Orange wheat blossom midge
– guidelines for assessment and control

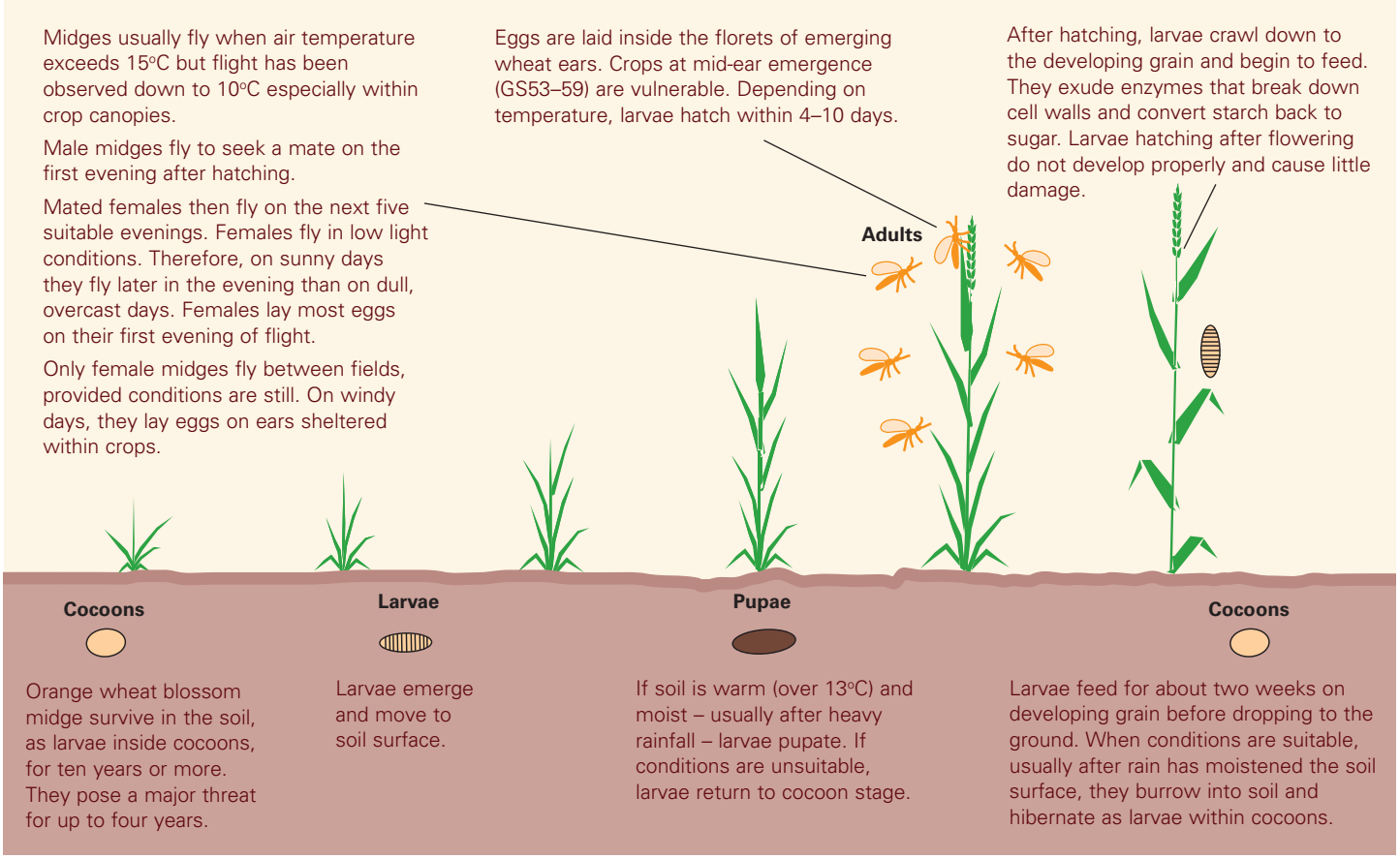
Spring 2009

HGCA

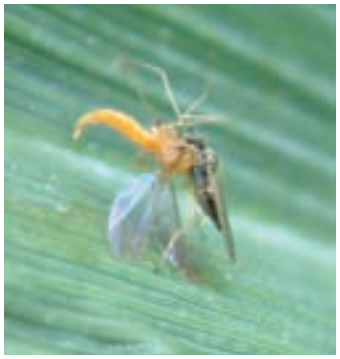
Biology

Life cycle

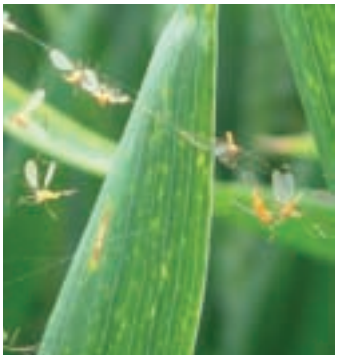
Two wheat blossom midge species occur in the UK – orange wheat blossom midge *(Sitodiplosis mosellana)* and yellow wheat blossom midge *(Contarinia tritici)*. In recent years orange wheat blossom midge (OWBM) has been the most significant and economically important.



