

## Scanning report (EIP format for practice abstracts)

- \*Project title (native language):** [EUFRUIT: Network Europeo sui Fruttiferi]  
**\*Project title (English):** EUFRUIT: European Fruit Network  
**\*Author/native language editor:** [Dr. Daniela Giovannini, CREA-OFA, Fruit Research Unit of Forlì (FRF), via La Canapona 1 bis, Forlì (Italy), Daniela.giovannini@crea.gov.it, +39 (0)543 89428, +39 (0)543 89566  
Dr. Stefano Tartarini, Departments of Agricultural Sciences, Bologna University, stefano.tartarini@unibo.it +39 051 2096420]

### Section A. Summary for EIP dissemination

- \*Keywords:** [Variety testing, peach and nectarines, sweet cherry]  
**\*Main geographical location:** [ITH51-59 Emilia Romagna region]  
**Other geographical locations:** [copy other NUTS 3 region from section C, below, 'NUTS 3 region(s)']  
**\*Summary (native language):**

Il miglioramento genetico di pesche e nettarine, e la valutazione varietale di pesche e nettarine e ciliegie sono settori di ricerca importanti al CREA-FRF. Le nuove varietà di pesca/nettarina dovrebbero essere dotate di produttività elevata e costante, tolleranza alle principali avversità biotiche ed abiotiche della specie, produrre frutti con prolungata tenuta sull'albero, maturazione omogenea e concentrata, tolleranti alle manipolazioni pre e post raccolta, di grosse dimensioni e di elevata qualità esteriore ed interna. Le varietà di ciliegio dovrebbero essere autofertili, costantemente produttive, con maturazione concentrata, produrre frutti grossi, poco suscettibili al cracking, di qualità esteriore e interna elevata.

Le nuove varietà di pesche/nettarine e ciliegie in valutazione al CREA-FRF sono organizzate in parcelle di 3 alberi/cultivar (2 alberi per il ciliegio) ed innestate su GF677 e Colt, rispettivamente. Il periodo di valutazione è di 3-5 anni a partire dalla prima produzione degli alberi, basata su 58 descrittori (pesco) e 35 descrittori (ciliegio) di tipo fenologico, morfologico, pomologico ed agronomico. I caratteri quantitativi vengono misurati e/o quantificati secondo una scala 1-9. Negli ultimi 5 anni, sono state introdotte in valutazione 172 varietà/selezioni di pesche e nettarine e 29 varietà di ciliegio dolce, provenienti dai principali programmi di breeding mondiale. L'attività di valutazione si avvale anche della presenza in collezione di diverse varietà di riferimento (es. la nettarina Big Top e le pesche Redhaven e Rome Star; le ciliegie Burlat, Lapins e Ferrovia). Le collezioni sono gestite secondo i principi delle Produzioni Integrate. A livello territoriale (Regione Emilia-Romagna), la valutazione di varietà e portinnesti è condotta in stretta collaborazione con l'Università di Bologna (Unibo, Partner 20) and CRPV (Centro Ricerche e Produzioni Vegetali, Cesena), con cui vengono co-organizzate mostre pomologiche indirizzate a produttori e tecnici. In un contesto di rapidi cambiamenti sociali, politici e climatici, la costituzione di nuove varietà bene adatte al territorio specifico e la valutazione esperta ed indipendente delle nuove varietà/portinnesti in commercio più adatti ai diversi territori regionali/nazionali sono settori di ricerca strategici per dare impulso al settore delle drupacee in Italia.

### Summary (english):

Peach breeding and varietal testing of novel peach/nectarines and sweet cherry cultivars are important research topics at the Fruit Research Unit of Forlì (CREA-FRF). The new peach/nectarine variety should be consistently productive, tolerant to major diseases, endowed with prolonged on-tree keeping quality with concentrated harvest (few pickings), the fruit being tolerant to disorders and handlings, with good fruit external (large size, well-coloured skin) and internal (high firmness, good taste and flavour) quality. The new sweet cherry varieties should be self-fertile, consistently productive, tolerant to major diseases, the fruit being tolerant to skin cracking, with good fruit external (large size, well-coloured skin) and internal (high firmness, good taste and flavour) quality.

