

5th ISAF 2025

INTERNATIONAL SYMPOSIUM
for AGRICULTURE AND FOOD
8–10 October 2025

Book of Abstracts



Organized by:
Faculty of Agricultural Sciences and Food - Skopje,
Ss. Cyril and Methodius University in Skopje





Republic of North Macedonia
**Ministry of agriculture,
forestry and water economy**

CO-ORGANIZERS



Golden Sponsor:



General Sponsor:



PHILIP MORRIS
TUTUNSKI KOMBINAT PRILEP LLC SKOPJE

The Faculty of Agricultural Sciences and Food-Skopje is organizing the **5th International Symposium for Agriculture and Food (ISAF-2025)**, which offers a possibility for presenting novel and fundamental advances in the field of sustainable agriculture and food production. ISAF 2025 will bring together and foster the communication among leading researchers, engineers and practitioners with an aim to share their scientific ideas and experiences with all actors in the agricultural sector. Since 2012, the International Symposium for Agriculture and Food is integrating the previous organized events: Faculty-Economy Meeting, Symposium of Viticulture and Wine Production, Symposium for Vegetable and Flower Production and International Conference of the Association of Agricultural Economists of the Republic of North Macedonia.

EVENTS WITHIN ISAF 2025

- 41st Faculty-Economy Meeting
- 14th International Conference of the Association of Agricultural Economists of the Republic of North Macedonia (AAEM)
- Meeting of the Association of Faculties of Agricultural Sciences of South Eastern Europe
- 10th Balkan Animal Sciences Conference BALNIMALCON 2025
- General Assembly of Agro-Well – Horizon Europe Project
- Beyond the leaf: Innovation, Research & Regulation - Philip Morris Panel Discussion
- Biobased Technologies for Climate-Resilient Farming: The DIVAGRI Project Approach
- AgriFood Business x EDIH: Innovate, Connect, Transform

SCIENTIFIC AREAS OF ISAF 2025

The topics of ISAF 2025 are divided into the following scientific sections:

- Animal Biotechnology & BALNIMALCON 2025
- Agricultural Economics
- Agricultural Machinery and Sustainable Agriculture
- Apiculture
- Phytomedicine - Plant Protection
- Food Quality and Safety
- Fruit Growing, Viticulture and Wine Production
- Vegetable, Flower and Decorative Plants Production
- Digital Agriculture & Natural Resources Management
- Field Crop Production
- Genetics, Breeding and Genetic Resources

ORGANIZING COMMITTEE	HONORARY ORGANIZING COMMITTEE
Prof. Dr. Mile Markoski, <i>President</i>	Prof. Dr. Vjekoslav Tanaskovikj, North Macedonia
Prof. Dr. Ivana Janeska Stamenkovska	Prof. Dr. Dragi Dimitrievski, North Macedonia
Prof. Dr. Biljana Kuzmanovska	Prof. Dr. Ordan Cukaliev, North Macedonia
Prof. Dr. Toso Arsov	Prof. Dr. Vidoja Trpevski, North Macedonia
Prof. Dr. Marjan Kiprijanovski	Prof. Dr. Marina Pintar, Slovenia
Prof. Dr. Srekjko Gjeorgjievski	Prof. Dr. Ales Gregorc, Slovenia
Prof. Dr. Vjekoslav Tanaskovikj	Prof. Dr. Aleksandar Mesic, Croatia
Prof. Dr. Mirjana Jankulovska	Prof. Dr. Krunoslav Zmaic, Croatia
Prof. Dr. Ile Canev	Prof. Dr. Tomislav Vinkovic, Croatia
Prof. Dr. Lenche Velkoska-Markovska	Prof. Dr. Muhamed Brka, Bosnia and Hercegovina
Prof. Dr. Riste Elenov	Prof. Dr. Zlatan Kovacevic, Bosnia and Hercegovina
Prof. Dr. Dragi Dimitrievski	Prof. Dr. Ivan Ostojic, Bosnia and Hercegovina
Prof. Dr. Koco Porcu	Prof. Dr. Jurica Primorac, Bosnia and Hercegovina
Prof. Dr. Tatjana Mitkova	Prof. Dr. Nenad Magazin, Serbia
Prof. Dr. Dane Boshev	Prof. Dr. Vladan Bogdanovic, Serbia
Prof. Dr. Romina Kabranova	Prof. Dr. Vladimir Kurcubic, Serbia
Prof. Dr. Aleksandar Uzunov	Prof. Dr. Igor Pajovic, Montenegro
	Prof. Dr. Bozidarka Markovic, Montenegro
	Prof. Dr. Mehmet Ihsan Soysal, Turkey

