

EUFRIN Board & Task Force (EUFRIN/AREFLH/FRESHFEL) joint meeting

Strategic Innovation & Research Agenda

Brussels, 2014-11-13



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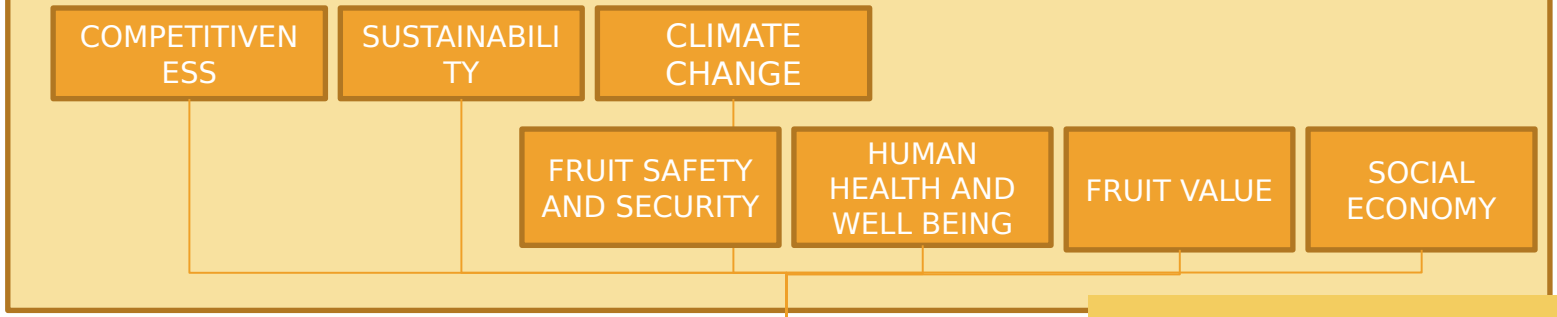


A.R.E.F.L.H

Index of SIRA

- Summary
- Current situation of fruit and vegetables industry
- European fruit and vegetables industry in the context of global challenges
- Weaknesses and gaps in the fruit and vegetables industry
- Identification of Innovation and Research needs for H2020
- The strenghts of European Fruit and vegetables Research and Development on Europe
- Contribution to the H2020 strategy

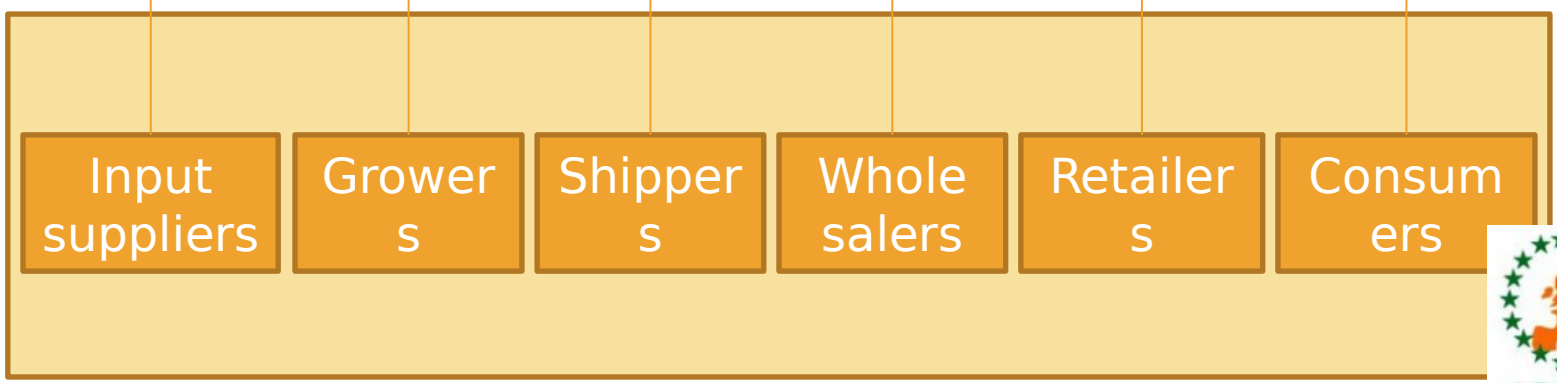
INWARD CHALLENGES



OUTWARD CHALLENGES

SECURE A SAFER & HEALTHIER FRUIT & VEGETABLES SUPPLY

SPECIFIC F&V CHAIN CHALLENGES



Weaknesses and gaps of fruit industry

- Fruit attributes and consumer expectations
- Fruit production and industry challenges
- Scientific challenges