Natural enemies – provide a useful natural background control



Dance flies *(Platyplapus* spp.*)* feed on adult midges during flight. Occasionally, large numbers in June can significantly reduce midge populations.



Spiders – webs can trap many wheat blossom midges.

Ground beetles *(Carabidae)* usually eat few midge larvae. Numbers eaten increase if dry soil prevents larvae burrowing into soil.

Parasitic wasps *Macroglenes penetrans* and *Platygaster tuberosula* lay their eggs within midge eggs. Wasp larvae attack midge larvae as they hatch the following year and prevent pupation.

All of these natural enemies are vulnerable to insecticides. Only use insecticides when orange wheat blossom midge infestations above the thresholds are observed and only treat at susceptible stages.

Monitoring

Unless resistant varieties are grown crops must be monitored and, if necessary, sprayed. Ears at GS53-59 are at most risk. The risk to a crop depends on the proportion of ears at this critical stage when midges fly.

National

Nationally, numbers of pupae and development of midges are assessed at a range of sites. Warnings are issued when a hatch is imminent via Dow Pestwatch. www.dowagro.com/uk/cereal/pest.htm

On-farm

Local conditions determine whether fields will be attacked. On-farm monitoring indicates where to target control measures.

Farmers growing susceptible varieties should monitor for orange wheat blossom midge.

Pheromone traps attract male midges and so provide the earliest warning of midge activity.

Place traps within fields damaged by OWBM in the past two years, whether the current crop is cereals, any other crop or fallow. A minimum of two traps should be placed in each field.

Attach traps at crop height to stakes at GS45 – a week before the first ears emerge. Leave them in position until any crop in the immediate area has reached flowering (GS61).

Pheromone traps should be placed to cover discrete blocks of cereals. Each block should represent different soil types, rotations, rainfall or soil temperature across the farm.

Pheromone trap catches *midges/trap/day*	
30 or more	General risk to crops in following week when fertilised females lay eggs. Monitor crops for female midges.
Over 120	Very high risk. Treat wheat crops in surrounding fields at susceptible growth stage as soon as possible.

Visual crop inspection, of susceptible crops at mid-ear emergence (GS53–59), is best conducted from mid-evening. As light levels fall, midges are spread evenly, so inspections can be made quickly.

Walk about 30 metres into the field, examining up to 100 ears, to assess if infestations exist and exceed threshold levels.

Variety status	Treatment threshold
Resistant	Not applicable
Susceptible feed crops	Over one midge on 3 ears through GS53-59
Milling and seed crops	Over one midge on 6 ears through GS53-59

Yellow sticky traps may be used to assist visual inspection and monitor movement in current wheat fields. Both sexes are caught, as well as many other insects, so correct identification is essential.

Use at least two yellow sticky traps, hung at ear height in each field. Monitor throughout ear emergence. A catch of around ten midges/trap indicates significant risk.

Give priority to milling or seed crops, as well as to more sheltered feed crops and second wheats.

