

# Lessons Learnt from Past Use and Current Use of Pyrethroids – Observations from a Practical Agronomist (1980-2017)

Dr David Ellerton

Technical Development Director

Hutchinsons



# Cereal and OSR Insecticide ai's & Groups 1979/80

Organophosphates	<b>Group 1B</b>	<p><b>azinphos-methyl (Gusathion)</b>  chlorpyrifos (Dursban)  demeton-s-methyl (Metasystox 55)  dimethoate (Dimethoate 40)  <b>disulfoton (Disyston P-10)</b>  <b>etrimfos (Ekamet)</b>  <b>fenitrothion (Dicofen)</b>  <b>fonofos (Dyfonate 10G)</b>  formothion (Anthio)  <b>heptenophos (Hostaquick)</b>  <b>malathion (Malathion 60)</b>  <b>mevinphos (Phosdrin)</b>  <b>omethoate (Folimat)</b>  <b>oxydemeton-methyl (Metasystrox R)</b>  phosalone (Zolone)  <b>phorate (BASF Phorate)</b>  <b>quinalfos (Savall)</b>  thiometon (Ekatin)  triazophos (Hostathion)</p>	
Organochlorines		<b>Group 3B</b>	<p><b>DDT (Arkotine DDT)</b>  <b>endosulfan (Thiodan Liquid)</b>  gamma-HCH (Gamma-Col)</p>
Carbamates		<b>Group 1A</b>	<b>pirimicarb (Aphox)</b>
Pyrethroids		<b>Group 3A</b>	<b>permethrin (Ambush)</b>

**Cereals only**  
**OSR only**  
**Cereals/OSR**

Source: List of Approved Products and their uses for Farmers and Growers ACAS



## Examples of IPM Techniques for Pest Control in Combinable Crops

- Later drilling to reduce risk of BYDV – lower yields/reduced profitability, fear of wet weather
- Earlier drilling to limit impact of wheat bulb fly – increased weed, pest and disease pressure
- Varietal resistance eg: orange wheat blossom midge/TuYV – few other pests
- Increase speed of emergence through varietal choice, starter fertilisers, biostimulants, etc to outgrow pests eg: Cabbage stem flea beetle – lacking trials info
- Rolling seedbeds to limit impact of slugs, CSFB, WBF – time available/conditions
- Avoid growing pest susceptible crops/destroy green bridge eg: OSR/slugs, peas/pots/WBF, beans/ stem nematodes, BYDV green bridge – rotations, profitability
- Soil and seed testing eg: WBF, stem nematodes – mapping, cost, responsibility
- Catch cropping/pheromones to attract pests away from crop eg: pollen beetle, codling moth – efficacy, complications to cropping, info
- Biofumigant crops eg: mustard and nematodes - trials info
- Biological control products - aphids, etc – cost, efficacy, production and storage
- More use of monitoring/thresholds before spraying to reduce selection pressure – lack of info, reliability, rapid pest build up, final accountability for outcome

**‘Use as much as necessary but as little as possible’ - LEAF**



# Key Pest Thresholds in Cereals and OSR

## Gout fly (*Chlorops pumilionis*)

### Thresholds

Limited evidence suggests that treating winter crops is economic if eggs are found on more than half of plants at GS12.

Currently, there is no threshold for spring-sown crops.

## Bird cherry-oat aphid (*Rhopalosiphum padi*)

## Grain aphid (*Sitobion avenae*)

### Thresholds

No satisfactory thresholds for treatment exist. If aphids are present, it should be assumed that they are carrying BYDV.

## Frit fly (*Oscinella frit*)

### Thresholds

Examine plants soon after full emergence. If more than 10% are damaged, an insecticide is recommended.

## Wheat bulb fly (*Delia coarctata*)

### Thresholds

- Fewer than 100 eggs/m<sup>2</sup>: Seed treatment justified in spring-sown cereals
- 100-249 eggs/m<sup>2</sup>: Seed treatment justified in late-sown and spring-sown cereals
- 250-500 eggs/m<sup>2</sup>: Seed treatment justified in late-sown and spring-sown cereals; egg-hatch spray may be justified
- More than 500 eggs/m<sup>2</sup>: Egg-hatch spray justified in early sown cereals; seed treatment and egg-hatch spray justified in late-sown and spring-sown cereals

## Grain aphid (*Sitobion avenae*)

## Rose-grain aphid (*Metopolophium dirhodum*)

### Thresholds

Before GS61: Half of tillers infested

GS61 to two weeks before end of grain filling: Two-thirds of tillers infested from stem extension to flag-leaf emergence, or if more than 66% of tillers are infested and numbers are increasing for the period from flowering to watery ripe.

## Orange wheat blossom midge (*Sitodiplosis mosellana*)

### Thresholds

Pheromone traps  
30 or more midges: General risk in the next week. Monitor crops for females.

More than 120 midges: Very high risk. Treat wheat crops in surrounding fields at susceptible growth stages (GS53-56) as soon as possible.

Visual crop inspection  
For feed crops: 1 midge per 3 ears

For milling and seed crops: 1 midge per 6 ears

Sticky traps

A catch of around 10 midges per trap indicates a significant risk.

Orange midge

Orange midge

## Bean seed flies (*Delia platura* and *Delia floralis*)

## Saddle gall midge (*Haplodiplosis marginata*)

## Yellow cereal fly (*Opomyza florum*)

## Tumip sawfly (*Athalia rosae*)

## Brassica leaf miner (*Scaptomyza flava*)

## Peach-potato aphid (*Myzus persicae*)

## Rape winter stem weevil (*Ceutorhynchus pictarsis*)

## Cabbage stem weevil (*Ceutorhynchus quadridens*)

## Cabbage stem flea beetle (*Psylliodes chrysocephala*)

### Thresholds

Assessing the need to spray adults in oilseed rape:

- >25% leaf area eaten at the cotyledon-2 leaf stage
- >50% leaf area eaten at the 3-4 leaf stage
- The crop is growing more slowly than it is being consumed

Assessing the need to spray larvae in oilseed rape:

- >35% beetles/eye low water trap caught in total over the monitoring period
- >2 larvae/plant, when dissected
- >50% of petioles damaged

## Pollen beetle (*Meligethes* spp.)

### Thresholds

Oilseed rape

The threshold scheme is based on the maximum number of buds each beetle can destroy and the number of excess flowers produced by different crops. Plant population is important, as low plant populations tend to produce more branches and more flowers.

- If there are fewer than 30 plants/m<sup>2</sup> the threshold is 25 pollen beetles per plant
- If there are 30-50 plants/m<sup>2</sup> the threshold is 18 pollen beetles per plant
- If there are 50-70 plants/m<sup>2</sup> the threshold is 11 pollen beetles per plant
- If there are more than 70 plants/m<sup>2</sup> the threshold is 7 pollen beetles per plant

## Cabbage seed weevil (*Ceutorhynchus assimilis*)

## Brassica pod midge (*Dasineura brassicae*)

### Thresholds

Northern UK: 0.5 per plant  
Elsewhere: 1 per plant

## Mealy cabbage aphid/Cabbage aphid (*Brevicoryne brassicae*)

### Thresholds

Winter oilseed rape: >13% of plants infested before petal fall

Spring oilseed rape: >4% of plants infested before petal fall

Mealy cabbage aphid