INSECTS AND PESTS
Winter cereals are most venerable to pests from sowing to early establishment. Once established most crops can tolerate some degree of damage. The major pests of cereals are:

- Aphids (Mostly the Grain Aphid and Rose Grain Aphid)
- Slugs (Mostly the Grey field Slug)
- Leatherjackets
- Rabbits
- Bird Damage (Mostly crows and pigeons)
- Minor pests (Wire worm, Gout Fly, Frit Fly etc.)

APHIDS
Damage from aphids occurs in two ways. The first type of damage is indirect and occurs when the aphid is feeding from the young plant. This transfer of the BYDV virus (complex) generally occurs during the first few weeks of growth of the cereal. BYDV can infect wheat, barley and oats. The BYDV virus inhibits plant growth through the season and can lead to yield losses up to 40%, in high incidences.

Grain aphid life cycle
The predominant virus transmitting aphid in Ireland is the Grain Aphid *Sitobion avenae* with the Bird Cherry aphid *Rhopalosiphum padi* being less common. The Grain Aphid fly into crops and rapidly (before gs 25) produces wingless offspring which can survive on crops through most winters (down to - 8ºC). Numbers increase during mild spells when further BYDV spread may occur.

‘Green bridge’ transmission
Warm, moist soil conditions facilitate aphid movement through soil. ‘Green bridge’ transmission is most likely in early-drilled crops and in mild, damp autumns. Aphids can transfer directly from grass or ploughed-down grass or weedy stubbles to new cereal crops. The aphids can feed on new crop roots, and transmit virus directly without appearing above ground level to provide a control opportunity.

Cultural control
1. Clean stubble before preparing seedbed.
2. Leave at least five weeks between ploughing and sowing the new crop.
3. Consider applying a desiccant herbicide if cultivation to sowing interval is less than five weeks.

Control of aphids is especially important in establishing cereal during the risk period (September to November). The application of an insecticide will coincide with the three to four leaf stage of the plant. A rule of thumb winter cereals, if sown early, will receive two insecticide applications, the first in mid October and the second in the first week of November. The second application is to control aphids which may have flown into the crop after the first application. Later sown cereals will generally only receive one insecticide application.

BYDV management

<table>
<thead>
<tr>
<th>Crop</th>
<th>BYDV risk</th>
<th>Control Actions</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept drilled winter cereals</td>
<td>High</td>
<td>1. Seed treatment* Followed by: May consider a pyrethroid* at 2/3 leaf stage followed</td>
<td></td>
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</tbody>
</table>
2. Pyrethroid* in early November in low risk scenarios.

<table>
<thead>
<tr>
<th>Oct drilled winter cereals</th>
<th>Medium to High</th>
<th>Seed Treatment</th>
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<tr>
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<td></td>
<td>Or</td>
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<tr>
<td></td>
<td></td>
<td>Pyrethroid* 1st week Nov</td>
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<td>(no later/second spray</td>
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<td></td>
<td></td>
<td>needed - even when</td>
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<tr>
<td></td>
<td></td>
<td>aphid occurrence is high,</td>
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<tr>
<td></td>
<td></td>
<td>there is NO benefit from extra</td>
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<td></td>
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<td>sprays)</td>
</tr>
</tbody>
</table>

Late spraying of previously unsprayed crops can be beneficial e.g. where timings are missed.

| Winter cereals emerging after end Nov | V. low | No treatment necessary (except in mild winters when aphids are plentiful) |

* Where pyrethroid fails, consider Chlorpyrifos or Dimethoate (wheat only)

Where low seed rates are used (e.g. <125 kg/ha; hybrid barley), very early drilled crops may need 2 pyrethroid applications

1. Where a pyrethroid is used the crop should be checked to see if adequate control has been achieved and where it has not an alternative product should be used

2. Pyrethroids should never be used to control aphids on the heads of cereals – use primicarb on barley or dimethoate on wheat.

