

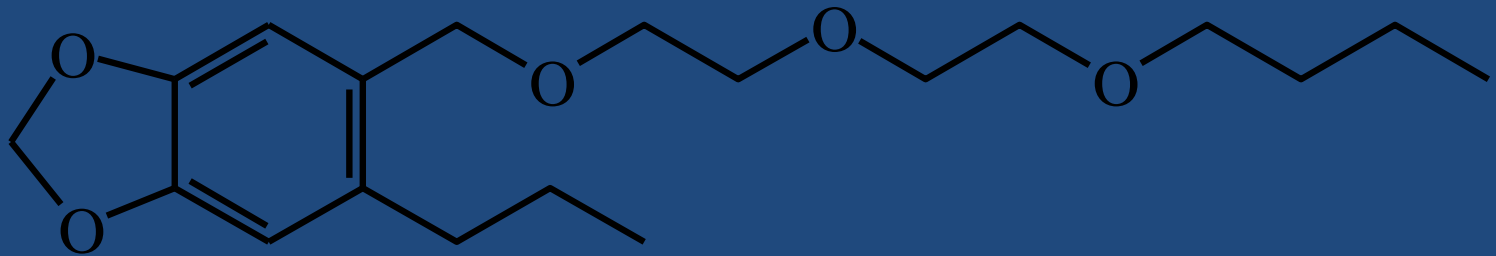
The use of 'temporal synergism' to control insecticide-resistant crop pests

Graham Moores

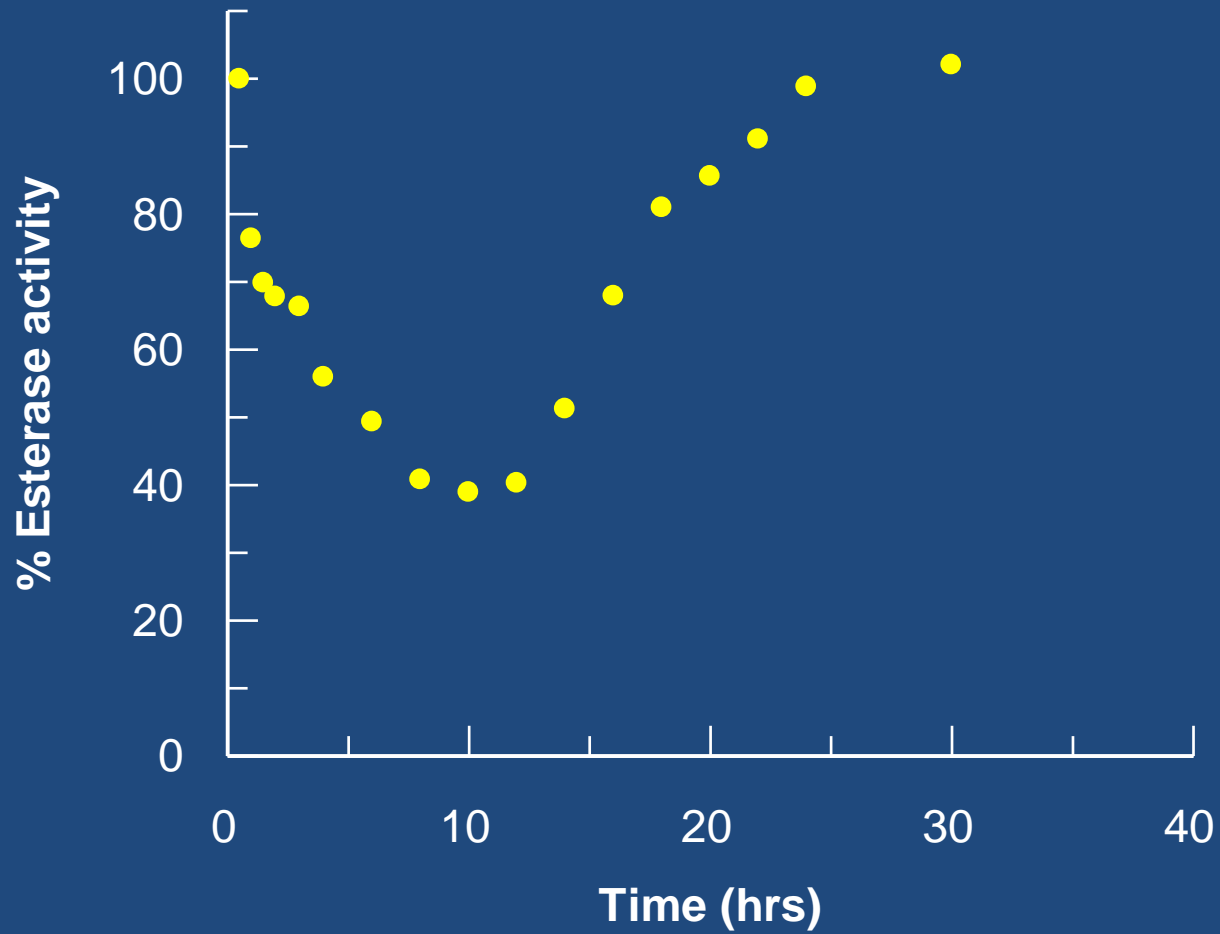
Insecticide resistance mechanisms

- Reduced penetration
- Enhanced detoxification
 - Mixed Function Oxidases (MFOs)
 - Glutathione S-Transferases (GSTs)
 - Hydrolases
- Altered site of action
 - Sodium channel - knockdown resistance (kdr)
 - GABA gated chlorine - resistance to dieldrin (rdl)
 - Modified Acetylcholinesterase (Mace)

