Insecticide Resistance Action Committee

Coleoptera WG Meeting

50th IRAC International Meeting, Dublin

April 7th, 2016

CropLife INTERNATIONAL

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ANTITRUST LAW REMINDER
for all CropLife International meetings

March 2015

I. Background

This Reminder has been **endorsed by the Board of CropLife International** as part of its commitment to compliance with the strictest and most developed antitrust laws and principles. It is intended to **provide antitrust guidance to CropLife International's members** when they interact, both at meetings (including via conference calls, webcasts and other means) hosted, organized or sponsored by CropLife International as well as in informal discussions before or after such meetings.

IRAC

Coleoptera WG Team Members

April 2014	April 2015	April 2016
Alan Porter (IRAC)	**Alan Porter (IRAC)**	**Alan Porter (IRAC)**
Anil Menon (BASF)	**Anil Menon (BASF)**	**Anil Menon (BASF)**
Ben Bolton (Nufarm)	*Gerald Huart (ADAMA) Chair*	**Brian Duggan (Nufarm)**
Gerald Huart (ADAMA) Chair	**Imre Mezei (Dow)**	**Chaoxian Geng (Dow)**
Imre Mezei (Dow)	*Magali Gravouil (DuPont)*	**Imre Mezei (Dow)**
Magali Gravouil (DuPont)	*Marie-Pierre Plancke (Nufarm)*	**Jan Elias (Syngenta)** *Vice-Chair*
Michel Sarazin (FMC)	*Faustine Fournie (FMC)*	**Niels Jacob Jakobsen (ADAMA)**
Ralf Nauen (Bayer)	**Ralf Nauen (Bayer)**	**Ralf Nauen (Bayer)** Chair
Russell Slater (Syngenta)	*Russell Slater (Syngenta)*	**Udo Heimbach (JKI)**
Udo Heimbach (JKI)	**Udo Heimbach (JKI)**	**Sacha White (ADAS UK)**
Steve Ellis (ADAS UK)	**Sacha White (ADAS UK)**	
N = 11 (8 companies)	**N = 11 (8 companies)**	**N = 10 (6 companies)**

IRAC

Agenda

1) Review minutes of last F2F meeting at Rothamsted Research
2) Coleopteran OSR pests
    a. Pollen beetle resistance monitoring poster 2015
    b. Status of pyrethroid resistance in CSFB in EU
    c. Other coleopteran pests of OSR
    d. Method changes
    e. Status - IRM trifold
    f. Scientific paper on CSFB kdr monitoring still interesting?
    g. Other
3) CPB IRM poster (review and approve final version)
4) WCR larvae testing method
5) Future directions and objectives 2016

AOB

Review meeting minutes (9/15)

Agenda:	
 Microsoft Word Document	1) Anti-Trust Reminder 2) Change of the WG members **3) Communication about the IRAC results on CSFB monitoring** 4) Amendment of IRAC 21 methodology (neonicotinoids/pollen beetle) **5) Amendment of IRAC 27 methodology (indoxacarb/pollen beetle)** 6) 2015 pollen beetle monitoring: first feedback **7) CPB poster** **8) Review of the Tri-fold leaflet for OSR pest IRM & Monitoring methodology (please see attached the last version initiated by Russell)** **9) CRW larvae methodology under IRAC template**

