



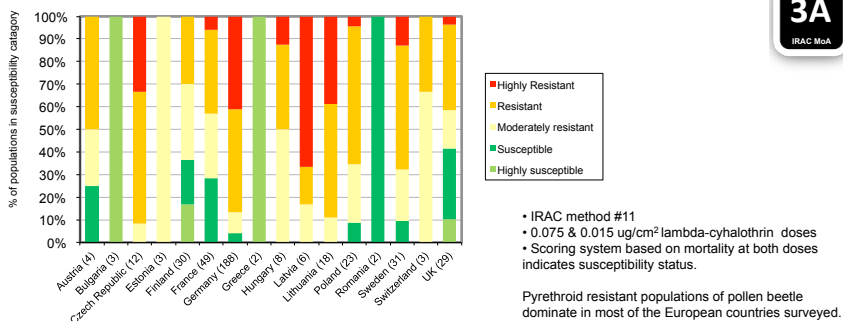
Pollen Beetle Resistance Monitoring 2013

Introduction and Background

Pyrethroid resistance has been recorded in European populations of the pollen beetle (*Meligethes aeneus*) since 1999, when it was first reported in Eastern France. The IRAC Coleopteran Working Group brings together expertise from agrochemical companies and independent researchers in order to monitor the development and spread of resistance in pollen beetles and other coleopteran pests of oilseed rape.

Pyrethroid, neonicotinoid, indoxacarb and organophosphate susceptibility is measured by the use of insecticide coated glass vial assays. Results of the 2013 susceptibility monitoring program are presented in this poster. More details of the methods used in this survey can be found on the IRAC website (www.irac-online.org).

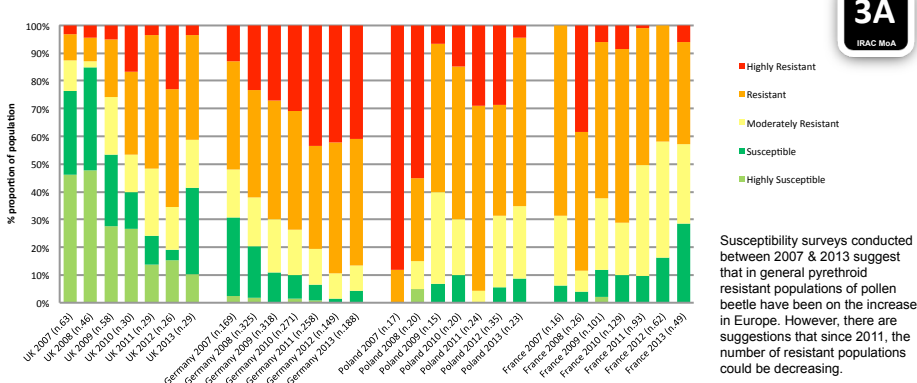
2013 pyrethroid resistance monitoring: *Meligethes aeneus*



- IRAC method #11
- 0.075 & 0.015 ug/cm² lambda-cyhalothrin doses
- Scoring system based on mortality at both doses indicates susceptibility status.

Pyrethroid resistant populations of pollen beetle dominate in most of the European countries surveyed.

Changes in the pyrethroid susceptibility of pollen beetle populations 2007 - 2013



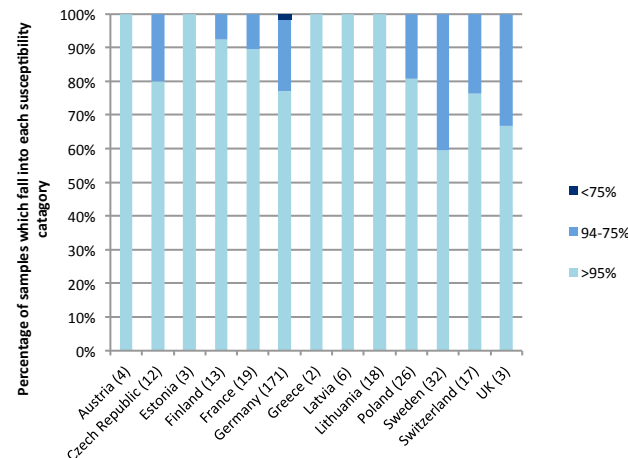
Susceptibility surveys conducted between 2007 & 2013 suggest that in general pyrethroid resistant populations of pollen beetle have been on the increase in Europe. However, there are suggestions that since 2011, the number of resistant populations could be decreasing.

4A

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2013 neonicotinoid susceptibility monitoring: *Meligethes aeneus*

- IRAC method # 21
- 1.44ug/cm² thiacloprid dose: > 95% mortality indicates susceptibility.



22A

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1B

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Indoxacarb & Organophosphate susceptibility

- IRAC method # 25 (Chlorpyrifos-ethyl)
- IRAC Method # 27 (Indoxacarb)

All European populations of pollen beetle tested were susceptible to both Indoxacarb and organophosphates based on the IRAC recommended discriminating dose.

Country	No. of populations tested	
	Indoxacarb	OP
United Kingdom	4	0
Czech Republic	0	1
France	7	9
Germany	30	1
Hungary	1	2
Poland	2	5
Greece	0	2
Sweden	1	0

Summary & Recommendations

- In the majority of countries surveyed, pyrethroid resistant populations of pollen beetle dominate (> 60% are resistant).
- 14% of pollen beetle populations surveyed in Europe can be classified as pyrethroid susceptible (2012= 7%).
- Across the UK, France, Germany and Poland there was evidence for an increase in the percentage of susceptible populations compared with 2012, with changes most noticeable in the UK and France.
- From the countries surveyed in Greece, Bulgaria, Romania, most populations were susceptible.
- The majority of populations tested across Europe remained susceptible to neonicotinoids, with only a small number of populations from Germany indicating a reduced susceptibility (<1% total samples).
- There was no evidence of changes in indoxacarb or organophosphate susceptibility observed in all countries surveyed.
- In order to prevent further insecticide resistance development, it is recommended that insecticides with different modes of action are utilised in an effective resistance management program, dependent on local insecticide availability and national use guidelines. IRAC guidelines for resistance management in oilseed rape can be found on the IRAC website (www.irac-online.org).
- IRAC would like to thank all of those who contributed to the survey. Participants are too numerous to name, but their contributions are very much appreciated.