Update on Slugs, Leatherjackets, BYDV and Pollen beetles

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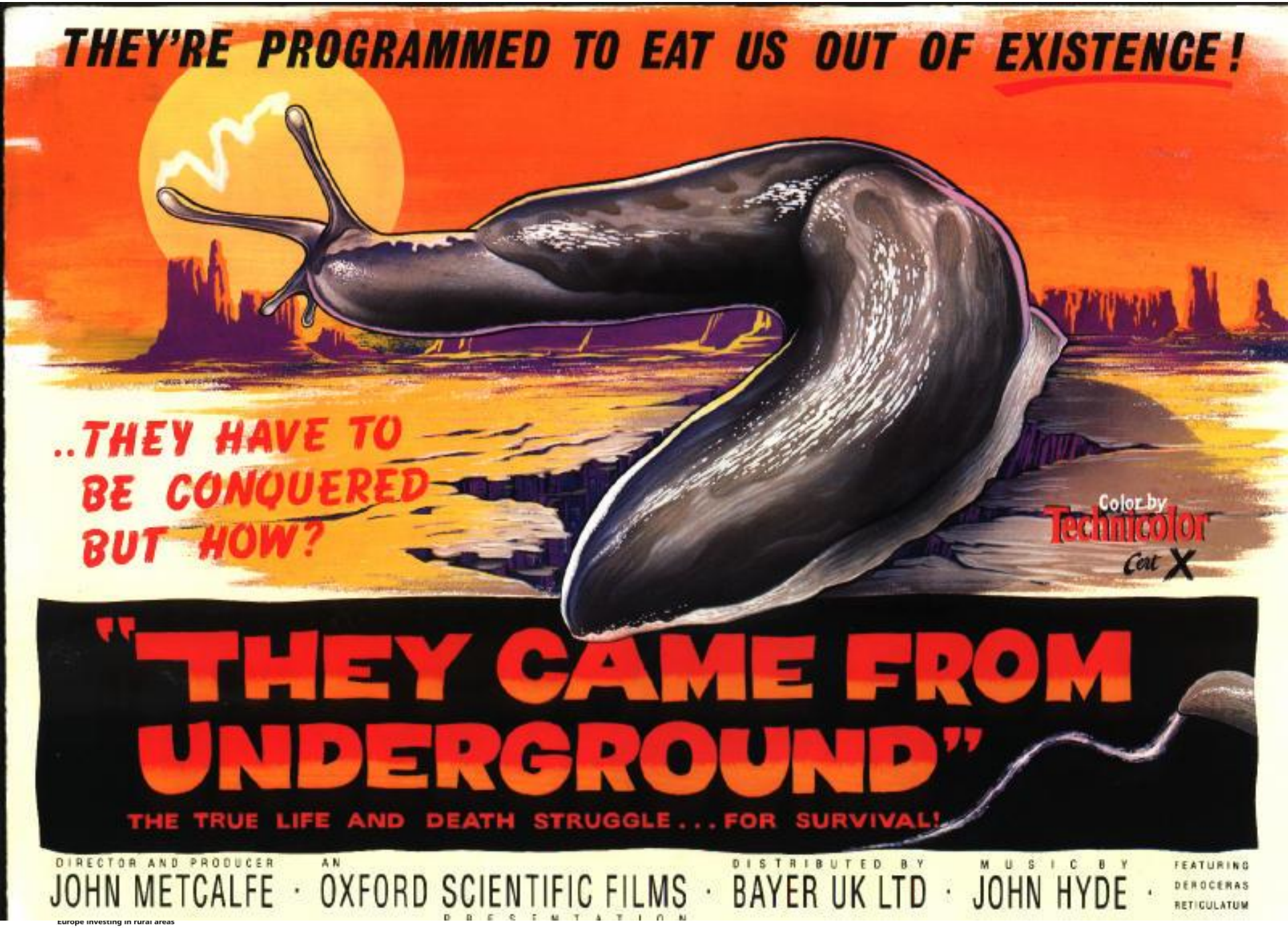

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The state of some farm bathrooms leave a lot to be desired…….