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Coleopteran OSR pests

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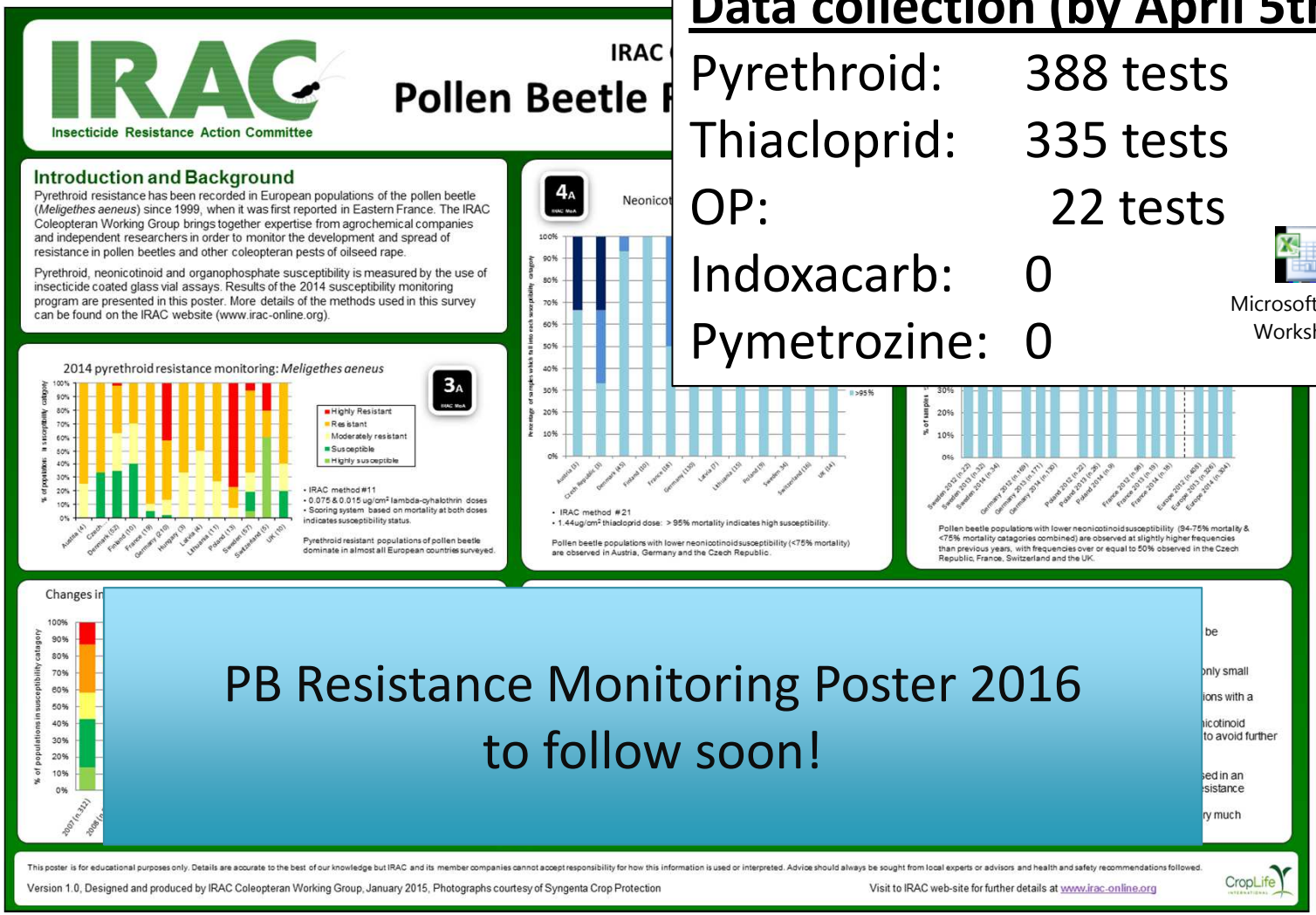
a) Pollen beetle RM poster 2015 data



PB Resistance Monitoring Poster 2016
to follow soon!

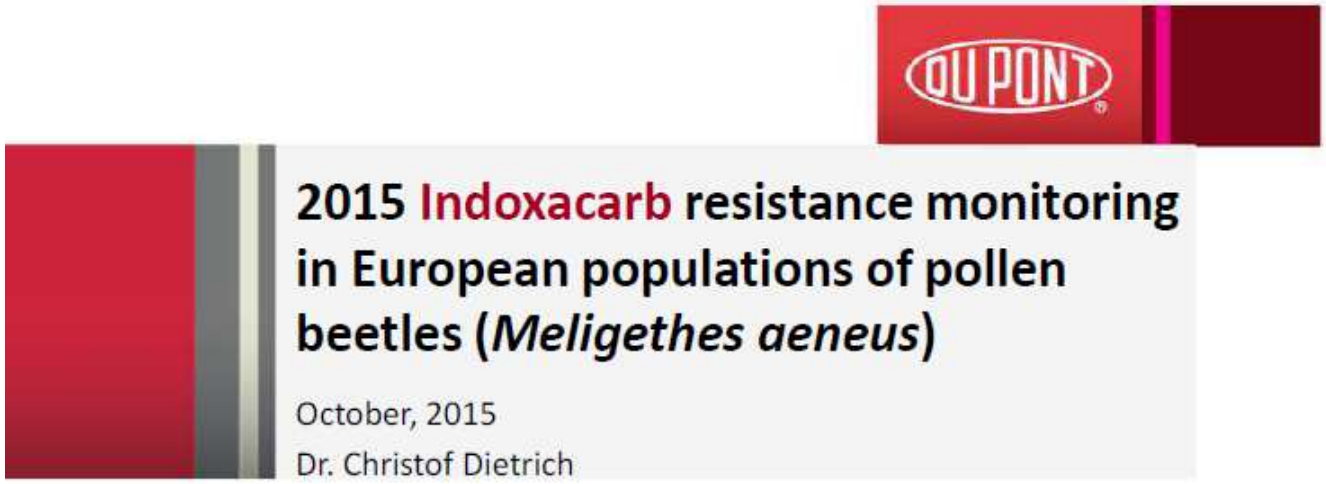
Data collection (by April 5th)

Pyrethroid:	388 tests
Thiacloprid:	335 tests
OP:	22 tests
Indoxacarb:	0
Pymetrozine:	0

Microsoft Excel Worksheet

IRAC

a) Pollen beetle RM poster 2015 data



- Dupont presented data on indoxacarb in Nov 2015
- Method 27 (two concentrations, all susceptible)
- Should we ask DIETRICH for his interest to join the WG?
- Asking if we can include data in PB RM Poster 2015?

