

# Session 3

47<sup>th</sup> Meeting of IRAC International, Indianapolis

March 27-30<sup>th</sup> 2012

## Coleoptera WG





## Team Members

Insecticide Resistance Action Committee

### Team Leader, Deputy and Members for 2011/12

- Russell Slater, Syngenta (chair)
- Gerald Huart, Makhteshim (deputy chair)
- Michel Sarazin, FMC
- Chris Longhurst, DOW Agrosiences
- Ralf Nauen, Bayer CropScience
- Matthias Haas, Bayer Crop Science
- Anil Menon, BASF
- Magali Gravouil, DuPont
- Jean Paul Genay, NuFarm
- **Udo Heimbach, JKI (Germany)**
- **Steve Ellis, ADAS (UK)**
- Alan Porter, APA (IRAC Facilitator)

### Transition members in 2011/12

- Jean-Luc Rison, DuPont
- Lynne Matthews, BASF

### Team Goal Summary:

- To expand the remit of the team to include prioritised activities against a wider range of coleoptera pests.
- To provide researchers, validated methods for measuring the susceptibility of coleopteran pests.
- To provide summarised information to growers and influencers on available control options and strategies for controlling key coleoptera pests (posters, leaflets, etc).
- To co-ordinate oilseed rape coleoptera sensitivity monitoring in European oilseed rape crops, using validated methodologies.
- To provide oilseed rape pest sensitivity information to growers and regulators, so that informed decisions on oilseed rape pest control and resistance management can be made.

### 2011/2012 Activities:

- Generation of Coleopteran MoA poster.
- Colorado potato beetle Resistance Poster
- Drafting of a method for assessing the susceptibility of corn rootworm to chemical insecticides.
- Validation & finalising of methodologies for assessing the susceptibility of pollen beetles to indoxacarb, neonicotinoids and other oilseed rape pests to pyrethroids.
- Monitoring of pollen beetle susceptibility to pyrethroids, indoxacarb, neonicotinoids & organophosphates.
- Monitoring of the *kdr* target site mutation in field collected pollen beetle
- Publication of 2011 oilseed rape coleoptera susceptibility monitoring results.
- Presentation on pollen beetle at 9th International conference on pests in agriculture (Montpellier, 26-27<sup>th</sup> October).
- Apple weevil – Neonicotinoid susceptibility assessment in Germany



