

Update on Slug, Aphid and Leatherjacket Management

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THEY'RE PROGRAMMED TO EAT US OUT OF EXISTENCE!

**..THEY HAVE TO
BE CONQUERED
BUT HOW?**

Color by
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"THEY CAME FROM UNDERGROUND"

THE TRUE LIFE AND DEATH STRUGGLE...FOR SURVIVAL!

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JOHN METCALFE

AN
OXFORD SCIENTIFIC FILMS

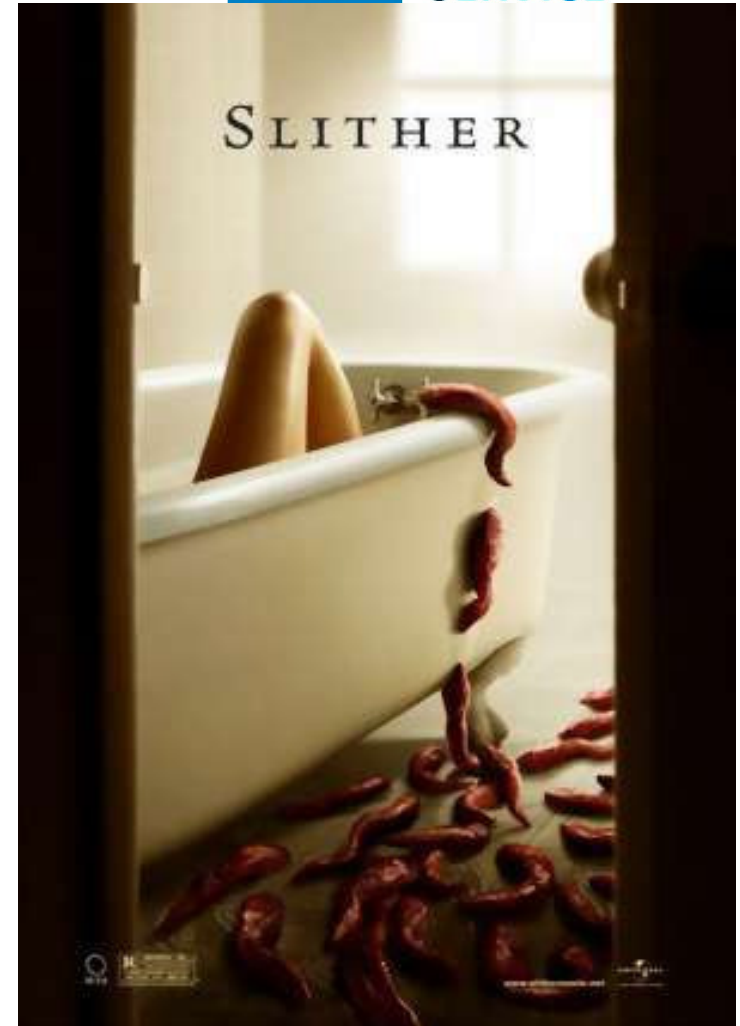
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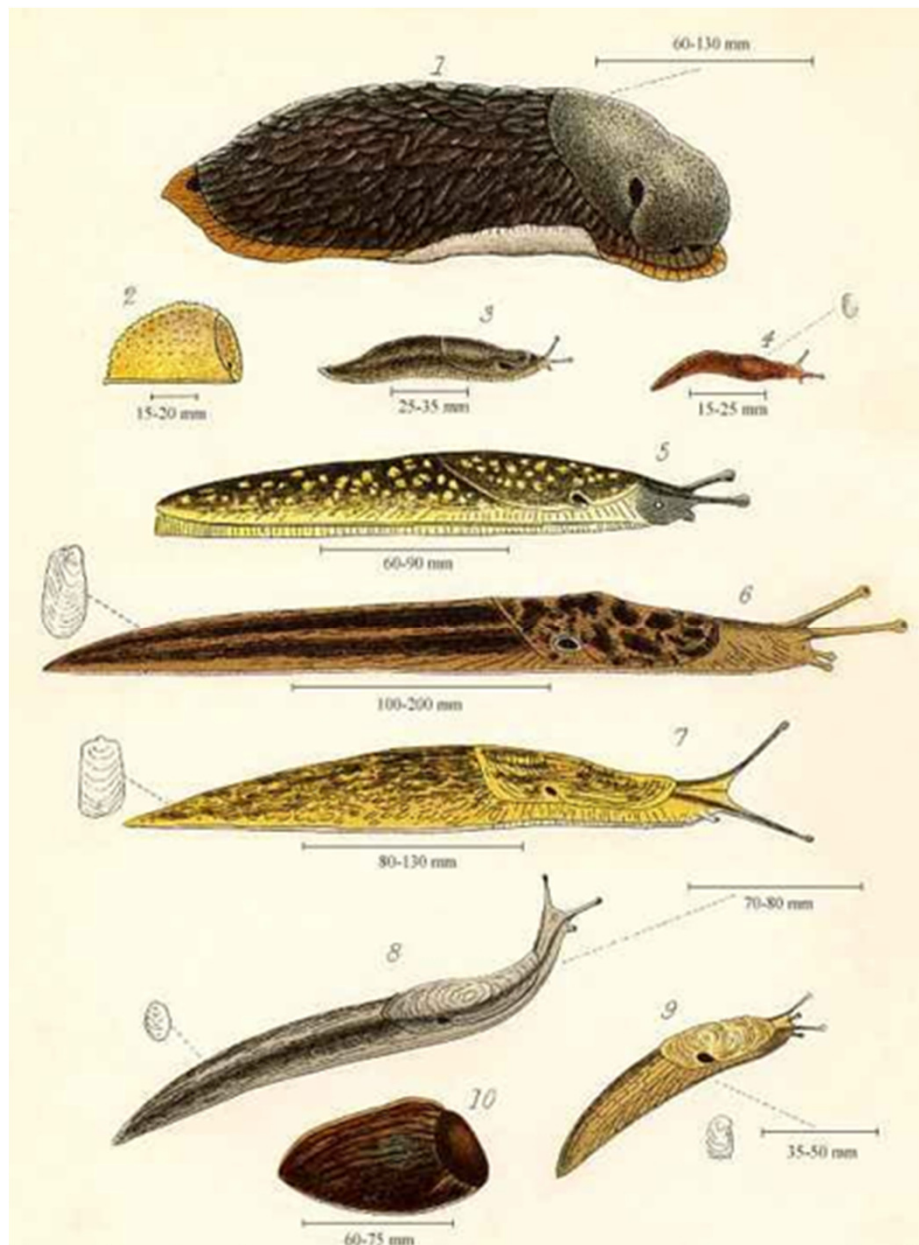
MUSIC BY
JOHN HYDE