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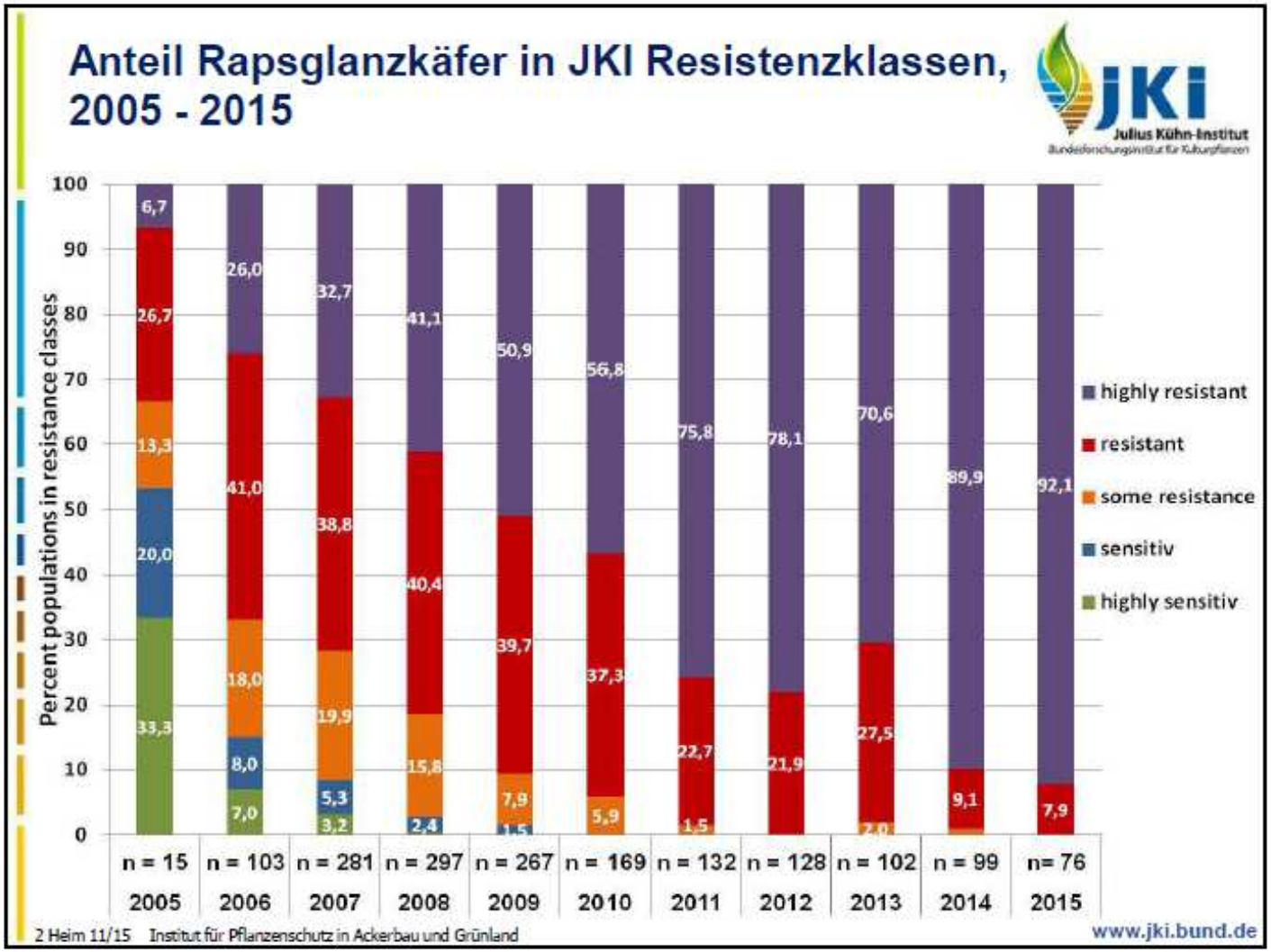
a) Pollen beetle pyr res over years (Germany; JKI data)



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a) Pollen beetle resistance monitoring

Meeting minutes, Sept 2015:

It was also decided to continue the monitoring in 2016 and think about a scientific paper that summarizes the monitorings carried out over the years

- Are monitoring activities planned in 2016?
  - Which member companies?
  - Which compounds?

- The last scientific WG paper (Slater et al, 2011) summarised pyrethroid monitoring data from 2007-2009!

  - Is the group interested in drafting a follow-up paper for PMS, summarising monitoring data from 2010-2015?