SECRETARIAT

Prof. Dr. Ivana Janeska Stamenkovska, <i>President</i>	Doc. Dr. Ivana Angelova
Prof. Dr. Biljana Kuzmanovska	Doc. Dr. Nikola Saraginovski
Prof. Dr. Toso Arsov	Doc. Dr. Igor Iljovski
Prof. Dr. Marina Nacka	Ass. MSc. Nadica Sandeva Atanasova
Prof. Dr. Ana Simonovska	Ass. Dr. Biljana Ristakjovska Shirgovska
Prof. Dr. Dushica Santa	MSc. Stojance Neckovski
Prof. Dr. Elizabeta Miskoska Mileska	MSc. Marija Zdravkovska
Prof. Dr. Mirjana S. Jankulovska	BSc. Biljana Stoilkovska
Prof. Dr. Margarita Davitkovska	BSc. Suncica Andonova
Prof. Dr. Frosina Babanovska Milenkovska	BSc. Zlatko Chanevski
Prof. Dr. Zlatko Prculovski	BSc. Marija Todorovska
Doc. Dr. Aleksandra Silovska Nikolova	BSc. Dragana Trajcevska

SCIENTIFIC COMMITTEE

Prof. Dr. Ivana Janeska Stamenkovska, <i>President</i>	Prof. Dr. Zoran Jovovic
Prof. Dr. Toso Arsov	Prof. Dr. Rade Rusevski
Prof. Dr. Biljana Kuzmanovska	Prof. Dr. Metodija Trajcev
Prof. Dr. Mirjana Jankulovska	Prof. Dr. Romina Kabranova
Prof. Dr. Koco Porcu	Prof. Dr. Krum Boskov
Prof. Dr. Hossein Azadi	Prof. Dr. Riste Elenov
Prof. Dr. Cecilia Costa	Prof. Dr. Emel Ozkan Unal
Prof. Dr. Svetoslav Malcev	Prof. Dr. Zaklina Karaklajic-Stajic
Prof. Dr. Mirjam Vujadinovic Mandic	Prof. Dr. Sanda Stanivukovic
Prof. Dr. Adriana Filipovic	Prof. Dr. Pavle Maskovic
Prof. Dr. Tomaž Langerholc	Prof. Dr. Branimir Njezic
Prof. Dr. Andreas Drichoutis	Prof. Dr. Tatjana Prentovikj
Prof. Dr. Bozidar Ivanov	Prof. Dr. Zlatko Prculovski
Prof. Dr. José-Luis Todolí-Torró	Prof. Dr. Marija Vukelikj-Sutovska
Prof. Dr. Irzada Taljić	Prof. Dr. Silvana Manasievska
Prof. Dr. Marin Kovacic	Prof. Dr. Hrisula Kiprijanovska
Prof. Dr. Dragana Bozic	Prof. Dr. Ana Kotevska
Prof. Dr. Sanja Radonjić	Prof. Dr. Mirjana S. Jankulovska
Prof. Dr. Shpend Shahini	Prof. Dr. Zvonko Pacanoski
Prof. Dr. Rozalija Cvejić	Prof. Dr. Tatjana Mitkova
Prof. Dr. Zdenko Lončarić	Prof. Dr. Mihail Petkov
Prof. Dr. Dragan Radivojević	Prof. Dr. Stanislava Lazarevska
Prof. Dr. Daniela Raicevic	Prof. Dr. Rukie Agic
Prof. Dr. Djordje Moravcevic	Prof. Dr. Dragoslav Kocovski
Prof. Dr. Ana Marjanovic Jeromela	Prof. Dr. Marina Nacka
Prof. Dr. Mirela Kajkut Zeljkovic	Prof. Dr. Frosina Babanovska Milenkovska
Prof. Dr. Simeon Rakonjac	Prof. Dr. Radmila Iliac
Prof. Dr. Levent Ozduven	Prof. Dr. Eser Kemal Gurcan
Prof. Dr. Jaka Zgajnar	Prof. Dr. Marko Petek
Prof. Dr. Imre Balazs	Prof. Dr. Angel Sarov
Prof. Dr. Ivana Majic	Prof. Dr. Jasmin Grahic
Prof. Dr. Mirjana Djukic Stojic	Prof. Dr. Biljana Lazovic
Prof. Dr. Denis Rusjan	Prof. Dr. Samir Muhamedagic
Prof. Dr. Marija Cerjak	Prof. Dr. Miljenko Konjacic

