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SYNTHESIS REPORT AND DISSEMINATION CATALOGUE

Work package 2: Performance of new fruit varieties

March 2016 – August 2018

EUFRUIT

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Project officer	Veerle Lammens
Coordinator	Dr. Michelle Williams, Aarhus University Department of Food Science • AU
Consortium Partners	<ol style="list-style-type: none"> 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 Dienst Landbouwkundig Onderzoek (Netherlands) • StDLO 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 • NIAB EMR (New 09-02-2016)*
Website	http://eufrin.org
Knowledge Platform	http://kp.eufrin.org

* Partner 6 (EMR) has been transferred to NIAB EMR. NIAB EMR is committed to performing all project tasks previously assigned to EMR. The personnel involved by EMR will continue performing the work in the project.

Deliverable documentation sheet	
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1. Synthesis report 2018



Synthesis report WP2 Performance of new fruit varieties

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- WP:** WP2
- IEG thematic area:** Performance of new fruit varieties
- Covered NUTS 3 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 (Wareme-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.
- Reporting period:** Y3 report due August 2018
- No. IEG members:** *Total: 25* *Male: 16* *Female: 9*

IEG participants

EUFRUIT Partners WP2

Name	Organization short name ¹	Type ²	Scanning included?	No. Reports/ organization
Marianne BERTELSEN Martin JENSEN	AU	RTO	Yes	1
Jef VERCAMMEN Miet BOONEN Dany BYLEMANS Kenneth HERCKENS Arthur MOMBAERTS Piet PUTZEYS	PCFRUIT	RTO	Yes	1
Gérard CHARLOT Jean-Philippe BOSC Sandrine CODARIN Julien RUESCH	CTIFL	RTO	Yes	1
Martin KOCKEROLS Felix KOSCHNICK Karsten KLOPP	OVA	RTO	Yes	1
Marc RAVESLOOT Alma VAN DER HEIDEN	WR	RTO	Yes	0
Felicidad FERNANDEZ	NIAB EMR	SME	Yes	1
Ignasi IGLESIAS	IRTA	RTO	Yes	0
Sarah PERREN	AGROSCOPE	RTO	Yes	1
Walter GUERRA Martina BOSCHIERO	LAIMBURG	RTO	Yes	1
Adrian Constantin ASANICA Florin STANICA	USAMV	RTO	Yes	1
Geza BUJDOSO	NARIC	RTO	Yes	1
Dalia GELVONAUŠKIENĖ Audrius SASNAUSKAS	LRCAF	RTO	Yes	1
Pauline PANEGOS	AREFHL	Other	No	0
Markus BRADLWARTER Philipp BRUNNER Julia STROBL	SKST	Other	Yes	1
Philippe BINARD	FRESHFEL	Other	No	0
Ulrich MAYR Jens WÜNSCHE	KOB UHOH	RTO RTO	No	0
Luca CORELLI GRAPPADELLI Stefano TARTARINI Luigi MANFRINI	UNIBO	RTO	Yes	1
Francois LAURENS	INRA	RTO	Yes	0

¹ If an EUFRUIT project partner, use EUFRUIT partner short name, if a contributing organization designate a partner short name

² Farm holder/grower, advisor/consultant, research institute/RTO, SME, NGO or other

Others

Name	Organization short name ¹	Type ²	Scanning included?	No. Reports/ organization
Irina ANCU Monica STURZEANU	RIFG Pitesti Romania	RTO	No	0
Silina DACE	LLU Latvia	RTO	No	0
Gottfried LAFER	BZ Silberberg Austria	RTO	No	0
Gunhild MUSTER	LVWO Germany	RTO	No	0
Mailis VINOGRADOV	EMU Estonia	RTO	No	0

¹ If an EUFRUIT project partner, use EUFRUIT partner short name, if a contributing organization designate a partner short name

² Farm holder/grower, advisor/consultant, research institute/RTO, SME, NGO or other

Synthesis findings

On April 24th and April 25th 2018 a meeting of the International Experts Group for EUFRUIT WP2 was organized at pcfruit npo, Fruittuinweg 1, 3800 Sint-Truiden (Belgium).

Participants:

EUFRUIT Partners: Martin Jensen (AU - Partner 1), Boonen Miet, Bylemans Dany, Herckens Kenneth, Mombaerts Arthur, Putzeys Piet and Vercammen Jef (pcfruit- Partner 2), Bosc Jean-Philippe (CTIFL - Partner 3), Brüggewirth Martin and Koschnick Felix (OVA – Partner 4), Ravesloot Marc (WR – Partner 5), Fernandez Felicidad (NIAB-EMR - Partner 6), Boschiero Martina (Laimburg – Partner 9), Asanica Adrian and Stanica Florin (USAMV – Partner 10), Bujdoso Geza (NARIC - Partner 11), Sasnauskas Audrius (LRCAF – Partner 12) and Brunner Philipp and Strobl Julia (SKST – Partner 14).

Others: Ancu Irina and Sturzeanu Monica (RIFG), Dace Silina (LLU), Lafer Gottfried (BZ Silberberg), Muster Gunhild (LVWO Weinsberg) and Vinogradov Mailis (EMU).

Excused

EUFRUIT Partners: Codarin Sandrine (CTIFL - Partner 3), Iglesias Ignasi (IRTA - partner 7), Perren Sarah (Agroscope - Partner 8), Guerra Walter (Laimburg - Partner 9), Mayr Uli (UHOH - Partner 19), Tartarini Stefano (UNIBO - Partner 20) and : Denoyes Béatrice Laurens Francois (INRA - Partner 21).

Others: Kruczynska Dorota (InHort).

Not present: AREFLH (Partner 13), FRESHFEL (Partner 15) and UNIBO (Partner 20).

Meeting:

After a short presentation of the EUFRUIT-project by Jef Vercammen, leader of WP2, each partner has presented its scanning of EUFRUIT WP2 (*In the IEG-meeting in Balandran it was decided to focus in the third year on variety testing of soft fruits (strawberries and small fruits).*) In this synthesis also the scannings of the EUFRUIT WP2 partners that were excused are included to the extent that they concern variety testing of soft fruits.

Scannings:

MEMBERS EUFRUIT WP2

AU

In summer-covered tunnels in organic production black berry varieties Loch Ness, Loch Tay and Natchez were most promising. In ongoing organic tests for black currants with standard recommended reference cultivars (Ben Hope, Ben Lomond, Ben Tirran, Narve Viking) and some new breeding clones from JHI (Scotland) a new test clone was late flowering, escaped spring frost in all years and gave the highest accumulated yield. Narve Viking, Ben Hope, Ben Lomond are the best cultivars in conventional tests. An organic trial with red currants showed that Red Poll and Roodneus had the highest yields and the highest content of color and therefore they are recommended. They are better than Augustus and Rovada.

For Aronia melanocarpa Viking showed a bit higher yield than Nero in an organic trial, but both had very high color content. Anthocyanin content in pomace varied depending on juice processing and pressing methods and more than 50% of anthocyanins were left in the pomace. Common garden trials with over 100 clones of European blueberries showed large variation in yield, berry size, plant growth, plant health and fruit quality. Efficient propagation methods using summer cuttings were developed and a special liquid fertilizer developed for EB. Data for selection of superior cultivars has been collected for several years and is expected to lead to release of clones in a few years.

36 cultivars of 12 different new specialty species/cultivars are being tested in the DANBERRY project, i.e. hascaps, highbush blueberries, bush cherries, saskatoons, goji berries, japanese silver berries, cornelian cherries, white (red) currant, green (black) currant, hybrid black currant x gooseberry and gooseberries. Plants were planted in 2016/2017 and first harvest with machine was done successfully in summer-autumn 2017. For some varieties also fruit analyses were performed.

Pcfruit

Since a correct variety choice is to a large extent decisive for the achieved result and as a consequence also for the income of a grower, most new soft fruit varieties are tested at the department field research berryfruits of pcfruit. It is important to evaluate new varieties in growing conditions comparable with these of the growers. Results are summarized, published and are available for the Belgian soft fruit growers.

Variety screening is an important part of the research for strawberries. The biggest share of this research is spend on the screening of new varieties/selections in open field conditions, with production, fruit classification, harvest period and fruit quality as main research characteristics. In 2017, twenty new short-day varieties were evaluated in phase 1 and six in phase 2 (Deluxe, 10-50-01, Sonsation and Destiny; Malling Centenary and Magnum). Six early varieties were evaluated in a tunnel production. Besides the open field production, seven varieties were tested as a table top crop. Optimisation tests (phase 3) were performed for Malling Centenary and Magnum. There were 14 new day-neutral varieties evaluated in phase 1 in open field conditions and five in phase 2 (08-06-10, Florentin and EMR 639; Verity and Harmony). Optimisation tests (phase 3) were performed for Verity and Harmony. Besides the open field production, seven varieties were tested as a table top crop.

In 2017, 22 varieties of florican raspberry were evaluated as a container crop in an unheated tunnel production with Tulameen as reference variety. In 2018, five of these varieties will move to phase 2 of the variety screening (T110L6, SO.LU.08.1.5, Cascade Bell, Cascade Gem and 06.15.11). In 2017 there were also 22 primocane raspberry varieties evaluated (Phase 1 and phase 2) as a container crop. Other variety trials were performed for goose berries (five varieties), red and white currants (8/2 varieties) and blackberries (two varieties) – container crops.

There are some important challenges and gaps for soft fruit growers:

- Some varieties are not available for all growers, because they are launched as a club variety.
- Novelties are planted without proper testing (certainly for strawberries).
- Infestation of all soft fruit species by *Drosophila suzukii*.
- Most soft fruits are limited in production area, which means that generally there are little products available to control pests and diseases. Especially for covered crops.
- Changing climatic conditions.
- Taste is underestimated, shelf life is more important.

CTIFL

In France, the strawberry industry (from the producer to the retailer) is focused on fruit quality to meet the consumer demand for a “made in France” high quality strawberry. Varietal choice is the first step of quality elaboration. Testing new strawberry varieties is organized around a national network including Ctifl and four regional stations. Ctifl is coordinating this national network. It takes in account all the steps of the supply chain (from the producer to the retailer) to meet the consumer requirements in terms of price and quality.

The national production aims to differentiate a national quality from the foreign production. To develop a new variety means to meet a balance between diseases and pest resistance, yield, appearance, shelf life ability, taste,... In 2017, twenty cultivars were evaluated in Balandran Ctifl center toward reference varieties Gariguette, Clery, Darselect and Matis.

The varietal evaluation system will have to cope with new constraints:

- The “zero residue” demand emphasize the disease and pest resistance levels, in addition with the objective of Ecophyto 2 Government plan to reduce by 50 % the use of phytosanitary products (-25 % in 2020 and -25 % in 2025),
- Cost and lack of workforce to operate in the crop: a high productivity while maintaining a good quality of product (is one of the challenge facing strawberry production,
- Development of private evaluation by producer organizations concomitant with the development of club varieties; compromises the role of public and collective evaluation.

OVA

The focus of variety testing of all soft fruit varieties is to give a recommendation of cultivable varieties for the North German area, taking into account cultivation system, fertilization and water management, location (soil) and profitability for cultivation, for direct marketing and marketing through the food retail. The results of the variety examination are of crucial importance for success or failure in practice and therefore have a key role in the strategic planning of the growers and variety breeding.

Our research is based on three pillars: Variety testing, trials on current pest management issues, and cultivation and cultural practices.

The experimental work includes cultivation trials, variety testing and the entire cultural technique as well as plant protection for all berry fruit species. They are strawberries, blueberries, raspberries, blackberries, red and black currants, gooseberries and minikiwis (“kiwi berries”). The tests are carried out in experimental operation as well as in practical operations.

The field of cultivation tests comprises 10 to 20 experiments per year. For plant protection 20 to 40 experiments, also as outdoor experiments and in organic cultivation. In the field of crop protection, official mid-level tests are carried out for the approval of new products. In addition, intensive work is being done with the workgroup gap indication in order to provide new products for closing indication gaps for cultivation and consultation through biological impact tests and residue trials.

The aim of our work is to promote and expand the competitiveness of North German berry fruit cultivation. New and old varieties are continuously tested and tested for their competitiveness.

Our results are the basis for the decisions and advice of advisory councils, marketing organizations, trade, growers, research institutions, authorities and ministries and professional bodies.

WR

At WR no soft fruit varieties are tested.

NIAB-EMR

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 Sint-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.

IRTA

At IRTA no soft fruit varieties are tested.

Agroscope

The evaluation of new strawberry and raspberry varieties at Agroscope takes place in two phases. Depending on the year, eight to ten new strawberry varieties and four to eight new raspberry varieties (primocane and florican) are tested.

The variety testing for berries at Agroscope focuses on the following research topics:

- Evaluation of fruit quality of new varieties (sugar content, firmness, color).
- Evaluation of agronomic potential of new varieties (yield, diameter, maturing period, resistance or susceptibility to pests and diseases).
- Evaluation of marketability of new varieties.

The goal of a good variety range is to fulfill the expectations and demands of the producers, the market and the consumers. Variety testing aims at providing neutral evaluations of new varieties in favor of production and consulting. The evaluation

of new varieties takes place in two phases involving different regions within Switzerland as well as different cultivation methods.

The outcome of the research is published in different journals and is presented to the Swiss stakeholders of berry-production and at different meetings and conferences.

Laimburg

At the Laimburg Research Centre, research on berries currently focuses mainly on strawberry production. Variety testing and breeding represent the main focus of the research.

Since strawberry is extremely susceptible to pedo-climatic conditions and to the cultivation management, it is fundamental to test every variety in a specific growing area. This allows to determine the suitability of a variety for a certain pedoclimatic condition and to assess if the variety has the potential to provide some economic advantages for the farmers.

The Laimburg strawberry breeding program started in 2010 and it is carried out within the project “La fragola saporita dell’Alto Adige” (The tasty strawberry of South Tyrol), in collaboration with the CREA-OFA in Forlì (Italy). The aim of the breeding program is to obtain new superior strawberry genotypes, which should be suitable for the alpine environment (especially regarding the resistance to late frosts), should have an extraordinary quality, a unique taste, should guarantee the profitability to local farmers and it should be pest-disease tolerant, in order to achieve a sustainable production. At present, eight selections reached an advanced selection phase. Last year, one selection was positively evaluated, presenting a very good yield, good fruit size, which was maintained for the whole harvesting period, attractive colour, shape and taste. This year it will be tested by local farmers at a larger scale.

Other berry fruits, such as raspberry, black- and red- currant, blueberry and blackberry play a minor role in South Tyrol. Research projects on variety testing both on raspberry and *Actinidia Arguta* are going to be established at the Laimburg Research Centre.

Challenges:

- Severe late spring frost events and lower precipitations in winter are big challenges. In 2017, spring frost caused a reduction of the strawberry production of 40% on average. Solutions to this problem should be found.
- Soil-disease resetting: Most of the farmers cultivate strawberry in open fields, under tunnels. Farmers are obliged to continuously cultivate for several years the same berry cultivation on the same field, due to the small size of the berry fields. Only big and well-organized farms can adopt the rotation technique, which seems to be not profitable for smaller realities.
- Damages induced by *Drosophyla suzukii*, even if they can be significantly reduced with the use of insect-nets, remain a challenge.
- Find more varieties suitable for the peculiar alpine climatic conditions of South Tyrol.
- A standard method with a description list for testing strawberry cultivars is missing, and novelties are planted without a proper and common testing-standard.
- Even if results on the variety testing and breeding are presented to local farmers every year, an easily and free accessible database is missing.

USAMV

The main focus on berries is variety and training systems testing. A lot of research is made in respect to fruit quality, enlarging consumption period, greenhouse culture, organic crops, fertigation regime, breeding and grafting.

Many varieties and species are tested within the USAMV Bucharest trial fields in order to select the most suitable ones for the region, production destination and valorization type. Integrated management of factors in the orchard is applied and breeding for goji is ongoing. Two new goji hybrid selections are waiting the patent validation. Few trials of grafting in blueberry and goji have been developed within the Innoberry project.

Different strawberry varieties are tested and cultivated in open field (plastic film) and greenhouse (soilless culture), searching for best cultivars in terms of productivity, fruit quality, shelf life and resistance to biotic and abiotic stress factors.

Blueberries are cultivated in pot-in-pot system in open field and containerized crop management into plastic tunnel in order to obtain early and late fruit production. A comparative testing field of more than 40 blueberry varieties in the containerized crop is dedicated to a later fruit analyses in the lab for fruit quality and shelf life. Testing sessions are periodically organized for gathering the consumer preferences.

Currants, goji, chokeberry and blueberry are tested for vertical training system from more than 3 years.

New cultivars of raspberry (primocane, floricane, yellow and black fruits) are introduced for testing the resilience and productivity in the South region of Romania. A special attention to thornless blackberry varieties is given since this requirement is asked by most of the growers in the country,

Future needs:

- Selection of berry varieties suitable for organic production.
- Resilience to climate changes (dried summer long periods, high temperature amplitudes and inconsistent winters).
- Fruit appearance and taste together with firmness and better shelf life.
- Pruning and mechanical harvest technologies for bigger orchards.

NARIC

The National Agricultural Research and Innovation Center Fruitculture Research Institute has four research stations. One of them is located on the Hungarian – Austrian border in the city called Fertőd, where soft fruit species breeding programs are running. During the 70-year history of the Research Institute, there were more than almost 200 fruit cultivars selected or bred, and 26 state-approved soft fruit cultivars can be found among them. There are 10 strawberry, 7 raspberry, 4 black berry, 2 red currant, 2 black current and 1 black chokeberry cultivars in our assortment.

But the Hungarian berry sector is in trouble, because all berry species' production decreased a lot during the past two to three decades. The raspberry production decreased from 27 000 t to 1 000 t, the strawberry production reached 12 000 t in the past, now it is between 4 000 and 5 000 t annually. The black berry and the gooseberry production are on a low level. The reasons of these phenomena are the followings; the climate has changed; therefore some sunburnt symptoms appeared on different organs of the plants; our Southern neighbour country, Serbia supplies a lot of countries with cheap mass products; the Hungarian labour is expensive; the big stores imported a lot of berries at the early season; and there is no berry fruit-based processing industry. Our colleagues had to re-think the small fruit breeding programs due to new challenges. In the strawberry production, we started to make some crosses between the European and Asian species, and we are looking for the genotypes with early ripening time, good fruit quality, excellent flavour for fresh consumption. The raspberry breeding is going on using hybrids derived from crosses between European and Asian species. There is a new task to create raspberry genotypes for forcing, so the targeted aims are to have genotypes with early ripening time, bright fruit colour, high sugar content, compact vigour, long shelf-life. In the red current program the most important selection criteria are to have genotypes with tolerance to spring weather and big temperature fluctuations. In the black berry program the genotypes with rigid stem, good fruit quality and good tolerance to winter conditions are the selection criteria.

