Fact Checker: Oak Processionary Moth in the UK

Contents

Background

Oak Processionary *Thaumetopoea processionea* is a species of moth native to central and southern Europe (Fenk *et al*., 2007). The distribution of this species has expanded greatly in recent years across parts of northern and western Europe. The expansion can largely be attributed to climate change and the growth in the horticultural trade causing movement of oak trees for planting across Europe from different source locations. The species was first recorded in the United Kingdom from Cornwall in 1983 (Randle *et al*., 2019). Subsequently the moth has been recorded as a natural immigrant with increasing regularity, with all records thought to be males (Randle *et al*., 2019; NMRS, 2020). The moth was discovered to be resident in south-west London in 2006, when caterpillars were found on oak trees that had been imported and planted two years previously (Mindlin *et al*., 2012). The breeding population has spread and the moth can now be found in Greater London and some surrounding counties (Forest Research, 2020). There continue to be accidental introductions into new locations, with 70 cases in the Pest Free Area in July 2019, including cases in Scotland and Wales (Forest Research, 2020).

Caterpillars of Oak Processionary are hairy and live in a nest from their fourth instar (Lamy *et al*., 1988). This is not unique to Oak Processionary; many other species of moth caterpillar are hairy or live communally in a nest or web (Dorset Council, 2020; Henwood *et al*., 2020). Not all hairy caterpillars produce irritating effects. Caterpillars of the Oak Processionary begin developing irritating hairs in their third instar, which by the sixth instar covers all segments of the body (Gottschling and Meyer, 2006; Lamy *et al*., 1988). Again, possession of irritating hairs is not unique to Oak Processionary caterpillars. For instance, Brown-tail *Euproctis chrysorrhoea* is a locally common moth species with irritating hairs that communities have lived alongside for a long time (Dorset Council, 2020; Henwood *et al*., 2020). The hairs associated with causing irritation are short and not the long wavy hairs that can be readily seen (Erich and Meulenbelt, 1993). A report by Public Health England (2015)

reviewed how these hairs cause irritation. They attach within the skin and release a protein called thaumetopoein which causes the release of histamine and other vasodilators (Lamy *et al*., 1986; Lamy *et al*., 1988, Erich and Meulenbelt, 1993). No other stage of the moth's life-cycle (egg, pupa and adult) causes deleterious effects on human health.

In light of the ongoing spread of Oak Processionary, the UK Plant Health (Forestry) Order (2005) was amended in 2019 to strengthen measures on imports of oak trees into the UK. As a consequence, imports of oak trees are only permitted from Oak Processionary-free areas, or where trees have been grown under complete protection. The restrictions cover both imports from overseas and the movement of trees from areas of the UK where Oak Processionary is already present. The Forestry Commission may also serve Statutory Plant Health Notices on the owners of trees with the moth, requiring them to remove the caterpillars. Failure to comply with a notice can result in enforcement action and possible prosecution.

There has been considerable control work in recent years in an attempt to limit Oak Processionary numbers and spread in the UK. Defra has separated the UK into three distinct geographical zones for Oak Processionary management: 1) the Core Zone, where Oak Processionary is established and control action is not compulsory; 2) the Control or Buffer Zone, an area surrounding the Core Zone where control remains the aim to prevent or minimise outward spread; and 3) the Pest Free Area, which covers the remainder of the UK and where there is the requirement to prevent Oak Processionary establishment.

References

Dorset Council, 2020. https://www.dorsetcouncil.gov.uk/countryside-coast-parks/countryside-management/biodiversity/pdfs/species-and-habitat-advice-notes/web-spinning-moths.pdf.

Erich, H.E., Meulenbelt, J., 1993. Behaarde rupsen, een oprukkende oorzaak van pseudo-allergische reactie in Nederland. *Nederlandsch tijdschrift voor geneeskunde*, **137**, 1672-3

Fenk, L., Vogel, B., Horvath, H., 2007. Dispersion of the bio-aerosol produced by the oak processionary moth. *Aerobiologia*, **23**, 79-87.

