UPOV
International Union for the Protection of New Varieties of Plants

E

Technical Working Party for Fruit Crops

Fifty-Fourth Session
Nîmes, France, July 3 to 7, 2023

TWF/54/3

Original: English
Date: July 20, 2023

REPORTS ON DEVELOPMENTS IN PLANT VARIETY PROTECTION FROM MEMBERS AND OBSERVERS

Document prepared by the Office of the Union

Disclaimer: this document does not represent UPOV policies or guidance

1. The Technical Committee (TC), at its forty-seventh session, held in Geneva from April 4 to 6, 2011, agreed to request the Office of the Union to invite experts to submit written reports to the Office of the Union in advance of the Technical Working Party (TWP) sessions in order that a document containing those reports could be prepared by the Office of the Union. The TC noted that TWP experts would be invited to make a brief oral summary of their written report at the session and would also be encouraged to make reports under the agenda item "Experiences with new types and species", as appropriate. The TC also noted that TWP experts would have an opportunity to raise questions concerning matters of interest (see document TC/47/26 "Report on the Conclusions", paragraphs 9 and 10).

2. Written reports were invited by the Office of the Union in Circular E-23/080 of April 26, 2023. The following reports were received (in alphabetical order):

- Members of the Union: Annexes I to X: Australia, China, European Union, France, Germany, Japan, Kyrgyzstan, Netherlands, New Zealand and South Africa

3. The reports from Australia, China and France include content presented during the fifty-fourth session of the TWF.

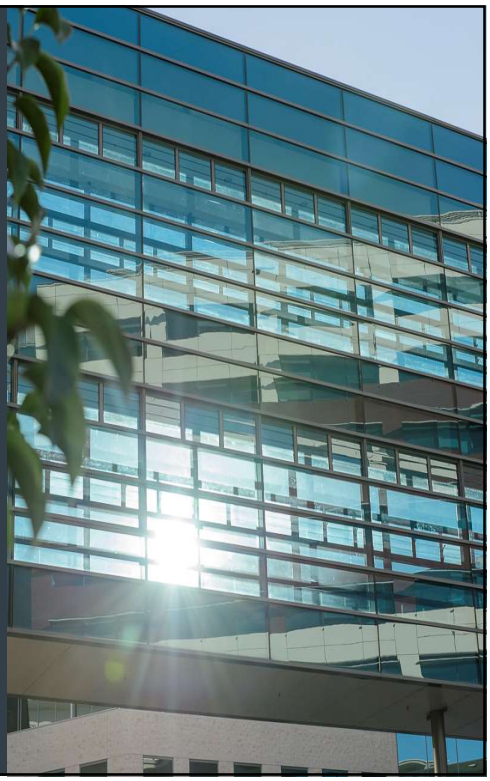
[Annexes follow]

Australian Government
IP Australia

04 July 2023

New Australian PBR Database Search

Barkat Mustafa,
PBR Office
IP Australia

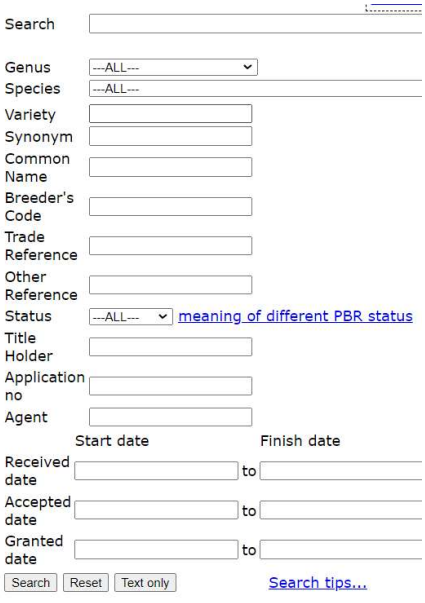


2

Australian PBR Database Search

-Searchable Database
-Over 10000 searchable records
-Provides information on accepted and granted varieties.
-Variety description and image available for granted varieties

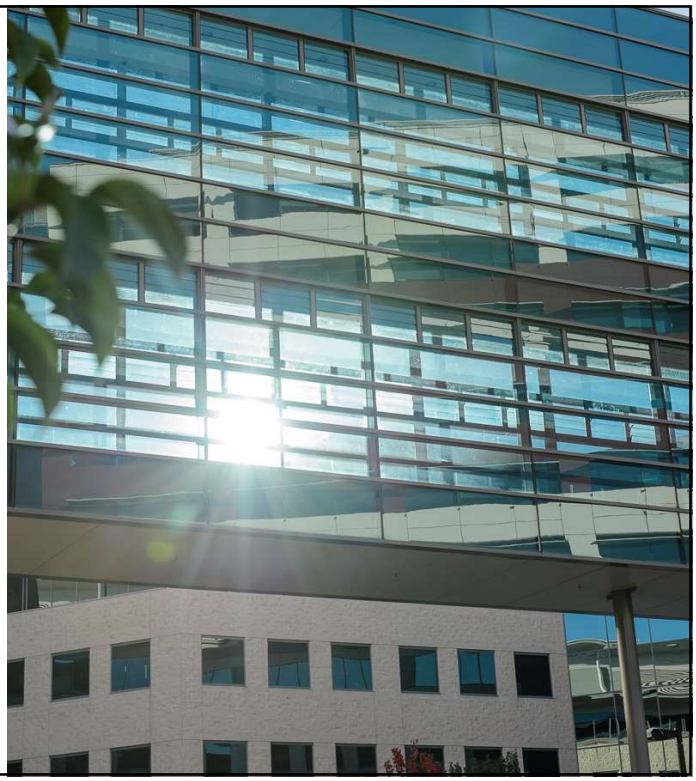
However,
-the database over 20 year old
-running on old technology



Australian Government
IP Australia

PBR Modernisation Initiatives

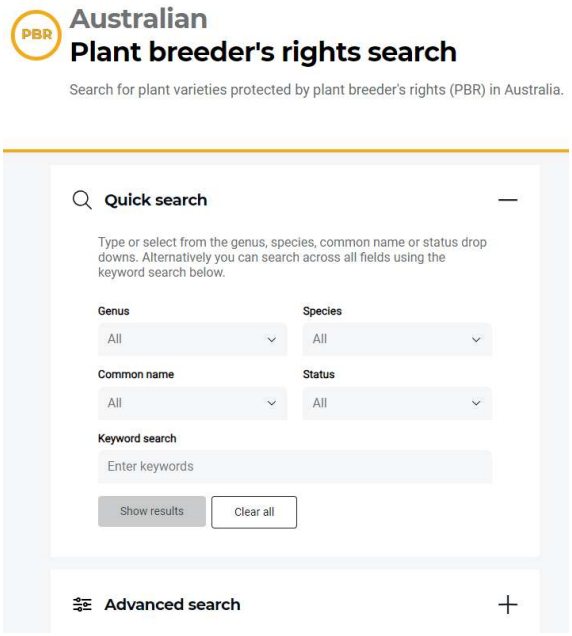
-Extensive stakeholder consultation
-Policy Research
-Modernisation of IT Systems
-New PBR Administration System
-New Records Management System
-New PBR search database



4

New Australian PBR Database Search

-Searchable Database
-Over 10000 searchable records
-Quick Search
-Advanced Search
-Searchable by
    Genus
    Species
    Common name
    Application status
    Key words



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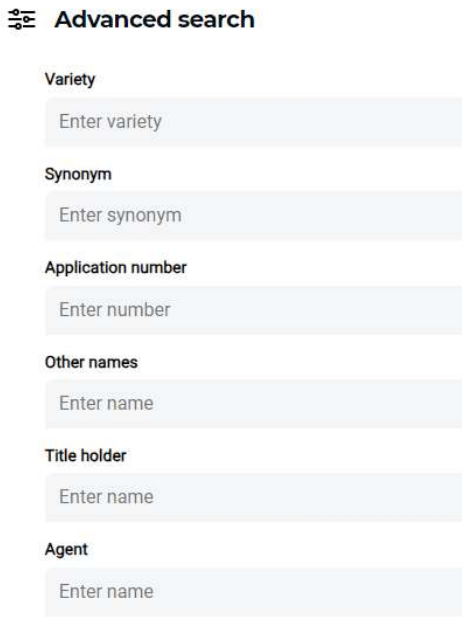
New Australian PBR Database Search

- Advanced Search
-Searchable by
    - Variety name,
    - Synonym
    - Application Number
    - Other names
    - Title holder
    - Agent name



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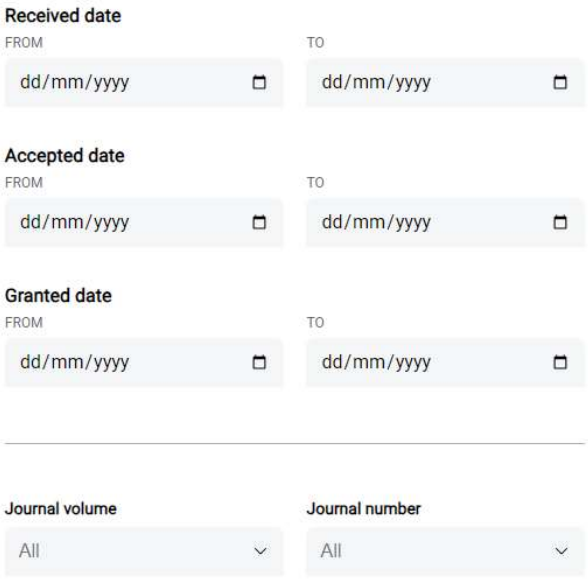
New Australian PBR Database Search

- Advanced Search
-Searchable by
    - Application date,
    - Acceptance date
    - Granted date
    - Other names
    - Journal details



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New Australian PBR Database Search

Search for Kangaroo Paw returns 76 hits

Thumbnail view
✔ List view

Common name	Genus species	Variety	Title ho		Application number
Apple	*(Malus domestica)*	Pinkie	Prevar Limited	Withdrawn	2005/026
Apple	*(Malus domestica)*	RS103-130	The State of Queensland acting through the Departme...	Granted	2005/278
Apple	*(Malus domestica)*	Co-op 39	Purdue Research Foundation	Granted	2007/144
Apple	*(Malus domestica)*	DG202	Denis Carniel and Giovanna Carniel	Withdrawn	2007/170
Apple	*(Malus domestica)*	Fugachee Fuji	Brandt's Fruit Trees Inc.	Granted	2007/257
Apple	*(Malus domestica)*	Burkitt Gala	BMA TRUST c/-Dr Mark Burkitt	Granted	2007/258
Apple	*(Malus domestica)*	Fuji Supreme	CABP4 LIMITED	Granted	2007/307
Apple	*(Malus domestica)*	Early Cripps Pink	Teak Enterprises Pty Limited	Granted	2008/116
Apple	*(Malus domestica)*	CIVG198	C.I.V. - CONSORZIO ITALIANO VIVAISTI - SOCIETA...	Granted	2008/205

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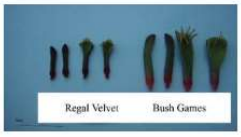
New Australian PBR Database Search

Search for Kangaroo Paw returns 76 hits

Kangaroo Paw
(Anigozanthos hybrid)
KPTAIL
Botanic Gardens and Par...
Accepted
2021/082

Kangaroo Paw
(Anigozanthos hybrid)
KPWORKS
Botanic Gardens and Par...
Accepted
2021/084

Kangaroo Paw
(Anigozanthos hybrid)
Amber Velvet
George Lullfitz
Granted
2005/047



Kangaroo Paw
(Anigozanthos hybrid)
Regal Velvet
George Lullfitz
Granted
2006/012

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New Australian PBR Database Search

Detailed variety record:

Kangaroo Paw

(Anigozanthos hybrid)

Summary

Variety	KPWORKS
Synonym	N/A
Common name	Kangaroo Paw
Breeders' code	15/540
Trade reference	N/A
Other reference	A17-1286
Certificate number	N/A
Application number	2021/084
Status	Accepted

Dates

Anigozanthos hybrid 'KPWORKS' and its comparator.

View large image

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New Australian PBR Database Search

Large image of the variety

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New Australian PBR Database Search

Provides application details

Dates

Received	30-Mar-2021
Rejected	N/A
Refused	N/A
Accepted	19-May-2021
Withdrawn	N/A
Granted	N/A
Terminated	N/A

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New Australian PBR Database Search

Provides applicant details

Detailed variety description available

Ownership

Title holder	Botanic Gardens and Parks Authority
Genetic resource centre 1	1 Kattidj Close, Kings Park, WA 6005
Agent	Ramm Botanicals Pty Ltd as a trustee for the Ramm Botanicals Trust
Phone number	0243512099

Download

Download a detailed description of the variety.