FEATURING
**DEROCERAS
RETICULATUM**



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

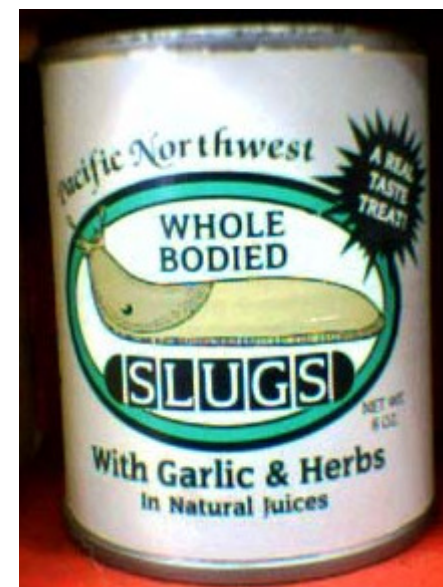




Slugs will eat most crops



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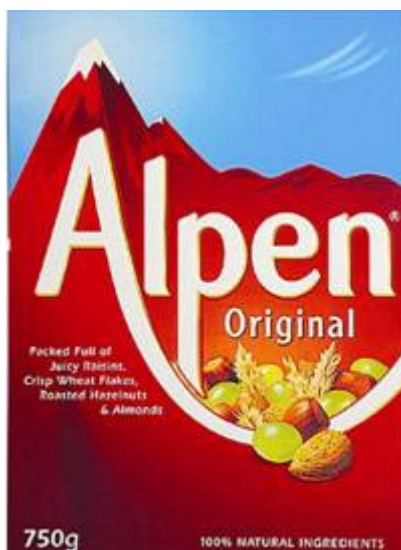
Slug risk assessment



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

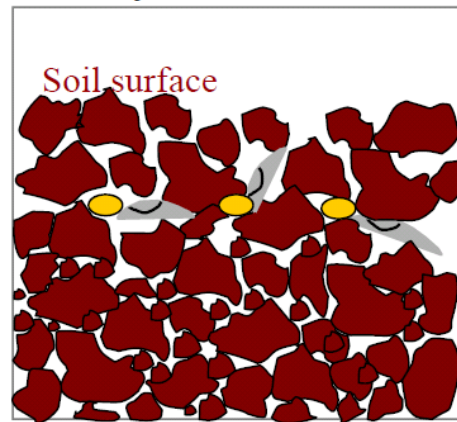


- Begin monitoring before planting
- Check traps (am) on several occasions, best if soil is damp