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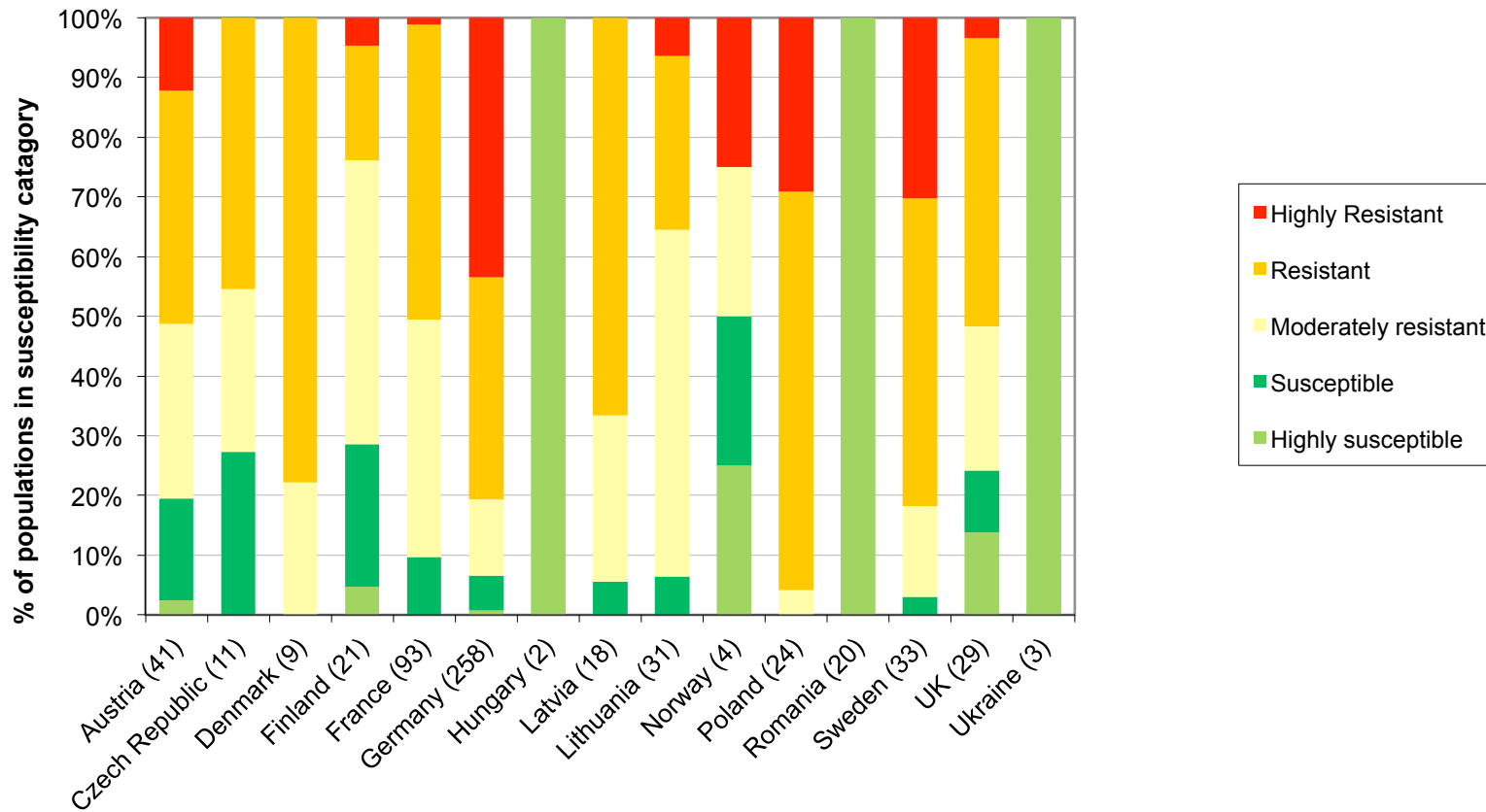
# Pollen Beetle Pyrethroid Resistance Monitoring 2011

NOTE: Please try to include postal code, as this makes mapping of samples easier

	Country	Region	Nearest Town	Date of test	L-cyhalothrin %	10	20	40	C	IRAC Susceptibility Category
1	Switzerland	Aargau	Stein	07.04.09	N	77	67	N	20	4
2	France	Indre et Loire	Joué les Tours	27.04.09	N	73	80	N	10	4
3	France	Indre et Loire	Reugny	04.05.09	N	62.5	100	N	13	4
4	Switzerland	Zurich	Dielsdorf	16.04.09	N	100	98	N	3	2
5	Czech Republic	South Bohemia	Kluky	21.04.09	N	95	100	N	3	3
6	Czech Republic	Zlin	Kromeriz	13.04.09	N	50	63	N	18	5
7	Czech Republic	Hradec Kralove	Nechanice	26.04.09	N	100	95	N	3	2
8	Czech Republic	Opava	Opava	15.04.09	N	35	70	N	0	5
9	Czech Republic	West Bohemia	Horšovský Týn	16.04.09	N	97	82	N	10	3
10	Czech Republic	South Moravia	Zabdice	21.04.09	N	65	7	N	5	4
11	Czech Republic	North Moravia	Kunin	21.04.09	N	16	33	N	5	5
12	Czech Republic	Jicin	Luzaný	22.04.09	N	69	82	N	50	4
13	Czech Republic	Praha Zapad	Bratrinov	27.04.09	N	92	96	N	0	3
14	Germany	Hannover								
15	Germany	Schleswig-Holste								
16	Germany	Mecklenburg Vorpom								
17	France	Cote-d'Or								
18	France	Saone-et-Loire								
19	Sweden	Skane								