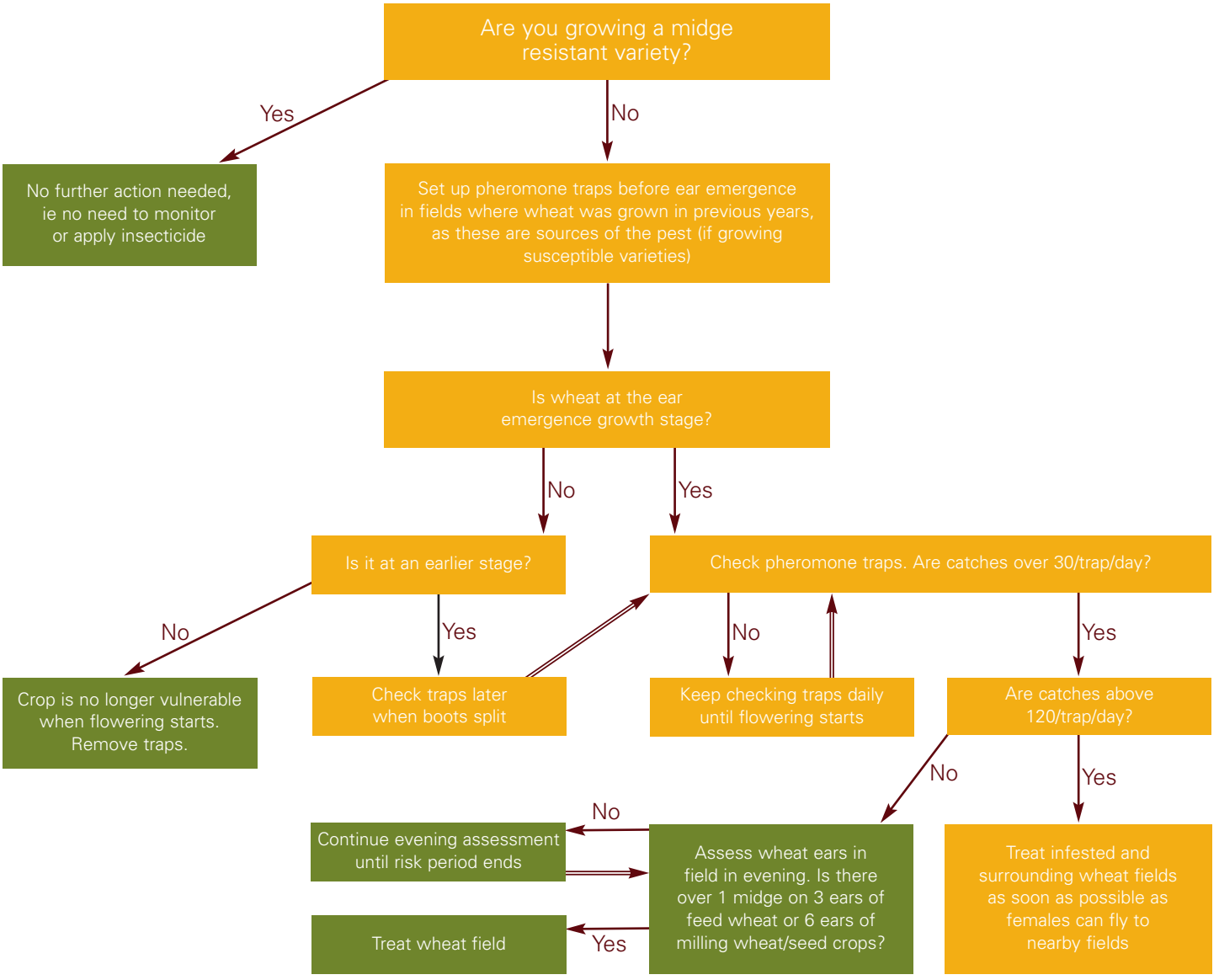
The highest crop risk is on the three nights following a rise in pheromone trap catches.

Place pheromone traps at height of crop ears

One midge on six ears – the threshold for spraying quality wheat

Place yellow sticky traps level with emerging ears

Decisions in orange wheat blossom midge management



The susceptible growth stages

GS53
ear ¼ emerged

GS55
ear ½ emerged

GS57
ear ¾ emerged

GS59
ear fully emerged

Management and control

Rotations

Rotation has little effect on overall risk of OWBM.

Where crops are grown in blocks, this may help monitoring and control in current crops. It may also reduce future risk.

Varieties

Variety choice must be based on market demand. Resistant varieties may ease management in remote fields that are difficult to monitor and treat, or in crops close to housing.

Resistant varieties

Wound plugs in developing grain of resistant variety

A few winter wheat varieties are classified as resistant and do not require monitoring or insecticide treatment. Wound plugs form on attacked grains and prevent larvae from feeding.

Varieties on the 2009/10 HGCA Recommended List that are resistant to orange wheat blossom midge are Gatsby, Glasgow, Oakley, Qplus, Robigus, Scout and Viscount.

However, these varieties are susceptible to yellow wheat blossom midge, although this species has not yet presented a serious problem.

It is encouraging that resistance is fairly widespread within European breeding material, so there is good scope for breeders to produce more resistant varieties.

Resistance to OWBM should not be the sole reason for variety selection. Choice must be based on market requirements and all relevant parameters on the HGCA Recommended List. Currently, most growers should not restrict their choice to resistant varieties.

Chemical control

Three active substances are approved for orange wheat blossom midge control:

Chlorpyrifos (eg Dursban WG), an organophosphate, kills adults as well as eggs and newly-emerged larvae on exposed parts of wheat florets. The effective treatment window is four to ten days. Apply treatments during ear emergence if control thresholds are reached.