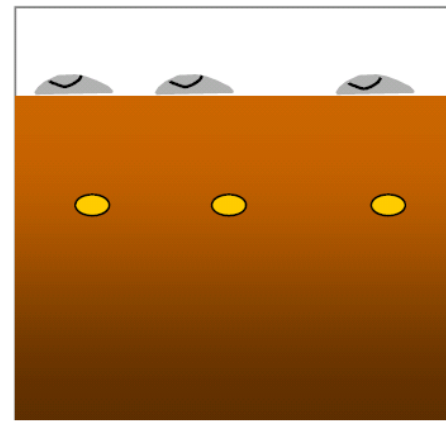
Slug management

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

Cloddy seedbed



Fine seedbed



- 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

Slugs are getting all the breaks



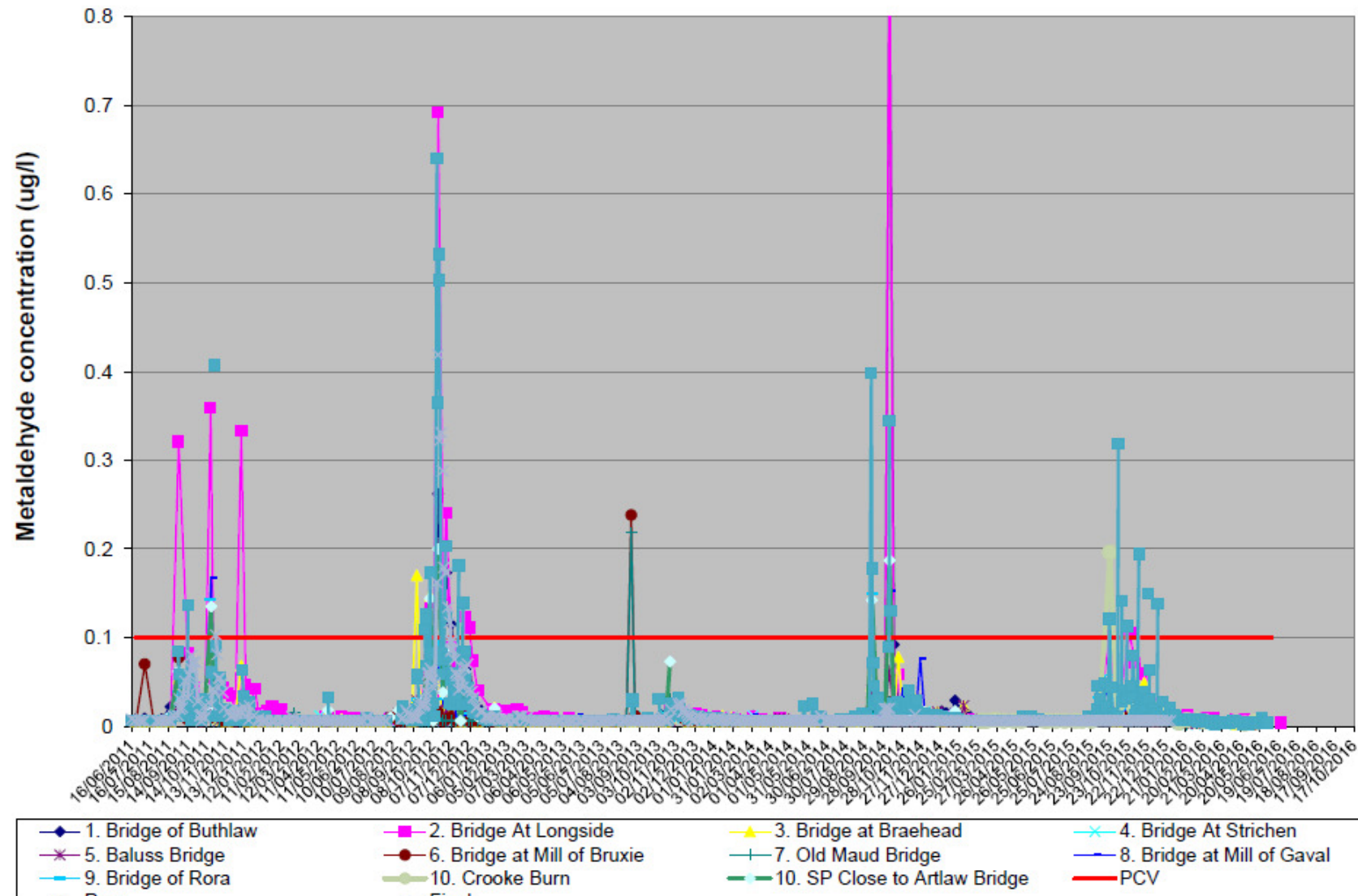
- The European Union voted to revoke the use of methiocarb in slug pellets, due to their risk to grain-eating farm birds a couple of years ago
- The other major slug pellet product used in the UK is Metaldehyde, but it has come under pressure because it has been found in watercourses at levels that often 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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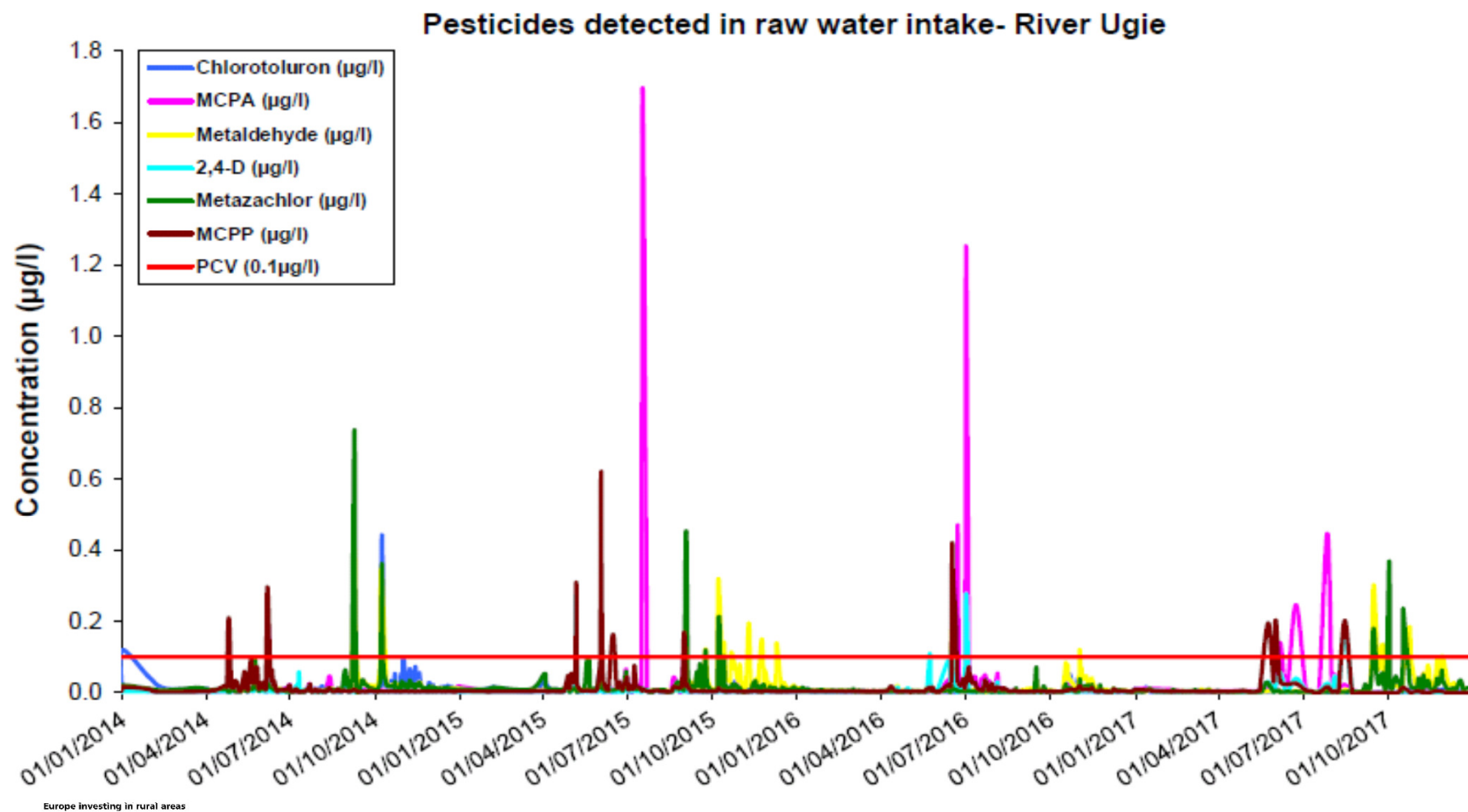
Metaldehyde levels in the River Ugie catchment