ID: 317 / SES-P-GBGR-02: 12**Abstract Submissions****Poster Presentation***Topics:* Genetics, Breeding and Genetic Resources*Keywords:* Crop Wild Relatives, Pre-breeding, Genetic Diversity, Malus, Pyrus, Prunus, Multi-omics, Horizon Europe**EXPLOITING THE UNTAPPED POTENTIAL OF FRUIT TREE WILD DIVERSITY FOR SUSTAINABLE AGRICULTURE (FRUITDIV PROJECT)****Vlatko Andonovski¹, Nikolco Velkovski¹, Viktorija Brndevska Stipanovic¹, Ivana Janeska Stamenkovska²**¹University Ss. Cyril and Methodius in Skopje, Hams Em-Faculty of Forest Sciences, North Macedonia, Republic of; ²University Ss. Cyril and Methodius in Skopje, Faculty of Agricultural Sciences and Food- Skopje; vandonovski@sf.ukim.edu.mk

The domestication of fruit trees has resulted in a significant genetic bottleneck, limiting the resilience of modern cultivars to abiotic and biotic stresses driven by climate change. Crop Wild Relatives (CWR) of major pome (apple, pear) and stone (cherry, plum, etc.) fruits represent a critical, yet underutilized, reservoir of genetic diversity for traits like disease resistance and drought tolerance. The FRUITDIV project, a 5-year Horizon Europe initiative (2024-2028), aims to systematically monitor, characterize, use, and conserve the diversity of fruit tree CWR to enhance the sustainability and climate resilience of European fruit production. A multidisciplinary consortium of 27 partners from 14 countries employs an integrated approach across six core research work packages. This includes: (1) creating a comprehensive CWR inventory; (2) advanced genotypic and ex-situ phenotypic characterization; (3) developing multi-omics resources for data analysis and sharing; and (4) using these data to strategically introduce CWR alleles into pre-breeding programs. FRUITDIV will generate and make publicly available a suite of resources, including a detailed CWR knowledge base, genomic datasets, phenotyping data on valuable agronomic traits, and novel pre-breeding plant materials. The project will also deliver frameworks for the sustainable conservation and economic valuation of CWR genetic resources. By bridging the gap between conservation and breeding, FRUITDIV will unlock the genetic potential of wild fruit species. The project's outputs are designed to provide breeders and farmers with the tools and genetic material needed to develop robust fruit varieties, ensuring the long-term productivity and sustainability of European agriculture.

Exploiting the Untapped Potential of Fruit Tree Wild Diversity for Sustainable Agriculture (FruitDiv Project)

Vlatko Andonovski¹, Nikolco Velkovski¹, Viktorija Brndevska Stipanović¹, Ivana Janeska Stamenkovska²
¹ Ss. Cyril and Methodius University in Skopje, Hans Em Faculty of Forest Sciences, Landscape Architecture and Environmental Engineering, Skopje, North Macedonia
² Ss. Cyril and Methodius University in Skopje, Faculty of Agricultural Sciences and Food, Skopje, North Macedonia

INTRODUCTION - What is FRUITDIV?

FruitDiv is a European research project launched on the 1st of January 2024. The project is funded under the Horizon Europe framework for a period of five years (January 2024 - December 2028). FruitDiv aims to monitor, characterise, use, and conserve the diversity of fruit tree Crop Wild Relatives (CWR), with a particular emphasis on pome (Malus, Pyrus) and stone (Prunus) fruits.