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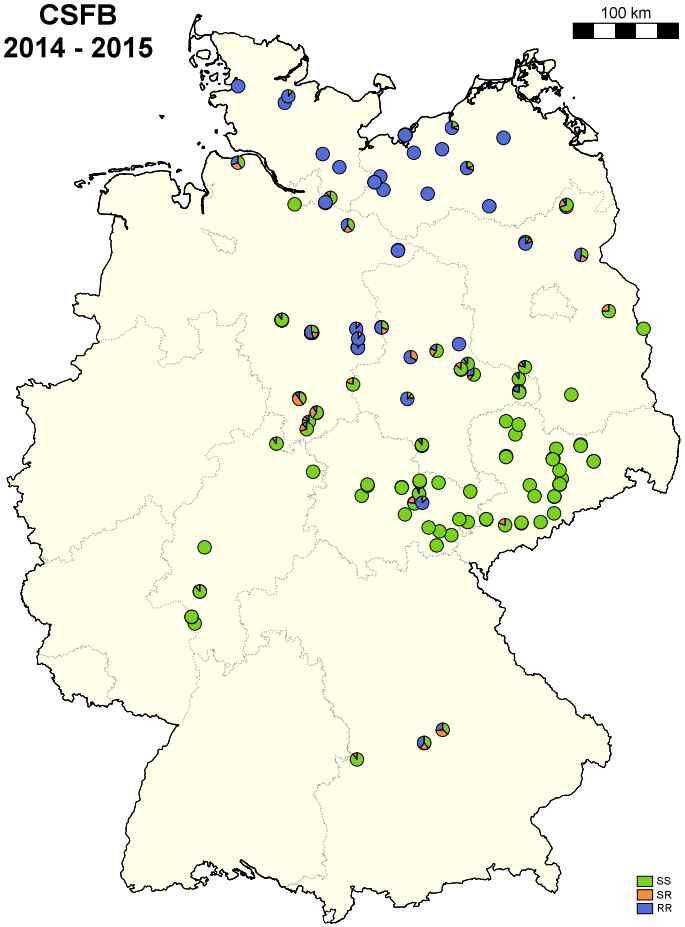
b) Status of pyrethroid resistance in CSFB

Source: Daum & Elias, April 2015



Source: Nauen *et al*., November 2015

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b) Status of pyrethroid resistance in CSFB

- Analyses of 2015 *kdr* data done (slide 8)
- Additional data late 2015/early 2016 available from Syngenta?
- Data from sources other then Bayer/Syngenta?
- Do we want to continue with monitoring next season?
- If yes, who wants to participate by providing samples?
- What else (e.g. specific CSFB IRM poster)?

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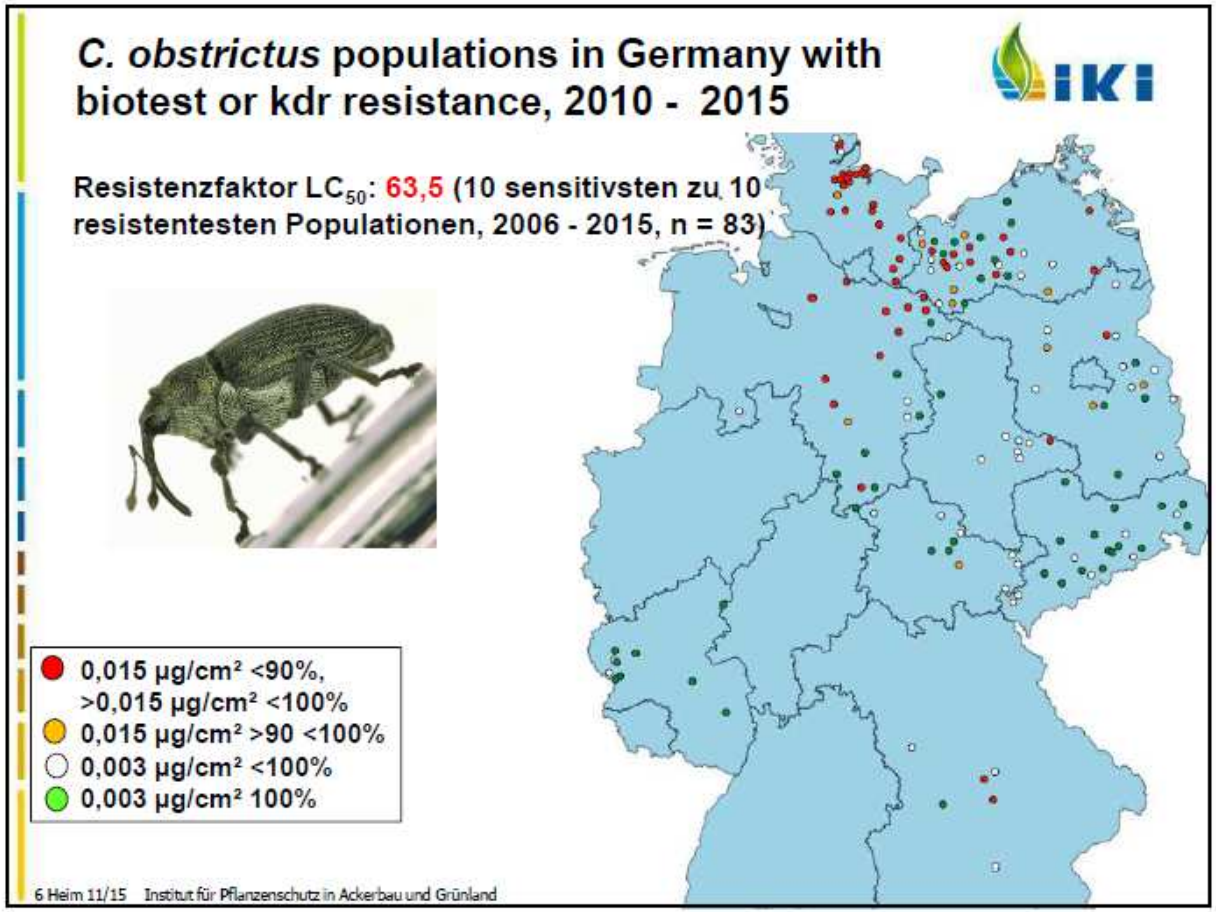
c) Other coleopteran pests of OSR

