

Scanning report (EIP format for practice abstracts)

***Project title (native language):** EUFRUIT: European Fruit Network, WP3 Reduktion von Pestizidrückständen

***Project title (English):** EUFRUIT: European Fruit Network, WP3 Reduction in pesticides residues

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Section A. Summary for EIP dissemination

***Keywords:** disease and pest modelling, monitoring, low-input trial, mating disruption, exclusion netting
apple-breeding

***Main geographical location:** CH0 Schweiz/Suisse/Svizzera

Other geographical locations: CH011 Waadt, CH012 Wallis, CH021 Bern, CH022 Freiburg, CH023 Solothurn, CH024 Neuenburg, CH025 Jura, CH032 Basel-Landschaft, CH033 Aargau, CH040 Zürich, CH052 Schaffhausen, CH055 St. Gallen, CH056 Graubünden, CH057 Thurgau, CH061 Luzern, CH063 Schwyz, CH066 Zug, CH070 Tessin

***Summary (native language):**

Moderne integrierte Obstproduktionssysteme setzen zur Bekämpfung von Schädlingen, Krankheiten und Unkräutern vor allem auf selektive und nützlichsschonende Pflanzenschutzmittel. Dies bedingt den Einsatz einer grösseren Anzahl verschiedener Wirkstoffe, die als Rückstände auf den Früchten nachweisbar sein können. Konsumenten erwarten aber eine Reduktion des Pflanzenschutzmitteleinsatzes in der Landwirtschaft und idealerweise die Eliminierung von Rückständen der Pflanzenschutzmittel, um Auswirkungen auf die Umwelt und die Gesundheit zu minimieren. Grossverteiler haben dementsprechend Qualitätsmanagement-Systeme lanciert, um die Gesamtmenge an Rückständen und die Anzahl der verwendeten Pflanzenschutzmittel zu reduzieren. Agroscope hat bei Äpfeln in einem mehrjährigen Versuch die Möglichkeiten einer rückstandsfreien Produktion aus agronomischer und ökonomischer Sicht geprüft. Die Ergebnisse zeigen, dass die Produktion von rückstandsfreien Tafeläpfeln unter Schweizer Bedingungen möglich ist, wenn die Pflanzenschutzstrategie gegen Pilzkrankheiten angepasst wird und alternative Methoden wie Totaleinnetzung gegen Schädlinge, Verwirrungstechnik gegen den Apfelwickler (*Cydia pomonella*), Mulchen des Falllaubs zur Reduktion des Schorfinokulums (*Venturia inaequalis*) und moderne Lagerungstechniken eingesetzt werden. Mit der Umsetzung einer solchen Strategie in der Anbaupraxis liesse sich ein wichtiger Konsumentenwunsch erfüllen. Allerdings rentiert diese Strategie ohne Preisdifferenzierung gegenüber der integrierten Produktion ökonomisch bisher nicht. Forschung, Beratung und Produktion sind gefordert! Sie müssen gemeinsam Methoden für eine wirtschaftliche, umwelt- und konsumentenfreundliche Produktion von Qualitätsobst entwickeln.

Summary (english):

Integrated fruit production systems rely on pest, disease and weed control with specific pesticides, which spare beneficial organisms. This leads to crop protection strategies with a larger number of different pesticides. However, consumers demand a reduction of pesticide use in agriculture and ideally an elimination of pesticide residues in order to minimize the impact on the environment and on risk for human health. Wholesalers introduced quality management systems in order to reduce residues and the used plant protection products. Agroscope tested during several years from a technical and economic point of view a low residue strategy. The production of residue-free apples is possible under Swiss conditions if the crop protection strategy against fungal diseases is adapted and alternative measures such as insect exclusion netting, mating disruption against codling moth (*Cydia pomonella*), mulching with leaves to reduce scab (*Venturia inaequalis*) inoculum, and modern storage techniques are applied. The production of low-residue apples meets consumer demand, but the economic calculation showed that the low-residue strategy is not profitable without a price premium compared to integrated production. Research, advisory services and production are challenged to develop profitable eco- and consumer-friendly production systems for high quality fruits.

