



Epagri's Apple Breeding Program and the most important brazilian apple varieties

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EPAGRI

Conhecimento para a produção de alimentos
Knowledge for food production



GOVERNO DE
SANTA CATARINA
SECRETARIA DE ESTADO DA
AGRICULTURA, DA PESCA E
DO DESENVOLVIMENTO RURAL

Mission

Knowledge, technology and rural extension for sustainable development of rural areas, aiming benefits of society.

Objectives

Promoting the preservation, recovery, conservation and sustainable utilization of natural resources.

Pursuing the competitiveness of agriculture in Santa Catarina State compared to global markets, adapting products to the consumers requirements.

Promoting the quality of life in rural and fishing environment.

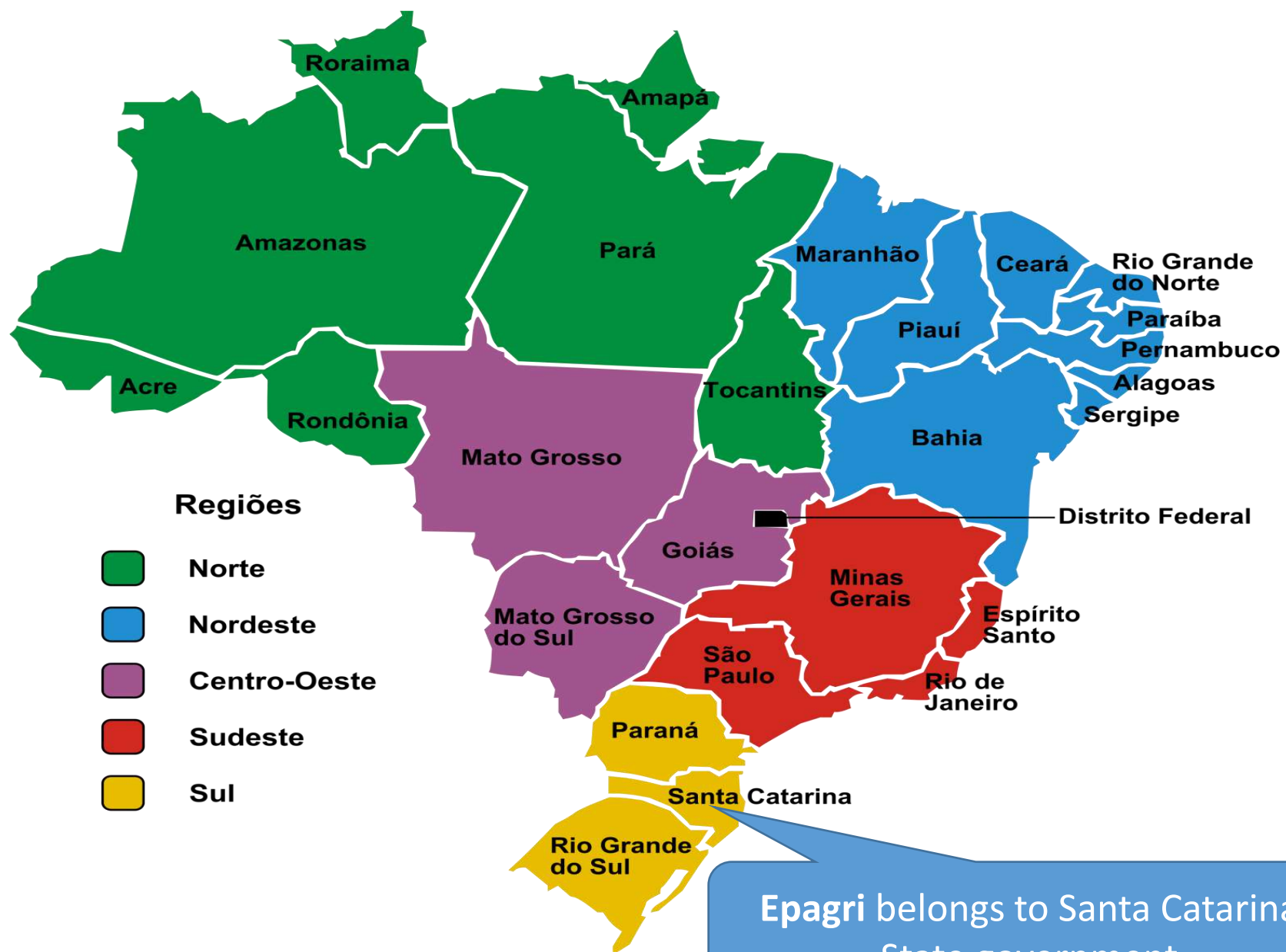
Main activities

Agricultural Research: promoting improvement of yield in agriculture

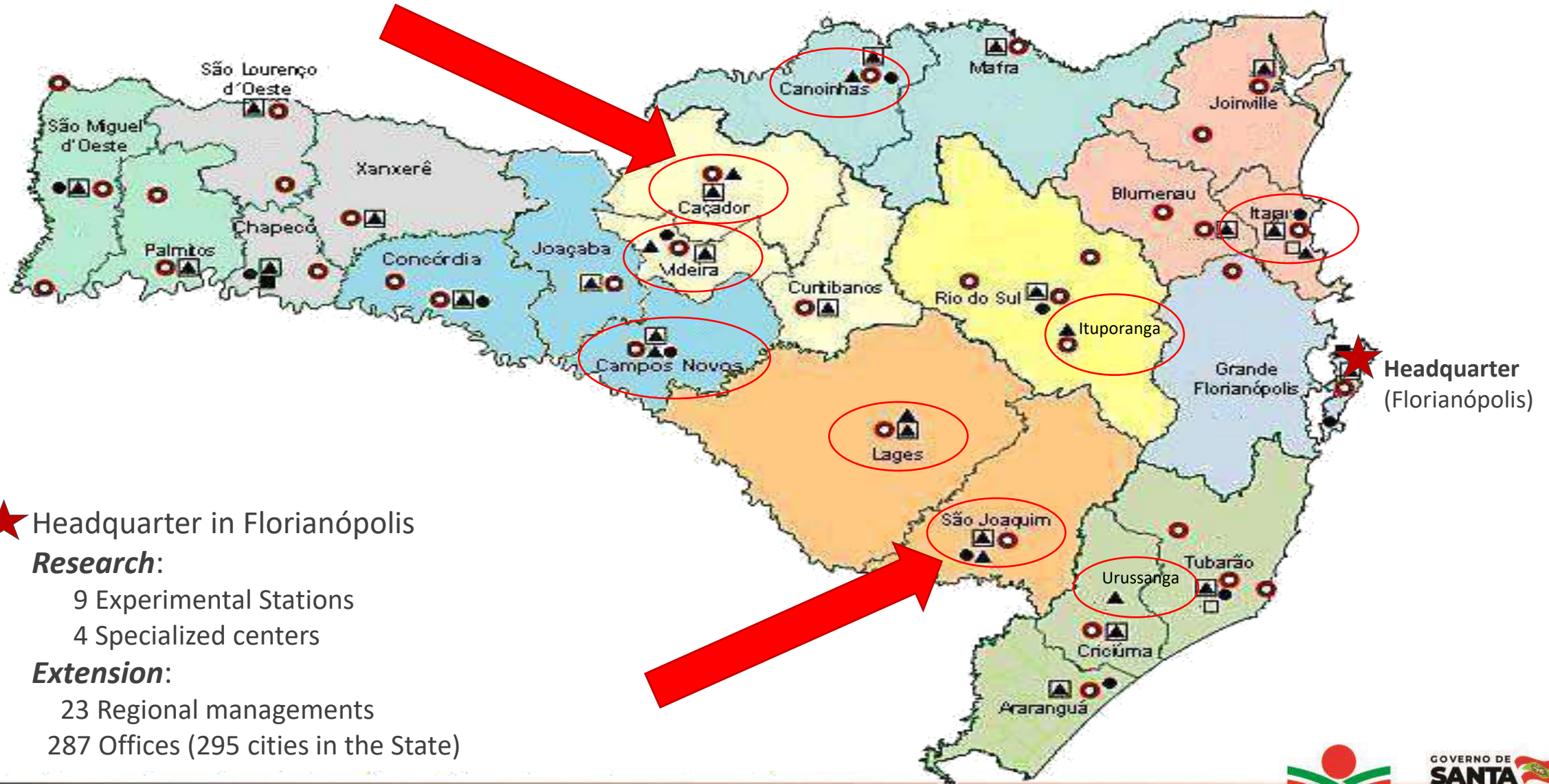
- Development of new technologies of production
- Weather conditions studies and forecast