Forest Research, 2020. Oak processionary moth (*Thaumetopoea processionea*). Forest Research. 4.12.20. Available at: https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/oak-processionary-moth-thaumetopoea-processionea/

Gottschling, S., Meyer, S., 2006. An epidemic airborne disease caused by the oak processionary caterpillar. *Pediatric dermatology*, **23**, 64-66.

Henwood, B., Sterling, P., Lewington, R., 2020. *Field Guide to the Caterpillars of Great Britain and Ireland*. Bloomsbury, London.

Lamy, M., Novak, F., Duboscq, M.F., Ducombs, G., Maleville, J., 1988. The oak processionary caterpillar (*Thaumetopoea processionea* L.) and man: Urticating apparatus and mechanism of action [French] LA CHENILLE PROCESSIONNAIRE DU CHENE (THAUMETOPOEA PROCESSIONEA L.) ET L'HOMME: APPAREIL URTICANT ET MODE D'ACTION. *Annales de Dermatologie et de Venereologie,* **115**, 1023-32.

Lamy, M., Pastureaud, M.H., Novak, F., Ducombs, G., Vincedeau, P., Maleville, J., Texier, L., 1986. Thaumetopoein: an urticating protein from the hairs and integument of the pine

processionary caterpillar (*Thaumetopoea pityocampa* Schiff., Lepidoptera, Thaumetopoeidae). *Toxicon*, **24**, 347-356.

Mindlin, M.J., le Polain, D.W.O., Case, S., Walsh, B., 2012. The arrival of oak processionary moth, a novel cause of itchy dermatitis, in the UK: experience, lessons and recommendations. *Public Health*, **126**, 778.

NMRS, 2020. The National Moth Recording Scheme. Butterfly Conservation, Wareham.

Public Health England, 2015. *Health effects of exposure to setae of oak Processionary moth larvae: systematic review*. Public Health England, London.

Randle, Z., Evans-Hill, L.J., Parsons, M.S., Tyner, A., Bourn, N.A.D., Davis, T., Dennis, E.B., O'Donnell, M., Prescott, T., Tordoff, G.M., Fox, R., 2019. *Atlas of Britain and Ireland's Larger Moths*. Pisces Publication, Newbury.

Claim 1: Caterpillars of the Oak Processionary pose a threat to human health

What the Science Says

Correct

Caterpillars of the Oak Processionary can cause human health effects. Most symptoms are mild, being limited to dermatitis or pruritus. Media reports of deadly asthma attacks are unfounded. Where populations of Oak Processionary are already present education should be used to inform people and reduce exposure over time. Control should be conducted only when vulnerable groups such as children are present.

Literature Review

Public Health England (2015) undertook a review of the medical literature documenting the effects of exposure to Oak Processionary on human health. The review found the severity of health impacts was generally low and the effect on health services was also low. There was less literature and fewer documented cases of exposure to Oak Processionary compared to other species of processionary moth, particularly the Pine Processionary *Thaumetopoea pityocampa*. Of the two main studies carried out it was found 5-7.5% of people reported health complaints (Rots-de Vries and Jans, 2000; Maier *et al*., 2003). Upon exposure to Oak Processionary the majority of symptoms were dermatitis and pruritus (itchy skin). This contrasts with reports in the media documenting caterpillars causing deadly asthma attacks; these are completely inaccurate based on the current evidence.

Less commonly reported symptoms included respiratory problems, ocular irritation and general symptoms such as fever (Public Health England, 2015). There is one incidence of an anaphylaxis response although there is uncertainty around whether this case should have been attributed as a severe allergic response instead (Bosma and Jans, 1998; Rot-de Vries, 2000; Public Health England, 2015).

Severe symptoms were often related to pre-existing health conditions and in particular direct contact with caterpillars which cause them to release large quantities of hairs. It must also be recognised that symptoms can occur without handling caterpillars, due to windblown hairs or those already existing in the environment (Mindlin *et al*., 2012). There are no reports of hospital admission being required after exposure to Oak Processionary and most cases were treated with over the counter remedies available from a pharmacy (Public Health, England, 2015). Severity of symptoms and numbers of cases is dependent on the density both of the moth population and the human population. Other key factors include previous exposure and degree of exposure to Oak Processionary (Public Health England, 2015).