Cabbage seed pod weevil, Germany (JKI)



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c) Other coleopteran pests of OSR

Do we have other weevil species showing resistance to pyrethroids?

C. picitarsis (rape winter stem weevil), status France?

Any interest by WG in follow up work on weevils in 2016?

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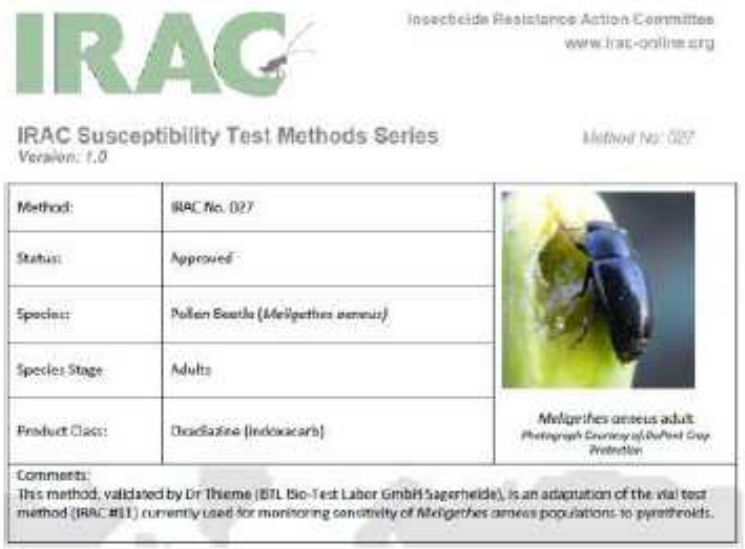
d) Method changes



IRAC

Insecticide Resistance Action Committee
www.irac-online.org

IRAC Susceptibility Test Methods Series
Version: 1.0

Method No: 027

Method:	IRAC No. 027
Status:	Approved
Species:	Pollen Beetle (*Meligethes aeneus*)
Species Stage	Adults
Product Class:	Oxadiazine (indoxacarb)

Meligethes aeneus adult
Photograph Courtesy of DuPont Crop Protection

Comments:
This method, validated by Dr Thieme (BTL Bio-Test Labor GmbH Sagerheide), is an adaptation of the vial test method (IRAC #11) currently used for monitoring sensitivity of *Meligethes aeneus* populations to pyrethroids.

IRAC Method #027*

- Glass vials with coated insecticide
- 4 replicates of 10 adults
- Evaluation 24 hours later

Tested rates in vials

- Untreated check (<20% for test validation)
- 2 discriminating rates:
  - **DC1 = 25% field rate** (63.25 ng ai/cm^2)
  - **DC2 = 100% field rate** (255 ng ai/cm^2)
- Expected mortality at DC rates: **>90 % recommended**

Amendment of IRAC 27 methodology (indoxacarb/pollen beetle)	**Contact Dupont in order to get news**	**GH**

?

Any other open method changes (OSR pests)?

