

The impact of peat-free growing media and the emergence of sciarid flies (Sciaridae) as a pest or just a nuisance in Scotland

Policy Summary



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1 Policy Summary

1.1 Background

The use of peat for horticulture is now widely acknowledged as being environmentally unsustainable. As a result, a wide range of peat-free growing media have become available, but the biosecurity status of some of these materials is currently unclear. In order to explore this, this scoping study engaged with stakeholders to understand their perceptions on fungus gnat (*Sciaridae*) prevalence in the growing facilities that they are using.

Fungus gnats (*Bradysia* spp.) (also commonly known as sciarid fly) are small, black, slow-flying insects which are commonly encountered in glasshouse environments, although for most people they are best known as a nuisance on houseplants. There are at least 250 species of fungus gnat in the UK, and their larvae are small and transparent which makes them difficult to identify on, or in, growing media and other organic material.

In UK horticulture, fungus gnats have long been thought of as a nuisance and a low-level pest, but little research has been conducted on fungus gnat impact in Scotland. This scoping study therefore:

- Interviewed stakeholders who are growing plants in the glasshouse context to understand the impacts they are seeing with fungus gnat infestations.
- Reviewed the literature to establish what is known about fungus gnat issues in Scotland, the UK, and internationally.
- Engaged with biological control suppliers to establish what species are currently deployed to manage fungus gnats.

1.2 Main Findings

After extensive literature research and interviews, it is apparent that there is a lack of scientific research in this area and therefore the impact of fungus gnats in Scottish glasshouse and protected crop contexts is unknown. The majority of research has been conducted in the US and is concentrated on fungus gnat issues in mushroom production facilities. Fungus gnat diversity in Scotland is currently not known.

Ninety-two percent of stakeholders believed that fungus gnats arrived at their facilities via the growing media which they had purchased. However, this information was anecdotal, we could not identify any experimental data to confirm or challenge this. This scoping study did not test any of the growing media, establish its contents, or the conditions present at growing facilities.

There were not enough respondents to establish if fungus gnats were more of a problem in peat-free compost than peat-based mixes. Further rigorous experimental work therefore needs to be conducted before definitive conclusions can be drawn. Given that fungus gnats are a problem in mushroom farms (who would traditionally use peat), it is unlikely that there will be a difference between growing media, this would require experimental data to clarify.

The literature suggests that fungus gnats can act as primary pests. The larvae do attack live roots, and the adults can spread pathogenic propagules around a facility (e.g. fusarium and botrytis). Seedlings and young plants are most at risk.

Respondents reported that populations of fungus gnats can be reduced through good horticultural practices, such as clean glasshouses and work areas, and the use of yellow sticky traps. Using traps also provides a means of monitoring the population in a given area. In addition, adjusting the type of growing media, and controlling its moisture content, are key strategies in managing fungus gnat populations in greenhouse environments. It is possible that these factors are more important for increased risk of sciarid fly infestations rather than the specific growing media used (i.e., whether it contains peat or not). This is due to sciarid fly larvae being non-specific in their feeding habits, they will consume any organic matter available to them. The relevant properties of the range of growing media ingredients commonly used should therefore be assessed for their ability to inhibit or support sciarid fly development.

Biological controls can be effective, but they need to be applied in combinations as they are often not effective on their own. The most commonly used are nematodes in combination with rove beetles.

1.5 Recommendations

In order to provide accurate advice for stakeholders in the future, this scoping study revealed that experimental work is required to:

- Identify the species of sciarid fly in Scotland and whether some species are more damaging than others. Currently, all sciarid fly species are treated in the same way which may be ineffective.
- Establish which components of growing media are more attractive to fungus gnats. This would enable growers to make more informed decisions around growing media choice as a means of sciarid population control.
- Clarify the most effective horticultural management strategies in the glasshouse context in Scotland (e.g., watering regimes) to lower sciarid fly populations.
- Identify the pathogenic disease-causing species which can be spread by sciarid fly in Scotland.
- Increase consumer confidence in peat-free growing media by clarifying the provenance of the constituents and their biosecurity status in comparison to peat mixes.

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