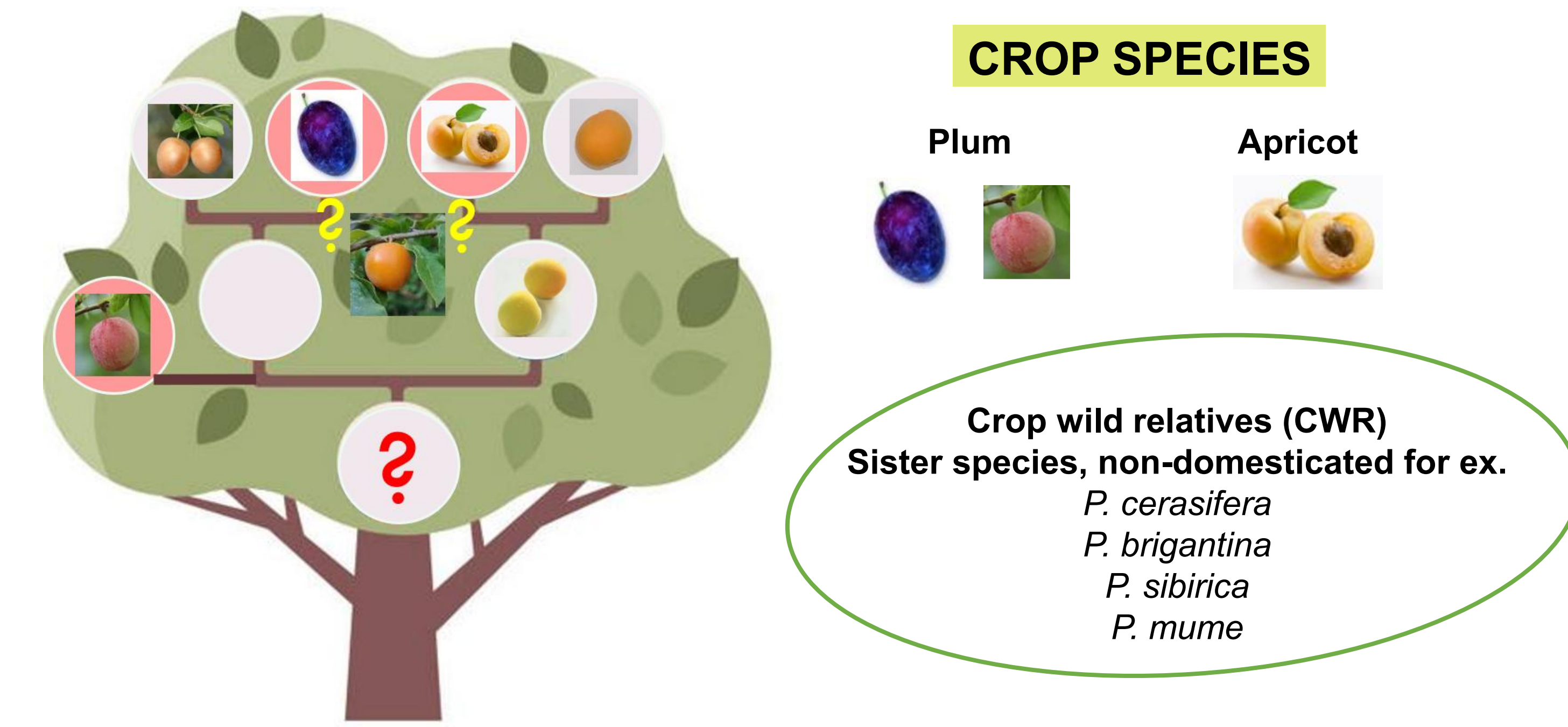
The domestication of fruit trees has resulted in a significant genetic bottleneck, limiting the resilience of modern cultivars to abiotic and biotic stresses driven by climate change. Crop Wild Relatives (CWR) of major pome (apple, pear) and stone (cherry, plum, etc.) fruits represent a critical, yet underutilized, reservoir of genetic diversity for traits like disease resistance and drought tolerance. The FRUITDIV project, a 5-year Horizon Europe initiative (2024-2028), aims to systematically monitor, characterize, use, and conserve the diversity of fruit tree CWR to enhance the sustainability and climate resilience of European fruit production.

