



How policies constrain native seed supply for restoration in Brazil

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Large scale
restoration

International
commitments

350 Mha
by 2030

Native
seeds

Shortage of
supply

Low genetic
diversity and
poor quality

certification or accreditation

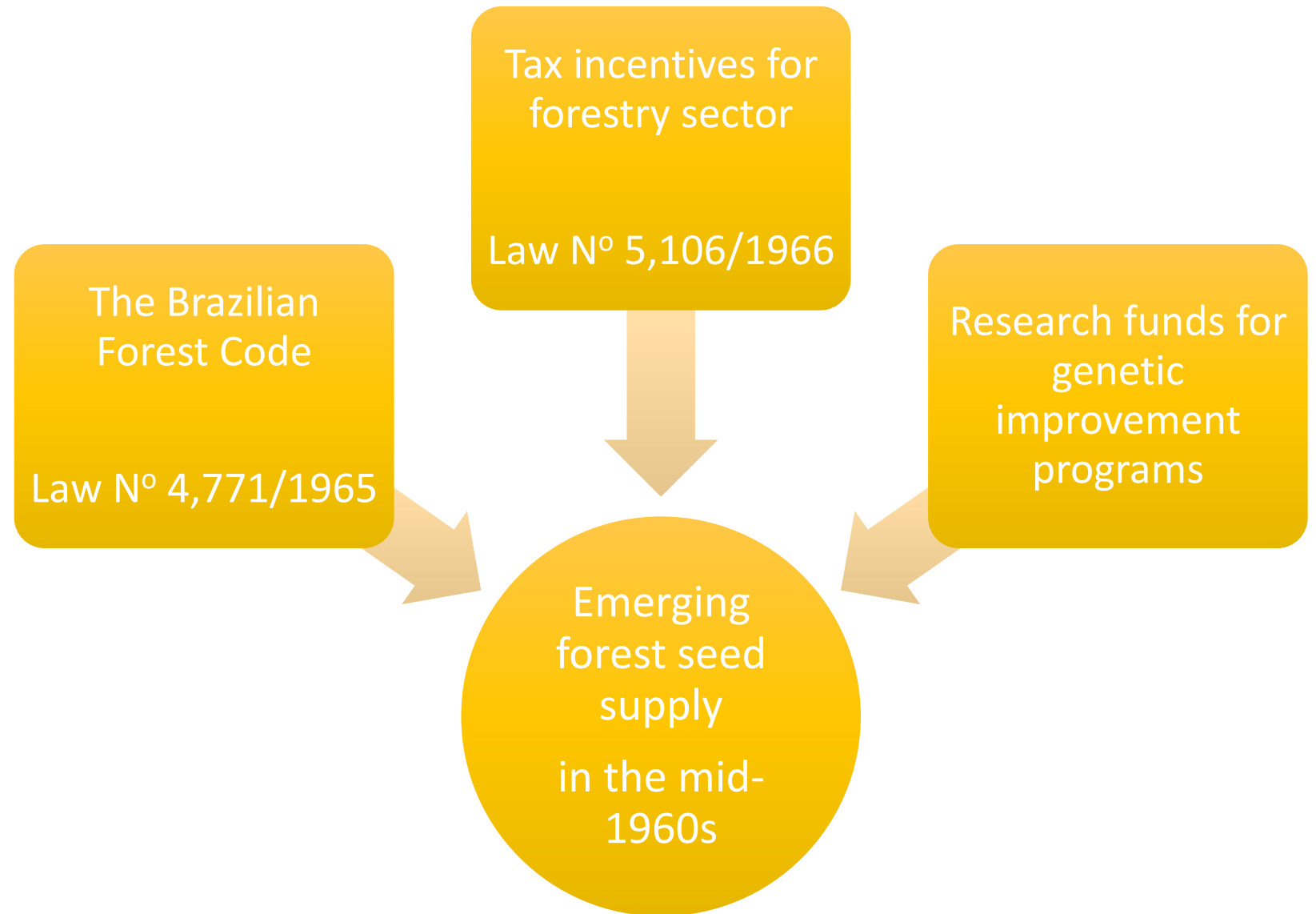


Seed programs In tropical countries

Transformed local smallholders or communities into seed producers

National agencies have established regulations

