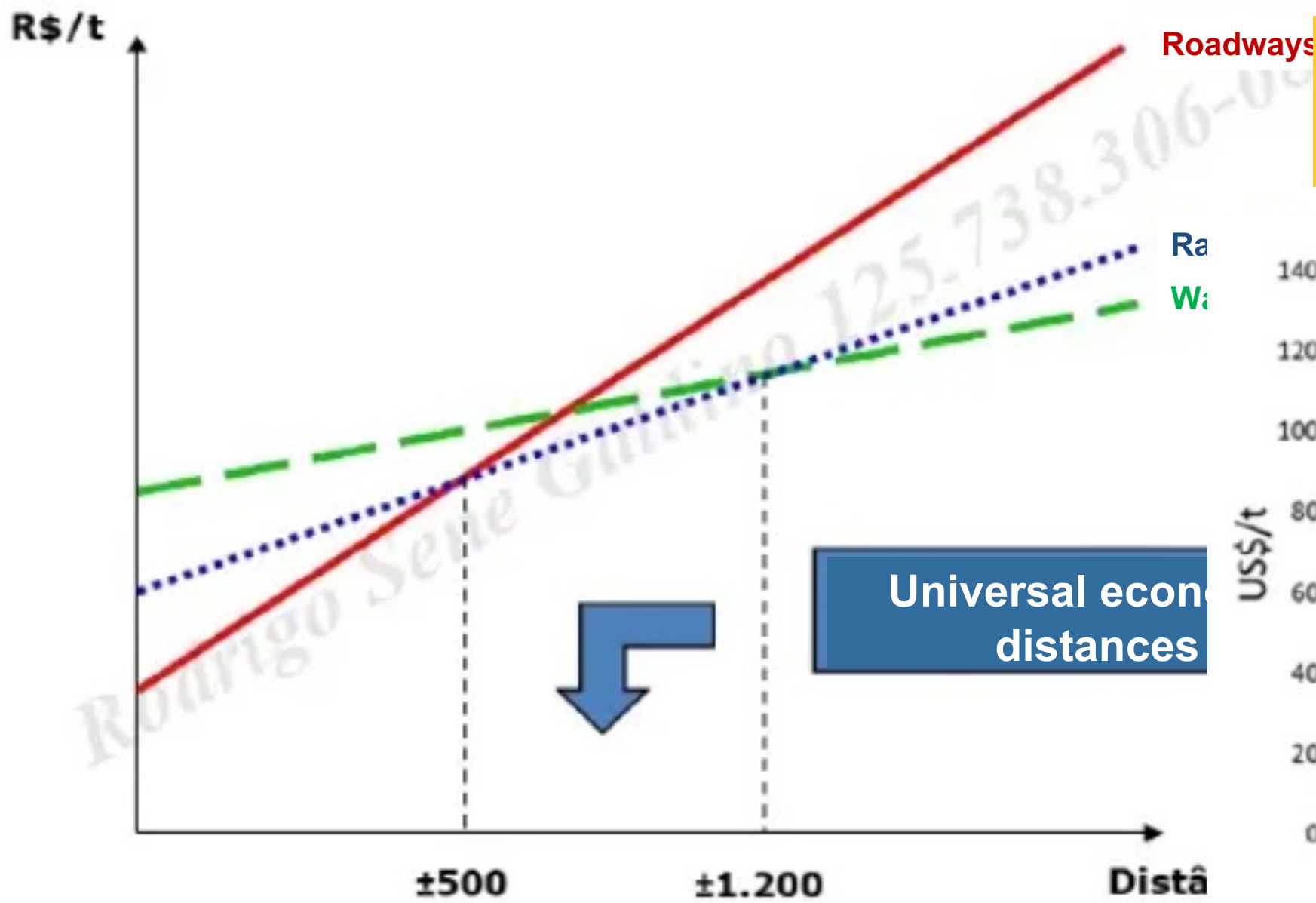
Paved state and federal highways

61.8% have problems

