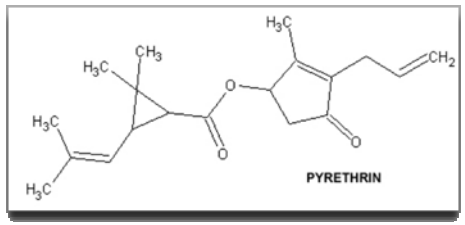
Science For A Better Life

Pest and Beneficial's Review

"is the toolbox half full, or half empty?"

Dave Holah

A synthetic chemists dream!



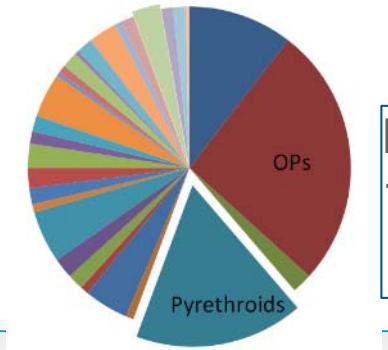
3	SODIUM CHANNEL MODULATORS
A	PYRETHROIDS, PYRETHRINS

Acrinathrin, Allethrin, Bifenthrin, Bioallethrin, Bioallethrin S-cyclopentenyl, Bioresmethrin, Cycloprothrin, Cyfluthrin, Cyhalothrin, Cypermethrin, Cyphenothrin [(1R)-trans-isomers], Deltamethrin, Empenthrin [(EZ)- (1R)-isomers], Esfenvalerate, Etofenprox, Fenpropathrin, Fenvalerate, Flucythrinate, Flumethrin, Halfenprox, Kadathrin, Permethrin, Phenothrin [(1R)-trans- isomer], Prallethrin, Pyrethrins (pyrethrum), Resmethrin, Silafluofen, Tefluthrin, Tetramethrin, Tetramethrin [(1R)- isomers], Tralomethrin, Transfluthrin, alpha-Cypermethrin, beta-Cyfluthrin, beta-Cypermethrin, d-cis-trans Allethrin, d-trans Allethrin, gamma-Cyhalothrin, lambda-Cyhalothrin, tau-Fluvalinate, theta-Cypermethrin, zeta-Cypermethrin

1960s 1st generation pyrethroids developed

1974 onwards - 2nd generation of more persistent compounds - permethrin, cypermethrin and deltamethrin. **41 actives listed by IRAC**

Reg package - Ecotox Pre-91/414/EEC (15 July 1991)
Birds: 1 species acute oral LD50 with a.i.
Mammals: no requirement
Fish: 2 species acute LC50 (96h) with a.s. and formulation
Daphnia acute EC50 (48h) with a.s. and formulation
Algae 1 or 2 species EC50 (72h) with a.s. and formulation
Earthworm acute
Honey bees acute oral and contact LD50 with formulation
Soil micro organisms: C- and N-cycle with formulation
Rough estimate of total Ecotox costs 40 to 50 k€



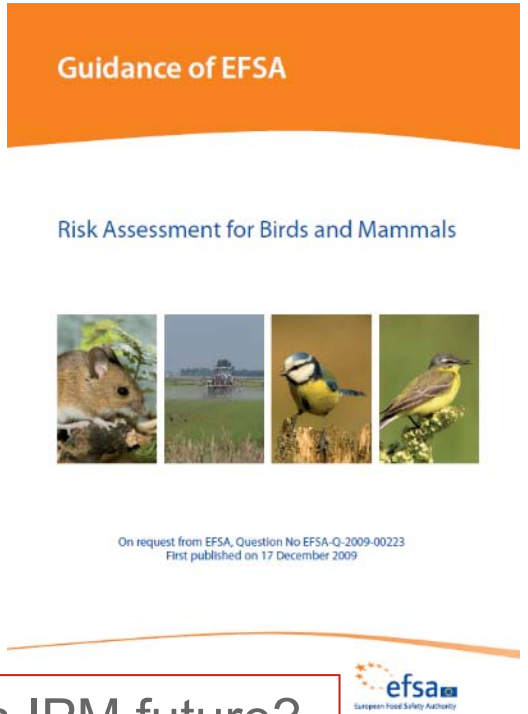
IRAC - Ca 17% of all ais
10 approved in UK.

