

NATIONAL TRUST EXTENDS PIONEERING NEW TRIAL TO PROTECT PRECIOUS COLLECTIONS

- *New trial, simultaneously using wasps and pheromones to combat clothes moths, is a first for a heritage setting with encouraging early results*
- *Trust hopes new multi-pronged approach will protect precious items including a tapestry gifted by Catherine the Great*
- *Charity's analysis showed insect pests and mould thrived in lockdown, with less disturbance from visitors and staff*
- *Mild winters and warmer springs also helped push pest numbers to record levels*

In March 2021, the National Trust began a groundbreaking new pest-control trial, using natural methods in a combination not previously used in a heritage setting to tackle clothes moths at the estate believed to be the birthplace of Anne Boleyn.

Despite vigilant housekeeping and other preventive measures, common or 'webbing' clothes moths (*Tineola bisselliella*) have proved hard to control at Blickling Hall in Norfolk.

The multi-pronged trial, about to enter its second year, is using a microscopic 'parasitoid' wasp, *Trichogramma evanescens*, together with specially prepared moth pheromones and the Trust's existing regime, to target the whole lifecycle of the moth, which can cause serious damage to carpets, furniture, clothing and other wool and silk objects.

While wasps and pheromones have been used separately against clothes moths, and pheromones have been used to manage moth pests in agricultural settings, the Trust believes the combination hasn't been deployed in a heritage setting until now.

David Loughlin, owner of Historyonics, the company supplying the wasps and pheromones to the Trust, says: "There has been a global move to adopt biological techniques to manage pests of food crops, so this is a natural development to adopt similar tools to manage the pests threatening our valuable national heritage."

Trichogramma evanescens is a natural enemy of the clothes moth, searching out moth eggs and laying its own eggs inside, so that a new beneficial wasp hatches, rather than a moth larva. Once the wasp eggs are laid, the wasps die naturally and disappear inconspicuously into house dust.



Measuring about 0.5mm, the wasp is barely visible and is not harmful to humans or other animals. The wasps are supplied in small card dispensers (each containing around 2,400 wasps) which can be discreetly hung or placed in drawers or open rooms [1].

The trial also uses pheromone 'tabs' to disrupt adult mating. These work continuously to spread female pheromones (chemicals released to attract males of the same species) which confuse male moths, reducing their chance of finding a female mate. The tabs use electrostatic technology to physically transfer the pheromone onto the bodies of male moths, turning them into portable female pheromone dispensers.

Used alongside existing measures, it is hoped the two biological control methods will vastly reduce the moth population at Blickling, safeguarding one of the Trust's most significant collections. Among its most treasured items are the 'Peter the Great' tapestry, gifted by Catherine the Great to Blickling's then owner in the 1760s, and a State Bed whose ambassadorial canopy and headcloth are the most complete 18th-century examples of their kind. Recent research has shown that the bed's counterpane is likely to be one of only two surviving pieces of Queen Anne's throne canopy.

Assistant National Conservator Hilary Jarvis says: "Early signs are that this pioneering approach will provide a practical and sustainable method that any of our properties can use to deal with serious infestations.

Although these are rare, they can sometimes prove immune to our usual, more gentle approaches, with potentially serious results."

The National Trust presented the trial at the Pest Odyssey virtual conference in September, which advocates for sustainable pest management in cultural heritage institutions.

The backdrop to the trial was the Trust's results from its 2020 pest review [2], which found that insect pests such as moths and silverfish thrived during lockdown, partly due to less disturbance from house staff and visitors, both inside and outdoors [3].

Hilary continues: "There's no doubt lockdown suited our resident bugs. The relative quiet, darkness and absence of disruption from visitors and staff provided perfect conditions for larvae and adults alike from March onwards.

"When we closed all of our houses, we knew insects would likely thrive, so pest monitoring was high on our list of essential



Above, the State Bedroom at Blickling. ©National Trust Images by Angelo Homak

tasks in 2020. Staff did monthly checks, which meant we could take swift action before outbreaks could take hold.”

Despite widespread staff furloughing, 2020 was a record-breaking year for insect pests, with at times mere handfuls of individuals at a record 173 properties counting more than 62,000 insects in 6,800 traps; also records for the Trust.

Hilary says: “The dedication of our house staff throughout 2020 was remarkable, given the impact of Covid-19 on all our lives, let alone working practices, in a truly challenging year.”

Analysis showed that normalised [4] insect numbers rose 11% in 2020 compared to 2019, with many houses also reporting mould outbreaks, due to a lack of activity to drive airflow [5].

As well as lockdowns, the mild winter and early – and in many cases very warm – spring also helped push pest numbers to record levels. The absence of harsh frosts appeared to particularly favour cluster flies, with many houses inundated throughout the summer [6]. These are a good food source for other insects so can compound insect pest problems if not cleared up promptly.

The review also showed a continued north-south divide for several key species, probably due to temperature and rainfall patterns. Hilary says: “Clothes moths remain more common in the south of England, and don’t look to be creeping northwards, though we are alert to that prospect, given the ever-warming climate.”

The top five most prevalent insect pests in 2020 (and what they feed on) were:

1. Silverfish (*Lepisma saccharina*; books, paper and cotton): dropped 8% in 2020 (to just above webbing clothes moth), possibly due to warm and sunny weather at critical times drying out their water supplies.
2. Webbing clothes moth (*Tineola bisselliella*; silk, wool, fur and feathers): rose 3%.
3. Woolly bear (a generic term for various carpet beetle larvae; silk, wool, fur and feathers): appears stable.
4. Australian spider beetle (*Ptinus tectus*; dust and detritus): numbers rising, though only north of the Midlands.
5. Common booklouse (*Liposcelis bostrychophila*; paper): slight rise in 2020, after a sharp increase in 2019.

Hilary says: “Though early data are promising, the results of our trial at Blickling won’t be clear until autumn 2022, when we’ll have data from two breeding seasons. We are therefore continuing the multi-pronged approach into next spring and summer too.

“In the meantime, staff are maintaining their vigilant checks and really enjoying being able to talk to visitors about the project as it unfolds.”

Below, exterior of the house at Blickling Estate, Norfolk. ©National Trust Images by Ian Ward.





Protecting your home and our heritage



Whether you own a precious inherited object, curate a collection, or manage an entire historic property, keeping possessions in the best possible condition and protecting them from damage by insects is a constant concern. Natural fabrics are vulnerable to feeding by larvae of clothes moths and carpet beetles; bathrooms and kitchens can be invaded by silverfish; books and libraries shredded by booklice and furniture and timber mined by woodworm.

All too often pest control in museums, libraries, archives and historic houses is a reaction to the discovery of insect activity and damage. Historyonics promotes the science of Integrated Pest Management (IPM), the aim of which is to monitor for pests and targeting treatment only where and when it is needed. We have many years of experience in managing insects and we back-up our advice with a trusted portfolio of products, from pheromone monitoring systems to insecticide and non-insecticidal control solutions.

We are proud to support many of the great houses and museums of the UK and Europe.



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