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



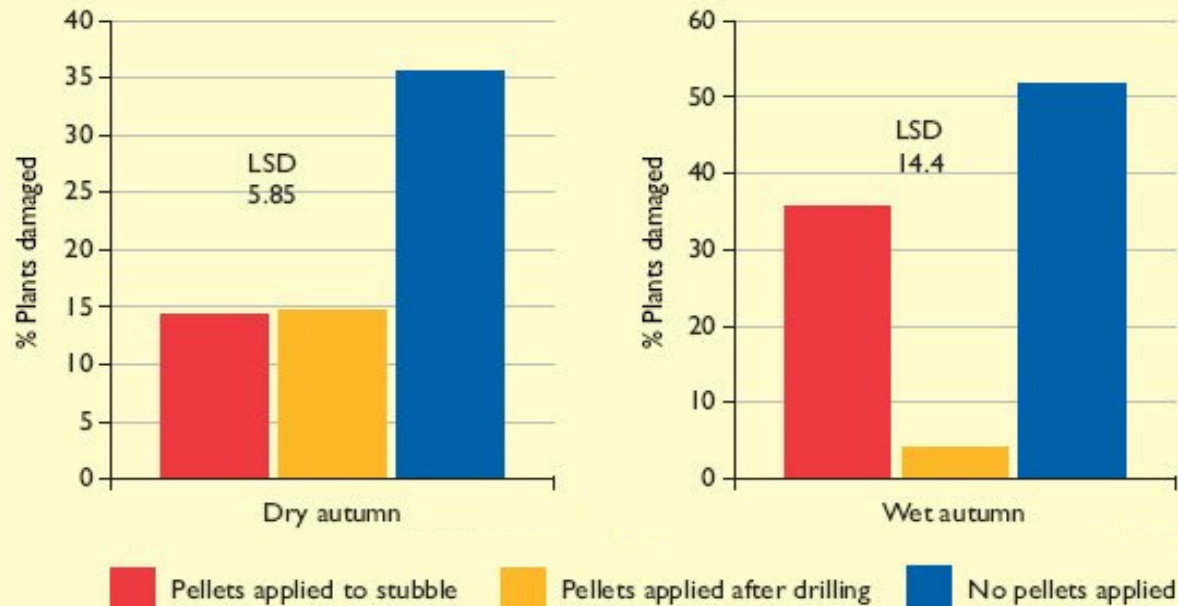
1,760 pints of IPA – a day!⁶⁹

Update to Metaldehyde Stewardship Guidelines



- 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

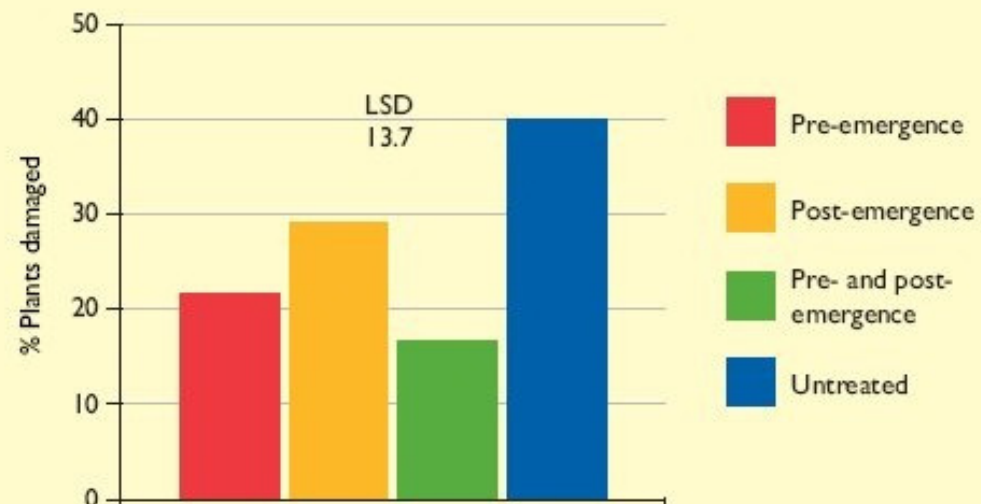
Figure 1. Percentage damage to winter wheat plants following use (or not) of slug pellets