2021084
WORD DOCUMENT

New Australian PBR Database Search

Detailed variety description:

-Application details
-Comparative trial details
-Information on breeding
-Grouping characteristics
-Most similar VCK name
-Characteristics of the variety and most similar VCK

Details of Application

Application Number	2021/084
Variety Name	'KPWORKS'
Genus Species	Anigozanthos hybrid
Common Name	Kangaroo Paw
Accepted Date	19 May 2021
Applicant	Botanic Gardens and Parks Authority, Kings Park, WA, Australia
Agent	Ramm Botanicals Pty Ltd as a trustee for the Ramm Botanicals Trust, Kangy Angy, NSW
Qualified Person	Hannah Clifton

Details of Comparative Trial

Location	Kangy Angy, NSW
Descriptor	TG/175/4
Period	January - September 2022
Conditions	Tissue cultured plants of the candidate and comparator varieties were potted into 140mm standard black plastic pots. 6g of Nutricote Total+TE 180 day was incorporated into the media of each pot at planting. No supplementary fertilizer was used. Plants were grown in an open sided, plastic covered structure with daily exposure to natural sunlight. The potting media was a general purpose type consisting of composted pine bark and coir with a pH of 5.7-5.9. No pest or disease was encountered during the trial.
Trial Design	12 plants each of the candidate variety and comparator were arranged in a randomised manner.
Measurements	Observations were taken from 10 randomly selected plants in accordance with the technical guideline. Measurements were taken when the plants were in full flower with the flower on the main inflorescence fully open.
RHS Chart - edition	Sixth edition 2015

Origin and Breeding

'KPWORKS' was developed as part of a breeding program for Kangaroo Paw for garden and pot use conducted at Kings Park, Botanic Gardens, Perth, WA. 'Proprietary breeding plant 20121100'was self-pollinated in 2015. Mature seed was harvested in 2016 and germinated in vitro at Ramm Botanicals in 2017. Tissue cultures of 'KPWORKS' were transferred to the Nursery in 2018. Tissue culture productivity and nursery pot trials were conducted throughout 2019 and 2020. 'KPWORKS' was selected based on its unique flower colour and attractive pot presentation. Breeder: Digby Growns, Botanic Gardens and Parks Authority, Kings Park, WA, Australia.

Choice of Comparators: Characteristics used for grouping varieties to identify the most similar Variety of Common Knowledge

Organ/Plant Part	Context	State of Expression in Group of Varieties
Plant	height	very short to short
Inflorescence	ramification	absent
Perianth lobes	reflexing	strong
Ovary	colour of hairs	red

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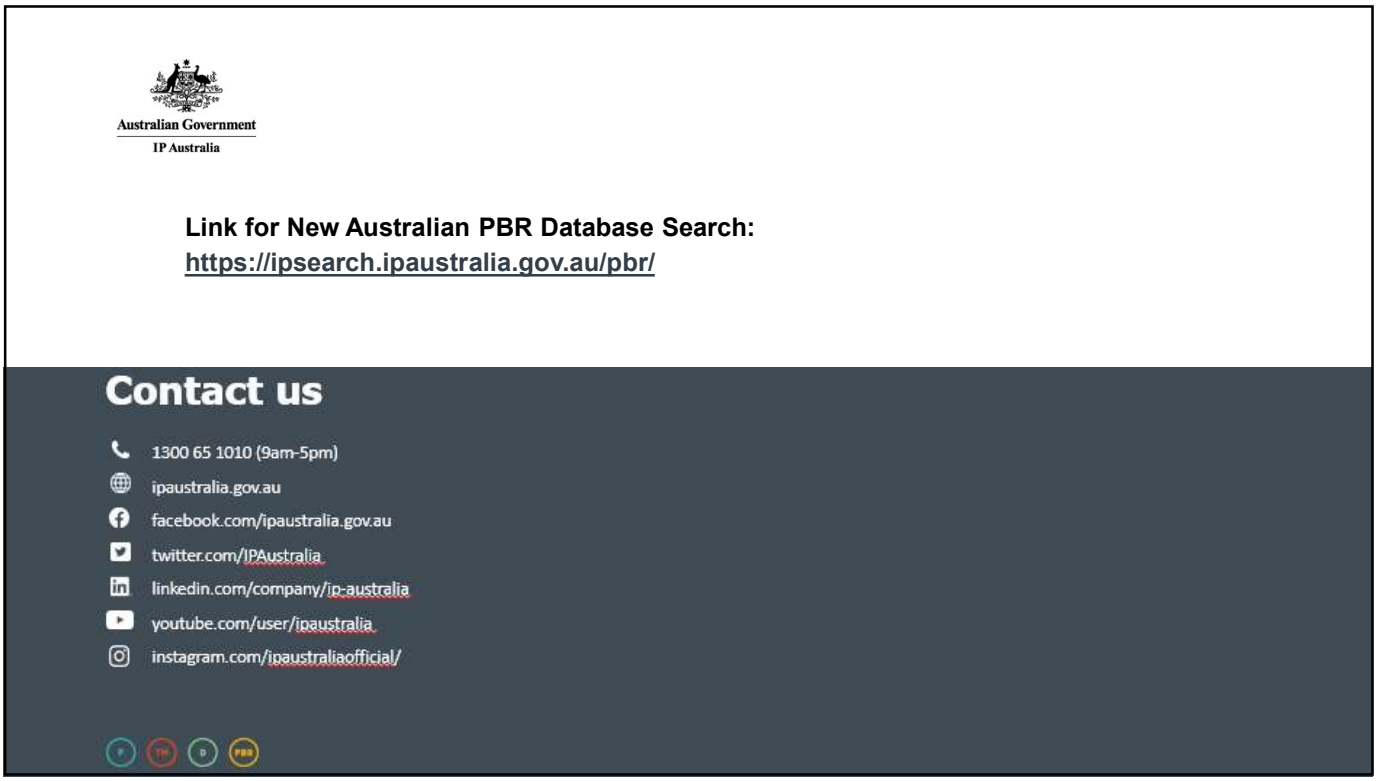
New Australian PBR Database Search

Detailed variety description:

Variety Description and Distinctness - Characteristics which distinguish the candidate from one or more of the comparators are marked with X

Organ/Plant Part: Context	'KPWORKS'	'Rambudan'
☐ *Plant: height	very short to short	very short to short
☒ *Leaf: attitude	erect	semi-erect
☐ Perianth tube: profile	expanded medially	expanded medially
☒ Perianth tube: number of colours of hair	one	two
☒ Perianth tube: colour of tip of hairs (RHS colour chart)	116A moderate blue	131A dark bluish green
☐ Perianth lobe: length of longest	medium	medium
☐ *Perianth lobes: reflexing	very strong	very strong
☒ Flower: number of anthers at top of perianth	six	four
☐ Ovary: colour of hairs (RHS colour chart)	63A strong purplish red	60A deep red



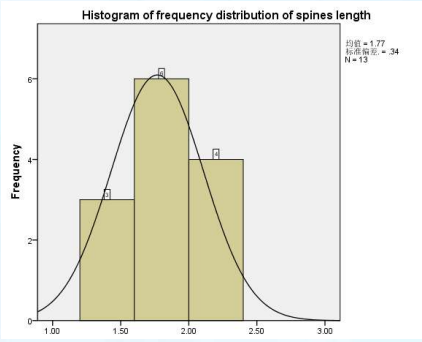
[Annex II follows]

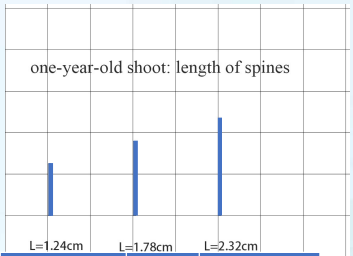
QN Characteristics for Goji berry

Drafting Group for TG of Goji berry
China

Char.7 Only for varieties with present spines: one-year-old shoot: length of spines

range = 1.08 cm
Difference of note = 0.54cm

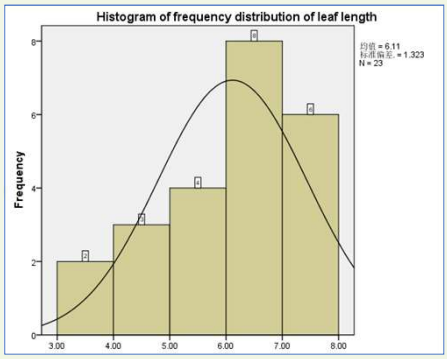


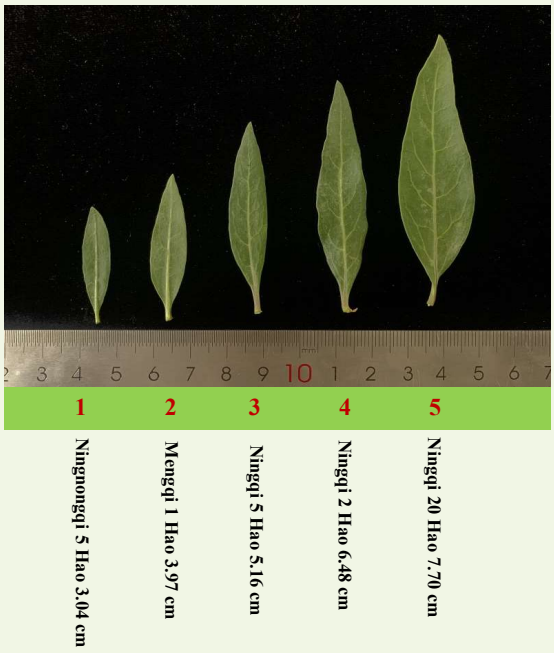


1	2	3
'Ningqi 8 Hao' 1.24 cm		'Ningqi 7 Hao' 2.32 cm

Char.10 Leaf: length

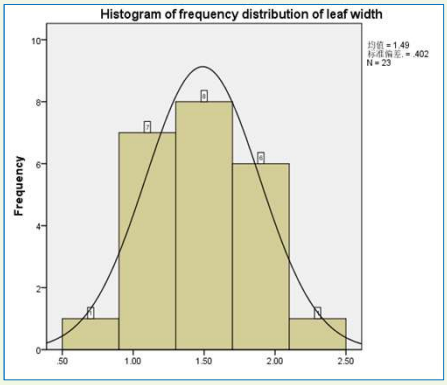
Variation range = 4.66 cm
Difference of note = 1 cm

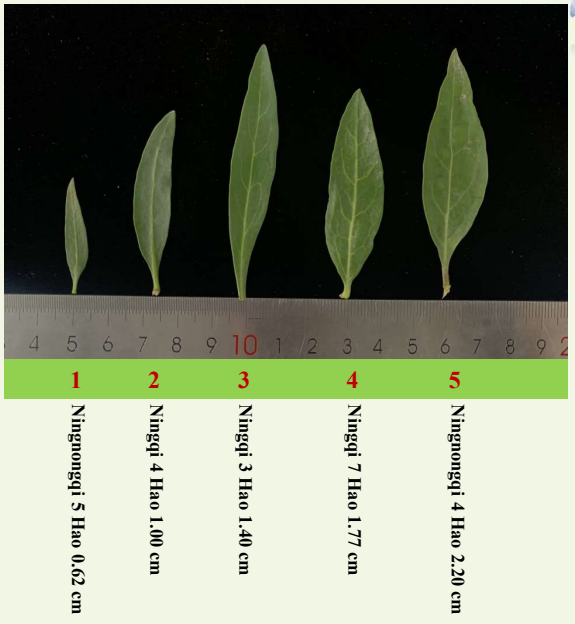




Char.12 Leaf: width

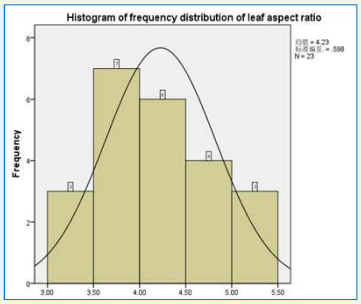
Variation range = 1.6 cm
Difference of note = 0.4 cm





Char.13 Leaf: ratio length/width

Variation range = 3.5
Difference of note = 0.25/0.5



1 3 5 5 6 7 8 9

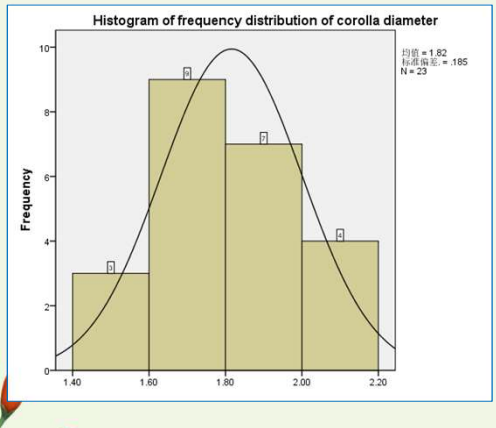
Tianjing 3 Hao 2.06
Ningqicai 4 Hao 2.56
Ningqicai 3 Hao 3.03
Ningnongqi 4 Hao 3.29
Ningnongqi 18 Hao 3.76
Ningqi 3 Hao 4.33
Ningnongqi 19 Hao 5.12
Ningqi 8 Hao 5.49