20	Sweden	Halland								
21	Sweden	Halland								
22	Sweden	Halland								
23	Sweden	Halland								
24	Sweden	Skane								
25	Sweden	O.Gotland								
26	Sweden	O.Gotland								
27	Sweden	O.Gotland								
28	Sweden	Sormland								
29	Sweden	O.Gotland								
30	Sweden	Orebro								
31	Sweden	Orebro								
32	Sweden	O.Gotland								
33	Sweden	V.Gotland								
34	Sweden	V.Gotland								
35	Sweden	V.Gotland								
36	Sweden	V.Gotland								
37	Sweden	V.Gotland								
38	Sweden	Varmstland								
39	Sweden	Varmstland								
40	Sweden	Varmstland								
41	Sweden	Uppsala								
42	Sweden	Uppland								
43	Sweden	Uppland								
44	Sweden	Uppland								
45	Sweden	Uppland								
46	Sweden	Uppland								
47	Sweden	Uppland								
48	Sweden	Uppland								
49	France	Poitou Charentes								
50	France	Poitou Charentes								
51	France	Bretagne								
52	France	Poitou Charentes								
53	France	Bretagne	Brech	24.03.09	N	100	97	N	3	2
54	France	Poitou Charentes	Leignes Sur Fontaine	26.03.09	N	97	55	N	21	3
55	France	Pays de Loir	Roillon	31.03.09	N	94	67	N	9	3
56	France	Centre	Braslou	01.04.09	N	85	30	N	3	4
57	France	Centre	Buzançais	02.04.09	N	88	58	N	3	4
58	Germany	NRW	Leverkusen	06.04.09	N	88	61	N	3	4
59	Germany	Rhineland-Palatinate	Matzenbach	06.04.09	N	67	55	N	0	4

