

## Scanning report

### Audrius Sasnauskas, LRCAF

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

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

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#### Section A. Summary for EIP dissemination

**\*Keywords:** Variety testing, stone fruits, sweet cherries, sour cherries, plums, apricots

**\*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 kaulavaisinių augalų mokslinių tyrimų kryptys yra: veislių tyrimas ir selekcija, vaismedžių auginimo ir apsaugos technologijos.

Lietuvos agro klimatinėmis sąlygomis svarbiausi kaulavaisinių augalų požymiai yra: ištvėringumas žiemai, atsparumas pavasario šalnoms, vėlyvas žydėjimas, atsparumas pagrindinėms grybinėms ligoms ir vaisių kokybė.

2017 m. genų banko kolekcijoje tiriama 80 trešnių, 70 vyšnių, 130 slyvų, 10 abrikosų veislių ir genotipų. Jie naudojami selekcijos tikslams. Kaulavaisinių augalų veislių įvertinimas atliekamas pagal Cherry Descriptor ir Plum and Allied Species Descriptor sąrašus (Tarptautinė augalų genetinių išteklių taryba).

Lietuvos sodininkų tarpe pripažintos trešnių - 'Jurgita', 'Mindaugė', 'Jurga', 'Meda', vyšnių - 'Vytėnų žvaigždė', 'Notė', slyvų - 'Gynė', 'Jūrė', 'Rausvė', 'Kauno vengrinė' ir 'Aleksona' veislės. IVS tyrime vertinamos 3 trešnių ir 1 vyšnių veislės, sukurti 26 nauji kaulavaisinių augalų perspektyvūs hibridai.

LAMMC sukurtos kaulavaisinių augalų auginimo technologijos ir veislės yra svarbios sodininkams. LAMMC bendradarbiauja su Lietuvos komercinių sodų "Vaisiai ir uogos" asociacija ir kitomis uždaromis akcinėmis bendrovėmis. Šis bendradarbiavimas padeda sukurti naujus pažangius produktų prototipus, atlikti eksperimentinius tyrimus, tobulinti ir kurti naujas technologijas.

#### **Summary (english):**

The main research topics for stone fruits at LRCAF are: variety testing and breeding, management systems, and plant protection.

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

In 2017 at gene bank collection evaluated 80 sweet cherry, 70 sour cherry, 130 plum and 10 apricot varieties and genotypes. These accessions are used for breeding purposes. The evaluation of the stone varieties is conducted according to the Cherry Descriptor List and Plum and Allied Species Descriptor List (International Board for Plant Genetic Resources).

Lithuanian sweet cherry cultivars 'Jurgita', 'Mindaugė', 'Jurga', 'Meda', the sour cherry cultivars 'Vytėnų žvaigždė' and 'Notė', the plum cultivars 'Gynė', 'Jūrė', 'Rausvė', 'Kauno vengrinė', and 'Aleksona' increasing profitability for fruit growers. 3 sweet cherry and 1 sour cherry varieties evaluated at DUS testing, developed 26 new stone fruits promising hybrids.

In LRCAF developed growing technologies and varieties are important for local farmers. LRCAF close collaborated with Lithuanian association of commercial orchards "Fruit and Berries" 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 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 (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. 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 report<sup>1</sup>

## Scanning report

## Audrius Sasnauskas, LRCAF

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<b>Country:</b>	Lithuania
<b>NUTS 3 region(s):<sup>2</sup></b>	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
<b>WP no. and title:</b>	WP2 – Performance of new fruit varieties
<b>Date:</b>	20/04/2017

## Source materials and methodology

Collection and breeding at LRCAF of *Prunus* plants was started in 1952. Crossing the local cold resistant varieties and productive, disease resistant cultivars developed abroad led to the selection of winter-hardy, productive cultivars resistant to leaf spot featuring attractive and high quality fruits. Successful cultivar development depends on the availability of diverse genetic material, application of leading knowledge of important plant traits, and efficient methods of breeding. Biotechnology applications, such as *in vitro* methods and molecular techniques, are being developed and employed to guarantee high quality reproductive material of fruit plants for production practices and preservation. The most popular between fruit growers are sweet cherry cultivars 'Jurgita', 'Mindaugė', 'Jurga', 'Meda', the sour cherry cultivars 'Vytėnų žvaigždė' and 'Notė', the plum cultivars 'Gynė', 'Jūrė', 'Rausvė', 'Kauno vengrinė', and 'Aleksona'.