References

Bosma, A, Jans, H., 1998. Serious anaphylactic reactions in connection with combating the oak processionary caterpillar (*Thaemetopoea processionea*) in North Brabant. *Nederlands Tijdschrift voor Geneeskunde*, **142**, 1567-9.

Maier, H., Spiegel, W., Kinaciyan, T., Krehan, H., Cabaj, A., Schopf, A., Hönigsmann, H., 2003. The oak processionary caterpillar as the cause of an epidemic airborne disease: survey and analysis. *British Journal of Dermatology*, **149**, 990-997.

Mindlin, M.J., le Polain, D.W.O., Case, S., Walsh, B., 2012. The arrival of oak processionary moth, a novel cause of itchy dermatitis, in the UK: experience, lessons and recommendations. *Public Health*, **126**, 778.

Public Health England, 2015. *Health effects of exposure to setae of oak Processionary moth larvae: systematic review*. Public Health England, London.

Rots-de Vries, M.C., Jans, H.W.A., 2000. Eikenprocessierupsen in Nederland en België. Verloop van een epidemie en evaluatie van een voorlichtingscampagne. TSG. *Tijdschrift voor Gezondheidswetenschappen*, **78**, 28-34.

Claim 2: Caterpillars of the Oak Processionary cause severe damage to oak trees

What the Science Says

Partially Correct

There is little evidence of severe defoliation events in the UK. Oak Processionary can defoliate oak trees but little evidence has been gathered to determine the factors influencing severe defoliation and the effects on tree health after defoliation occurs.

Literature Review

Insect herbivory and defoliation are natural processes and a key disturbance regime within forest ecosystems that alter biogeochemical cycles and open up niches for other species. The impacts of invertebrates that defoliate trees on tree health at an individual and whole forest level are complex (Boyd *et al*., 2013; Dietze and Matthews, 2014; Anderegg *et al*., 2015). Defoliation of trees is not a new phenomenon; caterpillars of many native species of moth can defoliate trees in certain years. For instance the Bird Cherry Ermine *Yponomeuta*

evonymella spins webs, which caterpillars hide within, causing defoliation in years of high population numbers. This is a common sight across the UK. Some species such as the Gypsy Moth *Lymantria dispar* and the Horse-chestnut Leaf Miner *Cameraria ohridella* can cause severe defoliation in commercial settings. This can reduce seed production but not necessarily timber growth (Salleo *et al*., 2003; Thalmann *et al*., 2003). The response to defoliation also appears to vary widely depending on factors such as the mixture of tree species in a stand, which can also influence tree mortality and recovery (Davidson, 1999; Csóka *et al*., 2015).

The main defoliators of oaks trees in the UK from a moth perspective are winter-flying members of the family Geometridae which feed in the spring (Henwood *et al*., 2020). Many of these are however undergoing drastic declines in abundance, which will likely reduce such instances (Randle *et al*., 2019). Oaks are adapted to defoliation through a range of mechanisms (Feeny, 1970). One such response is the production of so-called 'lammas' growth in mid-late summer. Insect populations can vary dramatically on an annual basis influenced by temperature, weather patterns, population of parasitoids and habitat availability. When populations reach high levels this can cause defoliation. The effects on tree health are complicated and depend on a wide range of abiotic and biotic factors such as weather patterns and tree physiology (Ayres and Lombardero, 2000; Boyd *et al*., 2013). Decay if it does occur is a natural part of the life-cycle of a tree, which provides habitat for many species, especially those associated with deadwood (Radu, 2006).

Oak Processionary caterpillars feed during the April to June period and are a known defoliator of oak trees on continental Europe, where the habitat and guild of species is very similar to the UK (Wagenhoff and Veit, 2011). Very little evidence has quantified the effect of Oak Processionary herbivory either in terms of the amount of defoliation and whether this increases the susceptibility of oaks trees to other pressures after defoliation occurs (Wagenhoff and Veit, 2011; Damestoy *et al*., 2020). The main study conducted from France found that defoliation was higher for Sessile Oak *Quercus petraea* compared to Pedunculate Oak *Q. robur* and that defoliation was higher in monocultures compared to mixed woodlands containing a range of species (Damestoy *et al*., 2020). There is currently little evidence of severe defoliation in the UK or of the effects of Oak Processionary defoliation on tree health or commercial timber growth.