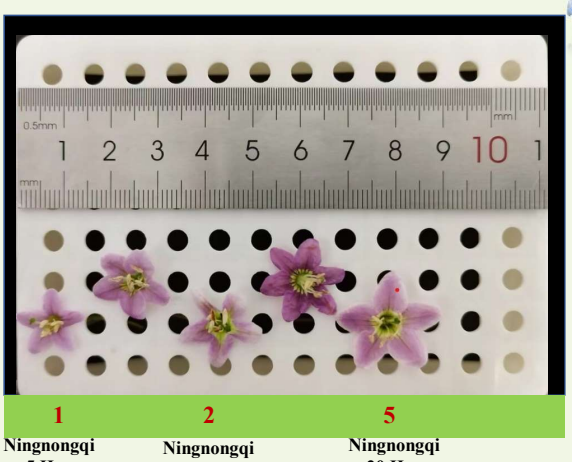
Difference of note = 0.25

0.5 or 0.6

Char.16 Corolla: diameter

Range = 0.5 cm
Difference of note = 0.2 cm



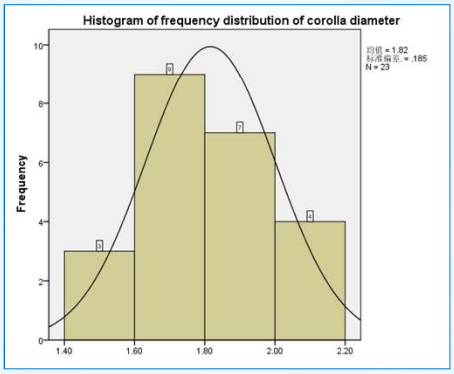


1 2 5

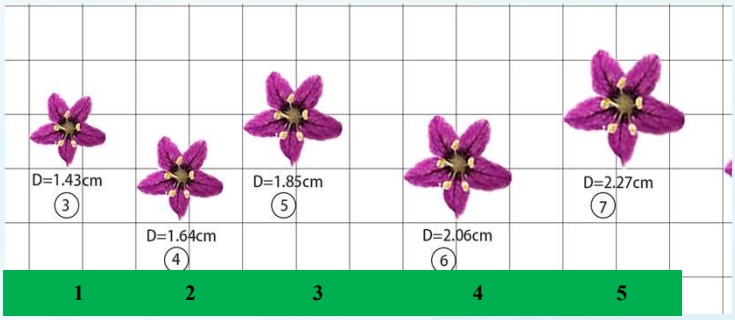
Ningnongqi 5 Hao 1.5 cm
Keqi6082 1.70 cm
Ningnongqi 5 Hao 1.70 cm
Ningnongqi 4 Hao 1.75 cm
Ningnongqi 20 Hao 2.17cm

Char.16 Corolla: diameter

Variation range = 0.6 cm
Difference of note = 0.2 cm



5 states



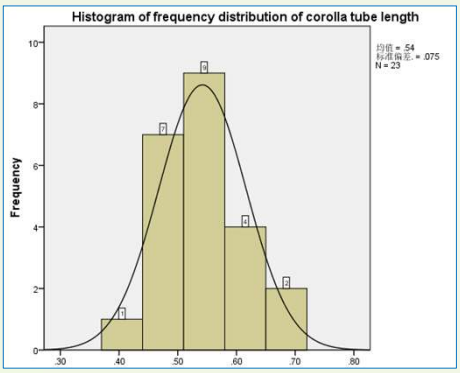
Mengqi
1 Hao
1.40 cm

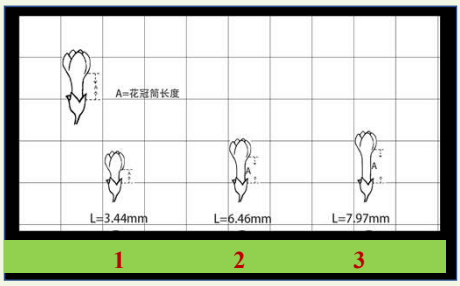
Jingqi
4 Hao
1.80 cm

Ningnongqi
20 Hao
2.17cm

Char.18 Corolla: length of tube

Range = 0.27 cm
Difference of note = 0.1 cm



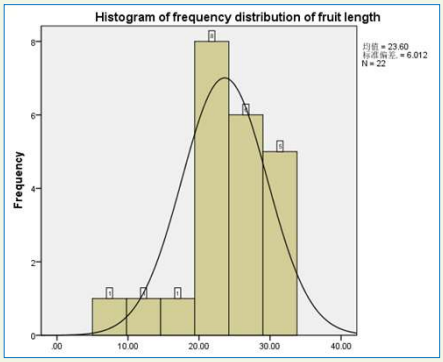


Note	1	2	3
Range (mm)	<4	4.0-8.0	>8
Example variety	Ningqi 7Hao		Keqi 6082
Value	0.4		0.67

Char.20 Fruit: length

Char.20 Fruit: length

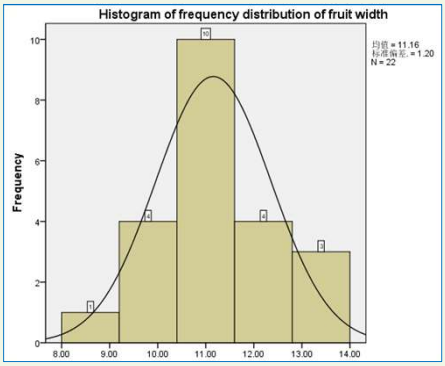
Range = 21.23 mm
Difference of note：
1-3: 3.5 mm;3-5: 2.0 mm;
5-7: 2.5 mm;7-9: 2.5 mm



1	3	5	7	9
Mengqi 1 Hao 8.93mm	Ningnongqi 4 Hao 15.91mm	Ningqi 1 Hao 19.65mm	Ningnongqi 9 Hao 24.58mm	Ningqi 8 Hao 30.16mm

Char.21 Fruit: width

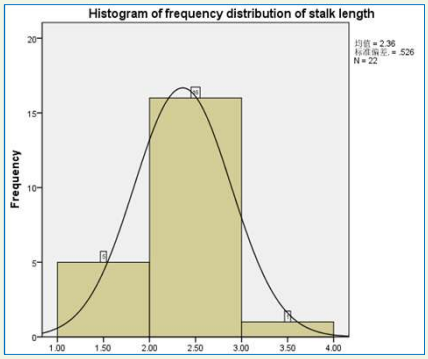
Range = 5.0 mm
Difference of note = 2.5mm

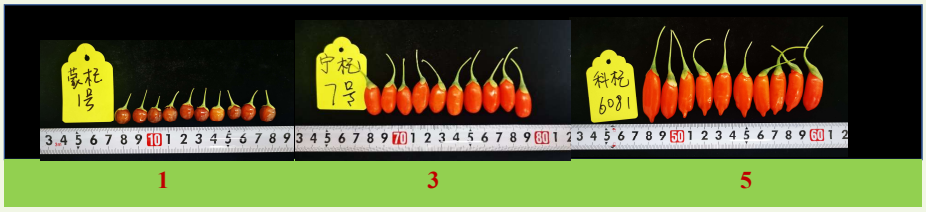


1	2	3
Mengqi 1 Hao 8.88 mm	Ningqi 7 Hao 11.36 mm	Ningnongqi 18 Hao 13.8 mm

Char.21 Fruit: length of stalk

Range = 2.20 cm
Difference of note = 0.50cm





1	3	5
Mengqi 1 Hao 1.08 cm	Ningqi 7 Hao 2.07 cm	Keqi 6081 3.22 cm

[Annex III follows]

ANNEX III

EUROPEAN UNION

Statistics

Community Plant Variety Protection Office of the European Union (CPVO) applications decreased slightly but remained strong in 2022, with 3193 applications in total. The processing of more than 78 000 applications since 1995 underlines the stability of the system.

The distribution between crop sectors was as follows:

- Ornamental, 1265 applications (40%),
- Agricultural, 1 002 applications (31%),
- Vegetable, 664 applications (21%),
- Fruit 262 applications (8%).

In 2022, the CPVO Office granted 2964 titles for Community protection; 30 562 titles were in force by the end of the year. National authorities from all over the world regularly base their decisions on applications for CPVRs on technical examinations carried out on behalf of the CPVO (international cooperation, takeover of reports). In 2022, the CPVO provided 550 technical reports to 39 countries, the five countries from which most requests emanated were United Kingdom, Colombia, Morocco, Australia and Kenya.

Administrative Council (AC)

The CPVO is supervised by an Administrative Council (AC) comprising representatives of the Member States and the European Commission and their alternates. In 2022, the members of the AC adopted the following:

- Intellectual Property Action Plan/SMEs: EU SME fund – a new scheme of financial vouchers to support SMEs in filing applications for EU Plant Variety Rights; extension to PVR application fee in 2023, the half of the application fee can be reimbursed (more information on: SME Fund for community plant variety - How to apply | CPVO (europa.eu)
- Fees regulation update launched in December 2022, expected to enter into force in 07/2023.
- Revision of Entrustment requirements document adopted with entry into force from 01/01/2023.
- Strategic Plan 2022-2026, strategic goals – operational excellence, developing the PVR value chain and fit for purpose legal and policy framework.

Administrative Council decisions on technical protocols

In the course of 2022, the following technical protocols were adopted by the AC:

- *Lactuca sativa L.*	CPVO-TP/013/6-Rev.3
- *Chrysanthemum* L.	CPVO-TP/026/2-Rev
- *Spinacea oleracea* L.	CPVO/TP-055/5-Rev.4
- *X Triticosecale* Witt.	CPVO/TP-121/3-Corr
- *Secale cereale* L.	CPVO-TP/058/1-Rev-Corr
- *Hippophae rhamnoides* L.	CPVO-TP/240/2
- Diplotaxis tenuifolia	CPVO-TP/244/1-Rev.2
- *Foeniculum vulgare* Mill.	CPVO-TP/183/2
- *Eruca sativa* Mill	CPVO-TP/245/1-Rev.2-Corr.

- *Cannabis sativa* L. CPVO-TP/276/2-Rev
- *Echinacea* Moench CPVO-TP/281/2
- *Lagerstroemia* L. CPVO-TP/095/1
- *Eustoma exaltatum* (L). CPVO-TP/197/2

Legal developments and Regulations

A study about "the economic contribution of PVR system in the EU" has been launched in 2021 and published in April 2022. It involves the CPVO, EUIPO, the European Commission and breeder's associations. The study considers the potential for the PVR system to help meet the Commission's Green Deal objectives and the United Nations (UN) Sustainable Development Goals.

International affairs

The CPVO participated in several IP Key international outreach activities

IP Key China

- Closed webinar Chinese Seed Law: videos of the activity available on the IPKey China website;

IPKey Latin America and AL INVEST PI: new phase in 2022-2023.

- Study on the PVR legislation of Ecuador presented to Ministries in Ecuador during a seminar in May 2022

- October 2022 together with the project AL INVEST PI, IPKey Latin America: webinar (with more than 400 participants) on licensing of plant variety rights, partially relying on the content developed for the learning course on licensing plant varieties (“Laboratorio de Contratos de Licencias de Variedades Vegetales”).

- November 2022: enforcement seminar, carried out in cooperation with UPOV and national authorities of the Region.

IPKey South East Asia:

- Webinar on Plant Variety Protection and the 1991 Act of the UPOV Convention (January 2022)

- Workshop on support to beneficiary countries to accession to UPOV (January 2022), presentations available on the IPKey SEA website.

AfrIPI: due to the project constraints, no activity was carried out

OAPI: the Office gave a support in the implementation of 9 activities, of which:

- 2 national seminars on PVR system

- 4 activities concerning Quality Audit System in 4 different OAPI countries

- 2 study visits of OAPI delegation to the CPVO

- 1 training on the application process for legal and officers and examiners of OAPI

CarIPI:

- 2022 CarIPI, together with the CPVO and UPOV, organised an in-person seminar on Regional Cooperation in PVR in the Dominican Republic

- The other activity, carried out in September 2022, concerned the protection of plant genetic resources, traditional knowledge and folklore and the interfaces with the PVR System.

TAIEX: (Dominican Republic, Chile, Saint Vincent and the Grenadines)

- The CPVO in 2022 cooperated with 3 different countries in the implementation of TAIEX activities, together with experts from EU Member States. The activities were all targeting PVR authorities, to support them in the implementation of the national PVR system, including administrative procedures for the management of the application process, technical examination and guidelines on administrative proceedings before PVR offices.

UPOV activities

- Attendance of all TWPs
- Attendance of the regular UPOV meetings in Geneva
- EDV WG
- WG Harvested Material
- WG on Smallholder Farmers in relation to private and non-commercial use
- Seminar on plant breeding and plant variety protection and climate change
- DUS WG

OECD

- Attendance of the OECD Seed Scheme Technical Working Group meetings and the annual meeting

FRUIT SECTOR

Statistics

The table hereunder shows number of applications received by the CPVO in 5 last years for the 10 most important fruit crops in the history of the Office. The number of fruit CPVR applications slightly decreased in 2022. The top 3 crops in the history of the CPVO until 2022 remained peach, strawberry and apple, but the highest number of applications received in 2022 was for strawberry (50), peach (41) and blueberry (34).