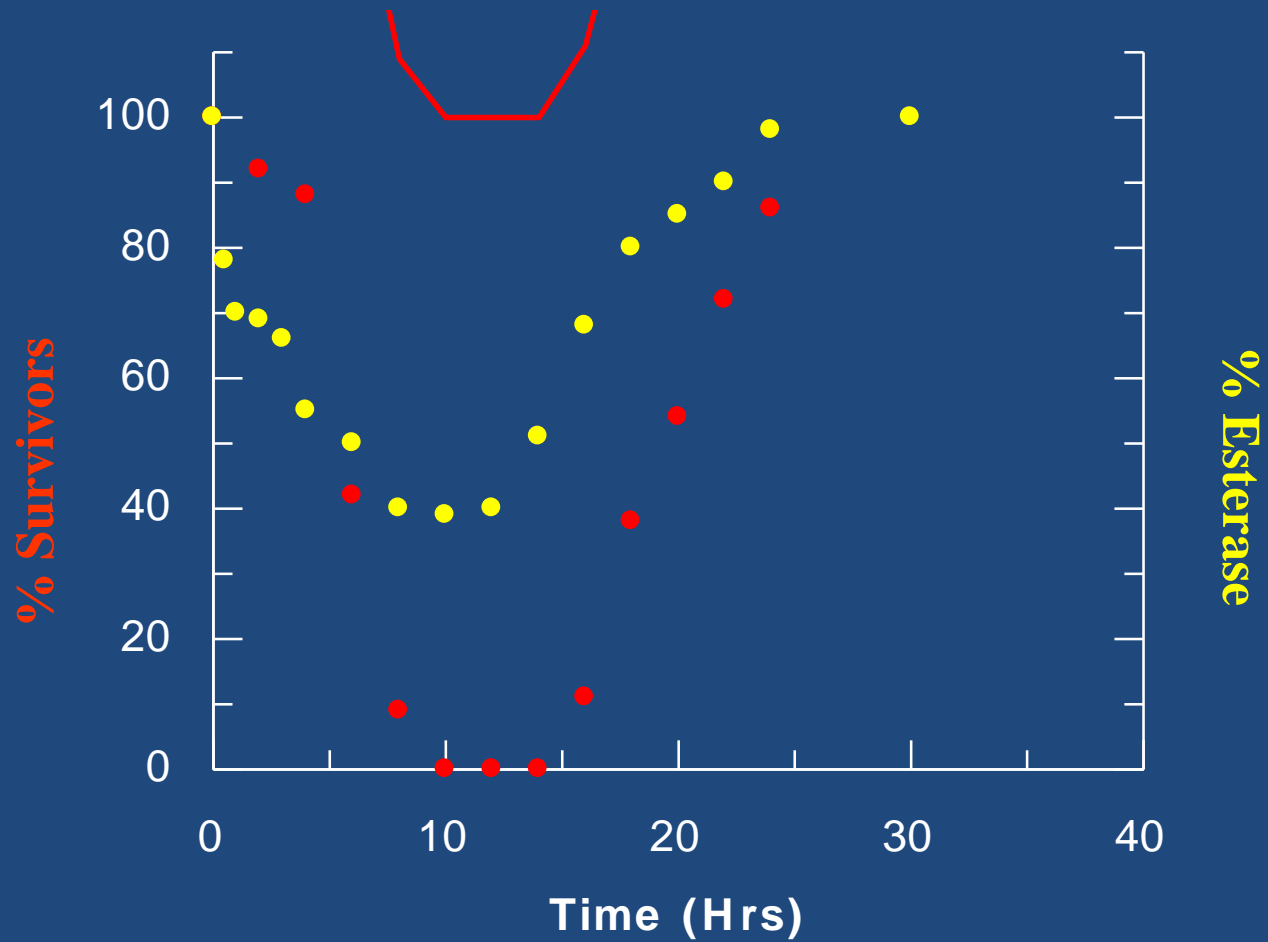
Piperonyl butoxide

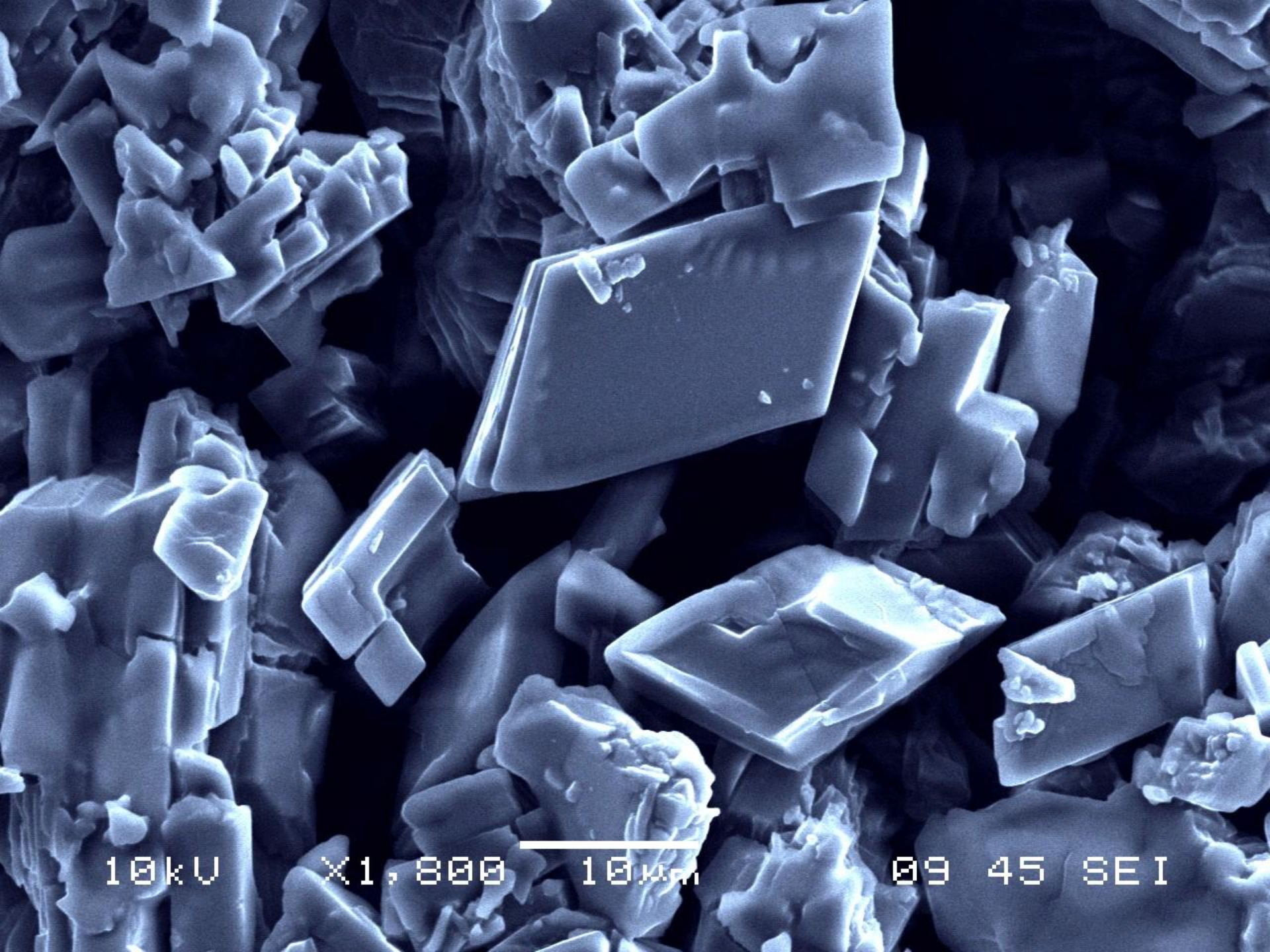


Inhibition of 'B' esterase from *B. tabaci* by PBO



B. tabaci / α -cypermethrin



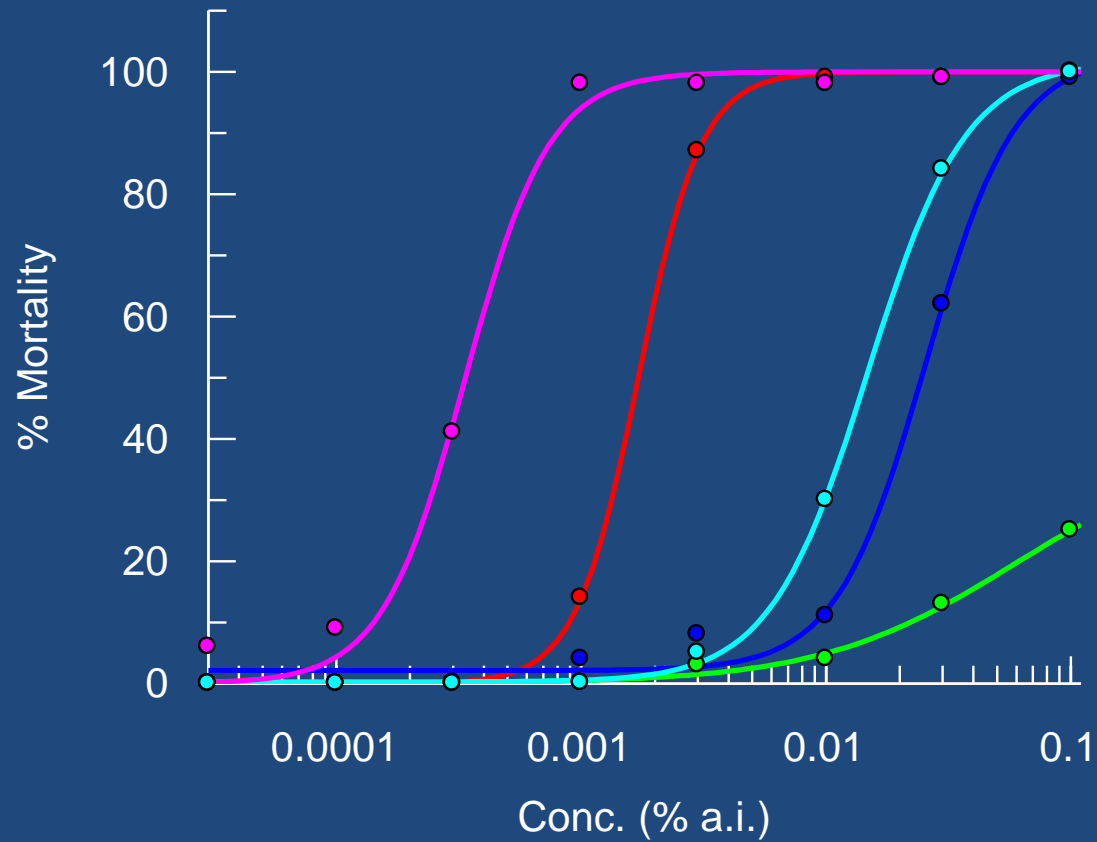