The new cultivars in evaluation at CREA-FRF are organized in 3 trees/cultivar plots (2 trees/plot for sweet cherry) and grafted onto the peach x almond hybrid GF677 (peach cvs.) and Colt (sweet cherry cvs.), respectively. The evaluation is carried out from

3 to 5 years after the first cropping by using 58 (peach) and 35 (sweet cherry) phenological, pomological and agronomic descriptors, mostly UPOV descriptors, based on which the global performance of each cultivar is scored. Quantitative traits are measured or scored according to a 1-9 scale. In the last 5 years, 172 variety selections of peaches and nectarines and 29 varieties of sweet cherry, coming from important breeding programs worldwide, have been under evaluation. CREA collection includes also several Reference cultivars (eg. the nectarine Big Top and the peach cvs. Redhaven and Rome Star; the sweet cherry Burlat, Lapins and Ferrovia), useful to harmonize the evaluation and characterization activity and comparatively score the new entries. All the trees in collection are managed under IPM conditions. At the regional (Emilia-Romagna) level, the testing activity is partly done in networking with the University of Bologna (Unibo, Partner 20) and CRPV, including the co-organization of fruit exhibitions of the novelties dedicated to farmers and technicians. In the current contest of fast social, political and climatic changes, breeding new varieties being well-adapted to this specific environment and the expert and independent testing of new varieties/rootstocks on the market being more adapted to the different regional/national environments are strategic research activities to promote the peach industry in Italy.

## Section B. Project information

**\*Project coordinator:** Michelle H. Williams; Aarhus University, Department of Food, Kirstinebjergvej 10, 5792 Aarslev, Denmark; mw@food.au.dk; +45 25170049

**\*Project period:** 2016 - 2019

**\*Project status:** Ongoing

**\*Funded by:** Horizon 2020

**\*Total budget:** €1.8m

**\*Geographical regions:** DK011 Copenhagen, DK012 Copenhagen and its environs, DK013 North Zealand, DK014 Bornholm, DK021 East Zealand, DK022 West- and South Zealand, DK031 Funen, DK032 South Jutland, DK041 West Jutland, DK042 East Jutland, DK050 North Jutland, BE211 (Arrondissement. Antwerpen), BE212 (Mechelen), BE213 (Turnhout), BE221 (Hasselt), BE222 (Arr. Maaseik), BE223 (Tongeren), BE231 (Aalst), BE232 (Dendermonde), BE233 (Eeklo), BE234 (Gent), BE235 (Oudenaarde), BE236 (Sint-Niklaas), BE241 (Halle-Vilvoorde), BE242 (Leuven), BE251 (Brugge), BE253 (Ieper), BE254 (Kortrijk), BE255 (Arr. Oostende), BE256 (Arr. Roeselare), BE257 (Tielt), BE258 (Veurne), BE310 (Nivelles-Nijvel), BE331 (Huy-Hoei), BE332 (Liège- Luik), BE334 (Waremmе-Borgworm), BE335 (Verviers), FR8 Méditerranée; FR81 Languedoc-Roussillon, FR6 SUD-OUEST, FR512 Maine et Loire, FR611 Dordogne, FR812 Gard, DE6 (Hamburg), DE8 (Mecklenburg-Vorpommern), DE9 (Niedersachsen), DEF0 (Schleswig-Holstein), DEE0 (Sachsen-Anhalt), DEA (Nordrhein-Westfalen), DE111, DE112, DE113, DE114, DE115, DE116, DE117, DE118, DE119, E11A, DE11B, DE11C, DE11D, DE121, DE122, DE123, DE124, DE125, DE126, DE127, DE 128, DE129, DE12A, DE12B, DE12C, DE131, DE132, DE133, DE134, DE135, DE136, DE137, DE138, DE139, DE13A, DE141, DE142, DE143, DE144, DE145, DE146, DE147, DE148, DE149, DE600 Hamburg, DE932 Cuxhaven, DE933 Harburg, DE939 Stade, DEF09 Pinneberg, NL1-NL4 + NLZ Holland; NL 224 zuidwest Gelderland, NL 226 Arnhem/Nijmegen, NL230 Flevoland, NL310 Utrecht, NL321 Kop van Noord-Holland, NI322 Alkmaar en omgeving, NL338 oost Zuid-Holland, NL33A zuidoost Zuid-Holland, NL341 Zeeuws-Vlaanderen, NL342 overig Zeeland, NI411 west Noord-Brabant, NL413 noordoost Noord-Brabant, NL414 zuidoost Noord-Brabant, NL421 noord Limburg, NL422 Midden-Limburg, NL423 zuid Limburg, ES620 Murcia, UKG11 Herefordshire, UKG12, Worcestershire, UKH12 Cambridgeshire, UKH16 North and West Norfolk, UKH17 Breckland and South Norfolk, UKJ22 East Sussex, UKJ35 South Hampshire, UKJ36 Central Hampshire, UKJ37 North Hampshire, UKJ41 Medway, UKJ42 Kent, UKJ43 Kent Thames Gateway, UKJ44 East Kent, UKJ45 Mid Kent, UKJ46 West Kent, ES618 Sevilla, ES511 Barcelona, ES512 Gerona, ES513 Lérida, ES514 Tarragona, CH0 Schweiz/Suisse/Svizzera, ITH51-59 Emilia Romagna region, ITH10 Bolzano-Bozen, HU101 Budapest, HU102 Pest, RO111, RO112, RO113, RO114, RO115, RO121, RO122, RO123, RO124, RO125, RO126, RO211, RO212, RO213, RO214, RO215, RO216, RO221, RO222, RO223, RO224, RO225, RO226, RO311, RO312, RO313, RO314, RO315, RO316, RO317, RO321, RO322 RO411, RO412, RO413, RO414, RO415, RO421, RO422, RO423, RO424. HU101, HU102, LT001 Alytaus apskritis, LT002 Kauno apskritis, LT003 Klaipėdos apskritis, LT004 Marijampolės apskritis, LT005 Panevėžio apskritis, LT006 Šiaulių apskritis, LT007 Tauragės apskritis, LT008 Telšių apskritis, LT009 Utenos apskritis, LT00A Vilniaus apskritis.

