



ECPGR Activity Grant Scheme Proposal Form

Fifth Call – Phase X (2019-2023)

Activity Proposal

| Activity | |
|---|---|
| Full title | Improvement of Fruit Tree Data Inclusion in EURISCO |
| Acronym (or short title) | FRUITTREEDATA |
| Duration of Activity (in months) | 24 |
| Start date – End date <i>Please indicate start date not earlier than 3 months after deadline of Call</i> | 1.1.2022 - 31.12.2023 |

Applying Working Group(s)

| | Working Group | Indicate name and surname of Working Group Chair |
|----|---------------|--|
| 1. | Malus/Pyrus | Marc Lateur |
| 2. | Prunus | Daniela Giovannini |
| 3. | | |
| 4. | | |
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Activity Coordinator

| Activity Coordinator | |
|----------------------|-------------------------|
| Name and Surname | Matthew Ordidge |
| Working Group | Malus/Pyrus and Prunus |
| Nationality | British (UK) |
| Current position | Senior Research Fellow |
| Institute | University of Reading |
| Country | UK |
| Telephone | +44 (0)118 378 7018 |
| Email | m.ordidge@reading.ac.uk |

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Activity Partners (ECPGR-funded)

Please note that each partner needs to be a member of an ECPGR Working Group to be eligible for funding. For self-funded partners please use the separate box below.

| Partner ID No. | Name and Surname | Institute | Country |
|----------------|--|--|-----------------|
| 1 | Matthew Ordidge | University of Reading | UK |
| 2 | Marc Lateur | CRA-W, Gembloux | Belgium |
| 3 | Daniela Giovannini & Mauro Bergamaschi | CREA Council for Agricultural Research and Economics, Research Centre for Olive, Fruit and Citrus crops, Forlì | Italy |
| 4 | Markus Kellerhals | Agroscope | Switzerland |
| 5 | Monika Höfer | Julius Kuhn-Institute, Institute for Breeding Research on Fruit Crops | Germany |
| 6 | Zsuzsanna Békefi | National Agricultural Research and Innovation Centre, Fruitresearch Institute | Hungary |
| 7 | Willem van Dooijeweert | Centre for Genetic Resources the Netherlands (CGN) Wageningen University & Research | The Netherlands |
| 8 | Stein Harald Hjeltnes | Njoes Fruit and Berry Centre | Norway |
| 9 | Boris Krska and Jiri Sedlak | Research and Breeding Institute of Pomology Holovousy Ltd. | Czech Republic |
| 10 | Charles-Eric Durel | INRAE - IRHS | France |
| 11 | Frida Carka | Institute of Plant Genetic Resources (Gene Bank of Albania) Agricultural University of Tirana | Albania |
| 12 | Marine Delmas | Unité Expérimentale Arboricole, INRAE | France |
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Self-funded partners

| Partner No. | Name and Surname | Institute | Country |
|-------------|-----------------------------|----------------------------------|-------------|
| 1 | Stephan Weise | IPK Gatersleben (EURISCO) | Germany |
| 2 | Anne-Françoise Adam-Blondon | INRAE-URGI | France |
| 3 | Christina Kägi | Federal Dept of Economic Affairs | Switzerland |
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Description of Activity (suggested max. 1000 words)

Please address the following aspects:

– **Background:** Explain the context behind the choice of this Activity, e.g. why this has been prioritized or selected. If this is the continuation of a preceding Activity, please indicate how and why the new Activity will build on previous results/experiences.

Central crop databases (CCDBs) for *Malus*, *Prunus* and *Pyrus* continue to exist, although their management has become unsustainable and has stagnated in the case of *Malus* and *Pyrus*. At the time of the most recent working group (WG) meetings (2010 [*Prunus*] & 2012 [*Malus/Pyrus*]) justification for maintaining the CCDBs was because they: (i). were believed to contain accessions that were not listed within EURISCO; and (ii). had greater potential for the inclusion of C&E data (and were beginning to include such data) as well as SSR data and photographs. EURISCO developed the capacity to hold C&E data in 2015 and has invited partners to upload data. This includes developing a system to avoid the requirement for data to come from the national focal point. However, as of September 2021 EURISCO presents only 16K C&E datapoints for *Malus* (all from CZE), 2K datapoints for *Pyrus* (again, entirely from CZE) and 13K datapoints for *Prunus* (from CZE and LVA).