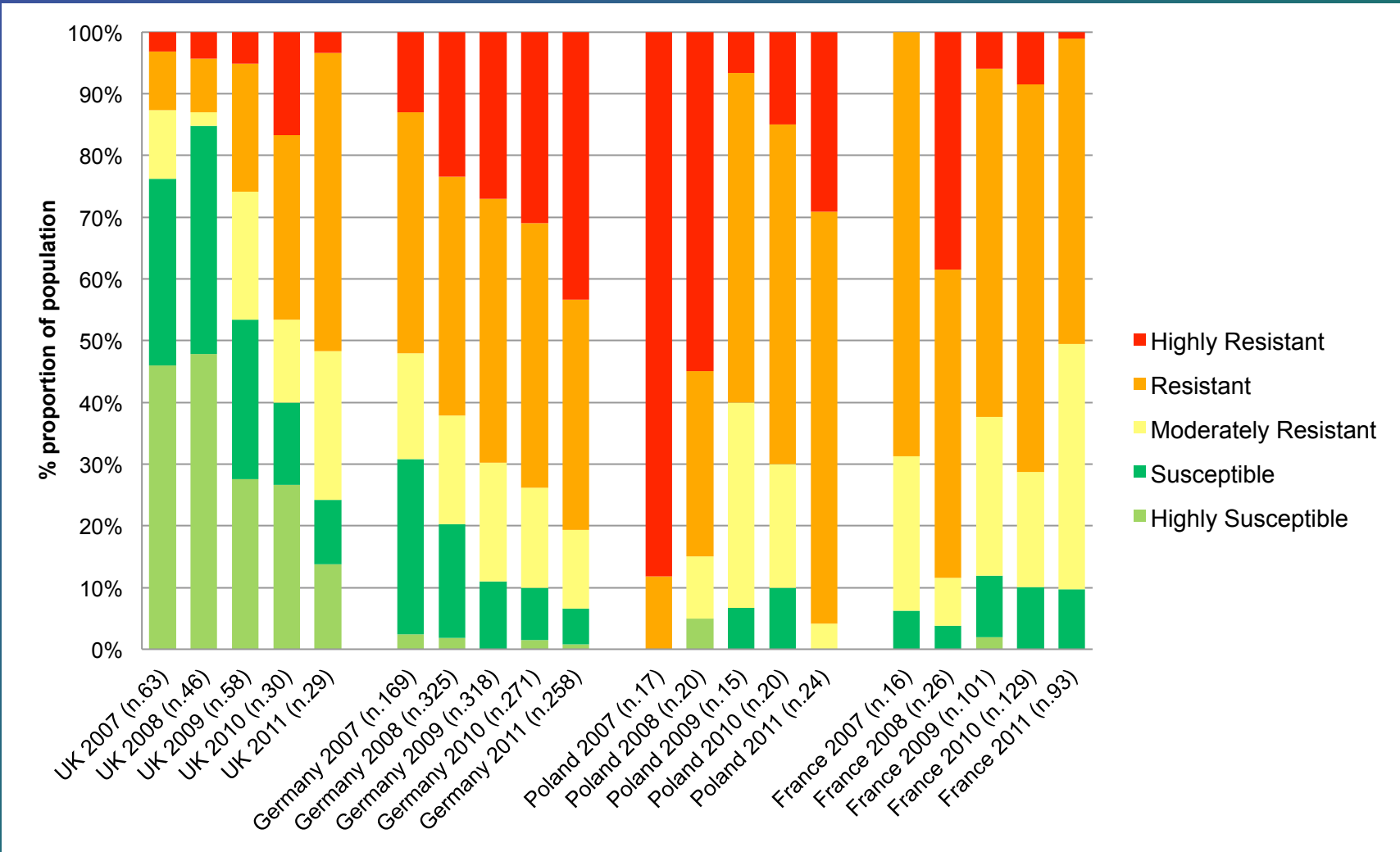
	2007	2008	2009	2010	2011
<b>Populations</b>	608	577	804	723	1183
<b>Countries</b>	10	17	20	15	15
<b>Insecticide MOA's</b>	1	1	1	1	4
<b>Beetles</b>	120,000	115,000	160,000	145,000	240,000