References

Anderegg, W.R., Hicke, J.A., Fisher, R.A., Allen, C.D., Aukema, J., Bentz, B., Hood, S., Lichstein, J.W., Macalady, A.K., McDowell, N., Pan, Y., 2015. Tree mortality from drought, insects, and their interactions in a changing climate. *New Phytologist*, **208**, 674-683.

Ayres, M.P., Lombardero, M.J., 2000. Assessing the consequences of global change for forest disturbance from herbivores and pathogens. *Science of the Total Environment*, **262**, 263-286.

Boyd, I.L., Freer-Smith, P.H., Gilligan, C.A., Godfray, H.C.J., 2013. The consequence of tree pests and diseases for ecosystem services. *Science*, **342,** 6160.

Csóka, G., Pödör, Z., Nagy, G., Hirka, A., 2015. Canopy recovery of pedunculate oak, Turkey oak and beech trees after severe defoliation by gypsy moth (*Lymantria dispar*): Case study from Western Hungary. *Central European Forestry Journal*, **61**, 143-148.

Damestoy, T., Jactel, H., Belouard, T., Schmuck, H., Plomion, C., Castagneyrol, B., 2020. Tree species identity and forest composition affect the number of oak processionary moth

captured in pheromone traps and the intensity of larval defoliation. *Agricultural and Forest Entomology*, **22**, 169-177.

Davidson, C.B., Gottschalk, K.W., Johnson, J.E., 1999. Tree mortality following defoliation by the European gypsy moth (*Lymantria dispar* L.) in the United States: a review. *Forest Science*, **45**, 74-84.

Dietze, M.C., Matthes, J.H., 2014. A general ecophysiological framework for modelling the impact of pests and pathogens on forest ecosystems. *Ecology Letters*, **17**, 1418-1426.

Feeny, P., 1970. Seasonal changes in oak leaf tannins and nutrients as a cause of spring feeding by winter moth caterpillars. *Ecology*, **51**, 565-581.

Radu, S., 2006. The ecological role of deadwood in natural forests. In *Nature Conservation* (pp. 137-141). Springer, Berlin.

Salleo, S., Nardini, A., Raimondo, F., Gullo, M.A.L., Pace, F., Giacomich, P., 2003. Effects of defoliation caused by the leaf miner *Cameraria ohridella* on wood production and efficiency in *Aesculus hippocastanum* growing in north-eastern Italy. *Trees*, **17**, 367-375.

Thalmann, C., Freise, J., Heitland, W., Bacher, S., 2003. Effects of defoliation by horse chestnut leafminer (*Cameraria ohridella*) on reproduction in *Aesculus hippocastanum*. *Trees*, **17**, 383-388.

Wagenhoff, E., Veit, H. 2011. Five Years of Continuous *Thaumetopoea processionea* Monitoring: Tracing Population Dynamics in an Arable Landscape of South-Western Germany. *Gesunde Pflanzen,* **63**, 51–61.

Claim 3: It is appropriate to use *Bacillus thuringiensis* to control Oak Processionary

What the Science Says

Incorrect

In 2020 alone 106,644 trees were sprayed with 53,332 applications of *Bacillus thuringiensis* (Bt). There is a lack of comprehensive studies on the influence of Bt on both Lepidoptera and other taxonomic groups in the UK. Studies that have been conducted have lacked initial baseline comparisons making it difficult to draw firm conclusions about the effects of Bt. Based on these findings and that the moth's known range continues to expand we feel it is not appropriate to use Bt to control Oak Processionary, especially when alternatives such as better education and mechanical removal are available.