- 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





- 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

Slug management



- Metaldehyde pellet products vary in their metaldehyde content – from 1.5% up to 5%.
- Choosing a product containing 5% metaldehyde you limit yourself to one application at most, and you may have to sacrifice the number of baiting points (pellets per m²)
- A 1.5% metaldehyde product (e.g. Appeal, Desire or Trounce) can still maintain a good number of baiting points (>40), and by varying application rates be able to apply 3 or even 4 applications without exceeding the 210 g/ha recommended dose of metaldehyde in the autumn

Baiting points and metaldehyde rates

TDS Major	Pack size	P/kg	Rate	BPSM	g/ha	Rate	BPSM	g/ha	Rate	BPSM	g/ha	1 application only
	15	60,000	7	42	280	5	30	200	4	24	160	
					100%			71%			57%	
Gusto 3%	Pack size	P/kg	Rate	BPSM	g/ha	Rate	BPSM	g/ha	Rate	BPSM	g/ha	2 applications @ 3.5kg 1 application @ 5kg
	15	143,000	11.5	164	345	5	72	150	3.5	50	105	
					100%			43%			30%	
Appeal 1.5%	Pack size	P/kg	Rate	BPSM	g/ha	Rate	BPSM	g/ha	Rate	BPSM	g/ha	3 or 4 applications
	20	200,000	7.5	150	112.5	4	80	60	3.5	70	52.5	
					100%			53%			47%	
Trigger 3%	Pack size	P/kg	Rate	BPSM	g/ha	Rate	BPSM	g/ha	Rate	BPSM	g/ha	1 application only
	15	67,000	11.7	78	351	7	47	210	5	34	150	
					100%			60%			43%	

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



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





- 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



A Practical Guide to Integrated Management of Slugs and Leatherjackets



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Aphids - BYDV



Tackle the Green-bridge




The European Agricultural Fund
for Rural Development
Europe investing in rural areas

Green-bridge



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- 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.