## 2011 pyrethroid resistance monitoring: *Meligethes aeneus*





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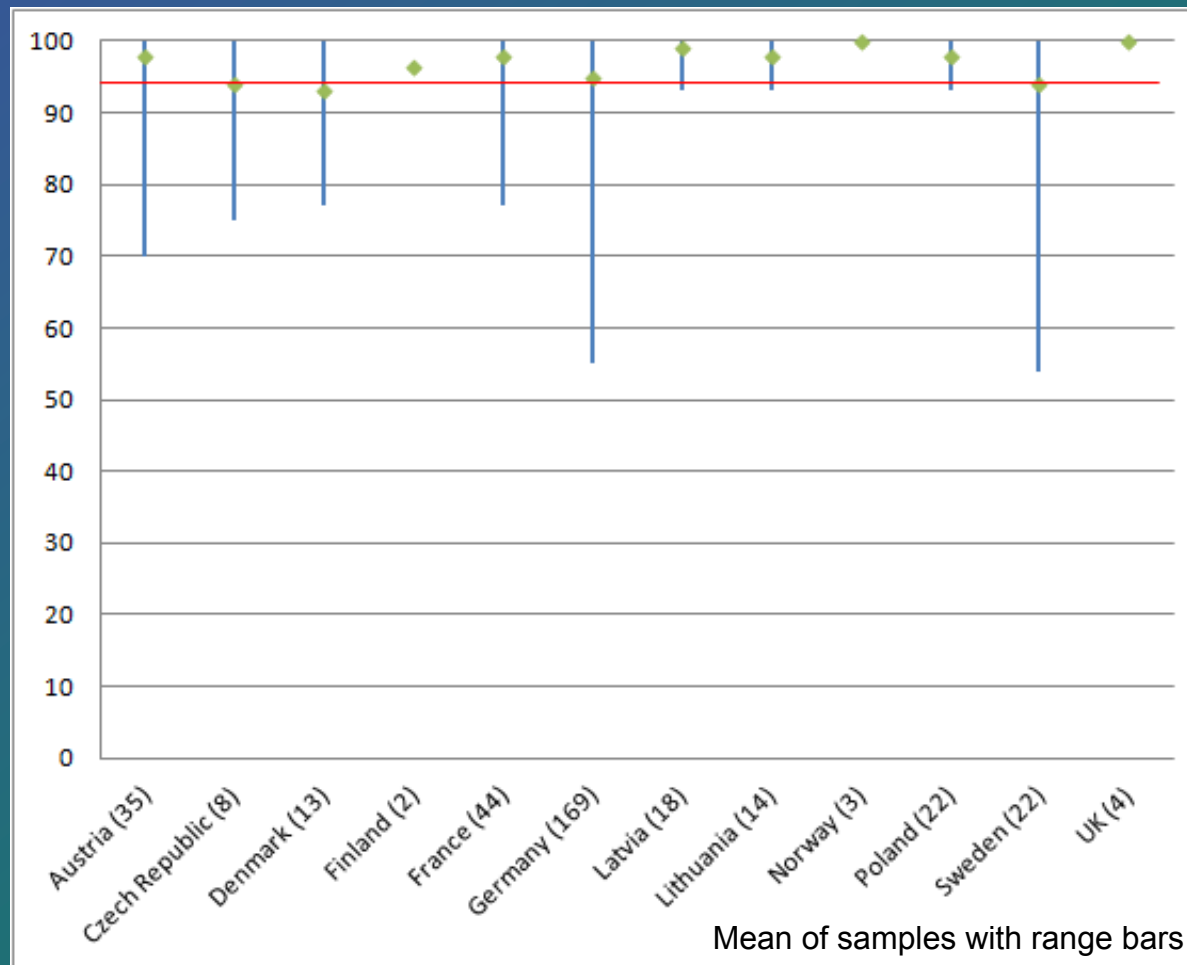