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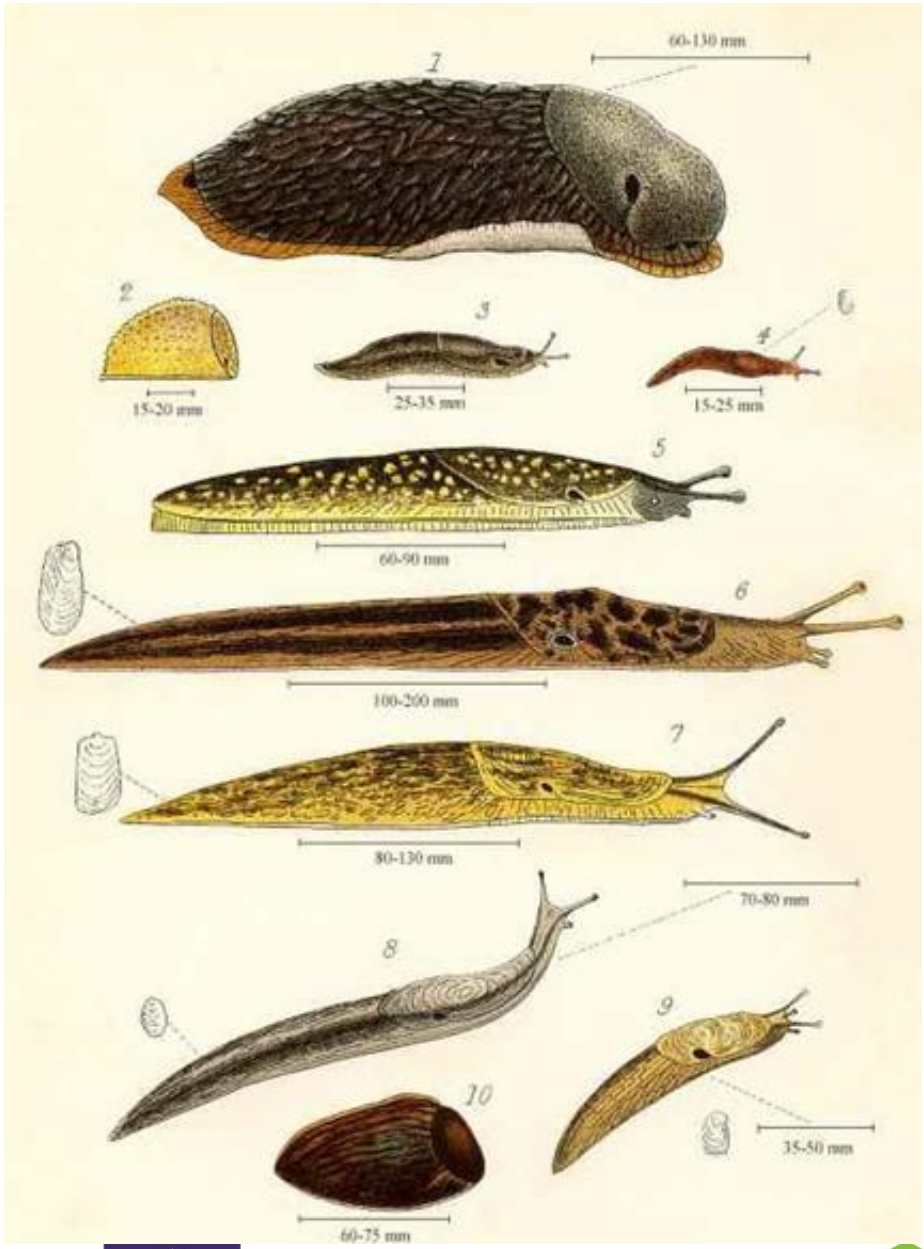

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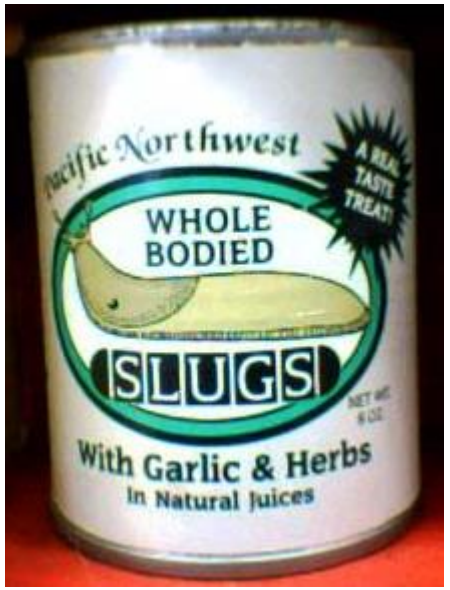
Slugs will eat most crops



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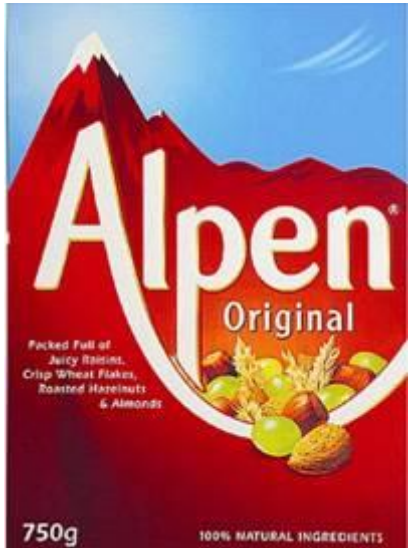
Slug risk assessment



Assess the risk using bait traps prior to sowing

- 3-4 per trap likely risk of damage in wheat
- 1 per trap for winter rape or potatoes

Bait with layers mash or Alpen

- Begin monitoring before planting
- Check traps (am) on several occasions, best if soil is damp