Rural Extension: supporting the development of agriculture

- Supporting production planning for small farmers
- Education for new techniques of production
- Fomentation to social organization and development



EPAGRI IN SANTA CATARINA STATE (Agriculture Research and Rural Extension)



Experimental Stations researching in Apple Crop:

Caçador Experimental Station:

- 965m above sea level
- 580 chilling hours ($\leq 7,2^{\circ}\text{C}$) on average

São Joaquim Experimental Station:

- 1.400m above sea level
- 920 chilling hours ($\leq 7,2^{\circ}\text{C}$) on average



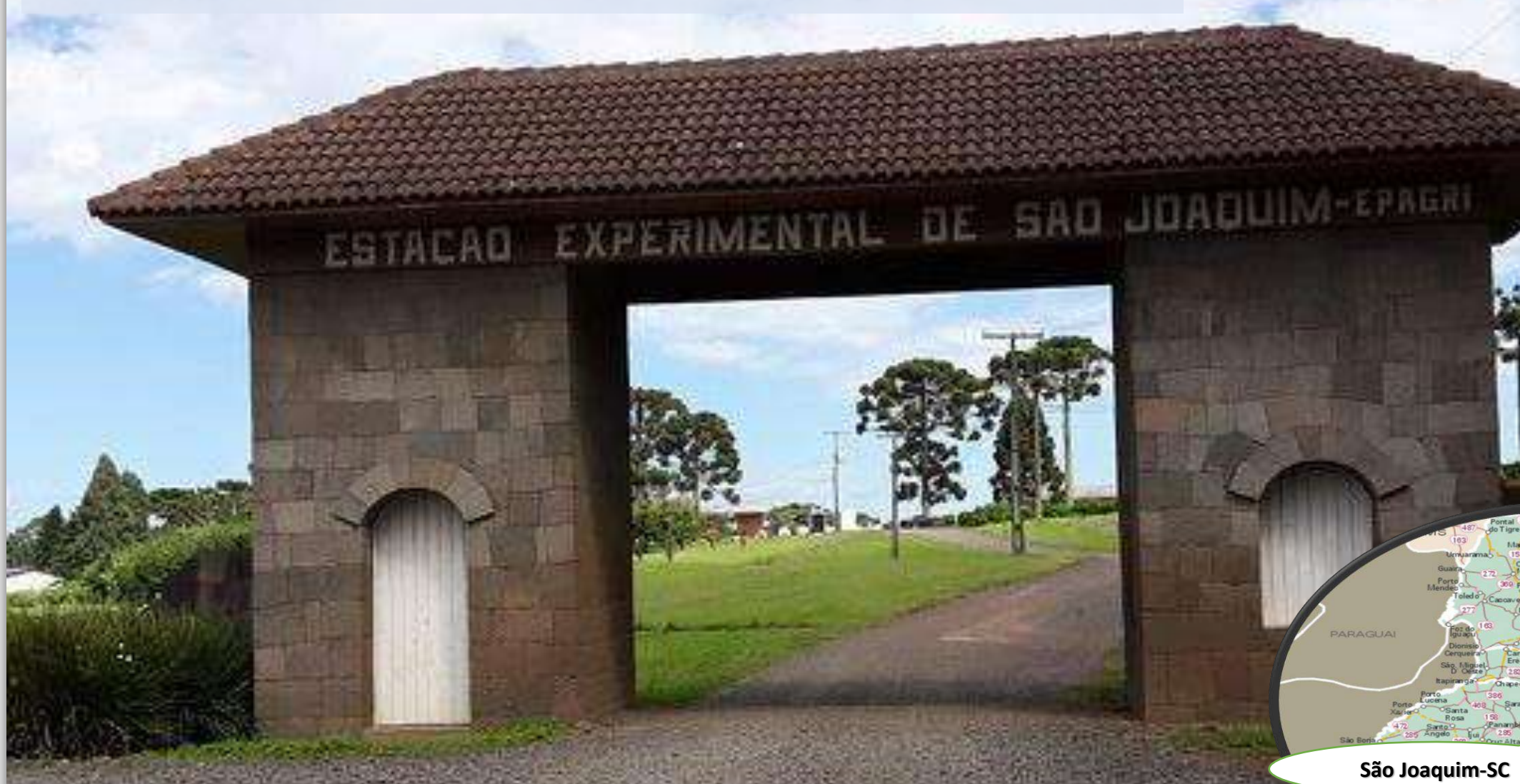
Caçador Experimental Station:

Caçador-SC



Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina – EPAGRI
Estação Experimental de Caçador

São Joaquim Experimental Station:



Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina – EPAGRI
Experimental Station of São Joaquim

The most challenges for Apple production in Brazil...

1st. Low winter chilling accumulation:

Poor budbreak:

Not enough adaptation to *brazilian climate* for most of foreign varieties



Pictures: Frederico Denardi

2nd. High incidence of diseases:

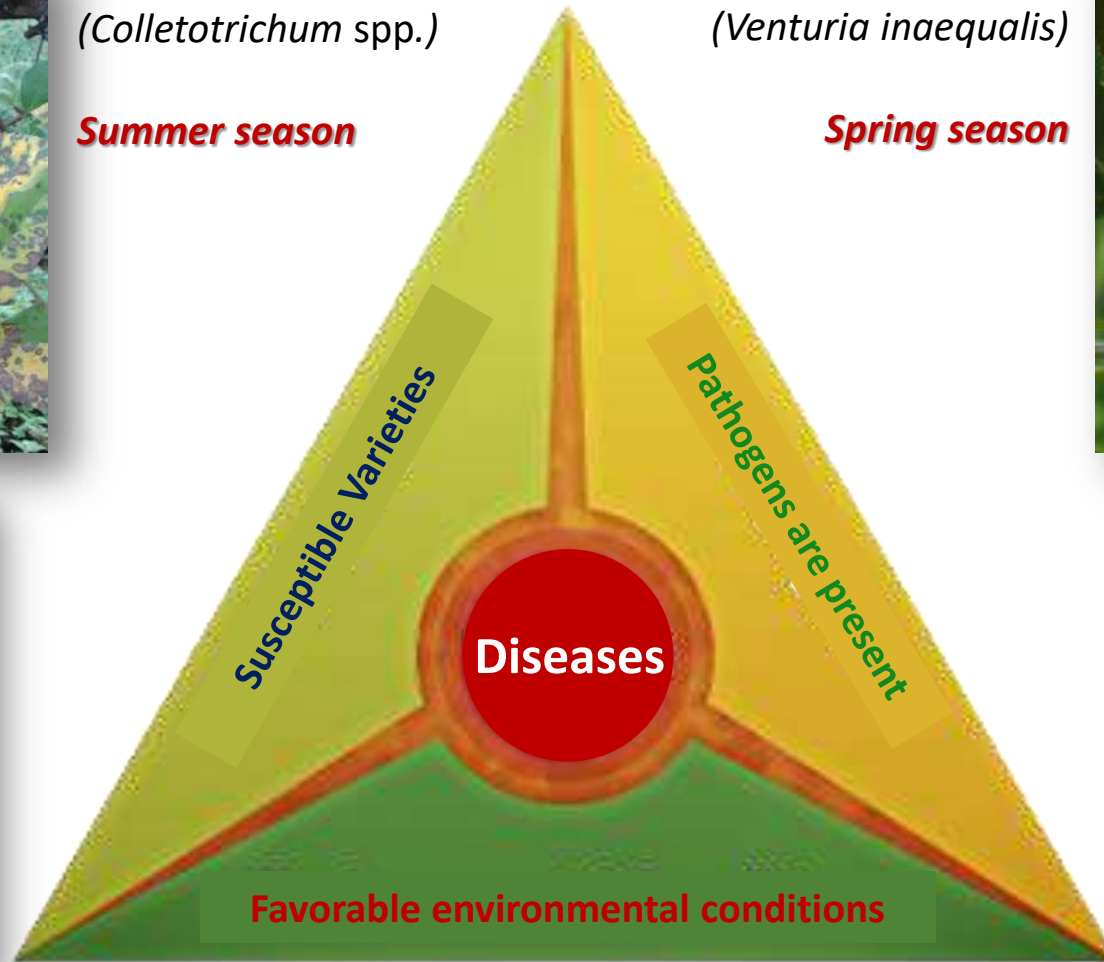


Glomerella Leaf Spot
(*Colletotrichum* spp.)