From informal discussion with WG members it is clear that a number of partners are aware of germplasm in their respective collections/countries that is not currently listed in EURISCO. In some cases, this represents whole collections missing from the inventory, in other cases collections are only partially listed. In further cases, material is either missing, or over-represented due to a need to adjust accession numbering from the individual tree level to that of the accession.

Through a number of recent European and ECPGR projects, supplemented by national funds, unique genotype codes (MUNQ/PUNQ for *Malus/Pyrus* and more recently CHUNQ for cherry) have been developed in an attempt to help to identify clonal replication* within and between collections. These codes have been applied to a number of accessions that are currently listed in EURISCO (as well as a number that are not). However, such genotype codes are not currently included in EURISCO and consequently it is not possible to link clonal accessions (which are often held under synonymous cultivar/accession names in different countries). Clonal replication* and synonymy are significant issues in the fruit tree collections.

*note: the current systems are insufficient to distinguish potentially important clonal mutants but are sufficient to identify the major clonal groupings.

– **Justification:** Explain why this Activity is justified in terms of making progress towards achieving the ECPGR objectives.

Provision of good quality data through the EURISCO database is one of the key objectives of ECPGR (Objective 2: Phase X). There is currently a gap remaining between the surviving CCDBs (in particular *PrunusDB*) and EURISCO and additional data in the *Prunus* DB has the potential to enhance the holdings of EURISCO. Since EURISCO now has the capacity to hold C&E data, the retrieval of such data from the *Prunus* DB, along with a consideration as to whether any unique accession listings remain extant, would allow most of the value in the database to be recovered. Subsequently, the CCDBs could effectively be closed, with the view that the WGs instead consider developing the concept of a crop portal in the future.

We also believe that there is a substantial gap between the material known to be held by ECPGR WG members and curators, and the material currently listed in EURISCO. A joint effort to resolve this will

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further help to make EURISCO more comprehensive (Objective 2.1).

It is clear that there is a shortage of C&E data within EURISCO for the fruit tree crops, although C&E descriptors have recently been updated/prioritised by both WGs for apple cherry, peach, pear and plum and available data are known to be held by some partners. It is also clear that valuable indicators of clonal groupings are available, although these are not currently incorporated, or directly aligned with the listings in EURISCO.

Improving the current position in all of these issues would substantially improve the quality of data for the fruit tree collections in EURISCO (Objective 2.2), further support the potential development of the AEGIS concept (which will rely upon such data in any decision-making process) (Objective 1) and contribute to incentivize PGRFA use (Objective 5).

– Rationale for the choice of partners: Explain why the selected partners are the most suitable to carry out the proposed Activity and briefly describe their respective roles in the Activity.

Partner 1 will act as the project co-ordinator and (nominally) acts as the *Malus* DB manager. Partner 1 is aware of C&E data for their collection that have not yet been prepared for upload to EURISCO and was directly involved in the allocation of CHUNQ codes for cherry.

Partner 2 is (nominally) the *Pyrus* DB manager and is aware of both accession listings and C&E data that have not yet been prepared for upload to EURISCO.

Partner 3 is aware of the amount of C&E data for their collection that have not yet been formatted for upload to EURISCO and will contribute to support the assessment of the *Prunus* DB.

Partner 4 is aware of a large amount of C&E data for the Swiss collection that have not yet been correctly formatted for upload to EURISCO.

Partner 5 is responsible for co-ordinating accession listings and C&E data for the German fruit genebank network and will identify any missing accessions and C&E data for EURISCO upload. Partner 5 has also agreed to help support the assessment of the *Prunus* DB.