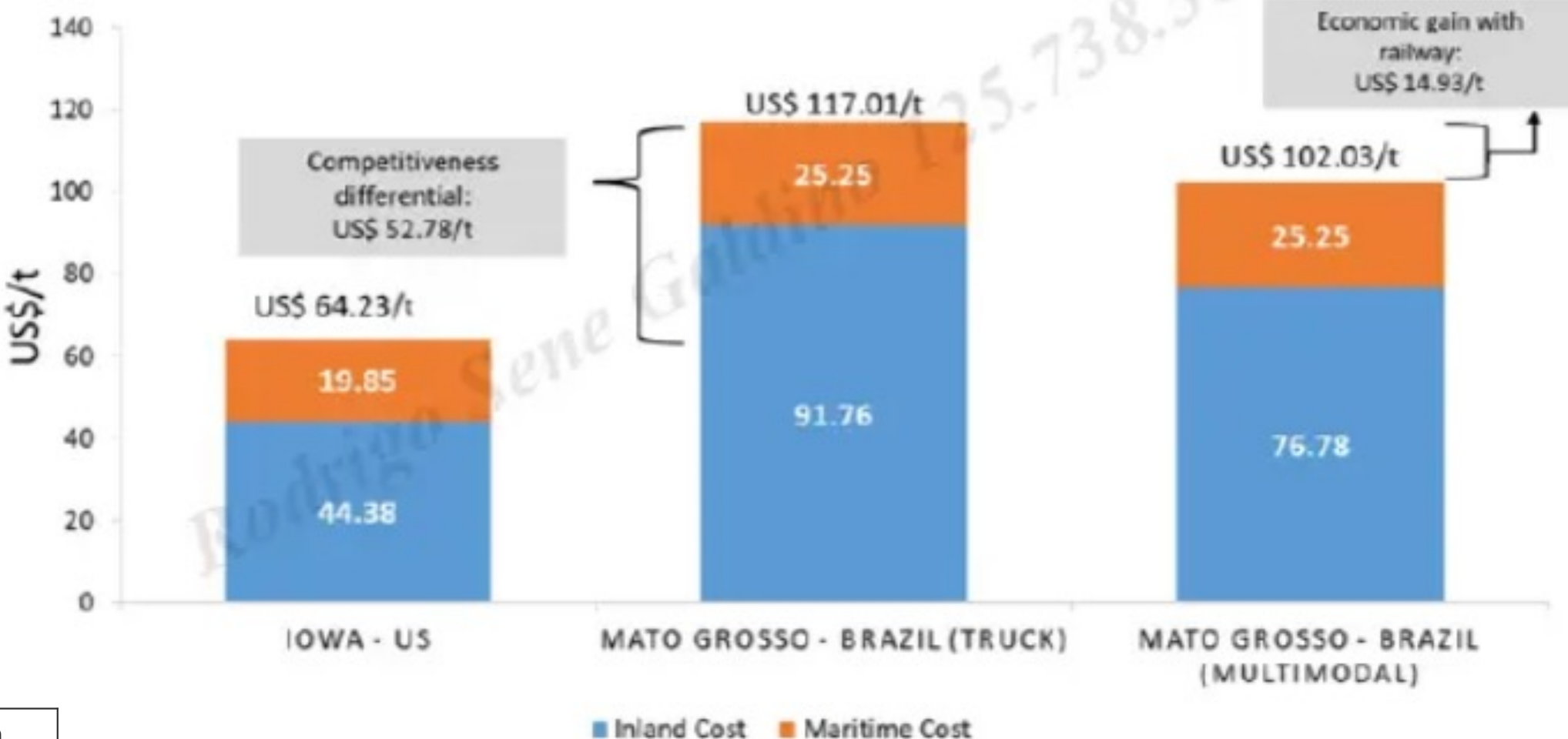
*Dados Confederação Nacional dos Transportes