Large amount of informal production



Highly productive wood industry based on exotic *Eucalyptus* and *Pinus* species



Policies for native seeds

Crop and exotic tree
seed supply



Ensuring quality for the
emerging market

Seed quality applicable to agricultural crops

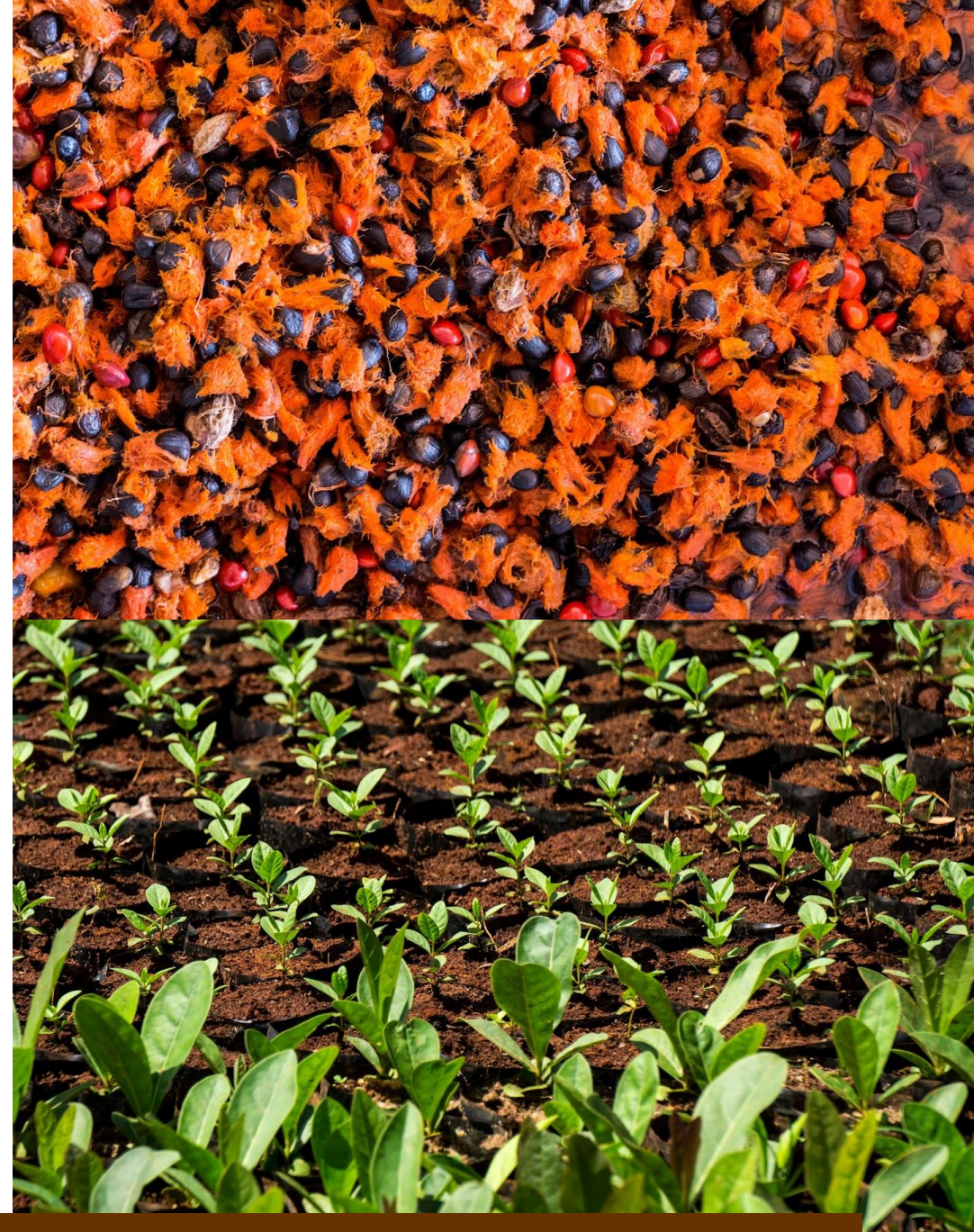
Restoration projects

Seed collectors and producers

Pioneer native seed suppliers:
Atlantic Coast

1990s:
international conservation agenda

Shortage of native seed production in Brazil





Associations
Cooperatives
