Session 3

47th Meeting of IRAC International, Indianapolis
March 27-30th 2012

Coleoptera WG
Team Members

Team Leader, Deputy and Members for 2011/12

- Russell Slater, Syngenta (chair)
- Gerald Huart, Makhteshim (deputy chair)
- Michel Sarazin, FMC
- Chris Longhurst, DOW Agrosciences
- 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

47th IRAC International Meeting, Indianapolis, March 27-30th, 2012
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, 26-27th October).
- Apple weevil – Neonicotinoid susceptibility assessment in Germany
### Pollen Beetle Pyrethroid Resistance Monitoring 2011

**Populations**

<table>
<thead>
<tr>
<th>Year</th>
<th>Populations</th>
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<tbody>
<tr>
<td>2007</td>
<td>608</td>
</tr>
<tr>
<td>2008</td>
<td>577</td>
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<tr>
<td>2009</td>
<td>804</td>
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<tr>
<td>2010</td>
<td>723</td>
</tr>
<tr>
<td>2011</td>
<td>1183</td>
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**Countries**

<table>
<thead>
<tr>
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<tr>
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<td>10</td>
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<tr>
<td>2008</td>
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<td>2009</td>
<td>20</td>
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<tr>
<td>2010</td>
<td>15</td>
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<td>2011</td>
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**Insecticide MOA’s**

<table>
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<td>2007</td>
<td>1</td>
</tr>
<tr>
<td>2008</td>
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<td>2010</td>
<td>1</td>
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<td>2011</td>
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**Beetles**

<table>
<thead>
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<th>Year</th>
<th>Beetles</th>
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</thead>
<tbody>
<tr>
<td>2007</td>
<td>120,000</td>
</tr>
<tr>
<td>2008</td>
<td>115,000</td>
</tr>
<tr>
<td>2009</td>
<td>160,000</td>
</tr>
<tr>
<td>2010</td>
<td>145,000</td>
</tr>
<tr>
<td>2011</td>
<td>240,000</td>
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2011 pyrethroid resistance monitoring: *Meligethes aeneus*

- **Highly Resistant**
- **Resistant**
- **Moderately resistant**
- **Susceptible**
- **Highly susceptible**

% of populations in susceptibility category

- Austria (41)
- Denmark (11)
- Finland (9)
- France (21)
- Germany (93)
- Hungary (258)
- Latvia (18)
- Lithuania (31)
- Norway (4)
- Poland (24)
- Romania (20)
- Sweden (23)
- UK (29)
- Ukraine (3)
- 200% FR (1.44ug) used as discriminating rate
- 95% mortality is recommended diagnostic in IRAC method protocol (98% +/- 3%).

Mean of samples with range bars
Organophosphates:

- 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.
- 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 (≥ 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.
Resistance Management for Oilseed Rape Pests

Winter Sown

**Oilsed 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 (MoAs).

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

Plan spray programs in advance, ensuring that the same MoAs are not used sequentially or multiple times throughout the crop cycle.

MoAs 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 pyrametaphos based insecticides cannot be used during flowering and therefore, should be considered for use pre-flowering, allowing other MoAs 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.

**Only weevils, flea beetles or pod midge present**

- Neonicotinoids provide only limited control of weevils present at pre-flowering, they are not recommended as a primary method of control for these pests.

**Pollen beetle targeted**

- If pyrethroid resistant pollen beetles are known to be present, then non-pyrethroid insecticide options should be primary choice.

**Availability of different insecticide modes of action varies between countries. Only use locally registered insecticides with recommended application rates and water volumes.

An application of an insecticide should not be followed by an application of an insecticide from the same MoA class. Plan your spray program carefully to avoid multiple sprays of the same MoA.**

**Seed Treatment ( Aphid & Pest Control)**

- Pyrene: 3A
- Pyriphos: 3A
- Deltamethrin: 4A
- Pyrimethrin: 4B

**CropLife**

This material is for educational purposes only. Users are advised to seek the latest advice from local experts in agriculture and pest management. Always ensure that the information is used in context. Always apply chemicals only as directed on the label. Always check with your local retailer or agent before purchase. Always check with your local retailer or agent before purchase.
<table>
<thead>
<tr>
<th>Goals</th>
<th>Objectives</th>
<th>Timeline</th>
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<tr>
<td>Coordinated European pollen beetle monitoring</td>
<td>• 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.</td>
<td>Q3, 2011</td>
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<td>Provide researchers validated methods.</td>
<td>• Validate methods for monitoring pollen beetle susceptibility to indoxacarb and publish on IRAC web-site.</td>
<td>Q4 2011</td>
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<td>Provide researchers validated methods.</td>
<td>• Validate methodologies for testing susceptibility of <em>Psylliodes spp</em> and other OSR coleoptera to pyrethroids.</td>
<td>Q4, 2011</td>
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| Provide and distribute relevant information on OSR pest sensitivity to growers and regulators. | • Review and incorporate new learning’s from OSR pest research, including 2010 resistance monitoring, into IRAC IRM recommendations for oilseed rape.  
• Present findings at international conferences. | All year  
Q4, 2011 |
| Provide and distribute relevant information on OSR pest sensitivity to growers and regulators. | • Provide summary poster of learning’s from 2011 pollen beetle susceptibility monitoring.  
• Provide summary poster of OSR pest resistance management recommendations. | Q4, 2011  
ONGOING |
| | • Provide set of summary slides of IRAC oilseed rape WG activities to for WG members to use for national and international meetings and conferences. | Q2, 2011 |
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!