Scanning report (EIP format for practice abstracts)

***Project title (native language):** **EUFRUIT: RETEAUA EUROPEANA IN POMICULTURA**

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

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Section A. Summary for EIP dissemination

***Keywords:** organic apple, pestes and diseases, Trichogramma evanescens, natural products

***Main geographical location:** RO321 Bucharest

Other geographical locations: 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

***Summary (native language):**

Sunt prezentate doua exemple legate de reducerea rezidiilor de persticide în fructele de măr: i) programul de protectie față de boli și dăunători pentu o livadă ecologică de măr, bazat pe insecticide/repelenți pe bază de uleiuri minerale sau din plante și fungicide pe bază de cupru, sulf și extracte din plante; ii) posibilitatea reducerii numărului de tratamente insecticide care au ca țintă *Cydia pomonella* și, implicit a reducerii poluării mediului prin aplicarea produslui Trichotim, care are ca ingredient activ viespea entomofagă *Trichogramma evanescens*.

Summary (english):

Two examples are presented as practice to minimize pesticide residues in oapple fruits: i) pest and diseases protection program applied in an organic apple orchard, based on insecticide/repelents mineral or plant oils and sulfur, copper-based fungicides or natural fungicides as plant extracts; ii) the possibility of reducing the number of insecticides teatments for *Cydia pomonella*, and thus reducing environmental pollution through application of Trichotim, a bioproduct based on parasitic wasp, *Trichogramma evanescens.*

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, Nl322 Alkmaar en omgeving, NL338 oost Zuid-Holland, NL33A zuidoost Zuid-Holland, NL341 Zeeuws-Vlaanderen, NL342 overig Zeeland, Nl411 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 Hamphshire, 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. Realizarea unei rețele europene care are ca focus sectorul de fructe
2. Dezvoltarea și implementarea unei abordări sistematice pentru scanarea și sintetizarea cunoașterii practice și științifice existente
3. Stabilirea unui dialog continuu cu organisme recunoscute de politici europene, naționale și regionale
4. Identificarea și sprijinirea unor noi domenii prioritare de cercetare prin monitorizarea continua și analiza activităților de cercetare-inovare existente și viitoare.

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 report[1]

Scanning report
Iacomi Beatrice Michaela

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Country: Romania

NUTS 3 region(s)[2]: RO321 Bucharest

WP no. and title: WP3 Reduction in pesticide residues

Date: 10.04.2017

Source materials and methodology

The data are collected from research reports or database of esearch institutions and public institutions as Ministry of Agriculture and Rural Development (National Program of Rural Development). Unfortunately, there is a little or no readely available informations with regard to the best practice applied in fruit orchards to minimize pesticides residues. When interviewed, growers indicated resistant varieties, cultural practices and resonable pesticides treatments. There is still a lack of data on integrated or ecological apple production in different regions of Romania, no national statistics being presented/conducted. Furthermore, there is a lack of data shared by farmers on their personal technological program. In a research on internet, we have found some well known examples of ecological apple orchards in Romania.

Damianov S. Stef R., Grozea I., Vîrteiu A.M., Carabet A. 2014. Research concerning the biological control of codling moth (*Cydia pomonella*) using the entomophagous wasp *Trichogramma* sp. in the Caransebes pomicultural basin. 2014. *Research Journal of Agricultural Science*, 46 (1): 189-193
Mihele D., Stănică F. 2016. Establishing an organic apple orchard. Disertation.
(https://www.lumeasatului.ro/articole-revista/1154-lucrari-de-intretinere-intr-o-plantatie-ecologica.html).
(http://www.ebihoreanul.ro/stiri/ultima-or-31-6-20-41/eco-merita-cea-mai-mare-livada-de-mere-ecologice-din-romania-este-la-chersig-111270.html?mobile=no)
(*https://www.youtube.com/watch?v=yuVNkefEJF4*).