Just the elderberry production could increase during the past decades, and this fruit species become the most grown one in Hungary among the berry fruits. The number one cultivar is called Haschberg, and we are looking for some genotypes having early or late ripening time, similar yield and fruit quality compared to the Austrian-bred standard cultivar. In some small orchards the sea buckthorn and haskaps production started, but there is no breeding program behind them, the growers use global cultivars.

LRCAF

The main research topics for blackcurrant, raspberry, strawberry, wild strawberry, blackberry, sea buckthorn at LRCAF are: variety testing and breeding, management systems, growing and plant protection technologies. Most important parameters for soft fruits at Lithuanian agro climatic conditions is winter hardiness, resistant to spring frost, late flowering, resistance to main important fungal diseases, and high fruit quality.

At LRCAF 5 strawberry, 4 wild strawberry, 2 raspberry, and 20 blackcurrant varieties were developed. Lithuanian farmers growing local breeding strawberry variety 'Dangė', wild strawberry - 'Dena', 'Meda', 'Redita', 'Elina', raspberry - 'Vizija', 'Mistika', blackcurrants - 'Gagatai', 'Joniniai', 'Almiai', 'Gojai' and 'Pilėnai' et. all. 2 strawberry hybrids (N051901, N082901) and 2 blackcurrant varieties ('Aldoniai' and 'Didikai') evaluated at DUS testing.

In 2017 8 clones of strawberry, 5 clones of blackcurrant were selected, 14 introduced strawberry varieties were evaluated. 6 *F. vesca* × *F. nipponica* F2 and F3 interspecific hybrids, 4 *F. vesca* (alpine, cultivated) × *F. vesca* (wood) F3 hybrids, 11 selected lines of unknown origin and standard alpine strawberry cultivars were evaluated. Raspberry, blackberry and sea buckthorn varieties evaluation continued.

In LRCAF developed soft fruit growing technologies and varieties are important for local farmers. Centre close collaborated with Lithuanian associations of commercial orchards "Vaisiai ir uogos", "Pramoninių uogynų augintojų asociacija" and other joint-stock companies. These cooperation created a new advanced research-based products, conducted an experimental research, various measurements or construct a prototypes, created new or improved the existing growing and processed technologies.

Challenges and gaps

There are some important challenges and gaps for soft fruit growers:

- It is essential crop for amateur and commercial sector.
- Winter hardiness and quality is most important characters of soft fruit variety.
- Variety is the main character at chain of growing technology.
- Realization of fresh fruits to the market is still insufficient.
- Agricultural technics and storage facilities playing important role at this sector.

SKST

The members of the Cooperation of producers Martell (MEG), for its part member of the Federation of Vinschgau Fruit and Vegetable Producers (VI.P), grow berries on a total of 50ha, situated on 1.000-1.700 masl.

Regarding strawberries, cultivated on ca. 35 ha, the varieties Elsanta and Darselect are prevailing. Neither of these varieties are particularly suited for the high altitudes of the Martell valley. To find more suitable varieties for this region, a research field for strawberries is being created in the MEG area. Regarding the production systems, 30% of the MEG-area is still cultivated on traditional fields, whereas 70% of the strawberries are cultivated with rain- and weed-cover (double-cover).

On 6 ha of the Martell valley, raspberries are cultivated. The main varieties of raspberries grown are Polka, Tulameen, Glen Ample, Amira, and others. The main varieties of blueberries grown are Duke and Berkeley. Blueberries are cultivated in pots and on a total of 2ha, and blackberries, cultivated on 1ha of the MEG-area only, are grown as hedges. In this case, the cultivated varieties are Loch Ness and Novaho.

In the last couple of years, the harvest of berries decreased due to spring frosts and invasive pests such as *Drosophila suzukii*, which both pose very big problems to the berry-farmers. In addition, the rural exodus caused some of the decrease. Alpine farming poses a lot of challenges to the farmers in general, and for producers of soft fruits and berries in particular. Steep fields, high altitudes and no varieties particularly suited for these regions make farming challenging. Thus, more support, manpower and expertise for the berry-variety breeding and testing are needed. Another challenge is logistics: the fields are very far from the cities, which makes the transportation and the marketing of the fruits very difficult. Finally, South Tyrolean producers of soft fruits are lacking expertise and funding. If subsidized, however, berries provide a big potential for the zones, which are situated above 1.000 masl, where apples can't be produced. As such, the cultivation of soft fruits can provide an alternative to rural exodus, as it can be a vista for the rural communities in general and to farmers in particular.

Challenges:

Generally, many of the berry-types suffer from winter damages. In the last couple of years, the harvest of berries decreased. On the one hand, this was due to spring frosts and invasive pests such as *Drosophila suzukii*, which both pose very big problems to the berry-farmers. Thus, further research is required to mitigate these challenges. On the other hand, the rural exodus caused some of the decrease too. Alpine farming poses a lot of challenges to the farmers in general, and for producers of soft fruits and berries in particular. One factor that makes the cultivation of berries difficult is the steep fields; other factors are represented by the high investment costs, the high altitudes, and the fact that there are no varieties particularly suited for these regions. Thus, more support, manpower and expertise for the berry-variety breeding and testing are needed.

Another challenge is logistics: the fields are very far from the areas of high population density, which makes the transportation and the marketing of the fruits- which are characterized by a very short storability and shelf life- very difficult. Finally, in South Tyrol the focus lies traditionally on apples. Therefore, producers of soft fruits are lacking the expertise that has been developed and that is subsidized in some fruit production and research, and they are lacking financial support. The same is true for stone fruits. In fact, funding of the soft and stone fruit-sectors is very little in comparison to the funding of apple production. If subsidized, however, berries provide a big potential for the zones, which are situated above 1.000 masl, where apples can't be produced. As such, the cultivation of soft fruits can provide an alternative to rural exodus, as it can be a vista for the rural communities in general and to farmers in particular.

UHOH

No scanning report about variety testing of soft fruits received from UHOH (or KOB).

UNIBO

In recent years, new varieties of strawberries have been patented. Flavia* and Flaminia* are two of them and they arouse keen interest among the major Farmers Group in Morocco, Tunisia, Spain and Southern Italy where the first pilot-plants have been already planted confirming the good performances of this varieties, both in agronomic and commercial terms. The two cultivars are characterized by early maturity, medium vigor and fruit outside the foliage easy to collect, highly resistant to powdery mildew and leaf and root diseases in general. Also suitable for tired soils, showed good adaptability to the cropping practice and to the organic cultivations or with low environmental impact.

Other research programs on new strawberries varieties are undertaken by the research center of CREA (Crea, Olivicoltura, fruit-growing, citrus farming in Forlì). Examples are strawberry that has the particularly inviting scent of wild strawberries and a white strawberry that can meet those who would like to enjoy their favorite fruit but are allergic to red pigments. These are the main objectives for the next years of CREA. The aim is to give back those sensory properties that have been subtracted from a selection aimed at greater yield and a longer conservation than the intrinsic quality of the fruit. The research unit started from eight different programs that have interested Italy, from Sicily to Trentino, to find new varieties to improve the quality, in particular aroma and fragrance, through natural crossings, and therefore not in the laboratory.

INRA

No scanning report about variety testing of soft fruits received from INRA.

Summary for EIP dissemination

Project title: EUFROIT: European Fruit Network

Keywords: Strawberries, raspberries, blackberries, red currants, black currants, blueberries

Summary:

Because there is no recent list of members of the EUFRIN Working Group “Berry research (soft fruit)”, it is hard to say how many partners in EUFRUIT-WP2 who are a member of this EUFRIN Working Group. All partners, except AREFLH, Freshfel and SKST, are variety testers. In contrast to the EUFRIN Working Group “Apple & Pear Variety & Rootstock Testing” the EUFRIN Working Group “Berry research (soft fruit)” has not a common EUFRIN testing agreement or EUFRIN Descriptor lists.

Most of the partners in EUFRUIT-WP2 focus on variety testing of strawberries and small fruits (raspberries, red currants, black currants, blackberries and blueberries). Strawberries are the most important and most tested soft fruit species in the different places. For CTIFL and UNIBO it is even the only tested soft fruit species. AU only focus on small fruits (mostly black berries, red currants and black currants). At many places there is also interest in new soft fruit species like ...

Four participants have their own breeding program for soft fruit species or work together with a partner with a breeding program: NIAB-EMR (strawberries, raspberries and blackberries), Laimburg (strawberries together with CREA in Forli), LRCAF (strawberries, wild strawberries, raspberries and black currants) and UNIBO (strawberries together with CREA in Forli).

Looking at the demands for a new soft fruit variety some are very similar to the criteria for new pome and stone varieties: productivity, fruit size, appearance, fruit quality, storability and or shelf life. As for new pome and stone varieties also a new soft fruit variety must be less susceptible to pest and diseases.

Almost all participants are working with 2 levels. In level 1 a limited number of trees is planted in comparison with standard soft fruit varieties. These varieties differ depending on the location. After a few years a selection is made. The best varieties of level 1 are planted in a larger scale on one or sometimes more locations. It is clear that the selected soft fruit varieties for level 2 are not the same in the different institutes or climate zones.

Main challenges and gaps for variety testing of soft fruit species:

- 1) Some soft fruit varieties are not available for all growers, because they are launched as a club variety.
- 2) Novelties are planted without proper testing. Variety pre-evaluation through independent and expert testing is highly valuable for this crop to prevent growers from economic losses
- 3) Development of private evaluation by producer organizations concomitant with the development of club varieties; compromises the role of public and collective evaluation.
- 4) The breeding goals of foreign breeders do not always meet the requirements in other countries/regions.
- 5) Resilience to climate changes (dried summer long periods, high temperature amplitudes, inconsistent winters, spring frost).
- 6) Taste is underestimated, shelf life is more important.
- 7) A standard method with a description list for testing strawberry cultivars is missing.
- 8) Even if results on the variety testing and breeding are presented to local farmers every year, an easily and free accessible database is missing.
- 9) Selection of berry varieties suitable for organic production.
- 10) Fruit appearance and taste together with firmness and better shelf life.

Main challenges and gaps for growing soft fruit species:

- 1) *Drosophila suzukii* has become a major pest in soft fruits. Adequate management of this pest is a big challenge and can cause high costs (e.g. nets).
- 2) Most soft fruits are limited in production area, which means that generally there are little products available to control pests and diseases. Particularly for covered crops.
- 3) The “zero residue” demand emphasize the disease and pest resistance levels.
- 4) Severe late spring frost events and lower precipitations in winter are big challenges.
- 5) Soil-disease resetting: Most of the farmers cultivate strawberry in open fields, under tunnels. Farmers are obliged continuously to cultivate for several years the same berry cultivation on the same field, due to the small size of the berry fields. Only big and well-organized farms can adopt the rotation technique, which seems to be not profitable for smaller realities.
- 6) Cost and lack of workforce to operate in the crop: a high productivity while maintaining a good quality of product (is one of the challenge facing strawberry production).
- 7) Realization of fresh fruits to the market is still insufficient.
- 8) Agricultural technics and storage facilities playing important role at this sector
- 9) Pruning and mechanical harvest technologies for bigger orchards.

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

Contributing project partners: AU, Pcfruit, CTIFL, OVA, StDLO, NIAB-EMR, IRTA, Agroscope, Laimburg, USAMV, NARIC, LRCAF,
SKST and INRA.

Additional contributors: No

Project period: 2016 - 2019

Project status: Ongoing

Funded by: Horizon 2020

Total budget: €1.8m

2. Dissemination catalogue of planned and executed activities 2016-2019

Activity types	Executed 01-03-2016 – 01-06-2018		Additionally planned the 3. Year up to 28-02-2019
	No. activities	No. participants	No. activities
A. Participation in...			
A1: Dialogue meeting (Policy)	LAIMBURG: 1, UHOH: 2, INRA: 1, NIAB EMR: 4	Total: 166 Female: 17 Male: 34	
A2: EIP-AGRI conference or workshop	AGROSCOPE: 1	Total: 120 Female: Male:	
A3: Scientific conference	AU: 2, PCFRUIT: 7, CTIFL: 4, OVA: 1, IRTA: 6, AGROSCOPE: 3, LAIMBURG: 4, USAMV: 3, NARIC: 5, LRCAF: 7, INRA: 3, NIAB EMR: 12	Total: 8.037 Female: 508 Male: 700	PCFRUIT: 1, WR: 1, LAIMBURG: 1, LRCAF: 1, UNIBO: 1
A4: Industry event or exhibit	CTIFL: 3, WR: 1, IRTA: 8, AGROSCOPE: 1, LAIMBURG: 10, USAMV: 1, LRCAF: 7, SKST: 6, UNIBO: 6, INRA: 1, NIAB EMR: 15	Total: 37.720 Female: 359 Male: 936	USAMV: 1, AREFLH: 4
A5: Other stakeholder meeting	AU: 1, PCFRUIT: 11, AGROSCOPE: 1, LAIMBURG: 12, USAMV: 1, LRCAF: 3, SKST: 9, UNIBO: 2, INRA: 2, NIAB EMR: 5	Total: 2.459 Female: 360 Male: 1.434	PCFRUIT: 1, LAIMBURG: 4, USAMV: 1
A6: Event aimed at general public	AU: 2, AGROSCOPE: 2, LAIMBURG: 1, LRCAF: 4, SKST: 1, UNIBO: 1, INRA: 3	Total: 201.350 Female: 30.081 Male: 30.059	AGROSCOPE: 1, LRCAF: 2
B. Organising/holding...			
B1: Seminar/lecture-based workshops	AU: 2, PCFRUIT: 5, IRTA: 10, LAIMBURG: 17, USAMV: 3, NARIC: 1, LRCAF: 1, SKST: 10, UHOH: 2, UNIBO: 2, INRA: 1, NIAB EMR: 2	Total: 22.285 Female: 478 Male: 876	
B2: Field-based workshops	OVA: 3, WR: 1, AGROSCOPE: 2, SKST: 1, UHOH: 1, UNIBO: 1, INRA: 1	Total: 197 Female: 9 Male: 68	
B3: Open demonstration day	AU: 2, PCFRUIT: 20, CTIFL: 1, OVA: 28, WR: 2, IRTA: 14, AGROSCOPE: 6, LAIMBURG: 2, USAMV: 7, NARIC: 6, LRCAF: 2, UHOH: 3, UNIBO: 1, NIAB EMR: 6	Total: 69.533 Female: 909 Male: 3.035	PCFRUIT: 2, WR: 1, IRTA: 6, AGROSCOPE: 1, USAMV: 2, NARIC: 3, UHOH: 1
B4: Field visit	OVA: 5, WR: 5, AGROSCOPE: 1, LAIMBURG: 36, USAMV: 1, LRCAF: 3, SKST: 16, UHOH: 3, UNIBO: 7, INRA: 1, NIAB EMR: 3	Total: 2.021 Female: 119 Male: 763	LRCAF: 1

B5: Industry group meeting/event	AU: 2, PCFRUIT: 3, OVA: 2, WR: 2, IRTA: 12, LAIMBURG: 1, NARIC: 1, LRCAF: 2, SKST:2, UNIBO: 5, INRA: 2, NIAB EMR: 14	<i>Total: 1.302</i> <i>Female: 73</i> <i>Male: 290</i>	WR: 1
B6: Other stakeholder meeting/event	AU:2, PCFRUIT: 28, CTIFL: 6, OVA: 5, WR: 2, AGROSCOPE: 5, NARIC: 1, SKST: 8, UNIBO: 1, NIAB EMR: 1	<i>Total: 1.927</i> <i>Female: 164</i> <i>Male: 644</i>	AREFLH: 2
B7: event aimed at general public	PCFRUIT: 1, OVA: 5, AGROSCOPE: 1, LAIMBURG: 2, SKST: 1, NIAB EMR: 3	<i>Total: 46.360</i> <i>Female:96</i> <i>Male:214</i>	PCFRUIT: 1
C. Publication of...			
C1: EIP-AGRI practitioner abstract/scanning report	AU: 3, PCFRUIT: 3, CTIFL: 3, OVA: 2, WR: 2, IRTA: 1, AGROSCOPE: 2, LAIMBURG: 2, USAMV: 3, NARIC: 2, LRCAF: 3, SKST: 2, UHOH: 1, UNIBO: 3, INRA: 2, NIAB EMR: 3		
C2: Technical bulletin/guideline	PCFRUIT: 31,IRTA: 3, AGROSCOPE: 3, LAIMBURG: 1, LRCAF: 2, NIAB EMR: 2		AGROSCOPE: 1, NIAB EMR: 1
C3: Flyer/leaflet	CTIFL: 9, WR: 2		AREFLH: 1
C4: Newsletter	AU: 1, AGROSCOPE: 1, LRCAF: 3, UNIBO: 2		
C5: Book/booklet/chapter	AGROSCOPE: 2, NARIC: 3, UNIBO: 1, INRA: 1		
C6: Audio/video content	AU: 3, LAIMBURG: 4, LRCAF: 4, SKST:1		NIAB EMR: 1
C7: IEG Synthesis report	PCFRUIT: 3		
D. Publication in...			
D1: Scientific journal (peer review)	AU: 2, PCFRUIT: 2, IRTA: 3, LAIMBURG: 1, USAMV: 2, NARIC: 1, UNIBO: 1		LAIMBURG: 2

D2: Technical journal	CTIFL: 13, OVA: 15, IRTA: 25, AGROSCOPE: 9, LAIMBURG: 13, UNIBO: 1, INRA: 2	<i>Total: 145.417</i> <i>Female:</i> <i>Male:</i>	AGROSCOPE: 1
D3: Industry journal/magazine	AU: 8, PCFRUIT: 14, WR: 1, NARIC: 1, LRCAF: 3, SKST: 5, UHOH: 2, NIAB EMR: 1	<i>Total:16.403</i> <i>Female:3</i> <i>Male:29</i>	PCFRUIT: 2, UHOH:1
D4: Other stakeholder journal/magazine	AGROSCOPE: 1, NARIC: 1		
D5: Journal/magazine aimed at general public	LAIMBURG: 3, NARIC:1		
E. Final project conference			
E1: Participation with presentation (oral)			
E2: Participation with presentation (poster)			
E3: Other material			

Annex – WP2 Scanning reports 2018

Scanning report (EIP format for practice abstracts)

***Project title (native language):** EU FRUIT europæisk netværk

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

***Author/native language editor:** Senior scientist, Martin Jensen, Department of Food Science, Aarhus University, Kirstinebjergvej 10, 5792 Aarslev, Denmark. Email: Martin.Jensen@food.au.dk , phone: +45 87158331.