A multidisciplinary consortium of **27 partners from 14 countries** employs an integrated approach across six core research work packages. This includes: (1) creating a comprehensive CWR inventory; (2) advanced genotypic and ex-situ phenotypic characterization; (3) developing multi-omics resources for data analysis and sharing and (4) using these data to strategically introduce CWR alleles into pre-breeding programs.

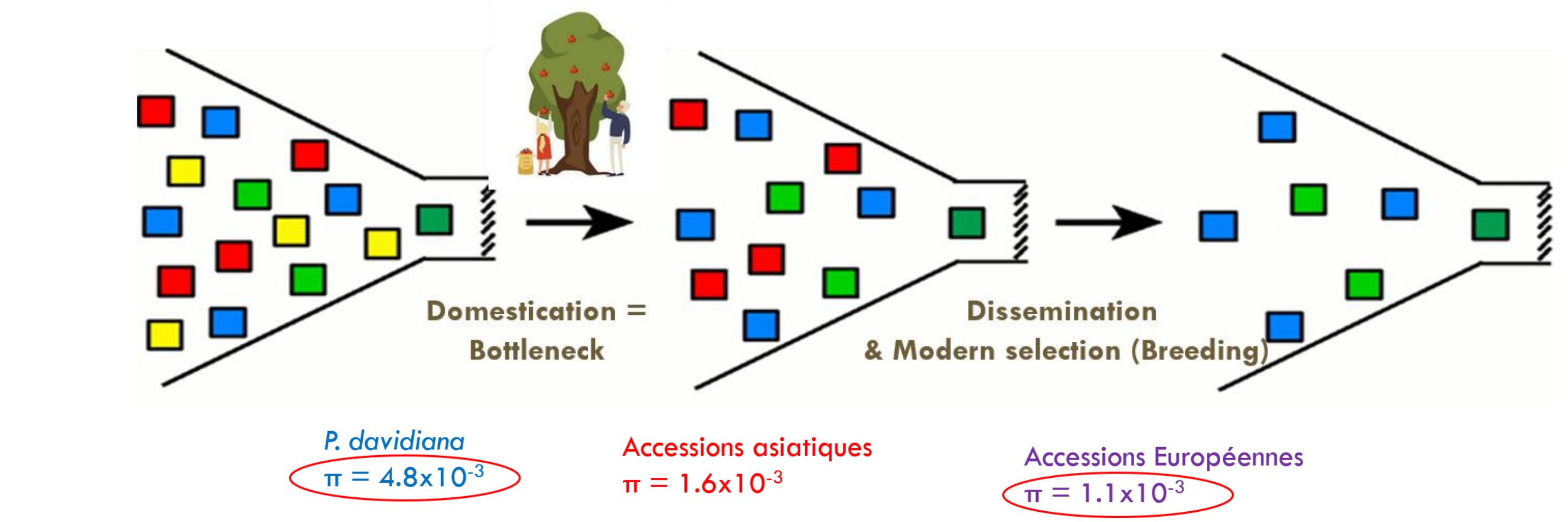
FRUITDIV will generate and make publicly available a suite of resources, including a detailed CWR knowledge base, genomic datasets, phenotyping data on valuable agronomic traits, and novel pre-breeding plant materials. The project will also deliver frameworks for the sustainable conservation and economic valuation of CWR genetic resources. By bridging the gap between conservation and breeding, FRUITDIV will unlock the genetic potential of wild fruit species. The project's outputs are designed to provide breeders and farmers with the tools and genetic material needed to develop robust fruit varieties, ensuring the long-term productivity and sustainability of European agriculture.

WHAT ARE THE CROP WILD RELATIVES? Also referred as the Wild COUSINS but not only

Crop Wild Relatives are wild plant species closely related to cultivated crops. They hold important potential as a source of genetic diversity, offering agronomic and nutritional traits like pest and disease resistance, tolerance to drought, and adaptability to fluctuating climatic conditions affecting fruit quality and production.



