

## Scanning report

### Felicidad Fernández Fernández, NIAB EMR

\*Project title (native language): [N/A]

\*Project title (English): EUFRUIT: European Fruit Network

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#### Section A. Summary for EIP dissemination

\*Keywords: Variety testing, soft fruits, strawberry, raspberry

\*Main geographical location: UKJ46 West Kent

Other geographical locations: UKG11 Herefordshire, UKJ22 East Sussex, UKJ41 Medway, UKJ42 Kent, UKJ43 Kent Thames Gateway, UKJ44 East Kent, UKJ45 Mid Kent, UKJ46 West Kent

\*Summary (native language):

[N/A]

Summary (English):

The UK industry has an expanding soft fruit sector of which strawberries are the dominant soft fruit crop, representing approximately 50% of soft fruit sales in the UK. Variety trialling of soft fruit is no longer a publically funded activity, with the last levy board-funded (Agriculture and Horticulture Development Board-AHDB) variety trials for strawberry and raspberry ceasing in 2016 and 2017 respectively. However limited information on strawberry trialling is made available via AHDB factsheets for material trialled as part of the East Malling Strawberry Breeding Club (EMSBC) programme or for EMSBC that is trialled on overseas sites (e.g. LNW Auweiler (Germany), Proefcentrum Hoogstraten (Belgium) and Proefcentrum Fruitteelt St Truiden (Belgium)). Other testing is carried out by private companies, principally producer organisations and private breeding companies, and the results of these trials is not publically shared.

Strawberry variety development has been a key aspect of NIAB EMR's portfolio, with the national breeding programme developing over 43 varieties since 1983 for all sectors, principally for the Northern European market. A key aspect of this process is the testing of new selections and varieties, with approximately 75% of the time taken from initial crossing to the release of a new variety being apportioned to **variety testing**. There are currently two strawberry genetic improvement programmes at NIAB EMR: East Malling Strawberry Breeding Club (EMSBC) that receives both public and private funding, and a private breeding programme for the development of strawberries for one customer using substrate systems in glasshouse production. For the EMSBC programme, over 100 new strawberry selections, 23 advanced selections and 15 varieties/standards were evaluated in initial (Stage 0) trials at NIAB EMR in 2017. Concurrently 10 advanced selections were tested on up to eight growers' trial sites (Stage 1) in the UK, and two near market selections were tested on a commercial scale on growers' trial sites (Stage 2) during the same period. All Stage 0 trials are currently performed in soil under protection (tunnel), with Stage 1 and 2 trials performed in substrate, also under protection (tunnel or glasshouse) both in the UK on EMSBC members farms.

Raspberry breeding has been ongoing at NIAB EMR for over 90 years and the blackberry programme was re-started in 2017 after a long pause. Variety testing is also part of the breeding programme in Rubus crops although industry led (second stage) trials are currently more informal.

The James Hutton Institute in Scotland in partnership with different industry partners also runs breeding programmes for raspberry, blackberry, blackcurrant and more recently blueberry. All of these programmes include a component of variety testing within them often carried out in collaboration with commercial stakeholders.

Additionally, several producer organisations have close links with private breeding programmes operating in the UK or selecting varieties elsewhere for UK trialling.

## 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 (Leper), 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):**

N/A

**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 Felicidad Fernández Fernández, NIAB EMR

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**Country:** United Kingdom

**NUTS 3 region(s)<sup>2</sup>:** UKG11 Herefordshire, UKJ22 East Sussex, UKJ41 Medway, UKJ42 Kent, UKJ43 Kent Thames Gateway, UKJ44 East Kent, UKJ45 Mid Kent, UKJ46 West Kent, UKJ46 West Kent

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

**Date:** 15/05/2018

**Source materials and methodology**

Fruit research has been carried out at East Malling since 1913, initially on top fruit but expanding into soft fruit later in the 20<sup>th</sup> century. It has undergone many name changes and ownerships, but most recently became part of the NIAB group in February 2016, changing its identity from East Malling Research (EMR) to NIAB EMR. However, throughout the core aim of the research station remains the same: supporting the UK fruit industry through research from the fundamental to the applied, and currently carries the motto of 'Plant Science into Practice'. East Malling is centered at one of the most productive fruit growing regions in

<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

the UK and uses this to its advantage through many industry interactions and technology transfer events which continues to allow the transfer and translation of scientific research into practical and relevant solutions for the fruit industry.