Section A. Summary for EIP dissemination

***Keywords:** EUFRUIT, innovations, dissemination platform, breeding and cultivar trials in soft fruits, organic trials, minor crops, blackberry in tunnel, black and red currant, Aronia, bilberries, new specialty crops, machine harvest.

***Main geographical location:** [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)]

Other geographical locations: [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)]

***Summary (native language):**

Sortsforsøg med *soft fruit* eller *small fruit* arter inklusiv specialsorter og -arter rapporteres. Resultater for brombær (økologisk), solbær og ribs til industri (økologiske eller konventionel), Aronia melanocarpa, en række nye buske og træer beregnet til maskinhøst med ny portalhøster , og domesticeringsprojekter for *Vaccinium myrtillus* (almindelig blåbær) blev afreporteret, enten ud fra igangværende forsøg med foreløbige resultater eller fra nyligt afsluttede forsøg. I økologisk brombær produktion i sommer-dækkede tunneller var Loch Ness, Loch Tay og Natchez mest lovende. I igangværende økologiske solbærforsøg med standard anbefalede sorter (Ben Hope, Ben Lomond, Ben Tirran, Narve Viking) og nogle nye forædlingskloner fra JHI (Scotland) viste det sig at en af de nye test kloner blomstrede meget sent og undslap sen forårsfrost i alle år og gav det højeste akkumulerede udbytte. Narve Viking, Ben Hope, Ben Lomond var de bedste sorter. I ribs dyrket økologisk viste Red Poll og Roodneus sig at give det højeste udbytte og også det højeste farveindhold, bedre end Augustus og Rovada.

For Aronia melanocarpa gav Viking lidt højere udbytte end Nero I økologisk forsøg. Anthocyanin koncentrationen i presseresten var afhængig af juice processeringsmetoder og pressemetoder og over 50% af anthocyaninerne var tilbage i presseresten efter presning. Sammenlignende klonforsøg med over 100 kloner af almindelig blåbær viste stor variation i udbytte, bærestørrelse, plantevækst, plantesundhed og frugt kvalitet. Effektive formerings og dyrknings metoder med urteagtige sommer stiklinger er udviklet og en specialtilpasset flydende gødningsopløsning er udviklet for almindelig blåbær. Data for selektion af de bedste kloner indsamles for flere år og det forventes at nye sorter kan udsendes snart.

36 sorter af 12 forskellige nye specialarter/sorter testes I DANBÆR projektet, bl.a. hascaps, amerikansk blåbær, busk kirsebær, saskatoons, goji bær, søvlblad, kirsebærkornel, hvidfrugtet ribs, grønne solbær, jostabær og stikkelsbær. Planter blev etableret i 2016/2017 og første høst med nye portal høster blev gennemført med succes i sommer-efterår 2017.

Summary (english):

Cultivar trials with soft fruit and small fruit species including specialty crops were reported. Results for blackberry (organic), black and red currants mainly for industry (organic and or conventional), Aronia melanocarpa, a range of new bush and tree species for machine harvest and the domestication process for *Vaccinium myrtillus* (European blueberry) were reported, either ongoing with preliminary results or from recent finished trials. In blackberry organic production in summer-covered tunnels Loch Ness, Loch Tay and Natchez were most promising. In black currant ongoing tests with standard recommended reference cultivars (Ben Hope, Ben Lomond, Ben Tirran, Narve Viking) and some new breeding clones from JHI (Scotland) in an organic

trial showed that a new test clone was late flowering and escaped spring frost in all years and gave the highest accumulated yield. Narve Viking, Ben Hope, Ben Lomond is the best cultivars in conventional tests. In red currant an organic trial showed that Red Poll and Roodneus had the highest yields and the highest content of color and were recommended, and better than Augustus and Rovada.

For Aronia melanocarpa Viking showed a bit higher yield than Nero in an organic trial but both had very high color content. Anthocyanin content in pomace varied depending on juice processing and pressing methods and more than 50% of anthocyanins were left in the pomace. Common garden trials with over 100 clones of European blueberries showed large variation in yield, berry size, plant growth, plant health and fruit quality. Efficient propagation methods using summer cuttings were developed and a special liquid fertilizer developed for EB. Data for selection of superior cultivars has been collected for several years and is expected to lead to release of clones in few years.

36 cultivars of 12 different new specialty species/cultivars is being tested in the DANBERRY project, i.e. hascups, highbush blueberries, bush cherries, saskatoons, goji berries, japanese silver berries, cornelian cherries, hascups, white (red) currant, green (black) currant, hybrid black currant x gooseberry, gooseberries. Plants were planted in 2016/2017 and first harvest with machine were done successfully in summer-autumn 2017 and fruit analysis performed for some varieties.

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. Etablering af Europæisk netværk med focus på frugt og bær sektoren
2. Udvikle og implementere en systematisk scanning og syntese af eksisterende videnskabelig og praktisk viden.
3. Etablere en fortløbende dialog med EU, nationale og regionale politiske styrelser
4. Identificere og bakke op om prioriterede forskningsområder ved fortsat monitorering og analyse af eksisterende og forskning- og innovationsaktiviteter på vej.

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) • Pcfruit
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 report¹

Scanning report Martin Jensen, AU

Author: Senior scientist Martin Jensen, Aarhus University, Department of Food Science, martin.jensen@food.au.dk , +45 8715 8331

Country: Denmark

NUTS 3 region(s)²: [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)]

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

Date: 25-04-2018

Source materials and methodology

Information on small fruits and or soft fruits research including new species was gathered.

Blackberry experiment was performed by Martin Jensen as a part of the CLIMAFRUIT EU 2010-2013 project and updated with more recent information obtained from recordings in 2014. For black and red currant Hanne Lindhard Pedersen, consultant for the Horticultural Advice in Denmark and coworker at AU Årsløv, Aarhus University, Dept. Food Science contributed to the scanning with both ongoing experimental results and with results from previous trials in black and red currant. Information was included from an ongoing project DANBERRY (2014-2019), on testing of a large range of species and cultivars of newer niche crops/ some small fruits in how adapted they are to machine harvest with an over-the-row harvester (New Holland 9090 Dual). Domestication of European blueberries from Danish wild habitats was initiated in 2009 and two projects are finished now but the work is still ongoing in the third project in 2018. Research on Aronia melanocarpa has been done previously on cultivars and production aspects (2010-2012) and recently in an ongoing project (COLARO 2014-2018) on understanding color compounds and color yield in juice and pomace of Aronia. Scientific reports, popular magazine papers, thematic days presentations and open house events are included here as sources.

Jensen, M. 2017 Økologisk dyrkning af brombær i tunnel. (Organic cultivation of blackberries in tunnels). Gartnertidende, 6, 48-49.

Jensen, M. 2013 Cultivar performance of blackberries in Danish organic cultivation. Video on dissemination homepage of EU CLIMAFRUIT interreg project. Link [Cultivar performance of blackberries in Danish organic cultivation](#).

Jensen, M. 2013 Climafruit Blackberry trial – update September 2013. Oral presentation at Climafruit final meeting in Jork, Germany, 18 September 2013.

Jensen, M. Organic blackberries without thorns. Poster and oral communication at Food Festival 6 September 2013 in Tangkrogen Aarhus. (27-30.000 visitors)

Jensen, M. og de Pedro, S.F. 2017 Vilde blåbær – på vej mod ny dansk bærafgrøde. Gartnertidende, 10, 52-53.

Jensen, M. 2012, Nye muligheder med danske vilde blåbær. Gartnertidende, 5, 12-13.

Jensen, M. 2011. Danske vilde blåbær skal tæmmes. Frugt og Grønt, No 11/12, 470.

Jensen, M. 2014. Domestication of European blueberries. Video on dissemination homepage of EU CLIMAFRUIT interreg project. Link [Domestication of European blueberries](#)

¹ Equivalent to 'final report' in EIP-AGRI format.

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

Jensen, M. 2013 Aronia. Video on dissemination homepage of EU CLIMAFRUIT interreg project.

Jensen, M. (2013) Aronia – produktion af velsmagende og sundhedsbevarende bær. Slutrapport, pp. 1-22. 30. sept. 2013 (confidential)

Vagiri, M. and Jensen, M. 2017 Influence of juice processing factors on quality of black chokeberry pomace as a future resource for colour extraction. Food Chemistry, 217, 409–417. . <http://dx.doi.org/10.1016/j.foodchem.2016.08.121>

Lindhard Pedersen H. 2008. Juice quality and yield capacity of black currant cultivars in Denmark. 2008. Acta Horticulturae. vol. 777, 511-516.

Lindhard, H. & Andersen, L. 2012. Gode ribssorter. Økologisk nyhedsbrev 8, 16.

Lindhard Pedersen H. and Andersen L. 2012. Black and red currant cultivars for organic production. Proceedings of the 15th International Conference on organic Fruit-Growing. February 20th to February 22th at the University of Hohenheim, Germany. P 215-220.

Jensen, M. 2018 Soft fruit variety testing in Denmark. PPT and oral at EUFRUIT meeting, PCSierteelt, Belgium, 24-25 April 2018.04.27

Gitte H. Jørgensen, Hanne Lindhard. Nye bær til produktion i Danmark. Gartnertidende nr. 7, maj-2016.

Gitte H. Jørgensen. Stor interesse for haskap i Canada. Gartnertidende nr. 12, 2016.

Gitte H. Jørgensen. Surkirsebær kan også dyrkes som buske. Gartnertidende nr. 14, 2016.

Hanne Lindhard, Helle Mathiasen. Nye bærkulturer giver optimisme. Temadag GartneriRådgivningen 28-02-2017, UF5 <http://www.gartnertidende.dk/frugtbaer/nyheder/2017/nye-baerkulturer-giver-optimisme#.WOI0mE1MQRY>

Petersen m.fl. 2016. Danbær – Nye bær til produktion i Danmark. Poster Food Festival Århus 2. – 4. september 2016.

Best practice findings

Trials with blackberry, black and red currants mainly for industry, Aronia, new species for machine harvest and the domestication process for *Vaccinium myrtillus* (European blueberry) were reported, both ongoing with preliminary results and recent finished trials. In blackberry organic production in summer-covered tunnels were investigated on 8 varieties. In black currant a number of trials were included in the scanning with many international cultivars and some new breeding clones from JHI (Scotland) both in an organic and conventional set up. In red currant results from an organic trial with red currant cultivars were included in the scanning report. New species being tested in the DANBERRY project included 36 cultivars of 12 different species. 2 wild plums (*Prunus domestica*, Mirabelle), 1 highbush blueberry (*V. corymbosum*), 4 bush sour cherries (*P. cerasus*), 2 saskatoons (*Amelanchier alnifolia*, serviceberries), 4 gojiberries (*Lycium barbarum*), 5 japanese silverberries (*Eleagnus umbellata*), 4 cornelian cherries (*Cornus mas*), 5 hascups (*Lonicera caerulea*, honeyberry), 2 white (red) currant, 2 green (black) currant, 1 hybrid black currant gooseberry, 4 gooseberries. Plants were planted in 2016/2017 and first harvest with machine were done in summer-autumn 2017 and fruit analysis performed for some varieties. Two projects with Aronia is reported briefly and three projects on European blueberries were included in this report with only brief inputs.

Blackberries of following varieties were tested: Loch Ness, Loch Tay, Karaka Black, Navaho, Natchez, Chester, Helen and Loch Marie. These were grown in a tunnel plastic house only covered in top to protect against rain from April to October. They were planted in 2010 directly in the ground with 1.5 m planting distance and 1.5 m row distance using mypex as cover against weeds. Dried chicken manure pills was used for fertilizer giving 80 kg N /ha/year. Drip irrigation was applied every day during cover period and biological control methods used against pest and diseases. In 2012 weekly and total yield was recorded together with berry weight, fruit quality, Brix, total acidity and total anthocyanins, disease attack on plants, frost hardiness, plant architectural aspects of flowering and flowering shoots. In 2014 the same planting was evaluated with same treatments but without plastic cover in the summer. Results showed that Loch Tay had the earliest harvest starting in week 29, followed by Natchez and Loch Ness. Navaho and Chester was the latest varieties giving fruit until mid October, with many fruits not getting

ripe. Loch Ness had the longest period of harvest of all varieties. Loch Marie and Karaka Black were intermediate in timing of harvest. The timing was about the same without the cover, but slightly later maturation for Navaho and Chester, with a lower total yield. The accumulated yield/plant in 2012 with cover was up to 12 kg fruit/plant in Chester and almost as much in Navaho, whereas Loch Tay gave almost 10 kg, Loch Ness slightly above 8 kg/plant and Natchez about 5 kg. Karaka Black and Helen did not do well, partly due to severe freeze back of shoots due to winter temperatures down to -24C. Loch Marie gave 4.4 kg/plant at same age after planting. In the 2014 recordings with no roof cover Loch Marie was performing quite well giving as much fruit as Loch Ness and Loch Tay.

Berry weight ranged from almost 10 g/berry in Natchez, to 8 g in Karaka Black, 7 g in Loch Ness, and about 6 g in Loch Tay, Navaho and Chester and about 5 in Loch Marie. The same sizes and ranking was observed in the 2014 experiment with no cover. As found in many species the mean berry weight dropped from a high level in the 2-5 week of harvest to lower values during the rest of the harvest period for each cultivar. In the best week Natchez had berry weights of 13 g/berry in the 2014 experiment. In the 2014 experiment the fruit were graded into saleable good fruits and discarded fruits with discoloration of drupes in the fruit, sooty mold and grey mould attack and other problems. The percentage of good fruit ranged from about 60% in Loch Ness and Loch Marie, to 50% for Loch Tay and Natchez, to between 30 and 40 % for Karaka Black, Navaho and Chester. Helen only reached 20 % good fruits. The attack of grey mould on fruits were higher without the plastic roof.

Plant architecture analyses showed that Natchez had on average only 6 flowers per flower-side-shoot and thus giving very few fruits overall. Much denser plantings and promotion of more florican shoots from the basis of each plant should potentially bring up the yield per running m of row. Chester and Navaho on the other hand had 37 and 31 flowers per flower-side-shoot giving a high number of fruits. Consumer tests over two years with more than 1000 people asked to grade selected cultivars showed that Loch Ness and Natchez were clearly preferred for their sweet and uniformly mature fruits, compared to Navaho and Chester. It is recommended to plant several cultivars to cover the full season from mid July to mid October in Denmark, even if Loch Ness alone may give fruit for most of this period. Karaka black with thorns and Helen seems not to be of interest in Danish organic conditions. Observations of the primocane cultivar Reuben grown in pots were done in plastic tunnel house and showed that fruits started to mature from late August and into September providing a late summer –autumn harvest. Without tunnel covers Reuben grown as primocanes will not reach fruit maturity in Danish conditions.

An ongoing black currant organic trial at AU Årslev holds 9 existing cultivars and 7 breeding clones from JHI, Scotland (refs. Ben Lomond, Ben Alder, Ben Hope, Ben Gairn, Ben Kilbreck, Ben Vane, Ben Finley, Intercontinental, Zusha). Plants were planted in 2010 with a slow start due to frost and attack of mice and moles. Data were recorded in 2014-2017. Susha were flowering very early most years and this caused frost damage in several years with low and variable yield, even if the best years had very high yields. Ben Vane also flowered quite early. The test clone 9165-5 showed very late flowering and escaped frost in most years which gave yields even in spring frost years. This clone had the highest accumulated yield over 4 years (20 tons/ha) and was better than Ben Hope (14.7 tons/ha) and Ben Kilbreck (13.7 tons/ha). The clone 9443-6 gave 14.3 tons/ha and should also be studied further. Spring frost in 2014 and 2017 reduced yield in most cultivars and in some test clones. Plants scores for frost damage, and attack by Aphid, sawflies, tortrix, leaf spot and rust was given, as important indicators of adaption to organic production. Total acidity, soluble solids and total anthocyanins were listed showing important differences in berry quality. Results from previous organic trials 2009 -2011 with 13 cultivars showed that Ben Hope, Ben Lomond, Ben Tirran and Narve Viking gave the highest yields (7.8 -8.9 tons/ha) and that Narve Viking is of interest due to the high color, low acidity and mild taste of berries. Narve Viking was evaluated as the best cultivar for organics followed by Ben Lomond, Ben Hope and Ben Tirran. Conventional trials were performed in separate series from 2001-2004 (17 cultivars), 2002 – 2004 (10 cultivars) and 2003-2004 (13 cultivars). Yields from 9-12 tons/ha could be found in years with no frost problems.

For red currants an organic trial was done in 2009-2011 comparing 10 varieties of red currant. Red Poll (17 tons/ha) was followed by Roodneus (15.4 tons/ha) and Rovada and Augustus at about 14.5 tons/ha. Red Poll and Roodneus had clearly the highest color content. Both of these cultivars showed good resistance to diseases and good quality fruit and are recommended for organic production.

Domestication of European blueberries from Danish wild habitats was initiated in 2009 and are still ongoing in a third project. The first project 'Danish Blueberries: Development and activation of Danish genetic resources' focused on collection and initial description of a broad range of clones from all over Denmark and establishing common garden trials. The aim of the second project 'Propagation and cultivation of bilberry for future berry production' was to develop knowledge and methods that enable a development of a future Danish horticultural high value berry production of the native species bilberry (*Vaccinium myrtillus*). This will be the first orchard based production of this species in the world and will facilitate future mechanical harvesting of

berries and thereby eliminate manual picking. The project investigated 1) efficient vegetative and generative propagation methods, 2) optimal cultivation of bilberry plants from propagated plant to first flowering and berry set, 3) first evaluation of cultivation methods and orchard systems to optimise berry production and 4) knowledge on seed production and use of seeds for ecological engineering by direct seeding in semi-natural environments. The third and ongoing project 'Bærkvalitet i danske genressourcer af almindelig blåbær' focus on quantification and evaluation of volatile compounds (taste and sensory) by GCMS and compounds of importance to health aspects (LCMS) in more than 50 selected EB clones. This is ongoing.