Industry needs

- Input suppliers and production
- Genetic resources and utilization
 - New genetic resources for narrow genetic bases species
 - New breeding techniques
- Sustainable plant protection
 - **Minimization of residues and innovative plant protection methods**
 - New quarantine diseases
 - Old and disrupting pest and diseases
 - European pests review and mitigation measures for market access

Industry needs

- Input suppliers and production
- Labour efficiency and safe orchards
 - **Increased labor efficiency in key fruit production processes**
 - New spraying techniques
 - Mechanization and robotics (harvest , thinning , pruning, weeding...)

Industry needs

- Input suppliers and production
 - Efficient production systems and use of primary resources
 - **Water usage**
- Enabling technologies
 - OMICS technologies for fruit and vegetables production management
 - Precision Horticulture

Industry needs

- Storage and handling
 - Minimally processed fruits and vegetables
 - Quality and food safety aspects
 - Prevention of produce contamination
 - Input contamination
 - Biological contamination
- Packaging
 - New technologies
- Impact reducing technologies
 - By-product valorization
 - Waste management
- Enabling technologies
 - **Post harvest (DCA, DSS), ...**
 - Energy efficient storage systems
 - New technologies in grading and sorting

Industry needs

- Distribution
 - Category and supply management
 - Logistics efficiency
 - Standardization of measures methodology for whole chain standards (EUREP/GAP, Carbon foot print, water foot print, ...)
 - Information exchange across the chain
 - Preservation of quality along the chain
 - Reducing the gaps between the links (training , education , communication , logistics , devices, varieties, shorter transit time)
 - Point of sales technologies to extend post-harvest shelflife (packaging, water spray, temperature,..)
 - New added value
 - New added value products (varieties, packaging convenience, food services, vending, ...)

Industry needs

- Better consumer knowledge
 - Better consumer knowledge
- Consumer awareness and education
 - Nutritional and health claims
 - Communication strategy and information tools

HEADING	TOPIC	TIME PRIORIT Y	CHALLENGES ADDRESSED						
			COMPE TITIVEN ESS	SUSTA INABIL ITY	CLIMAT E CHANG E	FOOD SAFETY AND SECURITY	HUMAN HEALTH AND WELL BEING	SOCIAL ECONOM Y	FRUIT VALUE
Genetics									
	New genetic resources for narrow genetic based species	2018-20 19	x	x	x	x			
	New breeding techniques - genomics	2020	x	x	x	x			
Sustainable Plant Protection									
	Minimization of residues and innovative plant protection methods	2016-20 17	x	x		x			
	New quarantine diseases	2018-20 19		x	x				
	Old and disrupting pest and diseases	2018-20 19		x					
	European pests review and mitigation measures for market access	2020	x						
Labour efficiency and safety									
	Increased labor efficiency in key fruit production processes	2016-20 17	x						
	New spraying techniques	2018-20 19							
	Mechanization and robotics (harvest , thinning , pruning, weeding...)	2018-20 19							
Efficient production systems and use of primary resources									
	Water usage	2016-20 17			x				
	Energy efficiency in greenhouses	2018-20 19	x		x				
	Soil and fertilizer efficient production systems	2018-20 19			x				
Enabling technologies									
	OMICS technologies for fruit and vegetable production management	2018-20 19	x						
	Precision Horticulture	2020	x						