10kV

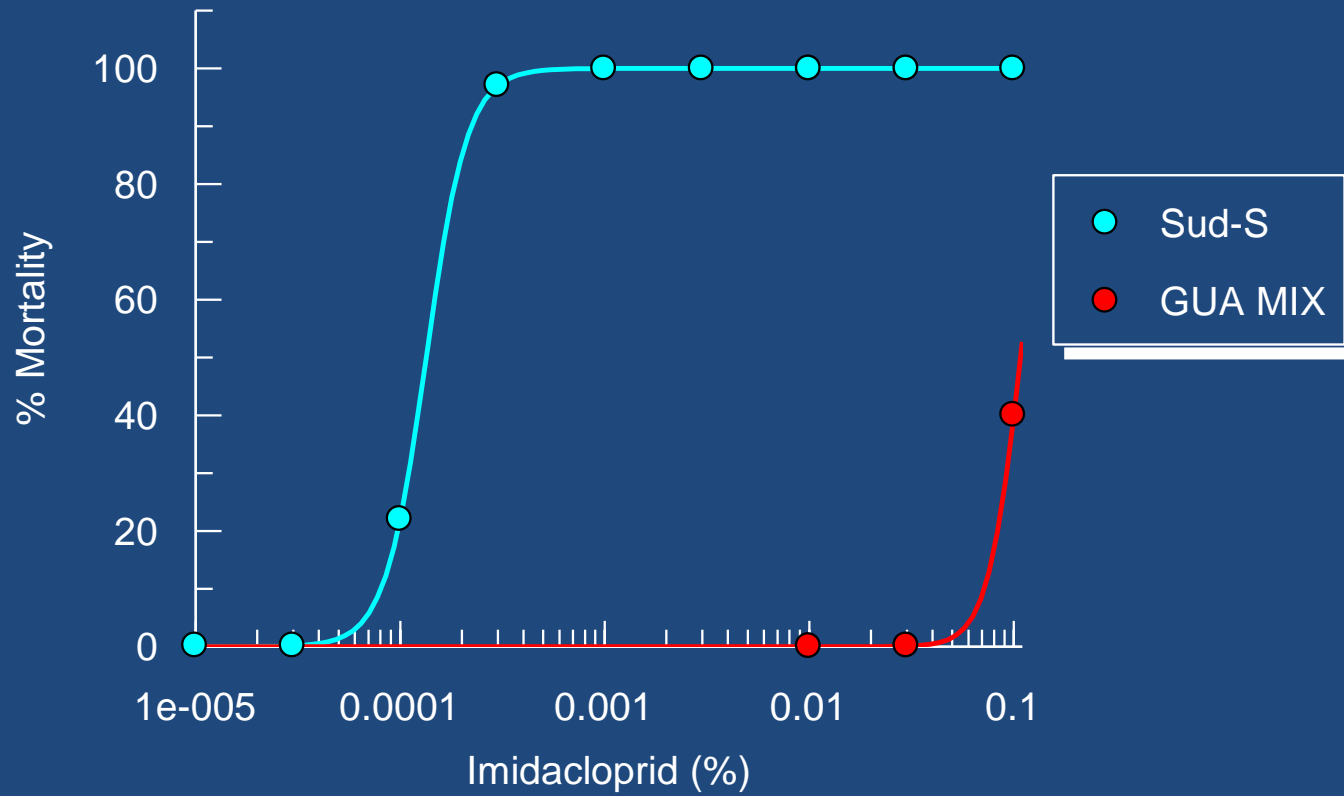
X1,800 10µm

09 45 SEI

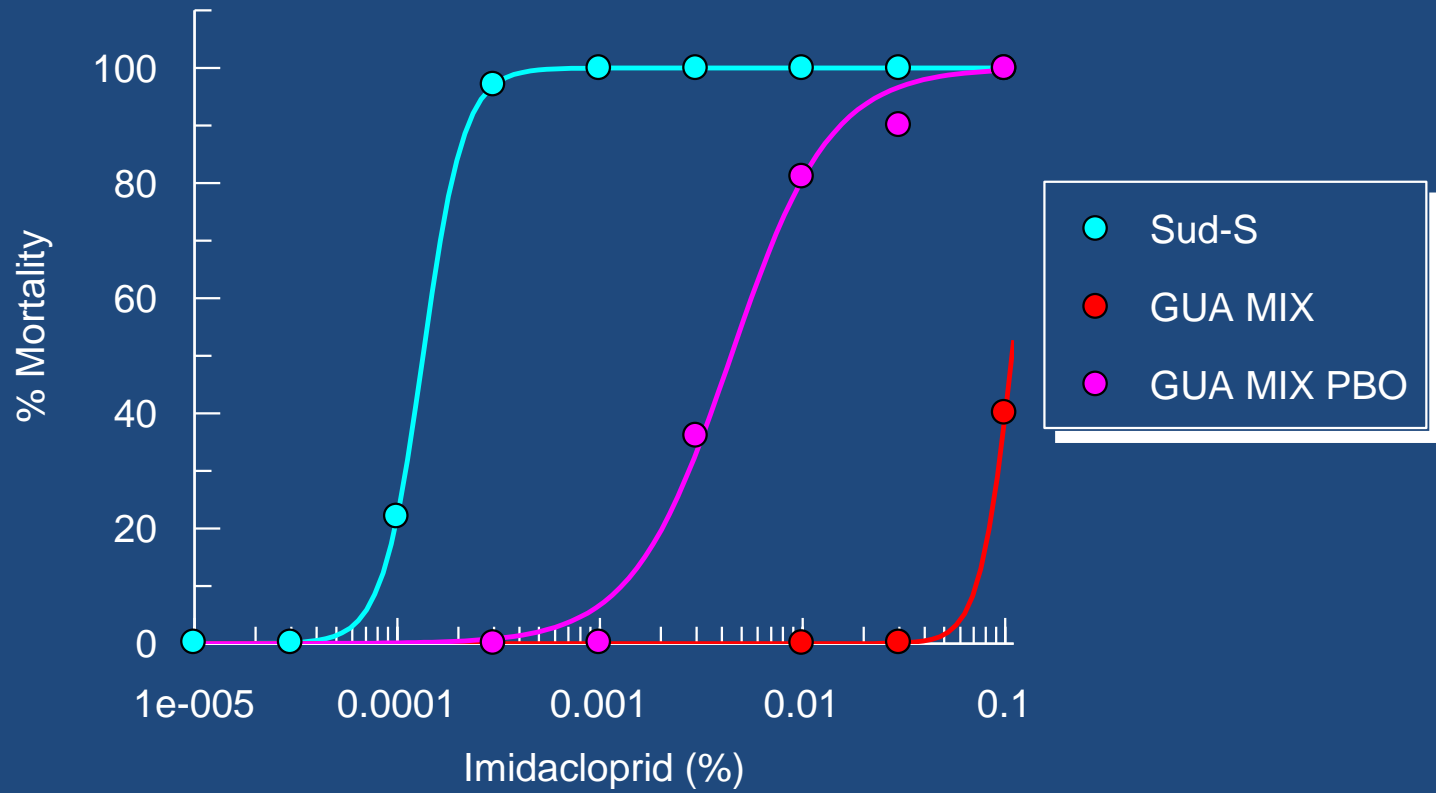
B. tabaci / α -cypermethrin



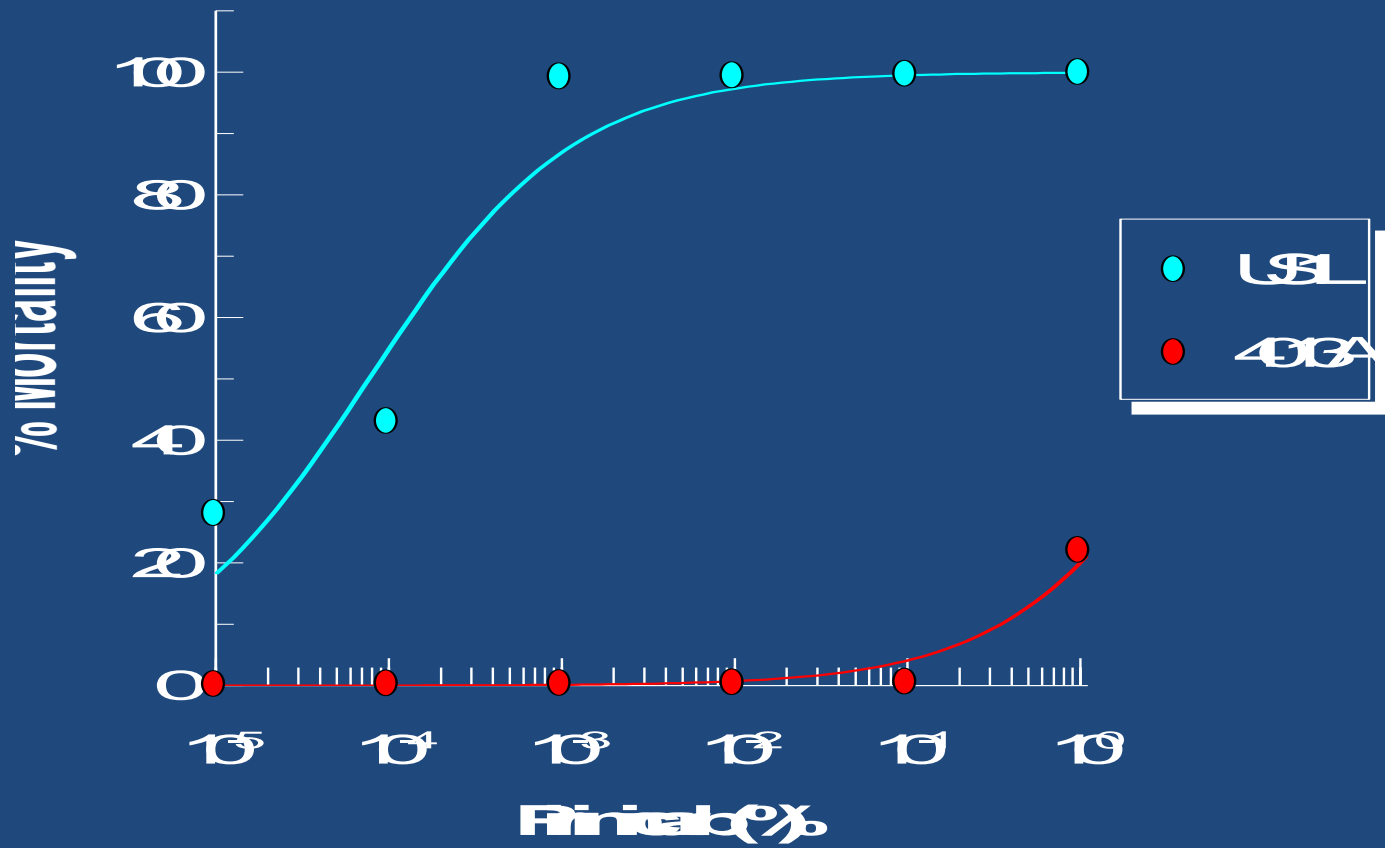
B. tabaci / imidacloprid