Summer season

Apple scab
(*Venturia inaequalis*)

Spring season



3rd. Too many fruits to pick in a too short-time window:

Too much **labor hand** required for harvesting all apple production on time
(time window of 60-70 days):

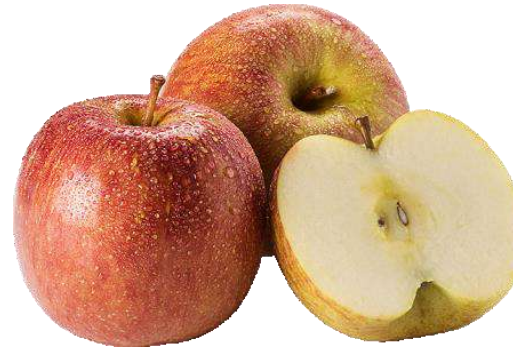


↘ Gala group:

(Imperial Gala, Royal Gala, Galaxy,
Maxi Gala, Baigent)

(60%)

≈ 550.000 a 700.000 ton/year



↘ Fuji group:

(Fuji, Fuji Suprema, Fuji Brak, Fuji
Precoce, Fuji Mishima)

(35%)

≈ 300.000 a 400.000 ton/year

↘ Other:

(Eva, Daiane, Monalisa, Luiza,
Venice, Kinkas, CrippsPink)

(5%)

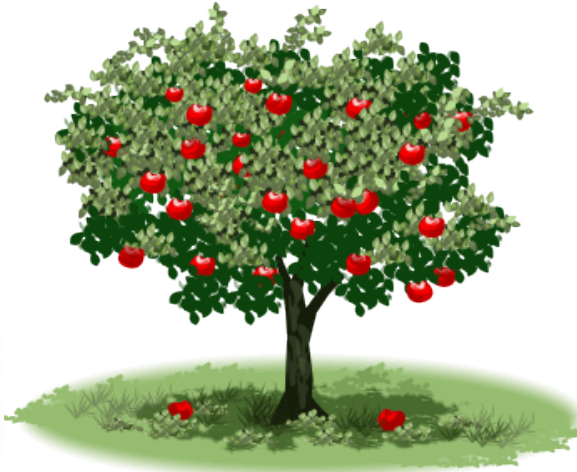
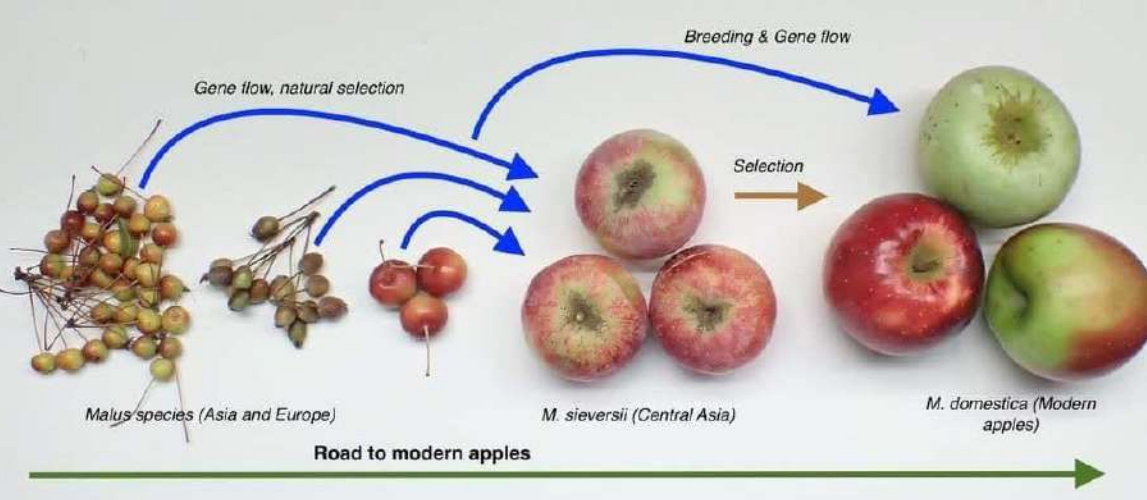
≈ 100.000 ton/year