Two projects have been done on *Aronia melanocarpa*: The aim of the first project 'Aronia – Production of tasty and health preserving berries' was to develop the basis for an increased Danish production of tasty and healthy Aronia products of high and uniform quality, as a prerequisite for development of Aronia products with functional claims on human health. The project focused on the following activities: 1.) Investigation of vegetative propagation methods, using different clones, different rooting hormones, winter cuttings or summer softwood cuttings, topophysis effects, 2.) Investigate variation in taste preferences and quality attributes (sugar, acid, colour) of berries depending on cultivars and harvest time. 3.) Investigate effect of extraction processing and postharvest treatment of berries and/or juice for improving taste and quality of products. 4. Characterisation of variation in bioactive compounds depending on cultivar, harvest time and processing treatments. HPLC analyses of anthocyanins, polyphenols and 5. Investigate effect of different fertilizer regimes on yield and quality of berries.

The second and ongoing project COLARO- extraction of nutraceuticals from pomace from juice production focus on how processing and juice pressing methods affect quality and color content of Aronia pomace. Results have been published in Food Chemistry.

The new species being tested in the DANBERRY project included 2 wild plums (*Prunus domestica*, Mirabelle), 1 highbush blueberry (*V. corymbosum*), 4 bush sour cherries (*P. cerasus*), 2 saskatoons (*Amelanchier alnifolia*, serviceberries), 4 goji-berries (*Lycium barbarum*), 5 japanese silverberries (*Eleagnus umbellata*), 4 cornelian cherries (*Cornus mas*), 5 hascups (*Lonicera caerulea*, honeyberry), 2 white (red) currant, 2 green (black) currant, 1 hybrid black currant gooseberry, 4 gooseberries. Plants were planted in 2016/2017 and first harvest with New Holland 9090 Dual over-the-row harvester was done in summer-autumn 2017 and fruit analysis performed for some varieties. Preliminary evaluation suggest that it will be possible to harvest fruits from these species efficiently with good quality and with low or no damage to plants. Challenges with the diverse species and growing habits involve for example, controlling branching and size to fit to the harvester, pruning strategies and timing, shaping of bush to allow harvest and fruit set, fruit maturity and uniformity at harvest, avoid damage to shoots, possible use of machine harvested fruits for fresh market and use as IQF. Since Danish consumers only know little of these new species and the taste and use of it, a considerable task of education and demonstration is needed to push this into the market.

Scanning report Boonen Miet, pcfruit

- *Project title (native language): EUFRUIT: Europees Fruit Network
- *Project title (English): EUFRUIT: European Fruit Network
- *Author/native language editor: Miet Boonen, pcfruit npo, Fruittuinweg 1, 3800 Sint-Truiden (Belgium)
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Section A. Summary for EIP dissemination

- *Keywords: Variety testing, soft fruits, strawberry, raspberry, blackberry, blue berry, currants, berries
- *Main geographical location: BE221 (arr. Hasselt)
- Other geographical locations: BE211 (Arrondissement. Antwerpen), BE212 (Mechelen), BE213 (Turnhout), 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)

*Summary (native language):

De belangrijkste onderzoeksthema's voor **zachtfruit** in pcfruit vzw pah zijn: **rassenonderzoek** (productie en vruchtkwaliteit), gewasbescherming, teelttechniek (beschermde en openlucht), bemesting, bodem- en waterbeheer en rendabiliteit.

Aangezien een juiste rassenkeuze in grote mate bepalend is voor het bekomen teeltresultaat en dus ook voor de inkomsten van een teler, worden de meeste veelbelovende nieuwe rassen uitgetest in de proeftuin. Het is belangrijk de rassen uit te testen in teeltomstandigheden die vergelijkbaar zijn met die van de telers. De resultaten worden gebundeld en kenbaar gemaakt aan de telers, zodat zij op basis hiervan eigen proeven kunnen aanleggen en gerichte beslissingen kunnen nemen.

Rassenproeven vormden ook in 2017 een belangrijk onderdeel van het aardbei onderzoek. Het screenen van nieuwe rassen en selecties in volle grond open lucht naar opbrengst, oogstverloop, vruchtsortering en vruchtkwaliteit had hierin het grootste aandeel. Voor de junidragers werden er twintig rassen in fase 1 gescreend en zes rassen in fase 2 (Deluxe, 10-50-01, Sonsation en Destiny; daarnaast werden ook Malling Centenary en Magnum hierin meegenomen). Zes vroege rassen werden ook in een tunnelproductie opgevolgd. Daarnaast waren er ook 7 objecten in een substraatteelt op stelling. In 2017 werden er optimalisatie proeven (fase 3) uitgevoerd voor Malling Centenary en Magnum. Voor de doordragers waren er 14 objecten in volle grond in fase 1 en 5 objecten (08-06-10, Florentin en EMR 639; daarnaast werden ook Verity en Harmony meegenomen) in fase 2. Optimalisatieproeven (fase 3) werden uitgevoerd voor Verity en Harmony. Zeven objecten werden opgevolgd in een substraatteelt op stelling.

In de rassenproef zomerframboos werden, naast Tulameen, 21 rassen getest in een warenhuis. In 2018 zullen vijf van deze rassen (T110L6, SO.LU.08.1.5, Cascade Bell, Cascade Gem en 06.15.11) doorschuiven naar fase 2 van het rassenonderzoek. Voor de herfstframbozenrassen werden er 22 variëteiten opgevolgd (fase 1 + fase 2). Verder werden er ook nog rassenproeven uitgevoerd voor stekelbessen (5 rassen), rode en witte bessen (8 rassen rode en 2 rassen witte bes) en bramen (2 rassen; Loch Ness en Loch Tay).

Summary (english):

The main topics for all soft fruits are: **variety testing** and optimisation (production & fruit quality), crop protection, cropping systems (as well protected as in open field conditions), fertilisation, soil & water management and rendability.

Since a correct variety choice is to a large extent decisive for the achieved result and as a consequence also for the income of a grower, most new soft fruit varieties are tested at the department field research berryfruits of pcfuit. It is important to evaluate new varieties in growing conditions comparable with these of the growers. Results are summarized, published and are available for the Belgian soft fruit growers.

Variety screening is an important part of the research for strawberries. The biggest share of this research is spend on the screening of new varieties/selections in open field conditions, with production, fruit classification, harvest period and fruit quality as main research characteristics. In 2017, twenty new short-day varieties were evaluated in phase 1 and six in phase 2 (Deluxe, 10-50-01, Sonsation and Destiny; Malling Centenary and Magnum). Six early varieties were evaluated in a tunnel production. Besides the open field production, seven varieties were tested as a table top crop. Optimisation tests (phase 3) were performed for Malling Centenary and Magnum. There were 14 new day-neutral varieties evaluated in phase 1 in open field conditions and five in phase 2 (08-06-10, Florentin and EMR 639; Verity and Harmony). Optimisation tests (phase 3) were performed for Verity and Harmony. Besides the open field production, seven varieties were tested as a table top crop.

In 2017, 22 varieties of florican raspberry were evaluated as a container crop in an unheated tunnel production with Tulameen as reference variety. In 2018, five of these varieties will move to phase 2 of the variety screening (T110L6, SO.LU.08.1.5, Cascade Bell, Cascade Gem and 06.15.11). In 2017 there were also 22 primocane raspberry varieties evaluated (Phase 1 and phase 2) as a container crop. Other variety trials were performed for goose berries (five varieties), red and white currants (8/2 varieties) and blackberries (two varieties) – container crops.

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. Oprichting van een Europees netwerk voor de fruitteelt
2. Ontwikkelen en implementeren van een systematische aanpak voor het scannen en synthetiseren van bestaande wetenschappelijke en praktische kennis.
3. Opstarten van een permanente dialoog met Europese (EU), nationale en regionale beleidsmakers.
4. Identificeren en ondersteunen van nieuwe prioritaire gebieden voor onderzoek door voortdurend te monitoren en door bestaande en toekomstige onderzoeks- en innovatieactiviteiten te analyseren.

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.

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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 report¹

Scanning report Boonen Miet, pcfruit

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Country:	Belgium
NUTS 3 region(s)²:	BE211 (Arrondissement. Antwerpen), BE212 (Mechelen), BE213 (Turnhout), 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)
WP no. and title:	WP2 – Performance of new fruit varieties
Date:	04/04/2018

Source materials and methodology

Pcfruit npo was started in 1997 as a coordinating structure of three former research institutes and experimental gardens, all specialised in fruit growing and located in Sint-Truiden, the heart of the fruit growing area of Belgium. The success of pcfruit is due to the combination of applied scientific research, demonstration activities to growers and services for industry and fruit growers at one central location with suitable infrastructure like labs, greenhouses, storage facilities, plastic tunnels, shelters and warehouses and orchards.

In pcfruit new and existing technologies, techniques and varieties are permanently evaluated and judged on their added value to fruit growing. Finally, the individual fruit growers are assisted in the introduction of new technologies and sustainable production methods. A close relationship with individual growers and grower associations exists, which benefits transfer of research results or information.

It is the task of the department field research berryfruits (PAH) to test and demonstrate new developments of the scientific research on strawberries; raspberries; blackberries; blue berries; red, black and white currants; gooseberries and kiwiberries. The main topics for all soft fruits are: **variety testing** and optimisation (production & fruit quality), crop protection, cropping systems (as well protected as in open field conditions), fertilisation, soil & water management and rendability.

For strawberries and other soft fruits there is a quick change to other varieties in comparison with pome and stone fruits. Consequently it is very important for soft fruit growers to estimate the value of new varieties as quick as possible. An existing market can be boosted or disturbed by a new cropping system or by a new variety. That is why new varieties are tested in specific cropping systems and variety specific characteristics are evaluated within the research of the department field research berry fruits of pcfruit.

In Flanders, soft fruits are mainly produced for the fresh market. Soft fruits have the typical characteristic of a vulnerable, fragile skin (except red currants) with a limited shelf life. They are harvested in summer time in a period of 5 to 7 weeks. Even with the most advanced techniques, the fruits have a shelf life of about 1 week. Although a continuous supply of high quality fruit is required.

The harvest of soft fruits can be expanded through the season by cultivating different varieties. Yearly new varieties and selections are developed worldwide in different breeding programs. Intensive screening of these new varieties and selections from over the world is necessary to compare them with varieties used in common practise.

¹ Equivalent to 'final report' in EIP-AGRI format.

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

In addition, it is not an evidence that every variety is suited for every cropping system or can be grown under all climatic conditions. That is why it is important to stay permanently in touch with breeding programs for soft fruits all over the world, to check if new varieties can have a potential value for the Flemish soft fruit growers.

The source materials for this scanning report are amongst others:

- Trekels H. & Boonen M., 2013. Screening and testing of new everbearing strawberry varieties and selections. Poster at the second International Strawberry Congress, Hoogstraten, Belgium.
- Gallace N., 2015. Nieuwe alternatieven bij de doordragers in vollegrond?. Proeftuinnieuws 20 blz. 18-21.
- Bogaerts I., 2016. Vaste waarden en beloftevolle nieuwkomertjes. Fruitteeltnieuws 21-22 blz. 10-11.
- Gallace N., 2016. Erfahrungen mit Juniträgern. Spargel & Erdbeer Profi 2 blz. 54-58.
- Gallace N., 2016. Veelbelovende nieuwe selecties doordragers. Management & Techniek 6 blz. 46-49.
- Gallace N., Boonen M., Lieten P. & Bylemans D., 2016. Electrical conductivity of the nutrient solution: Implications for flowering and yield in day-neutral cultivars. ISHS Acta Horticulturae 1156: VIII International Strawberry Symposium blz. 223-228.
- Gallace N., 2017. Doordragers 2016 pcfruit. Fruit 5 blz. 14-16.
- Gallace N., 2017. Optimiering des Anbaus im Tunnel. Spargel & Erdbeer Profi 2 blz. 82-86.
- Boonen M., Gallace N. & Bylemans D., 2017. Screening of new strawberry varieties/selections for open field production at pcfruit. Poster at the third International Strawberry Congress, 6-8 September 2017. Antwerp-Belgium.
- Herckens K. & Boonen M., 2017. Zomerframboos: Windstilte voorbij? Fruit 17 blz.8-10.

Best practice findings

Variety testing of strawberries and other soft fruits

The variety screening process at the department field research berryfruits of pcfruit consists of four steps/phases (Figure 1). New varieties/selections are collected from breeding programs all over the world.

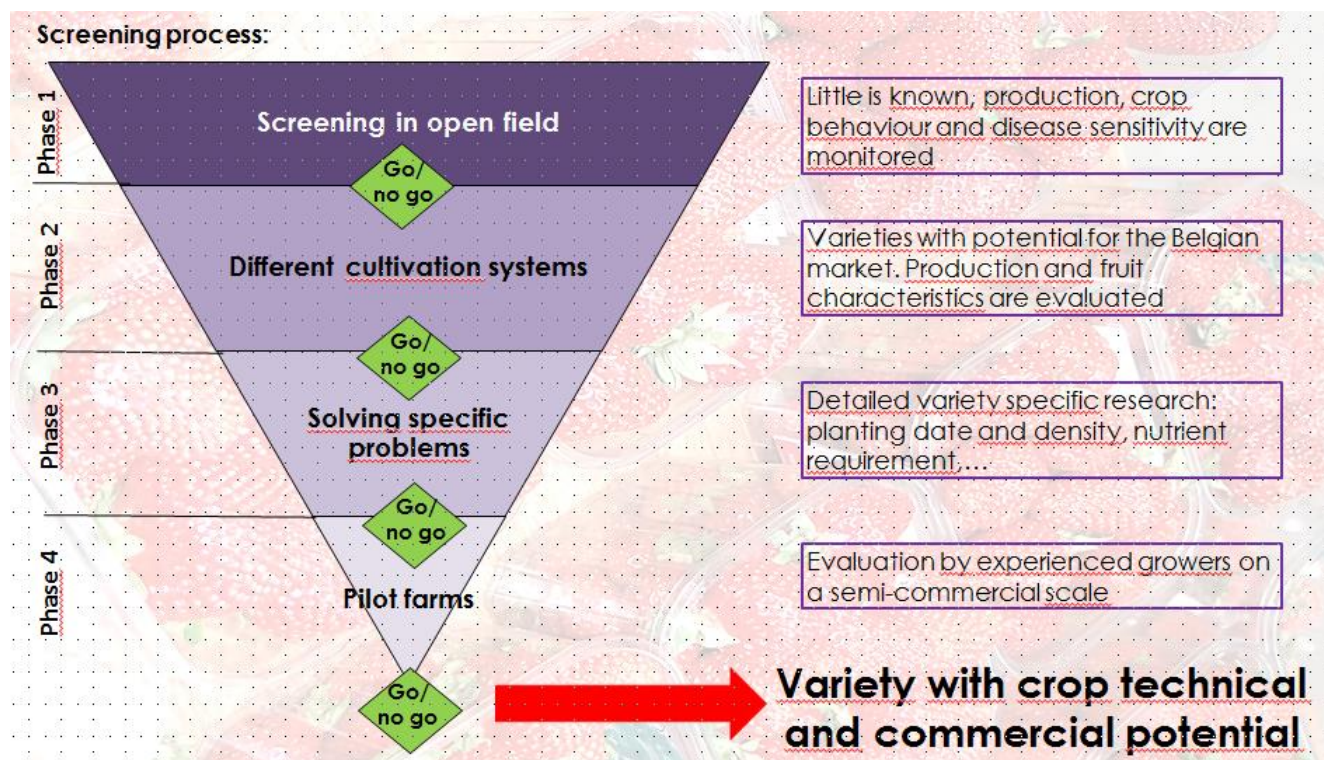


Figure 1: Screening process for new soft fruit varieties at the department field research berryfruits of pcfruit.

During the evaluation several characteristics are evaluated: production, fruit classification, harvest period, fruit colour, fruit weight, fruit firmness (fresh and after storage of 7 days at 4°C), fruit size, shelf life, vulnerability for diseases, plagues and climate conditions. Annually a report is sent to the breeders.

At this moment the reference varieties are:

Floricane raspberry: Tulameen; primocane raspberry: Kwanza; Blackberry: Lochness; Blue berry: Duke; Red currant: Junifer (early variety) and Rovada (Late variety); short-day strawberry: Elsanta and day-neutral strawberry: Portola.

Challenges and gaps

There are some important challenges and gaps for soft fruit growers:

- Some varieties are not available for all growers, because they are launched as a club variety.
- Novelties are planted without proper testing (certainly for strawberries).
- Infestation of all soft fruit species by *Drosophila suzukii*.
- Most soft fruits are limited in production area, which means that generally there are little products available to control pests and diseases. Especially for covered crops.
- Changing climatic conditions.
- Taste is underestimated, shelf life is more important.

Scanning report (EIP format for practice abstracts)

***Project title (native language):** EUFRUIT : Réseau européen d'évaluation des fruits

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

***Author/native language editor:** Jean-Philippe BOSCH, Ctifl, Centre de Balandran, 751 chemin de Balandran, 30127 Bellegarde, France, bosc@ctifl.fr, +33 466 01 10 54

Section A. Summary for EIP dissemination

***Keywords:** Variety testing, strawberry

***Main geographical location:** FR812 Gard

Other geographical locations: FR8 Méditerranée; FR81 Languedoc-Roussillon

***Summary (native language):**

En France, les attentes de la filière et du consommateur orientent la production nationale de fraise vers un haut niveau de qualité demandé par le consommateur.

Le choix variétal est la première étape de l'élaboration de la qualité proposée à la vente au consommateur. Les critères d'évaluation concernent l'ensemble de la filière, du producteur au rayon, pour satisfaire le consommateur en termes de prix et de qualité.

L'évaluation variétale concernant la fraise est organisée en réseau, regroupant le Ctifl et quatre stations régionales dont le Ctifl assure la coordination.

L'enjeu pour la production nationale est une offre différenciée de l'offre étrangère, fortement présente sur le marché français. Pour devenir présente sur le marché, une nouvelle variété doit respecter un équilibre entre qualité gustative, qualité visuelle, résistance aux bio agresseurs, aptitude à la conservation et productivité.

En 2017, vingt variétés ont été évaluées au Ctifl, réparties dans deux systèmes de production hors sol chauffé et à froid, comparées aux références de production Gariguette, Clery, Darselect, Matis.

Summary (english):

In France, the strawberry industry (from the producer to the retailer) is focused on fruit quality to meet the consumer demand for a "made in France" high quality strawberry. Varietal choice is the first step of quality elaboration.

