Scotland's Plant Health Conference 2025 Workshop Report

Supporting delivery of the UK Pesticides National Action Plan 2025 through the Plant Health Centre

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Scotland's Plant Health Conference 2025 Workshop

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Supporting delivery of the UK Pesticides National Action Plan 2025 through the Plant Health Centre

Purpose of Workshop: To gather expert perspectives on how to support delivery of the UK Pesticides National Action Plan (NAP) 2025 across all sectors in a Scottish context.

The outputs will help to identify:

- Priority knowledge and control gaps, including potential areas for research and innovation funding (such as future PHC-commissioned projects).
- Opportunities to increase the uptake of Integrated Pest Management approaches across Scotland's plant-based sectors; including Horticulture, Amenity, Natural Environment, Forestry and Agriculture.

Roundtable discussions focused on two key questions, with responses captured via Slido. This report summarises the information gathered from attendees in relation to both questions.

Methodology

A total of 130 conference attendees participated in the workshop. Participants were organised into table-based groups (approximately 13 tables of 10 participants), with a nominated representative from each table recording their group's comments using Slido.

Responses were downloaded into a spreadsheet for analysis. The workshop requested participants to consider all plant-based sectors, however, responses relating to Forestry, Agriculture and Horticulture dominated the answers received (the three sectors that are heavily reliant on planted material) and therefore participant inputs were categorised by these sectors, with responses that could not be clearly assigned to one of these three classified as "General".

Within each sectoral category, responses were further grouped into thematic areas and analysed to identify common concerns.

The notes below summarise the outcomes of this analysis and reflect the views expressed by participants during the workshop. These do not necessarily represent the views of the Plant Health Centre.

Question 1: Looking ahead, what are you most concerned about regarding the future of pest and pathogen control in Scotland, and what pests, weeds or diseases should be top priorities for action?

Several cross-cutting themes emerged across all plant sectors.

1. Pests of concern

Pests and diseases (hereafter referred to as pests) identified of particular concern for managing within relevance to each sector are:

Forestry	*Hylobius arbietis (large pine weevil)* (5 comments)* *Heterobasidion annosum (Root and butt rot)* (2 comments) *Dentroctonus micans (Great spruce bark beetle)* (2 comments) *Ips typographus (eight-toothed bark beetle)* (1 comment) *Neonectria* spp., (1 comment) *Phytophthora* spp. (2 comments) *Xylella* spp. (3 comments) Mammal pests (e.g. squirrels and deer) (3 comments) *Pteridium aquilinum* (bracken) (1 comment) Rhododendron spp. (1 comment)
Agriculture	Aphid transmitted potato viruses (3 comments) *Heterodera avenae* (Cereal cyst nematode) (1 comment) Wireworm (1 comment) *Bruchus pisorum* (Pea weevil) (1 comment) *Alopecurus myosuroides* (Black grass) (2 comments) *Globodera* spp. (Potato cyst nematode - PCN) (2 comments)
Horticulture	(*Chryseococcus arecae*) Golden root mealy bug (1 comment) *Xylella* spp. (2 comments) *Phytophthora* spp. (1 comment) *Anoplophora* spp. (Citrus and Asian longhorn beetle (1 comment)

Note *comments were received per table so could be reflective of a single person opinion or multiple people. For example, one comment means that 1 of the table-based groups identified that pest as being of particular concern and three comments means three of the groups identified that pest.*

Drivers of increasing pest and disease threats include:

- **Pathways and movement:** Incomplete understanding of introduction pathways, particularly in horticulture, and human-mediated spread, such as movement of black grass between regions on machinery. Weed contaminants in imported coir compost were also noted.
- **Climate change:** Intensifying drought stress on trees, increased wildfire risk, and expansion of suitable habitat for pests that could not establish previously, potentially increasing the risk of pest incursion. For cereal cyst nematodes, climate change is believed to reduce natural biological control by parasitic fungi.
- **Pesticide resistance:** Resistance in pests such as black grass and aphids that transmit potato viruses is increasing, reducing effectiveness of current chemical tools.
- **Reservoir species:** Some weeds act as persistent reservoirs, hampering control efforts—e.g. rhododendron harbouring *Phytophthora* in forestry.