95%

Epagri's Apple Breeding Program



Since 1972 Improving the Apple Crop in Brazil



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First line of Research:
HYBRID VARIETIES

**16 hybrid varieties
released**

**1 new hybrid variety
coming soon...**



Constantly *improving*

Works with new varieties seek even more flavor options and climate adaptation, besides cultivars geared towards sanity and conservation

Source: Anuário Brasileiro da Maçã 2015. Santa Cruz do Sul: Editora Gazeta, 2015, 72p.



Mutation for the *better*

More economical, research with this

FOCUS IS REINFORCED TO ACHIEVE RESISTANCE TO
GLOMERELLA LEAF SPOT, WITH GOOD PRODUCT COLOR

Source:

Anu rio Brasileiro da Maç  2017. Santa Cruz do
Sul: Editora Gazeta, 201.6, 56p.

**Second line of Research:
NATURAL MUTATIONS**

*5 sport varieties released
(mutations)*

*2 new sports
coming soon...*



The main Goals:

Development of new varieties to serve Growers and Customers

- High eating-quality fruits:
(high sugar content, crispness, juiciness...)
- Low-Medium Chilling Requirement
- Resistance to Apple Scab (*V. inaequalis*) and Glomerella Leaf Spot (*Colletotrichum* spp.)
- Harvesting time different of Gala and Fuji (*Diversification*)
- Long-time fruit storability
- Trees needing less labor hand in orchard:
 - *Plants not too vigours, with lot of spur buds, with open branches*
 - *Flower clusters requiring no thinning (still looking for germplasm)*

A big problem in warm regions



International Partnership:

(Epagri's apple varieties worldwide development)



Long-time partnership
with:



**PLANT MATERIAL
MANAGEMENT**

Introduction through
quarantine

Propagation by Dalival
nursery

Worldwide marketer
and nursery network



SCS417 **Monalisa**



SCS425 **Luiza**



SCS426 **Venice**



Daiane



SCS443 **Isadora**



The most important varieties released by Epagri

21 varieties released until 2022
(16 Hybrids; 5 Mutations)

More options to join Gala and Fuji sports for diversification of harvesting and choices by customers



ifo.

