Propyzamide case study: Practical control options

**Objective:** to reduce the amount of propyzamide leaching to water supplies

**How?** Can we place less reliance on propyzamide by placing greater reliance on clethodim?

At least with low/medium black-grass infestations or ‘high leaching risk’ fields

alopecurus@aol.com
2019 - 2022 Studies

- Resistance status of black-grass in all field trials
- Water hardness and clethodim efficacy
- Value of X-Change on clethodim efficacy
- Seven oilseed rape field trials: reduced rates/sequences of propyzamide after clethodim
- Propyzamide leaching studies
Black-grass resistance test: Clethodim

CLETHODIM 1 ppm: reduction in seedling growth

% reduction in seedling growth

Population

- Am2078
- WL-BNS21 2020 trial
- WL-3 21 2021 trial
- ADAM21 2020 trial
- ESS A-D19 2019 trial
- LOD/B21 2020 trial
- GSTAU20 2020 trial
- NOTTS05 (1781) trial
- DP1.21 No trial
- MANNY 2021 trial
- 5 ELMS 21 2021 trial
- TWY21 2020 trial
- ROTH13
- PELDTH17
Frequency of different ACCase target site mutations in black-grass in the UK

85%
4%
1%
2%
8%

% of different ACCase mutations

1781

Samples from 132 fields in England in 2014. 2574 plants assayed

BGRI AHDB Project Report No 601, 2019
Water hardness had **NO EFFECT** on clethodim.

Twyford (Manny) OSR field trial 2021/22

Spraying water hardness (CaCO₃ ppm)

<table>
<thead>
<tr>
<th>Water Hardness</th>
<th>% Reduction in Black-grass Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (36 ppm)</td>
<td>81</td>
</tr>
<tr>
<td>Medium (178 ppm)</td>
<td>80</td>
</tr>
<tr>
<td>High (328 ppm)</td>
<td>78</td>
</tr>
<tr>
<td>Mean</td>
<td>80</td>
</tr>
</tbody>
</table>
Water conditioner (X-Change) increased efficacy of clethodim on black-grass in 6 OSR trials 2020 - 2022

Clethodim applied Sept/early Oct
Twyford: black-grass populations in OSR (Feb/April 2021)

Black-grass plants/m²

Cherry picking: the worst data

Clethodim followed by Propyzamide

Untreated
Cleth 120 g/ha
Cleth 120 g/ha +WC
Prop 500 g/ha
Prop 750 g/ha
Prop 850 g/ha
Cleth fb Prop 500 g/ha
Cleth fb Prop 750 g/ha
Cleth fb Prop 850 g/ha
Mean of 6 oilseed rape field trials 2019 - 2022
(range = 95 – 100)

Herbicide Treatments
CLETHODIM Oct 500 B PROPYRAMIDE Nov/Dec
CLETHODIM Oct 850 B PROPYRAMIDE Nov/Dec

% reduction in black-grass plants

98.3

98.1

Black-grass populations: 21 – 170 plants/m²
Grafham tramline trial: 12 March 2022
Grafham trial 2021/22: propyzamide in soil water

Mean values 30Dec+7Jan+25 Feb+18 March samplings
‘Pecking’ order same at all 4 dates – only likely to happen 1 in 1296 x by chance

LSD $P \leq 0.05 = 0.779$
Sig $< 0.001$

91% reduction
Affinity Water/Anglian Water Project

• Can test for resistance status to clethodim – useful in confirming presence/absence of severe resistance

• No evidence that water hardness affects clethodim efficacy

• Good evidence that X-Change improves clethodim efficacy (by ~11%) regardless of water hardness

• Following clethodim, reducing the rate of propyzamide from 850 to 500 g/ha in Nov/Dec is possible without compromising control

• This can reduce the amount of propyzamide leaching to soil water

Yes, there are risks. These ideas are not about saving money; rather, they are more about saving propyzamide.
I would like to thank:

- **Affinity Water and Anglian Water for funding project**
- **Farmers for hosting trials**
- **Alan Dewar & Charlie Riches for trials support**
- **Particular thanks to Danny Coffey, Affinity Water, Catchment and Biodiversity Team**

Reduced rate propyzamide (500 g/ha in Dec) plot on 2 June 2022 – still very clean