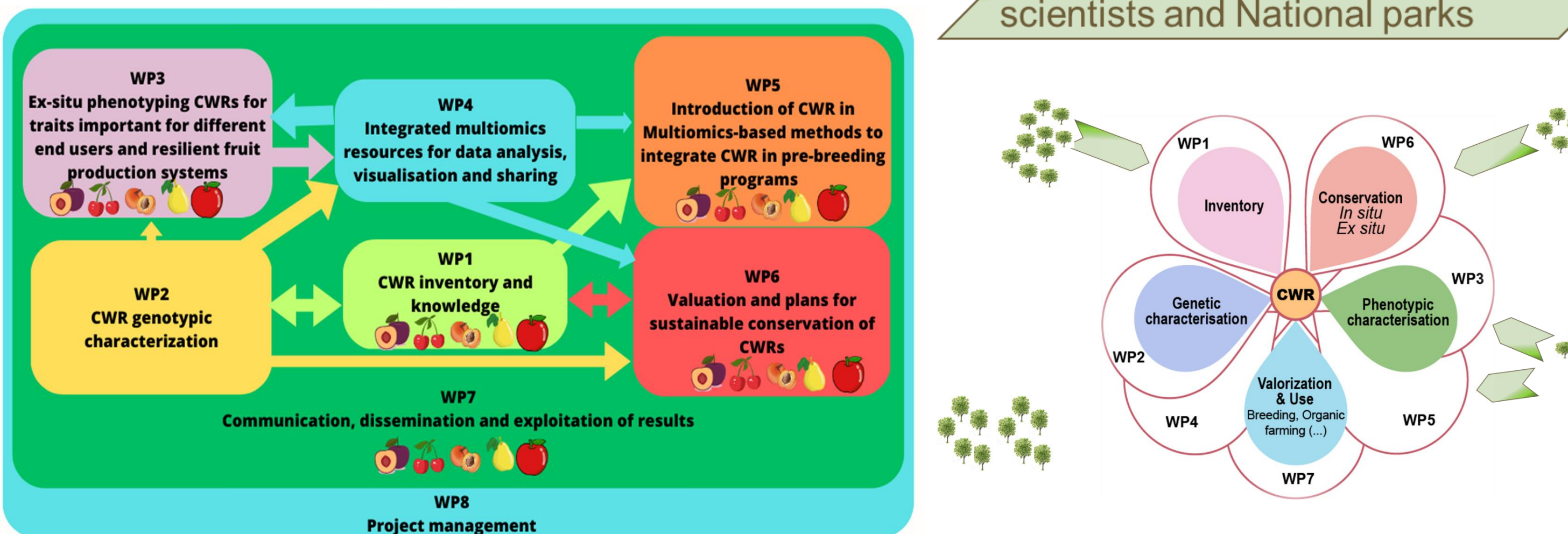
WHY STUDY CWR? Fruit tree domestication led to a reduction in genetic diversity ~ 80% reduction in peach ~ 30% reduction in apricot