Best practice findings

Ongoing research

1. Case study: *Establishing an organic apple orchard*. USAMV Bucharest orchard. Mihele Dan, Florin Stănică (2016)
The biological material was represented by Topaz, Goldrush and Rubinola cultivars grafted on the rootstock M9 and René® Civren, Gemini Gaia Fujion, grafted onto rootstock M9 T337 Smeralda. The main diseases and pests which have been identified in apple orchard were: powdery mildew (*Podosphaera leucotricha*), brown rot (*Monilinia fructigena*), woolly apple aphid (*Eriosoma lanigerum*), green apple aphid (*Aphis pomi*), San José Scale (*Quadraspidiotus perniciosus*), and codling moth (*Cydia pomonella*). Pest and diseases management program was based on Ovipron (mineral oil), Oleorgan (Neem oil), Kabon (plant oils), Laser 240 SC (spinosad), Deffort (pest repelent) – as insecticides and Microthiol (sulphur 80%), Mimox (Mimosa tree bark extract), Bouillie bordelaise (copper) as fungicides. Pheromone traps (AtraPom) have been also installed for *Cydia pomonella*. Almost all apple growers used pheromone traps for monitoring and risk assessment of pests. So, the treshold is established and the decision to aplly treatments is made, with more effective pesticide application.

[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

2. **Case study. Biological control of codling moth (*Cydia pomonella*) using the entomophagous wasp *Trichogramma evanescens*** (Damianov et al., 2014)

Codling moth is the most destructive pests in apple orchards in Romania. Its alternative hosts can be pears, quinces and walnuts. The control of the codling moth can prove to be difficult due to the overlapping of its generations and the limited time when spraying can be applied, which is the period between the hatching of the maggots and their entrance into the fruit. Once the larvae have entered the fruit, control is not possible. Fortunately, there are a number of non-chemical methods available to control codling moth as mating disruption, habitat management and other measures to stimulation the growth of predator populations.

In the last few years, there has been significant increase of the attack by the codling moth in Western Romania. To reduce the population of this pest, we used the product Trichotim and *Trichogramma evanescens* as an active ingredient. Trichotim was applied 3 times on the two generations of the pest (2 applications in the first generation and 1 application in the second generation): applied rate of 300.000 wasps/ha, of which 250.000 wasps on the first generation and 50.000 wasps on the second generation. The entomophagous *Trichogramma* evanescens was launched two days after the flight peak of *Cydia pomonella*. The biological product Trichotim was applied with good results to control the two generations of codling moth. The efficacy and the increased yield recorded recommend the use of Trichotim as an IPM element in apple orchards. When applied at a rate of 300.000 wasps/ha, the product reduces with 4 the number of chemical treatments and, so, a reduction of environmental pollution on apple tree plantations of 25%.

Organic apple fruit orchards in Romania

1. *Proviva orchard*. At 25 km southeast of Satu Mare in Homodoru village, is the first certified organic orchard in the county, which belong to engineer loan Pop. The farm has a total area of 13.95 ha 4 ha are planted with apple. Speaking strictly about apple, the engineer loan Pop used varieties with high resistance to scab and powdery mildew: Florina, grown on 1.70 ha, Prima, Rawena and Remo. Although these cultivars have increased resistance to scab and powdery mildew, some preventive treatments are applied. The scheme differs from year to year. In the autumn, after falling leaves, trees are sprayed with a product based on copper. In winter or spring, a product based on oils is applied. In the spring, before flowering, if necessary, two treatments are applied, with copper products. During the growing season, Laser 240 SC and copper are applied (https://www.lumeasatului.ro/articole-revista/1154-lucrari-de-intretinere-intr-o-plantatie-ecologica.html).
2. *Cheresig orchard*. Constantin Demian is the manager of the biggest organic apple orchards of Bihor and Romania. Every orchard in Cheresig put up for sale "clean" apple as in grandparents times plus one tone of natural apple juice. He used as fertilizer manure or dolomite and insecticides are accepted if they are made of plant extracts (http://www.ebihoreanul.ro/stiri/ultima-or-31-6-20-41/eco-merita-cea-mai-mare-livada-de-mere-ecologice-din-romania-este-la-chersig-111270.html?mobile=no)
3. ***La Mosie orchard.*** Situated at a short drive from Bucharest, in Adunatii Copaceni, Giurgiu. The orchard coverd over 25 hectares whith over 10 different apple cultivars(Fuji, Golden, Granny Smith, Jona Gold, Braebum, De Costa and others). Fruits are delivereed to retailer and markets (*https://www.youtube.com/watch?v=yuVNkefEJF4*).