Enterprises



Mobilize
resources
Enhance local
capacity
Knowledge

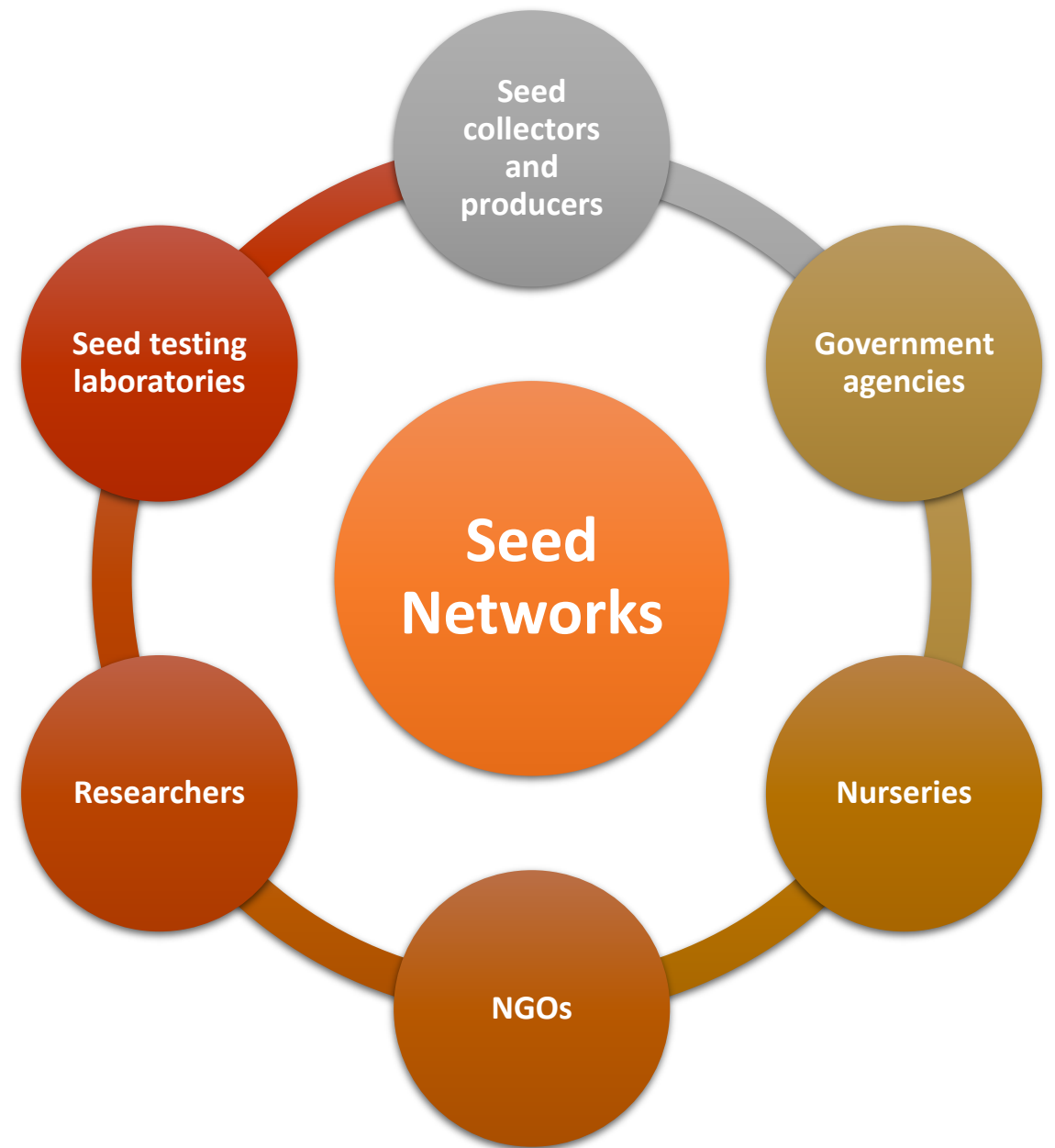
Decentralisation

Native seed supply



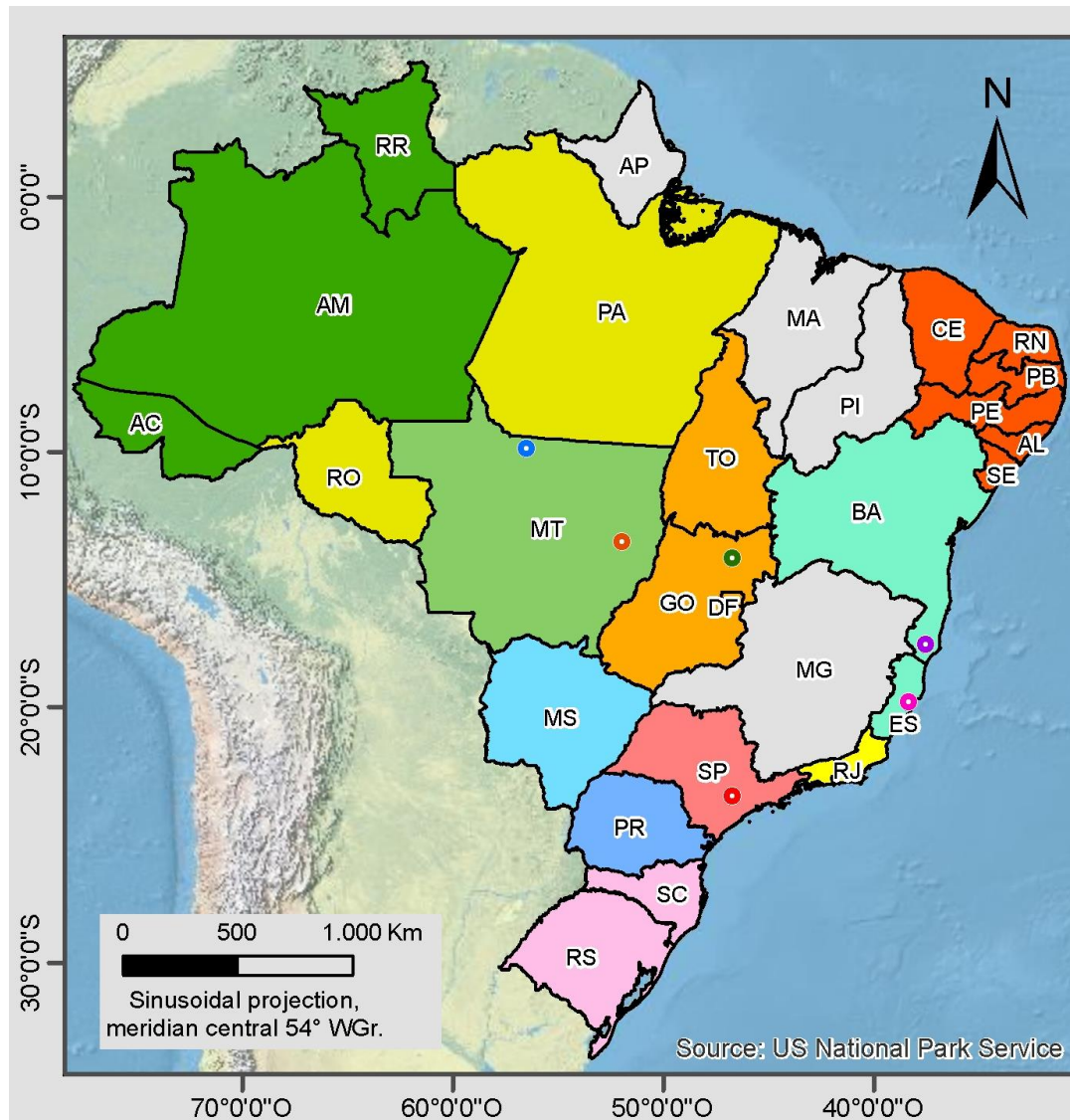
2000's: 1st governmental
funding
Ministry of the Environment

decentralisation strategy
intended devolution of
control over the forest
resources



Seed Networks

- eight seed networks
- different Brazilian Biomes
- funded: US\$ 3.7 million



Brazilian States with Seeds Networks created by Ministry of the Environment:

- Rioesba
- Western Amazon
- Meridional Amazon
- Rio-São Paulo
- Rio-São Paulo and Rioesba
- Caatinga
- South
- South and Pantanal
- Meridional Amazon and Pantanal
- Cerrado
- Pantanal
- State without Seed Network

Map developed by Nucleo de Monitoramento de Canarana, Instituto Socioambiental, december 2017

Sources:

State boundary: IBGE/DGC. Cartographic Base Continuing to the millionth – BCIM: version 3.0. Rio de Janeiro, 2010 ; Emerging Native Seeds Networks: ISA, 2017 ; Brazilian States with Seed Networks: Ministry of the Environment - National Environment Fund, 2002 ; Background image: World Physical Map - available in: <http://www.arcgis.com/home/item.html?id=c4ec722a1cd34cf0a23904cdf8923a0>



National Seeds and Seedlings System

Law nº
10,711/2003 &
Decree nº
5,153/2004

Regulations for
forest seed
production

MAPA +
Advisory
commission



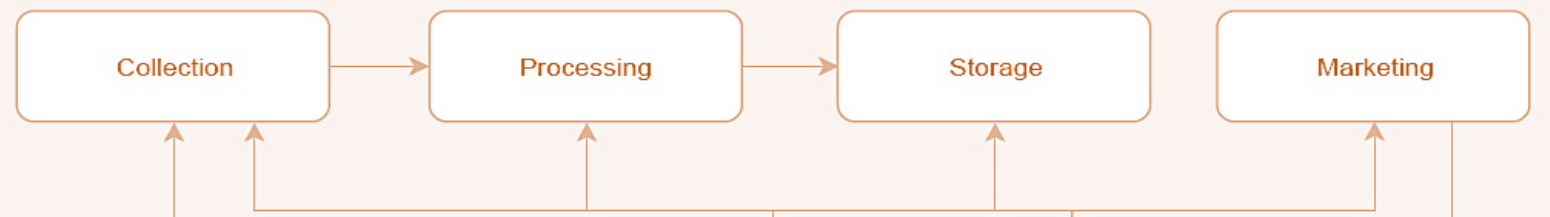
More detailed
processes for
forest and
native seed



Normative
Instruction nº
56/2011
substituted by
nº 17-19/2017

Brazilian System for Seeds and Seedlings

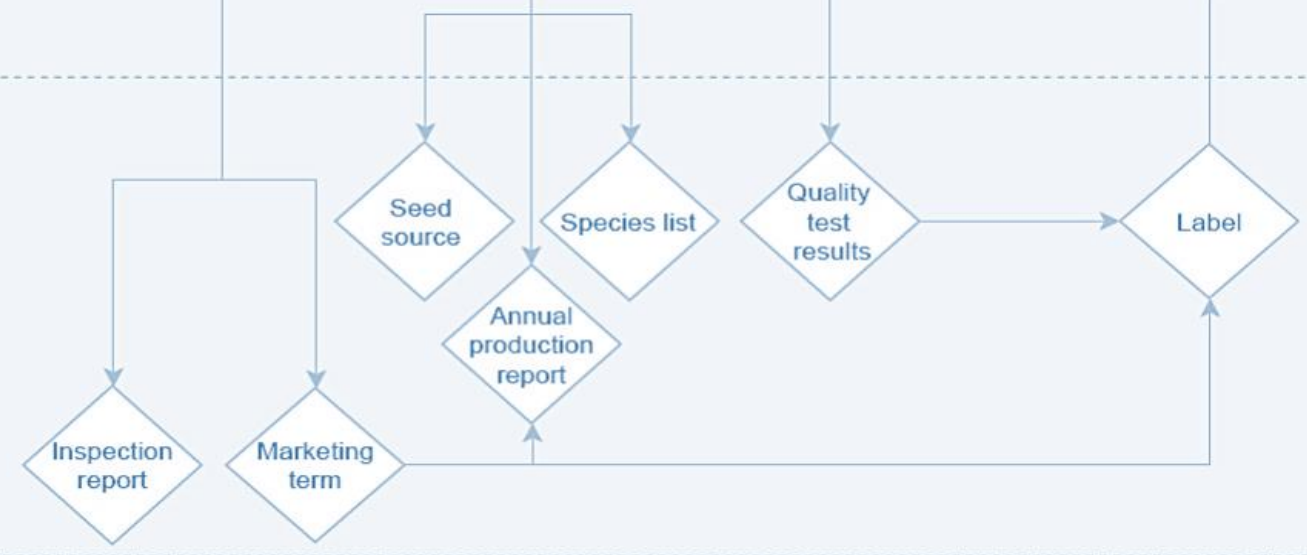
Seed production



Stakeholders



Mandatory documents



FOREST SEEDS COMMERCIAL TERM

Document

Number: ...

Identification of the seed producer

Producer's name: ...

Number of National Registry of Seed and Seedlings: ...

Commercial contacts: ...

Location: ...

I ensure the seed lots listed below were produced according to the norms and standards established by the Ministry of Agriculture, Livestock and Supply (MAPA) which I assume responsibility for identity and quality:|

Specie name	Commom name	Source Class	Selection criterium	Isolation	Collection site	Seed lot number	Number of mother trees	Total weight (kg)	Number of Quality analysis bulletin	Purity (%)	Germination (%)	Best before
...	*	*

* do not applied for Source identified class

Technical responsabel name: ...
 Number of National Registry of Seed and Seedlings for the technical responsabel: ...
 Professional registration number for the technical responsible: ...
 Technical responsible location and contacts: ...