- **Lack of preparedness:** A consistent concern was the lack of contingency planning for new pest incursions, limited surveillance, especially in unmanaged woodlands, and insufficient rapid-response capability. Participants emphasised that for new invasive pests, pest management methods (e.g. chemical or biological controls) are rarely available on first detection resulting in slowing down effective outbreak management.
- **Limited control methods available:** Concern for lack or future withdrawal of control chemicals. In forestry, there are few registered chemical options e.g. only urea is approved for the control of *H. annosum* and chemical options for *H. abietis* and *D. septosporum* remain limited. For pests such as *Xylella fastidiosa* (not present in the UK) and *Phytophthora* spp., both chemical and non-chemical IPM tools are either not available or have not been adequately developed or, in the case of forestry, may not be feasible to apply at the landscape scale. The short windows in which pesticides can be applied during the growing season (e.g., for aphid vectors in potatoes) further restrict effectiveness.
- **Polyphagous pests:** Species not present in the UK, such as Citrus longhorn beetle and Asian longhorn beetle raise concern because their wide host ranges greatly complicate surveillance and control.

2. Concerns Around the Use of Pesticides

Several challenges were reported associated with pesticide use:

1. **Loss of chemicals:** Withdrawal of active ingredients and increasing resistance reduce available management options for pests across all production sectors**.** Loss of glyphosate was cited as particularly impactful, especially in the amenity sector where alternatives are limited.
2. **Environmental pollution:** In direct contrast to concerns of chemical withdrawal, some participants raised concerns about the effects of chemical on non-target species, including pollinators (e.g. impacts leading to neonicotinoid bans), contamination of waterways, and long-term effects on soil health, which is considered fundamental for plant and forest resilience.
3. **Public perception:** Public understanding of pesticide use is limited, shaping attitudes towards practices such as **aerial spraying**. Misunderstanding around pesticide risks can influence policy and approval for essential control actions in the wider environment.
4. **Knowledge gaps:**
   Users frequently noted gaps in:
   - how mixing active ingredients affects treatment efficacy;
   - how efficacy changes under different field conditions;
   - impacts of application methods on non-target species;
   - relative cost, logistics, and effectiveness of different treatments.

3.Policy and Regulation

Stakeholders cited several policy and regulatory challenges:

- **Unintended consequences of regulation:** Regulatory changes can influence crop decisions, supply, and market prices. For example, following the neonicotinoid ban, oilseed rape became unprofitable, reducing cultivation. Reduced supply then triggered significant price increases.

- **Differences across devolved nations:** Divergent derogations between England and Scotland create an uneven playing field by giving some farmers access to control options unavailable to others. Greater alignment was viewed as essential.
- **Communication and accessibility:** Limited engagement between regulators and pesticide users results in confusion about authorised uses and restricted opportunities for feedback. Nurseries were noted as needing more timely guidance to support rapid decision-making.
- **Post-Brexit regulatory divergence:** Misalignment with the EU on approvals and derogations for pesticides has created additional complexity and uncertainty for producers.

4. Alternative Approaches to Chemicals

At least one group raised the point that reducing reliance on chemical controls requires a cultural shift and there needs to be better encouragement to adopt alternative IPM-based approaches. Examples of alternative approaches include resistance breeding, drought- or flood-tolerant varieties, diversification of crop rotations, cover crops, biological control, and gene-editing technologies. Forestry, however, was noted as already embedding IPM practices through certification requirements and forest plans.

Key concerns around alternatives approaches included:

- **Natural/nature-based products:** Biologicals are assessed under regulatory frameworks designed for chemicals, creating a poor fit-for-purpose pathway that slows field access and deployment.
- **Limits to diversification:** Diversification is not always feasible - one example raised by one participant group was related to **Orkney**, where both climate and market size constrain crop choices.
- **Cover crops:** While beneficial for some pests, cover crops can introduce new risks. For instance, *Solanum sisymbriifolium* (sticky nightshade) may reduce PCN but is also a host of *Potato spindle tuber viroid*. Increased cover crop use may itself require additional pest and disease management.
- **Breeding timelines:** In forestry, breeding for resistance requires long-term investment that extends beyond political cycles, generating uncertainty around sustained funding and outcomes.
- **Gene-editing constraints:** Gene editing is not distinguished from preceding genetic modification techniques in a regulatory context in Scotland and is therefore currently not deployable in forestry or other plant production sectors.
- **Disconnect between biosecurity and IPM:** These systems are not fully integrated. New pest incursions and resulting biosecurity requirements can undermine existing IPM plans, making them harder to implement and less effective.
- **Cost:** There is a general perception that alternative control methods are more expensive than chemical controls, which may slow uptake without appropriate incentives or support.

Question 2: What are the main barriers to wider IPM uptake in Scotland across all sectors, and how can research, technology, and collaboration unlock new opportunities for sustainable pest management?

Several cross-cutting barriers emerged across all plant sectors.

