

Current agroclimatic aptitude of different regions of Brazil for 'Hass' avocado production



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Avocado production in Brazil



Brazil: world's 7th largest avocado producer: 300,894 tons harvested from 18,254 hectares (2021), mainly of locally selected hybrids of West Indian x Guatemalan cultivars:



Geada

Fortuna

Quintal

Breda

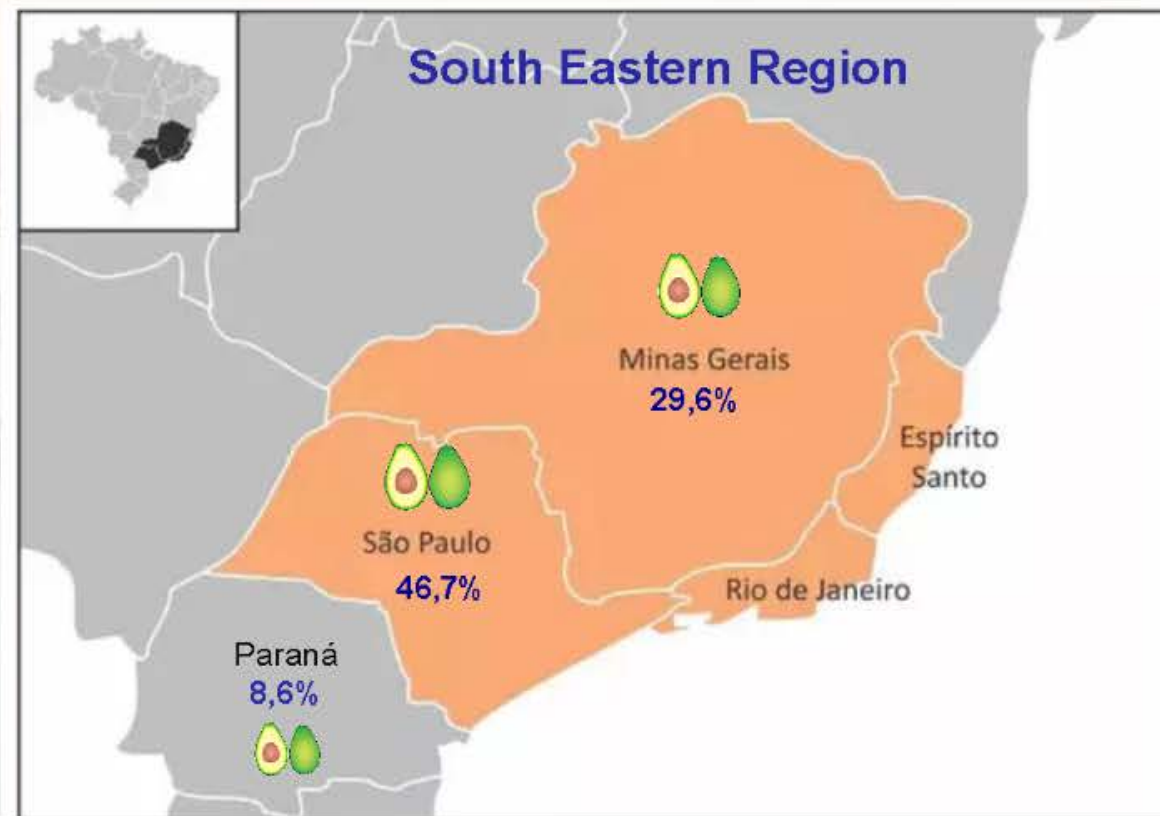
Margarida

Avocado production in Brazil



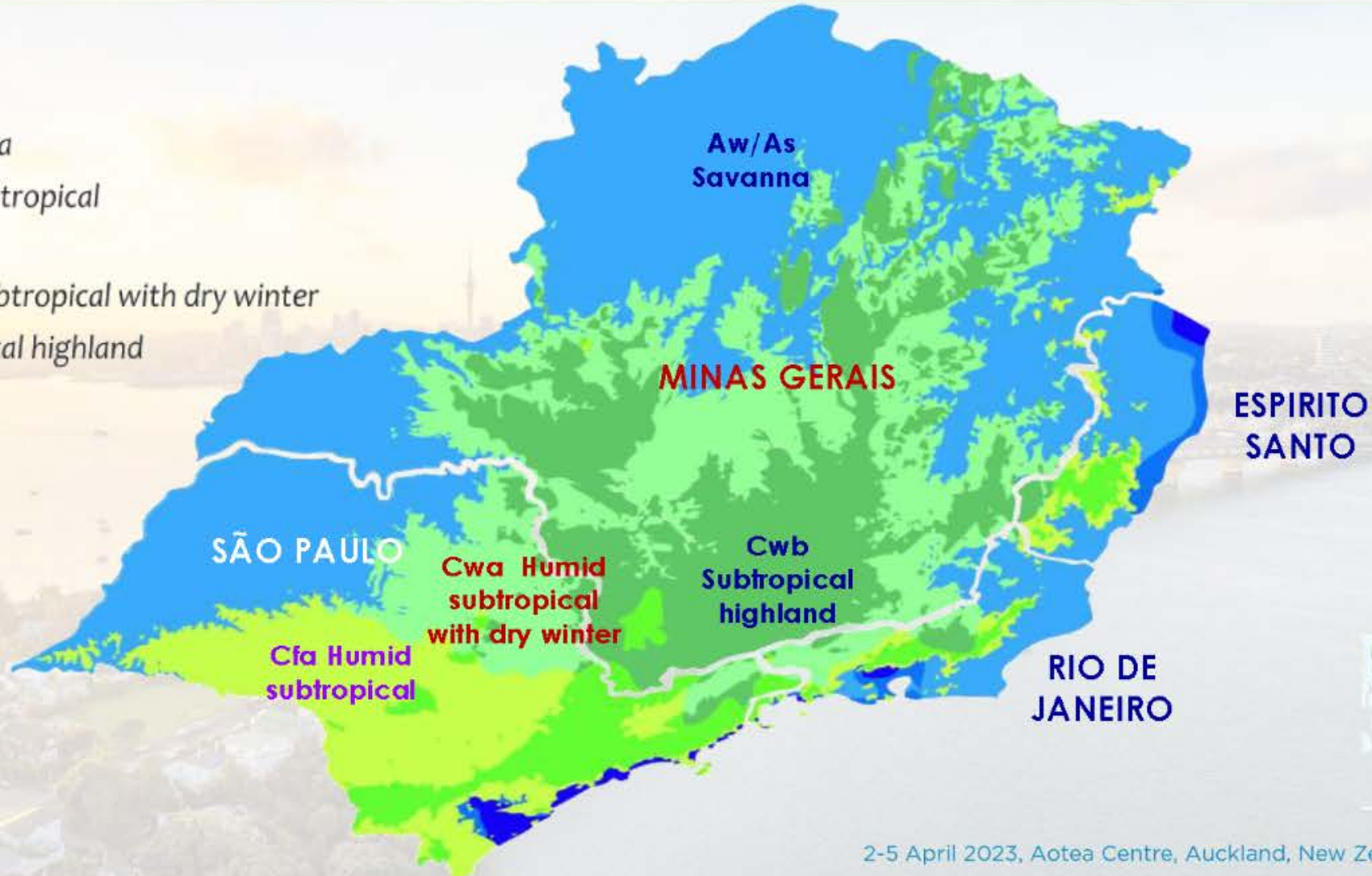
Tropical and Hass avocado production concentrates in the **Southeast Region**: **São Paulo** (46.7%), **Minas Gerais** (29.6%), and in the **South region**, at the **Paraná** state (8.6%).

'Hass' avocado is planted over an estimated total area between **5,000 to 7,000 ha**, mainly in São Paulo and Minas Gerais states.



Köppen climate types of the Southeast Region

- Af – Rainforest
- Am – Monsoon
- Aw/As – Savanna
- Cfa – Humid subtropical
- Cfb – Oceanic
- Cwa – Humid subtropical with dry winter
- Cwb – Subtropical highland



Expansion of 'Hass' cultivation in Brazil

The agroclimatic aptitude for 'Hass' cultivation was assessed in 6 regions:

-  **Bauru (São Paulo state)**
-  **South and Southwest regions of Minas Gerais**
-  **Rio Grande do Sul state**
-  **Northern Paraná state**
-  **North-eastern region**



BAURU - Center of São Paulo State

- 🌿 First Hass commercial orchards in Brazil (1975, Jaguacy Brasil).
- 🌿 Tropical Savanna wet climate (Aw Köppen); 22.3°C mean annual temperature; 1,357 mm annual rainfall; 537 m altitude.
- 🌿 Sandy & sandy loam soils, flat landscape.
- 🌿 Extreme dry air conditions at the flowering period in August reduce the pollination and fertilization rates, and the fruit yield and size of Hass avocados.