Toolbox "half full"

Regulations and Guidance

Reminder- Directive 91/414 saw the loss of over 600 active substances.

Modern dossier – Section 6 Ecotoxicological Studies/ Detailed summary of the risk assessment
Nearly 100 data points - studies and risk assessments to the required guidance documents.

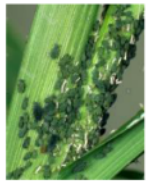


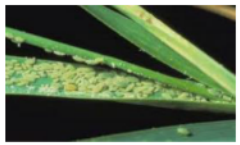
Peter Campbell (BCPC Conference) :

Impact of EFSA Scientific Opinion on Terrestrial Non-Target Arthropods

- Typical buffers of 5-10m will likely increase to 30-50m; A buffer of 1m (with 90% drift reduction nozzles) will increase to 10-20m
- Assuming a buffer size of 30-50 m in a square field:
  - 2 ha field ~ 50 % loss of cropped area
  - 20 ha field ~ 15 % loss of cropped area

Will make insecticides virtually unregisterable





Implications for an IPM future?
New GDs pose a serious threat to re-registering many actives

Toolbox "half empty"

 •Peter Campbell (BCPC conference 2016) Industry View on EFSA Environmental Guidance Document Development and Recent Experiences with Opinions & Guidance

Recreational spraying – warnings from Antibiotic resistance

Hallmark ₤ 4- 5 per ha.
A 7-day course of amoxicillin costs the taxpayer £1.68*

Its cheap so stick it in the spray tank anyway (or down the mouth) and the patient will go away happy.

Antibiotic resistance is one of the greatest dangers to our health. Dame Sally Davies, the UK Chief Medical Officer, has described the threat as "catastrophic". **It could lead to people dying from ordinary infections, and routine operations such as hip replacements becoming deadly due to the risk of infection.**

<u>By safely reducing the number of antibiotics prescribed inappropriately we can combat antibiotic resistance.</u>

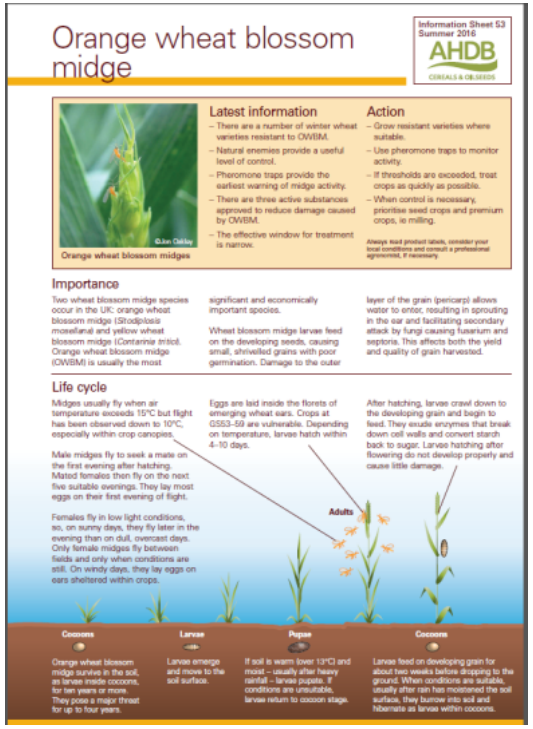
<u>Or</u> - By reducing the number of plant protection products prescribed inappropriately we can combat resistance.

• *July 2015BMJ 2015;350:h28

Implications for an IPM future

Orange blossom wheat midge

A well worked IPM example
Cultural/variety
Thresholds
Insecticides



Recommended Insecticides :
Lambda-cyhalothrin, beta-cyfluthrin, Thiacloprid
But for how long?

The Future?

- IPM may need a chemical input – threshold triggered.
- Insecticides present many “regulatory challenges”.
- Over use, irresponsible use - cheap generic products.
- Increased resistance – ie CSFB and pyrethroids.
- Seed breeders role
  - What resistant traits can be developed?
- Need to identify gaps in IPM recommendations.
  What ai’s likely to be lost?
  Encourage EAMUs etc.
- **A potentially empty tool box.**

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Thank you!