Testing new strawberry varieties is organized around a national network including Ctifl and four regional stations. Ctifl is coordinating this national network. It takes in account all the steps of the supply chain (from the producer to the retailer) to meet the consumer requirements in terms of price and quality.

The national production aims to differentiate a national quality from the foreign production. To develop a new variety means to meet a balance between diseases and pest resistance, yield, appearance, shelf life ability, taste,...

In 2017, twenty cultivars were evaluated in Balandran Ctifl center toward reference varieties Gariguette, Clery, Darselect and Matis.

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. Établir un réseau européen orienté sur les fruits
2. Développer et établir une approche systématique pour identifier et synthétiser les connaissances pratiques et scientifiques existantes.
3. Établir un dialogue continu entre les institutions politiques régionales, nationales et européennes.
4. Identifier et soutenir de nouveaux axes de recherche prioritaires par un suivi continu et une analyse des activités de recherche existantes, futures et innovantes.

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) • Pcfruit
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)

IEG WP 2 – Scanning report / Practice abstract

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)

Scanning report [Jean-Philippe Bosc, CTIFL]

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Country: France

NUTS 3 region(s)²: FR812 Gard

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

Date: 04-05-2018

Source materials and methodology

The Ctifl is the French national institute for applied research on fruit and vegetables and represents all professions within the industry: from the grower to the retailer. Ctifl's approach is a global one. It covers all production and distribution techniques of fruit and vegetables, from varietal selection and crop management, to logistics and merchandising in retail outlets.

Main research topics in strawberry are : crop protection, innovative cropping techniques, variety trials, fruit quality.

For strawberry, varietal choice is the first step toward meeting the consumer quality demand and the supply chain (from producer to retailer) is facing the challenge to preserve this quality.

Strawberry is present everywhere in France, with multiple cropping systems (open field, protected, table top, heated crop...), and various climatic conditions (oceanic, continental and Mediterranean climates). Strawberry is produce for the fresh market.

Breeding programs actively release new varieties in Europe and nurseries introduce new varieties from a worldwide scale. The French strawberry industry needs references to determine any new valuable varietal possibilities.

Testing new strawberry varieties is organized around a national network including Ctifl and four regional stations. Ctifl is coordinating this national network. Ctifl is a member of Eufirin.

A common protocol was established more than twenty years ago. It takes in account all the steps of the supply chain (from the producer to the retailer) to meet the consumer requirements in terms of price and quality: diseases and pest resistance, yield, appearance, shelf life ability, taste,... Common cultivar references are used in the network in order to compare the results.

The network is organized around 2 levels:

- level A in two locations : new varieties or selections are collected throughout Europe and characterized with a holistic approach of the quality,
- level B in four locations: each regional station selects the new varieties to be tested in level A list, according to regional specifications such as earliness, production system.

As a coordinator, Ctifl gathers information through direct contacts with European breeders or nurseries and transfers it to the network members.

Plants of new varieties to be trialed are collected as trayplants from European breeders and nurseries and trialed in Balandran Ctifl center (Mediterranean border) in two table top cropping systems: heated for early varieties and unheated for early to late season and everbearing cultivars. Results are sent to breeders, nurseries, advisors and researchers.

Best practice findings

Strawberry production has increased each year from 46 100 T in 2007 to 60 000 T in 2016 (greenhouse 1 852 ha). Production period last from February to November and the April to June period represents nearly 80%. Main varieties are Gariguette, Clery, Charlotte, Darselect, Ciflorette, Murano, Mara des Bois, Magnum. The variety panel is quite stable; Gariguette is most cropped

¹ Equivalent to 'final report' in EIP-AGRI format.

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

variety and is well known by the French consumers. Murano and Magnum are “new comers”. Most of the cultivated varieties were released from French breeding programs; Clery and Murano are exceptional cases.

New varieties are slowly increasing, such as Magnum, Murano, Mariguette, Dream and to a lesser extent Osiris. All these varieties were characterized in the network and references are available from Ctifl.

The varietal evaluation system will have to cope with new constraints:

- the “zero residue” demand emphasize the disease and pest resistance levels, in addition with the objective of Ecophyto 2 Government plan to reduce by 50 % the use of phytosanitary products (-25 % in 2020 and -25 % in 2025),
- cost and lack of workforce to operate in the crop: a high productivity while maintaining a good quality of product (is one of the challenge facing strawberry production,
- development of private evaluation by producer organizations concomitant with the development of club varieties; compromises the role of public and collective evaluation.

Scanning report (EIP format for practice abstracts)

***Project title (native language):** EUFRUIT: Europäisches Obstnetzwerk

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

***Author/native language editor:** Felix Koschnick, ESTEBURG – Standort Langförden,
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Section A. Summary for EIP dissemination

***Keywords:**]

***Main geographical location:** DE6 (Hamburg); DE9 (Niedersachsen)]

Other geographical locations: DE8 (Mecklenburg-Vorpommern), DEF0 (Schleswig-Holstein), DEE0 (Sachsen-Anhalt), DEA (Nordrhein-Westfalen)

***Summary (native language):**

Der Schwerpunkt der Sortenprüfung aller Beerenobstarten ist es, eine Empfehlung anbauwürdiger Sorten für den Norddeutschen Raum, unter Berücksichtigung von Anbausystem, Düngung und Wassermanagement, Standort (Boden) und der Rentabilität für den Anbau, bei Direktvermarktung und Vermarktung über den LEH, zu geben. Die in der Sortenprüfung erarbeiteten Ergebnisse sind von entscheidender Bedeutung über Erfolg oder Misserfolg in der Praxis und haben daher eine Schlüsselrolle in der Strategieplanung der Anbaubetriebe und Sortenzüchtung.

Unsere Forschungsarbeit stützt sich auf drei Säulen: Sortenprüfung, Versuche zu aktuellen Pflanzenschutzproblemen, und Versuche zu Anbau und Kulturverfahren.

Die Versuchsarbeit umfasst Anbauversuche, Sortenprüfung und die gesamte Kulturtechnik sowie den Pflanzenschutz bei allen Beerenobst-Arten. Das sind Erdbeeren, Heidelbeeren, Himbeeren, Brombeeren, Rote und Schwarze Johannisbeeren, Stachelbeeren und Minikiwis („Kiwibeeren“). Die Versuche werden im Versuchsbetrieb sowie in Praxisbetrieben durchgeführt.

Der Bereich Anbauversuche umfasst jährlich 10 bis 20 Versuche. Für den Pflanzenschutz 20 bis 40 Versuche, hier auch in Außenversuchen und im Ökologischen Anbau. Im Bereich Pflanzenschutz werden amtliche Mittelprüfungen für die Zulassung neuer Produkte durchgeführt, außerdem wird intensiv mit dem Arbeitskreis Lückenindikation zusammengearbeitet, um durch biologische Wirkungsprüfungen sowie Rückstandsversuche neue Produkte zum Schließen von Indikationslücken dem Anbau und der Beratung zur Verfügung zu stellen.

Ziel unserer Arbeit ist es die Wettbewerbsfähigkeit des norddeutschen Beerenobstanbaus zu fördern und auszubauen. Neue und alte Sorten werden kontinuierlich getestet und auf ihre Wettbewerbsfähigkeit geprüft.

Unsere Ergebnisse sind Grundlage für Entscheidungen und Beratung der Beratungsringe, Vermarktungsorganisationen, Handel, Anbauern, Forschungsinstitutionen, Behörden und Ministerien und Berufsständischen Gremien.

Summary (english):

The focus of the variety testing of all soft fruit varieties is to give a recommendation of cultivable varieties for the North German area, taking into account cultivation system, fertilization and water management, location (soil) and profitability for cultivation, for direct marketing and marketing through the food retail. The results of the variety examination are of crucial importance for success or failure in practice and therefore have a key role in the strategic planning of the growers and variety breeding.

Our research is based on three pillars: Variety testing, trials on current pest management issues, and cultivation and cultural practices.

The experimental work includes cultivation trials, variety testing and the entire cultural technique as well as plant protection for all berry fruit species. They are strawberries, blueberries, raspberries, blackberries, red and black currants, gooseberries and minikiwis ("kiwi berries"). The tests are carried out in experimental operation as well as in practical operations.

The field of cultivation tests comprises 10 to 20 experiments per year. For plant protection 20 to 40 experiments, also as outdoor experiments and in organic cultivation. In the field of crop protection, official mid-level tests are carried out for the approval of new products. In addition, intensive work is being done with the workgroup gap indication in order to provide new products for closing indication gaps for cultivation and consultation through biological impact tests and residue trials.

The aim of our work is to promote and expand the competitiveness of North German berry fruit cultivation. New and old varieties are continuously tested and tested for their competitiveness.

Our results are the basis for the decisions and advice of advisory councils, marketing organizations, trade, growers, research institutions, authorities and ministries and professional bodies.

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 (Wareme-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. Etablierung eines europäischen Netzwerks, das sich auf den Obstsektor konzentriert.
2. Entwicklung und Umsetzung eines systemischen Ansatzes zur Sichtung und Zusammenstellung bestehenden wissenschaftlichen und praxisnahen Wissens.
3. Etablierung eines laufenden Dialogs mit relevanten politische Gremien auf regionaler, nationaler und EU Ebene.
4. Ermittlung und Unterstützung neuer Forschungsschwerpunkte durch kontinuierliches Monitoring und Auswertung bestehender und neu bestehender Forschungs- und Innovationsaktivitäten.

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 report¹

Scanning report Felix Koschnick, OVA Jork – Standort Langförden

Author: Felix Koschnick, OVA Jork, Versuchstation Langförden Email: felix.koschnick@lwk-niedersachsen.de, Tel: +49-4447-9623-11

Country: Germany

NUTS 3 region(s)²: DE6 (Hamburg); DE9 (Niedersachsen) DE8 (Mecklenburg-Vorpommern), DEF0 (Schleswig-Holstein), DEE0 (Sachsen-Anhalt), DEA (Nordrhein-Westfalen)

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

Date: 30.04.2018

Source materials and methodology

The berry fruit section of the ESTEBURG - Fruit Research, Extension and Education Center is a branch office in Langförden, Germany's largest contiguous strawberry growing area.

In the variety trials were different berry fruits tested. Because of the fast rotating variety carousel, the changing requirements of the trade and the customers, the search for suitable varieties for the respective segment. LEH and direct marketing is an essential factor for the sustainability and economic success of the growers and variety breeders, as well as plant propagators, Through the continuous variety testing on our test site and also with growers, we are able to provide the current requirements appropriate advice promptly. The variety testing executed in different steps. New varieties are usually grown in the tunnel for assessment and screening. The actual variety testing then takes place in the field as frigo- or appointment culture (60 days) and in a one-year field trial. Subsequently, the varieties that have proven themselves are followed up and assessed in the recommended cultivation system for them. This is also happening on a larger scale in cooperation with growers in the region.

Through the different cultivation systems and the right choice of variety higher area performance, - yield, quality and cultivation and harvesting period can be advanced.

Our continuous intensive work allows us to draw conclusions about the suitability of a variety for our climate, our soils, our growers and our markets. Ultimately, our statements are continued verified by the trade, the growers and the end users, because only if they accept a new variety recommendation, the variety established in the area. [

Strawberry:

The variety testing is carried out in different steps. New varieties are usually grown in the tunnel for assessment and screening.

The actual variety testing then takes place in the field as frigo- or appointment culture (60 days) and in a one-year inventory.

Subsequently, the varieties that have proven themselves are then followed up and assessed in the recommended cultivation system for them. • Variety sighting Strawberry in the protected cultivation, there were 10 single-bearing and 12 remounting varieties in the test. • Variety classification strawberry in the classical outdoor cultivation, there were 28 single-bearing and 14 remounting varieties in the test. Cultivation technique, the experimental station berry fruit Langförden busy in the strawberry with the protected cultivation in substrate cultivation, outdoor cultivation with and without dam.

Blueberry:

• The variety classification of 12 new varieties was continued and recorded at several sites, as well as plant Raspberry: • Field sighting Freiland, much this year Due to frost, for 2018, the plot is dissolved and a new crop of summer-berries raspberries planned. The varieties from 2015 as well as the 7 further varieties from 2016 will be continued in the substrate under protected conditions. aterial and origin comparisons.

Blackberry:

¹ Equivalent to 'final report' in EIP-AGRI format.

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

•Variety survey, the same varieties were further observed and assessed. Loch Ness, Chester Thornl, Loch Tay, Black Diamond, Nightfall, SB 105, Black Pearl, Metolius, Loch Maree, Dirksen Thornless, Natchez, Quachita, Reuben, Primarc, 641 - M2, Asterina, Loch Maree, Newberry

Currant:

•Variety protection for the existing red and blackcurrants with a focus on the fresh market. More varieties were added, these young plants will move in 2018 in the new currant quarters.

Gooseberry:

•Variety survey continued. As well as two new Bekay selections added to the exam.

Kiwi berry (Minikiwi):

• Participation in the national variety trial Kiwi berries with 6♀ varieties and 2♂ fertilizer varieties.

Maibeere / honey berry, (*Lonicera kamchatatica*):

• Will be included in variety testing with some 2018 varieties.

Best practice findings

The variety testing is carried out in different steps. New varieties are usually grown in the tunnel for assessment and screening.

The actual variety testing then takes place in the field as frigo- or appointment culture and in a one-year inventory. Subsequently, the varieties that have proven themselves are then followed up and assessed in the recommended cultivation system for them.

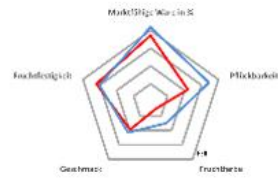
Examples from the variety test strawberry:

The image displays three example forms for strawberry variety testing, each with a red border. The forms are filled out with handwritten data and include small illustrations of strawberries.

- Form 1 (Left):** Contains sections for 'Pflücken der Frucht' (fruit picking), 'Lösen sich beim Pflücken Kaliche von der Frucht' (detachment of calyxes), 'Stellung der Kalichteller' (calyx position), 'Stellung des Kaliches' (calyx position), 'Fruchtfarbe' (fruit color), 'Fruchtfarbe im Vergleich zur Fruchtoberfläche' (fruit color comparison), 'Stärke der Fruchthaut' (fruit skin strength), and 'Empfindlichkeit der Fruchthaut' (fruit skin sensitivity).
- Form 2 (Middle):** Contains sections for 'Fruchtfestigkeit' (fruit firmness), 'Farbe des Fruchtfleisches' (fruit flesh color), 'Säufigkeit' (juiciness), 'Aussehen' (appearance), 'Zucker-Säure-Verhältnis' (sugar-acid ratio), 'Aroma' (aroma), 'Geschmack' (taste), 'Reifezustand zur Verkostung' (ripeness for tasting), and 'Weitere Anmerkungen/Auffälligkeiten' (further notes).
- Form 3 (Right):** Contains sections for 'Anzahl Ausläufer' (number of runners), 'Blattzustand, z.Z. des vollen Wachstums' (leaf condition at full growth), 'Farbe der Blattoberseite' (upper leaf color), 'Pflanzen gesundenheit' (plant health), 'Zeitpunkt der Blüte' (flowering time), 'Ort der Blüte' (flowering location), 'BBCH- Stadium' (BBCH stage), and 'Weitere Anmerkungen/Auffälligkeiten' (further notes).

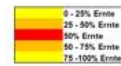
Comparison Sonata vs. Sonsation

	Ertrag (g/Pflanze)			Anteil marktfähige Ware in %	Fruchtgröße, g
	marktfähig	Nicht marktfähig	Gesamtertrag		
Sonata	699,6	239,3	939,0	74,3	17,6
Sonsation	752,3	141,9	894,2	83,7	18,8



Pflanzdatum: 20. April 2016

Datum	02.06.	06.06.	09.06.	13.06.	15.06.	16.06.	20.06.	23.06.	27.06.	30.06.	04.07.
Sonata											
Sonsation											



Sonata



Sonsation



In variety testing, plant, status, growth, susceptibility yield, marketability, crippled, lazy / ill and fruit characteristics, as well as overall performance compared to our reference varieties are assessed (score sheets, see above).

Scanning report

Felicidad Fernández Fernández, NIAB EMR

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

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

*Author/native language editor: Ms Felicidad Fernández Fernández, NIAB EMR, New Road, East Malling, ME19 6BJ (UK), felicidad.fernandez@emr.ac.uk, +44(0)1732523739

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
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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 report¹

¹ Equivalent to 'final report' in EIP-AGRI format.

Scanning report

Felicidad Fernández Fernández, NIAB EMR

Author: Felicidad Fernández Fernández, NIAB EMR, New Road, East Malling, ME19 6BJ (UK), felicidad.fernandez@emr.ac.uk, +44(0)1732523739

Country: United Kingdom

NUTS 3 region(s)²: UKG11 Herefordshire, UKJ22 East Sussex, UKJ41 Medway, UKJ42 Kent, UKJ43 Kent Thames Gateway, UKJ44 East Kent, UKJ45 Mid 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 20th 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 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

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

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-fruiting raspberries, Glen Ample and Tulameen are frequently used as reference cultivars whereas in primocane-fruiting 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 fruiting varieties are more numerous and usually obtained under proprietary deals. Many cultivars are grown in a double-cropping system (both as primocane and floricane-fruiting). 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'.

Scanning report (EIP format for practice abstracts)

- *Project title (native language): EUFRUIT: European Fruit Network, WP2 Potential neuer Beerensorten
*Project title (English): EUFRUIT: European Fruit Network, WP2 Potential of new berry varieties
*Author/native language editor: [Ançay André, Agroscope, andre.ancay@agroscope.admin.ch>, +41 (0)58 48 13550]

Section A. Summary for EIP dissemination

- *Keywords: [Variety testing, breeding, strawberries, raspberries]
*Main geographical location: [CH0 SCHWEIZ/SUISSE/SVIZZERA]

Other geographical locations:

Summary (english):

The variety testing for berries at Agroscope focuses on the following research topics:

- evaluation of fruit quality of new varieties (sugar content, firmness, color)
- evaluation of agronomic potential of new varieties (yield, diameter, maturing period, resistance or susceptibility to pests and diseases)
- evaluation of marketability of new varieties.

The goal of a good variety range is to fulfill the expectations and demands of the producers, the market and the consumers. Variety testing aims at providing neutral evaluations of new varieties in favor of production and consulting. The evaluation of new varieties takes place in two phases involving different regions within Switzerland as well as different cultivation methods.

