



Retour sur la réunion du Groupe de Travail EUVRIN "IPM in Vegetable production"

Bruxelles, 27-28 Novembre 2018



Objectifs de la réunion



- découvrir sur quoi les collègues travaillent
- identifier des opportunités de collaboration
- en tant que groupe: identifier des priorités pour EUVRIN
- discuter d'activités futures d'EUVRIN
- réunions futures
- leadership & organisation – comité restreint (volontaires?)
- autres activités à engager ensemble ?
- retour du groupe pour le Conseil d'EUVRIN ?

17 participants:

France: 10 (APREL, Caté, CTIFL, INRA, Terres d'Essais, Vegenov)

Belgique: 3; Pays Bas: 2; Suède: 1; Royaume Uni: 1

27th November		Speaker
13.00	Introduction to meeting and IPM in the open field	Rosemary Collier
13.20	Thrips control in leek, onions	Nathalie Cap,
13.40	Plant resilience (general outline for research opportunities, collaboration)	Kirsten Leiss
14.00	Harvesting molecules: New crops for plant protection and improved resilience	Azucena Gonzalez Coloma
14.20	Current IPM research lines on vegetable crops at IRTA	Nuria Agusti, IRTA
14.40	IPM against root pathogens in strawberry cultivation in tunnel	Sammar Khalil, SLU
15.00	<i>Tea and coffee break</i>	
15.20	Studies at Vegenov and CATE	Sarah Danan
15.40	Current studies run at CTIFL and research perspectives	Benjamin Gard
16.00	Info about INRA's ambition for "zero pesticide agriculture" for Horizon-Europe	Philippe Nicot
16.20	Research at Lelystad	Paula Westerman, WUR
16.40	Discussion and agree ideas for breakout group discussion on 28 th November	
17.15	<i>Meeting ends</i>	
28th November		
9.00	Breakout groups and feedback	
11.00	<i>Tea and coffee break</i>	
11.20	Future actions for the group – structure, activities etc	
13.00	<i>Meeting ends</i>	

Projects in the UK

Rosemary Collier, Univ. Warwick



- SEPTREplus – **novel insecticides and biocontrol agents** for vegetable crops 1.4 M£
 - 21 new trials in 2018 (6 weeds, 9 pests, 6 disease)
 - 20 crop protection companies contributed
- Insects
 - **virus/aphid control** in carrot
 - IPM **root-feeding fly** - pests of vegetables (C-IPM)
 - Combining host plant resistance and biocontrol (**aphids in brassicas** – Dave Chandler)
 - migrant moths – **Plutella xylostella**, **Autographa gamma** waarnemingen.be
 - **decision support**
- diseases
 - **Fusarium** (onion, **lettuce**)
 - Sclerotinia (lettuce)
 - identification of resistance traits (pest & disease resistance, resilience)

Thrips control in leek

Nathalie CAP, PCG Vegetable Research Center East Flanders (near Ghent)



- Info about the center:
 - non profit organization founded in 1977
 - funding from government, projects, sector
- Nathalie CAP – MS from Ghent Univ
- Thrips – situation 2017-2018
 - *Thrips tabaci* quality loss in leeks, onion, Brussel sprouts
 - 2017-2018: severe problem; 8-9 treatments, not efficient
 - less damage in Organic production => role of natural enemies?
 - ex: of predators *Aeolothrips intermedius*, lacewings, Orius
 - => project submitted about possible use of natural predators
 - Koppert trials in Netherlands / Brussel sprouts 300 €/ha
 - no differences among varieties of leeks
 - frequent irrigation => clearly less damage
 - evening spraying is more efficient
- Future work
 - irrigation
 - predators
 - spraying technique & timing (Brussel sprouts)

Harvesting molecules: new crops for plant protection

Azucena González-Coloma, Consejo Superior de Investigaciones Científicas (CSIC), Madrid



- **bioprospection:**
 - wild or cultivated plants
 - associated endophytic fungi
- Example: antifungal & insiecticidal compounds from *Artemisia absinthium*
 - toxic compounds in Absinthe: thujone
 - => select thujone-free germplasms
 - essential oil: strong antifungal and insect repelling effect – chrysanthenol
 - water extract: in vitro effect against Rootknot nematodes (*M. javanica*)
 - Pilot trial by company in Zaragoza
 - in vitro multiplication of the plant
 - questions: **priming effect on plants?**
 - collaboration with Univ Torino on thyme & other essential oils

Current research lines on vegetables at IRTA

Nuria Agusti (IRTA, Cabrils)



- **Sustainable Plant Protection Program** on Vegetables at IRTA:
 - **entomology**: biology and ecology of pests and their natural enemies
 - develop biocontrol methods
 - **search for natural enemies**
 - design **sampling methods to decide best treatment timing**
 - **conservation biological control**, companion plants (ex **Globularia**, used commercially in lettuce in California, Benjamin: info good effect against aphids – attracts hoverflies) (ex: **Calendula**), landscape management
 - integration with pollination issues (bee hotels near the crops)
 - invasive and emergent alien species
 - select flowering plants as refuge for parasitoids against *Tuta absoluta*
 - molecular methods related to biocontrol of pests
 - taxonomy of species
 - trophic networks
 - insect movements from refuge plants to crops
- **Mycorrhizae**
 - control of soilborne pathogens
 - formulation of inocula
 - effect on natural enemies of arthropods

IPM against root pathogens in strawberry

Sammar KHALIL (SLU, Alnarp)