Lambda-cyhalothrin (eg Hallmark Zeon), a pyrethroid, only kills adults present at the time of spraying, not eggs. Thus, spray timing is more critical than for chlorpyrifos.

Thiacloprid (Biscaya), a neonicotinoid, should be applied as soon as the OWBM threshold is reached during ear emergence to reduce damage from OWBM.

In all cases, follow label recommendations for field margin restrictions and for conservation headlands. Do not treat once the crop reaches an average growth stage of GS61 (start of flowering).

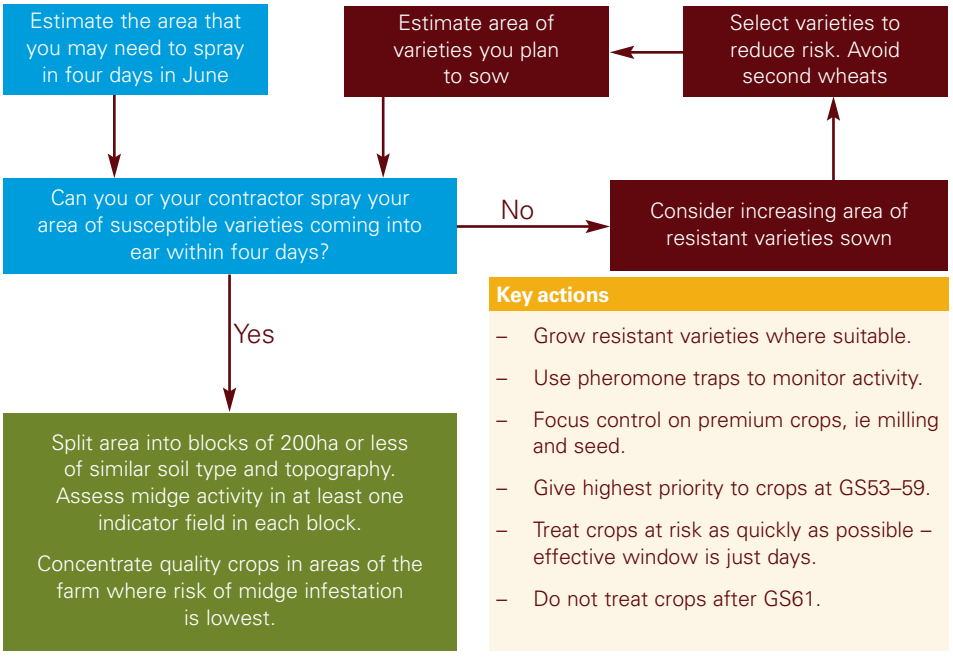
Warning:

Correct insecticide timing is critical.

Any wrongly applied chemical will do more damage than good by killing beneficial species.

Observe The Voluntary Initiative's 'Insecticides guidance on best practice'.

Matching cropping plans to spraying capacity



Key actions

- Grow resistant varieties where suitable.
- Use pheromone traps to monitor activity.
- Focus control on premium crops, ie milling and seed.
- Give highest priority to crops at GS53–59.
- Treat crops at risk as quickly as possible – effective window is just days.
- Do not treat crops after GS61.

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Acknowledgements

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Originally written by Jon Oakley, the guidelines have been revised by Dr Steve Ellis, ADAS.

Edited by Dr Clive Edwards, HGCA and Geoff Dodgson, Chamberlain.

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Further reading

HGCA Recommended Lists for cereals and oilseeds (annual)

Research Review 28 (1994). Orange wheat blossom midge: a literature review and survey of the 1993 outbreak

Project Report 106 (1995). Orange wheat blossom midge: survey of the 1994 outbreak

Project Report 363 (2005). Integrated control of wheat blossom midge: variety choice, use of pheromone traps and treatment thresholds

Project Report 451 (2009). Integrated management strategies for varieties tolerant and susceptible to wheat blossom midge

Additional information

Information from 'Dow Pestwatch' is distributed via agrochemical distributors, 'ADAS National Crop Action', crop consultants and the farming media.

Dow Pestwatch
www.dowagro.co.uk/cereal/pest.htm

Pheromone traps manufactured by:
AgriSense BCS www.agrisense.co.uk are marketed by Certis www.certiseurope.co.uk
These are available from local agricultural distributors.

The Voluntary Initiative –
www.voluntaryinitiative.org.uk

HGCA Guide 45 (G45)

HGCA is a division of the Agriculture and Horticulture Development Board.

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