Producer's Name

Number of National business registration: ...		Number of National Registry of Seed and Seedlings: ...	
Species name: ...		Commom name: ...	
Source category: Identified		Lot n°: ...	
Collection Date: ...		Collection site: ...	
Net weight (kg): ...		Number of seeds/kg: ...	
Seed Quality testing	Best before: ____ / ____ / ____		
Germination (%): ...	Purity (%):

✉️ 📍 Producer's location and contacts

Knowledge

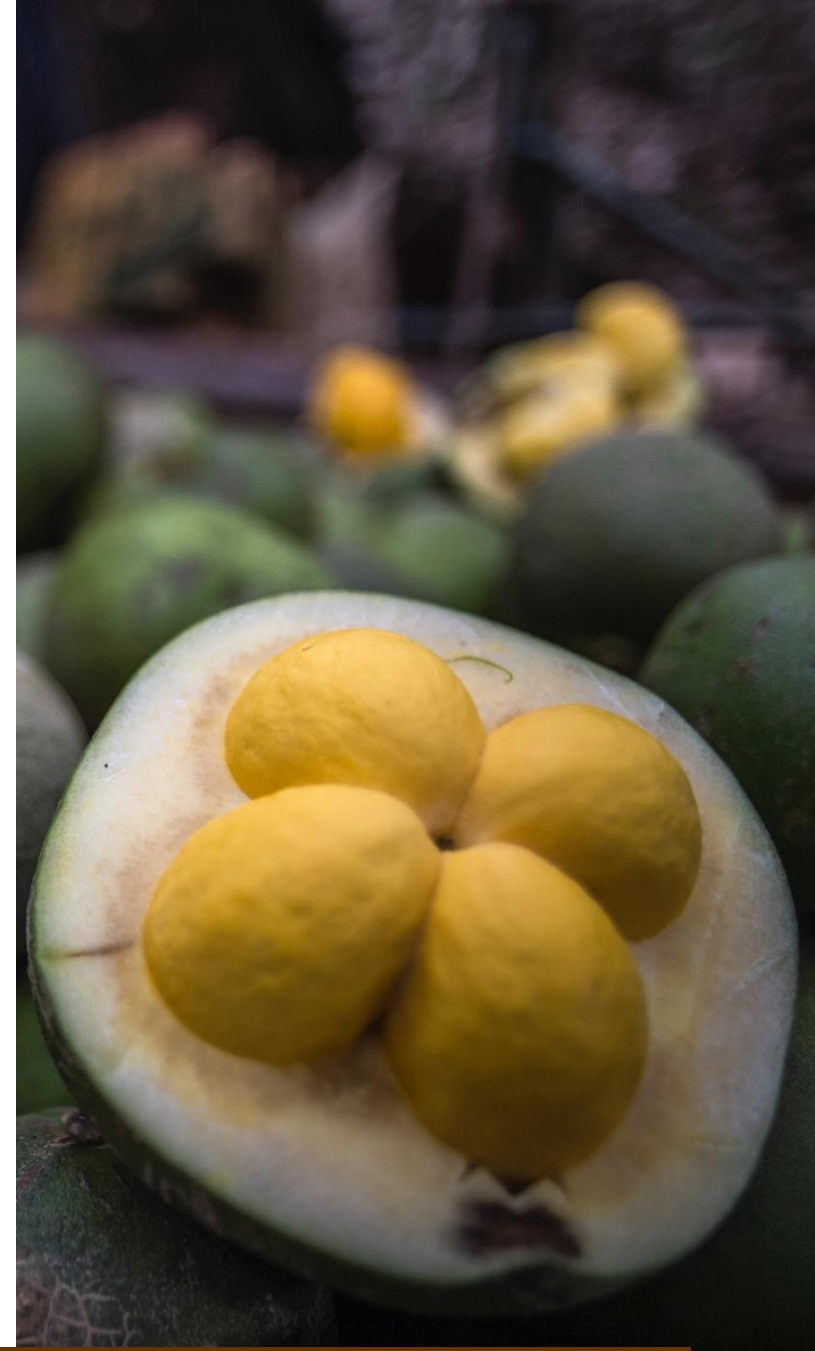
- 51 forest species with validated seed testing
- 300 forest species with seed testing instructions

Structure

- 16 labs operate with native and forest seed quality testing
- the south and southeast regions of Brazil

Management

- excessive technical procedure
- administrative process
- high costs





Native seed production is essentially a community-based activity

Advances: Normative Instruction N° 17-19/2017



Structure

- seed testing in non-accredited laboratories to be permitted until 2020

Technical

- exemption from mandatory quality testing for recalcitrant seed;
- technical assistance beyond forest engineers and agronomists

Commercial

- Trade mixed native seeds for direct seeding

Excessive bureaucratization: key barriers to upscaling seed supply

developing countries



restrictive seeds laws



informal channels



collectors and producers are ‘invisible’

Biome	Formal collectors (n)	States (n)
Amazon	63	4
Atlantic Coast	129	7
Caatinga	1	1
Cerrado	71	5
Pantanal	-	-
Pampa	-	-
Total	264	14