3. Yield loss from BYDV in winter barley in Teagasc trials was up 3.77 t/ha.

An excellent paper on BYDV management was delivered at the National Tillage Conference in 2014 by Tom Kennedy


Pyrethroid* Resistance in Irish Aphids

Teagasc (in conjunction with Rothamsted Research) conducted a preliminary study in 2013 and confirmed a low incidence (frequency) of the pyrethroid resistance gene (kdr) in the Grain Aphid Sitobion avenae population in Ireland.

A follow up study in 2014 confirmed a high incidence (100%) of the kdr gene amongst Grain Aphids in a small number of fields, where pyrethroids were applied. This is the first tentative Irish evidence, of a field control failure of Grain Aphids having been treated with pyrethroids. A full research project on BYDV and pyrethroid resistant aphids begun in 2015 supervised by Dr. Michael Gaffney, Teagasc, Ashtown

*Pyrethroids include: Cypermethrin, Deltamethrin, Esfenvalerate, Lambda-cyhalothrin

The second form of damage is from direct aphid feeding on the crop during grain fill. Due to the cold winters aphids generally start to build numbers from a small population. As the season warms up aphid numbers also increase. The established threshold for controlling aphids in late season is 5 aphids found on average per wheat head. Research at Teagasc, Oak Park found that the yield reduction attributed to aphid feeding over 5 years was 0.55 t/ha. Crops under stress will suffer a higher yield penalty from aphid feeding.
Pyrethroids should never be used to control aphids on the heads of cereals - use a suitably registered product such as primicarb (Aphox) on barley or dimethoate on wheat.

The following are taken from notes from Scottish Agricultural Colleges (SAC) and the Home Grown Cereals Authority (HGCA).

**Direct feeding damage by Aphids**

Once the crop has reached the 2nd node detectable stage (gs32), plants should be monitored weekly for the presence of aphids. If 50% of plants are infested with aphids then the application of an approved aphicide is justified to prevent direct damage. After the crop has reached ear emergence (gs59), prevailing weather conditions should be considered before making the decision to use an insecticide. If 50% of plants are infested with aphids at ear emergence and the weather is unsettled, aphid numbers should be assessed again after a few days; unsettled weather will limit any multiplication in aphid populations. If the forecast is for warm and settled weather, the presence of ladybirds (adults and grubs) or hoverfly grubs on the crop should be determined. If none are found an aphicide can be applied, but if ladybirds or hoverfly grubs are present, don't apply an aphicide just yet, wait a little longer and assess plants for aphids at early flowering (gs61). At early flowering (gs61), aphid numbers should exceed 5 per ear, or 30 aphids on the flag leaf before considering any action. Again the prevailing weather conditions and presence of natural enemies should be taken into account.

- If weather is warm and settled and no natural enemies are present on the crop - apply an aphicide
- If weather is warm and settled and natural enemies are present - examine the crop every two days to see if aphid numbers are increasing and apply an aphicide if aphids are multiplying above 5 per ear, or 30 on the flag leaf
- If weather is cool and unsettled, examine the crop every two days to gauge if aphid numbers are increasing and take into account presence of natural enemies and the weather forecast as mentioned above.
- Once the crop has reached milky ripe (gs73), aphid control with an aphicide will be uneconomic.

**HGCA Thresholds**

Treatments should only be considered if aphid numbers are increasing.

Spray when:
- 50% tillers infested before gs 61
- 66% tillers infested from gs 61 to two weeks before the end of grain filling

**References:**

The management of aphids and leatherjackets in spring barley, SAC 1999, Collette Coll and Andy Evans; West Mains Road, Edinburgh EH9 3JG; ISBN 1 85482 682 4

Pest management in cereals and oilseed rape – a guide; HGCA 2003, Jon Oakley; [www.hgca.com](http://www.hgca.com)
SLUGS
The grey field slug (Deroceræs reticolorum) is small - up to 4 cm- grew/fawn in colour and is
the predominant species which causes damage to winter cereals. Winter cereals are most at
risk from sowing through to early establishment. Once the plant reaches the 5 -6 leave stage
and is growing well slugs are rarely a problem. Slug damage generally occurs in two forms:
Pre–emergence of the seed (seed hollowing, grazing the emerging shoot, etc), and post
emergence leaf shredding.

