



BYDV control

Barley yellow Dwarfing Virus is spread by Aphids

Risk Factors:

- Early sown autumn crops / late sown spring crops
- Mild winters (Aphids overwintering)
- Mild Autumns (Aphid migration period lengthened)



Autumn cereals

Sowing date	BYDV Risk	Control Action
Early sown (Sept)	High	Aphicide at 2/3 leaf stage & Early Nov
Oct sown	Medium to high	Pyrethroid aphicide Early Nov
Emerging after Nov	Low	Control needed in mild winters where aphids are plentiful or in risk areas

Where crops did not receive their insecticide in Nov, they may still benefit from a treatment in Dec-Feb (pre- GS31)

Spring cereals

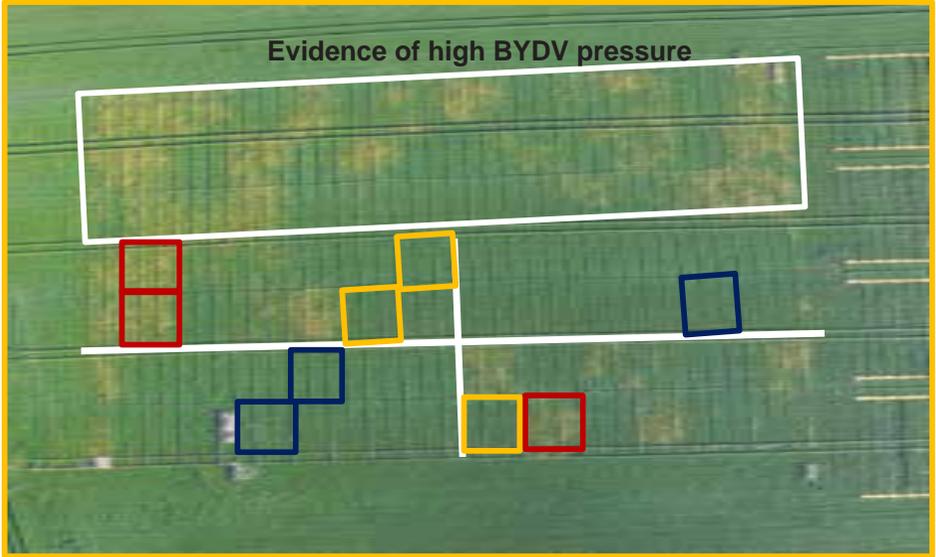
Sowing date	BYDV Risk	Control Action
March sown	Low	Aphicide spray may not be necessary
April sown	Medium to high	Pyrethroid aphicide at 4 leaf

Notes:



BYDV control

Winter barley, Cassia sown 12th October, Cork



Untreated **Pyrethroid** **Seed Treatment**

Notes: _____



'Knock Down Resistance'

'Knock Down Resistance' or 'KDR' was first identified in Ireland 2013

- Aphids with 'kdr' gene are less susceptible to pyrethroids
- To date, 'kdr' has only been identified in *Sitobion avenae* (Grain Aphid), an important vector of Barley Yellow Dwarfing Virus (BYDV)
- A single clone of *Sitobion avenae*, SA3 is most commonly associated with pyrethroid resistance
- Research indicates aphids carrying the resistance gene occur in all major grain growing regions
- When exposed to full rate applications of pyrethroids, approx. 40-50% of *Sitobion avenae* with the resistance gene will survive to at least 12 days post exposure
- Individual aphids exposed to full rate applications of pyrethroids continue to produce new nymphs post insecticide exposure



Notes: _____



'Knock Down Resistance'

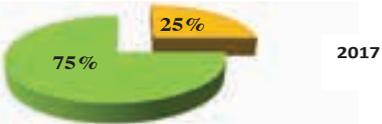
A ■ SR ■ SS



2016

- Stratified random sampling for aphids was carried out at 621 points across 89 cereal fields to collect *S. avenae*

B ■ SR ■ SS



2017

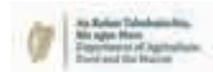
- The incidence of heterozygous resistant (SR) and non-resistant, pyrethroid susceptible (SS) aphids was recorded from three years of sampling in Irish cereal fields, 2016 (A), 2017 (B), 2018 (C)

C ■ SR ■ SS



2018

- All aphids scored as heterozygous for the *kdr* mutation, and no homozygotes (*kdr*-RR) genotypes were detected



Notes: _____



'BYDV control post Neonics'

2018 was the last season neonicotinoid seed treatment could be used to control BYDV in winter cereals

- Limited in our control options to manage aphids.
- Only one chemistry (pyrethroids) for BYDV control in winter and spring barley
- This may increase resistance risk.
- Integrated Pest Management increasingly important

Pre-planning IPM:

- Cultural control; i.e. drilling date
- Minimize “green bridge”
- Variety selection

In season IPM:

- Improved monitoring/forecasting
- Targeted application of insecticides
- Establishing thresholds
- Anti-resistance strategies: Monitoring for control failure, Alternative insecticides
- Biocontrol: Encouraging natural enemies

Notes: _____