Seed Networks

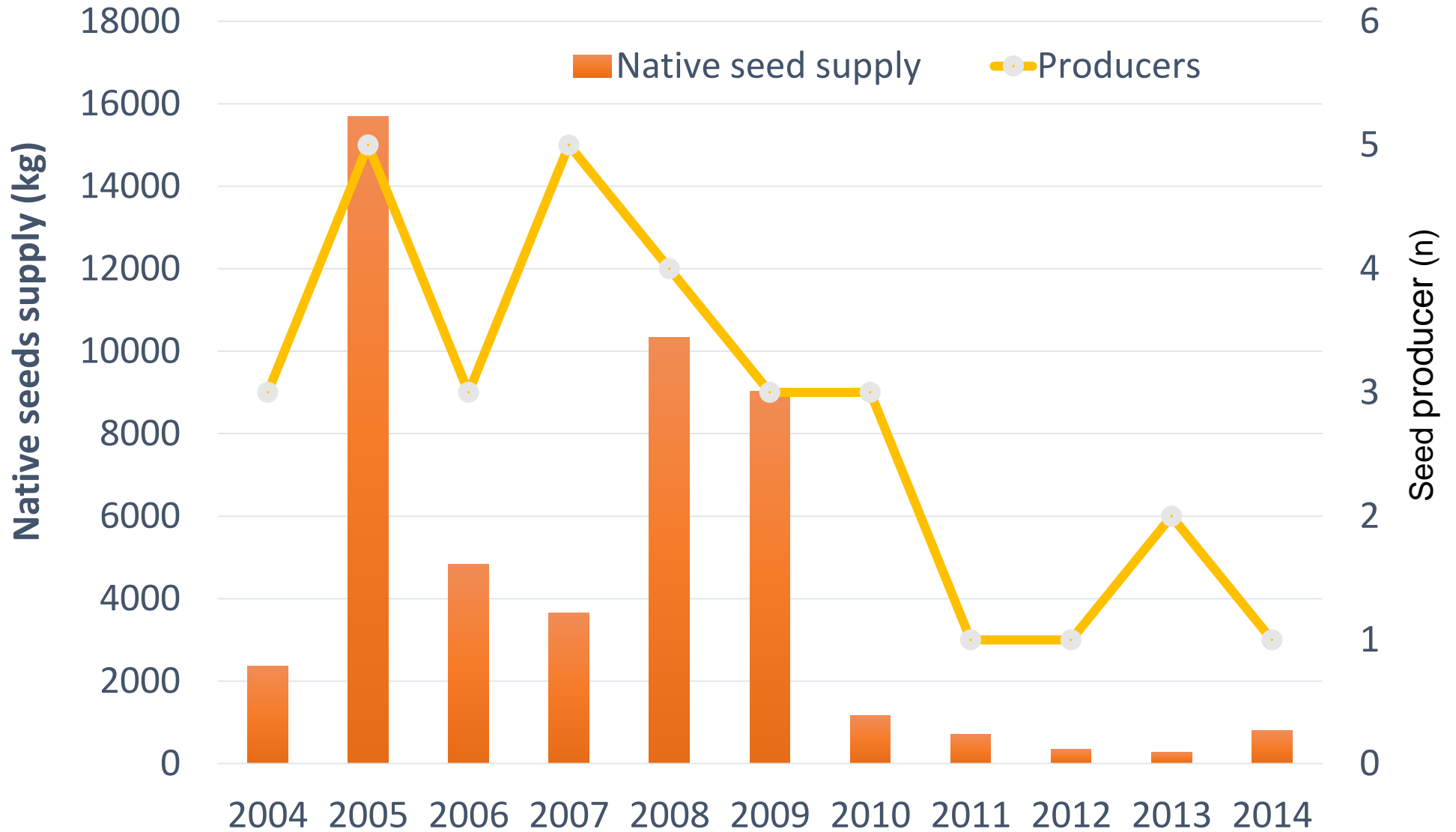


Expertise related to seed technology and training:

- creating technical parameters
- on-line system of information: 10,000 mother trees
- training stakeholders: 2,500 people
- diagnosing seed marketing