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e) Status OSR IRM trifold

Review of the Tri-fold leaflet for OSR pest IRM & Monitoring methodology (please see attached the last version initiated by Russell)  Microsoft PowerPoint 97-2003 Microsoft PowerPoint 97-2003	The following amendments decided during this meeting are : **AP : CSFB : no application in June** **AP : Add Athalia roseum** **AP : provide information on this pest** **AP : Add the following recommendation regarding the resistance of weevil in autumn : Alternation of MoA is recommended** **AP : Add arrow on the right for foliar applications on weevil and flea beetle. The involved MoA are PYR, OP and NNI** **AP : Add one pest : rape winter steam weevil, application October to November** Recommendations of each MoA are kept as they are. **Add MoA in the methodology part** The other amendments were done during the meeting **AP : report the amendments and send the updated version to the WG**	 **GH** **GH** **IM** **GH** **GH** **GH** **GH**

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e) Status OSR IRM trifold

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Oilseed Rape Pest Resistance Management

Next steps

1. Carefully review drafted text again
2. Additional information necessary?
3. Need to change graphics?
4. Add winter stem weevil
5. No Google hits for *Athalia roseum*
6. Small subteam to finalise trifold
    1. Volunteers?
7. Final type-setting and printing
    1. Outreach team
        1. Getting a quotation
        2. How many copies?
        3. Dissemination?

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f) Scientific paper on CSFB

This year a communication was published through IRAC econnection
However during the previous the conf call of April 2015,
It has been decided to draft a paper to be published in scientific journal.
This papers will have two parts
Part I : results ; Part II : recommendations

Only the Kdr results will be reported (not those from bioassay)
Those data come from BCS and Syngenta. It has been proposed to include those from Rothamsted with a common signature.

The current data have a good geographical coverage (DE, UK, FR, PL, HU).
It would be interesting to present field trials in order to see the consequence of the kdr mutation on efficacy. This is can be possible only if the populations were collected from those field trials.
This was the case for populations collected by ADAMA
AP : **prepare summary of field trial results from Adama**
Treatments are : control, pyrethroids insecticide and Standard

Prepare results section

f) Scientific paper on CSFB kdr monitoring

PLOS ONE

RESEARCH ARTICLE

Incidence, Spread and Mechanisms of Pyrethroid Resistance in European Populations of the Cabbage Stem Flea Beetle, *Psylliodes chrysocephala* L. (Coleoptera: Chrysomelidae)

Dorte H. Højland[1], Ralf Nauen[2], Stephen P. Foster[3], Martin S. Williamson[3], Michael Kristensen[1]*

1 Department of Agroecology, Aarhus University, Forsøgsvej 1, 4200 Slagelse, Denmark, **2** Bayer CropScience AG, Pest Control Biology, Alfred Nobel Str. 50, 40789 Monheim, Germany, **3** Department of Biological Chemistry and Crop Protection, Rothamsted Research, West Common, Harpenden AL5 2JQ, United Kingdom

A recent paper published as collaboration between 3 groups (kdr & bioassay)

f) Scientific paper on CSFB kdr monitoring

- Are we still interested in publishing a scientific WG paper?

1. Recommendation part drafted , edited and close-to-final (Part 2)
2. Critical is Part 1 (data are no problem)
    1. How many kdr monitoring data do we have?
        1. Bayer/JKI et al. (approx. 200 samples!)
        2. Syngenta?
    2. Need to draft a section on the ADAMA field trial data and impact of the presence of *kdr*
    3. Could link those to the lab data published in PLoS One
3. Who is interested to take the lead?