**Project web page:** <http://www.eufrin.org/index.php?id=55>

**\*Project Objectives (native language):**

1. Costituire un Network Europeo incentrato sul settore frutticolo.
2. Sviluppare e mettere a punto un sistema che consenta di analizzare e sintetizzare le conoscenze scientifiche e pratiche acquisite.
3. Stabilire un dialogo costante con le principali Istituzioni politiche a livello europeo, nazionale e regionale.
4. Identificare e supportare le aree di ricerca di nuova priorità attraverso il monitoraggio continuo e l'analisi delle attività di ricerca ed innovazione già esistenti o di imminente realizzazione.

**Project Objectives (English):**

1. Establish a European network focused on the fruit sector.
2. Develop and implement a systematic approach for scanning and synthesizing existing scientific and practical knowledge.
3. Establish an ongoing dialogue with relevant EU, national and regional policy bodies.
4. Identify and support new priority areas of research by continually monitoring and analysing existing and upcoming research and innovation activities.

**\*Project partners:**

1. Aarhus University, Department of Food Science (Denmark) • AU
2. Research Station for Fruit npo (Belgium) • Pcfuit
3. Centre Technique Interprofessionnel des Fruits et Légumes (France) • CTIFL
4. Obstbauversuchsanstalt Jork (Germany) • OVA
5. Stichting Wageningen Research (Netherlands) • WR
6. ~~East Malling Research (United Kingdom) • EMR (terminated 08-02-2016)~~
7. Institut de Recerca i Tecnologia Agroalimentàries (Spain) • IRTA
8. Federal Department of Economic Affairs, Education and Research (EAER), acting through Agroscope Institute of Plant Sciences (Switzerland) • Agroscope
9. Laimburg Research Centre for Agriculture and Forestry (Italy) • Laimburg
10. University of Agronomic Sciences and Veterinary Medicine of Bucharest (Romania) • USAMV
11. National Agricultural Research and Innovation Centre Fruitculture Research Institute (Hungary) • NARIC
12. Lithuanian Research Centre for Agriculture and Forestry (Lithuania) • LRCAF
13. Assemblée des Régions Européennes Fruitières, Légumières et Horticoles (France) • AREFHL
14. Variety Innovation Consortium South Tyrol (Italy) • SKST
15. Freshfel Europe (Belgium) • FRESHFEL
16. Elbe-Obst Erzeugerorganisation r.V. (Germany) • EO
17. Fruitconsult BV (Netherlands) • FC
18. University of Greenwich (United Kingdom) • UoG
19. University of Hohenheim (Germany) • UHOH
20. Università di Bologna (Italy) • UNIBO
21. Institut National de la Recherche Agronomique (France) • INRA
22. NIAB EMR (new 09-02-2016)