Species	2018	2019	2020	2021	2022	Total (1995-2022)
Prunus persica (L.) Batsch	21	34	47	37	41	**1121**
Fragaria x ananassa Duchesne ex Rozier	37	53	48	48	50	**841**
Malus domestica Borkh.	27	23	28	21	23	**646**
Vitis L.	50	14	20	29	20	**388**
Vaccinium L.	42	20	37	31	34	**333**
Prunus armeniaca L.	8	10	8	5	4	**331**
Rubus idaeus L.	22	27	24	13	28	**304**
Prunus salicina Lindl.	7	8	7	6	3	**158**
Prunus avium (L.) L.	12	8	5	13	2	**156**
Rubus subg. *Rubus*	8	5	12	23	13	**134**
Total	**234**	**202**	**236**	**226**	**218**	

The fruit expert meeting (FEM)

The CPVO held its annual meeting with EU fruit experts and representatives of the breeder's organisations on 8 November 2022 in Angers (France) and it continued on 13 January 2023 by electronic means. The group discussed among others DUS testing related topics, financial matters, R&D project and IT tools. Here are some agenda points of the meeting:

- DUS testing of some apple mutation groups: challenges in plant health related matters
- Submission of samples
- Additional information linked to the UPOV code to group varieties
- Revision of our plant health requirements in the request for plant material
- Specific measures taken to secure DUS trials from adverse weather conditions
- Exchange of reference samples between examination offices
- Postponement of testing rules – future revision
- Procedure or taking samples from examination offices
- Pear DUS trials affected by Pear Decline
- Duration of test for Prunus rootstock varieties
- Dutch certification scheme for strawberry
- 'Developing molecular markers allowing the distinction of apple mutants (sports)', results – follow up'
- INVITE, apple situation
- Possibilities to store DNA extracted from the fruit varieties
- Automated phenotyping – update
- Presentation of the access to eTQs via the TLO website + TLO rewrite
- New layout of application documents – free text in boxes if not in EN - feedback
- Cost calculation, fruit related issues
- Issues of relevance from the TWF
- Funds to help SMEs (via EUIPO platform)

[Annex IV follows]

ANNEX IV

FRANCE

PRESENTATION 1

DUS examination of fruit crops in France

Carole DIRWIMMER

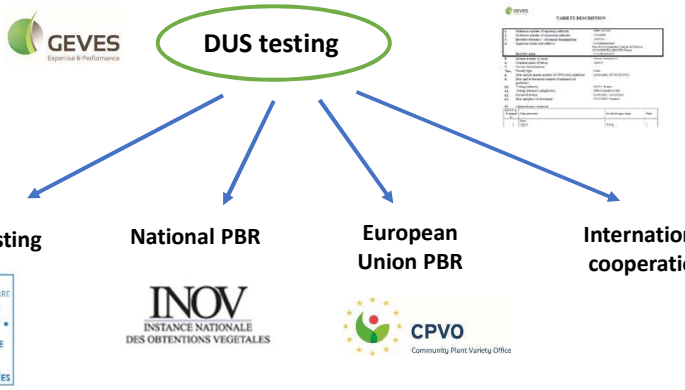
54th SESSION OF THE UPOV TECHNICAL WORKING PARTY FOR FRUIT CROPS

3-7 july 2023 | Nîmes - France

54ème SESSION DU GROUPE DE TRAVAIL TECHNIQUE DE L'UPOV SUR LES PLANTES FRUITIÈRES

UPOV GEVES INRAE MINISTÈRE DE L'AGRICULTURE ET DE LA SOUVERAINETÉ ALIMENTAIRE

DUS testing in France



54th SESSION OF THE UPOV TECHNICAL WORKING PARTY FOR FRUIT CROPS

UPOV GEVES INRAE MINISTÈRE DE L'AGRICULTURE ET DE LA SOUVERAINETÉ ALIMENTAIRE

Fruit DUS testing in France

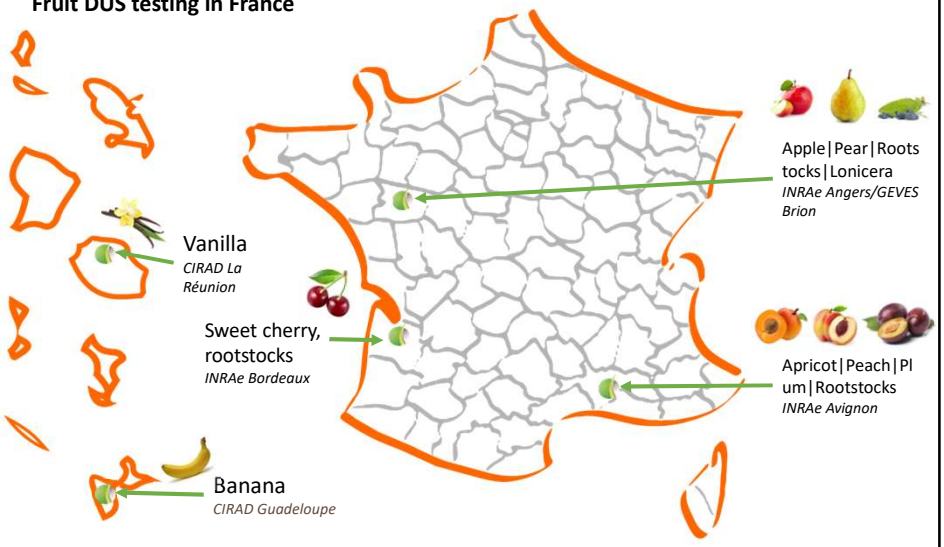
INRAE (Research Institute for Agriculture, Food and Environment) and **GEVES** (seeds and varieties testing) **separated their activities in 1989**.

INRAE: large **collections**, strong **expertise** on fruit varieties → GEVES **subcontracts** most fruit DUS tests to INRAE

CIRAD: French agricultural research and cooperation organization.

GEVES subcontracts CIRAD for tropical species DUS testing.

Fruit DUS testing in France



Fruit DUS testing in France

	Varieties under testing in 2023
Peach	90
Apple	74
Sweet cherry	28
Apricot	25
Japanese plum and interspecific hybrids of Prunus	15
Lonicera	5
Prunus rootstocks	5
Malus rootstocks	4
Banana	1

54th SESSION OF THE UPOV TECHNICAL WORKING PARTY FOR FRUIT CROPS — UPOV — GEVES Expertise & Performance — INRAE — MINISTÈRE DE L'AGRICULTURE ET DE LA SOUVERAINETÉ ALIMENTAIRE

Fruit DUS testing in France: main principles

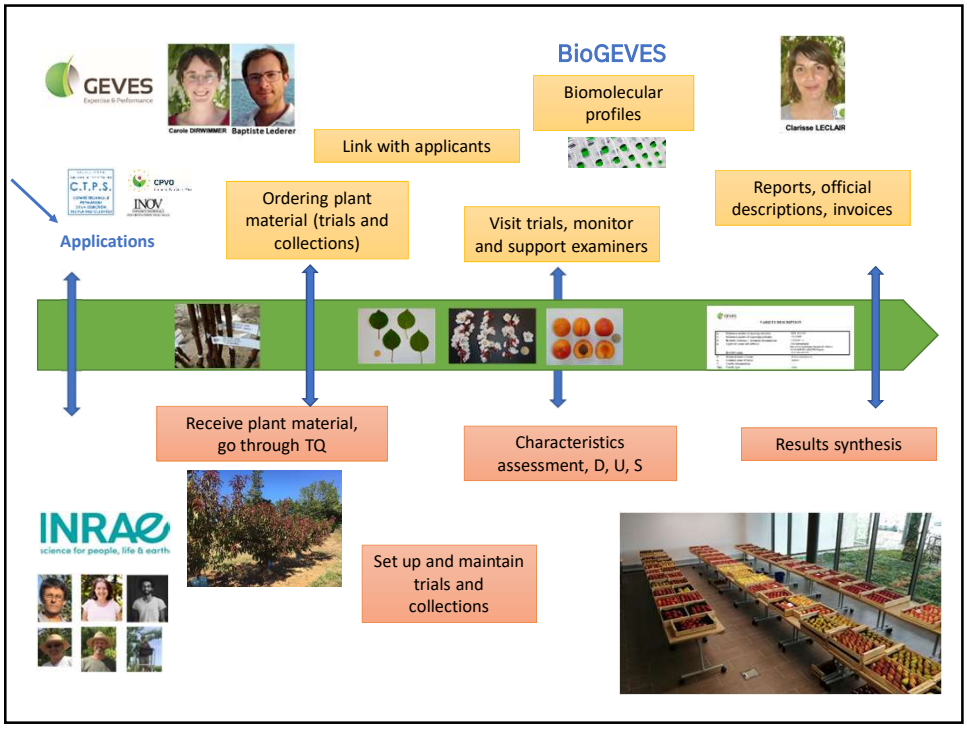
CPVO entrustment: meet quality requirements, follow CPVO protocols (based on UPOV TG)

DUS trials and living reference collections at INRAE/CIRAD/GEVES premises

A dedicated and trained DUS examiners team

A complete supervision of the process by GEVES

54th SESSION OF THE UPOV TECHNICAL WORKING PARTY FOR FRUIT CROPS — UPOV — GEVES Expertise & Performance — INRAE — MINISTÈRE DE L'AGRICULTURE ET DE LA SOUVERAINETÉ ALIMENTAIRE



Fruit DUS testing in France: main principles

DUS trial (1 dedicated orchard)	Reference collection (1 or several orchards)	Example varieties
• Candidate varieties, organised with grouping characteristics • Some example varieties • Some new reference varieties to be described • Maintained during the time of examination	• Can be in high density plantation • Can be in several premises (insect proof, second location…) • Can include genetic ressources collections • Maintained long-term	For some species, a special orchard dedicated to example varieties

54th SESSION OF THE UPOV TECHNICAL WORKING PARTY FOR FRUIT CROPS
UPOV
GEVES

During technical visit tomorrow

INRAE Amarine

Christophe TUERO, INRAE
Peach DUS testing

Eric MARTIN, INRAE
Apricot
Japanese plum and interspecific hybrids
Prunus rootstocks
DUS testing

You will:

- Practice DUS testing
- Visit the trials
- Learn about INRAE activities on fruit species
- And meet a team from Pépinières Toulemonde, member of Starfruit and Pink Lady®

54th SESSION OF THE UPOV TECHNICAL WORKING PARTY FOR FRUIT CROPS

UPOV GEVES INRAE star fruits

And if you need any information, please contact us !

Fruit species team

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Baptiste Lederer, Fruit species DUS manager
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Contacts for DUS cooperation

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Camille Zitter, administrative assistant for International cooperation for DUS testing
Camille.zitter@geves.fr

54th SESSION OF THE UPOV TECHNICAL WORKING PARTY FOR FRUIT CROPS

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Thank you for your attention
WWW.GEVES.FR
GEVES
Expertise & Performance

PRESENTATION 2

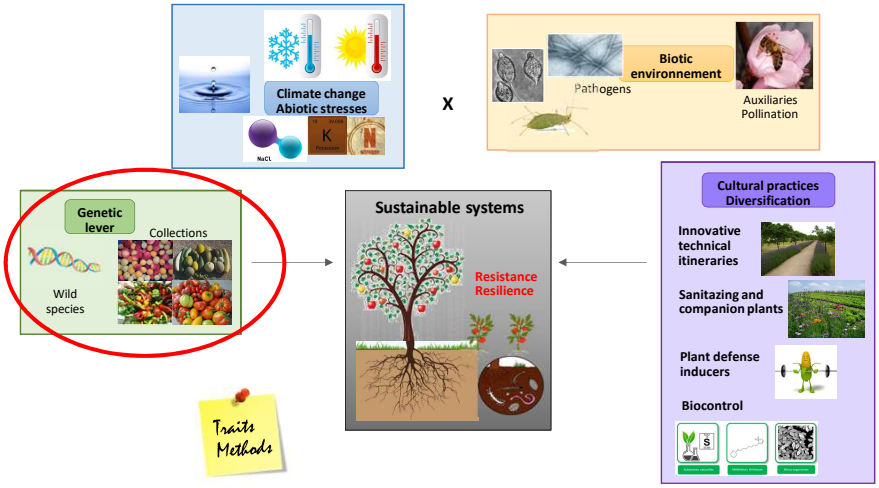
INRAE

Fruit Group

Biology, Genetic & Breeding Division

INRAE – 11 July 2023

INRAE BAP Fruit Group:
Main goals:
- identify and integrate the genetic components as lever to address Climatic Changes and Agroecology adaptation factors



INRAE – BAP Fruit group Identity card

- 4 Research Units
  - UMR IRHS Angers
  - UMR BFP Bordeaux
  - AGAP Institut
    - AFEF Montpellier
    - Seapag
  - URGAFL Avignon
- 6 Experimental Units
  - UE Horticole Angers
  - UE Arboricole Bordeaux
  - UE Melgueil
  - UE Citrus San Giuliano
  - *UERI Gotheron**
  - UE A2M Avignon
- Collaborations
  - *Montpellier SupAgro*
  - *Agrocampus-Ouest Angers*
  - *Agrocampus Bordeaux*

* *plant health and environment division*

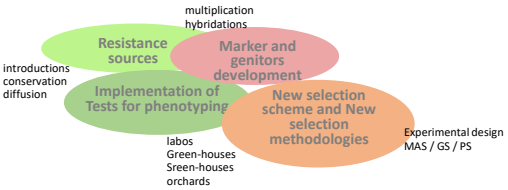
INRAe – BAP « Fruit group » Identity card

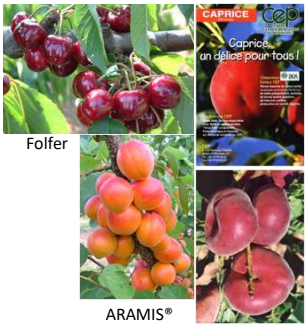
Research units	Species	Research axes - Plateforms	Breeding
IRHS *Angers*	Pome fruits • Apple • Pear • Pear RS	Durable resistance to Pest and diseases Fruit quality elaboration Abiotic stress resistance CRB RosePom	X (Novadi) X (CEP IN.) X (IRTA)
BFP *Bordeaux*	*Stone fruits* • *Cherry* • *strawberry*	*Climatic changes* *Genomic* *Abiotic stress resistance* *Biotic stress resistance* *CRB Prunus – Juglans - Castanea*	*X (CEP IN.)*
UGAFL *Avignon*	*Stone fruits* • *Apricot* • *Peach* • *Prunus RS*	*Resistance to biotic and abiotic stresses* *CRB Prunus* *Quarantine facilities*	*X (CEP IN.)*
AGAP Institut *Montpellier* - *AFEF* - *Seapag*	• Apple • Olive • Citrus	Architecture, and blooming period modelling Abiotic stress resistance Climatic change adaptation	X Cirad
UE Citrus *San Guiliano*	Citrus • Clementine	Fruit quality elaboration Resistance to biotic and abiotic stresses CRB *Citrus Genetic resources*	

