

BCPC Pest and Beneficials Expert Group: Current and future strategies for managing pests.

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Group, Syngenta*)

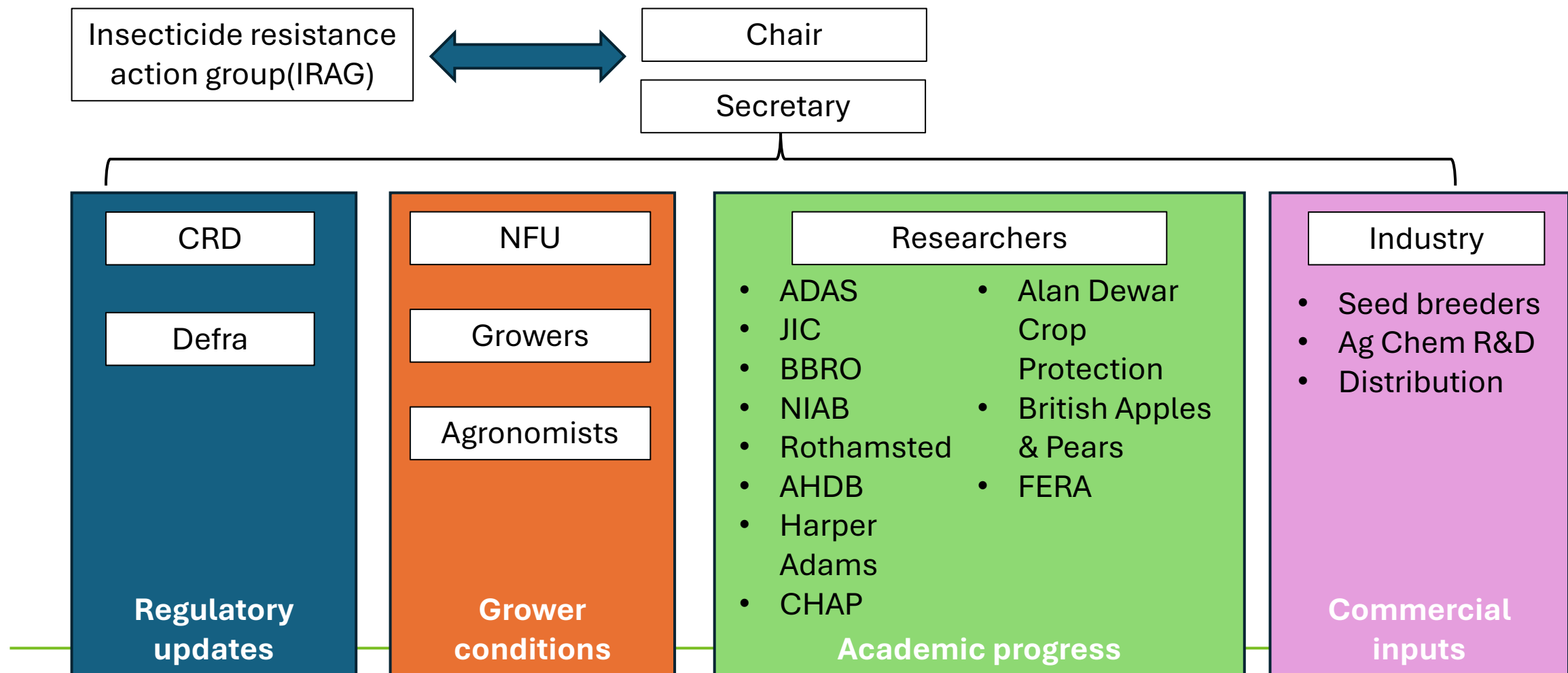
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The Role of BCPC Pest and Beneficials Expert Group

- Bridge between research and practical farming.
- Knowledge exchange platform.
- Annual Review, plus interaction with legislation bodies.
- Monitoring and tracking pest trends.
- Identifying research priorities.
- Promote younger career researchers.
- Collaborative approach to generate new IPM solutions.
- ~4 meetings annually of the working group.



The Role of BCPC Pest and Beneficials Expert Group



23 members

BCPC Pest and Beneficials Annual Review

- 10 annual reviews conducted.
- ~350 invites annually (industry and growers).
- Annual attendance ~70 people in person.