Literature Review

Over 2300 species are associated with the two native species of oak tree, Pedunculate Oak and Sessile Oak, with 125 macro-moths and butterflies using the *Quercus* genus as a foodplant in the UK (Mitchell *et al*., 2019, Cook *et al*., 2021). *Bacillus thuringiensis var. kurstaki* (Bt) is the primary pesticide used to control populations of Oak Processionary, which feed on oak trees as a caterpillar. Two other pesticides, diflubenzuron and deltamethrin, have also been approved for use (Forest Research, 2020). In 2020 alone 1186 sites and

106,644 trees were sprayed with 53,332 applications of Bt (Hopitt and Toft, 2020). Studies elsewhere in continental Europe have shown Bt to be effective at reducing populations of Oak Processionary (Roversi, 2008). Bt is not specific to Oak Processionary and the use of Bt will therefore influence populations of other, non-target species of butterflies and moths (Lepidoptera). The pesticide is thought to be Lepidoptera-specific although some accounts of other taxonomic groups being susceptible have been cited in the literature (Glare and O'Callaghan, 2000). Wider reviews on the use of pesticides suggest they are a major cause of invertebrate declines (Sánchez-Bayo and Wyckhuys, 2019). Bt has been applied to control a range of Lepidoptera species and there is some evidence for the effects this has on both target and non-target taxa (Miller, 1990a, Miller 1990b; Down and Audsley, 2018).

Limited evidence has been gathered from the UK regarding the effect of Bt on Lepidoptera and the wider influence this has on other organisms and ecosystem services. For instance the caterpillars of many species of Lepidoptera are important food sources for birds, adults moths are food for bats and Lepidoptera are integral for pollination (Hahn and Brühl, 2016). Responses to Bt spraying are complex but some evidence of changes in community composition of Lepidoptera and foraging behaviour of bird is apparent (Roversi *et al*., 2006; Anon, 2009; Höllrigi-Rosta and Wieck, 2013; Freed and Reeve, 2014). A study in Richmond Park in London found that taxonomic richness and abundance of Lepidoptera was lower compared to an area sprayed the year before and a control area which wasn't sprayed (Freed and Reeve, 2014). These findings were reflected in a study at Pangbourne, Berkshire where abundance, species richness and mean catch were lower in sprayed areas (Townsend, 2014). This study did however highlight that a lack of replication and initial baseline data prior to spraying reduced the strength of the results to determine Bt as the causal agent of the difference. Currently there do not appear to be any studies on Lepidoptera in the UK that may be affected by Bt dripping off the oak leaves onto surrounding vegetation in the understorey, field and ground layers.

A study on bats, also at Pangbourne, found higher bat species diversity and numbers of registrations in the sprayed plot leading to the conclusion that Bt hadn't led to a collapse in the population (Moxon and Carpenter, 2014). Data for Blue Tit *Cyanistes caeruleus* and Great Tit *Parus major* have been collected by Moxon and Carpenter (2014) and Ecosulis (2014). These data showed variable breeding productivity and in 2014 a general paucity of family group activity in both woods. Drawing firm conclusions as with other studies is therefore difficult. A key theme from many of these studies was the difficulty in determining whether effects were due to Bt and teasing those apart from natural fluctuations in abundance.

In summary there is evidence that species richness, abundance and composition is affected by Bt, but some of this evidence is limited in terms of its ability to specifically pinpoint Bt as the causal agent due to a lack of baseline monitoring or replication. There are also gaps in the research knowledge, such as studies on the effects of spray dripping on surrounding vegetation. Based on these findings and that the moth's known range continues to expand we feel is not appropriate to use Bt to control Oak Processionary especially when alternatives such as better education, mechanical removal and natural predators are available.

References

Anon. 2009. Faunistische Begleituntersuchungen zur Klärung der Auswirkungen von Insektizidbehandlungen gegen phyllophage Schmetterlingsraupen in Alteichenbeständen auf die sympatrische Arthropoden fauna. Nordwestdeutshe Forstliche Versuchsanstalt.

Cook, P., Parsons, M.S., Tordoff, Davis, T., G.M., Dennis, E.B., Fox, R., Bourn, N.A.D., 2021. *Traits database for the macro-moths and butterflies of Great Britain and Ireland*. Butterfly Conservation, Wareham

Down, R., Audsley, N., 2018. *Review of the impacts of Oak Processionary Moth (*Thaumetopoea processionea*) control methods on oak tree biodiversity*, DEFRA, London.