Logistics: Cost x Competitiveness



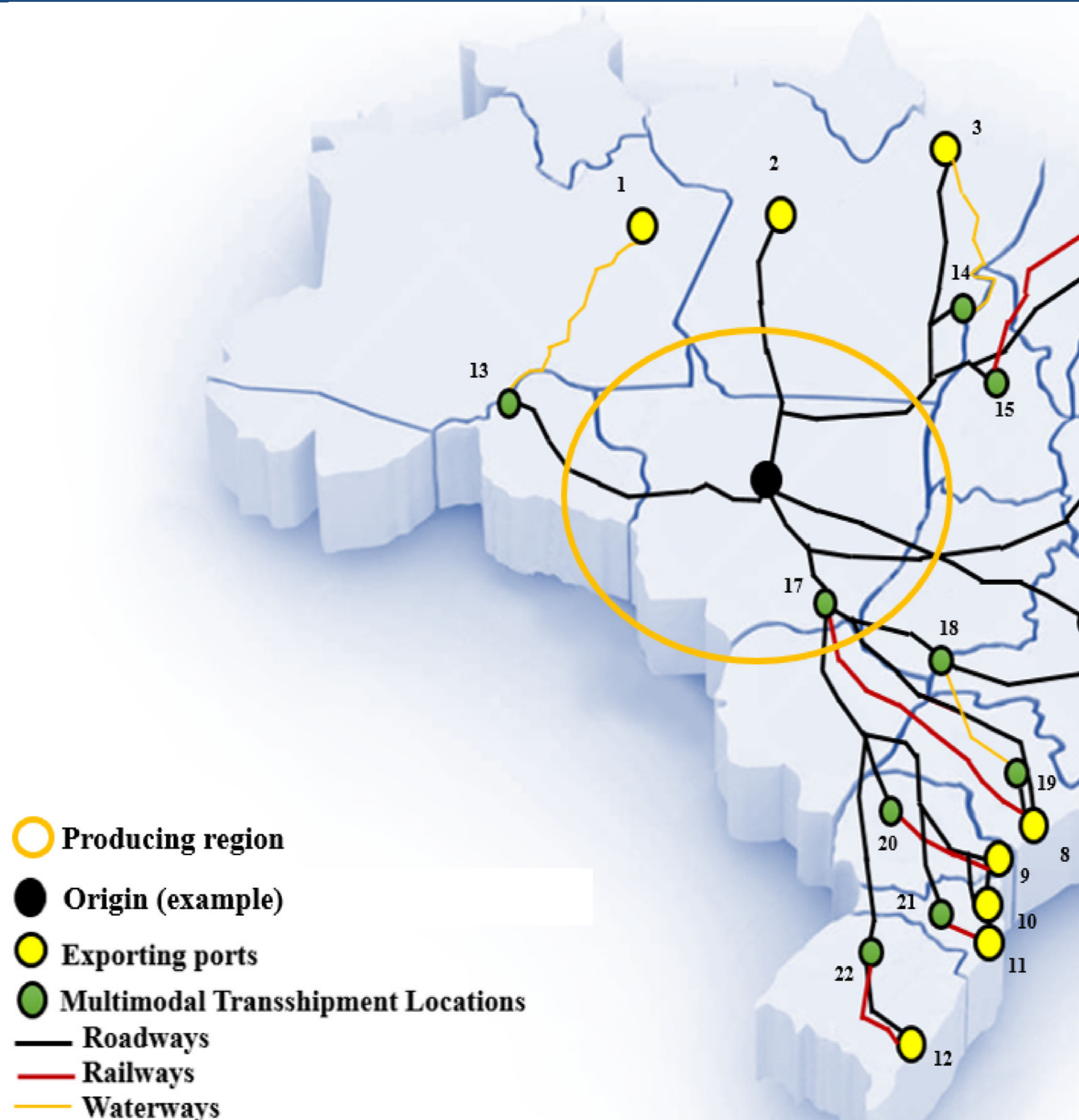
Logistical cost of exporting soybeans to China (Brazil vs. US)



Sector	Current mode of transport	Proposed mode of transport	Reduction in logistics costs
Food	Roadway	Cabotage	-20%
Automotive	Roadway	Roadway	-
Electronics	Roadway	Cabotage	-23%
Pharmaceutical	Roadway	Airway	-43%
Petrochemical	Roadway	Cabotage	-20%
Technology/Computing	Roadway	Airway	-20%