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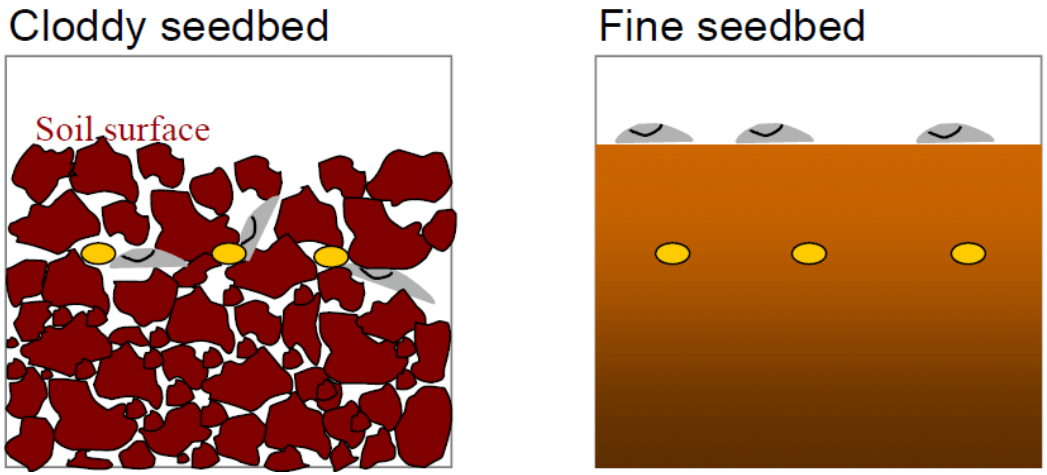
Slug management

- Minimum tillage gives considerable reduction in slug damage compared to direct-drilling
- Production of fine firm seedbeds is most important



- Drill a little deeper than normal (3-4cm) if seedbed is cloddy – but not if crop is late sown
- In cloddy seedbeds with large slug populations effective slug control is difficult

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Slugs are getting all the breaks

- The European Union voted to revoke the use of methiocarb in slug pellets, due to their risk to grain-eating farm birds a couple of years ago
- The other major slug pellet product used in the UK is Metaldehyde, but it has come under pressure because it has been found in watercourses at levels that often exceed recommended limits in drinking water
- The other active ingredient available to control slugs is ferric phosphate

Water contamination by metaldehyde

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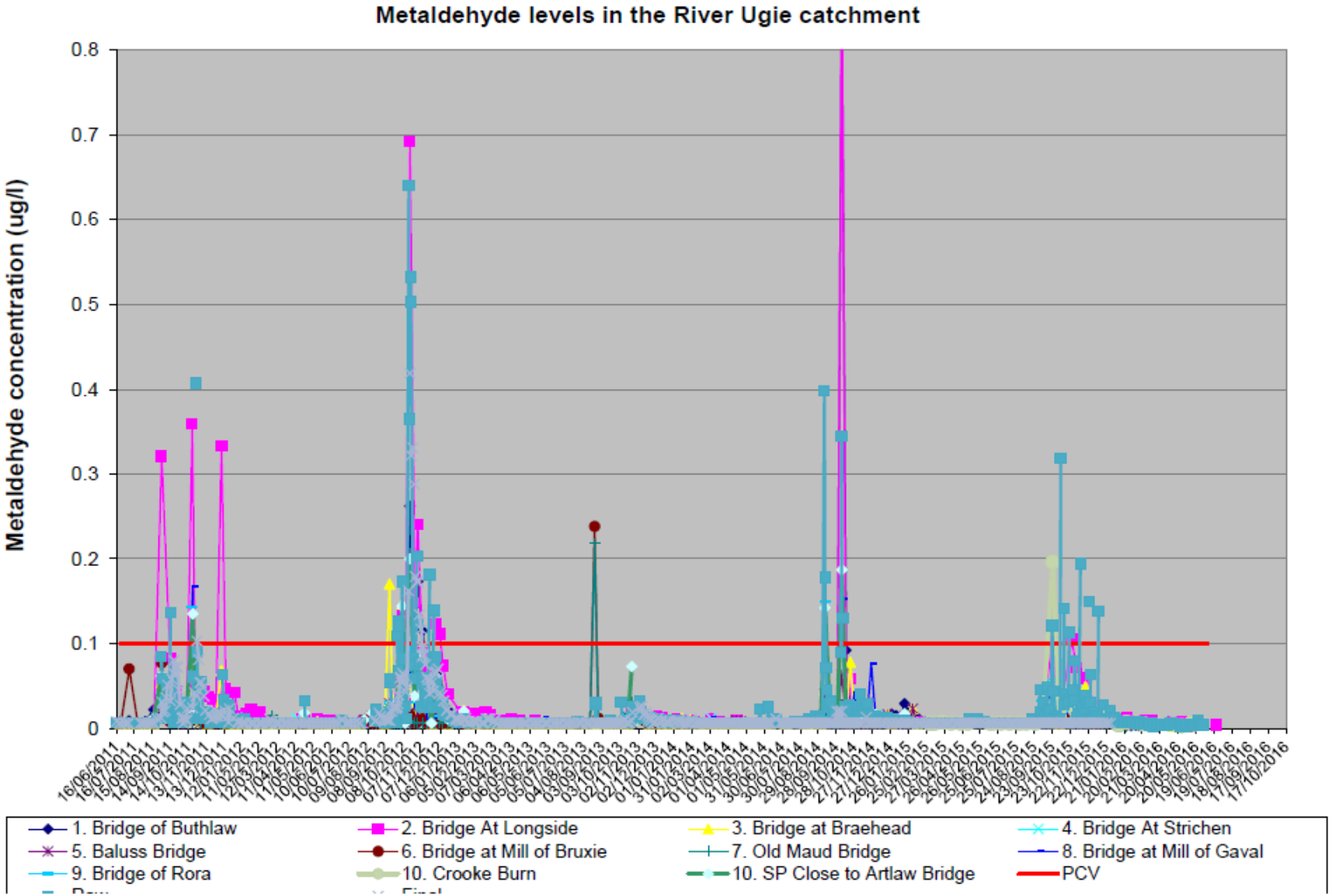