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# Neonicotinoids: Summary charts

- 200% FR (1.44ug) used as discriminating rate
- 95% mortality is recommended diagnostic in IRAC method protocol (98% +/- 3% ).



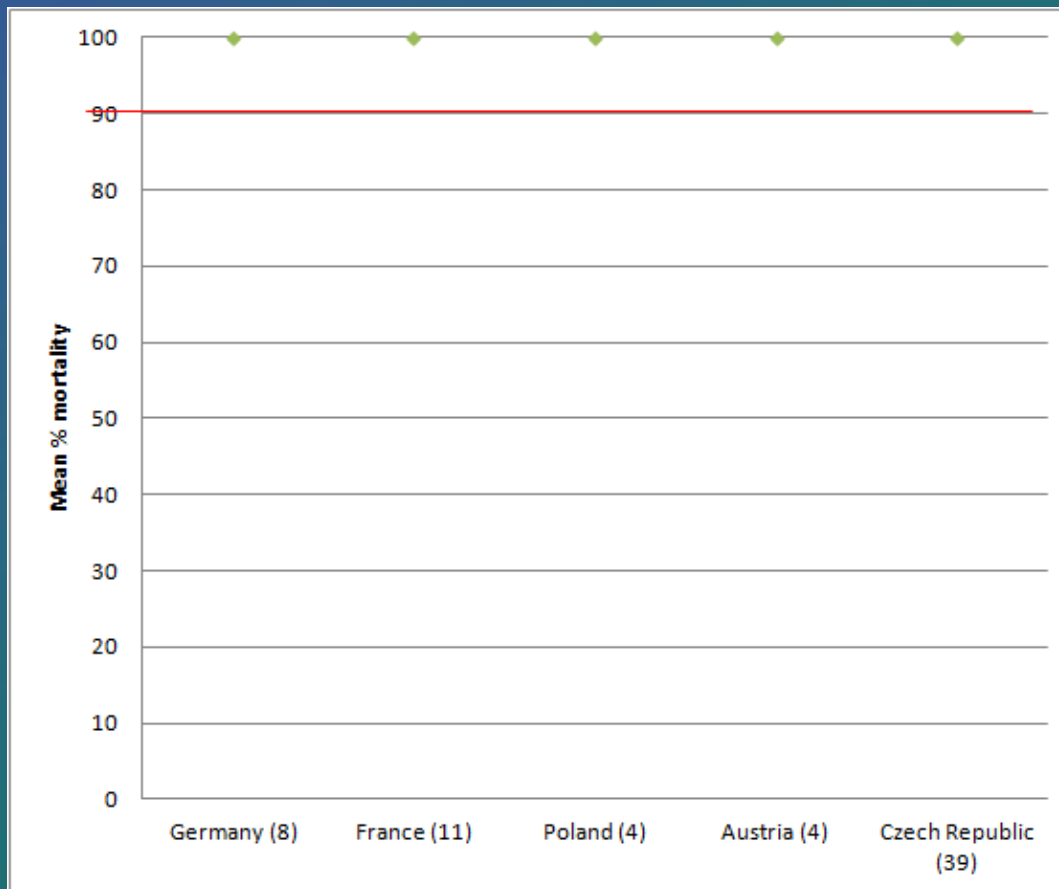




# Organophosphates:

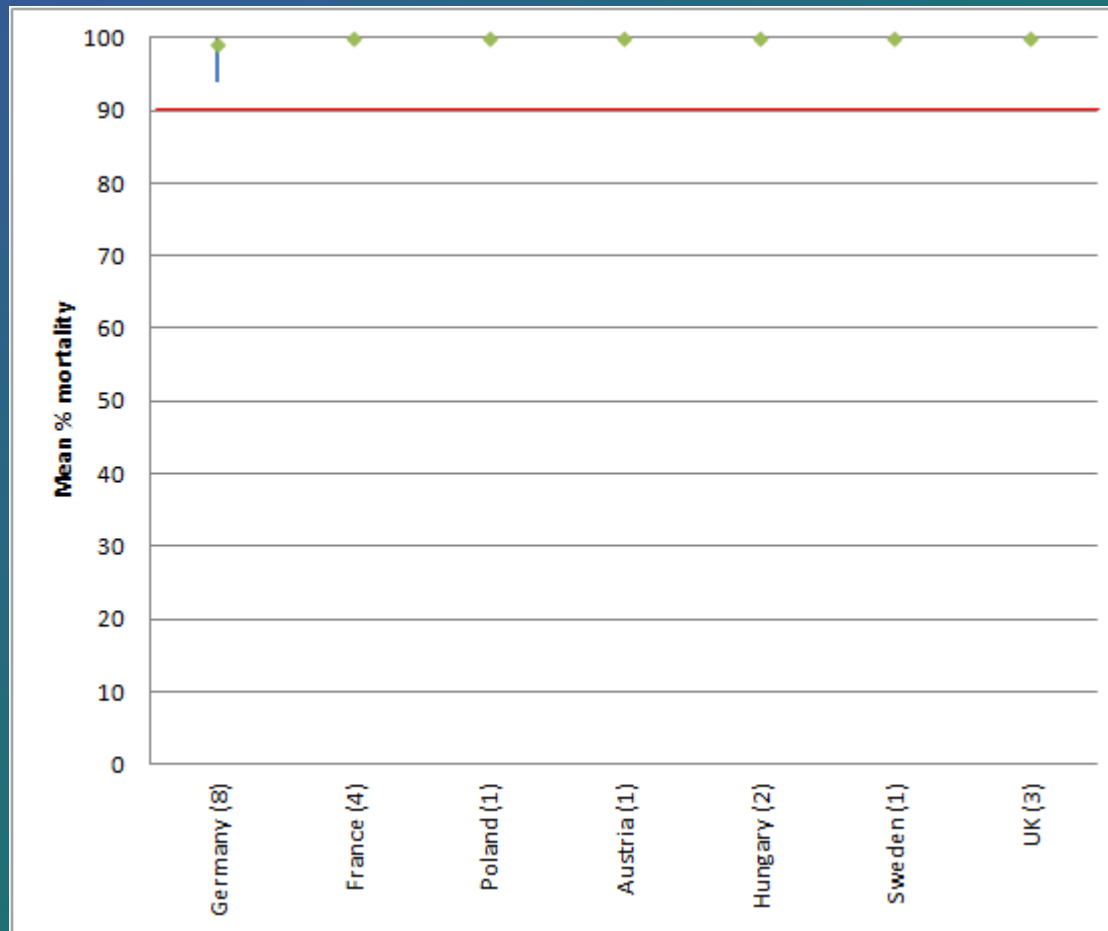
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- 66 data sets provided.
- 66 used in analysis (need to check control mortality is below 20% for all samples)
- 0.3ug used as discriminating rate
- 90% mortality is recommended diagnostic in IRAC method protocol.