NIAB EMR has a number of active soft fruit breeding programmes that have been successful in releasing varieties to the industry, and selection and variety testing is a key aspect of this process.

The East Malling Services (EMS) commercial trials test cultivars of a whole range of stone fruit crops including peaches, nectarines, apricots, plums and cherries for industry under commercially confidential agreements in the same site in Kent. Other advisory services (e.g. FAST) also provide confidential commercial trial services and many producer organizations and marketing desks seek and trial varieties directly from international breeding programmes under exclusive or priority deals. Additionally, the UK growers' levy board (AHDB horticulture) has commissioned industry wide trials for stone fruit to various contractors in the past but none is currently running. Producer organisations and the AHDB also carry out or commission agronomy trials; currently many of these are focussed on the control methods for spotted wing drosophila (SWD).

The main sources for this scanning report are personal communications with industry members and advisors as well as AHDB fact-sheets not accessible to non-levy payers.

### Best practice findings

Protocols for variety testing in soft fruit crops vary depending of the organisation that carries them out. At NIAB EMR it is typical to record objective measurements include harvest date, marketable and unmarketable yield (g/plant), firmness and sugar content (°brix) and. Firmness, appearance, flavour, post harvest storage, and flowering and vegetative characteristics are also usually recorded on a subjective (1-5 or 1-9) scale. Wherever possible varieties are sourced from breeding programmes world wide and can be evaluated alongside NIAB EMR selections and varieties.

Most strawberry trials still use the June-bearer cultivars 'Elsanta' and 'Sonata' as standards, although 'Malling Centenary' has become the cultivar of choice for most UK producers and retailers in the last two years. For Everbearer cultivars there is a greater range of standards, related to exclusivities of cultivars to different producer organisations. Currently the most widely grown everbearer cultivar is 'Murano' from the CIV, Italy programme, followed by Driscoll's European Genetics cultivars such as 'Amesti' and E Vinson Ltd cultivar 'Verity'.

In floricane-fruited raspberries, Glen Ample and Tulameen are frequently used as reference cultivars whereas in primocane-fruited ones different organisations will use cultivars they have access to (e.g. Berry Garden Growers will use Driscoll's Maravilla). Commonly grown cultivars include: 'Tulameen' and 'Glen Ample' and to a lesser extent 'Glen Dee' and 'Glen Fyne' for main season varieties. Primocane fruited varieties are more numerous and usually obtained under proprietary deals. Many cultivars are grown in a double-cropping system (both as primocane and floricane-fruited). Commonly grown cultivars include: 'Driscoll's Maravilla' (industry standard), 'Driscoll's Cardinal', 'Adelita', 'Gleam', 'Grandeur', 'Imara', 'Kwanza', 'Kweli', 'Ovation', 'Paragon', 'Paris' and 'Radiance'. In blackberry, old varieties such as 'Chester' and 'Loch Ness' are still widely grown with others such as 'Karaka Black', 'Loch Tay', 'Obsidian' and 'Ouchita' also in cultivation. 'Driscoll's Victoria' has become very popular with retailers and consumers since 2016.

Commercially-funded trials have been commissioned or are being run directly by various breeding companies, producer organisations, licencing agents and nursery companies to identify promising soft fruit cultivars. The general aim of the variety testing trials is to identify cultivars that: a) produce good quality fruit (appearance, flavour, shape and shelf-life); b) produce reliable yields in UK conditions; c) have large fruit size and good fruit display to enable rapid harvesting and d) have early, late or extended season of production. These trials usually focus on cultivars or advanced selections that are proprietary to the group testing them, or where a geographic exclusivity is in place. The standards used would reflect the cultivars currently grown or marketed that the group in question. Agronomy and data recording is usually to a high standard but results for these trials are often kept commercial in confidence.

Most strawberry trials in the UK are conducted in substrate culture, on table-tops or gutters that are under protection (plastic tunnels) with some more limited variety testing in glasshouses. Tunnel are also the most common environment to trial raspberries and blackberries; most frequently grown in substrate. There is little information available on how blueberry trials are conducted but in many areas of the UK they are grown by necessity in substrate to avoid high-pH soils. Common varieties include: 'Aurora', 'Blue Crop', 'Brigitta', 'Chandler', 'Darrow', 'Duke', 'Misty', 'Ozark' and 'Patriot'.