Rio-São Paulo Seed Network



Emergent community-based organisations

Commercial seed supply

Native Vegetation Protection Policy

international agreements on climate change

Brazilian restoration target of 12 Mha by 2030





Programa Arboretum
de Conservação e Restauração da Diversidade Florestal



ACSCP
Associação dos
Coletores de
Sementes
Cerrado de Pé



REDE de
sementes
do XINGU



COOPPROJIRAU

Cooperativa dos Produtores Rurais
do Observatório Ambiental Jirau



sementes do
portal



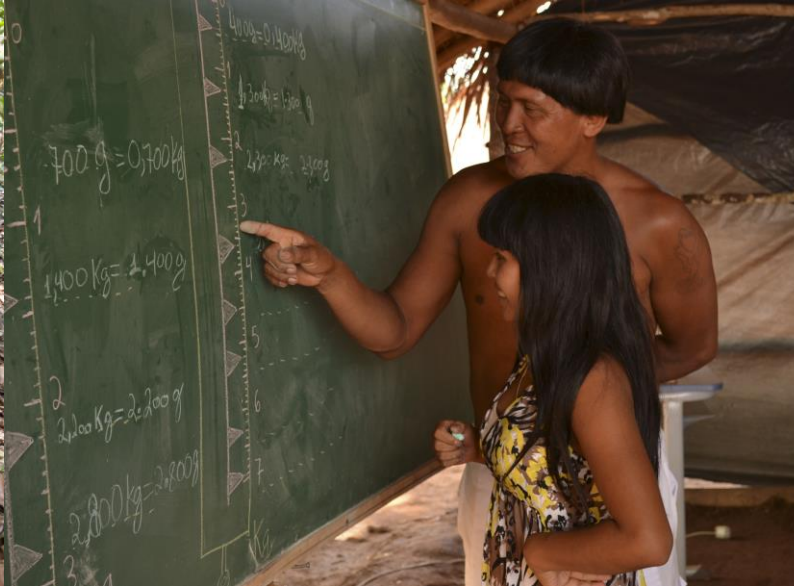


Trust

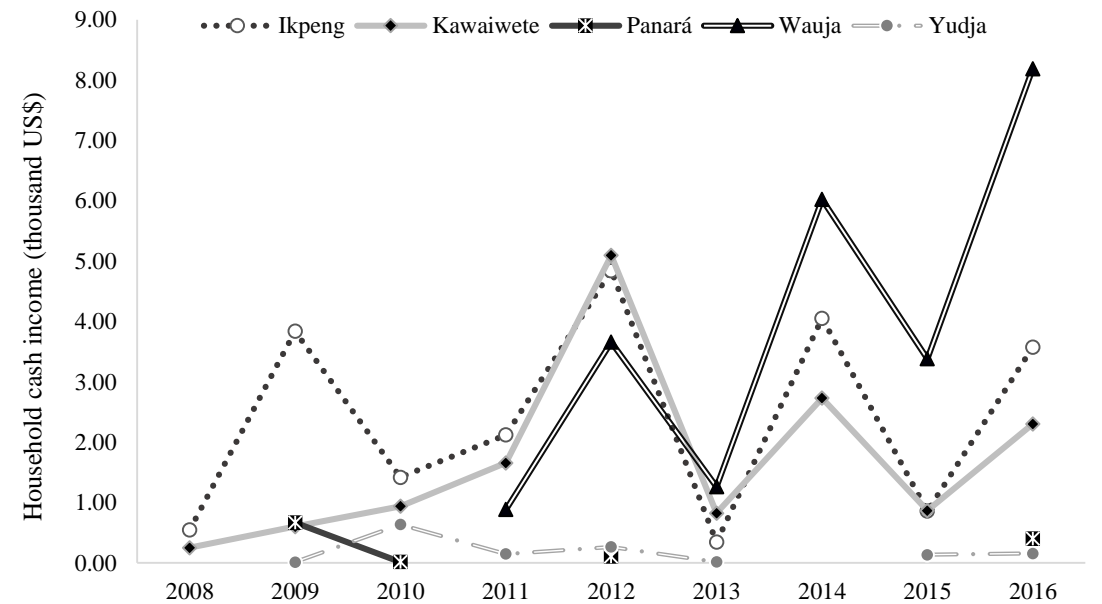


Institutions

- general agreements
- local arrangements

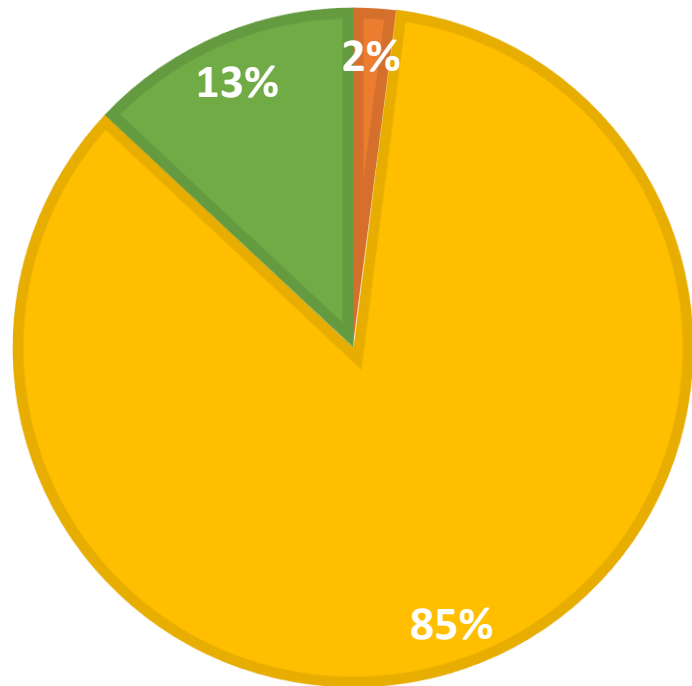


Ethnicity	Collectors	Gender		Age (years)		Experience in seed collection (years)	
		n	Male %	Female%	m	1 STD	m
Ikpeng	67	6.0	94.0	36.1	14.1	7.3	1.7
Kawaiwete	54	37.0	63.0	34.3	15.0	4.1	2.9
Panará	6	-	100	24.8	2.3	5.0	-
Wauja	40	32.5	67.5	38.3	13.2	4.8	0.8
Xavante	56	3.6	96.4	40.7	19.2	4.8	1.5
Yudja	9	66.7	33.3	20.0	6.8	0.7	1.1
Total for indigenous group	232	19.4	80.6	35.5	14.9	5.2	2.3
Total for Network	385	34.3	65.7	41.16	19.76	5.16	2.74