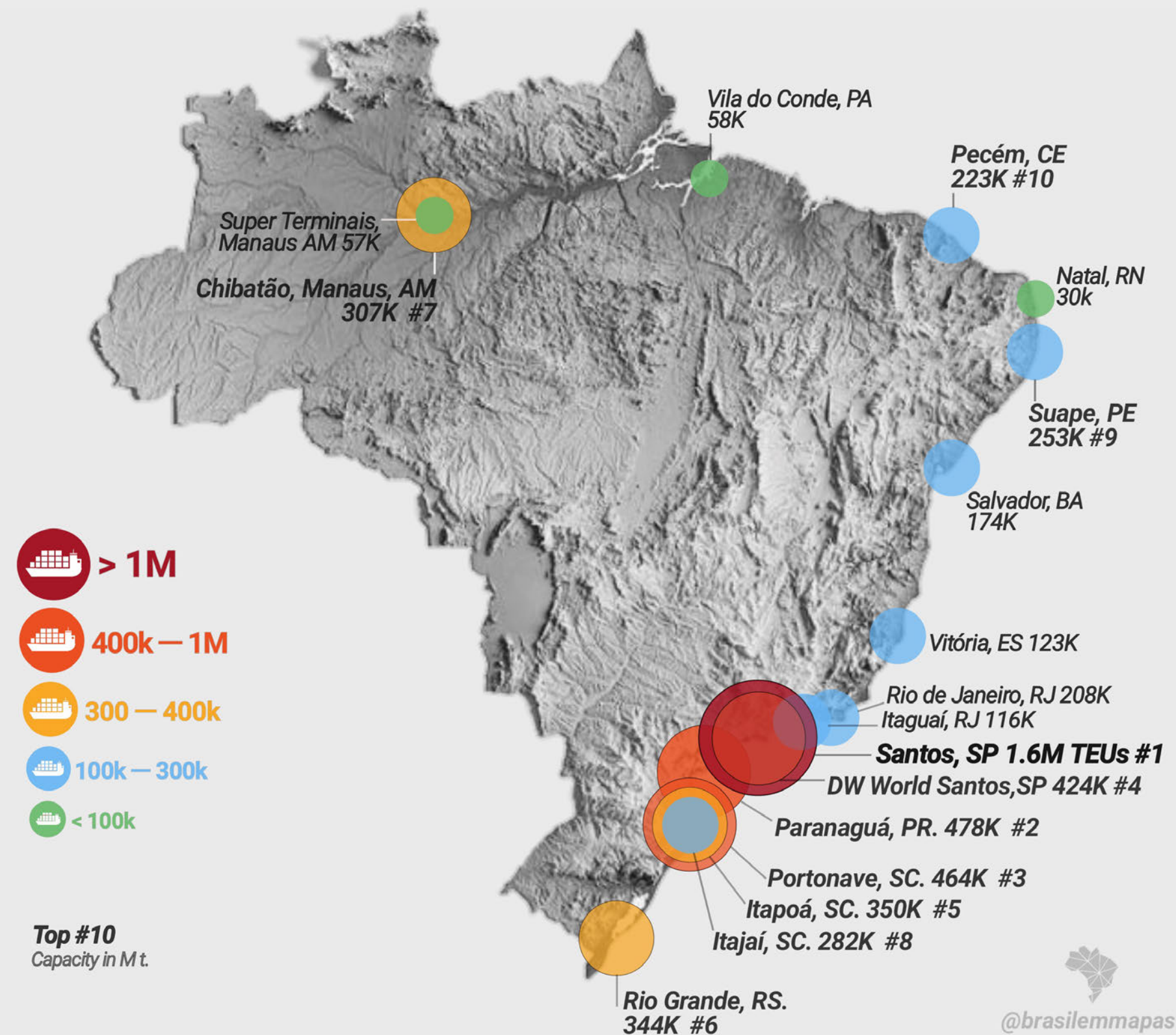
(Confederação Nacional do Transporte. Entraves logísticos ao escoamento de soja e milho, 2015.)