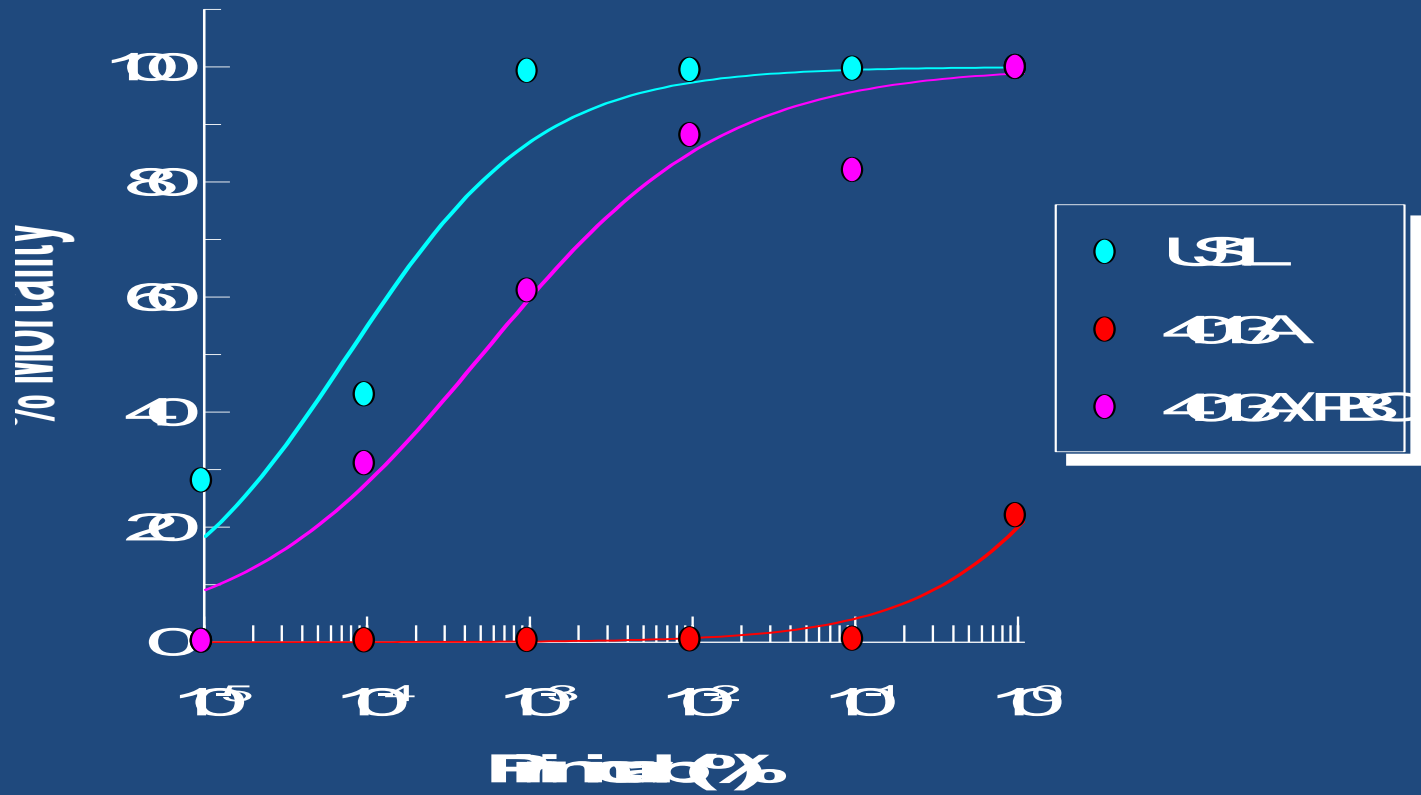
B. tabaci / imidacloprid



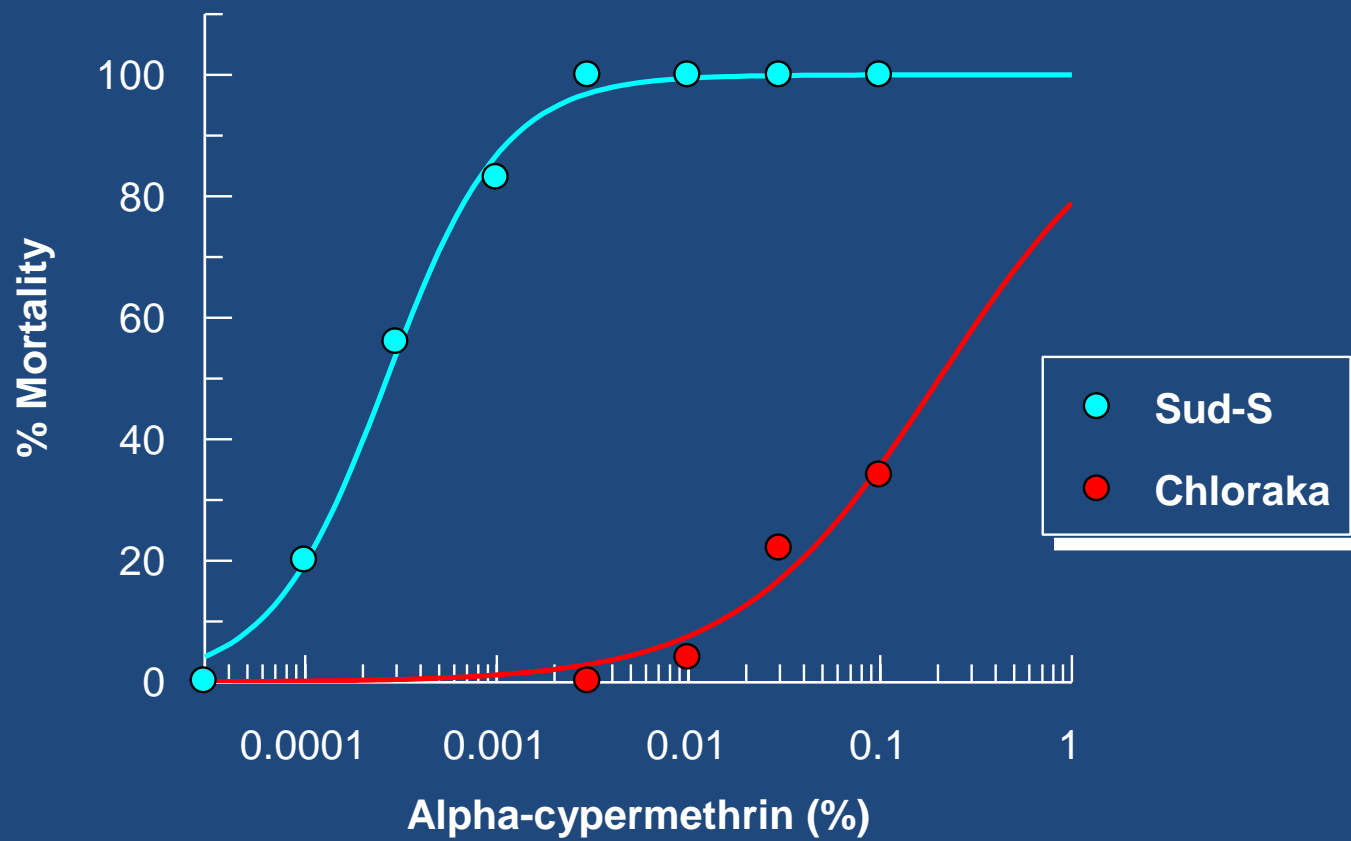
M. persicae / pirimicarb



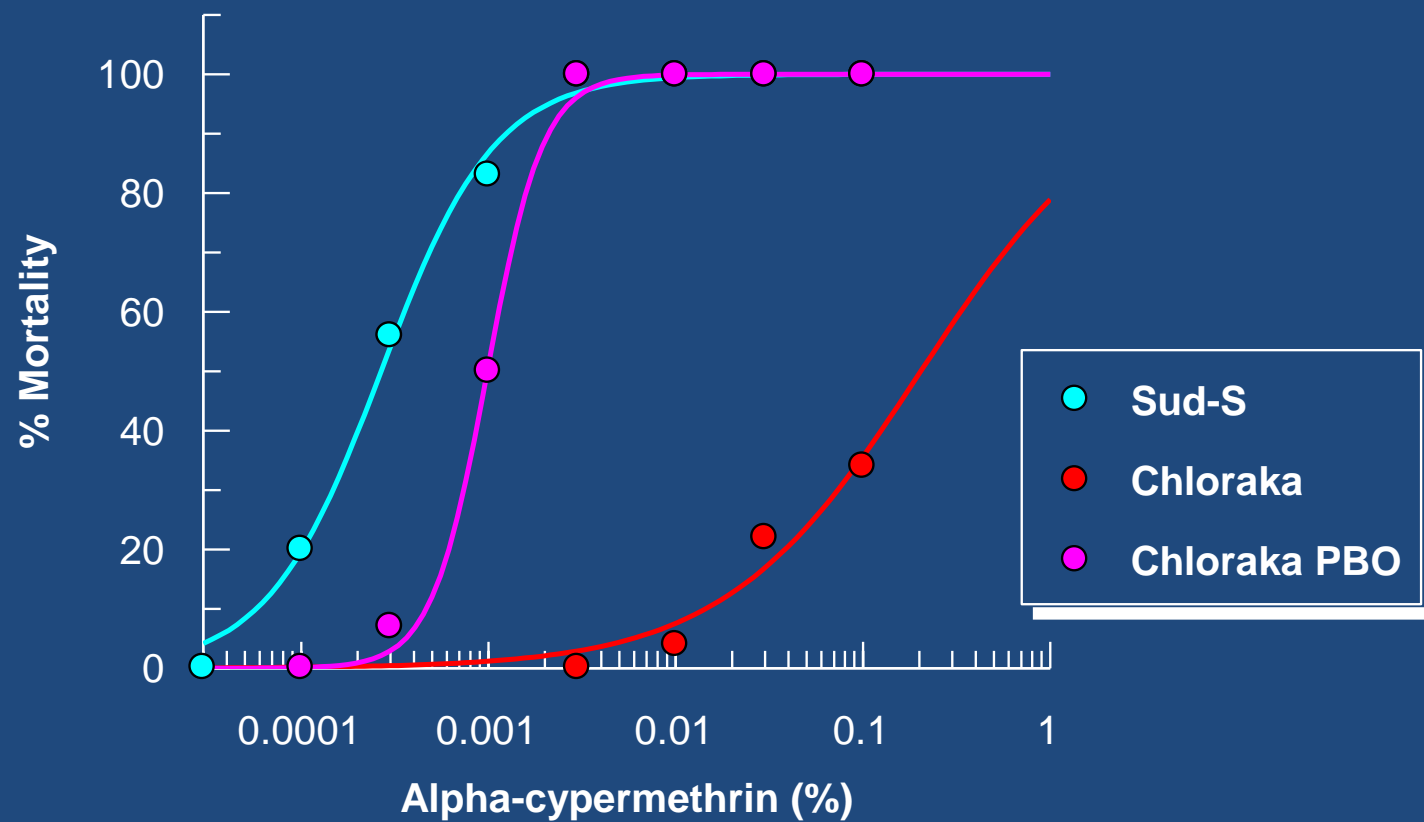
M. persicae / pirimicarb