Metaldehyde in drinking water

Some Perspective

- Even with the highest concentrations of metaldehyde found in tap water, the average-size person would need to drink more than 1000 litres, or one tonne, of water each and every day of their lives to get near the 'acceptable daily intake' for metaldehyde

1,760 pints of IPA – a day![69]

Update to Metaldehyde Stewardship Guidelines

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- No metaldehyde pellets should be allowed to fall within a minimum of **10 metres of any field boundary or watercourse**
- Maximum single application: **210 g metaldehyde a.i./ha**
- Maximum total dose rate from 1st August to 31st December: **210 g metaldehyde a.i./ha**
- Work out the total pellet application rate for the % of a.i. in your chosen metaldehyde product (slugpelletcalculator.co.uk)
- Maximum total dose rate: **700 g metaldehyde a.i./ha/calendar year** (from any combination of metaldehyde products)
- Do not apply when heavy rain is forecast
- If drains are flowing do not apply metaldehyde slug pellets

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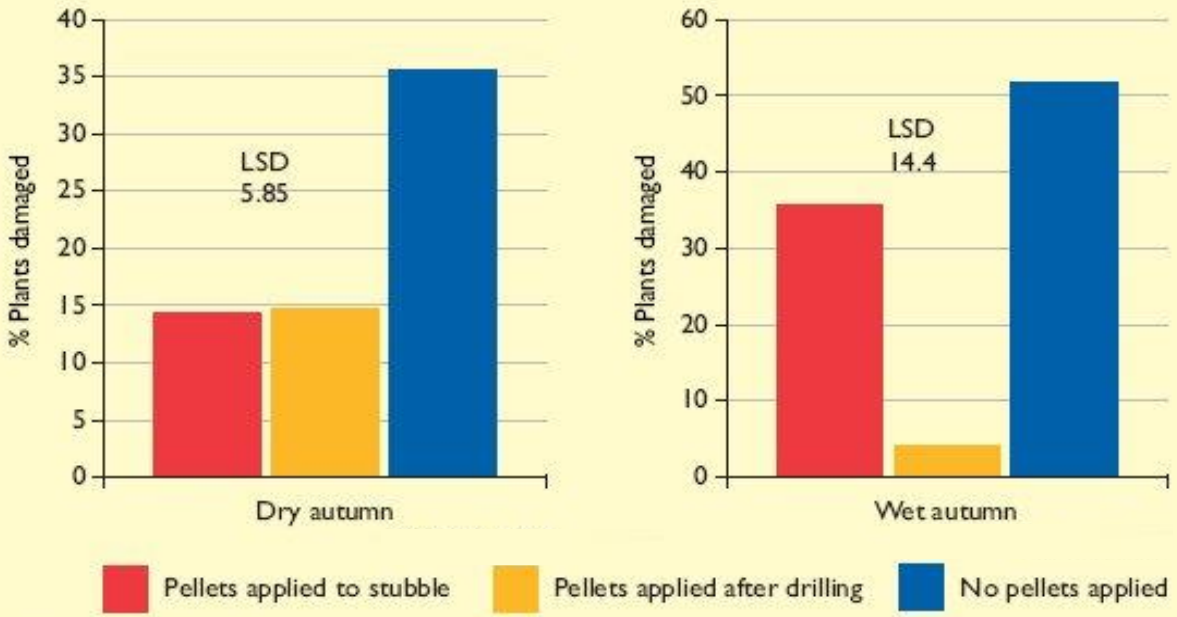
Figure 1. Percentage damage to winter wheat plants following use (or not) of slug pellets



LSD = least significant difference

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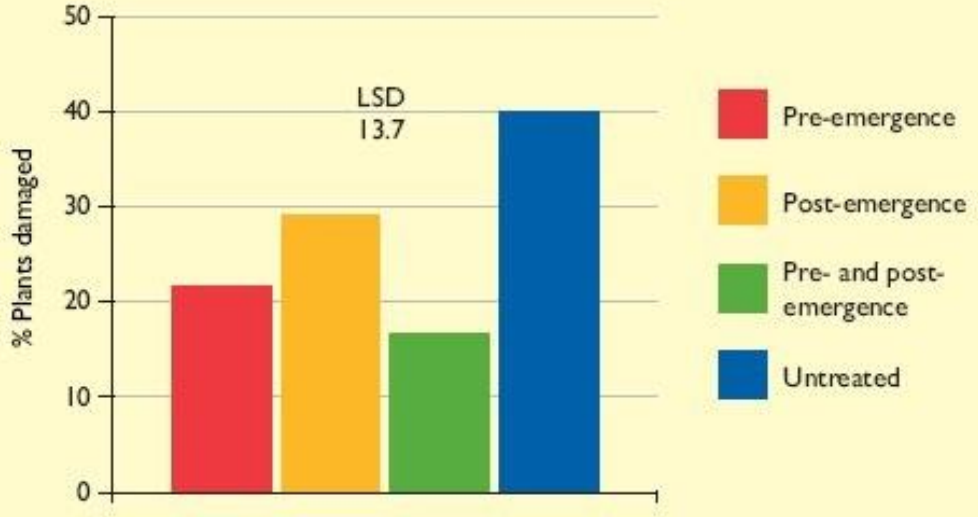
- Conditions dictate best timing for pellet application