Logistics: Problems and Opportunities

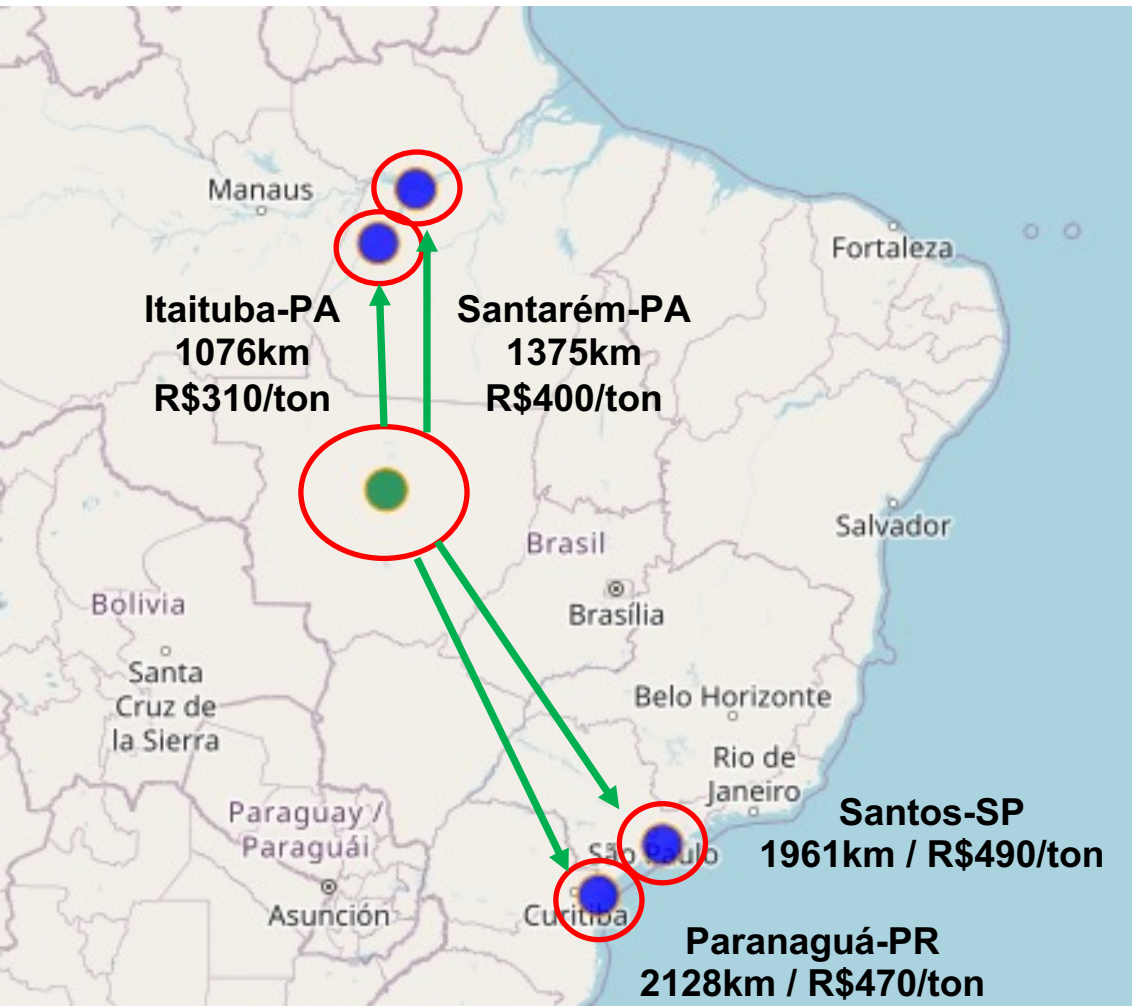


The biggest ports in Brazil

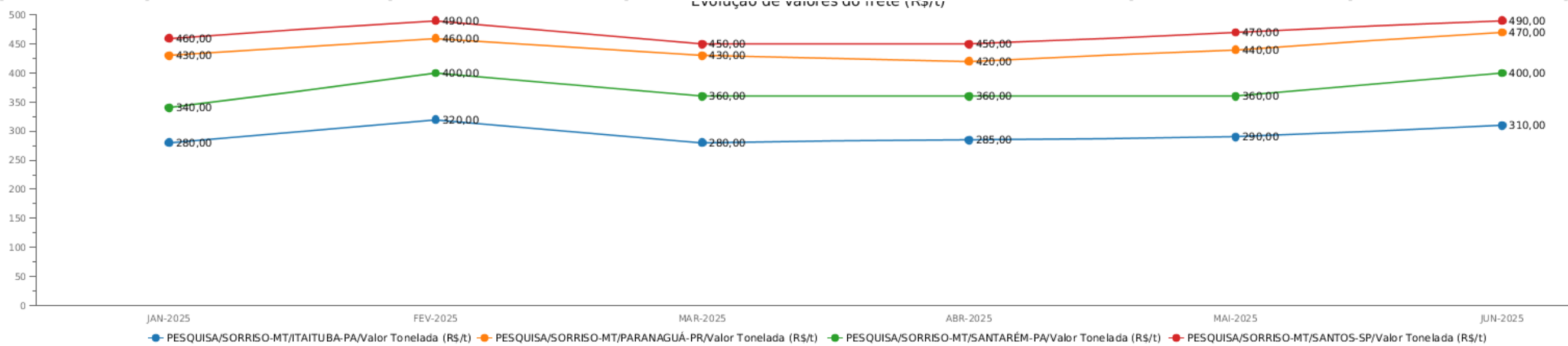
By container traffic in millions of tons.TEU (2020)