The outcome of the research is published in different journals and is presented to the Swiss stakeholders of berry-production and at different meetings and conferences.

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. Gründung eines europäischen Netzwerks im Bereich des Fruchtsektors.
2. Entwicklung und Implementierung eines systematischen Ansatzes um bestehendes wissenschaftliches und praktisches Wissen abzufragen und zusammenzufassen.
3. Aufbau eines fortlaufenden Dialogs mit relevanten EU, nationalen und regionalen Interessensvertretern.
4. Identifizierung und Unterstützung neuer Prioritätsbereiche durch kontinuierliches Monitoring und Analysieren bestehender und künftiger Forschungs- und Innovationsaktivitäten.

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 report¹

Scanning report [Ançay André, Agroscope]

Author: [Ançay André, Agroscope, andre.ancay@agroscope.admin.ch>, +41 (0)58 48 13550]
Country: Switzerland
NUTS 3 region(s)²: CH0 SCHWEIZ/SUISSE/SVIZZERA
WP no. and title: WP2 – Variety testing
Date: [15-05-2018]

Source materials and methodology

Agroscope is the Swiss Confederation's centre of excellence for agricultural research, and is affiliated with the Federal Office for Agriculture. One of its many tasks is the testing of new strawberry and raspberry varieties. In collaboration with leading breeders, variety managers, and license holders new varieties from all over Europe are tested. Agroscope evaluates their suitability for the climatic conditions in Switzerland, as well as their agronomic potential and their marketability.

The COST descriptor list is used for the agronomic evaluations. Data are stored in an Agroscope database. Agroscope is doing in house evaluation of post-harvest conditions, diseases, physiology, plant pathology and sensorial evaluation.

Best practice findings

Variety testing of strawberries and raspberries

The evaluation of new strawberry and raspberry varieties at Agroscope takes place in two phases. Depending on the year, eight to ten new strawberry varieties and four to eight new raspberry varieties (primocane and floricanes) are tested.

The strawberry varieties are evaluated regarding their qualitative (sugar content, firmness, color) and agronomic potential (yield, diameter, maturing period, resistance or susceptibility to pests and diseases). Cléry serves as a reference variety. Tastings complete the evaluation of new varieties.

In the first year, the new varieties are grown hors sol in a 8 meter long plastic tunnel on the terrain of Agroscope in Conthey (Canton of Valais), as well as outdoors on a plot of the cantonal office for fruits and vegetables (OCAC) in Châteauneuf (Canton of Valais). Based on the results of this preliminary examination and the tastings the members of the forum for agricultural research on berries (Forum Agrarforschung Beeren) select the most promising varieties.

In the second year, these varieties are newly planted in Conthey (Agroscope) and Châteauneuf (OCAC), as well as on the fields of producers in different regions (introduction network). Further reference parcels are established at the Research Institute of Organic Agriculture (FiBL) and on the land of organic producers. This geographic distribution over important regions for strawberry production in Switzerland together with the different cultivation methods (Integrated Production (IP) and organic) allow for conclusions on the suitability of the varieties under different conditions. Furthermore, the suitability of the fruits for different sales channels (major distributor, self-marketing and 'pick your own' schemes) is tested. In this second observation year, new varieties are rated in comparison to a variety of reference (Cléry in the case of strawberries). For this purpose, different criteria (growth vigor of the plant, cost of harvest, ease of harvest, yield potential, appearance and quality of the fruits) are rated on a scale from 1 to 9 (1 = much worse, 3 = worse, 5 = comparable, 7 = better, 9 = much better than the variety of reference).

The variety testing of raspberries takes place uniquely on substrate. The plants grow in pots of 10 liter. Tulamen serves as a reference variety. For floricanes, Agroscope works with longCane in yearlong cultivation. For primocanes the plants are kept over three harvesting periods. The main criteria for evaluating the new varieties are the quality, the handling of the fruits as well as the size of the fruits. The main objective is to find varieties that allow for a faster harvest.

¹ Equivalent to 'final report' in EIP-AGRI format.

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

Scanning report (EIP format for practice abstracts)

***Project title (native language):** EUFRUIT: Europäisches Obst-Netzwerk

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

***Author/native language editor:** Ph.D. Martina Boschiero, p.a. Massimo Zago, MSc. Julia Strobl, Ph.D. Walter Guerra, Laimburg Research Centre, Laimburg 6, 39040 Post Auer, BZ-Italia, Martina.Boschiero@laimburg.it, +390471969680

Section A. Summary for EIP dissemination

***Keywords:** Thematic Network, Fruit Sector, EUFRUIT, Berry fruits, best practices, variety testing

***Main geographical location:** ITH10 Bolzano-Bozen

Other geographical locations: ITH10 Bolzano-Bozen

***Summary (native language):**

Presso il Centro di Sperimentazione Laimburg, la ricerca sui piccoli frutti si concentra essenzialmente su fragola. Confronto varietale e miglioramento genetico sono le due tematiche su cui si focalizza la sperimentazione.

Poiché la fragola è estremamente suscettibile alle condizioni pedo-climatiche e alle tecniche di gestione, diventa fondamentale testare ogni cultivar nella specifica zona di produzione. Questo permette di determinare l'idoneità di una cultivar ad essere coltivata in un certo ambiente e verificare il suo potenziale economico per l'agricoltore.

Il programma di miglioramento genetico del Centro di Sperimentazione Laimburg è cominciato nel 2010, ed è svolto in collaborazione con CREA-OFA (Consiglio per la Ricerca in Agricoltura e l'analisi dell'Economia Agraria, Unità di Ricerca per la Olivicoltura, Frutticoltura e Agrumicoltura) con sede a Forlì (Italia). Lo scopo di tale programma è quello di ottenere un genotipo superiore di fragola, che sia idoneo all'ambiente alpino (specialmente adatto e resistente alle gelate tardive), che presenti una qualità straordinaria, un gusto unico, che garantisca profitto agli agricoltori locali e che sia tollerante alle malattie, al fine di raggiungere e promuovere una coltivazione sostenibile di tale prodotto.

Al momento, otto selezioni hanno raggiunto una fase avanzata del programma di breeding. Lo scorso anno, una selezione in particolare è stata valutata molto positivamente. Infatti presentava una eccellente produzione, buona dimensione del frutto che ha mantenuto per tutto il periodo di raccolta, bella forma, colore e dimensione del frutto. Quest'anno verrà sperimentata da diversi fragolicoltori locali su scala allargata.

Altri piccoli frutti, come lampone, ribes rosso e nero, mora e mirtillo, giocano un ruolo minore in Alto Adige. Il Centro di Sperimentazione Laimburg sta attivando due progetti di confronto varietale sia su lampone che su *Actinidia Arguta*.

Summary (english):

At the Laimburg Research Centre, research on berries currently focuses mainly on strawberry production. Variety testing and breeding represent the main focus of the research.

Since strawberry is extremely susceptible to pedo-climatic conditions and to the cultivation management, it is fundamental to test every variety in a specific growing area. This allows to determine the suitability of a variety for a certain pedoclimatic condition and to assess if the variety has the potential to provide some economic advantages for the farmers.

The Laimburg strawberry breeding program started in 2010 and it is carried out within the project "La fragola saporita dell'Alto Adige" (The tasty strawberry of South Tyrol), in collaboration with the CREA-OFA (Consiglio per la Ricerca in Agricoltura e l'analisi dell'Economia Agraria, Unità di Ricerca per la Olivicoltura, Frutticoltura e Agrumicoltura) in Forlì (Italy). The aim of the breeding program is to obtain new superior strawberry genotypes, which should be suitable for the alpine environment

(especially regarding the resistance to late frosts), should have an extraordinary quality, a unique taste, should guarantee the profitability to local farmers and it should be pest-disease tolerant, in order to achieve a sustainable production. At present, eight selections reached an advanced selection phase. Last year, one selection was positively evaluated, presenting a very good yield, good fruit size, which was maintained for the whole harvesting period, attractive colour, shape and taste. This year it will be tested by local farmers at a larger scale.

Other berry fruits, such as raspberry, black- and red- currant, blueberry and blackberry play a minor role in South Tyrol.

Research projects on variety testing both on raspberry and *Actinidia Arguta* are going to be established at the Laimburg Research Centre.

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. Errichtung eines europäischen Netzwerkes, welches sich auf den Obstsektor konzentriert

2. Entwicklung und Umsetzung einer systematischen Vorgehensweise zum Festhalten und Synthetisieren des bestehenden wissenschaftlichen und praktischen Wissens
3. Schaffen eines kontinuierlichen/anhaltenden Dialogs mit relevanten EU, nationalen, sowie regionalen politischen Körperschaften
4. Identifikation und Unterstützung von neuen prioritären Forschungsgebieten durch das kontinuierliche Monitoring und Analysieren von bestehender und aufkommender Forschung und Innovationsaktivitäten.

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
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4. Obstbauversuchsanstalt Jork (Germany) • OVA
5. Stichting Wageningen Research (Netherlands) • WR
6. ~~East Malling Research (United Kingdom) • EMR (terminated 08-02-2016)~~
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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 report¹

Scanning report

Martina Boschiero, Massimo Zago, Julia Strobl, Walter Guerra, Laimburg

Author: Ph.D. Martina Boschiero, p.a. Massimo Zago, MSc. Julia Strobl, Ph.D. Walter Guerra, Laimburg Research Centre, Martina.Boschiero@laimburg.it, +390471969671

Country: Italy

NUTS 3 region(s)²: ITH10 Bolzano-Bozen

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

Date: 12/04/2018

Source materials and methodology

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Best practice findings

The research of Laimburg Research Centre (LRC) on strawberries currently focuses on variety testing and breeding. The variety testing at LRC aims to verify the suitability of the varieties available on the market for their cultivation in the South Tyrolean area, by identifying the phenology, the productivity and quality of the fruits, and the resistance against pests and diseases. Based on the results, recommendations of varieties for the local growers are made. Another scope is to identify a strawberry cv. whit very good post-processing characteristics, suitable for jams and juices.

LRC started a breeding program with the aim to obtain a new superior strawberry genotype suitable for the alpine environment (especially resistance to late frosts), with an extraordinary quality, a unique taste, profitable to local farmers and pest-disease resistant for a sustainable production. This breeding program is carried out within a joint project with the CREA-OFA in Forlì (Italy). CREA-OFA is responsible for the selection of the parents and for the crossing (phase 0), whereas Laimburg carries out all the other open-field phases:

phase 1: about 3000 new seedlings are tested every year. During the selection procedure, the fruit quality (colour, size, shape and taste) and the plant behaviour and health (vigour, habitus and resistance to the main plant diseases) are evaluated;

phase 2: 8-10 plants per interesting selection and the yield potential are evaluated.

phase 3: testing the selections in randomized blocks;

phase 4: the selections with good evaluations are planted and evaluated in plots with more than 100 plants and tested in other representative sites.

At the moment, 8 selections reached phase 4. In 2017, one selection was positively evaluated, and 2018 it will be tested by local farmers at a larger scale.

Currently, LRC is looking for rustic genotypes able to substitute the medium-late-season cv. Elsanta. Elsanta is the June-bearing reference variety cultivated in South Tyrol. Lately it shows some weaknesses, such as its susceptibility to severe

¹ Equivalent to 'final report' in EIP-AGRI format.

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

winters, late frost periods. It is not resistant against soil-disease problems. Other June-bearing cultivars that are cultivated by local farmers are: Darselect, Roxana and Sonata.

There is an increasing interest in adopting ever-bearing cultivars. Murano cv. shows satisfying performances both in open field and as a table top crop. Farmers are trying also the Florina cv. However, due to the climatic conditions, at the moment, with the current available cultivars and with the actual field management, the cultivation of the ever-bearing cvs. is economically profitable only at lower altitudes.

Regarding cultivation techniques, 2019 different planting densities and different mulching materials will be investigated. The applied research will focus also on soil-disease resetting and on plant protection solutions.

In South Tyrol, the cultivated summer bearing varieties are Tulameen and Glen Ample, whereas the variety Polka, Himbo Top and Enrosadira represent the standard ever-bearing varieties.

At LRC a research project on raspberry varieties is going to be established. The aim is to update and revise the variety assortment suitable for South Tyrol. Some varieties and selections of an Italian breeder are already under study.

LRC is installing a trial on *Actinidia Arguta*, with the main scope to test and compare different cultivars (such as Fresh Jumbo, Super Jumbo, Red Jumbo, Red Beauty, Kens Red, Issai und Orsola). Two different training systems will be trialed too, to compare the performances of the aforementioned cultivars cultivated with a pergola (T-bar) trellis and with a "guyot" trellis.

Regarding Blueberries, two cultivation systems are tested: tops, and the plantation directly into the soil, using two different substrates. The aim is to verify if blueberry cultivation could be feasible at 1,200mas and which system can guarantee satisfying results.

Challenges:

- Severe late spring frost events and lower precipitations in winter are big challenges. 2017, spring frost caused a reduction of the strawberry production of 40% on average. Solutions to this problem should be found.
- Soil-disease resetting: Most of the farmers cultivate strawberry in open fields, under tunnels. Farmers are obliged to continuously cultivate for several years the same berry cultivation on the same field, due to the small size of the berry fields. Only big and well-organized farms can adopt the rotation technique, which seems to be not profitable for smaller realities.
- Damages induced by *Drosophyla suzukii*, even if they can be significantly reduced with the use of insect-nets, remain a challenge.
- Find more varieties suitable for the peculiar alpine climatic conditions of South Tyrol.
- A standard method with a description list for testing strawberry cultivars is missing, and novelties are planted without a proper and common testing-standard.
- Even if results on the variety testing and breeding are presented to local farmers every year, an easily and free accessible database is missing.

Scanning report (EIP format for practice abstracts)

*Project title (native language): [EUFRI: Európai Gyümölcs Hálózat]

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

*Author/native language editor: [Geza Bujdosó, NARIC Fruitculture Research Institute, Budapest, Park u. 2, 1223, Hungary, bujdosó.geza@fruitresearch.naik.hu, ++ 36 1 362 1596]

Section A. Summary for EIP dissemination

*Keywords: [sweet and sour cherry, novelty, cultivars, first results, evaluation]

*Main geographical location: [HU101, HU102, HU211, HU212, HU213, HU231, HU232, HU233, HU311, HU312, HU313, HU321, HU322, HU323, HU331, HU332, HU333]

Other geographical locations: [HU221, HU222, HU223]

*Summary (native language):

A Nemzeti Agrárkutatási és Innovációs Központ Gyümölcsstermesztési Kutató Intézete négy kutatóállomással rendelkezik. A kutatóállomások egyike az osztrák – magyar határon, Fertődön található, ahol a bogyós gyümölcsfajokkal kapcsolatos kutatási programok folynak. Az Intézet 70 éve történetében eddig közel 200 gyümölcsfajtát nemesítettek illetve szelektáltak, melyek között 26 államilag minősített bogyós gyümölcsfajta található meg; 10 szamóca, 7 málna, 4 szeder, 2 piros ribiszke, 2 fekete ribiszke és 1 fekete berkenye fajta.

A magyar bogyós gyümölcságazat bajban van, mivel valamennyi bogyós gyümölcsfaj termesztése csökkent az elmúlt 2-3 évtizedben. A málnatermesztés 27 000 t-ról 1 000 t-ra esett vissza, a szamóca termésmennyisége korábban elérte a 12 000 t-t, jelenleg 4 000 – 5 000 t között van évente. A szeder és a köszméte termesztése alacsony színvonalú. E jelenségek a következő okokra vezethetők vissza: a klíma megváltozott, ezért napégés figyelhető meg a növények különböző szervein, déli szomszédunk, Szerbia olcsó tömegáruval több országot is ellát, a magyar munkaerő drága, a nagy üzletek sok bogyós gyümölcsöt importáltak a korai érési időszakban, illetve nincs a bogyós gyümölcsökön alapuló feldolgozóipar. Az új kihívások miatt kollégáinknak át kellett gondolni a gyümölcsfajok nemesítési programjait. A szamócánemesítésben európai és ázsiai fajok keresztezésébe fogtunk és olyan genotípusokat keresünk, melyek korai érési idővel, jó gyümölcsminőséggel, kiváló íz- és zamatanyagokkal rendelkeznek friss fogyasztásra. A málna nemesítése továbbra is folytatódik európai és ázsiai fajok keresztezéséből származó hibridekkel. Új cél a hajtására alkalmas, korai érési idejű, csillogó gyümölcsszínű, magas cukortartalommal rendelkező, kompakt növekedési erélyű, hosszú ideig pulton tartható málna genotípusok előállítására. A piros ribiszkenemesítésben a legfontosabb szelekciós kritérium a tavaszi időjárásal és a nagy hőmérsékleti ingadozással szemben toleráns genotípusok előállítása. Szeder nemesítésben merev szárú, jó gyümölcsminőségű, a téli időjárási körülményekkel szemben toleráns egyedek előállítása a legfontosabb cél.

Csupán a bodzatermesztés tudott növekedni az elmúlt évtizedekben és ez a gyümölcsfaj vált a legnagyobb volumenben termesztett bogyós gyümölcsfajjává Magyarországon. Az elsőszámú fajta a Haschberg, mi keresünk e fajtahoz képest korábbi vagy későbbi érési idővel rendelkező, hasonló termésmennyiséget és gyümölcsminőséget produkáló genotípusokat. Kisebb gyümölcsültetvényekben a homoktövis és az ehető loncok termesztése megkezdődött, de nincs mögöttük nemesítési program, így a termesztők világfajtákat használnak.

Summary (english):

The National Agricultural Research and Innovation Center Fruitculture Research Institute has four research stations. One of them is located on the Hungarian – Austrian border in the city called Fertőd, where soft fruit species breeding programs are

running. During the 70-year history of the Research Institute there were more than almost 200 fruit cultivars selected or bred, and 26 state-approved soft fruit cultivars can be found among them. There are 10 strawberry, 7 raspberry, 4 black berry, 2 red currant, 2 black current and 1 black chokeberry cultivars in our assortment.