## Section C. Annex: Scanning report<sup>1</sup>

### Scanning report [Giovannini Daniela, CREA-FRF]

**Author:** Daniela Giovannini, CREA-Fruit Research Unit of Forlì, via La Canapona 1 bis, Forlì (Italy), daniela.giovannini@crea.gov.it, +39 (0)543 89428; +39 (0)543 89566

**Country:** [Italy]

**NUTS 3 region(s)<sup>2</sup>:** [ITH51-59 Emilia Romagna region]

**WP no. and title:** WP2 - Performance of new fruit varieties

**Date:** [19-4-2017]

#### Source materials and methodology

The Fruit Research Unit of Forlì (CREA-FRF) is part of CREA, the largest public Institution in Italy devoted to the research and dissemination in agriculture, under the supervision of the Italian Ministry of Agriculture. According to the very recent (2017) re-organization of CREA, which has led to the establishment of 12 Research Centres, CREA-FRF is part of the Research Center for Olive, Citrus and Fruit tree (OFA) together with the two Units of Rome and Caserta, also devoted to research in fruit growing, the Unit of Rende (Cosenza), focusing Olive, and the Unit of Acireale (Catania), focusing on Citrus. CREA-FRF is located in Emilia-Romagna, a region strongly suited to fruit crop production both at the environmental and organizational level. The Emilia-Romagna region has historically been an area leader for peach and nectarine production. Although in a downsizing phase, it still accounts for 23% of the Italian peach production, 14% of the peaches, 31% of the nectarines and 19% of the canning peaches. The Emilia-Romagna region is also a top producer of sweet cherry, undergoing a further expansion.

Important research topics at CREA-FRF are breeding, variety testing and rootstock testing of the main fruit crops (strawberry, apple, pear, peach and nectarine), with a minor testing activity on sweet cherry and plum (European and Japanese). CREA-FRF has its offices and its research facilities in Magliano (Forlì, Lat. 44° 13' N; Long. 12° 3' E, 34 m asl), including an experimental farm with about 40 cultivated hectares equipped with greenhouses and laboratories for genetic, genomic, biochemical and physiological studies, and the analysis of fruit quality traits.

At the National level, for two decades CREA-FRF participated to the National Project 'Liste varietali', that was funded by the Ministry of Agriculture from 1994 to 2014. This project implemented a National network of fruit variety and rootstock testing trials, where the new varieties on the market were evaluated in multiple sites following common descriptors and guidelines. Yearly technical files of the evaluated cultivars/rootstocks were published to disseminate the relevant information on the new releases. When the 'Liste varietali' Project ended, CREA-FRF continued with its own funds the evaluation activities in collaboration with a restricted number of other partners, including Unibo.

CREA-FRF has been member of the EUFRIN network since 2003. It has led the Stone fruit WG from 2003 to 2013, when this WG was split into crop-specific WGs. Since 2014, CREA-FRF has been chairing the Apricot and Peach WG. CREA-FRF participated in the COST Action FA1104 'Sustainable production of high-quality cherries for the European market' (2012-2016) and is member of the Sweet and Sour Cherry WG recently established in EUFRIN.

The source materials for this scanning report are, among others:

Scalisi A., Lo Bianco R., Caruso T., Giovannini D., Sirri S., Fontana F. Preliminary Evaluation of Six Prunus Rootstocks for Peach in Italy. *Acta Hort.*, *in press*.

Mennone, C., Silletti, A., Sartori, A., Liverani, A., & Nencetti, V. (2014). Lista del pesco 2014, le varietà per i nuovi impianti. *L'Informatore Agrario*, (31), 50–53.

Liverani, A., Sirri, S., Nencetti, V., Missere, D., & Etiopi, C. (2014). Tutte le varietà di susino in Lista 2014. *L'Informatore Agrario*, (27), 44–47.