* Research – Innovation pipe-line: targeted on the major agronomic traits

Understand the mechanisms and the architecture of the main agronomical traits → Integrate the interesting genes in the production system

Basic Research | Applied Research | Innovations





Folfer

ARAMIS®

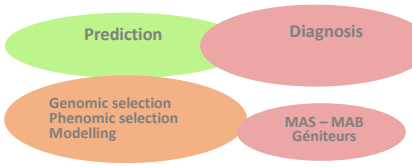
Knowledge transfer / tools / Methodologies
- CIFRE PhD
- CEP innovation agreement

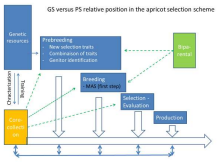
Project INRAE IVD 2017-2021 / 2021-2025
CGP INRAE-CEP innovation 2018-2021 / 2021-2025
Convention INRAE-GEVES
Project MP SelGen R2D2
Project InnOBreed Horizon Europe 2022-2025
PhD Nsibi 2021

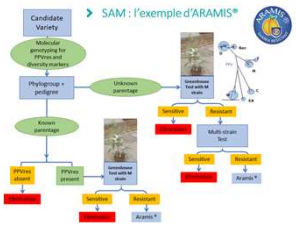
* Research – Innovation pipe-line: *Selection methodology*

Characterization & Diagnosis → Prediction

Basic Research | Applied research | Innovations



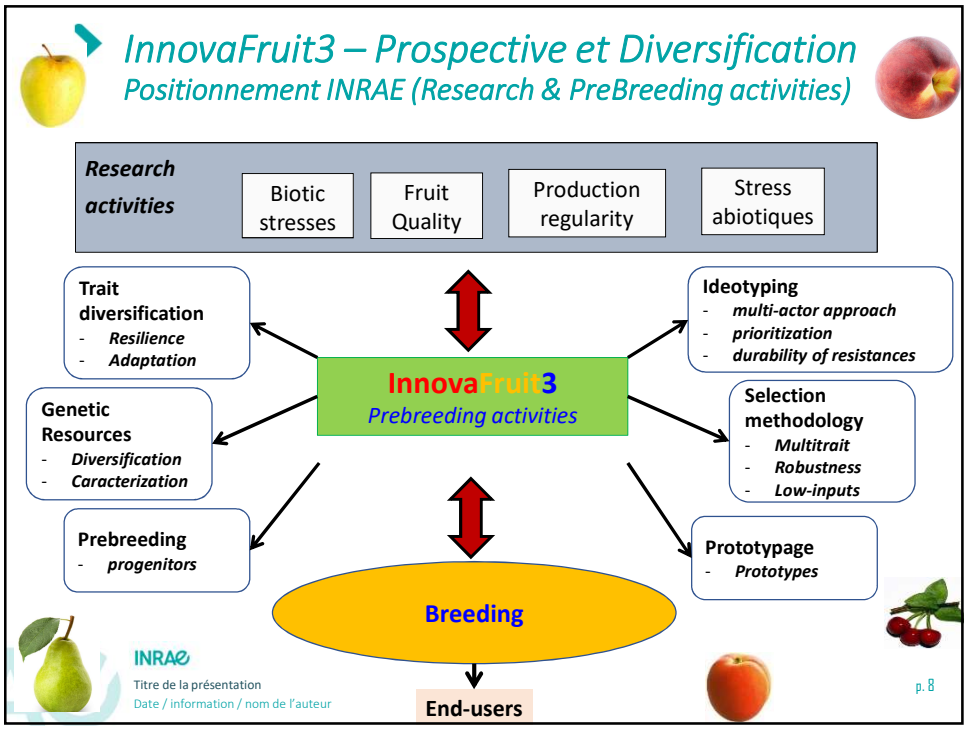




Transfer of knowledge / Tools / Methods
- CIFRE PhD
- CEP innovation agreement

Project INRAE IVD 2017-2021 / 2021-2025
CGP INRAE-CEP innovation 2018-2021 / 2021-2025
Convention INRAE-GEVES
Project MP SelGen R2D2
Project InnOBreed Horizon Europe 2022-2025
PhD Nsibi 2021


InnovaFruit3 – Prospective et Diversification
pour le développement d'une arboriculture fruitière adaptée à de faibles intrants phytosanitaires et à des climats changeants
Date / information / nom de l'auteur


InnovaFruit3 – Prospective et Diversification
Positionnement INRAE (Research & PreBreeding activities)
Research activities
Biotic stresses
Fruit Quality
Production regularity
Stress abiotiques
Trait diversification
- Resilience
- Adaptation
Ideotyping
- multi-actor approach
- prioritization
- durability of resistances
InnovaFruit3
Prebreeding activities
Genetic Resources
- Diversification
- Caracterization
Selection methodology
- Multitrait
- Robustness
- Low-inputs
Prebreeding
- progenitors
Prototypage
- Prototypes
Breeding
End-users
INRAE
Titre de la présentation
Date / information / nom de l'auteur
p. 8

INRAE – Major targeted traits in *Prunus* species

Species	Traits
Cherry	Phenologie – Cracking – Doble fruits – Fruit size
Peach	Sharka – Green aphids – Powdery mildew – Bacterial spot – Leaf curl
Apricot	Sharka – Bacterial canker – Monilinia on flowers – Rust – Necrosis
Prunus RS	Nematods – Green aphids – Powdery mildew
Japanese plum	Sharka
Amond	Fusicocum – Eurytoma amygdali

Thanks for your attention!

PRESENTATION 3

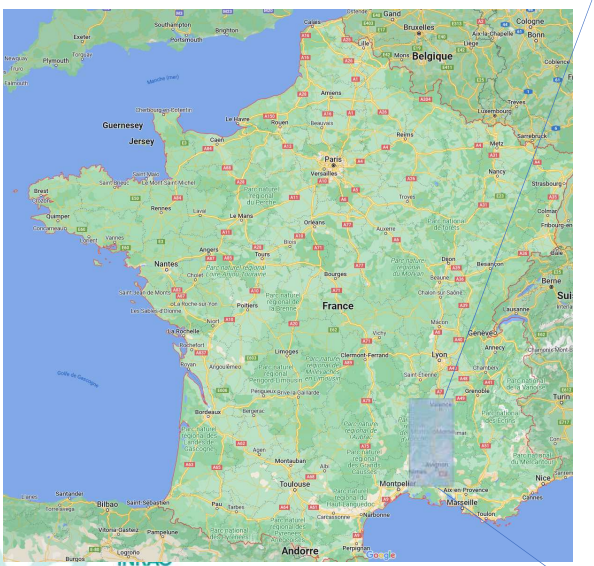
Domaine de l'Amarine
July, 11th 2023

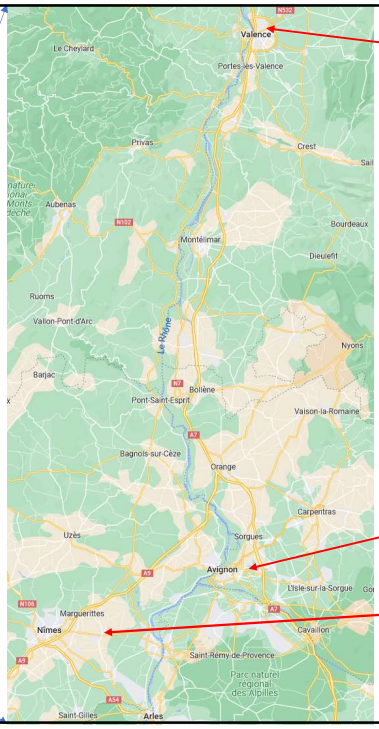
A2M and GAFL

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

INRAE

Geographical situation



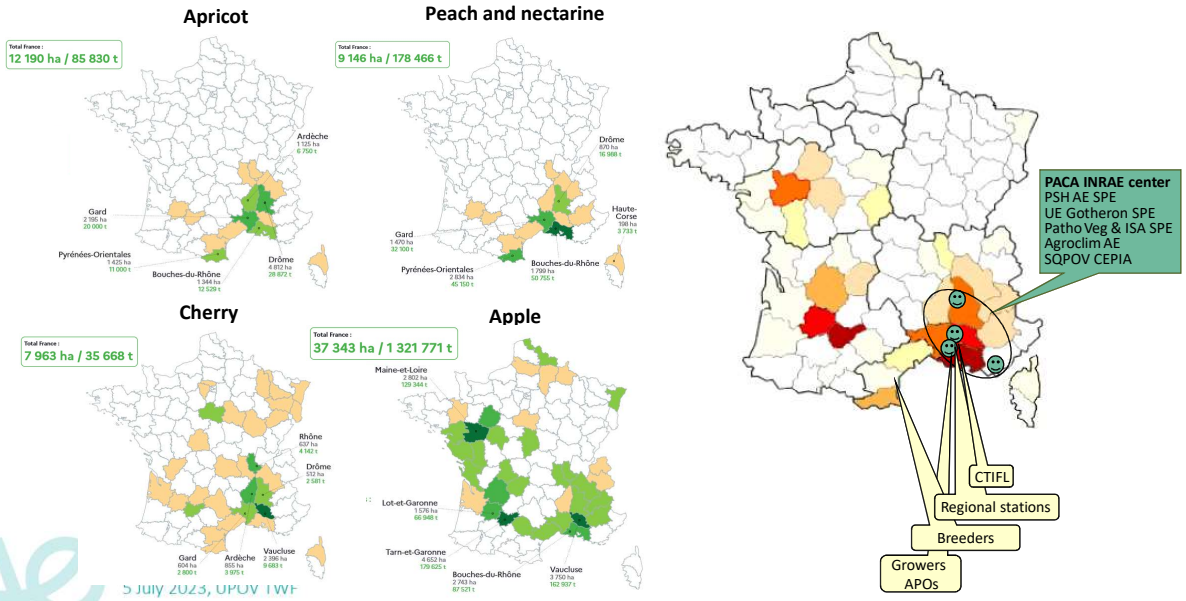


UERI Gotheron

A2M

A2M

At the heart of a large fruit basin



UE A2M

Experimental Unit 'Arboriculture et Maraichage Méditerranéen'

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

INRAE

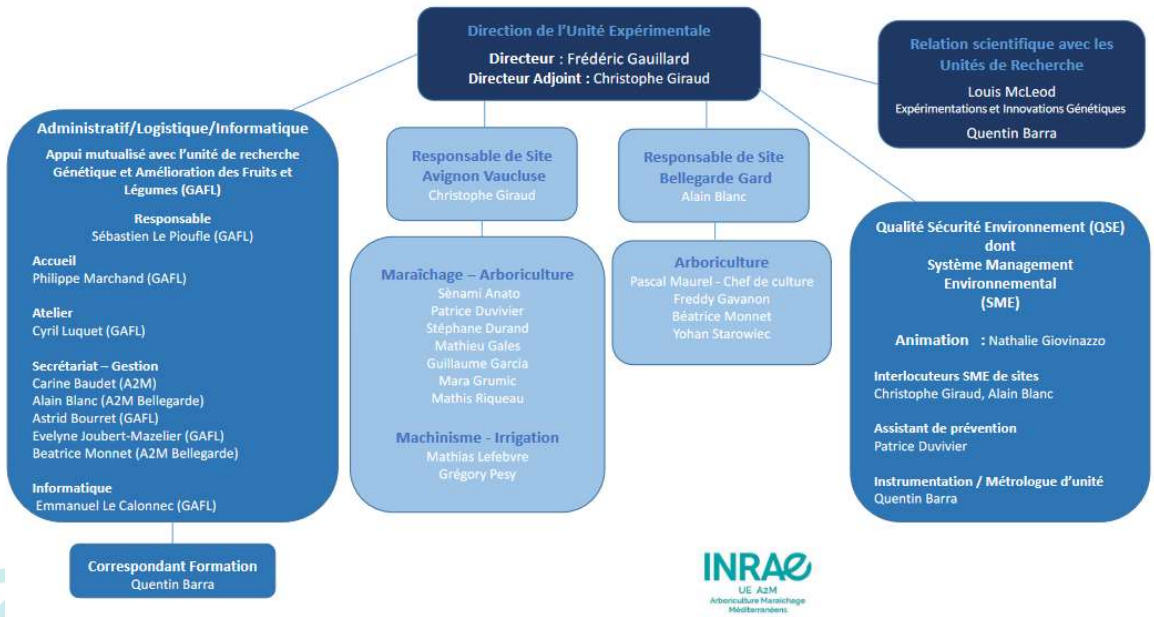
UE Arboriculture et Maraichage Méditerranéens

Objectives

1. **significantly reduce the use of inputs** such as synthetic pesticides and fertilizers (mainly N and P)
2. **optimize the use of water resources and the use of soils**
3. **maximize ecosystem services provided by horticultural agro-ecosystems**

The **challenge** of research in Mediterranean horticulture on the Avignon site is
- design of new horticultural systems
- based on the **principles of agroecology**
- **combining** as much as possible **genetic diversity, ecosystem services, economic sustainability** and production of products meeting different criteria of quality.