Freed, T.H., Reeve, N. 2014. *A Report of the effects on non-target Lepidoptera of spraying with Bacillus thuringiensis var kurstaki for the control of Oak Processionary Moth in Richmond Park*. The Royal Parks, London.

Glare, T.R., O'Callaghan, M., 2000. *Bacillus thuringiensis*: Biology, ecology and safety. John Wiley & Sons, Ltd, Chichester.

Hahn, M., Brühl, C.A., 2016. The secret pollinators: an overview of moth pollination with a focus on Europe and North America. *Arthropod-Plant Interactions*, **10**, 21-28.

Höllrigi-Rosta, A., Wieck, S. 2013. Umweltauswirkungen von Bioziden und Pflanzenschutzmitteln zur EPSBekämpfung. In Bräsicke, N. (ed.), Ökologische Schäden, gesundheitliche Gefahren und Maβnahmen zur Eindämmung des Eichenprozessionsspinners im Forst und im urbanen Grün. JuliusKühn-Institut, Bundesforschungsinstitut für Kulturpflanzen.

Hoppit, A., Toft, M. 2020. *Oak Processionary Operation Report 2020*. Forestry Commission.

Miller, J.C., 1990a. *Monitoring the effects of Bacillus thuringiensis kurstaki on nontarget Lepidoptera in woodlands and forests in western Oregon* p. 277-286. In P.A, Follet., J.J, Duan (Eds) Nontarget effects of biological control.

Miller, J.C., 1990b. Field assessment of the effects of a microbial pest control agent on nontarget Lepidoptera. *American Entomologist*, **36**, 135-140.

Mitchell, R.J., Bellamy, P.E., Ellis, C.J., Hewison, R.L., Hodgetts, N.G., Iason, G.R., Littlewood, N.A., Newey, S., Stockan, J.A., Taylor, A.F.S., 2019. Oak-associated biodiversity in the UK (OakEcol). NERC Environmental Information Data Centre. https://doi.org/10.5285/22b3d41e-7c35-4c51-9e55-0f47bb845202

Moxon, G., Carpenter, B. 2014. Herridge's Copse and Horns Copse (Control), near Pangbourne, Berkshire 2013 Monitoring of Impacts of Oak Processionary Moth Spraying on Bats and Birds. Bioscan Report No. E1771R1

Roversi, P.F., 2008. Aerial spraying of *Bacillus thuringiensis* var. *kurstaki* for the control of *Thaumetopoea processionea* in Turkey oak woods. *Phytoparasitica*, **36**, 175-186.

Roversi, P.F., Rumine, P., Barzanti, G.P., 2006. Efficacia di trattamenti aerei con Bacillus thuringiensis var. kurstaki per il controllo della processionaria della quercia e impatto sulla lepidotterofauna. *Atti G. FitopatoL,* **1**, 211-216.

Sánchez-Bayo, F., Wyckhuys, K.A., 2019. Worldwide decline of the entomofauna: A review of its drivers. *Biological Conservation*, **232**, 8-27.

Townsend, M., 2014. Report on monitoring the impact on non-target Lepidoptera of aerial spraying to control Oak Processionary Moth *Thaumetopoea processionea* (Linnaeus) (Lepidoptera: Thaumetopoeidae) (OPM) in Pangbourne, Berkshire in 2013-14 (year 1).

Claim 4: The current program of control is effective in preventing the spread of the Oak Processionary

What the Science Says

Incorrect

The moth has continued to spread, with the rate of spread accelerating despite control measures. There have been some successes in preventing spread at a site level.