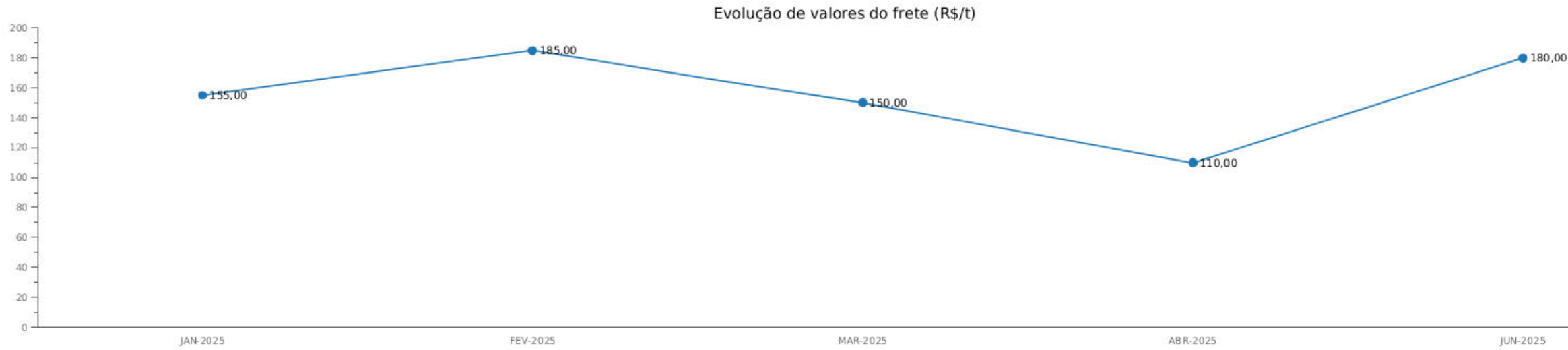
Logistics: Freight cost examples



Mês-Ano	Fonte	Origem	Destino	Distância (km)	Valor Tonelada km (R\$/t/km)	Valor Tonelada (R\$/t)
JUN-2025	PESQUISA	SORRISO-MT	SANTOS-SP	1,961	0.2499	490.00
JUN-2025	PESQUISA	SORRISO-MT	SANTARÉM-PA	1,375	0.2909	400.00
JUN-2025	PESQUISA	SORRISO-MT	ITAITUBA-PA	1,076	0.2881	310.00
JUN-2025	PESQUISA	SORRISO-MT	PARANAGUÁ-PR	2,128	0.2209	470.00



Mês-Ano	Fonte	Origem	Destino	Distância (km)	Valor Tonelada km (R\$/t/km)	Valor Tonelada (R\$/t)
JUN-2025	PESQUISA	CASCADEL-PR	PARANAGUÁ-PR	602	0.2990	180.00
ABR-2025	PESQUISA	CASCADEL-PR	PARANAGUÁ-PR	602	0.1827	110.00
MAR-2025	PESQUISA	CASCADEL-PR	PARANAGUÁ-PR	602	0.2492	150.00