## Indoxacarb

- 20 data sets provided.
- 20 used in analysis (need to check JKI sample control mortality is below 20% for all samples)
- 35% FR used as discriminating rate (not yet defined)
- 90% mortality is used as diagnostic (not yet defined in IRAC protocol).



# Summary

- Pyrethroid resistant pollen beetle found in all countries surveyed except Romania, Ukraine and Hungary.
- In all countries except the those mentioned above, resistant populations dominate ( $\geq 50\%$ ).
- Pyrethroid resistant populations appear to be increasing in frequency in the UK, Poland, Latvia and Finland, whilst the frequency of resistant populations appeared to be less in the Czech Republic compared to previous years.
- 75% of all pollen beetle populations tested were scored as susceptible to neonicotinoids.
- Some populations from the most of the countries surveyed provided lower levels of mortality than expected with the neonicotinoid treatment, with the exception of the UK, Norway and Finland.
- Further examination of these populations is required to determine if the lower than expected mortality is due to variations in susceptibility or differences in experimental interpretation.
- All populations of pollen beetle surveyed were susceptible to organophosphate and indoxacarb insecticides.

#### Oilseed Rape Pest Management

The management of oilseed rape pests whilst trying to prevent the selection of insecticide resistance is made more difficult by the lack of effective insecticide modes of action (MoA).

It is essential to maximise the use of available MoA's, whilst still ensuring effective pest control is achieved.

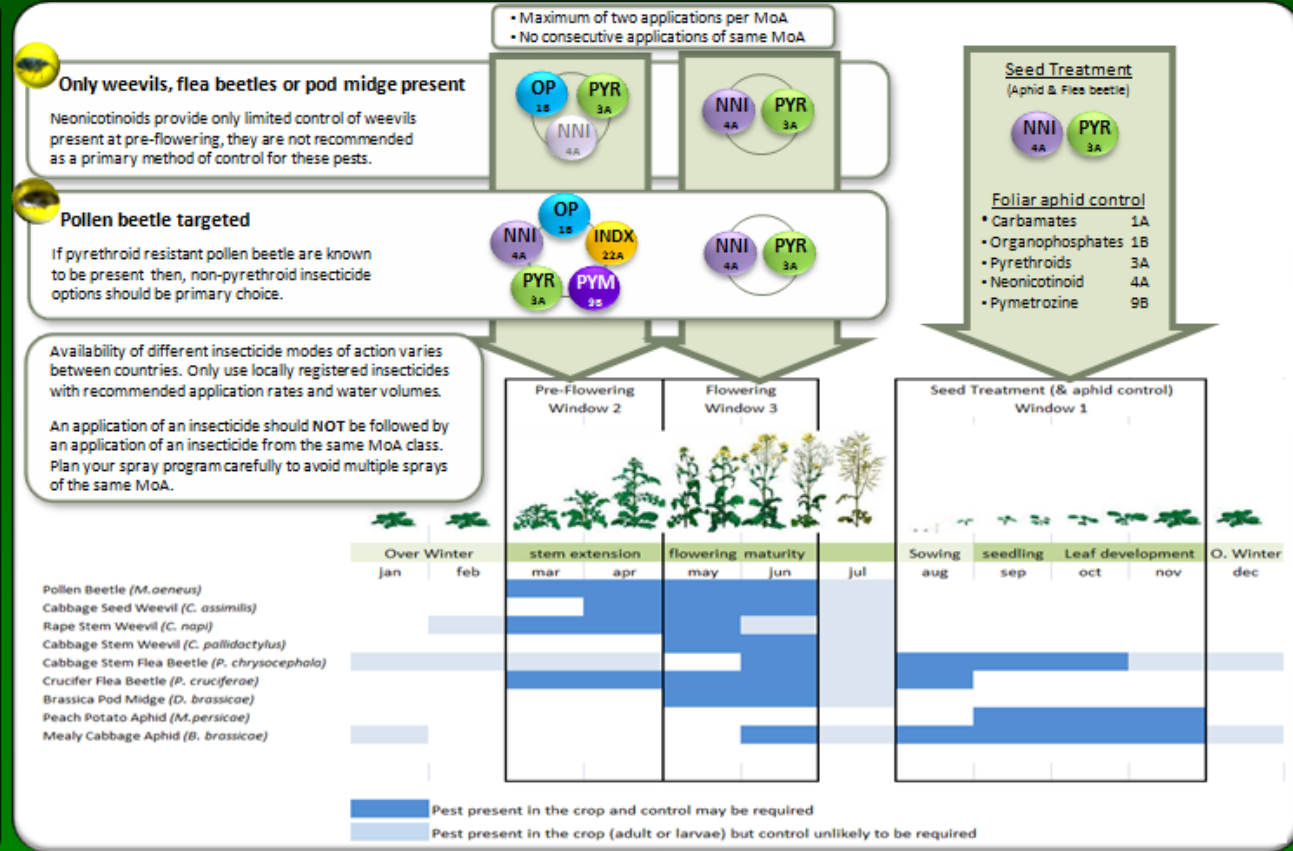
Plan spray schedules in advance, ensuring that the same MoA's are not used sequentially or multiple times throughout the crop cycle.