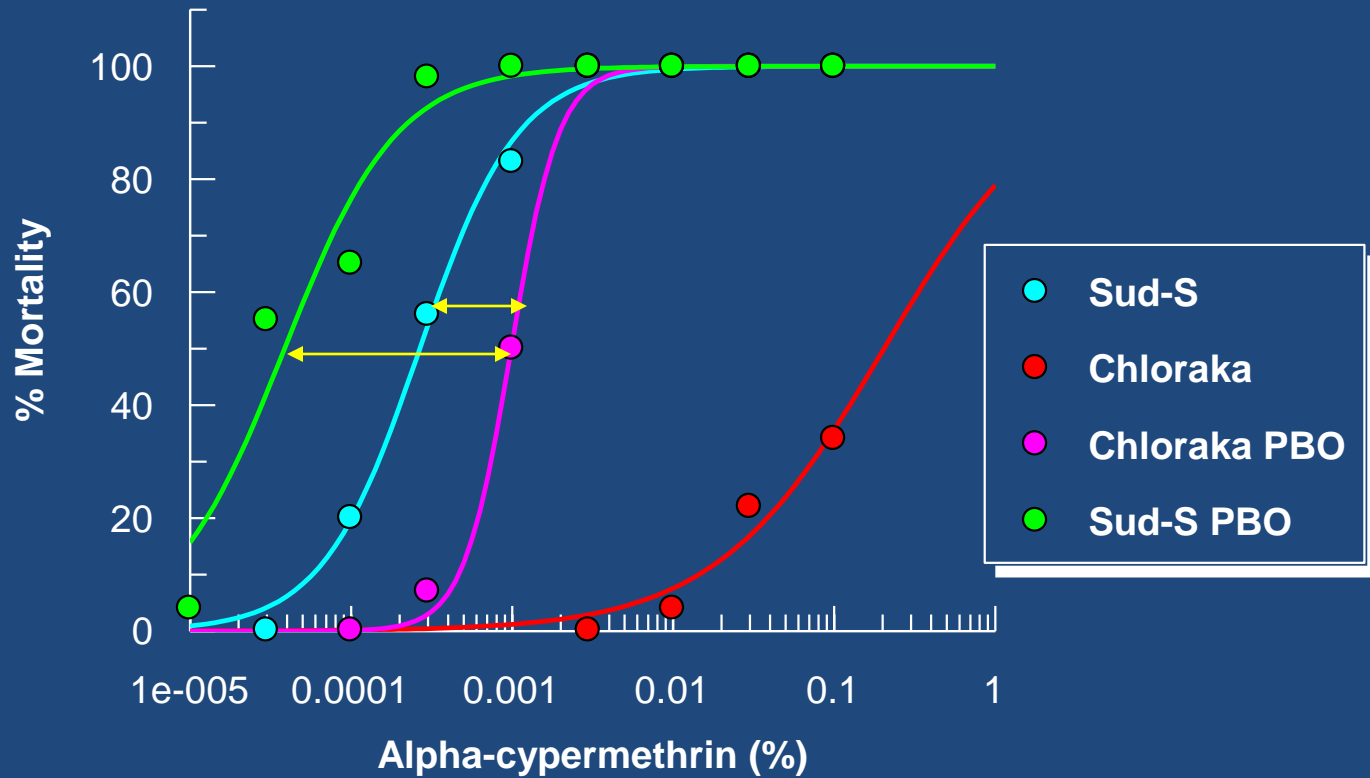
B. tabaci / α -cypermethrin



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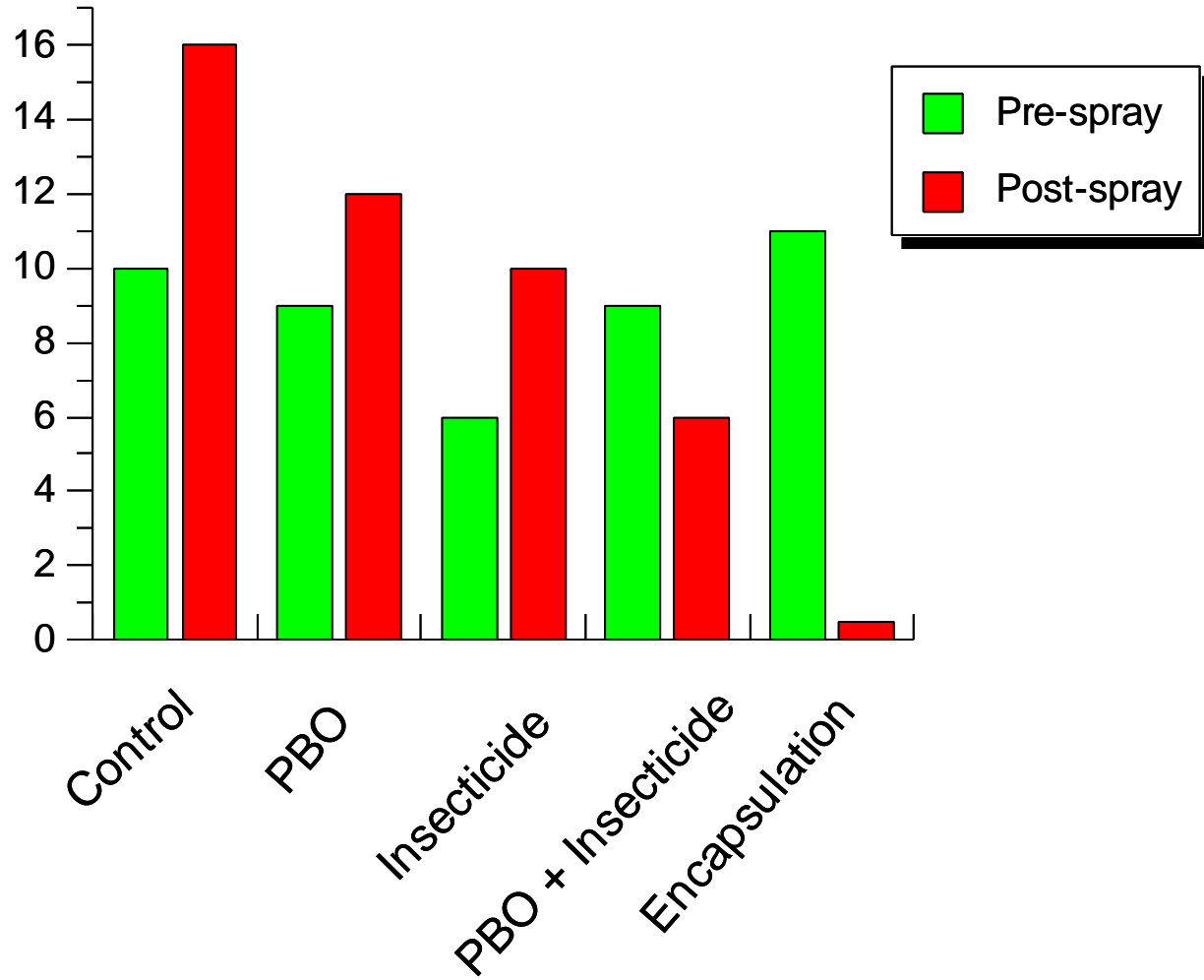
Temporal synergism

- Can control insecticide-resistant pests