HEADING	TOPIC	TIME PRIORITY	CHALLENGES ADDRESSED						
			COMPETITIVENESS	SUSTAINABILITY	CLIMATE CHANGE	FOOD SAFETY AND SECURITY	HUMAN HEALTH AND WELL BEING	SOCIAL ECONOMY	FRUIT VALUE
Minimally processed fruit and vegetables									
	Minimally processed fruit and vegetables taking into account quality and safety	2018-2019	x				x		
Preventing produce contamination									
	Input contaminants (chlorate, perchlorate, ...)	2020					x		
	Biological contamination (listeria, E. Coli ...)	2018-2019					x		
Packaging									
	New technologies in packaging	2020	x						
Impact reducing technologies									
	By-product valorization	2020		x					
	Waste management	2020		x					
Enabling technologies									
	New storage technologies (improved dca)	2016-2017	x						
	New technologies in grading and sorting (robotics, non destructive quality measurements, ...)								
	Energy efficient storage systems	2018-2019		x	x				
	Decision support system for storage and handling disorders: scald, bitter pit, internal browning, ...	2018-2019	x						

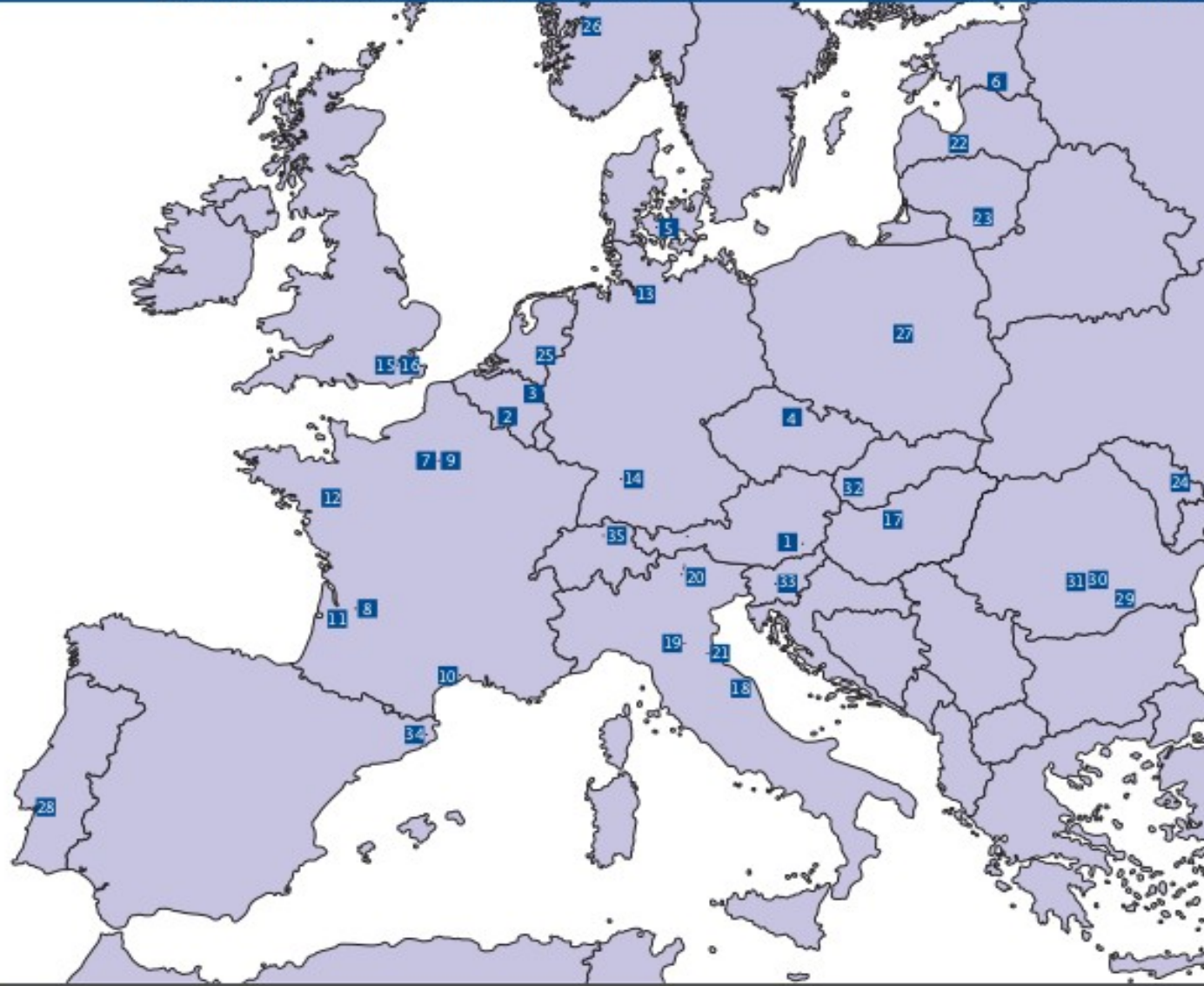
Research topics proposal for Work Program 2016/2017