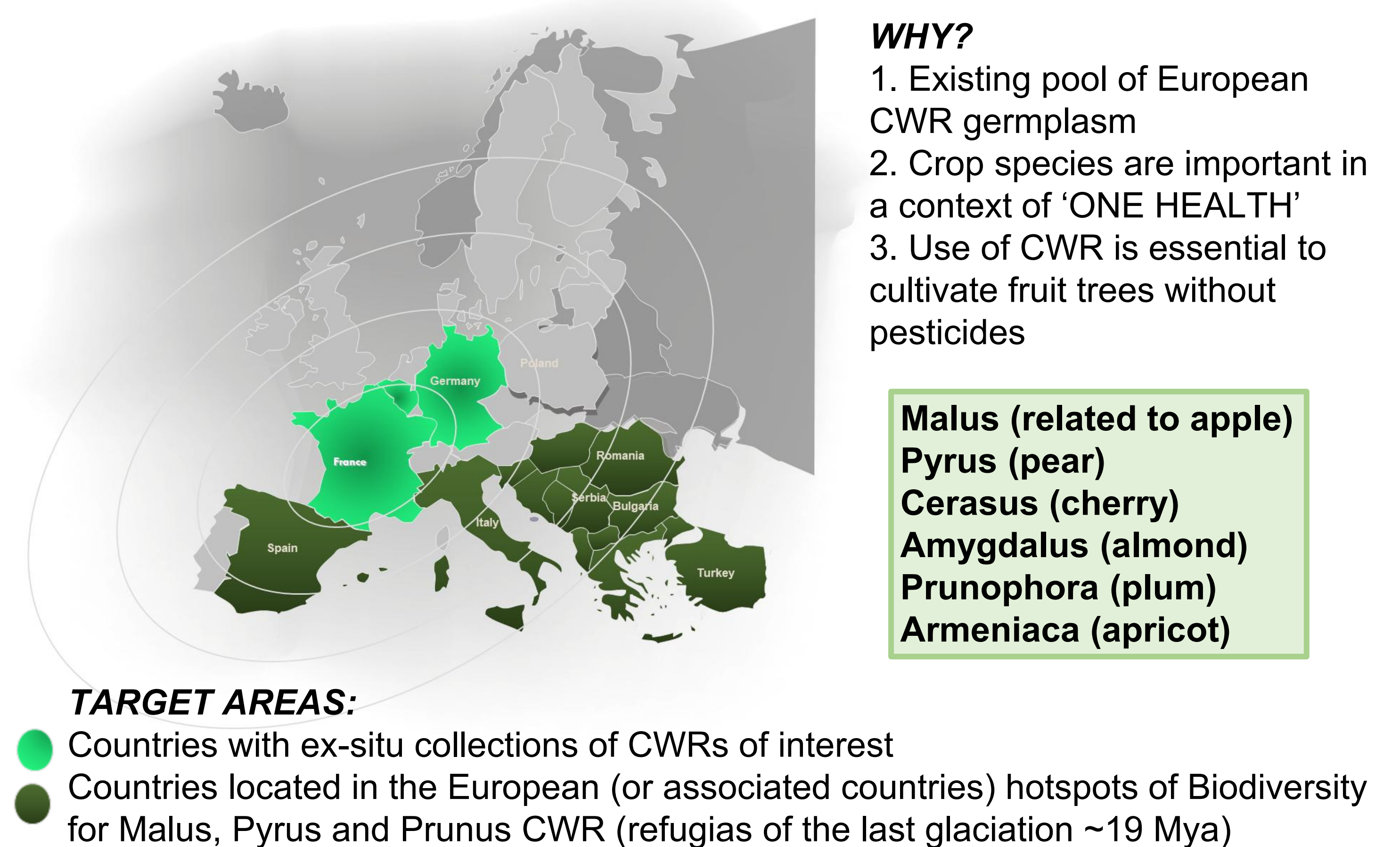
THE CONSORTIUM

The FruitDiv consortium is coordinated by INRAE France. It includes 27 multi-disciplinary partners from 10 EU Member States and 4 other European countries.

ACADEMIC AND NON-ACADEMIC SECTOR:
Geneticists (population, quantitative)
Physiologists, biochemists and agronomists
Specialist of social sciences (lawyer incl.)
Fruit breeders
Forestry officers
Germplasm curators
Farmers
Citizens