1. Knowledge Exchange, Communication & Collaboration

- There is a need for **greater diversity in discussions** (demographic, stakeholder, geographic, sectoral) and better use of existing knowledge, as previous research is often overlooked. There are knowledge-exchange barriers between research, government and the public which are exacerbated. when demonstration projects or pilot interventions are poorly communicated or generate public concern.
- **Peer-to-peer communication** and **engagement with government research** require strengthening; a **co-design** approach to research would ensure better outcomes that are delivered in accessible formats. **Existing living labs** need greater visibility as they support co-construction of IPM strategies and demonstration of outcomes.
- **Resource constraints** and reluctance within industry to contribute to solutions remain significant barriers.
- More **events** such as GO Falkland (regenerative farming event) would be beneficial to allow farmers to share their **regenerative practices.**
- **Demonstration plots**, networks, CPD, knowledge exchange and opportunities to trial approaches would help to build confidence and skills.
- **Long-term field projects** should be used more extensively for monitoring.
- There is a lack of training and advice for the **amenity sector** where there is heavy product use.

2. Regulatory Barriers, Policy Gaps & Governance

- Regulatory and policy barriers include **funding constraints** and **slow regulatory processes**, with an **insufficient number of regulators** overwhelmed by applications for new products to be used. The lack of capacity is compounded by **difficulties training and retaining** staff who are often poached by the private sector.
- **Timelines** for banning chemical products are not aligned with the development and approval of biological alternatives, leaving growers without viable options in the interim.
- There are concerns that the NAP does not adequately consider increasing or **evolving pest pressures**, nor does it track the impacts of pesticide losses on pest populations or on grower outcomes such as yields.
- IPM efforts remain **fragmented**, with too little strategic oversight of how decisions in one area might affect neighbouring systems.
- **A national assurance policy** is needed to manage strategic risks, enable investment and support cross-border collaboration. Heavy reliance on government R&D funding limits innovation, and access to surveillance data is restricted by barriers that prevent wider use.

- Regulatory resistance to **precision breeding**, particularly in Scotland, creates fears of the sector being left behind, with broader regulatory obstacles further hindering the adoption of gene-editing technologies.

3. Science, Research Gaps & Innovation Needs

- **Scaling promising ideas** beyond the research stage remains difficult, with many of these ideas failing to progress to **practical deployment**.
- **BCAs** have a **short shelf life** which creates a disincentive for use.
- There is a need to identify, breed and safely release **biological control agents** (BCAs) ahead of emerging threats, e.g., preparing parasitoids for Emerald Ash Borer before it arrives, as with the production of *Rhizophagus grandis* for *Dendroctonus micans*. There needs to be more funding to turn research developed **BCAs into real field applications.**
- Greater emphasis may be needed on **improving in-field diagnostic testing** such as improved **precision detection technologies** (e.g. imaging, eDNA, eNoses) to rapidly and accurately locate pests and pathogens for targeted treatment.
- **Consistent IPM** also requires far more **monitoring and surveillance** to understand current and emerging threats. Inadequate funding remains a barrier, limiting both the research needed to validate new technologies and the confidence required for their wider uptake.
- **More interconnected, large-scale projects** such as the PCN Action Scotland project and investment in research facilities to model climate-change scenarios would be beneficial in helping to understand IPM.

4. Public Perception and strategies to promote IPM

- **Raising public awareness** is essential to support the adoption of more diverse tree and crop varieties.
- Raising public awareness is considered essential if **precision breeding via gene editing** is to be accepted. Balanced and evidence-backed discussion about the future of gene-editing is important. Currently views on gene editing and precision breeding vary across stakeholders. Even if growers support precision breeding, resistant varieties will not be profitable without consumer demand. Greater promotion of the environmental benefits of different crops could help shift perceptions.
- **Gene editing** also faces significant **regulatory and consumer-acceptability** barriers, reinforced by media narratives. Many growers still rely on cheap chemicals and operate with zero risk tolerance.

5. Economic Factors & Financial Barriers

- **IPM is considered more costly** than chemical approaches and costs may be too high for some growers. IPM approaches therefore need to be more affordable, or there needs to be financial support or incentives for growers to trial IPM approaches.
- It is currently expensive to get alternatives into the market, e.g. **biopesticides,** and it is felt that they are **less reliable and have low efficiency**, so there is no incentive for growers to choose these potentially more sustainable options. Chemical companies are buying some of the smaller companies and should be able to absorb developed and registrations costs more easily.

- There may be a **benefit to looking overseas**, e.g. environmental schemes from Europe. In South America, biocontrols are brewed and used locally.
- There is a **fear of financial loss** and uncertainty, around alternative approaches, which limits uptake. Uptake in protected systems (e.g. soft-fruit tunnels) tend to be higher as it is easier to manage biocontrol approaches than in the open field.