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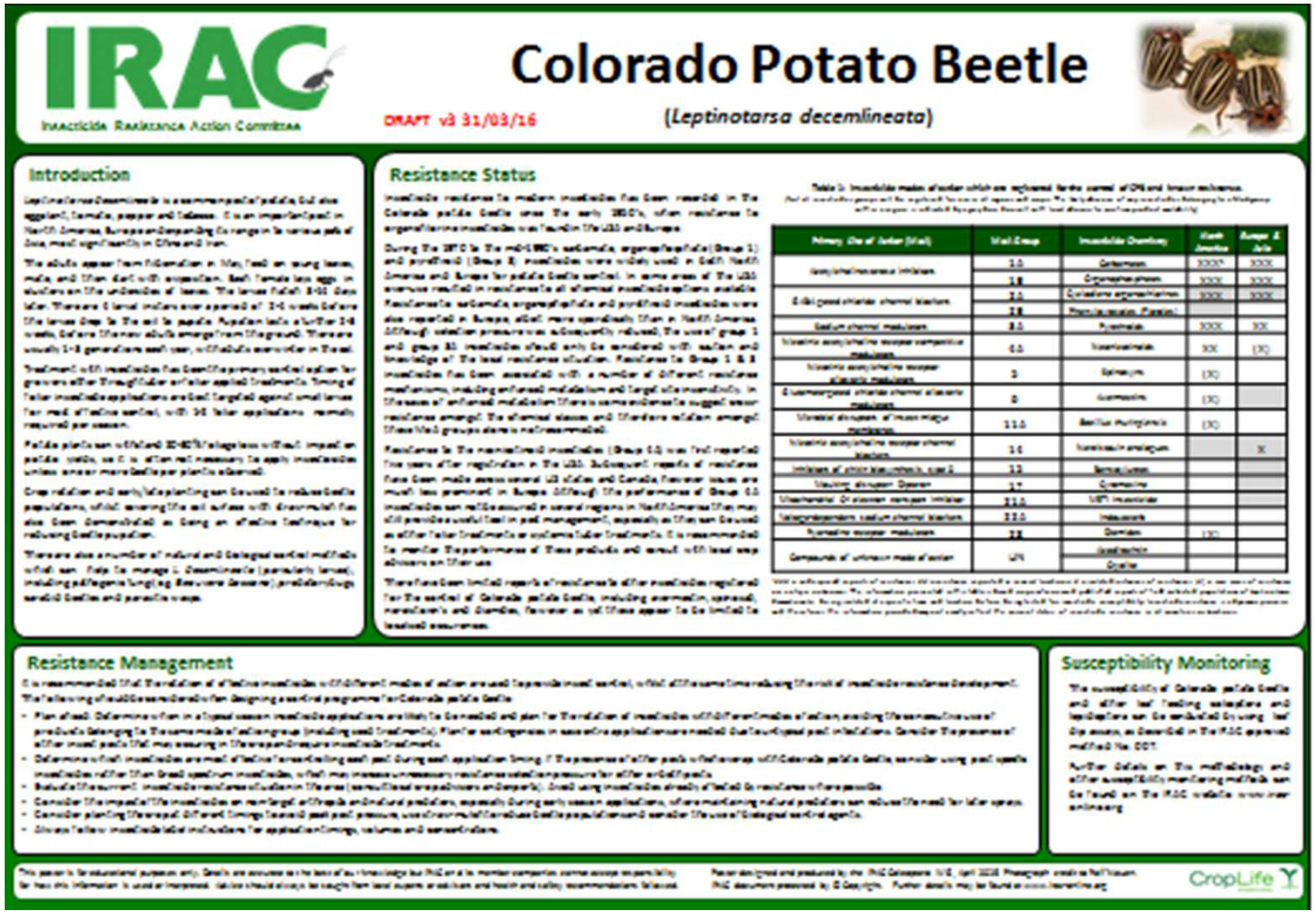
3) CPB poster



- Final version circulated (incl. edits by Udo Heimbach)
- Other suggested changes? If not, we can submit it to Outreach Team

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4) WCR larvae testing method

1. CRW larvae methodology under IRAC template	**AP : to do it**	**JE**

Status: Update from Jan?

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Goals	Objectives	Target completion date
Strengthen the WG and expand its remit by increasing membership and adding a wider range of coleopteran pests, respectively	• Seek for new (recent) WG member companies and represenatatives actively contributing to WG goals • Complete Colorado potato beetle IRM poster • Adjust Coleoptera MoA poster to latest MoA classification version 8.1 • Seek collaboration opportunities with Biotech WG by addressing WCR resistance issues and IRM • Constantly monitor situation on coleopteran pest resistance outside OSR and decide on actions	Q4 2016 Q2 2016 Q3 2016 Q4 2016 ongoing
Provide and validate methods for measuring the susceptibility of coleopteran pests	• To finalise the insecticide sensitivity testing method of CRW larvae and adults to a range of insecticides used for their control (e.g. vial tests) • Update the IRAC mmethod n°27 on indoxacarb with regards to test kit storage (DuPont) • Continuously monitor for weaknesses in OSR pest susceptibility testing methods	Q3 2016 Q2 2016 ongoing
Provide summarised information to all stakeholders on IRM strategies for key coleoptera pests	• Summarise current status and impact of target-site resistance in CSFB in European OSR by drafting a scientific paper • To produce a electronic (and print) version of a tri-fold which provides information on resistance, IRM advice and susceptibility monitoring assays for European oilseed rape pests. • Draft scientific paper on pollen beetle pyrethroid resistance monitoring results and impact 2010-2015	Q4 2016 Q3 2016 Q4 2016
Coordinate oilseed rape coleopteran pest sensitivity monitoring in EU	• Collaborate with public labs, regulators and other bodies involved in resistance monitoring of pollen beetle to prepare, share and interpret a joint set of monitoring data for 2015 season. • Collect CSFB samples to monitor the spread of kdr (and s-kdr) resistance in selected countries and provide data to the public • Provide AVT test kits to support resistance monitoring activities	Q1 2017 Q1 2017 Q1 2016
Provide information to all stakeholders for coleoptera pest control in an IRM context	• Review and incorporate new learning's from OSR pest research, including 2015 and recent resistance monitoring, into IRAC IRM recommendations for oilseed rape. • Provide summary poster of learning's from 2015 pollen beetle susceptibility monitoring. • Update summary poster of OSR pest resistance management recommendations. • Update Coleoptera WG website content • Provide information on coleopteran pests for IRAC pest pages on website by adding new species	ongoing Q2 2016 Q4 2016 Q2 2016 Q4 2016