The unit includes **18 permanent staff**



UE Avignon Horticulture Méditerranéenne

To achieve this common goal, **6 priority issues** are identified:

1. Produce **quality fruits and vegetables** (organoleptic, sanitary, nutritional and commercial) according to various needs (short and long circuits, fresh and processing, etc.)
2. **Zero synthetic pesticides** (by mobilizing the genetic diversity and resistance of plants to pathogens, their regulation within agroecosystems, etc.) and the development of alternative agronomic levers
3. For a **reasoned use of resources** (water, nutrients, light) and soil in low-input and diversified Mediterranean systems
4. Maintain and promote the **use of the genetic diversity** of cultivated species and their wild relatives
5. **Adapt production to climate change**
6. **Develop and share knowledge and tools** for diverse and evolving horticultural systems

3 sites

2 sites in Avignon including 20 ha SAU:

- 3 ha of orchards
- 1 ha in vegetables
- 3 ha of herbaceous and flowery biodiversity

- 32 tunnels (potentially 8000 m²)
- 4700 m² of greenhouse including 1000 m² of S2 greenhouse, GMOs and quarantine organisms
- 30 Phytotrons/culture chambers

Amarine site 32 ha SAU:

- 11 ha of orchards
- Collection of fruit species
- 7 hectares of woods

Tree Conservation Tunnels

INRAE
5 July 2023, UPOV TWF

p. 9

Amarine Surfaces
- 48,32ha
- SAU: 31,5ha

Typology of experiment
- Genetic resources: 3,91 ha
- DHS: 3,44 ha
- Pré-Breeding: 2,72 ha
- Populations: 1,55 ha

Genetic resources
- Apricot: 750 accessions - Japanese plum: 80 accessions
- Almond: 120 acessions - Peach: 835 accessions
- Prunus sp: 283 accessions

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5 July 2023, UPOV TWF

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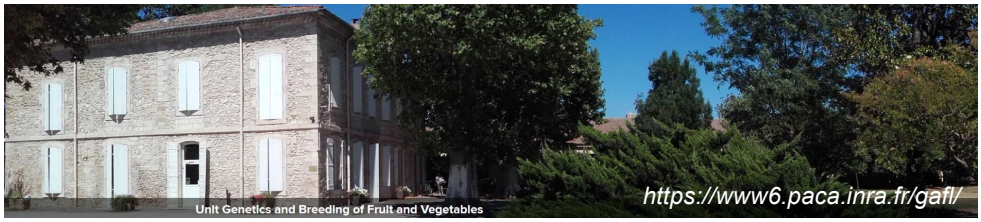


GAFL

Research Unit 'Génétique et Amélioration des Fruits et Légumes'

Main scientific objectives of the Research Unit




- Contribute to durable **pesticide reduction** with the use of genetics
  - Find disease resistance and tolerance genes and associated markers
  - Establish protocols for genetic diagnoses (ex. marker assisted selection)
  - Study the interactions between stress of biotic and abiotic origin
- **Promote the use of genetic diversity**
  - Preserving genetic resources of mediterranenan crops
  - Facilitating the access to genetic resources
- Use genetic diversity of horticultural crops as **driver for the agro-ecological transition**
  - Perspectives on interactions between crops, crops and pollinators, crops and microorganisms

Strategy : from research to innovation

Science :

Generate knowledge

- Dissect genetic and molecular bases of traits of interest
- Identify the causal genes
- Investigate the functional diversity of causal genes
- Explore the environment effect (GxE)

Impact :

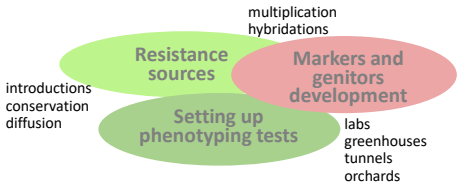
Translate knowledge into innovations

- Promote new alleles
- Construct new genetic systems
- Design adapted ideotypes for ecological production systems
- Propose strategies for ensuring sustainable resistance

Find an equilibrium

Strategy : from research to innovation

Research activities



An integrated research to innovation approach

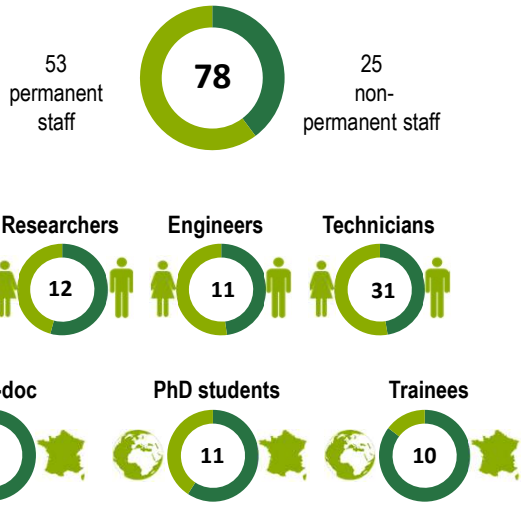
Genetic resources	Progenitors	Selection methodology
Maintenance & characterization	Elaboration of genitors resistant to biotic and abiotic stresses	Elaboration and validation of methods (MAS, GS), tests and procedures

Transfer to end-users

Breeding * Regional stations * Fruit breeders

Understand the mechanisms and genetic architecture of traits of agronomic interest → **Best use of genes of interest at the production system level**

GAFL Staff



INRAE
5 July 2023, UPOV TWF
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GAFL organization

2 research teams

ReDD Resistance to Pests and Pathogens, Diversity and Durability

DADI Diversity, Adaptation to Environment, Determinants and Innovation

CRBLeg
Center of genetic resources for vegetables

Informatics, biostatistics and bioinformatics team

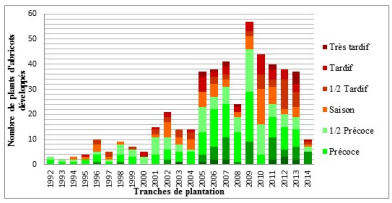
Research support team shared GAFL – A2M

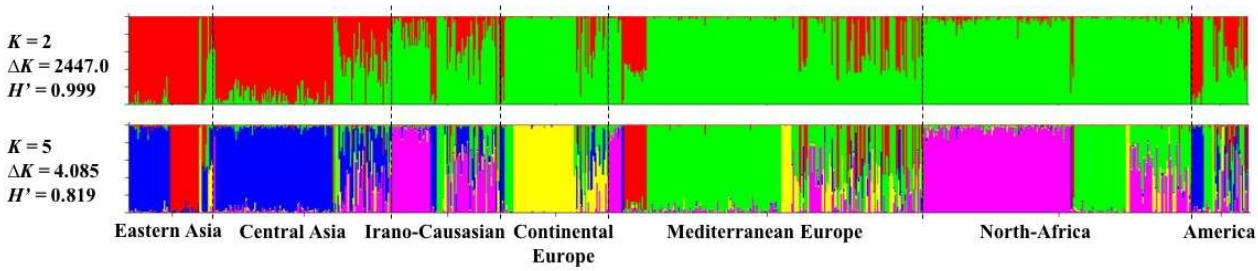
INRAE
5 July 2023, UPOV TWF
p. 16

DADI Prunus: genetics and genomics of Prunus
in particular peach, apricot, almond and their rootstocks

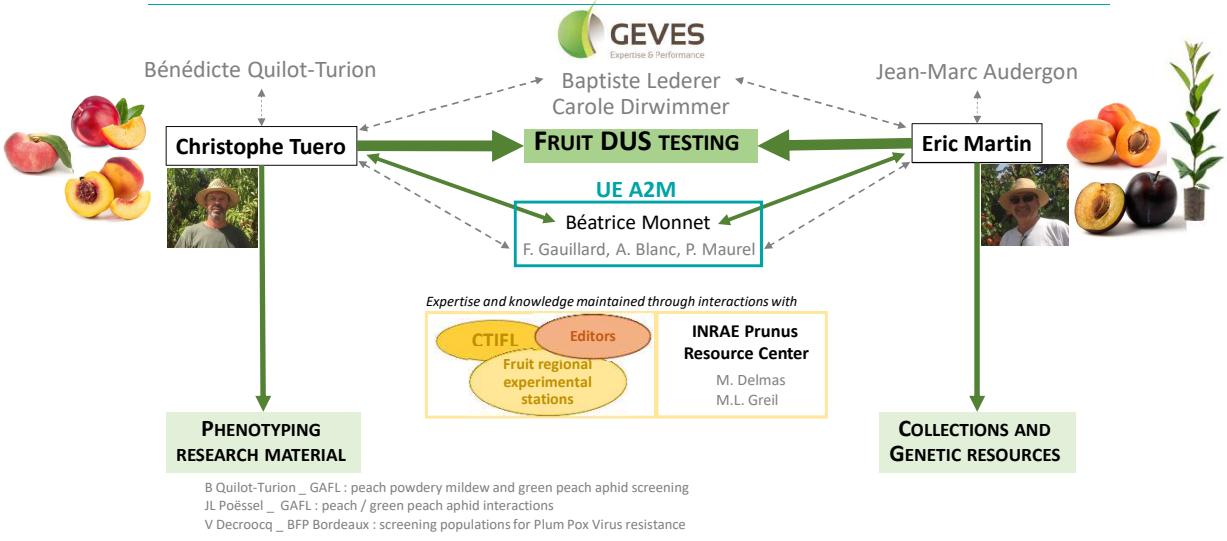
Genetic resources

- ***Maintenance – Characterization of Prunus germplams***
- ***DUS Testing***
- ***PreBreeding activities***
  - Progenitors adapted to
    - Organic farming system
    - Climatic changes





DADI Prunus: DUS Testing

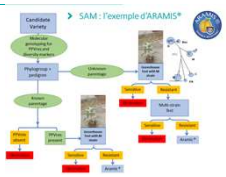


B Quilot-Turion _ GAFL : peach powdery mildew and green peach aphid screening
JL Poëssel _ GAFL : peach / green peach aphid interactions
V Decroocq _ BFP Bordeaux : screening populations for Plum Pox Virus resistance

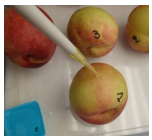
DADI Prunus: Genetics and Genomics of Prunus

in particular peach, apricot, almond and their rootstocks

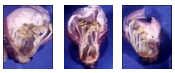
Research based activities



- ***Selection methodologies***
  - Test, Inheritance
  - MAS, MAB, Genomic selection, phenomic selection
- ***Targeted approaches on traits of interest for the industry***
  - **Pest & Diseases**
    - ***Virus:*** Sharka (Apricot, Plum, Peach)
    - ***Fungus:***
      - Leaf curl, Monilinia on fruits, Powdery mildew (Peach)
      - Monilinia sp. on flowers, Rust, Powdery mildew (Apricot)
    - ***Bacteries:***
      - Bacterial canker (Apricot)
      - Bacterial spot (Peach)
    - ***Pests:***
      - Nematods (Prunus RS)
      - Green aphids (Peach)
  - **Adaptation**
    - Floral necrosis, Self-fertility (Apricot)
    - Low imput mangement system (multitolerance – resilience concepts)

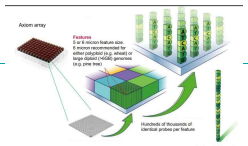


Necroses au stade dormant



Necroses à la floraison

Expertise and recognition



Knowledge of

- diversity of the species and their relatives
- sanitary regulations and associated management
- diseases and pathogenes recognition and phenotyping
- molecular biology techniques
- development of digital phenotyping

Internationally recognized team in the field of genetics and genomics of Prunus, in particular peach, apricot, almond and their rootstocks:

- large network
- coordination of projects at local, national and international levels
- scientific publications : numerous and high level
- invitation and participation to congress
- expertise activities for different institutions

HORIZON 2020

agropolis fondation
Supporting agricultural research for sustainable development

tersys
l'intelligence du vivant

PRIMA
IN THE MEDITERRANEAN AREA

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
CASDAR

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ÉTABLISSEMENT NATIONAL DES PRODUITS DE L'AGRICULTURE ET DE LA MER

InnOBreed

Thank you for your attention

PRESENTATION 4

INRAE

université de BORDEAUX

Team 'Sweet Cherry Adaptation to Climate Change' (A3C)





Research objectives and strategy

A3C

Understand sweet cherry adaptive responses to climate change

Targets . Phenology
. Fruit quality traits

Experimental approaches

- Genetic architecture
- Molecular mechanisms
- Physiological analyses
- 'Omics' integration

Data
Hypotheses
⇄
Validation

Predictive modelling

- Networks (genes, metabolism)
- Phenological models
- Climate models
- Genomic/phenomic prediction

Marker development
Hybrids
⇄
Scientific questions

Molecular target
⇄
Modeling topics

Breeding program

- Ideotype definition
- Pre-breeding selection
- DNA – informed breeding

Genetic control of phenology and fruit quality traits

A3C

Segregating populations

Germplasm collections

QTLs Fine mapping GWAS

Multi-parental QTL approaches

Multi environment trials (METs)