6.Skills and Expertise

- There are currently **industry pinch points** from **loss of expertise** (e.g. through retirement) which puts many agricultural industries at risk.
- Scotland needs to **protect inter-disciplinary skills**, which is currently good compared to elsewhere.
- Some people don't realise their **normal standard practice** is already IPM.

7. IPM Adoption Barriers & influencing update

- There remains disease and weed problems in which chemical control remains the most effective or indeed the only viable control option e.g. removal of rail vegetation control and control of invasive weed species.
- **Example** – It was found that when attempting to use predators in hops, subsequent insecticides removed them, suggesting a need for true integrated across the whole system.
- Potential actions to **encourage IPM uptake** include:
    - embedding IPM in early training
    - incentivising garden centres to use BCAs
    - public-facing demonstrations of IPM
    - normalising cosmetically imperfect produce
    - increasing outreach via horticulturists and agronomists
    - expanding BASIS IPM advisors
    - providing training for outreach teams
    - sharing resources such as ready-made demonstration kits, directories, and cooperative platforms for exchanging practices and ideas

Industry specific barriers

Agriculture

Knowledge Exchange and building IPM awareness

- Advisers have significant power due to their knowledge of control options and must therefore avoid conflicts of interest with possible ties to chemical companies.
- Agronomists could increase farmer engagement by demonstrating IPM working in real life through local trials.
- Knowledge sharing is crucial between sectors and through intermediaries like farmer alerts and peer-to-peer benefits.
- Questions remain about whether successful biocontrol structural changes found in horticulture can be effectively adapted to agriculture. High-Risk Crops: Specific sectors such as seed potatoes face huge risk due to a low-tolerance policy for viruses.

Funding and regulatory constraints

- Better funding is needed for developing **resistant varieties** and to improve **regulation** around the development and use of **biocontrols**.

- **Narrow profit margins** and financial risk aversion make farmers reluctant to adopt new methods.
- **Lack of incentives** ("carrot or stick") for IPM adoption is a significant barrier.
- **Biological alternatives** can be inconsistent across different microclimates, making them harder to trust than chemical counterparts.
- **Risk aversion** leads farmers to maintain fungicide use due to its low cost and perceived protective benefit.

Practical and consumer issues

- Barriers exist with consumers and supermarkets, who are slow to change preferences.
- Public awareness of IPM needs to improve, with retailers playing a strong part.

Horticulture

Financial Costs

- High cost of implementation for new practices and a need for support against crop failure for horticulturalists.
- Funding barriers are an issue, with agriculture receiving more funding than horticulture ones.

Expertise Gap

- There is a significant loss of pathology and entomology expertise, particularly within the industry where general trainees are now sought over specialists, despite Scotland being relatively strong in this area.

Forestry

Silviculture, Species Diversity & Forest Management

- Current silvicultural practices, heavily reliant on conifer clear felling, are misaligned with IPM best practices (e.g., *Hylobius* management). Participants indicated that continuous cover forestry could be a promising approach more broadly. (Note, more evidence for CCF is needed to access the risks of other threats such as wind risk.
- The sector's dependence on too few species needs diversification through greater research, planting of alternative species, and revival of traditional methods like coppicing. Challenges include ensuring the right species are matched to the right sites, reforming grant schemes that encourage planting without adequate knowledge, and addressing reduced staffing that limits active management and effective IPM implementation.

Timber Markets

- Markets drive sawmill choices, so end-users must be engaged to stimulate demand for alternative species. Examples include potential uses such as aspen for disposable drones, and the need for multiple species in Glulam products to meet strength and aesthetic requirements.

Research Needs, Trials & International Collaboration

- Long-term funded species-trials are needed, supported by international collaboration to identify research relevant to Scotland.
- Tree breeding for resistance is slow and resistance in existing tree species is already breaking down under climate stress.
- Although biological control options (e.g. for *D. micans*) exist, funding and lack of cross-border coordination limit progress.

IPM Strategy, Barriers & Implementation Challenges

- Questions remain over how, and by whom, IPM should be implemented in natural forestry environments; this is most likely to require government leadership.
- Strong links with forest research and industry bodies (e.g., Confor) are important to reduce barriers.
- Key barriers include developing an IPM strategy that functions over a 60-year rotation and across landscapes, generating the evidence base to justify it, securing industry buy-in and funding, creating standardised guidance for diverse land managers, and ensuring access to technical expertise for landscape-scale deployment.

Skills, Training & Workforce Capacity

- The forestry skills pipeline is weak: university forestry programmes and apprenticeships are limited, the workforce is ageing, and too few new entrants are available to adopt flexible, modern IPM practices.

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