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. 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 [Andreas Naef, Agroscope]

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Country: Switzerland
NUTS 3 region(s)²: CH0 Schweiz/Suisse/Svizzera
WP no. and title: 3 – Reduction in pesticides residues – pomefruits
Date: 09052017

Source materials and methodology

1) Decision support systems

Pome and stone fruits

Every second year, Agroscope, the Swiss centre for agricultural research, publishes recommendations for plant protection in commercial fruit production. For 2017, this booklet has been supplemented with an updated list of plant protection products (Kuske et al. 2017: Flugschrift Nr. 122 (Aktualisierte Beilage): Empfohlene Pflanzenschutzmittel für den Erwerbsobstbau). This document is used in practice as an independent guideline for selection of products.

Due to limited resources, Agroscope had to stop the weekly plant protection bulletin for fruit production. After intensive discussions with the fruit production sector, the Agroscope bulletin could be replaced with a joint bulletin of several regional advisory services, which are supported by Agroscope with three information meetings during the season.

Agroscope provides several webpages with disease and pest modelling and monitoring information:
www.agrometeo.ch (apple scab infection forecasting, wheater data, pest monitoring data, crop stage data)
www.sopra.ch (pest forecasting)
www.feuerbrand.ch (fireblight forecasting)

For apple scab, a new model for prediction of infections was implemented. Monitoring is mainly done by research farms and advisory services but rarely by producers.

3) Chemical strategies

Pome fruits

Agroscope started a low-input trial with scab sensitive and scab resistant apple varieties several years ago. Results are described in the general summary. In 2017, two new projects were started. An international project in the Lake of Constance region aiming to build up demonstration orchards with innovative plant protection strategies and a collaboration with the fruit trading company aiming to build up a network of farmers producing low-residue apples.

Stone fruits

Agroscope started a new trial to control *Pseudomonas* in cherries with a combination of chemical treatments with acid clay and Bion and non-chemical preventive measures such as white stem painting and summer pruning.

4) Bio-control

Pome fruits

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

Mating disruption against codling moth is used by about 50% of the apple growers of the Lake of Constance area. In 2017, Agroscope performs a test with aerosol emitters, which actively puff pheromone into the air. The combination of mating disruption and granulosis virus is mainly used by organic producers (about 10%).

Since streptomycin has been banned in Switzerland, many farmers are using a combination of biocontrol with yeasts (Blossom Protect), acid clay (Myco-Sin) and potassium aluminium sulphate (LMA) to control fireblight.

5 Physical Barriers

Pome fruits

In 2005, Agroscope started trials with exclusion netting first on apples to control moths. The exclusion netting is used only by pioneers farmers and orchards next to extensively managed high stem trees to prevent bees, contaminated with fireblight bacteria, to enter the orchards.

Stone fruits

At the beginning, trials with exclusion netting on cherries were done to find an alternative to the withdrawn insecticide dimethoate used to control the cherry fruit fly. Despite of promising results, this method was rarely implemented by producers because of higher costs. Since 2015, the situation has completely changed. In table cherry production, exclusion netting is used in combination with spinosad treatments to reach a 100% control of spotted wing drosophila. However, a reduction of residues is questionable, because additional treatments against the new pest may result into additional residues.

6) Mechanisation

Pome and stone fruits

Mechanical thinning is used only by organic farmers but mechanical weeding is becoming more important in integrated production – mainly due to political pressure. In 2016 a demonstration day was used to show different machines available. In addition, a project has been started to test mechanical weeding in integrated cherry production.

7) Genetics

Pome fruits

The Agroscope apple-breeding program focusses on robust varieties. The most promising candidates from this program and from other breeders are tested under a standard IP plant protection strategy and a low input strategy with reduced use of synthetic pesticides.

Best practice findings

As described in 2016, the invasion of new pests and diseases such as the spotted wing drosophila and the withdrawal of pesticides like dimethoate and streptomycin and the first Swiss national action plan to reduce risk of pesticide use, becoming operative this year, have changed the mind of many producers and cooperatives. Cooperatives and regional advisory services intend to establish a net of demonstration farms with low-residue crop protection strategies. Researchers of Agroscope are involved as experts in these initiatives.