International development

scs417 Monalisa®

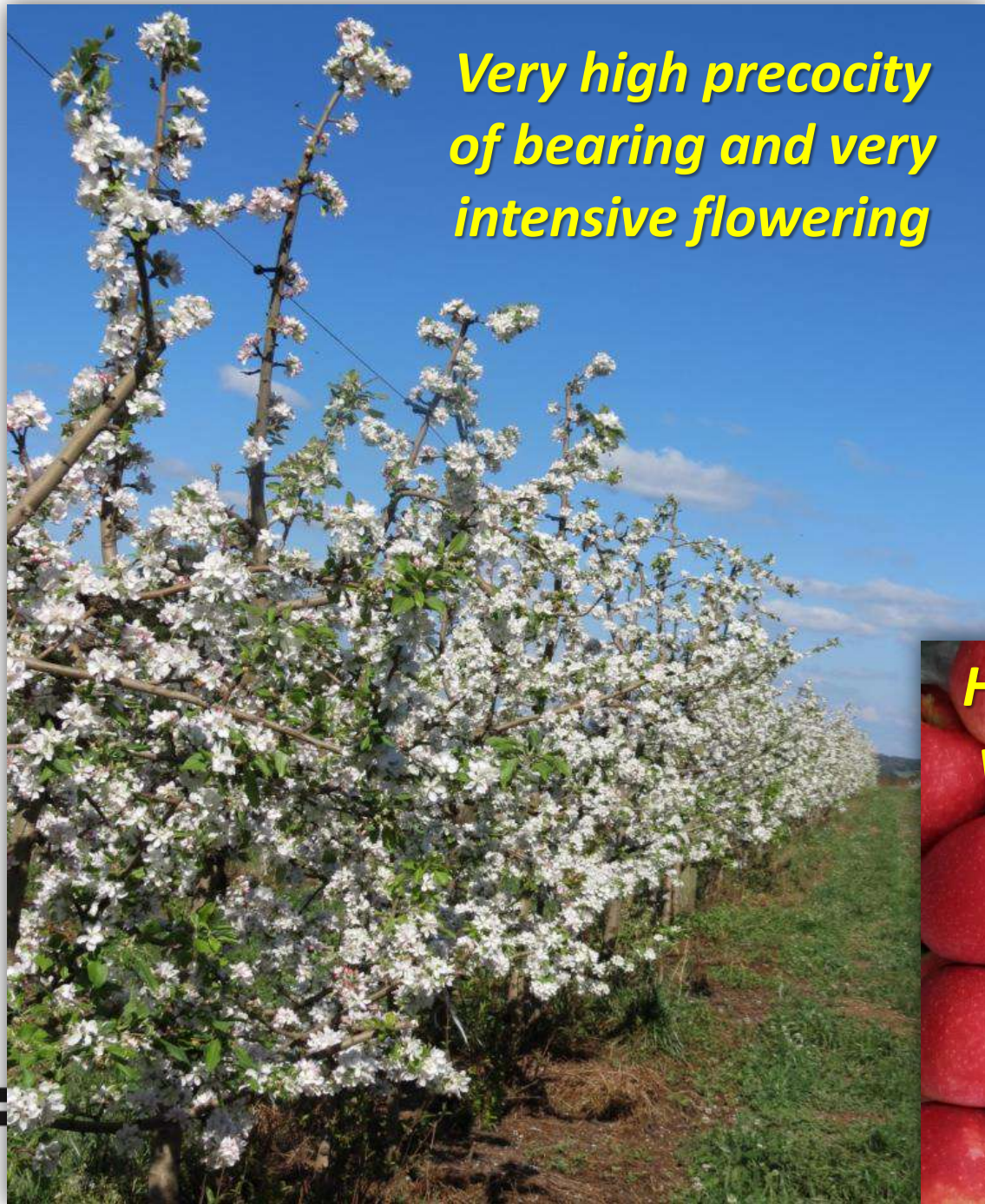
Releasing: 2009

- ✓ Medium chilling requirement (*adapted to warm climates*)
- ✓ High ability to develop spur buds and open branches
- ✓ Resistant to scab (*Rvi₆*) and Glomerella Leaf Spot (*vertical resistance*)
- ✓ Resistant to bitter rots (*G. cingulata*) (*horizontal resistance*)
- ✓ Resistant to red spider mite (*Panonychus ulmi*)
- ✓ Susceptible to marssonina spot (*Marssonina mali*)
- ✓ Early picking time: 7 to 10 days before Gala
- ✓ Very nice fruit appearance, **crunchy** and **juicy** flesh
- ✓ Firm texture, **high sugar content** (>14°Brix), medium/high acidity
- ✓ Storage ability: similar to Gala
(*Warning: sensible to high CO₂ levels in Controlled Atmosphere*)



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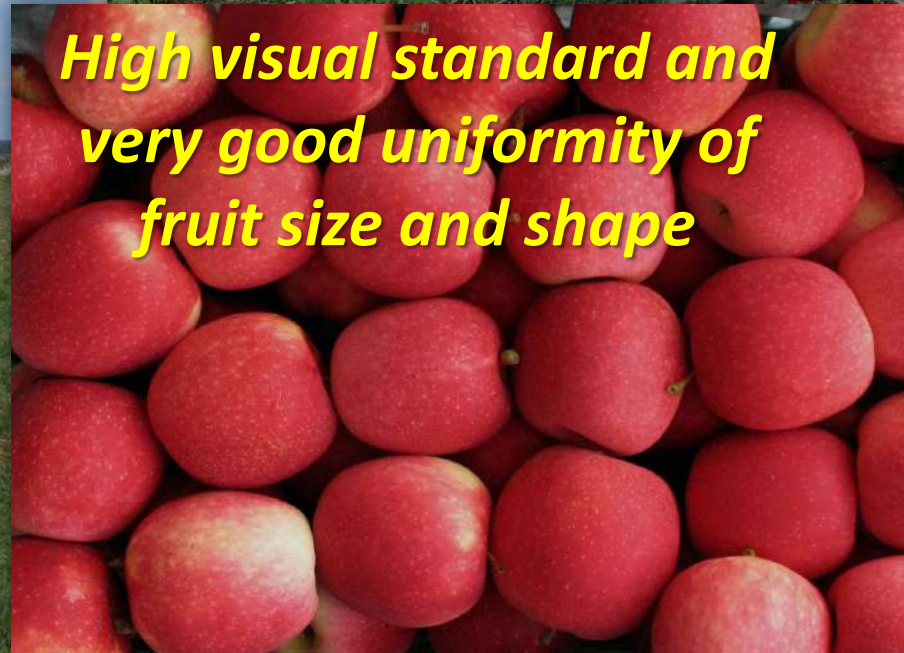
*Very high precocity
of bearing and very
intensive flowering*