- Improving pest and disease control and reducing pesticide residues; a challenge for sustainable fruit production
- Maintaining yield and quality of fruit production under combined water and heat stresses
- Repositioning the fruit and vegetables sector within its nutrition and health claims assets
- New storage techniques
- Development of mechanical and robotic technical aids to hand fruit picking for a more efficient and safe labor

Strengths of R&D in the EU

EUROPEAN FRUIT RESEARCH INSTITUTES NETWORK

EUROPEAN FRUIT RESEARCH INSTITUTES NETWORK



- 1 Versuchsanstalt für Obst- und Weinbau Heidegg; Graz, Austria
- 2 CRA-W/ Department of Life sciences, Unit Breeding and Biodiversity, Walloon Agronomical Research Centre; Gembloux, Belgium
- 3 Research Center for Fruit Growing (pfruit vzw); Sint-Truiden, Belgium
- 4 Research and Breeding Institute of Pomology Holo vavouy Ltd; Holo vavouy, Czech Republic
- 5 Department of Food Science, Aarhus University; Aarhus, Denmark
- 6 Estonian University of Life Sciences, Põli Horticultural Research Centre; Põli, Karula Nuias, Estonia
- 7 Centre Technique Interprofessionnel des Fruits et Légumes (C.T.I.F.L.); Direction Scientifique et Technique Fruits et Légumes; Paris, France
- 8 Centre Technique Interprofessionnel des Fruits et Légumes (C.T.I.F.L.); La Force, France
- 9 INRA (Institut National de la Recherche Agronomique) Genetics and Fruit Breeding; Paris, France
- 10 INRA (Institut National de la Recherche Agronomique) UMR AGAP, équipe AFIP; Montpellier, France
- 11 INRA Centre de Recherche Bordeaux-Aquitaine (UMR 1313 BFP); Bordeaux, France
- 12 INRA Centre de Recherche Angers-Nantes; Angers, France
- 13 ESTEBURG Fruit Research Center; Jork, Germany
- 14 Universität Hohenheim; Stuttgart, Germany
- 15 East Malling Research; East Malling, Great Britain
- 16 Natural Resources Institute, University of Greenwich; Great Britain
- 17 National Agricultural Research and Innovation Centre, Research Institute for Fruit Growing and Ornamentals of End; Budapest, Hungary
- 18 Consiglio per la Ricerca e la Sperimentazione in Agricoltura (CRA), Unità di Ricerca per la Frutticoltura di Forlì, Fruit Tree Research Unit; Forlì, Italy
- 19 Department of Agricultural Science, University of Bologna; Bologna, Italy
- 20 Leibniz Research Centre for Agriculture and Forestry; Osnabrück, Italy
- 21 Università Politecnica delle Marche; Ancona, Italy
- 22 Latvian State Institute of Fruit Growing; Dobele, Latvia
- 23 Institute of Horticulture, Lithuanian Research Centre for Agriculture and Forestry; Babtai, Kaunas district, Lithuania
- 24 State Agrarian University of Moldova; Chişinău, Moldova
- 25 Wageningen UR - Applied Plant Research - fruit; Zetten, the Netherlands
- 26 Norwegian Institute for Agricultural and Environmental Research, Biosk Ullensvang; Lofthus, Norway
- 27 Research Institute of Horticulture; Skierniewice, Poland
- 28 Instituto Superior de Agronomia, Seccao de Horticultura; Lisboa, Portugal
- 29 Research Center for Integrated Fruit Growing, Faculty of Horticulture, University of Agronomic Sciences and Veterinary Medicine; Bucharest, Romania
- 30 Research Institute for Fruit Growing; Piteşti-Mărcăieşti, Romania
- 31 Vâlcea Fruit Research and Development Station, University of Craiova; Râmnicu Vâlcea, Romania
- 32 National Agriculture and Food Centre - Research Institute of Plant Production; Piešťany, Slovak Republic
- 33 Agricultural Institute of Slovenia, Department of Fruit Growing, Viticulture and Oenology; Ljubljana, Slovenia
- 34 Institut de Recerca i Tecnologia Agroalimentàries (IRTA); Catalonia, Spain
- 35 Research Station Agroscope at Changins; Conthey and Widenswil, Switzerland