Identification and validation of CGs and markers for MAS

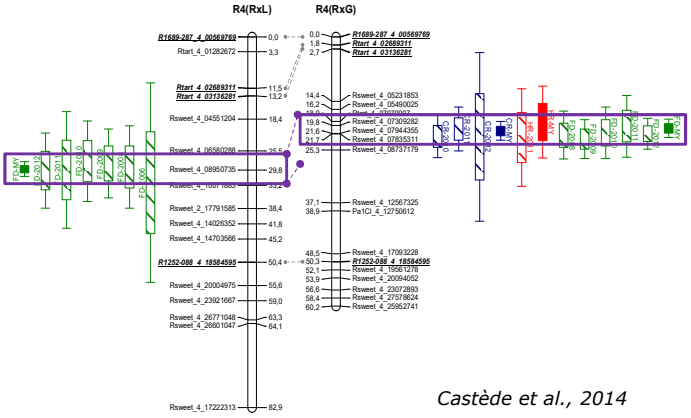
QTL stability over genetic backgrounds

G x E
QTL x E
GWAS x E

Phenology QTL detection

A3C

Co-localization of QTLs for dormancy (CR and HR) and flowering date



Castède et al., 2014

Phenology QTL detection

A3C

Interactions with the environnement

Multi-site trial:
5 European sites
Grafted, 2 replicates / genotype

Population F_1 'Regina' x 'Lapins' (R×L)
121 full-sibs
'Regina' (late flowering)
'Lapins' (early flowering)

	Flowering date									
				PVE mean in each location (%)						QTL x E - Multi-QTL model
LG	L (cM)	CI 95% (cM)	Forli (4 y)	Maribor (3 y)	Murcia (4 y)	Nimes (4 y)	Toulenne (5 y)	PVE overall mean (%)	P-value QTL main effect	P-value QTL x E
R3	47.6	36.2-59.0	1.4	0.6	4.8	2.2	2.5	2.4	0.098975	0.1786204
R4	29.4	< 0.5 cM	20.1	36.1	3.6	23.2	24.6	20.9	< 2.2e-16 ***	1.628e-09 ***
R7	60.3	21.8-70.4	1.5	1.2	5.1	0.8	1.6	2.0	0.0221818 *	0.1879125
L1	145.9	136.9-152.2	7.7	3.1	14.8	3.3	6.2	7.2	1.512e-10 ***	0.0002322 ***
L6	16.0	8.6-23.4	5.5	2.9	3.2	10.2	12.4	7.3	6.909e-05 ***	0.0027840 **

- *R4, L1 and L6 : QTL and QTL×E significant*
- *R4 present in all sites except Murcia*
- *L1 specific to Murcia : QTL related to a lack of chill ?*
- *L6 significant effect in Nimes and Toulenne ('French' QTL ?)*

Branchereau et al., 2023

Molecular and physiological analyses of dormancy and flowering

A3C

Identification of key signalling pathways involved in the response to environmental conditions

Tree monitoring and bud sampling

Controlled conditions

- Multiple climate chambers for trees and branches
- Cold deprivation
- High temperatures
- Daylengths

Natural conditions

- Multi-site
- Multiple cultivars
- Multiple years

Molecular and physiological analyses of dormancy and flowering

A3C

Identification of key signalling pathways involved in the response to environmental conditions

Molecular level

Transcriptomic analyses
- Key genes - master regulators
- Target of these regulators
- Gene regulatory networks

Physiological level

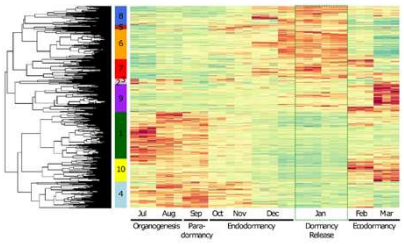
- Phenological data
- Flowering buds composition
  - ✓ Metabolites
  - ✓ Hormones
  - ✓ Lipids
  - ✓ ROS (Oxydative Stress)
  - ✓ Transport capacity

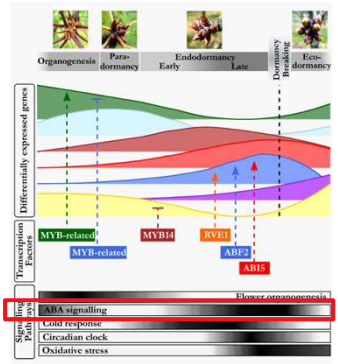
Example of ABA

A3C

RNA-seq analysis of flowering bud dormancy

- Numerous pathways identified
- Pathways stage-specific





Vimont et al., 2019

Predictive modelling

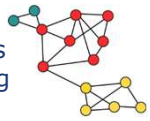
A3C

Data collection and homogenization

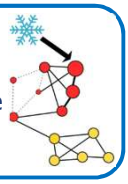
Physiological | *Molecular* | *Genetic* | *Environmental*

Gene regulatory networks

Network inference
- Transcription factors and target modelling



Perturbation modelling
- Impact of temperature on the network



Multiscale modelling: Integration into phenology models

- How do signalling pathways and environmental cues regulate dormancy progression and flowering time?

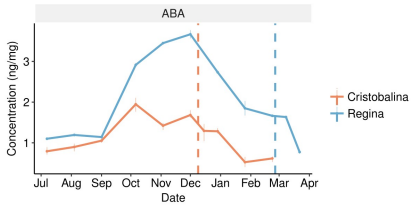
Predictive tools to simulate the tree behavior under environmental constraints

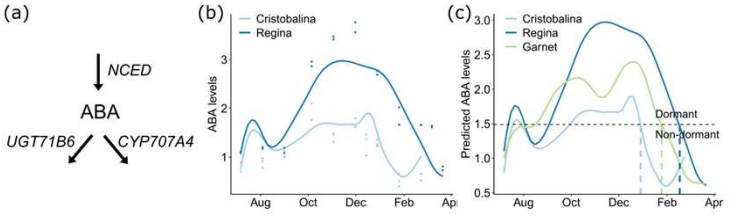
Breeding program

Mechanistic predictive approaches : ABA

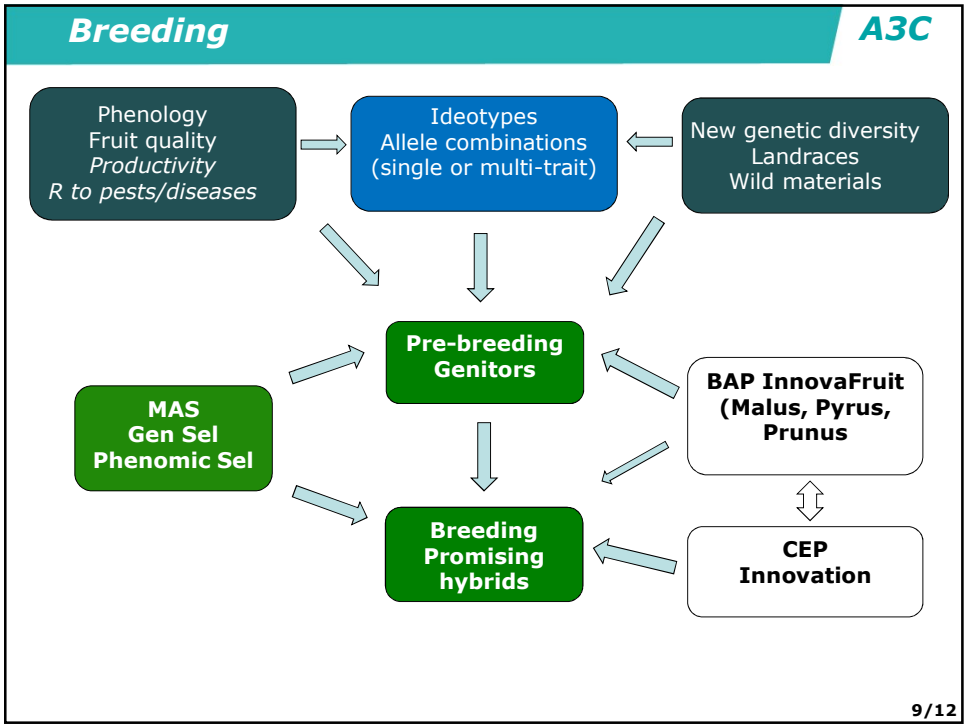
A3C

- Key role of ABA during dormancy ?
- Study of expression of genes involved in ABA synthesis and degradation through dormancy
- Modelling of ABA and dormancy levels





Vimont et al., 2021



[Annex V follows]

ANNEX V

GERMANY

1. In 2023 the Bundessortenamt started 75 new examinations for PBR for varieties of fruit species. In total, there are 188 candidate varieties of 13 fruit species currently under examination at the testing station Wurzen of the Bundessortenamt; the most important of which are raspberry (50 candidate varieties under examination in 2023), strawberry (34), blackberry (47), and apple (32). The majority of actual examinations of fruit varieties at the Bundessortenamt are carried out on behalf of other PBR authorities, mostly for the CPVO. 2 varieties of European pear are currently examined for National Listing in Germany.

2. For the time being a total of 111 varieties of fruit species are under protection according to the German Plant Breeders' Rights Act, and 1 variety has been admitted to the National List, according to the German Seed Act.

[Annex VI follows]

ANNEX VI

JAPAN

1. Number of applications in 2022

Year	Number	(2022/2021)	Fruits	(2022/2021)
1978 to 2022	36,615	-	2,300	-
2021 2022	776 683	(88.0%)	66 63	(95.5%)

Top 5 of application for Fruits in 2022
Strawberry 21, Grapevine 10, Blueberry 7, Japanese Pear 5, Kiwifruit 3.

2. Number of granted in 2022

Year	Number	(2022/2021)	Fruits	(2022/2021)
1978 to 2022	29,495	-	1,839	-
2021 2022	590 672	(113.9%)	31 39	(125.8%)

Top 5 of granted for Fruits in 2022
Grapevine 10, Apple 7, Peach 5, Citrus 4, Blueberry 3, Strawberry 3.

3. National test guidelines harmonized with UPOV TGs in 2022

Common name of plants (7)
Abelia, Camellia, Chestnut, Barley, Tree peony, Eringi, Coleus

4. National test guidelines developed for new type of species in 2022

Genera or Species (13)
Bupleurum rotundifolium L., *Dichroa febrifuga* Lour., *Disporum* Salisb., *Dorycnium hirsutum* (L.) Ser., *Fatsia japonica (Thunb.)* Decne. & Planch., *Hylotelephium* H. Ohba, *Kaempferia parviflora* Wall. ex Baker, *Prunus* L.(root stock), *Sarcococca* Lindl., *Scindapsus pictus* Hassk. , *Sedum lineare* Thunb., *Viburnum dilatatum* Thunb., *Westringia* Sm.

Web-site: https://www.maff.go.jp/j/shokusan/hinshu/info/sinsa_kijun_jp.html

5. Other

✓ To enable PBR holders to exercise their rights effectively and to have a check on any unintended outflow of their protected varieties overseas, Japan PVP and Seed Act was amended in December 2020 and took into effect on April 1, 2022. Under the amended PVP and Seed Act, any acts in respect of the propagating material of all protected varieties (including use of farm saved seeds) shall require the authorization of right holders.

✓ Japan continuously provides other UPOV members with examination reports under the Memorandum of Cooperation (MOC). Japan had provided 64 DUS examination reports in total to other countries in 2022. In addition, MAFF and NCSS have been carrying out DUS examination for CPVR application of *Eutrema japonicum* (Miq.) Koidz. (syn. *Wasabia japonica* (Miq.) Matsum.) on behalf of CPVO.

- ✓ Since the establishment of the East Asia Plant Variety Protection （EAPVP）Forum in 2008, Japan continuously supports cooperative activities with the Forum member's conducted under the EAPVP Forum 10 year Strategic Plan. The common long-term direction of the 10 year Strategic Plan is to establish effective PVP systems consistent with the UPOV Convention, with the aim of achieving UPOV membership among all South East Asian Countries as a basis for further harmonization and regional cooperation.
- ✓ Japan, Vietnam and UPOV are also working together to develop a single online application Platform "e-PVP Asia" that enables a onetime application to multiple PVP Offices connected with the PRISMA, thereby expediting the application process. The "e- PVP Asia" is also expected to facilitate cooperation in examination among participating countries. We are aiming to launch "e-PVP Asia" by early 2027.

Since 2016, based on the Memorandum of Understanding, Center for Seeds and Seedlings, NARO (NCSS) and Naktuinbouw have established Calibration Manuals for DUS technical harmonization. "Calibration manual for lettuce ver.2" was finalized in 2023, and it will be published through both of websites. With revision of this, a total of 10 Calibration Manuals will be available for third country.

[Annex VII follows]

ANNEX VII

KYRGYZSTAN

1. The State Agency of Intellectual Property and Innovation under the Cabinet of Ministers of the Kyrgyz Republic (Kyrgyzpatent) having considered the reminder of the UPOV Secretariat informs that Kyrgyzpatent conducts a preliminary examination by part 1 Article 11 of the Law of the Kyrgyz Republic.

2. The preliminary examination of the application shall include verification of

- The composition of the application and the documents attached thereto;
- The correctness of the documents as required;
- compliance with the rules for applying for a patent attorney, including the presence and correctness of the power of attorney proving the powers of the patent attorney;
- the name of the breeding achievement.

The issues listed below are:

- Use of molecular methods in DUS examination;
- databases of varietal description;
- exchange and use of software and equipment;
- experience with new varieties and species;
- cooperation in the field of expertise;
- issues related to DUS expertise in the fruit sector;
- number of growing cycles and final examination of fruit crops;
- color evaluation of fruit crops.

3. Conducted by the bilateral agreement between the State Agency for Intellectual Property and Innovation under the Cabinet of Ministers of the Kyrgyz Republic (Kyrgyzpatent) and the Department of Crop Expertise under the Ministry of Agriculture by Article 14 of the Law of the Kyrgyz Republic "On legal protection of breeding achievements" using appropriate methods of the International Union for the Protection of New Varieties of Plants (UPOV).