In LRCAF developed growing technologies and varieties are important for local farmers. LRCAF close collaborated with Lithuanian association of commercial orchards "Fruit and Berries". At LRCAF open access centre "Fruit storage and modeling" has agreements with joint-stock companies "Rūta", "Salpronė", "Mėlynė", "Paslaugos žemdirbiams" 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 is also a member of EUFRIN network. LRCAF participated in the international COST Action FA1104 "Sustainable production of high quality cherries for the European market" (16/04/2012-15/04/2016) and national projects coordinated by Lithuanian Science Council.

The source materials for this scanning are amongst others:

Gelvonauskienė D., Frercks B., Stepulaitienė I., Stanys V. 2013. Diversity of resistance to *Monilinia laxa* and spring frost of sour cherry germplasm. *Acta Horticulturae*, 976: 537–542.

Frercks B., Stanys V., Siksnianienė J.B., Stepulaitienė I., Gelvonauskienė D., Staniene G., Rugienius R., Siksnianas T. 2014. Efficiency of AFLP marker attributes in the genetic analysis of sweet cherry cultivars. *Journal Food, Agriculture and Environment*. 12 (1): 122–127.

Rugienius R., Frercks B., Siksnianienė J.B., Stepulaitienė I., Staniene G., Baniulis D., Stanys V. 2015. Characterisation of genetic diversity of the Lithuanian sour cherry (*Prunus cerasus* L.) genetic resources using microsatellite markers. *Acta Horticulturae*. 1100(14): 105-108.

Rugienius R., Šnipaitienė L., Staniene G., Šikšnianienė J.B., Haimi P., Baniulis D., Frercks B., Pranckietis V., Lukoševičiūtė V., Stanys V. 2016. Cold acclimation efficiency of different *Prunus* and *Fragaria* species and cultivars *in vitro*. *Žemdirbyste=Agriculture*. 103(2): 207-214.

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

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

## Best practice findings

The ideal stone fruit variety should be self-fertile, winter hardy, resistant to spring frost, late flowering, short vegetation period, resistant to main important fungal diseases and pests, be productive, and have a high fruit quality (firm, large, dark, good separation from stone, small stone, without cracking).

### Variety testing and breeding of sweet cherries

Introduced and local sweet cherry varieties we evaluated according planting scheme 4 x 4m. From each variety planted 4 trees on *Prunus Mahaleb* (mostly for winter hardiness). As standard variety we plant 'Jurgita', 'Dniprovka', 'Vytėnų juodoji', and 'Vytėnų rožinė'.

The evaluation of the new introduced and local sweet cherry varieties is conducted according to the Cherry Descriptor List (International Board for Plant Genetic Resources).

In 2017 at gene bank collection we have 80 sweet cherry varieties. This year LRCAF will evaluate 8 promising hybrids. Depending on the variety we do trials on plant protection and fertilization. New 3 candidates to be evaluated at DUS testing.

### Variety testing and breeding of sour cherries

Introduced and local sour cherry varieties evaluated according planting scheme 2 x 4 m. From each variety planted 4 trees on *Prunus Mahaleb*. As standard variety we plant 'Vytėnų žvaigždė', 'Vietinė rūgščioji', and 'Žagarvyšnė'.

The description of sour cherry varieties is performed the same like sweet cherries.

In 2017 at gene bank collection LRCAF have 70 sour cherry varieties. This year will evaluated 5 promising hybrids. A new variety 'Verkne' are evaluated at DUS testing.

### Variety testing and breeding of plums and apricots

Introduced and local plum and apricot varieties we evaluated according planting scheme 3 x 4 m. From each variety planted 4 trees on *Prunus cerasifera*. As standard variety for plum we plant 'Skoroplodnaja', 'Štaro vengrinė', and 'Anna Spath'.

The evaluation of these plum and apricot varieties is conducted according to the Plum and Allied Species Descriptor List (International Board for Plant Genetic Resources).

In 2017 at gene bank collection LRCAF have 130 plum and 10 apricot varieties and genotypes. This year will evaluated 12 plum and 1 apricot promising hybrids.

### Challenges and gaps

There are some important challenges and gaps for stone fruit growing:

- No large commercial orchards for stone fruit growing (not suitable agroclimatic conditions),
- All stone fruit orchards are planted without plastic covering and tunnels,
- It is important crop for amateur sector,
- Infestation of plum trees and fruits by Plum pox virus, of sweet and sour cherries by *Monilinia laxa*.