MoA's chosen for autumn flea beetle or aphid control, should be avoided during pre-flowering and flowering if the same pests are likely to be present.

OP, indoxacarb and pymetrozine based insecticides can not be used during flowering and therefore, should be considered for use pre-flowering, allowing other MoA to be used later.

If pyrethroid resistant pollen beetle are known to be present in the target crop, then non-pyrethroid. Insecticides should be the primary choice for pollen beetle control.

Non-chemical control options should be considered as part of any pest management strategy.



This poster is for educational purposes only. Details are accurate to the best of our knowledge but IRAC and its member companies cannot accept responsibility for how this information is used or interpreted. Advice should always be sought from local experts or advisors and health and safety recommendations followed.

Version 1.0, Designed and produced by IRAC Oilseed Rape Pest Working Group, July 2010, photographs courtesy of Bayer CB



# Goals & SMART Objectives 2011

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Goals	Objectives	Timeline
Coordinated European pollen beetle monitoring	<ul style="list-style-type: none"> <li>Collaborate as member team companies and cooperate with public labs, regulators and other bodies involved in resistance monitoring of pollen beetle in to assemble, share and interpret coordinated set of monitoring data for 2011 season.</li> </ul>	Q3, 2011
Provide researchers validated methods.	<ul style="list-style-type: none"> <li>Validate methods for monitoring pollen beetle susceptibility to indoxacarb and publish on IRAC web-site.</li> </ul>	Q4 2011
Provide researchers validated methods.	<ul style="list-style-type: none"> <li>Validate methodologies for testing susceptibility of <i>Psylliodes spp</i> and other OSR coleoptera to pyrethroids.</li> </ul>	Q4 2011
Provide and distribute relevant information on OSR pest sensitivity to growers and regulators.	<ul style="list-style-type: none"> <li>Review and incorporate new learning's from OSR pest research, including 2010 resistance monitoring, into IRAC IRM recommendations for oilseed rape.</li> <li>Present findings at international conferences.</li> </ul>	All Q4, 2011
Provide and distribute relevant information on OSR pest sensitivity to growers and regulators.	<ul style="list-style-type: none"> <li>Provide summary poster of learning's from 2011 pollen beetle susceptibility monitoring.</li> <li>Provide summary poster of OSR pest resistance management recommendations.</li> </ul>	Q4, 2011
	<ul style="list-style-type: none"> <li>Provide set of summary slides of IRAC oilseed rape WG activities to for WG members to use for national and international meetings and conferences.</li> </ul>	Q2, 2011

**ONGOING**

**Those with an interest in coleopteran resistance management or that have specific issues that they would like to address, please feel to join us in the working group !**