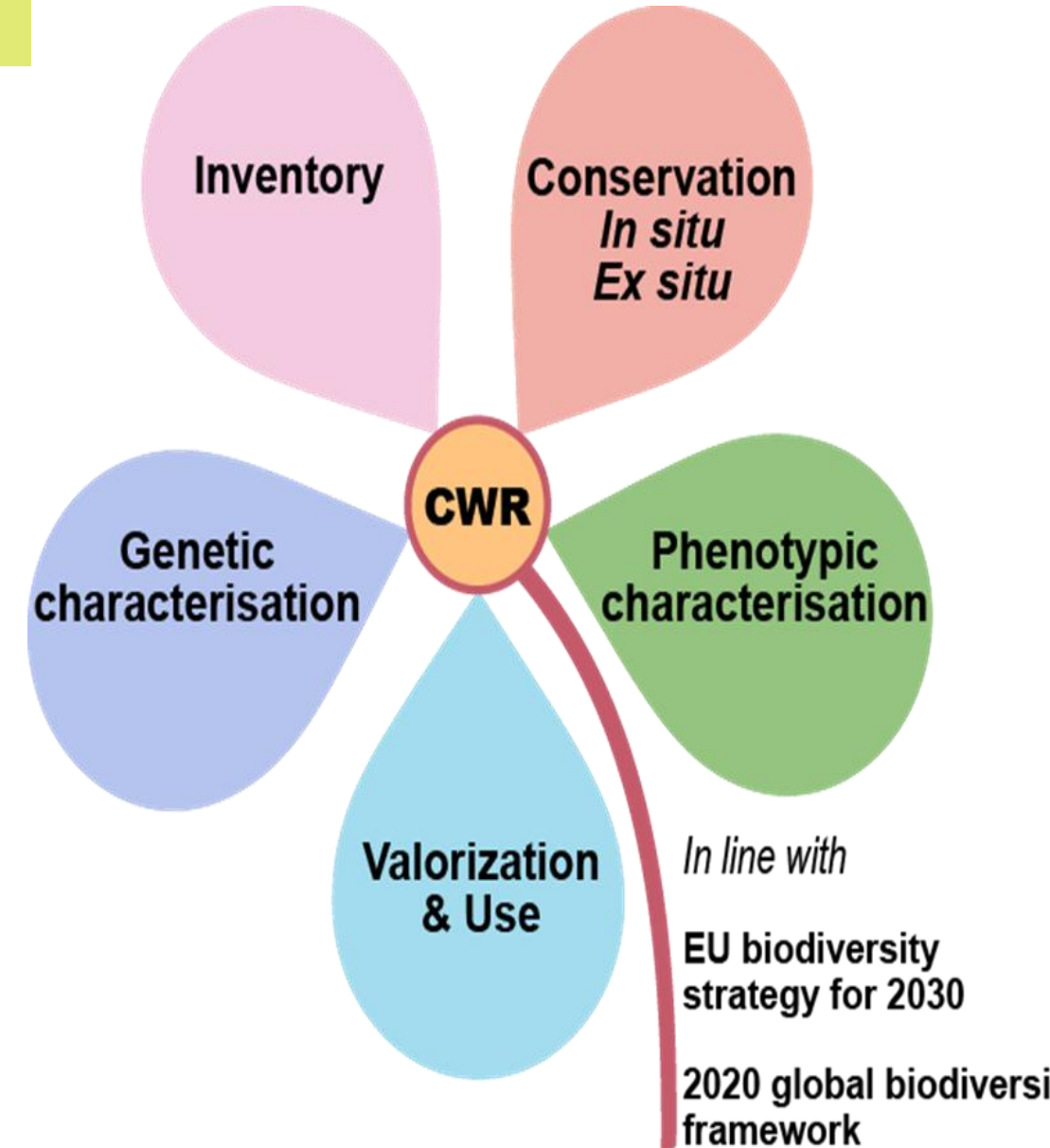
TARGET SPECIES IN FRUITDIV: Malus, Pyrus, Prunus (CWRs are FORESTRY SPECIES)



HORIZON-CL6-2023-BIODIV-01-13: Crop wild relatives for sustainable agriculture

The research is carried out through the following main activity areas:

- Establishing a CWR inventory and ensure knowledge
- Conduct CWR genotypic characterisation
- Ex-situ phenotyping CWRs for traits important for different end users and resilient fruit production systems
- Integrated multiomics resources for data analysis, visualisation and sharing
- Introduction of CWR in Multiomics-based methods to integrate CWR in prebreeding programs
- Valuation and plans for sustainable conservation of CWRs



Expectations of FRUITDIV in HORIZON-CL6-2023-BIODIV-01-13

- **More effective measures for the conservation of Crop Wild Relatives (CWR)**
 - Better conservation of CWR in ex situ repositories (gene banks)
 - Better ex situ conservation by the implementation of genetic reserves in the European hotspots of diversity (former refugia during the last glaciation)
 - Better characterisation of CWR diversity at the population level
- **Better knowledge and dissemination on the value and interest of CWR**
 - Genome- and population-wide characterisation of fruit tree CWR
 - Identification of CWR traits of interest for Agriculture, Forestry and Society
 - Survey and sharing on the traditional knowledge linked to Fruit tree CWR
- **Greater use of CWR in breeding and acceleration of CWR-based breeding programs**
 - Development of genomic tools adapted to CWR features (genetic load, domestication syndrome, domestication alleles etc.
 - Better access by farmers and citizens to CWR-based, environmentally-friendly, improved varieties



Funded by the European Union

www.fruitdiv.eu