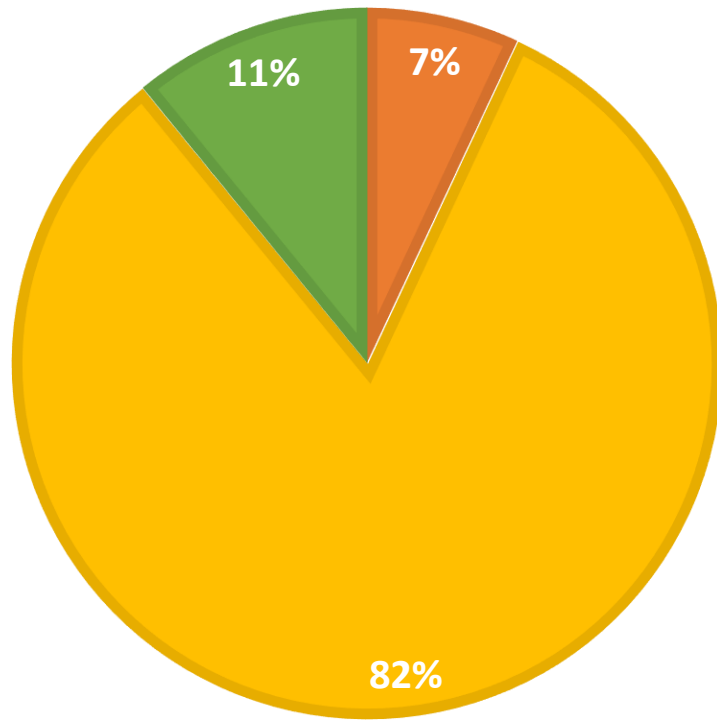
AWARNESS ABOUT SEED LAWS

Yes No Partially

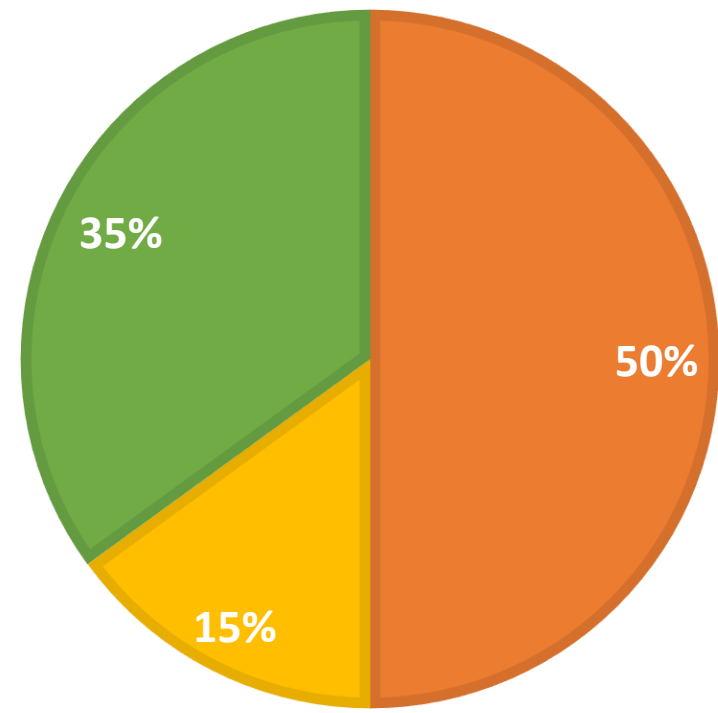


2012

PAY FOR TECHNICAL SUPPORT



LOCAL SEED TESTING



2015 – RENASEM

	Early Seed Networks
Main stakeholders	Governmental agencies Public universities
Funding	Specific governmental announcement
Main actions	Seed technology research Forest seeds commissions Training courses
Outcomes	Technical protocols Quality control tests Seed regulations



Workshop on Seeds for large-scale restoration

- 69 participants (42.3% women)
- 11 countries (72.46% from Brazil)



Seed origin and identity

Seed collection areas:
georeferencing

Seed orchards: species that are
less available in the seed market

RNC must update constantly the
species' scientific names





**Registration of laboratories
without the current
standard requirements**

**Universities and research
institutes: key role for seed
quality testing**

**Relaxation of the
laboratory
accreditation process**

Purity test and identity

**Alternative seed testing:
faster, cheaper and easier
procedures**



**Research to
provide
technological
innovation**



Foster markets for native seeds for restoration

legal restoration requirements

inspections for demanding restoration

governmental plan: purchase seed to support small farmers and local communities

Support local, diverse and small businesses

strategic business planning
access to funding support and investments

commercial arrangements with partnerships

Legal improvement should also consider specific conditions for small producers (<500 kg seed yearly)

Implications for practice

- **regulations:** native seed for restoration x improved plant material for the forestry industry

- The **identity and origin** of native seed = genetic variability in restoration programs;

- **accredited laboratories** prevents formal recognition of local native seed suppliers

- Multiple stakeholder **participation** in policy decision-making processes

- **Governmental support** for structuring market and technological innovation.





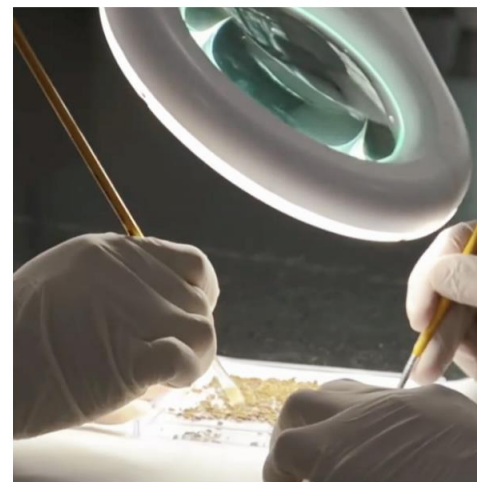
COLETORES E PRODUTORES



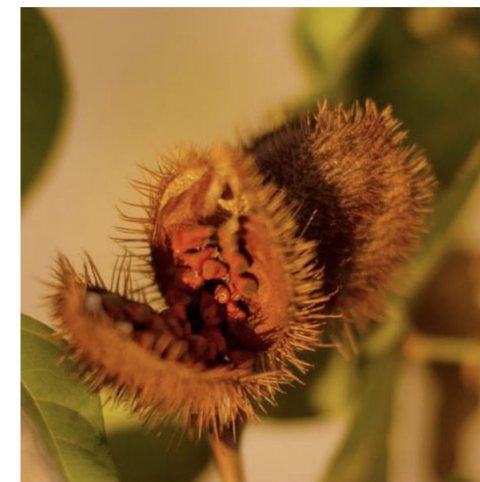
REDES E PROGRAMAS



LABORATÓRIOS



GRUPOS DE PESQUISA





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