- Pre-emergence applications of pellets with follow up post-emergence if damage seen

Figure 2. Effects of slug pellet treatments, applied pre- or post-emergence, or both, on slug damage to winter wheat



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- Cereal seed treatments (primarily for BYDV) reduce grain hollowing to some extent (Deter, Redigo Deter, NipsIT INSIDE)
- Pellets - more baiting points the better
- Use pellets when slugs are on the surface - moist soils, no rain, warm, no wind
- Use all available actives: metaldehyde and ferric phosphate
- Remember 10m from field edge you can’t apply metaldehyde

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Slugs in potatoes

- Monitor slugs before planting
- Plan months in advance – autumn treatment
- Apply at least 2 full-rate pellet treatments (or 4 x half-rate - but remember No. of baiting points and metaldehyde limits)
- Get one application on before crop canopies meet and another at burn down of the crop
- Avoid unnecessary irrigation
- If damage occurring try to lift early
- Be cautious about metaldehyde use
- Ferric phosphate as good as metaldehyde
- Use ferric phosphate and metaldehyde in a programme

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Slug damage in store?

- Slugs can be taken into store, particularly during wet conditions at lifting
- Slugs hitch a ride on clods of soil and in tubers
- Slugs will continue to damage potatoes in store
- Ensure soil and damaged tubers that could be harbouring slugs are graded out and tubers washed to be free of soil

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- The world's greatest slug masher is Mr. Poopdeck Platt.
- In one year, 97-year old Platt and his weary, beaten, ductape-covered boots mashed over 45,000 slugs on his property in Alaska

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Leatherjackets

Annual SAC/SRUC Leatherjacket Survey

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Key thresholds

- A density of over 0.6 million grubs per ha in a grassland field is, if left untreated, likely to result in severe damage to any crop subsequently sown into that field in the spring
- A density of over 1 million grubs per ha in a grassland field is likely to markedly reduce the subsequent growth of grass in that field
- A density of over 2.0 million grubs per ha in a grassland field is, likely to result in severe and visible damage to that sward

Summary of Leatherjacket Survey Results 2005/06-2016/17

Survey	Mean	Percentages of fields in each population category		
Year	Population (millions/ha)	Over 0.60 million/ha	Over 1.00 million/ha	Over 2.00 million/ha
2005/06	2.50	85%	75%	39%
2006/07	2.11	77%	63%	39%
2007/08	0.32	21%	8%	1%
2008/09	0.68	38%	26%	7%
2009/10	1.24	67%	51%	19%
2010/11	0.67	39%	27%	8%
2011/12	0.61	33%	19%	5%
2012/13	1.89	86%	68%	37%
2013/14	2.54	89%	78%	56%
2014/15	0.37	23%	8%	1%
2015/16	0.88	50%	34%	10%
2016/17	**1.63**	**77%**	**62%**	**31%**

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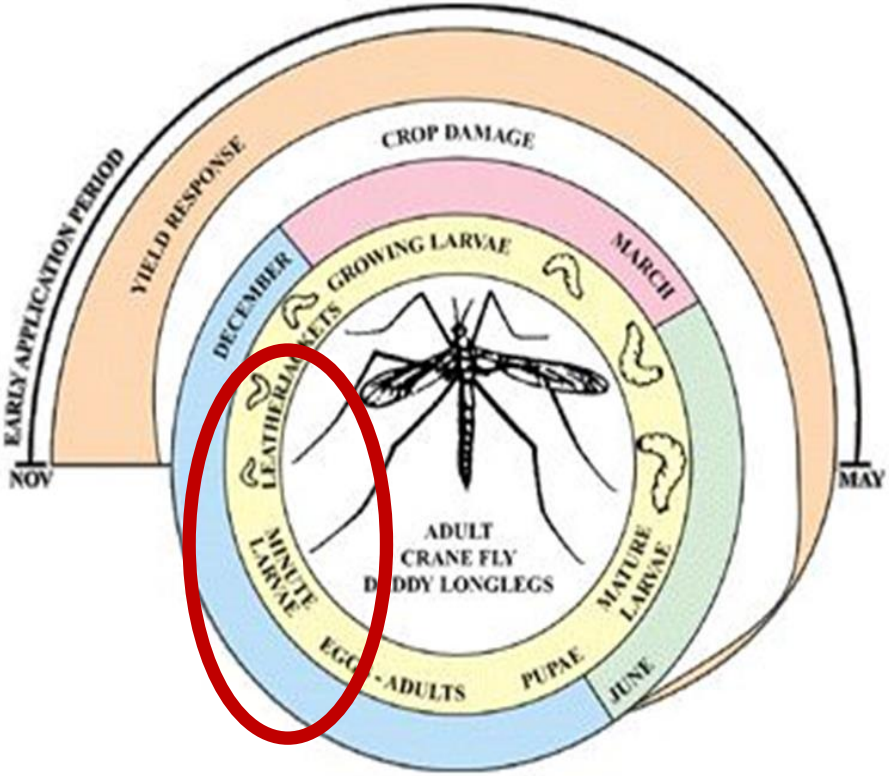
Options for leatherjacket management