But the Hungarian berry sector is in trouble, because all berry species' production decreased a lot during the past two to three decades. The raspberry production decreased from 27 000 t to 1 000 t, the strawberry production reached 12 000 t in the past, now it is between 4 000 and 5 000 t annually. The black berry and the gooseberry production are on a low level. The reasons of these phenomena are the followings; the climate has changed; therefore some sunburnt symptoms appeared on different organs of the plants; our Southern neighbour country, Serbia supplies a lot of countries with cheap mass products; the Hungarian labour is expensive; the big stores imported a lot of berries at the early season; and there is no berry fruit-based processing industry. Our colleagues had to re-think the small fruit breeding programs due to new challenges. In the strawberry production we started to make some crosses between the European and Asian species, and we are looking for the genotypes with early ripening time, good fruit quality, excellent flavour for fresh consumption. The raspberry breeding is going on using hybrids derived from crosses between European and Asian species. There is a new task to create raspberry genotypes for forcing, so the targeted aims are to have genotypes with early ripening time, bright fruit colour, high sugar content, compact vigour, long shelf-life. In the red current program the most important selection criteria are to have genotypes with tolerance to spring weather and big temperature fluctuations. In the black berry program the genotypes with rigid stem, good fruit quality and good tolerance to winter conditions are the selection criteria.

Just the elderberry production could increase during the past decades, and this fruit species become the most grown one in Hungary among the berry fruits. The number one cultivar is called Haschberg, and we are looking for some genotypes having early or late ripening time, similar yield and fruit quality compared to the Austrian-bred standard cultivar. In some small orchards the sea buckthorn and haskaps production started, but there is no breeding program behind them, the growers use global cultivars.

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. A gyümölcsszektorral fókuszáló európai hálózat alapítása
2. Szisztematikus megközelítés létrehozása és fejlesztése a létező tudományos és gyakorlati ismertanyag összefoglalása és szintetizálása érdeklben
3. Dialógus kezdeményezése az EU, nemzeti és regionális szervezetekkel
4. Új kutatási területek meghatározása és támogatása folyamatos monitorozással és analízissel, létező és küszöbön álló kutatási és innovációs aktivitással

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 report¹

Scanning report [Bujdosó, Géza, NARIC]

Author:	[Geza Bujdosó, NARIC Fruitculture Reserach Institute, Budapest, Park u. 2, 1223, Hungary, bujdoso.geza@fruitresearch.naik.hu, ++ 36 1 362 1596]
Country:	[Hungary]
NUTS 3 region(s)²:	[HU101, HU102, HU211, HU212, HU213, HU231, HU232, HU233, HU311, HU312, HU313, HU321, HU322, HU323, HU331, HU332, HU333]
WP no. and title:	[WP2 – Performance of new fruit varieties]
Date:	[Y3 report due May 2018 for the period 06-17 to 05-18]

Source materials and methodology

Cultivar evaluation based on UPOV description. trends / tendencies based on statistical data collection.

Best practice findings

One of the first ripening sweet cherry cultivar in the global cherry assortment is the Hungarian-bred Rita[®]. This cultivar is the standard cultivar among the early ripening cultivars on the Iberian peninsula, not just because of its early ripening time and good taste, but low CU-demand as well. Unfortunately, this cultivar has a big tendency to rain-induced cracking, so it needs a tunnel to grow safely. Due to its extra demand propagation of Rita[®] will be stopped in widely Northern European countries like in Poland, Germany.

The winter of 2017/2018 was mild; there was no frost in Hungary until February. In February the daily minimum temperatures dropped to -10 to -15 degrees, but on the final night of the second month of the year the minimum temperature reached -15 to -20 degrees. Trouble was that the frosty air came from south, so the orchards located on the south part of the country damaged a lot. Almost 80 to 90% of apricot production was destroyed. Other problem was the early summer weather during April, starting from Easter Monday (2nd April) the daily maximum temperatures reached new records, up to 29 degrees C. The blossom was very rash taking just same days. The three-week early summer weather caused drought-like situation as well. Unfortunately, just some percentages of the Hungarian orchards are irrigated, so these weather-related problems are really big problems for the Hungarian fruit sector.

Two new sweet cherry genotypes derived from the NARIC breeding program were accepted by the CPVO. One of them has late ripening time, and the second one is a blush genotype. Soon, the Institute will put them on the market.

There is a keen interest in European plum production in Hungary. During the past years there was no interest in this stone fruit species, therefore a lot of growers cut off their plum orchards. Today this trend changed. Beside the European plum production there is a big interest in quince production as well.

Among the grown fruit species it was not possible to produce virus-free grafted trees from Persian walnut because of not having virus-free rootstock(s). During the past years an old walnut genotypes was re-found, which used to use as generative propagated rootstock for walnut, and status of the mother trees is virus symptom-free after many examinations. Starting from this fall the Institute is making the mother plantation from it, so the virus-free grafted tree production can start within 5 to 6 years.

¹ Equivalent to 'final report' in EIP-AGRI format.

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

Scanning report

Audrius Sasnauskas, LRCAF

***Project title (native language):** EUFRUIT: Europos vaisių tinklas

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

***Author/native language editor:** Dr. Audrius Sasnauskas, Institute of Horticulture, Lithuanian Research Centre for Agriculture and Forestry, Lithuania, a.sasnauskas@lrsdi.lt, +37037555210

Section A. Summary for EIP dissemination

***Keywords:** Variety testing, soft fruits, strawberry, wild strawberry, raspberry, blackcurrant, blackberry, sea buckthorn

***Main geographical location:** LT002, Kauno apskritis

Other geographical locations: LT001 Alytaus 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

*Summary (native language):

Pagrindinės LAMMC Sodininkystės ir daržininkystės instituto juodųjų serbentų, aviečių, braškių, gervuogių, žemuogių, šaltalankių mokslinių tyrimų kryptys yra: veislių tyrimas ir selekcija, auginimo ir augalų apsaugos technologijos.

Lietuvos agroklimatinėmis sąlygomis uoginiai augalai turi pasižymėti ištvėringumu žiemą, aukšta uogų kokybe, atsparumu pavasario šalnoms, išsiskirti vėlyvu žydėjimu, atsparumu pagrindinėms grybinėms ligoms ir kenkėjams.

LAMMC sukurta 5 braškių, 4 žemuogių, 2 aviečių ir 20 juodųjų serbentų veislių. Lietuvos sodininkų tarpe pripažintos šios vietinės kilmės uoginių augalų veislės: braškių - 'Dangė', žemuogių - 'Dena', 'Meda', 'Redita', 'Elina', aviečių - 'Vizija', 'Mistika', juodųjų serbentų - 'Gagatai', 'Joniniai', 'Almiai', 'Gojai' ir 'Pilėnai' ir kt. IVS tyrime vertinami braškių hibridai N051901 ir N082901, juodųjų serbentų veislės 'Aldoniai' ir 'Didikai'.

2017 m. tirta LAMMC SDI sukurtų braškių hibridinių sėjinukų, iš jų tolimesniems tyrimams atrinkti 8 klonai. Tirta 14 introdukuotų braškių veislių. Tirti 6 F. vesca × F. nipponica F2 ir F3 kartų tarprūšiniai hibridai, 4 F. vesca (alpine, kultūrinė) × F. vesca (miško) F3 kartos hibridai, 11 nežinomos veislės atrinktų žemuogių linijų bei standartinės žemuogių veislės. Atrinkti 4 perspektyvūs vietinės kilmės žemuogių hibridai. Selekciniame augyne atrinkti 5 juodojo serbento selekciniai numeriai. Aviečių ir gervuogių auginimo šiltnamyje bei atvirame grunte bandyme buvo atrinktos geriausios versliniams uogynams tinkančios veislės. Įvertintos Lietuvos agroklimatinėmis sąlygomis tinkamos auginti šaltalankių veislės.

LAMMC sukurtos uoginių augalų auginimo technologijos lauke ir šiltnamyje. Institutas bendradarbiauja su Lietuvos komercinių sodų "Vaisiai ir uogos" asociacija, "Pramoninių uogynų augintojų asociacija" ir kitomis uždaromis akcinėmis bendrovėmis. Šis bendradarbiavimas padeda sukurti naujus produktus, atlikti eksperimentinius tyrimus, atrinkti veisles bei įdiegti auginimo ir perdirbimo technologijas.

Summary (english):

The main research topics for blackcurrant, raspberry, strawberry, wild strawberry, blackberry, sea buckthorn at LRCAF are: variety testing and breeding, management systems, growing and plant protection technologies.

Most important parameters for soft fruits at Lithuanian agro climatic conditions is winter hardiness, resistant to spring frost, late flowering, resistance to main important fungal diseases, and high fruit quality.

At LRCAF 5 strawberry, 4 wild strawberry, 2 raspberry, and 20 blackcurrant varieties were developed. Lithuanian farmers growing local breeding strawberry variety 'Dangė', wild strawberry - 'Dena', 'Meda', 'Redita', 'Elina', raspberry - 'Vizija', 'Mistika', blackcurrants - 'Gagatai', 'Joniniai', 'Almiai', 'Gojai' and 'Pilėnai' et. all. 2 strawberry hybrids (N051901, N082901) and 2 blackcurrant varieties ('Aldoniai' and 'Didikai') evaluated at DUS testing.

In 2017 8 clones of strawberry, 5 clones of blackcurrant were selected, 14 introduced strawberry varieties were evaluated. 6 *F. vesca* × *F. nipponica* F2 and F3 interspecific hybrids, 4 *F. vesca* (alpine, cultivated) × *F. vesca* (wood) F3 hybrids, 11 selected lines of unknown origin and standard alpine strawberry cultivars were evaluated. Raspberry, blackberry and sea buckthorn varieties evaluation continued.

In LRCAF developed soft fruit growing technologies and varieties are important for local farmers. Centre close collaborated with Lithuanian associations of commercial orchards "Vaisiai ir uogos", "Pramoninių uogynų augintojų asociacija" and other joint-stock companies. These cooperation created a new advanced research-based products, conducted an experimental research, various measurements or construct a prototypes, created new or improved the existing growing and processed technologies.

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 (Waremme-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. Įkurti vaisių sektoriaus Europinį tinklą.
2. Mokslo ir praktikos žinių ryšio kūrimas ir įgyvendinimas.

3. Išvystyti dialogą tarp atsakingų ES, nacionalinių ir regioninių institucijų.
4. Identifikuoti naujas mokslo tyrimų kryptis ir palaikyti esamą monitoringą bei inovacijas.

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 report¹

Scanning report

Audrius Sasnauskas, LRCAF

Author:	Dr. Audrius Sasnauskas, Institute of Horticulture, Lithuanian Research Centre for Agriculture and Forestry, Lithuania, a.sasnauskas@lrsdi.lt, +37037555210
Country:	Lithuania
NUTS 3 region(s):	LT001 Alytaus 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
WP no. and title:	WP2 – Performance of new fruit varieties
Date:	20/04/2018

Source materials and methodology

An experimental station for horticultural crops was founded in 1938. Since 2010, Lithuanian Horticulture Institute has become a branch of the Lithuanian Research Centre for Agriculture and Forestry. The main research activities are: research into horticultural plants genetics, biotechnology, physiology and biochemistry, plant breeding, and development of plant genetic resources, plants biology regularities, modelling of agrobiological systems determining quality and productivity, storage methods, safety and control of plant food products, research on horticultural plants' biologically active substances in natural and processed produce.

In LRCAF developed soft fruit growing technologies and varieties are important for local farmers. Centre close collaborated with Lithuanian commercial orchards "Vaisiai ir uogos" and "Pramoninių uogynų augintojų asociacija" associations. A close relationship with growers, individual farmers and companies exists to transfer science knowledge at consultations, open days, seminars, conferences. The main topics for all soft fruits are: variety testing, genetic control of plant traits and creation of new breeding methods, development of berry plant growing technologies for fresh market and processing, efficacy trials of the new plant protection products according to GEP (Good Experimental Practice) standards.

In Lithuania soft fruits are produced for fresh market (strawberry, wild strawberry, blackberry) and processing (blackcurrant, raspberry, sea buckthorn). Screening of new varieties for earlier, medium and late season in the market are very important for the growers. At LRCAF open access centre "Fruit storage and modeling" has agreements with joint-stock companies "Rūta", "Mėlynė" and et. al. These cooperation created a new advanced research-based products, conducted an experimental research, various measurements or construct a prototypes, created new or improved the existing technologies. LRCAF participated in the international "Pre-breeding for future challenges in Nordic fruit and berries" and national projects.

The source materials for this scanning are amongst others:

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2. Buskienė L., Šikšnianas T., Bobinaitė R., Stanys V., Sasnauskas A., Kviklys D., Lanauskas J., Uselis N., Viškelis P. Productivity and fruit quality of new and commercially important raspberry. 1 st International Conference on the Scientific Actualities and Innovation in Horticulture: Development and technology. 2016 06 02-03. Kaunas, Lietuva. Book of abstracts, P9:56.
3. Kviklys D., Buskienė L., Čeidaitė A., Duchovskis P., Gelvonauskienė D., Kviklienė N., Lanauskas J., Rasiukevičiūtė N., Samuolienė G., Sasnauskas A., Uselis N., Valiuškaitė A., Viškelis J., Viškelis P. 2017. Vaismedžių ir uoginių augalų agrobiologiniai tyrimai kuriant naujas ir patobulinant esamas vaisių bei uogų auginimo technologijas. „Agrariniai ir miškininkystės mokslai: naujausi tyrimų rezultatai ir inovatyvūs sprendimai“. Lietuvos agrarinių ir miškų mokslų centras: 145-148.
4. Majienė, D., Liobikas, J., Trumbeckaitė, S., Kopustinskienė, D.M., Bendokas, V., Sasnauskas, A., Siksnius, T., Liegiutė, S. and Anisimovienė, N. 2014. Antioxidative and antimicrobial activity of anthocyanin-rich extracts from fruits of blackcurrant and cherry. Acta Hort. (ISHS) 1040:173-177

¹ Equivalent to 'final report' in EIP-AGRI format.

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

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6. Mažeikienė I., Stanys V., Juškytė A. D., Sasnauskas A., Šikšnianas T. 2017. Juodojo serbento veislės 'Aldoniai' ir 'Didikai'. *Sodininkystė ir daržininkystė*, 36 (1–2): 3-14
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9. Rasiukevičiūtė N., Valiuškaitė A., Uselis N., Buskienė L., Viškelis J., Lukšienė Ž. 2016. Inovatyvios technologijos aviečių ir braškių uogų mikrobiologinei saugai ir kokybei. *Agrariniai ir miškininkystės mokslai: naujausi tyrimų rezultatai ir inovatyvūs sprendimai*. 6: 90-91 p.
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16. Sasnauskas, A., Viškelis, P., Rubinskienė, M., Rugienius, R. and Bobinas, C. Productivity and small fruit quality of blackcurrant cultivars. *Acta Horticulturae*. 2014. 1040: 289-293.
17. Stanys V., Šikšnianas T., Gelvonauskienė D., Rugienius R., Bendokas V., Sasnauskas A., Baniulis D., Frercks B., Starkus A. 2017. Geros prekinės ir desertinės kokybės vaisių ir dekoratyvios paskirties sėklavaisinių, kaulavaisinių bei uoginių augalų veislių kūrimas. „Agrariniai ir miškininkystės mokslai: naujausi tyrimų rezultatai ir inovatyvūs sprendimai“. Lietuvos agrarinių ir miškų mokslų centras: 111-112.

Best practice findings

Variety testing of soft fruits

The variety testing scheme at the Institute of Horticulture, LRCAF consists of 6 phases (Figure 1). During the evaluation main characteristics are evaluated: winter hardiness, phenological phases, morphological characters, productivity, berry quality, chemical composition, harvest period, resistance to main fungal, virus diseases and pests.

In the Lithuanian climatic conditions, the main varieties are: strawberry - 'Asia', 'Vivaldi' and 'Salsa', wild strawberry - 'Dena', 'Meda', 'Redita', 'Elina', blackcurrant – 'Ben' series, 'Joniniai', 'Almiai', 'Gagatai', 'Viktor', 'Ritmo' and 'Domino', raspberry - 'Polka' and 'Erika', blackberry - 'Reuben', 'Polar' and 'Brzezina', sea buckthorn - 'Avgustinka', 'Botaniceskaya', 'Podarok sadu' and 'Trofimovskaya'.

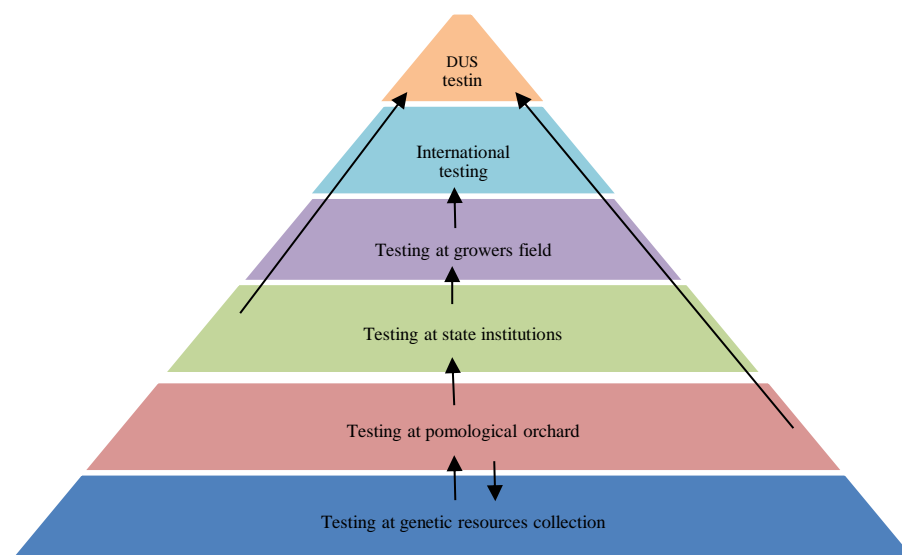


Figure 1. Variety testing scheme of horticultural plants (Mokslinės metodikos inovatyviems žemės ir miškų mokslų tyrimams, 2013, p. 206-215)

Challenges and gaps

There are some important challenges and gaps for soft fruit growers:

- It is essential crop for amateur and commercial sector.
- Winter hardiness and quality is most important characters of soft fruit variety.
- Variety is the main character at chain of growing technology.
- Realization of fresh fruits to the market is still insufficient.
- Agricultural technics and storage facilities playing important role at this sector.