RISK ASSESSMENT AND CONTROL
There is good evidence supporting trapping slugs as a method of targeting control. Trapping
can start in before cultivations and following sowing of the crop. Trapping before
cultivations may indicate control is needed at sowing and if left any later the likelihood of
damage is high. Post sowing trapping will give an indication of the slug numbers after the
cultivations. Ploughing and other secondary cultivations will reduce slug populations on the
surface but in many cases may not be sufficient to avoiding additional control.

TRAPPING TO ASSESS SLUG ACTIVITY
Slug activity on the soil surface is dependent on moist and mild conditions at soil level. Traps
act as shelters for slugs on the soil surface.. If conditions are suitable for surface activity traps
predominantly record larger slugs and will give an indication of the number of slugs in the
area. Placing bait beneath traps increases the numbers of slugs trapped.
Slug pellets are not recommended as chicken layers’ mash or breakfast muesli is a safe and
effective alternative. Traps with bait left out from one night will give the same results as traps
bailed with slug pellets left out for three nights.

TRAP CONSTRUCTION
Traps may consist of mats or pieces of hardboard etc. Traps should be:
• 25 cm diameter or width.
• With a heap of around 20 ml (two heaped teaspoonfuls) of chicken layers’ mash is
placed under each trap.

SLUG NUMBERS FOR ACTION
For cereals, an average of four or more slugs per trap will justify treatment, provided that
favourable conditions for slug activity (and control) continue and provided that other risk
factors (described below) are positive. Monitoring should be considered well in advance of
drilling to maximise flexibility in subsequent operations. Use trap catches together with other
information to assess the risk of slug damage
When trap catch exceeds the threshold, slug pellet treatment is advised when one or more of
the following criteria are met:
• the field is drilled during a period of generally wet weather
• wet weather delays sowing in a prepared seedbed
• the seedbed tilth is coarse and cloddy, and further consolidation is not possible
following sowing
• wet weather continues after drilling and further trapping shows evidence of high slug
activity on the seedbed
the crop is slow to emerge or to grow through the early vulnerable stages and symptoms of
slug damage are seen.

CONTROL
Control with a registered slug pellets based on metaldehyde or Ferric Phosphate . Rates vary
from 5-16kg/ha depending on product. Where slug numbers are expected to be high, apply
slug pellets directly after sowing (if mild, moist conditions prevail). Where an extended
period of wet weather persists after application the efficacy of the slug pellets can be
reduced and reaplication may be necessary. Where the crop has established but leaf
shredding is a problem (and there is little or no growth of the crop) the application of slug pellets can be justified. Target the applications to areas where slug bait numbers are above the thresholds.

Methiocarb is one of a group of chemicals called carbamates, which includes insecticides and will kill non target species.

**LEATHERJACKETS**

Leatherjackets have elongate tubular bodies, up to 30mm long, and are greyish brown. They have no legs or obvious head. They are the larvae stage of the crane fly or daddy long legs. Leatherjackets like similar conditions to slugs (cloddy seedbed) but can be more at home in a very moist (or flooded) soils than slugs. Leatherjackets are generally not a major problem in cereals although incidences of attack are more common over the past few years. Commonly problems arise following leys or after heavy dressings of farm yard manure or where the field has a history of leatherjacket activity. Leatherjackets feed underground or just at the surface. Cutting the emerging or emerged shoot below soil level is common. Alternatively young leaves can be cut at the ground level.

**CONTROL**

The UK (ADAS) threshold is more than 10 leatherjackets per 10 x 30 cm drill length at 13 cm spacing

Field cultivations will reduce populations but chemical control is more reliable. Spray with chlorpyrifos (Dursban, Clinch etc).