- Most vulnerable stage of the life cycle? NOW!
- Winter kill can be impressive
- Bare soil from July-Sept or a non-grass crop will reduce egg laying as they prefer to lay eggs in grass
- Ploughing in the autumn/winter/spring – let birds have a go!
- Delay sowing grass until the autumn

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Leatherjackets and cereals

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Where damage usually occurs

First year cereals after ploughing grass leys.
Grass reseeds, permanent grass, especially in:

- high rainfall areas
- poorly drained soils

Anticipation and avoidance

In final year of ley, **graze down hard in August/September** to reduce egg-laying by crane fly.
Look out for SRUC leatherjacket population forecasts in February/March.
Soil sample grass for leatherjackets before ploughing - then you know the risk.

Plough ley in January, at least two months before anticipated sowing date of cereals.

- Leatherjackets will start feeding voraciously in March and die because of lack of food.
- More soil N is released giving higher grain yield, compared with later ploughing.

If winter ploughing not possible, and forecast is high for leatherjacket populations, **delay ploughing until late April/early May**.

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Leatherjackets and cereals

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Control

Ploughing helps a lot

- If you know that damaging levels are present **before** sowing the grass then there is an opportunity to do additional cultivations of the soil thereby killing a greater proportion of the grubs
- Ploughing kills approximately 50% of grubs

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Established grass

- If grubs are present at levels high enough to damage grass remaining as grass:
  - At the lower end of the scale (between 1.0 and 2.0 million grubs/ha) then grass may be able to grow away from damage, especially if growing conditions in the spring allow it to do that.
  - Rolling affected fields when the grubs are small may help limit grub movement until such time as the grass can grow away from the damage. But any possible short-term benefit of that would have to be balanced against the likely soil compaction issues that would arise from rolling such fields in mid-winter.
  - An alternative approach would be for the grower to accept that grass yields would be lower from such affected fields and decide to choose to target other fields that year on which to concentrate the necessary forage and fodder production.

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A Practical Guide to Integrated Management of Slugs and Leatherjackets

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Aphids - BYDV

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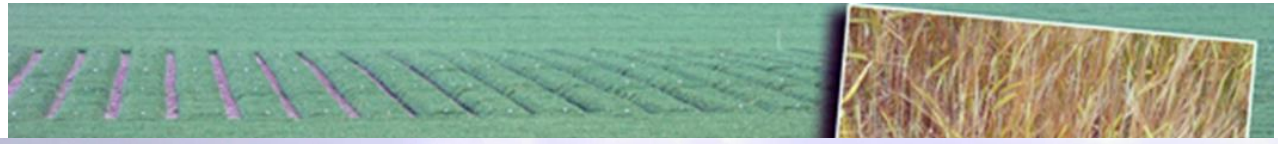

Tackle the Green-bridge

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Green-bridge

- Desiccate stubble with a herbicide, plough 7-10 days later, and sow 2 weeks later (21 -24 days after desiccation)
- Plough stubble and sow 4 weeks later.

Green-bridge and flying aphids

- Aphicide (spray or seed treatment) at crop emergence and maybe spray in late September/mid-October
- Aphids were still flying in mid November 2017

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When do aphids fly into crops?