Embrapa Soybean



MINISTÉRIO DA
AGRICULTURA E
PECUÁRIA



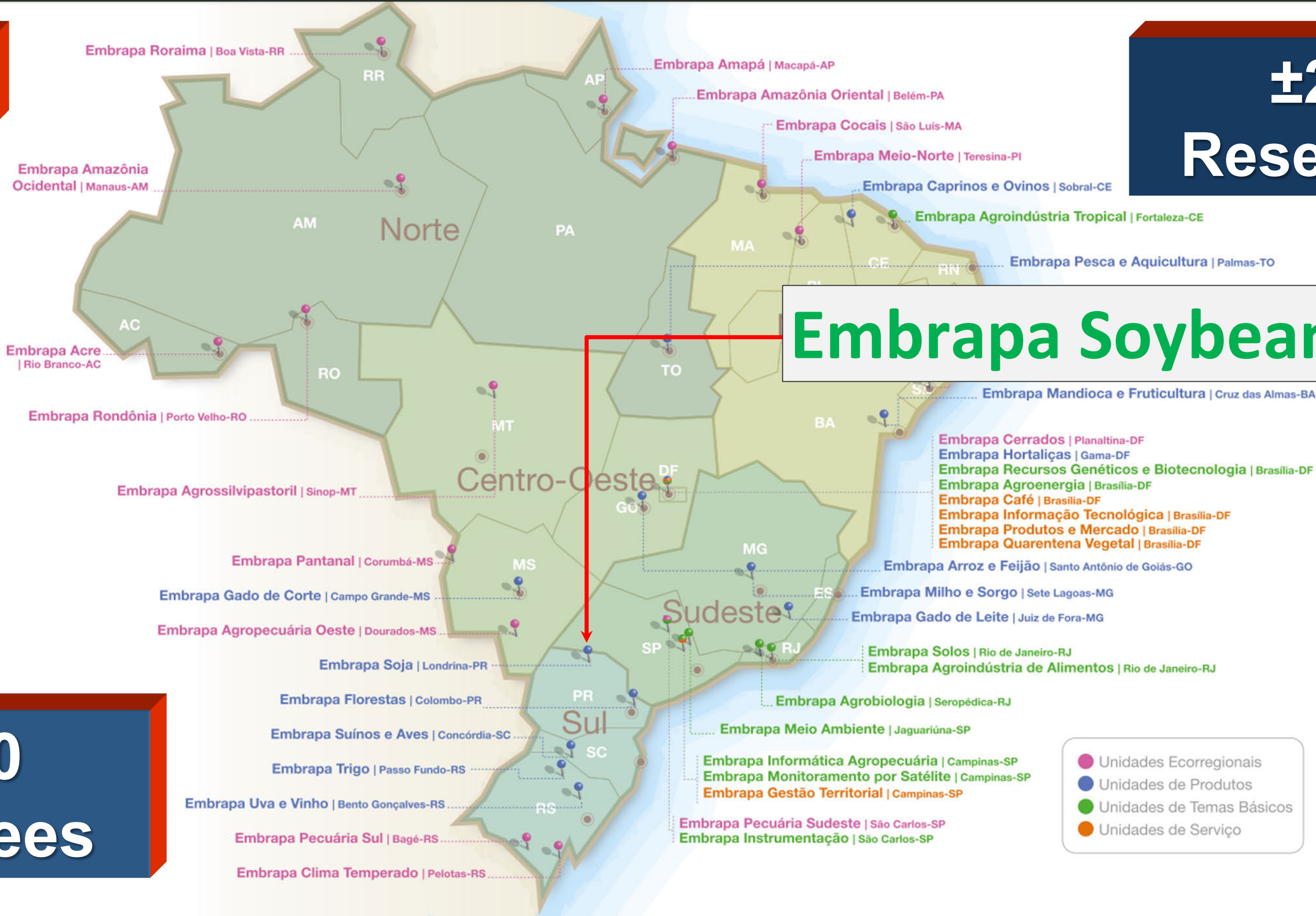
Embrapa (Brazilian Agricultural Research Corporation)

43 UDs

±2.100
Researchers

Embrapa Soybean

±7.450
Employees



Embrapa Soybean Infrastructure



- Located at Londrina, Paraná state (South of Brazil).



37.221 m²
Built-up Area



38 (12.396 m²)
Greenhouses



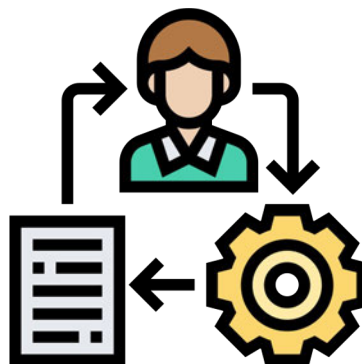
251
Employees

61 Researchers

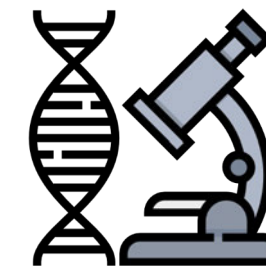
49 Analysts

86 Assistants

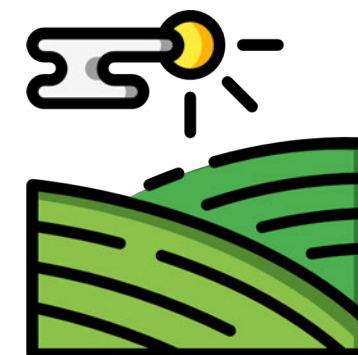
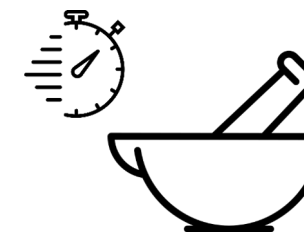
55 Technicians