Previous Reviews:

- 2025 – Mind The Gap: Managing pests with a decreasing choice of chemical options.
- 2024 -What the SFIs mean for IPM.
- 2023 - IPM - bringing it together.

3. Prevention

Companion planting: Trap cropping
Trap crops – plants more attractive than the main crop used to divert pest pressure away from the crop

2005: Turnip rape trap crop borders significantly reduced no. CSFB larvae in OSR vs controls
(Barri, Cook, Clark & Williams (2005) BioControl 50: 69-89)

2015-16: Turnip rape trap borders significantly reduced CSFB feeding in OSR vs controls



Coston (2020) PhD; Coston et al., in prep

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fera
Original thinking... applied

Genomic Tools to Enable Epidemiological Monitoring of Eukaryotic Pests

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BACKGROUND AND RATIONALE

- Epidemiological comparative genomic techniques are more difficult to deploy on the larger more complex genomes of eukaryotic organisms
- Larger scale single nucleotide polymorphism (SNP) typing on Next Generation Sequencing (NGS) platforms have the potential to improve the discriminatory power when differentiating between individuals (Andrews 2018)
- *Vespa velutina* (Asian hornet) and *Mesochorus* (Asian hornet) are pest species that are of particular interest in the world of plant health
- Asian hornets are non-native pest species to the UK and consume native pollinators such as honeybees. There have been 23 confirmed sightings since 2014 (Lowe 2020)
- *M. felleus* cause external galling and internal necrosis on crops such as potatoes, carrots and leeks affecting the yield, marketability, and quality of the crops (DEFRA 2021)



Fig 1. *Vespa velutina* (Asian hornet). Copyright Fera Science Ltd. 2021



Fig 2. *Mesochorus* (Asian hornet) on a plant. Copyright Fera Science Ltd. 2021

AIMS AND OBJECTIVES

The main aim of the project is to develop genotyping panels for *Mesochorus* (Asian hornet) and *Vespa velutina* that can be used on outbreaks and incursions

- Identification of highly informative single nucleotide polymorphism (SNP) panels in both study species
- Design primers to optimise highly multiplex PCR as part of genotyping in thousands sequencing (GT-seq) assays
- How rapidly can a generalisable GT-seq assay workflow be applied to other species

METHODOLOGY

- Comparison of sequencing technologies for suitability for the project, e.g., Oxford Nanopore, PacBio and Illumina. Genome assembly and analysis of various resequencing data samples of *Mesochorus* and *Vespa velutina*
- Identification of single nucleotide polymorphism (SNP) panels to establish relationships and origins of outbreaks and incursions
- Design primers to optimise highly multiplex PCR as a part of the GT-seq assay and apply assay to testing of *V. velutina* and *M. felleus*
- Extract DNA and sequence any samples from new outbreaks or incursions
- Apply the GT-seq assay methodology to any other pest species of interest to plant health to assess the generalisability of the technique, e.g., *Mesochorus* chironomid (close relative of *M. felleus*)



Fig 3. *Mesochorus* (Asian hornet) on a plant. Copyright Fera Science Ltd. 2021

REFERENCES

Andrews, A. & B. (2018) Genomic Tools to Enable Epidemiological Monitoring of Eukaryotic Pests. *Genomic Tools to Enable Epidemiological Monitoring of Eukaryotic Pests*. Fera Science Ltd. 2021

DEFRA (2021) Asian hornet sightings in the UK. <https://www.defra.gov.uk/news/2021/04/2021-asian-hornet-sightings/>

Lowe, D. (2020) Asian hornet sightings in the UK. <https://www.defra.gov.uk/news/2020/04/2020-asian-hornet-sightings/>