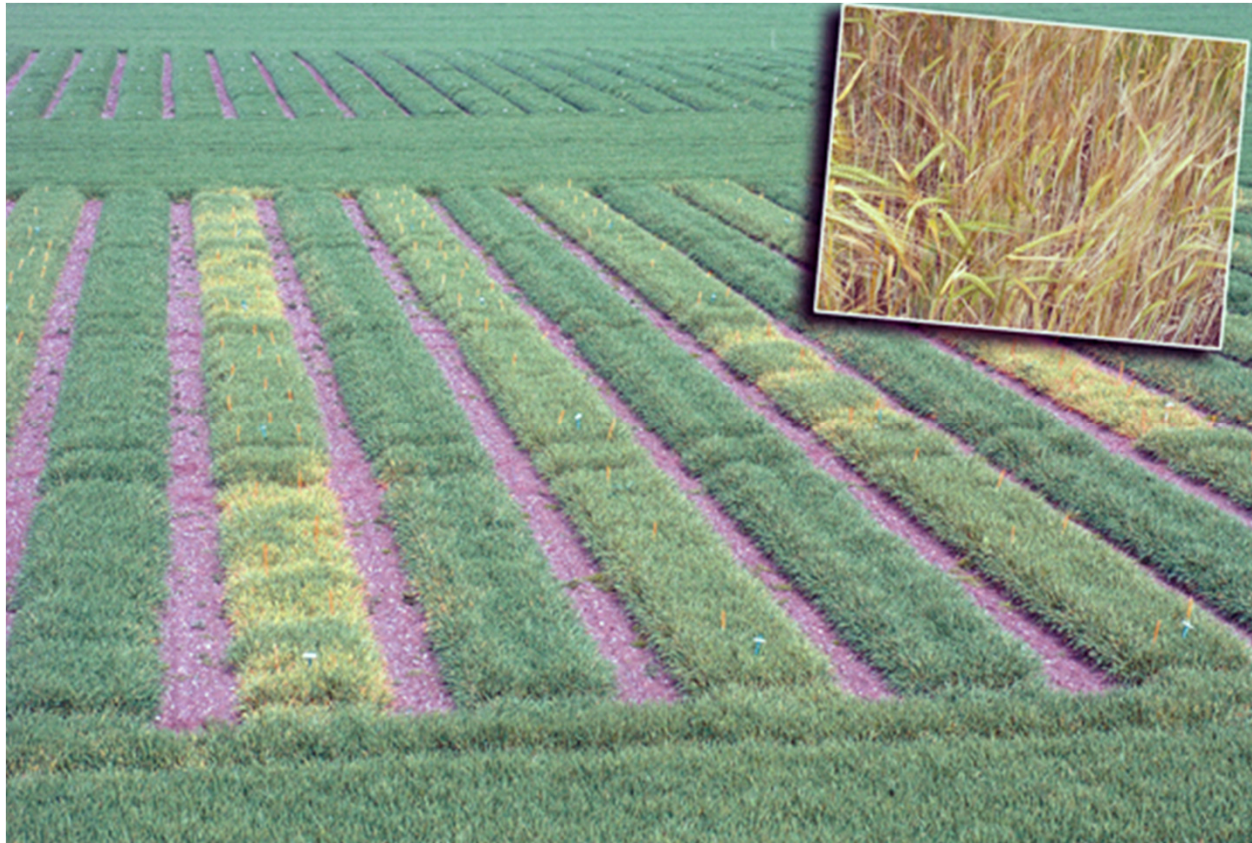
Green-bridge and flying aphids

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



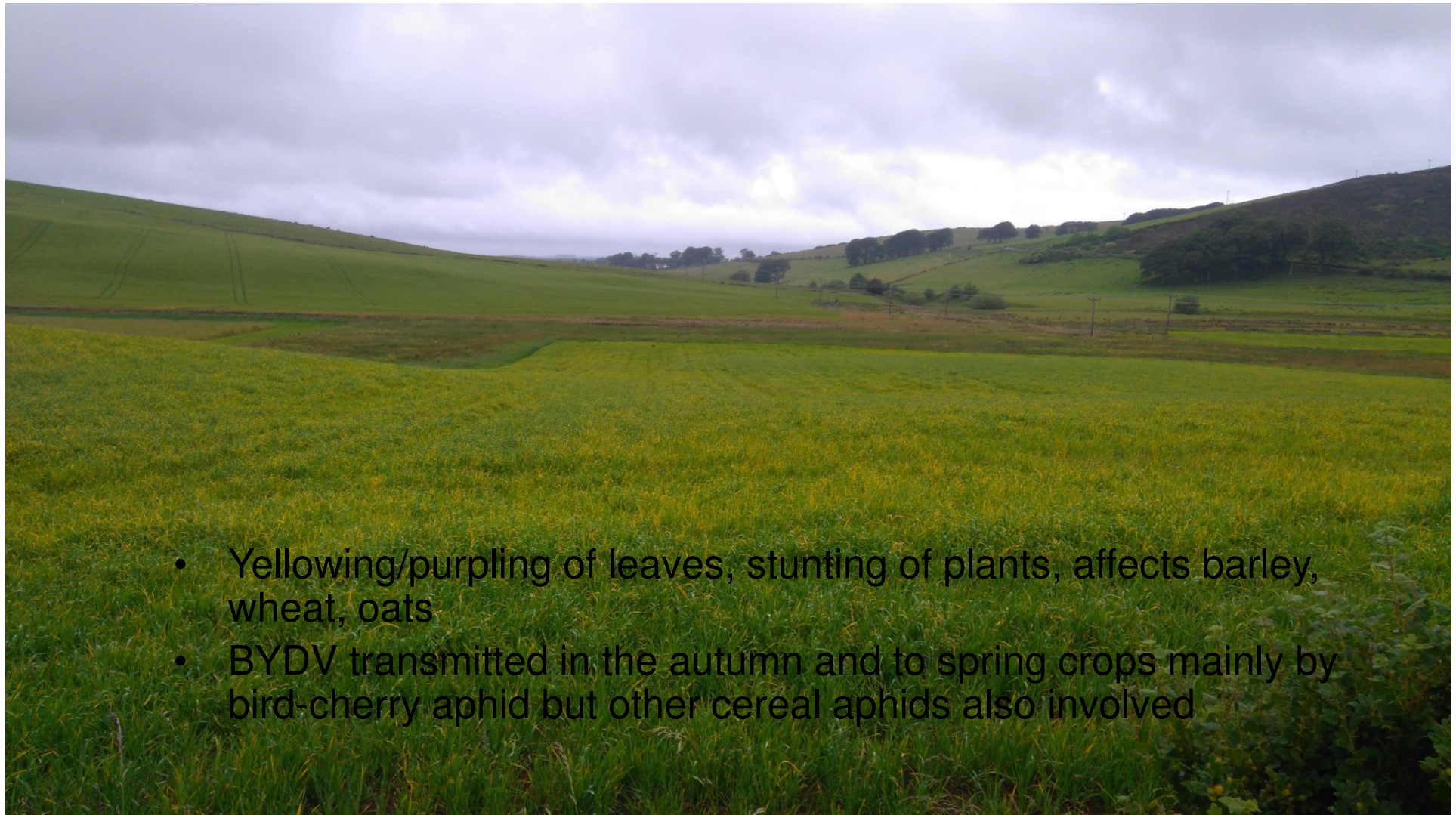
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Aphids - BYDV



- Yellowing/purpling of leaves, stunting of plants, affects barley, wheat, oats
- BYDV transmitted in the autumn **and to spring crops** mainly by bird-cherry aphid but **other cereal aphids also involved**