Partner 6 has agreed to identify any accessions that are not listed in EURISCO as well as identifying, preparing and uploading available C&E data.

Partner 7 has agreed to identify any accessions that are not listed in EURISCO as well as identifying, preparing and uploading available C&E data.

Partner 8 is aware of significant accessions that are not currently listed within EURISCO and has agreed to identify and prepare any available C&E data for potential upload.

Partner 9 represents the main contributor (of only two) who have successfully uploaded C&E data to EURISCO and so has valuable experience in this process. Partner 9 will therefore act as the coordinator for the C&E data task (Action 3).

Partner 10 has led the development and allocation of MUNQ and PUNQ codes and currently manages the MUNQ and PUNQ datasets with respect to material both with and without of scope for ECPGR. Partner 10 has agreed to lead the comparison of MUNQ and PUNQ codes against EURISCO holdings (Action 4) and has agreed to identify any national accessions that are not listed in EURISCO as well as identifying, preparing and uploading available C&E data.

Partner 11 has agreed to identify any accessions that are not listed in EURISCO as well as identifying, preparing and uploading available C&E data.

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Partner 12 is the *Prunus* DB manager and has amalgamated C&E data from previous ECPGR projects (PRUNDOC/EU.CHERRY) for inclusion in the *Prunus* DB and these will be made available for upload to EURISCO. Partner 12 has agreed to lead on the comparison of *Prunus* DB holdings against EURISCO (Action 1) and has agreed to identify any national accessions that are not listed in EURISCO as well as identifying, preparing and uploading available C&E data.

Self-funded Partners 1 and 2 have specific database expertise with regards to EURISCO and the current hosting of the *Prunus* DB and are both members of the Documentation and Information WG.

Self-funded Partner 3 has responsibility for the co-ordination of data for accession holdings across distributed collections in Switzerland.

– Methodology or Approach: Explain how the partners will operate. Clearly explain who is expected to do what. Also explain the rationale of meeting (or not) as part of the Activity. Include a Gantt Chart, to illustrate the work breakdown structure of the project.

Partners 1, 2 and 12, along with Self-funded Partner 3 will be responsible for the comparison of data holdings and accession listings between the CCDBs (*Malus*, *Pyrus*, *Prunus*, respectively) and EURISCO.

All partners will be responsible for carrying out an assessment of their holdings against those listed in EURISCO both at the accession level and in terms of available C&E data. Accession listings will be prepared for inclusion (subject to inclusion in National Lists). Available C&E data will be prepared and uploaded where available by partners (following the additional upload procedure).

Partner 10 will carry out an assessment of the allocation of MUNQ and PUNQ codes to accessions in EURISCO. Partners 1/3 will carry out an assessment of the allocation of CHUNQ codes to accessions in EURISCO. All unallocated codes will be documented by partners 1/3 and 10. Partner 10 will also carry out an initial assessment of the numbers of rare and unique alleles that are represented only in MUNQ/PUNQ accessions not currently listed in EURISCO. Partners will discuss the potential for inclusion of these codes within EURISCO with EURISCO representatives.

– Description of genetic material: If your Activity is focusing on genetic material, please describe in detail, as far as possible, who is providing this genetic material, its status and the number of accessions under investigation (for example: *This Activity aims at molecularly analysing / safety-duplicating / evaluating / collecting XY accessions (listed) of "Genus species", provided by genebank Z/ farmers in country W /to be collected in country P..., etc.*).

No new genetic material will be collected or analysed.

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– **Expected impact.** Clearly specify the expected impact from this Activity for the respective ECPGR objective(s), compared to the current state of progress of those same objectives. Explain how the impact will be obtained.

Objective 1: The project will increase and update the listing of available material within EURISCO and/or establish the reasons for the lack of inclusion of known material in National Lists.

Objective 2: The project will increase the phenotypic information within EURISCO and will highlight and consider the opportunity and need to identify clonal material held under different accession names within different countries.