4. The Department of Crop Expertise under the Ministry of Agriculture based on the results of trials of a breeding achievement shall conclude the compliance of the breeding achievement to the conditions of protection and make an official description of the breeding achievement.

5. If a breeding achievement passed the distinctiveness, homogeneity, and stability tests with a positive result, Kyrgyzpatent, based on the materials of the reports and conclusions of the Department of Crop Expertise of the Ministry of Agriculture, shall decide on granting a patent.

[Annex VIII follows]

ANNEX VIII

NETHERLANDS

Naktuinbouw Variety Testing developments

- As from April 2022 one junior DUS examiner joined the DUS team to replace colleagues who retired or changed jobs. The DUS team now consists of 40 employees, including 2 managers and 4 specialized in disease resistance. The Department of Variety Testing includes also a support team, a trial management team and a project team. In total there are 70 employees.
- The Variety Testing Department yearly offers a number of courses around Plant Breeders' Rights and/or Listing. Last year almost all courses have been provided as online-sessions (Zoom/Teams).
- Applicants more and more use the online systems of UPOV PRISMA and CPVO for filing their applications for listing and/or Plant Breeders' Rights. Nowadays it is possible to apply for Plant Breeders' Rights for all species through UPOV PRISMA as well as for Listing in the Netherlands.

Number of applications received

In 2022, 2393 applications were received for testing for the first year for National listing, and for National or European Plant Breeders' Rights. Applications of the same variety for Listing as well as PBR, in vegetables and in agricultural crops are split in this table.

2022	NL listing	NL PBR	EU PBR	TOTAL
Agriculture	252	70	42	
Vegetable	717	453	58	
Ornamental (incl. trees)		161	640	
TOTAL	969	684	740	2393

DUS projects

Digitisation

- Naktuinbouw continues to work on the expansion of the Naktuinbouw Academy: a digital training platform.
- Databases: Naktuinbouw develops SNP-databases in French bean, Rose, Lettuce, Onion, Hemp and Tomato. Some databases are developed nationally, others in international projects (e.g.IMODDUS). The projects are funded by amongst others the Dutch board for plant varieties and CPVO.

EU projects: Database Melon, Harmorescoll and INVITE and IPKey

- An EU database for melon varieties is developed by cooperation between France, Portugal, Slovakia Spain and the Netherlands. The development is funded by CPVO. In 2021 the project has been finished and continuation in cooperation is agreed.
- Harmorescoll: in this project the reference material for obligatory disease resistance tests will be harmonized.
- The EU project INVITE on the improvement on DUS and VCU. Naktuinbouw is one of the partners in this program.
- Imoddus join a project on setting up resistance tests to *Aphis gossypii* in Melon
- Naktuinbouw continues to support IPKey projects

Other projects

- Study on minimum distances in Tulip 2021-2023.
- Studies on DUS and VCU testing in True Potato Seeds
- Automatic morphological descriptions of ornamental crops through machine learning. https://www.wur.nl/nl/Onderzoek-Resultaten/Onderzoeksinstituten/plant-research/biometris/show-biometris/MODOMA-Deep-Learning-in-sierteelt.htm
- Develop a disease resistance test for ZYMV in courgette

International cooperation 2023

- Since 2022, a holistic project has been started in the Philippines with the funds provided by RVO. The project aims to share knowledge and provide trainings for the development of the Philippines National Seed Technology Park (NSTP) project. The project continues until July 2024.
- In 2023, Naktuinbouw hosted the Sounding Board meeting of SeedNL, received a delegation from Morocco regarding knowledge exchange for DUS trials of fibre-cannabis and will receive experts from Colombia in October for a DUS training on Cannabis under the TAIEX project.
- Another TAIEX project with Japan regarding the exchange of knowledge on molecular techniques for infringements of plant breeder rights is under planning.

PVP Development Program (Toolbox)

- This is a tool to help countries to develop, improve and implement their Plant Breeders' Rights system. The first 5 years period has been finalised successfully. The Dutch Ministry has made another 5 years of funds available (2022-2027) for the implementation of this program. In 2023, different PVP projects in 11 countries are being carried out.
  More info: PVP Development Program – PVP Toolbox | Naktuinbouw or contact: PVPToolbox@naktuinbouw.nl

Plant Breeders Rights training course.

- In 2022, the course was presented in an online format. In 2023, the course will be split into four separate e-learnings, each with its own theme. The courses will probably start this fall.

More information: https://www.naktuinbouw.com/bulb/training-course/plant-breeders%E2%80%99-rights-food-security-and-economic-development or contact: l.pinan.gonzalez@naktuinbouw.nl

[Annex IX follows]

ANNEX IX

NEW ZEALAND

1. Application numbers for fruit varieties in the 2022/23 period have halved in comparison with previous years, with 15 new fruit applications accepted. These included four (4) apple varieties, four (4) kiwifruit, two (2) peach, one (1) nectarine, one (1) sweet cherry, one (1) raspberry, one (1) blueberry, and one (1) grape. At the conclusion of 2022/2023 there were 154 fruit varieties under examination.

2. Apple and Kiwifruit varieties comprise the highest percentage of new fruit applications in New Zealand each making up 25% of applications in 2022/2023. Kiwifruit applications have increased by 20% in the last twelve months. Applications for strawberry and blueberry varieties have decreased significantly with no new strawberry applications filed. Currently there are still 26 blueberry varieties and 19 strawberry varieties under test.

3. The Apple Cultivar Centre, home of the PVR Variety Collection for *Malus*, has been severely impacted by Cyclone Gabrielle which hit eastern parts of New Zealand's North Island, in particular Gisborne (Tairawhiti) and Hawkes Bay, in February 2023. Over 80 varieties, both candidate and reference, will need to be either re budded or replaced with commercially available trees in the next two years, which may have a negative impact on DUS testing in the short term. A plan is now in place to work cooperatively with variety owners or agents to source replacement plant material for both reference and candidate varieties.

4. 'In person' meetings and training sessions have resumed in the last 12 months with international and national travel now possible. A DUS training workshop was recently run in Christchurch, the first since 2018, which included the PVR regional describers, Examiners from IP Australia, and Plant and Food Research staff involved with DUS testing.

5. The Plant Variety Rights Act 2022 and the Plant Variety Rights Regulations 2022 came into force on 24 January 2023. The new law contains elements of the 1991 Act of the UPOV Convention, with additional provisions for applications for varieties belonging to taonga (treasured) species, primarily species of native plants. These provisions will come into force in late 2023 and are intended to address obligations under the Treaty of Waitangi and include establishment of the Māori Plant Varieties Committee. All parts of the new law are intended to be in force by early 2024. The Plant Variety Rights Act 2022 will run in parallel with the Plant Variety Rights Act 1987 because there are no retrospective provisions in the new law. This dual system could potentially continue for the next 25 to 30 years

[Annex X follows]

ANNEX X

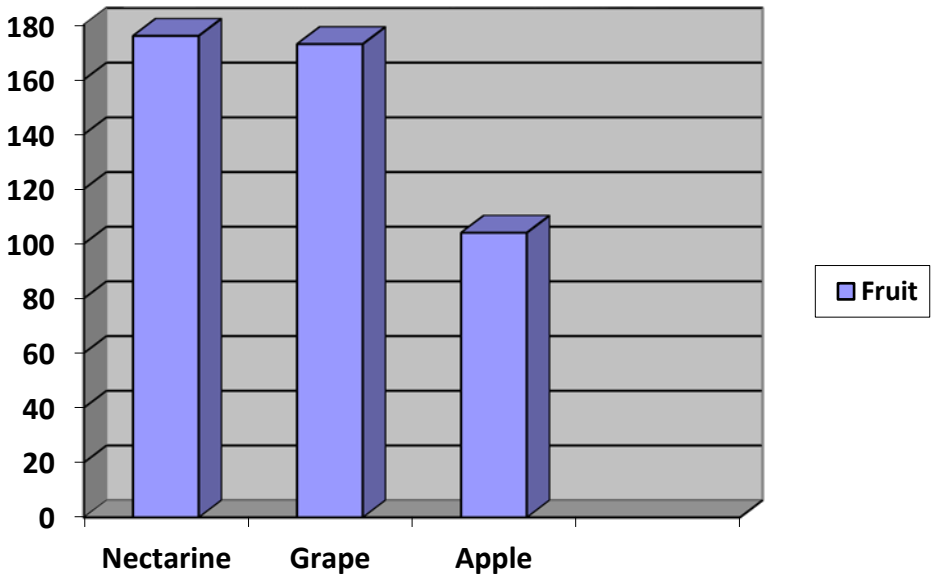
SOUTH AFRICA

TWP PBR STATISTICS FOR FRUIT CROPS FOR SOUTH AFRICA ENDING 31 DECEMBER 2022

With reference to Applications and valid Plant Breeders' Rights for 2022 the following is reported:

- No additional taxa for fruit crops have been declared in terms of the Plant Breeders' Rights Act during **2022.**
- **263** PBR applications were received of which **42% [109] for Fruit crops.**
- As of December **2022**, a **TOTAL** of **3637** varieties had valid plant breeder's rights in South Africa, of which **30%** were **for Fruit** crops.

The top three fruit crops were:
1. *Prunus persica* (L.) Batsch var. *nucipersica* Schneid. [**176**]
2. *Vitis* L. [**173**]
3. *Malus* Mill. [**104**]



TWP PBR STATISTICS FOR SOUTH AFRICA ENDING 31 DECEMBER 2022

With reference to Applications and valid Plant Breeders' Rights for 2022 the following is reported:

- One additional taxa have been declared in terms of the Plant Breeders' Rights Act during **2022.**
- **263** PBR applications were received of which **37% [96] were for Agricultural crops**, **10% [29] for Ornamental crops, 42% [109] for Fruit crops** and **11% [29] for Vegetable crops**.
- As of December **2022**, a **TOTAL** of **3637** varieties had valid plant breeder's rights in South Africa, of which **23% were for Ornamental** crops, **39% for Agricultural** crops, **30% for Fruit** crops and **8% for Vegetable** crops. The top three crops for each crop are:

FRUIT CROPS

1. *Prunus persica* (L.) Batsch var. *nucipersica* Schneid. [**176**]
2. *Vitis* L. [**173**]
3. *Malus* Mill. [**104**]

ORNAMENTAL CROPS

1. *Rosa* L. [**307**]
2. *Chrysanthemum* L. [**84**]
3. *Aloe* L. [**48**]

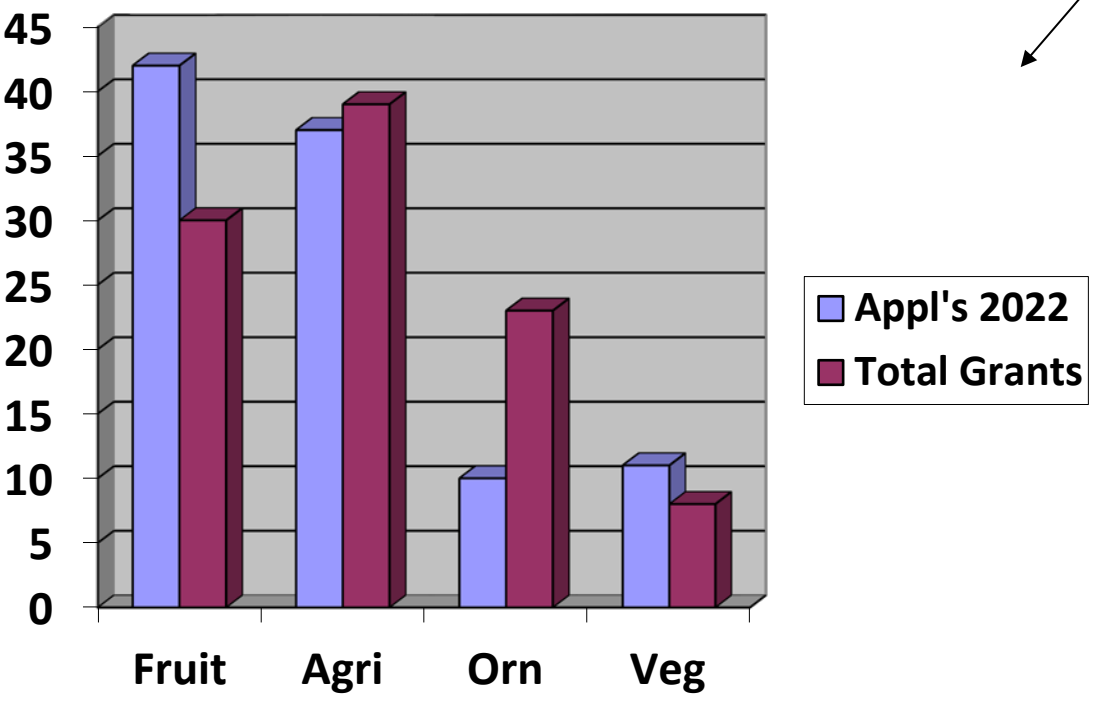
AGRIC CROPS

1. *Zea mays* L. [**674**]
2. *Glycine max.* (L.) Merrill. [**165 GMO + 12 CONV**]
3. Triticum L. [123]

VEGETABLE CROPS

1. *Solanum lycopersicum* L. [**59**]
2. Phaseolus vulgaris L. **[34]**
3. Capsicum L. [26]

White CONV	**51**
White open pollinated	**6**
White GMO	**222**
Yellow CONV	**113**
Yellow GMO	**247**
Hybrid White	**24**
Sweetcorn	**11**



[End of Annex X and of document]