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Tackle the Green-bridge



Green-bridge

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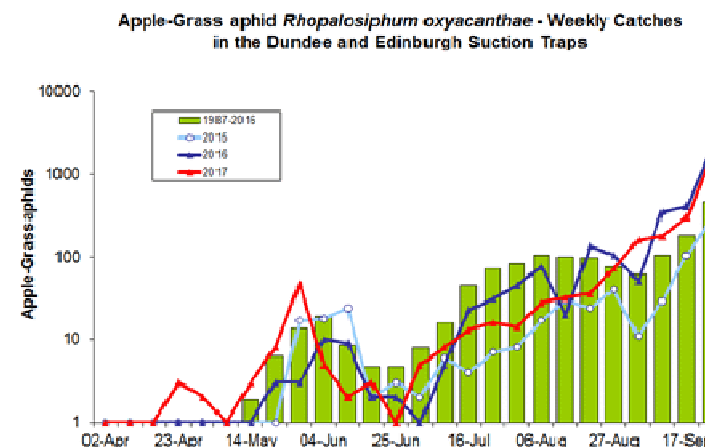
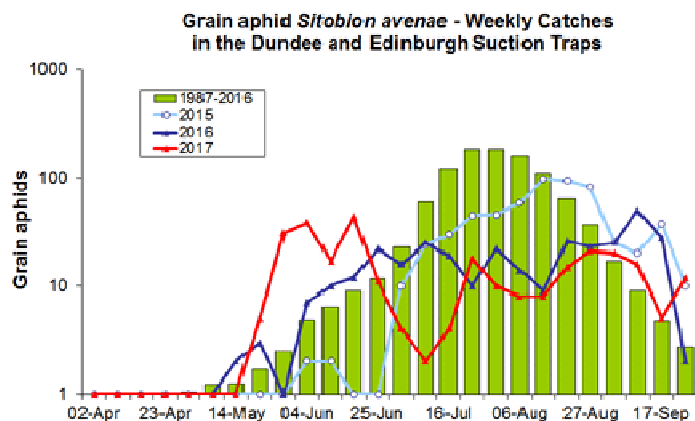
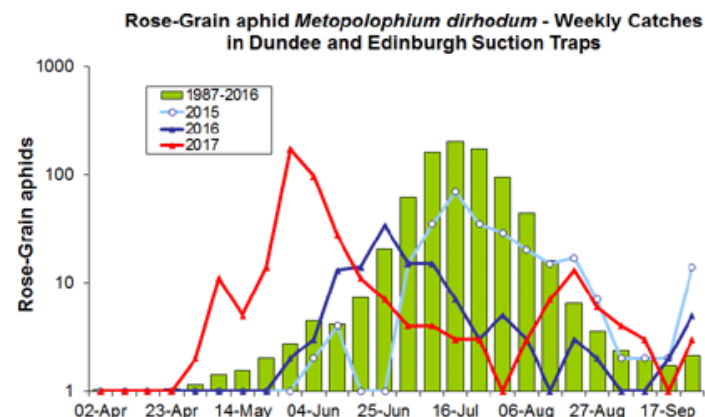
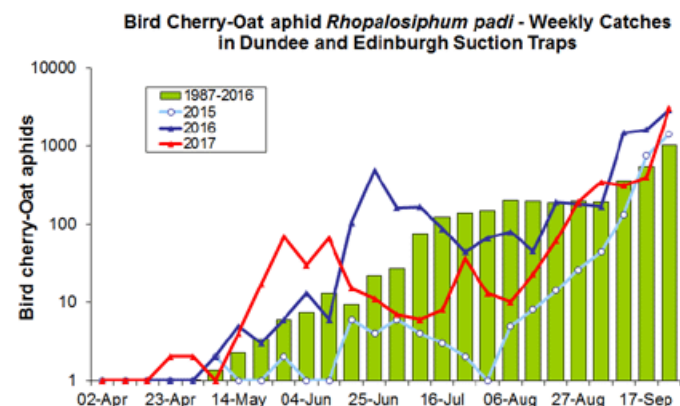
Flying aphids

- Aphicide at crop emergence and/or when aphids fly into the crop
- Aphids were flying early in 2017
- Mild winters promote aphid survival on stubble, cover crops and volunteers, and early spring flights

When do aphids fly into crops?



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No seed treatments allowed on spring cereals



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Relying on sprays could be an issue – grain aphids are showing resistance to pyrethroids sprays

Hope is on its way.....



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Novel insecticide ‘could be available in UK by 2018’

Tuesday 17 November 2015 8:00

Adam Clarke

Agrochemical company Dow AgroScience could have a new insecticide product available by 2018, subject to approval.

The systemic and translaminar active sulfoxaflor – named “isoclast” by the company – works on the central nervous system of insects and is a completely novel mode of action for the UK.