Objective 1: All of the above are pre-requisites for the decision-making process to develop the AEGIS concept for the fruit tree field collections.

– **Links with other non-ECPGR projects or individuals:** If applicable, clearly explain the objectives of the linked projects and the reasons for complementarity with the ECPGR Activity.

No specific links (apart from the various National Programs)

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Expected products and related ECPGR Objectives

List concrete products and results that are obtained by the Activity and the corresponding number(s) of the ECPGR Outcome(s) and/or Output(s) and/or Activities to which each product/result will contribute.

| | Expected products/results | Corresponding ECPGR output, activity |
|---|---|--------------------------------------|
| 1 | Documented assessment of remaining value in the <i>Malus/Pyrus</i> and <i>Prunus</i> CCDBs (with the emphasis on <i>Prunus</i> C&E data and novel accessions). Novel available data added to EURISCO. | 2.1, 2.2 |
| 2 | Identification of partner/national holdings that are currently available but missing from EURISCO, and inclusion in national listings where possible. | 1.2, 2.1 |
| 3 | Identification and uploading of publicly available C&E data for accessions currently listed in EURISCO. | 2.2 |
| 4 | Listing of MUNQ/PUNQ/CHUNQ unique genotype codes for EURISCO material, and identification of codes (and potentially associated alleles) that are not currently known to be represented in EURISCO. Considered position on the potential to include such codes within EURISCO output/search. | 2.4 |

Workplan for the proposed period of the Activity

Brief description of meetings and/or main actions of the Activity.

| | Type of Action (indicate if “meeting” or “other action”) |
|---|---|
| 1 | Other: Data will be downloaded from the Prunus CCDB and a direct comparison will be made against accession listings from EURISCO, initially to compare accessions by ACCENUMB/ACCENAME and INSTCODE. In cases where institutions listed to hold accessions unique to the Prunus DB are still active, they will be encouraged to transfer listings of all viable material to EURISCO. Phenotypic data for extant, and specifically accessions listed in EURISCO will be noted and data will be extracted. Data will be uploaded to EURISCO subject to permission and/or support from the relevant partner country. |
| 2 | Other: In addition to any accessions found to be unique in the CC Prunus DB, partners will each make an assessment of their public holdings against their institutional/national submission to EURISCO. Where publicly available material is known not to be listed this will be detailed in a written report. In cases where collections are only partially listed, partners will attempt to complete their listings for resubmission. In cases where whole collections are missing from |

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| | EURISCO (because they have not been included in National Lists) findings will be presented for discussion with the national co-ordinators (assuming that initial discussion will be held by the relevant partner). |
| 3 | Other: All partners will carry out an assessment of the publicly available C&E data in the respective countries. Where possible, these will be converted to a format suitable for submission and uploaded to EURISCO through the additional upload procedure. |
| 4 | Other: Partner 10 will carry out an assessment of the EURISCO status of MUNQ and PUNQ allocated accessions. Partner 1 will carry out an equivalent assessment of CHUNQ allocated accessions in cherry. A report will be produced detailing the number of genotype codes that are known to be represented within EURISCO and the number that are not known to be represented. Partner 10 will carry out an initial analysis detailing any rare or unique alleles that are represented only in the non-EURISCO MUNQ/PUNQs. Partners (1, 10, 2 and 3 as a minimum) will discuss the possibility of including such data as a field in EURISCO with EURISCO representatives. |
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Additional remarks

Indicate any additional remark(s) that is/are important for the evaluation/implementation of the proposed Activity

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| Remarks: |
| <p>We would ask that this proposal is considered 'in principle' with the view that it would be further strengthened by a wider membership (specifically in tasks 2 and 3 – the identification of missing accessions and available C&E data). Subject to approval we would hope to approach the working groups again to look for expressions of interest from additional partners and adjust budgets accordingly before a final decision is reached.</p> |

**Please send the completed form together with the budget table to the
Chair of the submitting Working Group for submission of the Activity proposal.**