South and Southwestern regions of Minas Gerais

- Mountain ranges: Serra da Mantiqueira, Serra da Canastra with $> 1,000$ m altitude
- **Humid subtropical** (Cwa) and **subtropical highland** (Cwb) climates: 1,600 mm mean annual rainfall; Minimum: 14°C , Mean: 21°C Maximum: 27°C .
- **Favourable for late harvest, off-season production.**
- Steep slopes and clayey soils increase the establishment costs by 30-40%.



South and Southwestern regions of Minas Gerais

- Variable soil types, predominantly Red-Yellow and Yellow Latosols (Oxisols), Cambisols and Quartzarenic Neosols, and some Ultisols, low-fertility acidic soils, which are appropriate for avocado planting after heavy chemical and organic soil amendment.



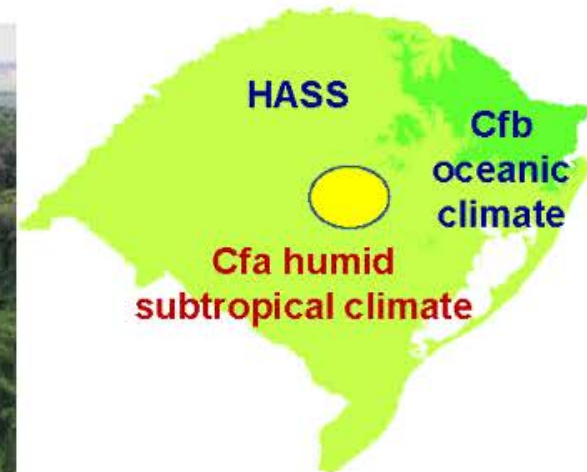
Serra da Mantiqueira



Serra da Canastra

Rio Grande do Sul State

- 🦉 Climatic and geographical aptitude for **late-season Hass production** between October and December in the counter-season of the domestic market.
- 🦉 Good transport facilities and proximity to foreign consumer markets (Argentina, Uruguay and Chile).
- 🦉 Mean temperatures 16 to 18°C, 2000 to 2500 mm annual rainfall, altitude < 350 m.
High summer rainfall may interfere with harvest and foliar sprayings.
- 🦉 Latosols, Cambisols, Quartzarenic Neosols and Chernozems, with frequent drainage limitations.



Northern Paraná state

- Paraná is a climatic transition zone, due to large altitude and latitude variations.
- **Frost** is the main adverse climatic factor that restricts avocado cultivation to the **North and Northwestern regions** of the state.
- Humid subtropical climate with 19-20°C mean air temperature, 1300-1500 mm annual rainfall. Water deficit < 50 mm/month allows **rainfed avocado cultivation**.
- Latosols and Ultisols are most common, some of them with erosion risk and drainage restrictions.



North-eastern Region of Brazil

- ✓ Second most populous region, with > 53 million inhabitants= 28% of the country's population.
- ✓ The states of **Bahia and Ceará** stand out, with more than 440,000 (Bahia) and 160,000 (Ceará) potentially irrigated hectares.
- There are 3 sub regions with aptitude for Hass avocado:
 - * **Zona da Mata (Forest Zone)**
 - * **Agreste (Arid Zone)**
 - * **Sertão (Hinterland)**
- Humid tropical weather in the coast; humid subtropical to subtropical highland climate in the inner regions.
- Proximity to main consumer markets.
- Diverse relief: plateaus, lowlands, valleys and mountains with 700-900 m altitude.



North-eastern Region of Brazil

ZONA DA MATA (Forest Zone)



Sertão (Hinterland)



CHAPADA DIAMANTINA, BAHIA STATE



Author: Karla F. Paiva

CHAPADA PERNAMBUCANA, CEARA STATE

North-eastern Region of Brazil

- **Climatic restrictions increase establishment costs:** high radiation and temperatures, low thermal amplitude and air humidity, low and irregular rainfall, high wind intensity.
- Low-fertility, acidic Latosols and Quartzarenic Neosols more demanding in fertilisation and irrigation.
- Good climate in specific mountain ranges in **Bahia, Ceará** and **Pernambuco** states.
- In **Tianguá, at Serra da Ibiapaba in Ceará**, Hass avocado is harvested from **December through February**.



Serra da Ibiapaba, Ceará State

Final Considerations

- ✓ In Brazil, the **Southern** (Rio Grande do Sul & Paraná), **South-Eastern** (Minas Gerais, São Paulo & Espírito Santo), and **North-Eastern** (Ceará, Pernambuco) regions have adequate soil and climate conditions for Hass commercial production.
- ✓ In the **North-eastern region**, lower land costs, proximity to main US and EC consumer markets and enlargement of the irrigated areas are encouraging to establish new orchards in areas of > 700 m altitude.



Questions

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