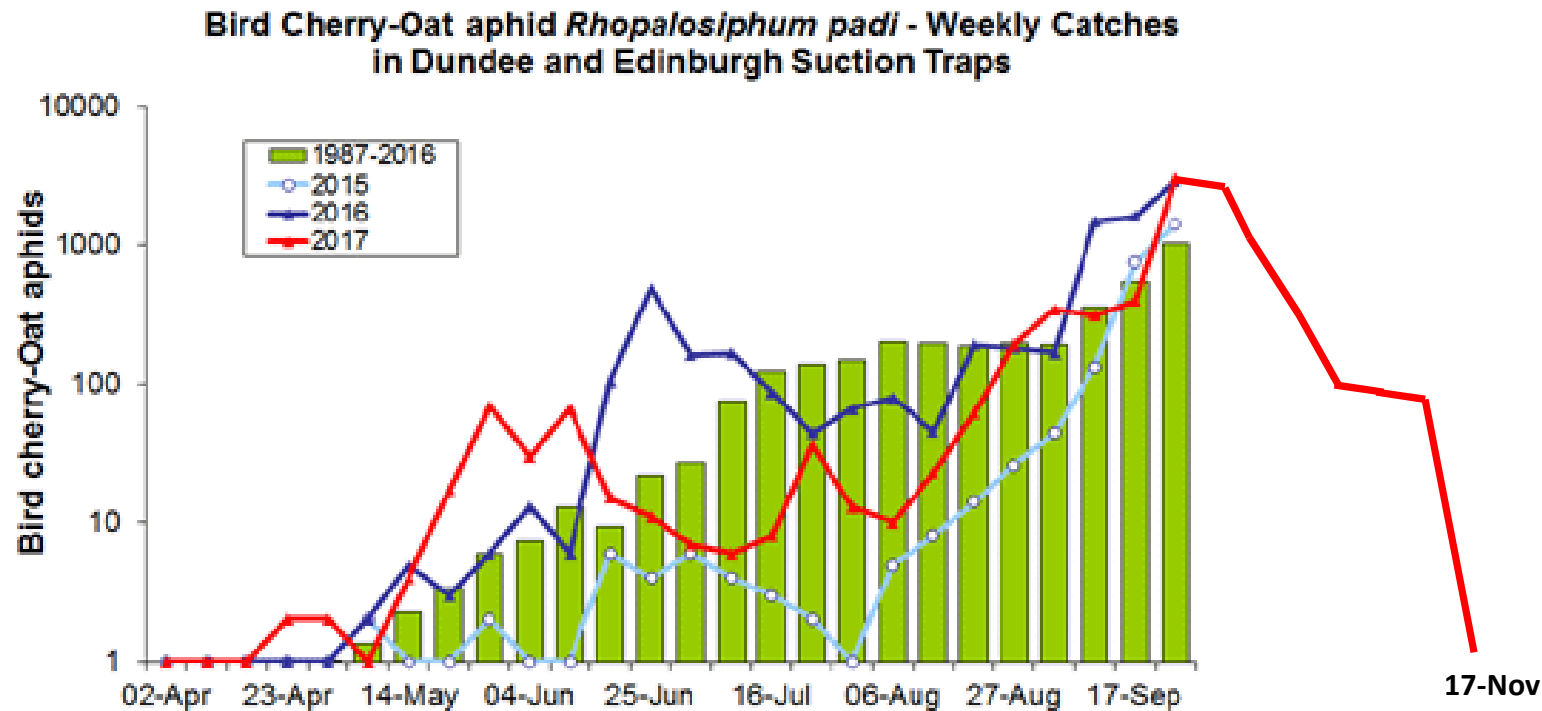
Dow insecticide product manager John Sellars says the product will be aimed at controlling aphids resistant to pyrethroids or carbamates in cereal, potato and veg crops. In the future, the company may also consider registration for use in oilseed rape.

“It has a relatively low toxicity to bees and beneficials and is taken up rapidly by the plant, so has a good environmental profile.



© Tim Scrivener

When do aphids fly into crops?



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 pyrethroid sprays

Optimising BYDV treatments



Winged aphids fly in, produce wingless young

1st 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 and England**

Currently no other alternative for spraying. 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



Leatherjackets



Annual SAC/SRUC Leatherjacket Survey



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

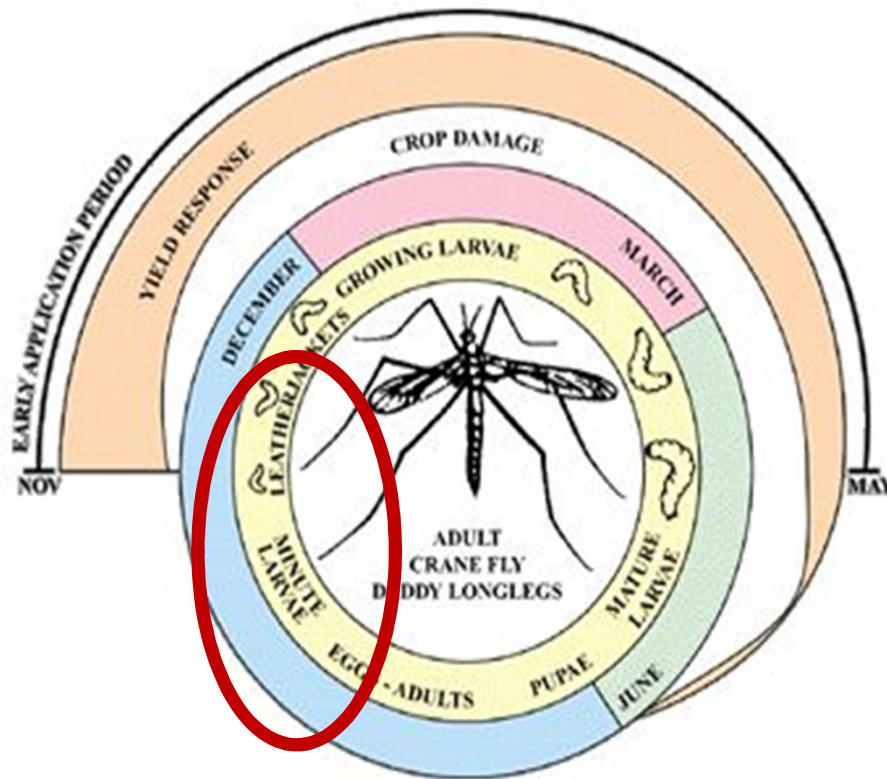
Summary of Leatherjacket Survey Results 2005/06-2016/17

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%



The European Agricultural Fund
for Rural Development
Europe investing in rural areas

Options for leatherjacket management



- Most vulnerable stage of the life cycle
- 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

Leatherjackets and cereals



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.**

Leatherjackets and cereals

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



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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Thank You