- Acts on metabolic systems, independent of insecticide class
- Creates 'hypersensitive' state prior to insecticide exposure

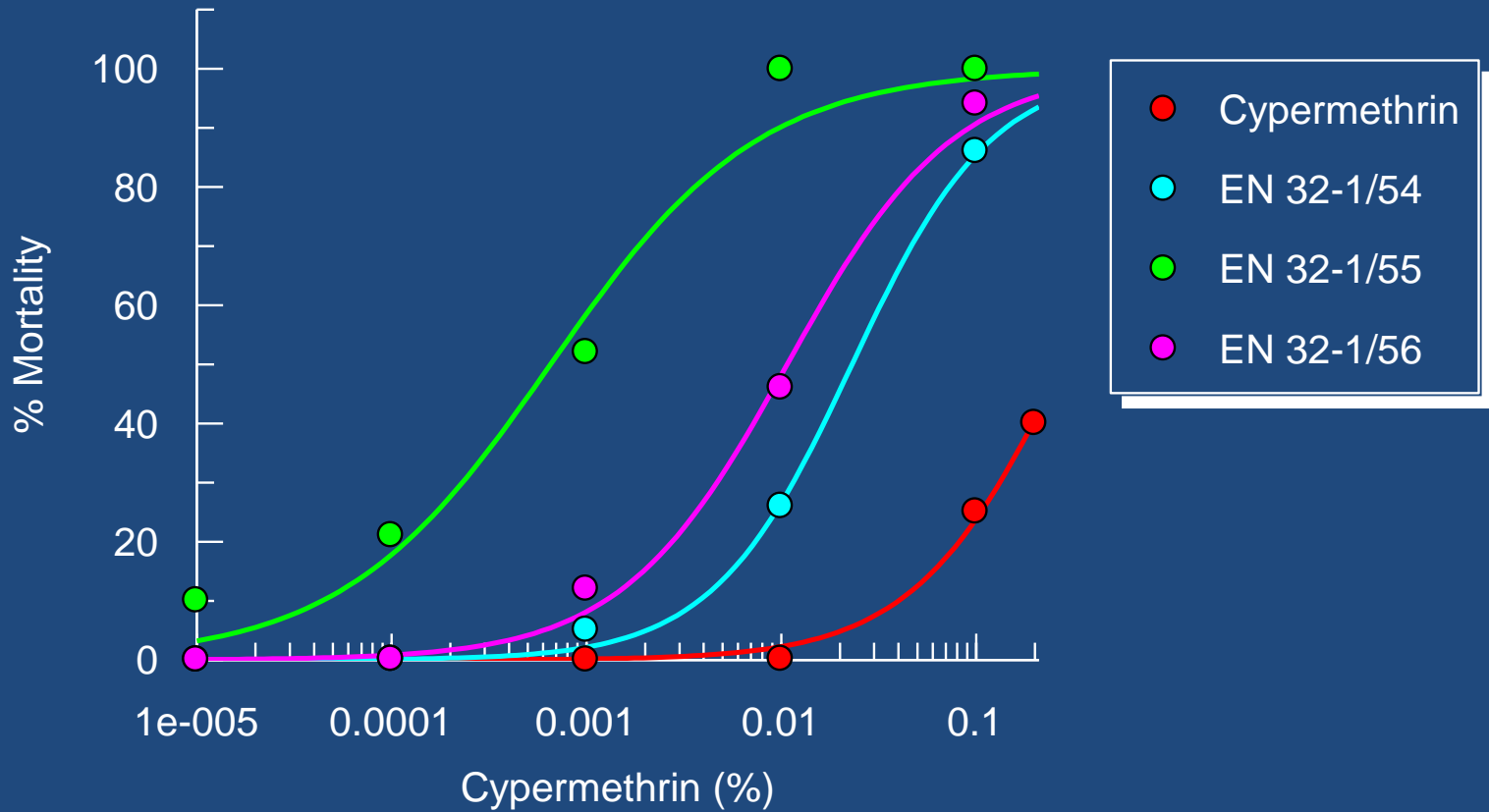
Does it work in the field?