Scanning report (EIP format for practice abstracts)

- *Project title (native language):** EUFRUIT: Europäisches Obst-Netzwerk
- *Project title (English):** EUFRUIT: European Fruit Network
- *Author/native language editor:** Markus Bradlwarter; MSc, Julia Strobl, Variety Innovation Consortium South Tyrol, Jakobistrasse 1A, Julia.Strobl@laimburg.it, 0039 0471258195; Agronomist, Philipp Brunner, MEG, martell, philipp.brunner@vip.coop

Section A. Summary for EIP dissemination

***Keywords:** Thematic Network, Fruit Sector, EUFRUIT, Berries, best practices, variety testing, cultivation, plant protection

***Main geographical location:** ITH10 Bolzano-Bozen

Other geographical locations: ITH10 Bolzano-Bozen

***Summary (native language):**

Die Mitglieder der Erzeugergenossenschaft Martell (MEG), selbst Mitglied der Vinschgauer Produzenten (VI.P), produzieren Beerenobst auf einer Fläche von 50ha auf 1.000 bis 1.700 m Meereshöhe.

Bei Erdbeeren, welche auf insgesamt 35ha angebaut werden, überwiegen die Sorten Elsanta und Darselect. Keine dieser Sorten ist besonders geeignet für die Höhenlagen des Martelltals. Um bessere Sorten für dieses Anbauggebiet zu finden, wird im Einzugsgebiet der MEG ein Versuchsfeld für Erdbeeren errichtet. Was die Anbausysteme betrifft, so werden 30% der MEG-Erdbeeren noch traditionell angebaut, 70% jedoch mit Doppelabdeckung (Regen- und Unkrautabdeckung).

Auf 6ha des Martelltals werden Himbeeren angebaut. Die angebauten Sorten sind: Polka, Tulameen, Glen Ample, Amira und andere. Heidelbeeren, bei denen vor allem die Sorten Duke und Berkeley überwiegen, werden auf 2 ha und vor allem in Töpfen angebaut. Brombeeren, welche auf lediglich 1ha angebaut werden, wachsen als Hecken direkt im Boden. Hier werden vor allem die Sorten Loch Ness und Novaho angebaut.

In den letzten Jahren konnte ein Rückgang der Ernte von Beeren vermerkt werden. Dies war einerseits den Spätfrösten und invasiven Schädlingen (wie *Drosophila suzukii*) geschuldet. Andererseits hat auch die Landflucht ihren Teil zum Rückgang beigetragen. Steile Hänge, die Höhenlagen und keine Sorten, welche besonders für diese hohen Lagen geeignet sind machen den Anbau in diesen Lagen zu einer Herausforderung. Daher werden unter anderem mehr Unterstützung, Arbeitskraft und Expertise für die Sortenzucht und -testung bei Beeren benötigt. Eine weitere Herausforderung stellt die Logistik dar: die Felder sind sehr weit von den Städten entfernt, was den Transport und die Vermarktung erschwert. Außerdem fehlen den Südtiroler Beerenbauern die nötige Expertise und finanzielle Unterstützung, um ihre Tätigkeit aufrecht zu erhalten. Der Anbau von Beerenobst stellt jedoch, wenn subventioniert, ein großes Potential für Zonen über 1.000 m über dem Meeresspiegel dar und kann eine echte Alternative zur Landflucht darstellen, da er der Landbevölkerung und besonders den Bauern eine Perspektive bieten kann.

Summary (english):

The members of the Cooperation of producers Martell (MEG), for its part member of the Federation of Vinschgau Fruit and Vegetable Producers (VI.P), grow berries on a total of 50ha, situated on 1.000-1.700 masl.

Regarding strawberries, cultivated on ca. 35ha, the varieties Elsanta and Darselect are prevailing. Neither of these varieties are particularly suited for the high altitudes of the Martell valley. To find more suitable varieties for this region, a research field for strawberries is being created in the MEG area. Regarding the production systems, 30% of the MEG-area is still cultivated on traditional fields, whereas 70% of the strawberries are cultivated with rain- and weed-cover (double-cover).

On 6ha of the Martell valley, raspberries are cultivated. The main varieties of raspberries grown are Polka, Tulameen, Glen Ample, Amira, and others. The main varieties of blueberries grown are Duke and Berkeley. Blueberries are cultivated in pots

and on a total of 2ha, and blackberries, cultivated on 1ha of the MEG-area only, are grown as hedges. In this case, the cultivated varieties are Loch Ness and Novaho.

In the last couple of years, the harvest of berries decreased due to spring frosts and invasive pests such as *Drosophila suzukii*, which both pose very big problems to the berry-farmers. In addition, the rural exodus caused some of the decrease. Alpine farming poses a lot of challenges to the farmers in general, and for producers of soft fruits and berries in particular. Steep fields, high altitudes and no varieties particularly suited for these regions make farming challenging. Thus, more support, manpower and expertise for the berry-variety breeding and testing are needed. Another challenge is logistics: the fields are very far from the cities, which makes the transportation and the marketing of the fruits very difficult. Finally, South Tyrolean producers of soft fruits are lacking expertise and funding. If subsidized, however, berries provide a big potential for the zones, which are situated above 1.000 masl, where apples can't be produced. As such, the cultivation of soft fruits can provide an alternative to rural exodus, as it can be a vista for the rural communities in general and to farmers in particular.

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. Errichtung eines europäischen Netzwerkes, welches sich auf den Obstsektor konzentriert
2. Entwicklung und Umsetzung einer systematischen Vorgehensweise zum Festhalten und Synthetisieren des bestehenden wissenschaftlichen und praktischen Wissens
3. Schaffen eines kontinuierlichen/anhaltenden Dialogs mit relevanten EU, nationalen, sowie regionalen politischen Körperschaften
4. Identifikation und Unterstützung von neuen prioritären Forschungsgebieten durch das kontinuierliche Monitoring und Analysieren von bestehender und aufkommender Forschung und Innovationsaktivitäten

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
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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 report¹

Scanning report [Julia Strobl, SKST]

Author: MSc Julia Strobl, SKST, Julia.Strobl@laimburg.it, 0471258195
Country: Italy
NUTS 3 region(s)²: ITH10 Bolzano-Bozen

¹ Equivalent to 'final report' in EIP-AGRI format.

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

Date: 26.04-2018

Source materials and methodology

Data gathered by MEG on its members.

Best practice findings

In South Tyrol, berries occupy a surface of about 180ha: 115ha strawberries, 45ha raspberry, 6ha black- and 3ha red-currant. Other berries, such as blueberry and blackberry, are cultivated rarely and in single spots, with a field size of maximum 200m². Most of the farmers cultivate berries on a small scale (on 0.2ha to about 5ha) to complement their income.

The Variety Innovation Consortium South Tyrol collects independent information on the agronomic performance and the market potential of new apple varieties of interest, both from abroad and through local evaluation. The consortium does currently not conduct variety testing for berries. Therefore, this Scan will tackle the experience with berries of the consortium's members VOG and VI.P.

The Association of South Tyrolean Fruit Grower Cooperatives (VOG) is a recognized producer's organization for Apple, Pear, Cherries and Strawberries. Currently, however, no berries are marketed through VOG, as there is no request from its members.

One of the seven cooperatives of the Federation of Vinschgau Fruit and Vegetable Producers (VI.P), namely MEG (Cooperation of producers Martell) works exclusively with berries and stone fruits. MEG represents 45 members who are cultivating a total of 50ha. The area of MEG is situated in the Martell valley and on 1.000-1.700 masl. The valley is small and remote, lies among the boundaries of a national alpine Natural Park (Parco dello Stelvio), and bases a significant part of its economy on berry fruit production. About 40% of the whole strawberry production in South Tyrol comes from this valley (followed by the Puster-valley, and the Eisack valley).

Strawberries:

Strawberries in South Tyrol are cultivated in an alpine environment, at an elevation from 500 up to 1,700 m a.s.l. The climate is characterized by severe winters and a short vegetation season. The main crop cultivated by far in the area of MEG is strawberries (ca. 35ha). The strawberry-varieties are Elsanta (53%) and Darselect (24%), next to Roxana (7%), Salsa (7%), Arosa (5%), and other varieties (Aprica, Murrano, Malgo, Sunsation, 5%). None of these varieties is particularly suited for the high altitudes of the Martell valley. Therefore, MEG is developing, in collaboration with the Laimburg Research Centre, a research field for strawberries to find more suitable varieties for this region and for these altitudes. Regarding the production systems, 30% of the MEG-area is still cultivated on traditional fields, whereas 70% of the strawberries are cultivated with rain- and weed-cover (double-cover). Newer systems, such as mechanical harvest or vertical farming, are not introduced in South Tyrol yet, and the introduction might prove to be difficult, due to the steep fields.

Other berries:

Raspberries are cultivated on 6ha of the Martell valley. Here, the main varieties of raspberries are Polka, Tulameen, Glen Ample, and Amira. Blueberries are cultivated in pots due to their requirement of an acid soil, and on a total of 2ha. The varieties grown are Duke and Berkeley. Blackberries, cultivated on 1ha of the MEG-area only, are grown as hedges. Loch Ness and Novaho are the main varieties of this berry.

Challenges:

Generally, many of the berry-types suffer from winter damages. In the last couple of years, the harvest of berries decreased. On the one hand, this was due to spring frosts and invasive pests such as *Drosophila suzukii*, which both pose very big problems to the berry-farmers. Thus, further research is required to mitigate these challenges. On the other hand, the rural exodus caused some of the decrease too. Alpine farming poses a lot of challenges to the farmers in general, and for producers of soft fruits and berries in particular. One factor that makes the cultivation of berries difficult is the steep fields; other factors are represented by the high investment costs, the high altitudes, and the fact that there are no varieties particularly suited for these regions. Thus, more support, manpower and expertise for the berry-variety breeding and testing are needed.

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

Another challenge is logistics: the fields are very far from the areas of high population density, which makes the transportation and the marketing of the fruits- which are characterized by a very short storability and shelf life- very difficult. Finally, in South Tyrol the focus lies traditionally on apples. Therefore, producers of soft fruits are lacking the expertise that has been developed and that is subsidized in pome fruit production and research, and they are lacking financial support. The same is true for stone fruits. In fact, funding of the soft and stone fruit-sectors is very little in comparison to the funding of apple production. If subsidized, however, berries provide a big potential for the zones, which are situated above 1.000 masl, where apples can't be produced. As such, the cultivation of soft fruits can provide an alternative to rural exodus, as it can be a vista for the rural communities in general and to farmers in particular.

Scanning report (EIP format for practice abstracts)

***Project title (native language):** EUFRUIT: Fruit Network europeo

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

***Author/native language editor:** Luigi Manfrini, Dipartimento di Scienze e Tecnologie Agro-Alimentari, Viale Fanin 44, Bologna (Italy). luigi.manfrini@unibo.it, +39(0)512096430

Section A. Summary for EIP dissemination

***Keywords:** Variety testing, soft fruit, strawberry

***Main geographical location:** ITH51-59 Emilia Romagna region

Other geographical locations: ITH10 Bolzano-Bozen

***Summary (native language):**

Negli ultimi anni sono state brevettate nuove varietà di fragole tra cui Flavia * e Flaminia * suscitando vivo interesse tra i maggiori gruppi di agricoltori in Marocco, Tunisia, Spagna e Sud Italia dove sono già stati messi a dimora i primi impianti pilota che confermano le buone prestazioni di queste varietà, sia in termini agronomici che commerciali. Le due cultivar sono caratterizzate da una precoce maturazione, vigoria media e frutti esterni alla chioma facili da raccogliere, elevata resistenza ad oidio e alle malattie fogliari e radicali in genere. Adatte anche a terreni stanchi, hanno dimostrato buona adattabilità alla pratica del ristoppio ed alla coltivazione biologica o con basso impatto ambientale.

Altre ricerche su nuove varietà di fragole sono offerte dalla ricerca di CREA (Crea, Olivicoltura, frutticoltura, agrumicoltura a Forlì). Gli esempi sono una ricerca rivolta verso un frutto che abbia il profumo particolarmente invitante di fragoline di bosco o una fragola bianca che può essere apprezzato da coloro che vorrebbero godersi il loro frutto preferito ma sono allergici ai pigmenti rossi. Questi sono gli obiettivi principali per i prossimi anni del centro di ricerca CREA. L'obiettivo è quindi quello di restituire le proprietà sensoriali che sono state sottratte da una selezione mirata a una maggiore resa e una conservazione più lunga rispetto alla qualità intrinseca del frutto. L'unità di ricerca CREA è partita da otto diversi programmi che hanno interessato l'Italia, dalla Sicilia al Trentino, per trovare nuove varietà per migliorare la qualità, in particolare l'aroma e la fragranza, attraverso incroci naturali e quindi non in laboratorio.

Summary (english):

In recent years, new varieties of strawberries have been patented. Flavia* and Flaminia* are two of them and they arouse keen interest among the major Farmers Group in Morocco, Tunisia, Spain and Southern Italy where the first pilot-plants have been already planted confirming the good performances of this varieties, both in agronomic and commercial terms. The two cultivars are characterized by early maturity, medium vigor and fruit outside the foliage easy to collect, highly resistant to powdery mildew and leaf and root diseases in general. Also suitable for tired soils, showed good adaptability to the cropping practice and to the organic cultivations or with low environmental impact.

Other research programs on new strawberries varieties are undertaken by the research center of CREA (Crea, Olivicoltura, fruit-growing, citrus farming in Forlì). Examples are strawberry that has the particularly inviting scent of wild strawberries and a white strawberry that can meet those who would like to enjoy their favorite fruit but are allergic to red pigments. These are the main objectives for the next years of CREA. The aim is to give back those sensory properties that have been subtracted from a selection aimed at greater yield and a longer conservation than the intrinsic quality of the fruit. The research unit started from eight different programs that have interested Italy, from Sicily to Trentino, to find new varieties to improve the quality, in particular aroma and fragrance, through natural crossings, and therefore not in the laboratory.

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. Stabilire una rete europea focalizzata nel settore frutticolo.
2. Sviluppare e implementare un approccio sistematico per la ricerca e la sintesi delle conoscenze scientifiche e pratiche esistenti.
3. Stabilire un dialogo continuo con i componenti della politica europea, nazionale e regionale.
4. Identificare e supportare nuove aree di ricerca monitorando e analizzando continuamente le attività di ricerca e di innovazione tecnologia esistenti e all'avanguardia.

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.

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2. Research Station for Fruit npo (Belgium) • Pcfuit
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5. Stichting Wageningen Research (Netherlands) • WR
6. ~~East Malling Research (United Kingdom) • EMR (terminated 08-02-2016)~~
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22. NIAB EMR (new 09-02-2016)

Section C. Annex: Scanning report¹

Scanning report

Luigi Manfrini - Dipartimento di Scienze e Tecnologie Agro-Alimentari

Author: [Luigi Manfrini; Brunella Morandi; Luca Corelli Grappadelli, Dipartimento di Scienze e Tecnologie Agro-Alimentari, University of Bologna; e:mail Luigi.manfrini@unibo.it; brunella.morandi@unibo.it; luca.corelli@unibo.it Ph: +39 512096428]

Country: [Italy]

NUTS 3 region(s)²: [ITH51-59 Emilia Romagna region]

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

Date: [02/05/2018]

Source materials and methodology

The CONSORZIO ITALIANO VIVAISTI (CIV) is one of the world's most specialized private entities in strawberry plants, apple and pear tree and rootstock research and development. CIV aims to reach a high level of variety innovation and production of certified propagation material.

CIV have patented the new strawberry varieties Flavia* and Flaminia* arouse keen interest among the major Farmers Group in Morocco, Tunisia, Spain and Southern Italy where the first pilot-plants have been already planted confirming the good performances of this varieties, both in agronomic and commercial terms. The two cultivars are characterized by early maturity, medium vigor and fruit outside the foliage easy to collect, highly resistant to powdery mildew and leaf and root diseases in general. Also suitable for tired soils, showed good adaptability to the cropping practice and to the organic cultivations or with low environmental impact.

With the variety Flavia* and Flaminia* CIV is proving to be able particularly careful to the low environmental impact productions (e.g. contained CFP's level thanks to fewer treatments in the field) suitable for an integrated production cultivation, organic and of course conventional one," emphasizes CIV General Director, Marica Soattin. In this way CIV seeks to satisfy the growing demand from the consumers for quality products not only from organoleptic point of view but also in terms of environmental, social and economic performance for the whole production-chain.

Features:

Flavia* – Very good fruit flavor, very sweet, with low acidity. Perception of prolonged and intense sweetness. High percentage of extra quality fruits. Harvesting time: Very early BRIX 8.8 -11.5. Excellent consistency and shelf life.

Flaminia* – Fruit of the excellent flavor, very sweet, with a good balance between sweetness and acidity. Harvesting time: Early BRIX 8.7 -10.6. High tolerance to the plant ripening. Excellent consistency and shelf life.

Other research on new varieties of strawberries are offered by the research of CREA (Crea, Olivicoltura, fruit-growing, citrus farming in Forlì). Examples are strawberry that has the particularly inviting scent of wild strawberries and a white strawberry that can meet those who would like to enjoy their favorite fruit but are allergic to red pigments. These are the main objectives for the next years of CREA. The aim is to give back those sensory properties that have been subtracted from a selection aimed at greater yield and a longer conservation than the intrinsic quality of the fruit. The research unit started from eight different programs that have interested Italy, from Sicily to Trentino, to find new varieties to improve the quality, in particular aroma and fragrance, through natural crossings, and therefore not in the laboratory. Gianluca Baruzzi - researcher from CREA - says "Flavor is always the driving element and, in a few years, we will be able to put on the market a very sweet, fragrant and long-lasting strawberry".

¹ Equivalent to 'final report' in EIP-AGRI format.

² Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

The source materials for this scanning report are amongst others:

- agronotizie.imagelinenetwork.com/vivaismo-e-sementi/2018/04/26/la-fragola-nel-2018-pensando-al-2020/58483
- <https://rivistafrutticoltura.edagricole.it/frutta/fragola-e-piccoli-frutti-unaltra-annata-difficile-a-causa-del-clima/>
- http://www.crea.gov.it/wp-content/uploads/2018/03/Fragola-bianca_interv-Baruzzi_riv-Cia.pdf?x99213
- <http://www.agrimpresaonline.it/fragola-bianca-allergico-ai-pigmenti/>

Best practice findings

In order to reach its goals, CIV and CREA work in partnership with the best international hybridation programs and commercial companies to test varieties throughout the world, to guarantee commercial success to marketing businesses, and provide healthy fruits to consumers.

CIV is a founder member of INN, International New-varieties Network, an association that promotes the exchange, evaluation and marketing of new varieties in the major fruit production areas in the world.

OBJECTIVES:

- To develop new breeds and varieties
- To develop new horticultural regions
- To develop a worldwide technical and commercial structure for the promotion of new varieties
- To develop a standard, coordinated evaluation process