Strengths of R&D – EU Projects

- **D.A.R.E.** (*Durable Apple Resistance in Europe*) - 1998-2002
- **HiDRAS** (*High-quality Disease Resistant Apples for a Sust.Ag.* - 2003-2007
- **FLAVO** (*FLAVOnoids in Fruits and Vegetables: their impact on food quality, nutrition and human health*) - 2005-2007
- **ISAFRUIT** (*Increasing fruit consumption through a transdisciplinary approach* - 2006-2010
- **Sharco** (*Sharka Containment in view of EU expansion* - 2009-2012
- **ClimaFruit** (<https://www.climafruit.com>) - 2009-2013
- **FruitBreedomics** (*an integrated approach for increasing breeding efficiency in fruit tree crops* - 2011-2015
- **ENDURE** (<http://www.endure-network.eu/>) - 2007-2010
- **COST-Action 864: PomeFruitHealth** (*Combining tradit.and adv. strategies for plant protection in pome fruit growing*)- 2006-2011
- **Cost Action 863: Euroberry** (*Toward an organisation of the integrated research of berries*)
- **EU-Berry** (*The sustainable improvement of European berry production, quality and nutritional value in a changing environment: Strawberries, Currants, Blackberries, Blueberries and Raspberries* - <http://www.euberry.univpm.it/>) - 2011-2014

The Fruit sector contribution to EU Society



- A broad supply of consumer-oriented, healthy, accessible, convenient fruits and fruit products
- Improve health, develop expertise throughout the supply chain, create wealth, empower rural areas, preserve landscapes

How R&D in the fruit sector will contribute to EU society



Novel approaches to pest control for minimization of pesticide residues

The Fruit sector contribution to EU Economy



Increased competitiveness by novel, eco-innovative technologies

Greater profitability by:

- Increased labor efficiency,
- Improved quality and productivity,
- Reduced waste,
- Innovative products

How R&D in the fruit sector will contribute to EU economy

Innovation-driven fruit handling systems to increase efficiencies and drive profitability



The Fruit sector contribution to EU Environment



Preservation of the environment by adopting eco-innovative technologies under threats from climate change and limited natural resources.

- Energy efficient systems
- Innovative management tools
- Optimization of production factors
- Minimization of carbon, water, mineral nutrients, pesticides footprint

Contribution to the European H2020 strategy: Society

Increased fruit consumption will contribute significantly to Europeans' well being and health.

A reliable supply and consumption of healthy, accessible, convenient, novel fruit and fruit-based products.

The European fruit production will provide a secure, continuous supply of consumer-oriented healthy foods.

Multi-actor approach to deliver results through interdisciplinary research, encompassing social and natural sciences.

The development of specialist expertise throughout the supply chain, education through knowledge exchange, wealth creation for the rural environment, the empowerment of rural areas and the preservation of landscape.

Contribution to the European H2020 strategy: Economy

- All the components of the European fruit chain will have increased competitiveness by intensive use of novel, eco-innovative technologies.
- These will secure greater profitability by means of:
 - increased labor efficiency,
 - improved quality and productivity,
 - innovative products,
 - increased consumption of fruit (products).

Contribution to the European H2020 strategy: Environment

- Innovative European fruit production systems will contribute to the preservation of the environment via eco-innovative technologies.
- They will deliver better products and reduced wastage under threats from climate change and limited natural resources.
- This will be achieved through:
 - energy efficient systems,
 - innovative management tools to optimize production factors,
 - minimize the C, H₂O, nutrient, pesticide footprint improving land-stewardship.