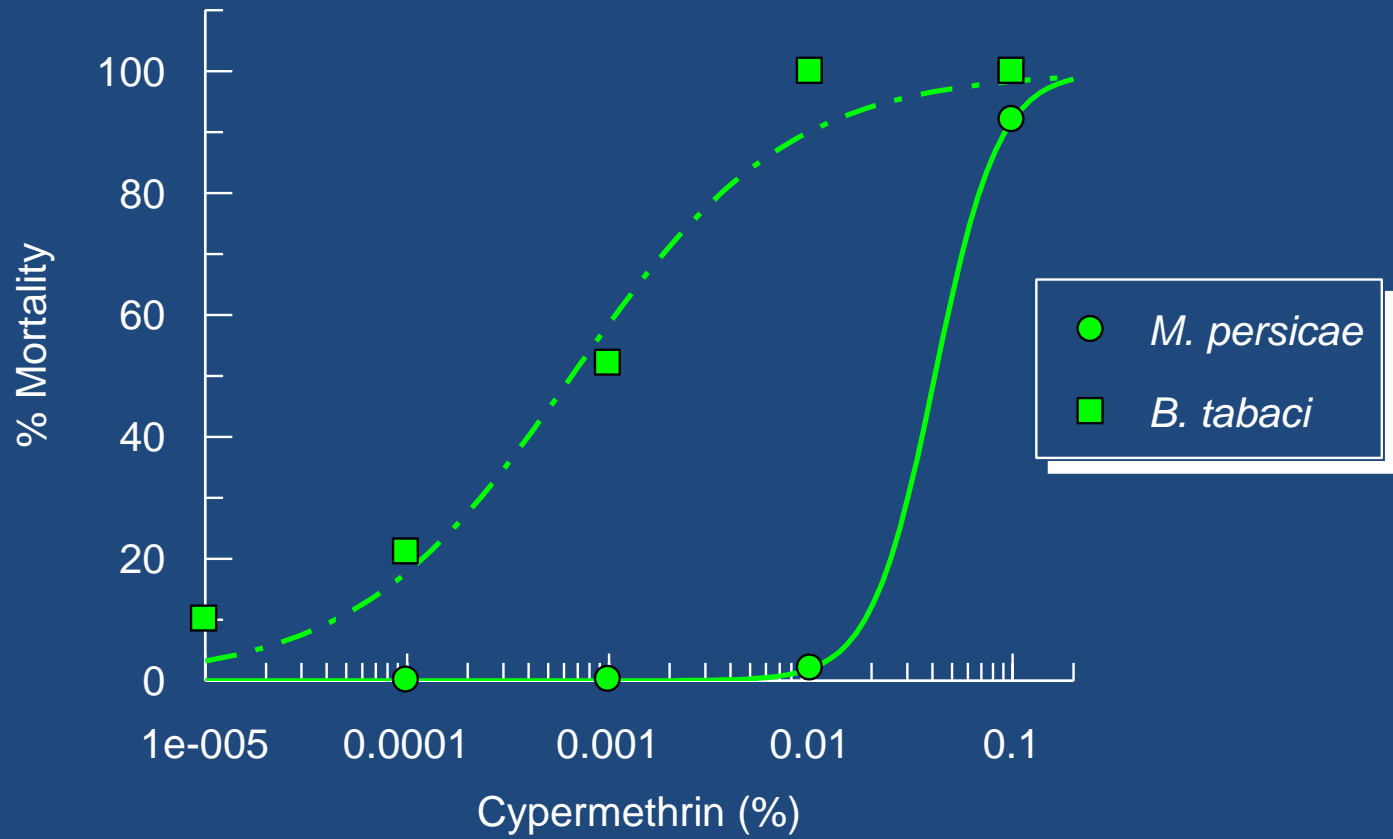
Whitefly – Australian field trial



B. tabaci / encapsulations



EN 32-1/55



Temporal synergism

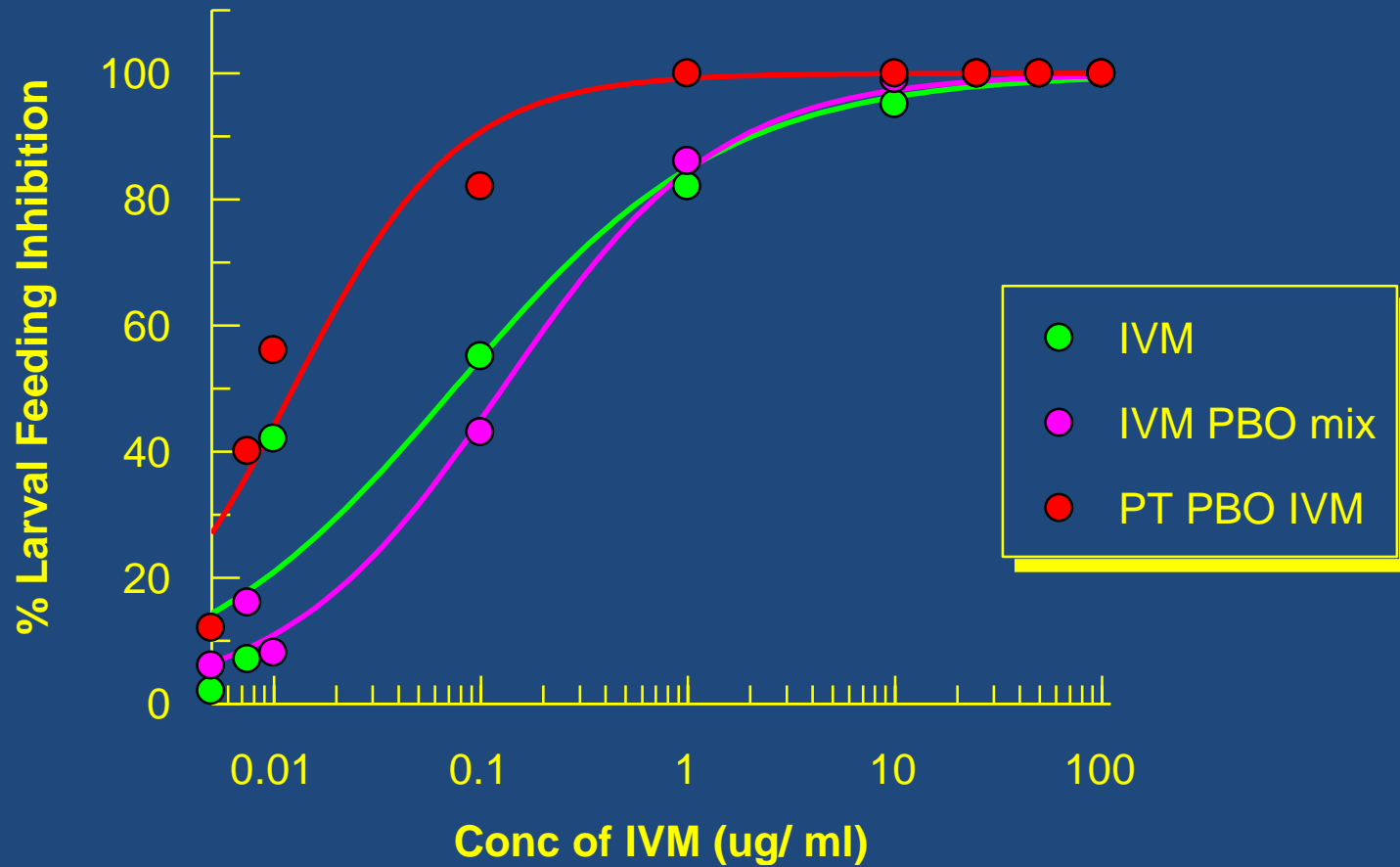
- Can control insecticide-resistant pests
 - Acts on metabolic systems, independent of insecticide class
 - Creates 'hypersensitive' state prior to insecticide exposure
-
- Bespoke formulations can target specific pests