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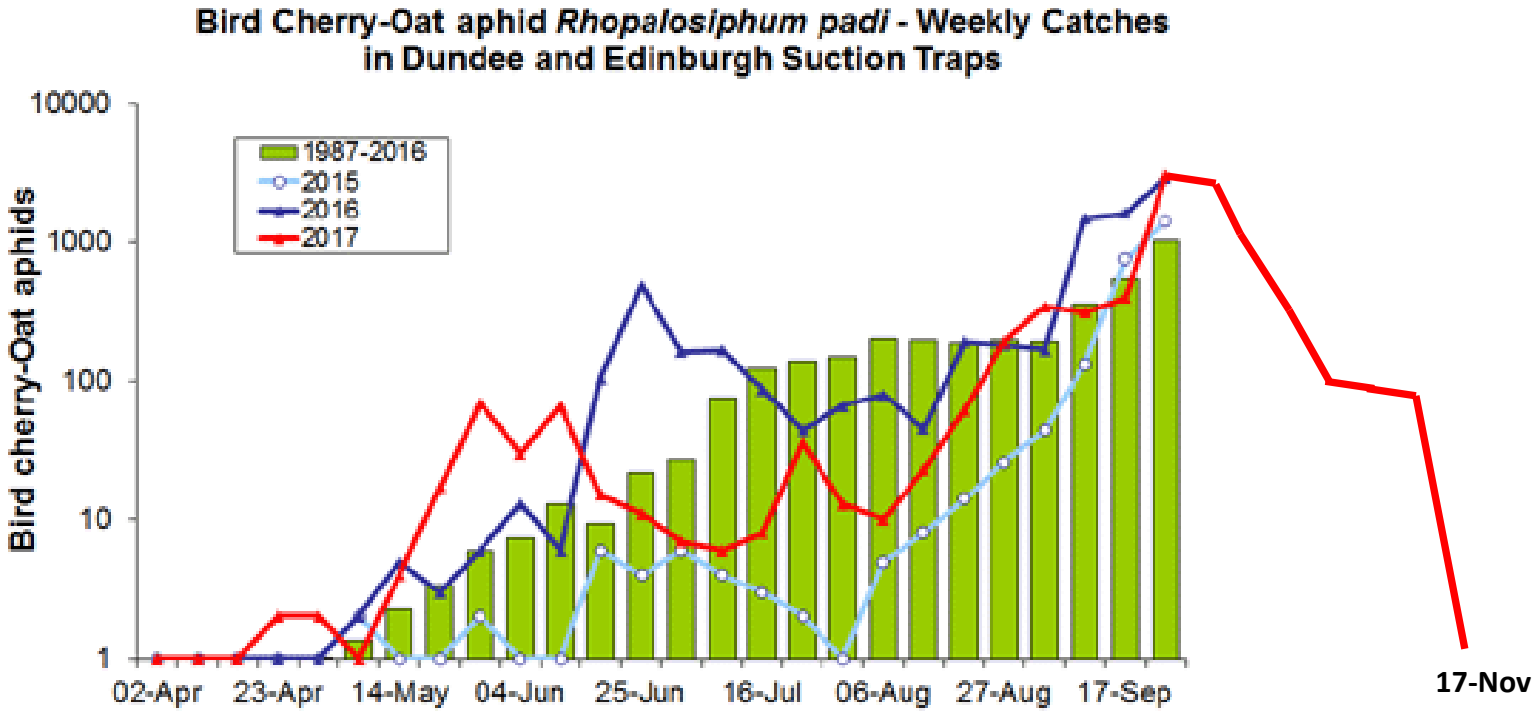

Bear in mind all the different cereal aphids

http://www.sasa.gov.uk/wildlife-environment/aphid-monitoring/cereal-aphids

Seed treatments are the best option. Relying on sprays could be an issue – grain aphid resistance to pyrethroids sprays

?

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Optimising BYDV treatments

Winged aphids fly in, produce wingless young	Ist generation of wingless start to breed	2nd generation of wingless start to breed
BYDV transmitted to one plant	BYDV spread to adjoining plant	BYDV spread to patch
No treatment	Spray if can tank mix	Spray urgently

Optimising BYDV treatments

If need to spray, use a pyrethroid insecticide – **note resistance in grain aphid to pyrethroids in Scotland (~50%) and England (>60%).**

Currently no alternative for spray – seed treatments best option whilst still available……(neonics)

e.g. Toppel 100 (cypermethrin), Decis, Bandu (deltamethrin), lambda-cyhalothrin (Hallmark, Karate), zeta-cypermethrin (Fury) – stick to label rates

Sowing date and BYDV

Pollen Beetles

- Beetles attack the buds of winter and spring rape, trying to get access to the pollen within
- They kill the bud giving rise to blind-stalks with no flowers or pods forming on them

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- Treatment necessary at green-yellow bud stage
- There is an online pollen beetle predictor tool

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New thresholds for assessing pollen beetle risk