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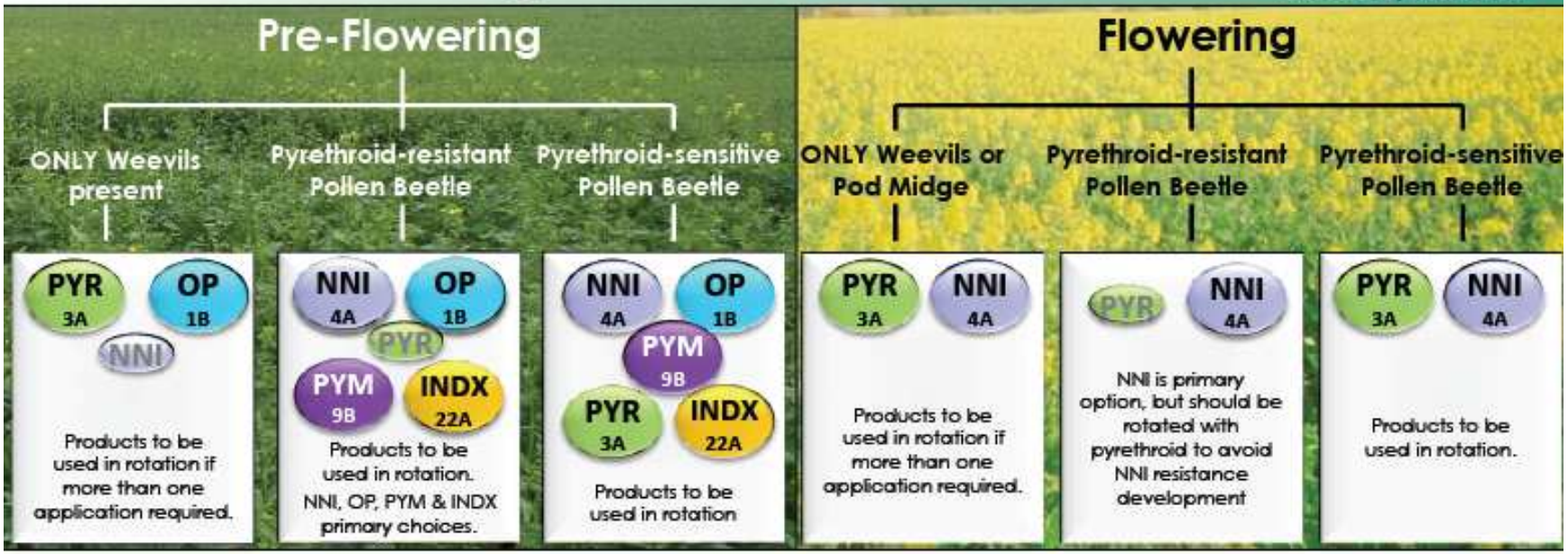
Oilseed Pest Management Decision Tree

Version 5, Feb 2011



- **ONLY apply insecticides IF locally recommended pest thresholds are exceeded.**
- **A maximum of two applications per mode of action (MoA) class should be utilised (excluding autumn applications).**
- **An application of a insecticide should NOT be followed by an application of an insecticide from the same MoA class.**
- **Utilise the most efficacious insecticide within its MoA class against INDIVIDUAL TARGET PESTS.**
- **If pyrethroid resistant pollen beetles are known to be present in the target crop then non-pyrethroid insecticides should be the primary choice for pollen beetle control.**
- **The use of insecticide mixtures containing pyrethroids for the control of pyrethroid resistant pollen beetle is not recommended. Where insecticide mixtures are used, it is recommended that the following insecticide application should be from a different MoA class than the mixture components.**
- **In countries where the insecticide spinosad is registered for use to control pollen beetle, it should be utilised in rotation with any other insecticide belonging to a different MoA class.**
- **If aphid control is necessary during the period when pollen beetle are present in the crop, insecticides not previously used in the current season for pollen beetle control are recommended.**
- **Where possible alternative methods of oilseed rape pest management should be employed.**

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1. Update Coleoptera MoA poster according to MoA classification v8.1
2. Seek for collaboration opportunities with Biotech team specifically addressing WCR IRM needs
3. Update Coleoptera WG website content
4. Update of general OSR IRM poster v5, Feb 2011
5. Do we want to add more Coleoptera pests to the IRAC pest pages?
    1. CSFB, weevils?
    2. WCR?
    3. Others?

6. Anything else to cover under AOB?

Any changes WG members and lead?

RN happy to continue as Chair?

JE happy to continue as VC?

Next meeting date?

Thank you !