31
Research
Laboratories

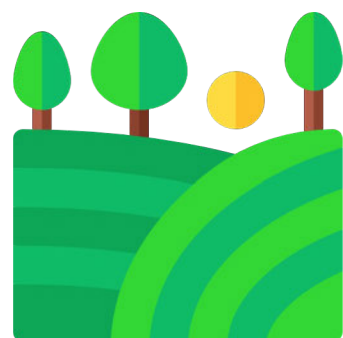


1
Experimental
Kitchen

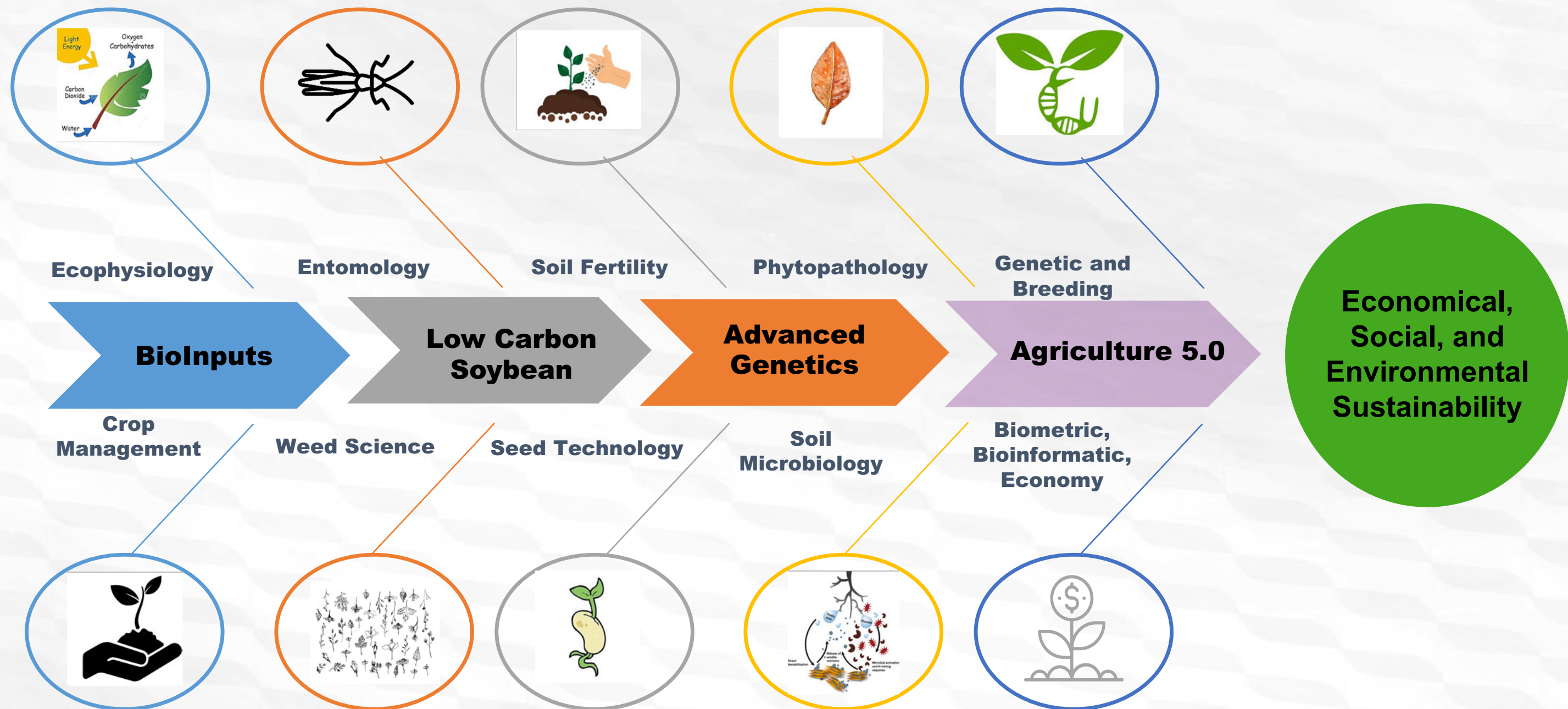


350 ha
Experimental Field
Santa Terezinha Farm

121 ha
Experimental Field
Maravilha Farm



Embrapa Soybean research axes



Thank you! Dankie!

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MINISTRY OF
AGRICULTURE, LIVESTOCK
AND FOOD SUPPLY