Palasciano, M. (2015). Ciliegio: tutte le varietà per i nuovi impianti. *L'informatore Agrario*, (32), 21–24.

<sup>1</sup> Equivalent to 'final report' in EIP-AGRI format.

<sup>2</sup> Please see [ec.europa.eu/eurostat/ramon/nomenclatures/](http://ec.europa.eu/eurostat/ramon/nomenclatures/) for details on NUTS regions, level 3

## Best practice findings

### Variety testing of peaches and nectarines

The ideal peach and nectarine variety should be consistently productive, tolerant to major diseases, endowed with prolonged on-tree keeping quality, concentrated harvest (few pickings), the fruit being tolerant to disorders and handlings, with good fruit external (large size, well-coloured skin) and internal (high firmness, good taste and flavour) quality. Currently, about 340 peach and nectarine cultivars and advanced breeding selections from various breeding programs worldwide are under evaluation at CREA-FRF, 84 of which (40 peaches & 44 nectarines) were introduced in collection in the last 5 years. The varietal performance is assessed at the CREA-FRF experimental facilities (Forlì, Lat. 44° 13' N; Long. 12° 3' E, 34 m asl), an area strongly suited to fruit production. Parcels of 3 trees per cultivar, grafted onto GF677 (the most spread in Italy), are evaluated for 3 to 5 years after the first cropping. The collection is managed under IPM conditions. Evaluation is performed by using of 58 phenological, pomological and agronomic descriptors, mostly of which UPOV descriptors. The peach collection includes also several reference cultivars (among which the nectarine Big Top and the peaches Redhaven and Rome Star), useful to harmonize the scoring of the new material. At the regional (Emilia-Romagna) level, testing is partly done in networking with Unibo (Partner 20) and CRPV, including the organization of common fruit exhibitions.

### Challenges and gaps

Varietal turn-over in peach is very rapid, and the new releases often planted by growers without proper testing. Adaptability of the new varieties to the environment of introduction can result poor, especially when exacerbated by climatic variability. Higher and higher winter temperatures jeopardize the dormancy completion of cultivars with high chilling requirement and/or anticipate excessively the flowering season, subjecting flowers/fruitlets to low (< 1°C) temperatures. In Emilia-Romagna area, peach blooming occurs 10-14 days before blooming in the years before 1990. Finally, traits such as fruit disorders pre- and post-harvest are becoming more and more important in the assessment of the commercial value of a novel cultivar. Variety pre-evaluation through independent and expert testing is highly valuable for this crop to prevent growers from economic losses.

### Variety testing of sweet cherries

The ideal sweet cherry variety should be productive, tolerant to major diseases, endowed with prolonged on-tree keeping quality, concentrated ripening, with good fruit external (large size, well-coloured skin) and internal (high firmness, good taste and flavour) quality. CREA-FRF has currently 111 sweet cherry cultivars and advanced breeding selection under evaluation, 29 of which introduced in collection in the last 5 years. This material, evaluated at the CREA-FRF experimental facilities, derives from different breeding programs in the world. 2-3 trees per cultivar, grafted onto Colt are evaluated for 3 to 5 years after the first cropping. Evaluation is performed by using 35 phenological, pomological and agronomic descriptors, mostly of which UPOV descriptors. CREA-FRF collection includes also several reference cultivars (among which Burlat, Lapins and Regina, useful to harmonize the scoring of the newly introduced material. The collection is managed under IPM conditions. At the regional (Emilia-Romagna) level, the testing activity is partly carried out in networking with Unibo (Partner 20) and CRPV, including the organization of common fruit exhibitions.

### Challenges and gaps

The cherry industry in Emilia-Romagna region and, in general, in Italy is undergoing a period of constant rise, also thanks to the release of new varieties and the development of planting systems that hasten and optimize the productions. The new releases are often planted by growers without proper testing and might result poorly adapted to the environment of introduction. Higher and higher winter temperatures jeopardize the dormancy completion of cultivars with high chilling requirement. In the last years we experienced a strong increase of *Drosophila Suzuki* attacks. Variety pre-evaluation through independent and expert testing is highly valuable for this crop to prevent growers from economic losses