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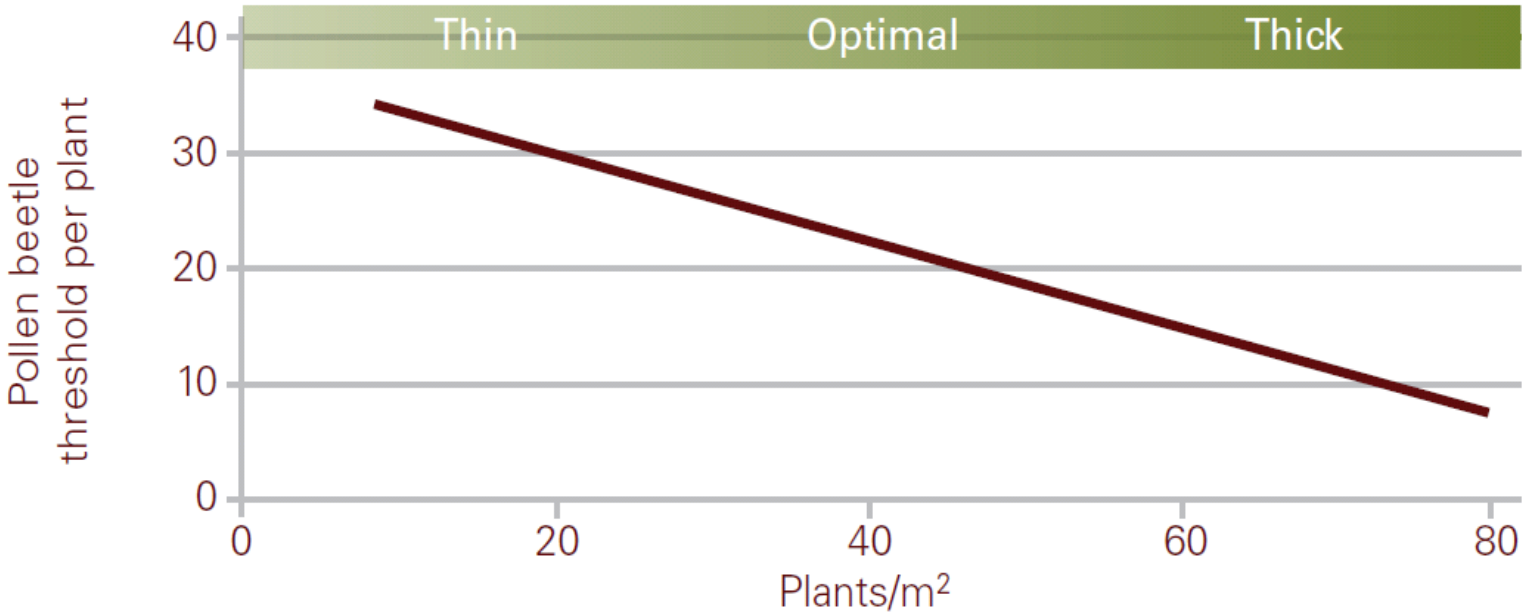
Pollen beetle control is not necessary when the crop starts to flower (ie when >20% of buds on the main shoot are flowering on >75% of the crop).



- Less than 30 plants/m^2 - threshold is 25 pollen beetles/plant
- Between 30-50 plants/m^2 - threshold is 18 pollen beetles/plant
- Between 50-70 plants/m^2 - threshold is 11 pollen beetles/plant
- Greater than 70 plants/m^2 - threshold is 7 pollen beetles/plant

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Insecticides available for pollen beetle control

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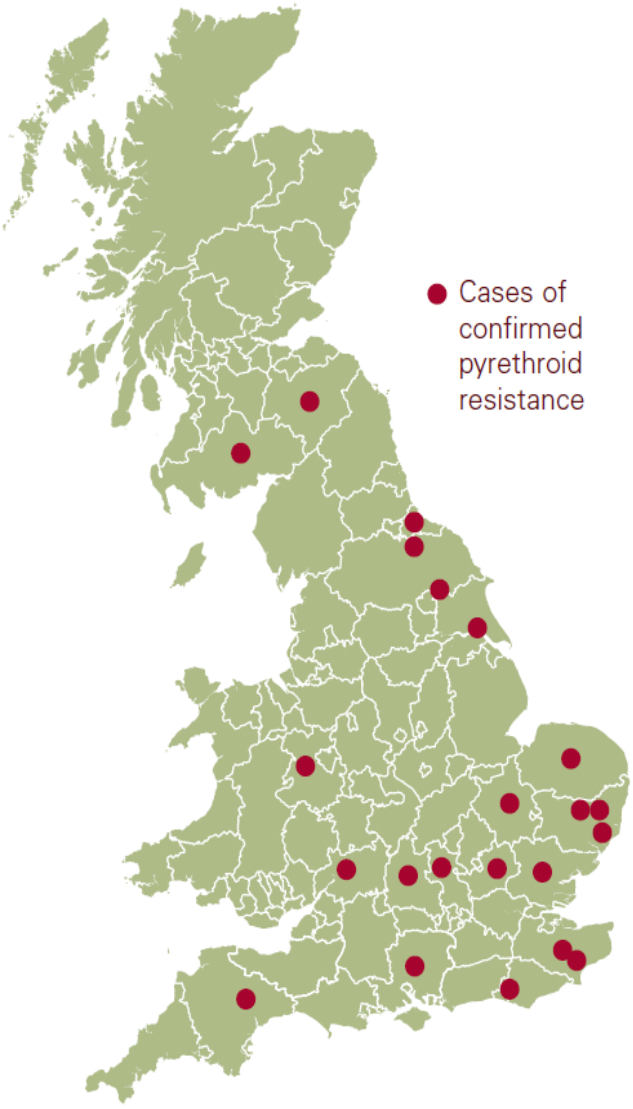
- Pyrethroid insecticides for pollen beetle control in oilseed rape should only be used if treatment thresholds have been exceeded at green-yellow bud
- Only use **one** pyrethroid insecticide treatment per crop (e.g. Mavrik, Decis, Hallmark) - if poor beetle control or another treatment is required, use one neonicotinoid (thiacloprid – Biscaya or acetamiprid - InSyst) treatment and/or one indoxacarb (Rumo) or pymetrozine (Plenum) treatment (especially in high risk areas)
- Please note that pymetrozine and indoxacarb may take several days to kill pollen beetles, although feeding and consequently damage will stop immediately after treatment.



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