SCS417 Monalisa



*High visual standard and
very good uniformity of
fruit size and shape*





- ✓ Adaptation to warm climates
- ✓ Resistant to Glomerella Leaf Spot
- ✓ More tolerant to apple scab than Gala (*but not immune*)
- ✓ More precocious to start production than Gala
- ✓ High yield potential (*high fruit set*)
- ✓ **Very crunchy, very juicy and very sweet**

Brand name:



(by Rivoira Group)



Luiza, Venice, Isadora

info@rivoira.it

RIVOIRA GIOVANNI & FIGLI spa Via Mattona 174/c 12039 Verzuolo CN ITALY



Home

The 3 sisters

Features



Gallery

Contact

English



Discover the advert



Luiza, Venice, Isadora

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Home

The 3 sisters

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**ONE DROP
AND YOU
CAN'T STOP!**



Discover the advert



Particularities of each variety:

- ✓ Good tolerance to bitter rots (*G. cingulata*)
- ✓ Picking time: quite similar to Gala
- ✓ Storage ability: similar to Gala

- ✓ Very high uniformity of fruit size and shape
- ✓ Picking time: mid-march (*after Gala, before Fuji*)
- ✓ Storage ability: very good, *but susceptible to Penicillium spp.*

- ✓ Very wide picking time window
- ✓ Picking time: half april (*after Fuji*)
- ✓ Storage ability: very very good (much better than Fuji)
- ✓ Very low fruit rot on storage





SCS425 **Luiza**



High fruit set



High visual standard and very uniform fruit size and shape



SCS426 Venice



SCS426 VENICE



SCS443 **Isadora**





- ✓ Medium / High Chilling Requirement
(better performance on highlands – not for warm climates)
- ✓ Resistant to Glomerella Leaf Spot
- ✓ Susceptible to apple scab *(similar to Gala and Fuji)*
- ✓ Higher yield potencial than Gala
- ✓ Picking time: mid-march *(between Gala and Fuji)*
- ✓ **Crunchy, juicy, sweet and very good aroma**
- ✓ Storage ability: slightly better than Gala



Daiane



High cropping potential



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SCS441 Gala Gui[®]

Releasing: 2019

✓ **Gala mutation** for good skin color and resistant to Glomerella Leaf Spot

A big problem in warm regions



Royal Gala
(New Zealand)

- * *Poor skin color*
- * *Susceptible to Glomerella Leaf Spot*



Star Gala
(Brazil)

- * *Resistant to Glomerella Leaf Spot*



Gala Gui
(Brazil)

- * *Resistant to Glomerella Leaf Spot*
- * *Good appearance*



✓ Fuji Mutation for good skin color



Fuji
(Japan)

Poor skin color



Fuji Suprema
(Brazil)

** Good skin color*





New varieties to be released

(coming soon...)

Code: **F2P101**



- * *Resistant to Apple Scab (Rvi6)*
- * *Very good eating quality*

Code: **SG17M**



Star Gala Sport

- * *Solid full color / No stripes*
- * *Resistant to Glomerella Leaf Spot*

Code: **CON18M**



Condessa Sport

- * *Super early harvesting (3-4 weeks before Gala)*
- * *Resistant to Glomerella Leaf Spot*

Thank you for your attention!



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