- Tendency in Sweden = move strawberry from field to tunnels (extend season)
- Problems with root pathogens when changing from soil to substrate (peat, pumice, coconut fiber) - Phythophthora
- **Zero pesticide objective**
- Chemicals
 - potassium phosphite – interactions with other components of IPM system?
- LED light against powdery mildew
- Need for tools against Botrytis
 - **plant extract** (from blueberry) sprayed on leaves
 - **side effects** on plant growth, soil microflora
- **Aquaponic systems** (with fish) – tomato, herbs, lettuce, strawberries

Studies conducted at Vegenov and Caté

Sarah Danan (Végénov), Marine Guerret (Caté)



- **Plant level**

- develop **DSS** and identify **damage thresholds**
(spore traps - *Vigispores* shallots /3 key foliar diseases)
- genetic diversity (identify resistant cultivars)
- search for **natural enemies** / replacement of neonicotinoid
(*Agronicoleg* - attract natural enemies of lettuce aphids in artichoke crops)

- **Practice level**

- promote biocontrol (*NASPA* Screening of marine-based bioproducts)
- system level trials 50% reduction in pesticide use (*Ecophyto* Dephy)
- promote robots for pest detection and treatments (*UV ROBOT* – UVC / powdery mildew)

- **Soil level**

- biodiversity (characterize microbial communities, impact of innovative practices, identify practices that foster beneficial microbes)
- new biocontrol agents (*CORAL* – white rot of *Allium*)

- **Future**

- screening of varieties (resistance to pests)
- screening for new biocontrol agents, mass trapping, sterile flies)
- develop DSS / damage threshold
- develop robots

Current studies conducted at Ctifl

Benjamin GARD (Ctifl)



- Presentation Ctifl
- Projects Balandran
 - 3 projects in ECOPHYTO PSPE2
 - Acarosol (mites / eggplant)
 - IMPULsE (phytophagous bugs in vegetable crops – tomato, cabbage, eggplant)
 - DSS & damage thresholds
(spore traps ex: Vigispores project 3 main foliar diseases of shallots)
 - H2020 - EUCLID
(essential oils / white fly, plant stimulators / powdery mildew, *Bacillus firmus* / root knot nematodes)
 - CASDAR
- **Future**
 - management of **Thrips** (*Frankliniella*) on strawberry - how to **improve biological control** (predatory bugs & mites)
 - **sterile insect techniques** (SIT) against moths & flies (Codling moth, *Drosophila suzuki*)
 - **plant functional diversity** (banker plants, improve habitat to improve biocontrol **in soilless greenhouses**)
 - **toxicity of PPP** (especially "biocontrol" products) **against natural enemies** & improve compatibility

Research at Lelystad

Paula Westerman (WUR, Lelystad)




- Crop protection in the NL in 2030
 - In the polders, vegetables are "arable crops" (in rotation with any other field crops)
 - BO Green Crop protection, BO Pollinators
- Test location Agroecology & technology in Lelystad
 - H2020 / PPS **crop diversification / strip cropping**
 - H2020 Local proteins & robust varieties
 - Agroforestry
 - H2020 Crop mixtures
 - PPS healthy soil management (green manures, reduced tillage)

 - technology to support ecological functions (controlled traffic / small flexible **robots; detection and monitoring; DSS, thresholds**)
- BO Green Crop protection - **Systems approach**
 - arable farming, apple production, strawberry production, lily bulb production
 - goal = 2030 crop production without PPP that are on a blacklist

 - emphasis on crops that are important for the NL (potato, carrots, onion)
 - requirement: same yield



 TOWARDS CHEMICAL PESTICIDE-FREE AGRICULTURE



Working Group on Pests (animals, plant pathogens, weeds)

- **Convenors :**

Caroline Djian-Caporalino & Philippe Nicot (Inra),
Benjamin Gard & François Villeneuve (Ctifl)

- **Membres :**

Johanna Bodendorfer (Planète Légumes), Jérôme Lambion (GRAB), Mickaël Legrand (Unilet), Anne Le Ralec (AgroCampus ouest), Grégory Roy (Ctifl/LCA), Christian Steinberg (INRA), Anne Terrentroy (CA 13) Charlotte Berthelot (Ctifl Carquefou), Rachel Graindorge (ArmeFlhor), Béatrice Rhino (CIRAD), Jean-Marc Thevenin (Cirad), Marion Turquet (Invenio)



3 groupes de discussion

Besoin d'outils ("tool box" pour la protection intégrée)

- conservation biology
- natural plant/microbe extracts
- DSS
- weeds
- service plants (eg: control of nematodes) – effectiveness and side effects, breeding new varieties of service plants
- breeding for resistant crop varieties and plant resilience
- microbiome manipulation
- select endophytic fungi with specific excretion spectra (molecules with various desired properties)
- seed coating

Besoin d'intégration

Actions futures

Outils de partage d'information / site web EUVRIN (alternative = OILB?)

- partage de résultats publiés, y compris en "littérature grise"
(beaucoup de préoccupations communes)
- forums (vidéoconférences - groupes restreints) sur des problématiques ciblées?
- veille sur les appels à projet (mailing list)
- mise à jour du fichier des expertises

Prochaine réunion:

- octobre 2019 Stratford u/ Avon ? (conjointe avec Groupe OILB)
- thématiques scientifiques / techniques spécifiques à définir

Comité de pilotage:

Rosemary Collier, Vincent Faloya, Sarah Danan, Catherine Coutant,
Azucena González-Coloma