Temporal synergism and animal endoparasites

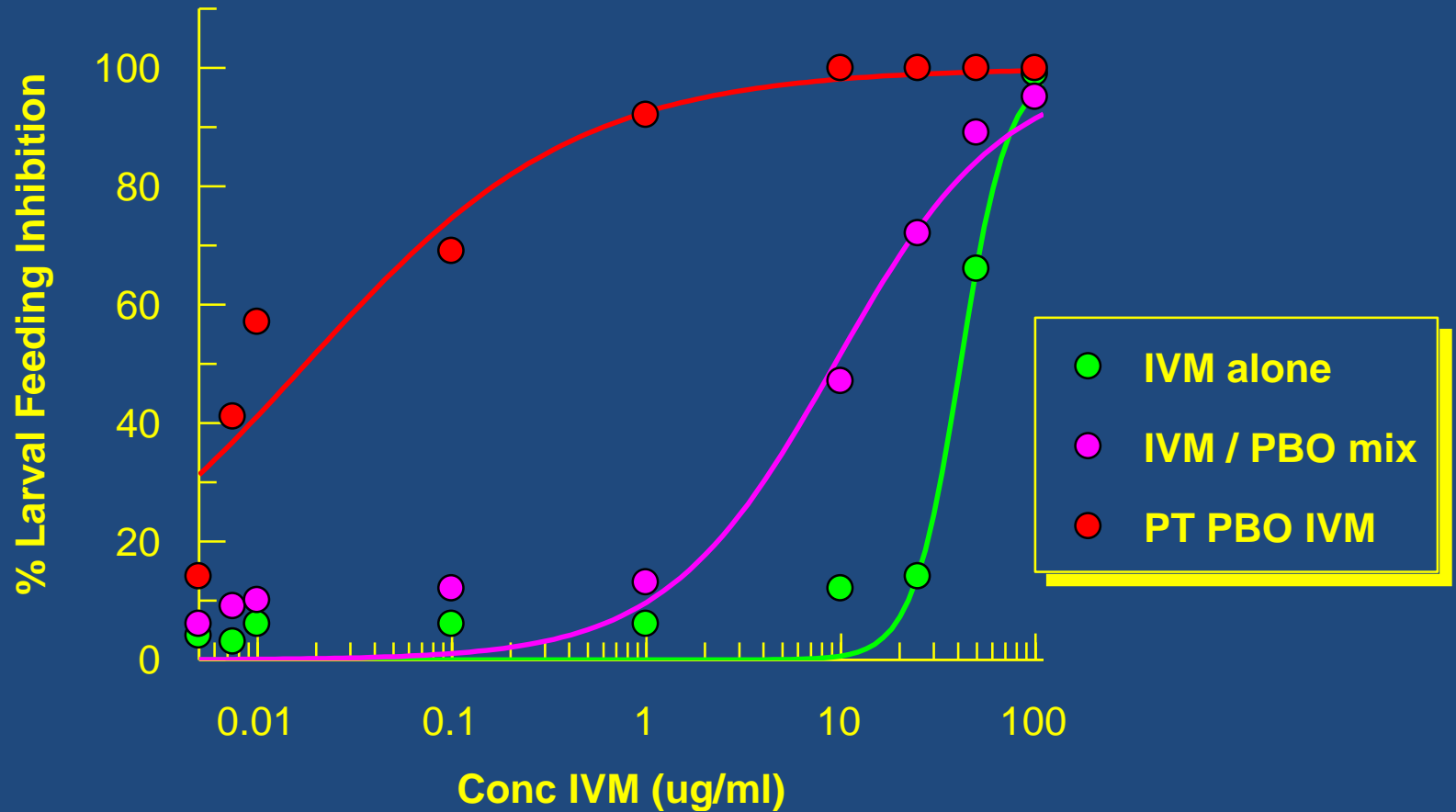
Barber's Pole worm

Haemonchus contortus

ISE - Susceptible



WRS – multi-drug resistant

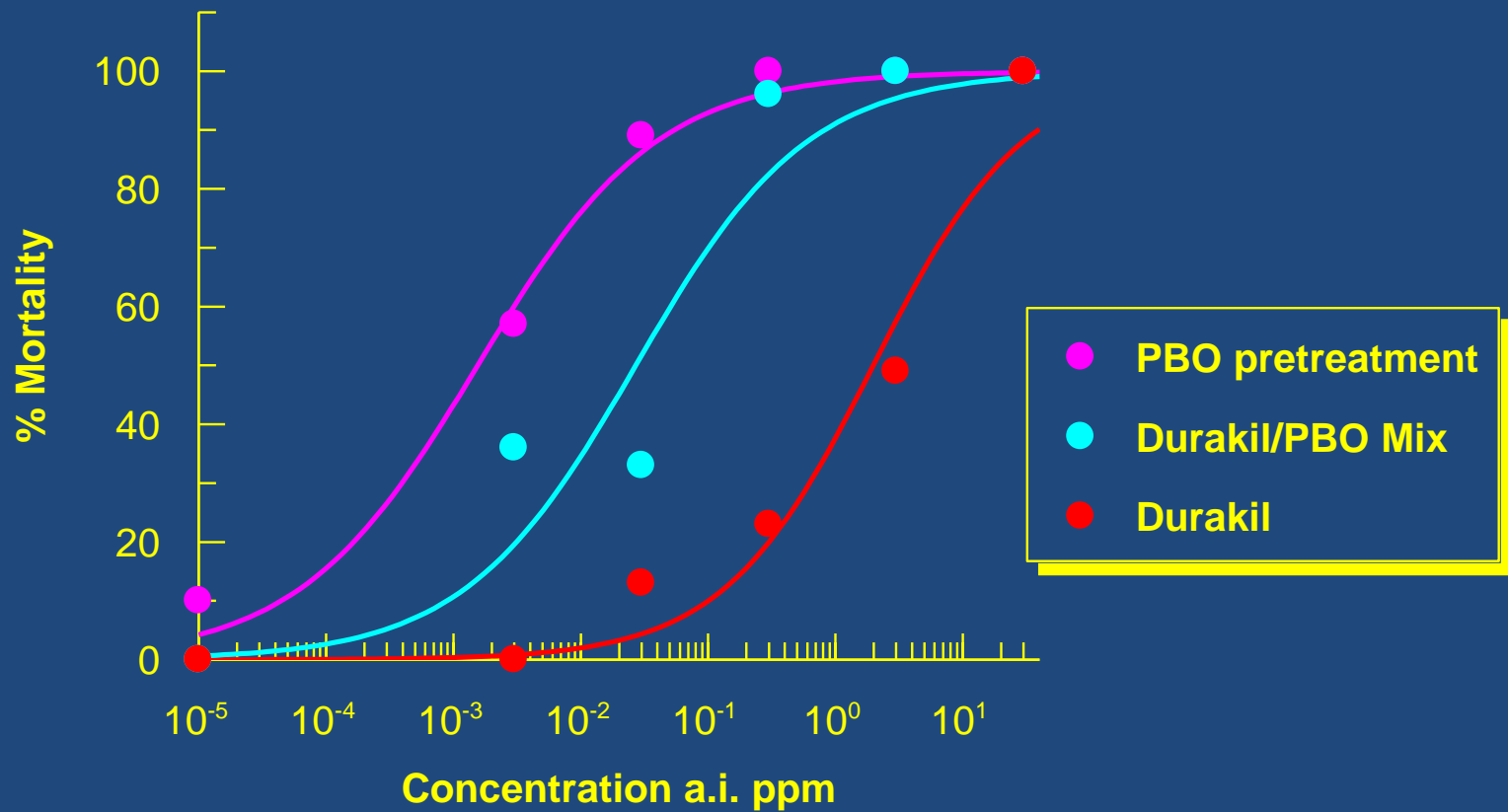


Temporal synergism and animal ectoparasites

Poultry Red Mite

Dermanyssus gallinae

VLA Laboratory Susceptible



Wolfhangar field strain