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The Situation in the UK



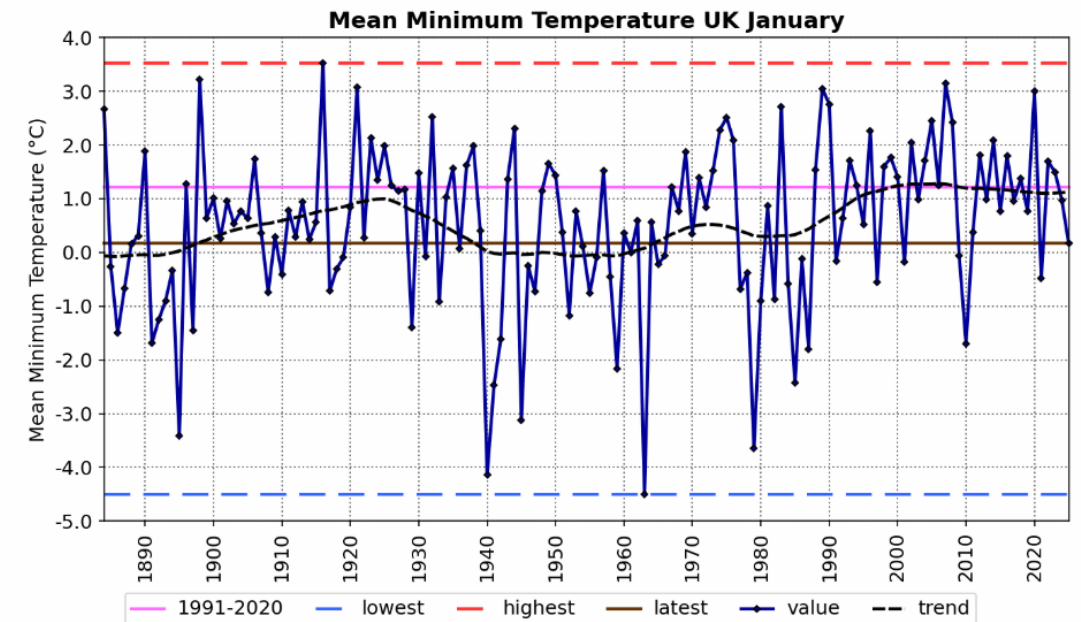
- Current challenges in UK pest management:
 - Reduction in active ingredients to control insects.
 - Resistance issues.
 - Warming climate.
- The "perfect storm": reduced chemical options, climate change, emerging pests.
- Economic pressures on farmers.
- SFI confusion.
- Food security implications.
- Benefits possible precision breeding techniques, could provide help with viruses in particular.

UK - Mean daily minimum temp January

Met Office

Source: HadUK-Grid 21/07/2025 11:26

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Emerging Pest Issues



Alan Dewar*



Mark Sevens BBRO

*Dewar, Alan M., and Tim Martin. "The First Record of Tortoise Beetle Damage to Sugar Beet in the UK: Is Global Warming Responsible?." *Outlooks on Pest Management* 32, no. 4 (2021): 158-161.

IPM solutions

- Growing new BYDV resistant varieties of Wheat and Barley.
- Increase in companion cropping for pests such as Cabbage Stem Flea Beetle or trap crops around fields to distract pest or reduce non-persistent virus transfer.
- Changes in cultivation and rotation to reduce pest pressure and increase crop vigour.
- The use of pheromones and beneficial insects even in open field conditions.
- Increase use of DSS support tools to predict outbreaks or seasonal pressure to inform spray programmes.



Future alternatives:

- Endophytic organisms.
- RNAi.
- Precision application.



Source: AHDB

Challenges



- Resistance.
- Regulatory impact on tools available.
- Changing climate and pests.



Building for the Future



- In 2025, the Pest and Beneficial group pushed to ensure we had younger members in the consortium.
 - The new Secretary, Charles Griffiths, an early career Pathologist from NIAB.
 - Each review the Pest and Beneficial expert working group organises has a session for PhD and early career researchers.
 - We also interact with education bodies within the industry such as BASIS passing on new information to include in their training.
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Current projects from P&B

Expert group members



- Slug and CSFB IPM approaches – JIC, Harper Adams, ADAS.
 - Wireworm research understanding the pest – FERA.
 - Landscape connectivity on agroecosystem sustainability – NIAB.
 - Involvement within the UK insect resistance monitoring work.
 - Biocontrol measures implementation and their effectiveness.
 - Current discussion within the group on how to support the industry in the future, with the legislative process of getting predatory species (such as parasitic wasps) registered more readily for the UK market.
 - Promote output from studies looking at the changing regulatory landscape on UK agriculture and effective IPM approaches.
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Tom Pope – Harper Adams

Looking ahead



- Building resilient agricultural systems involving the growers and the wider industry.
- Future research priorities driven by UK needs.
- Supporting the next generation to ensure this work continues.

Please reach out if you want to know more or be involved.



**Thank you for your
attention**

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