

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. Pyrethroid insecticides have long been favoured as the method of control for insect pests of oilseed rape and a lack of alternative insecticides with different modes of action, has ensured a continued high selection pressure for pyrethroid resistance. This has led to the spread of resistant pollen beetle across much of the oilseed rape growing regions of Europe.

In 2007 an IRAC Pollen Beetle Working Group was established to bring together expertise from agrochemical companies and independent researchers in order to monitor the development of insecticide resistance in oilseed rape pests and to provide guidance and advice on the best practices to prevent further insecticide resistance development.

Pollen Beetle Resistance Monitoring Methodology

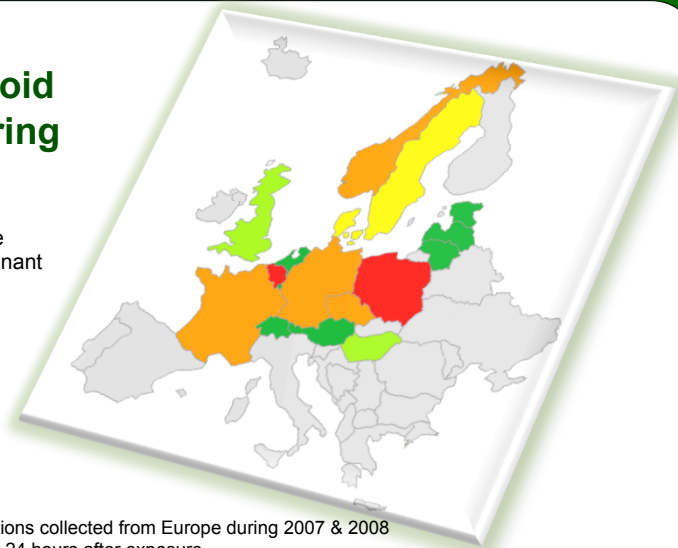
A simple methodology was developed by members of the working group to determine the pyrethroid susceptibility of pollen beetle populations in Europe. Technical grade pyrethroid insecticide is coated on the inside of glass vials at two different concentrations which represent 100% and 20% of the recommended label rate of the chosen pyrethroid. A minimum of 10 adult beetles are placed inside each vial, with beetle mortality assessed five and twenty four hours after initial exposure. Mortality observations can then be converted to one of five susceptibility classifications: Highly susceptible, susceptible, moderately resistant; resistant and highly resistant. Further details of this method and the classifications can be found on the IRAC web-site.

Summary & Recommendations

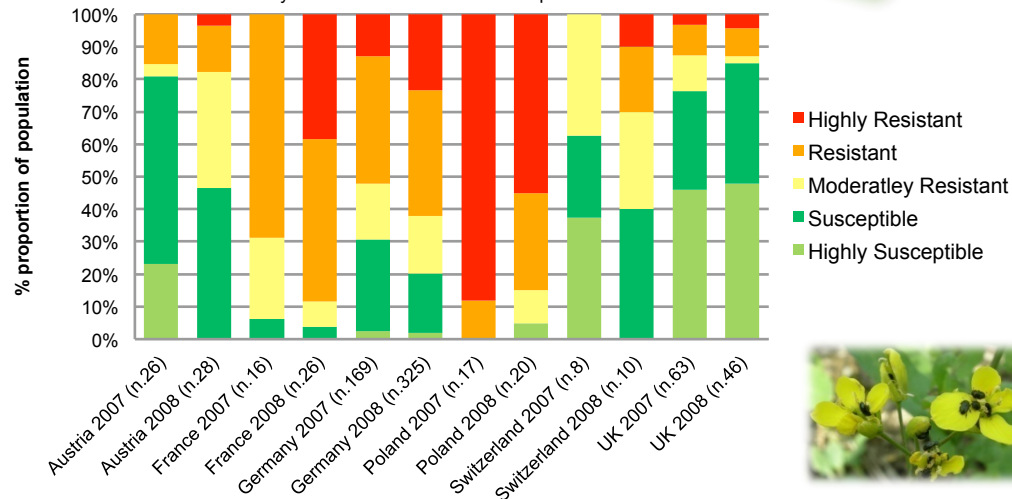
- Pyrethroid resistant populations of pollen beetle remain dominant in France, Germany and Poland.
- A reduction in pyrethroid susceptible populations can be observed in Switzerland and Austria, with greater proportions of resistant populations detected.
- UK populations remain largely susceptible, with resistant populations centered in the South East of England.
- Pyrethroid resistant populations also identified in Belgium, Czech Republic, Denmark, Estonia, Netherlands, Sweden, Latvia, Lithuania and Luxembourg.
- Pyrethroid resistant populations of pollen beetle remain dominant in Europe and in order to prevent further insecticide resistance development, it is recommended that insecticides with different modes of action are utilised in a effective resistance management program, dependant on local insecticide availability and national use guidelines.
- A new version of the IRAC methodology for measuring pollen beetle sensitivity to pyrethroids has been published for 2009 which utilises only a 24 hour assay endpoint.

Pollen Beetle Pyrethroid Susceptibility Monitoring 2008

Map of Europe coloured to indicate pyrethroid susceptibility status of dominant pollen beetle populations in 2008.



Susceptibility status of pollen beetle populations collected from Europe during 2007 & 2008
Mortality assessment 24 hours after exposure



Samples of pollen beetles were collected from both insecticide treated and untreated fields between March and August 2008