Literature Review

Oak Processionary has been surveyed extensively using pheromone lures. Data in figure 9 of Hoppit and Toft (2020) shows that despite active control the moth has continued to expand its range in London since first being discovered in 2006. The rate of range expansion has accelerated from 1.7km per year between 2007 and 2014 to 6.2km per year between 2014 and 2019 (Suprunenko *et al*., 2021). There have been cases of site level control which have prevented further spread in the Core and Control Zones but also the Pest Free Area. Given the range expansion, transitioning towards a risk-based strategy to inform landowners of decision-making options including alternative control techniques such as manual control and education of at risk groups such as school children and tree workers should be encouraged (Gottschling and Meyer, 2006; Public Health England, 2015). Natural predators such as the tachinid fly *Carcelia iliaca,* which parasitises caterpillars (Sands, 2017), or birds such as the Great Tit should also be considered as control measures, particularly at sites which pose no significant threat to human health.

References

Gottschling, S., Meyer, S., 2006. An epidemic airborne disease caused by the oak processionary caterpillar. *Pediatric dermatology*, **23**, 64-66.

Hoppit, A., Toft, M., 2020. *Oak Processionary Operation Report 2020*. Forestry Commission.

Public Health England, 2015. *Health effects of exposure to setae of oak Processionary moth larvae: systematic review*. Public Health England, London.

Sands, R.J., 2017. The population ecology of oak processionary moth, PhD thesis, University of Southampton, Southampton.

Suprunenko, Y.F., Castle, M.D., Webb, C.R., Branson, J., Hoppit, A., Gilligan, C.A., 2021. Estimating expansion of the range of oak processionary moth (*Thaumetopoea processionea*) in the UK from 2006 to 2019. *Agricultural and Forest Entomology.* https://doi.org/10.1111/afe.12468

Claim 5: The majority of outbreaks of Oak Processionary in the Pest Free Area are associated with imports of oak

What the Science Says

Correct

Imports of oak have largely been responsible for outbreaks of the Oak Processionary. The first instance of this species arriving as a breeding species in the UK was associated with planted trees. In 2019 at least 70 cases of Oak Processionary were found in the Pest Free Area, many associated with imports from the European Union (EU). Legislation was subsequently strengthened to reduce the risk of a repetition of these events.

Literature Review

Between 2013 and 2015, 1,117,696 oak trees were imported into the UK (Woodland Trust, 2020). Imports of Oak are notifiable under the Plant Health Act (2005), in which Oak Processionary is listed as a quarantine species. The Pest Free Area is an area designated as free of Oak Processionary. In the UK this currently refers to areas beyond the boundary of London (Forest Research, 2020).

In 2019 at least 70 cases of Oak Processionary were discovered in the Pest Free Area including sites in Scotland and Wales (Forest Research, 2020). These were associated with planting of oaks, with 2000 consignments traced back to the European Union (EU) including the Netherlands, Belgium and Germany (Forest Research, 2020). Following the outbreaks that occurred in 2019 national legislation was amended to protect against the threat from importing oak trees and their subsequent movement.

The most effective way to reduce introduction of Oak Processionary, or any tree pest or disease, in the Pest Free Area is to prevent arrival to the local area in the first place (Woodland Trust, 2017). Ensuring good biosecurity and ideally avoiding trees sourced and grown from outside the UK where possible will reduce the risk of outbreaks. During tree procurement using nurseries signed up to the United Kingdom and Ireland Sourced and Grown (UKISG) scheme will prevent importation of stock from abroad (Woodland Trust, 2020). Alternatively, local seeds can be used, as oaks can readily be grown from acorns, or a species of tree other than oak can be planted as recommended in France (Anses, 2020).

References

Anses, 2020. *Controlling pine and oak processionary caterpillars in urban areas: ANSES recommends combining preventive and curative measures*, Anses. Available at: https://www.anses.fr/en/content/controlling-pine-and-oak-processionary-caterpillars-urban-areas-anses-recommends-combining [Accessed 04/12/2020].

Forest Research, 2020. Oak processionary moth (*Thaumetopoea processionea*). Forest Research. Available at: https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/oak-processionary-moth-thaumetopoea-processionea/ [Accessed 04/12/2020].

Plant Health Act, 2005. The Plant Health (Forestry) Order 2005, UK Government. Available at: https://www.legislation.gov.uk/uksi/2005/2530/contents/made [Accessed 20/12/2020].

Woodland Trust, 2017. Tree Health: UK biosecurity and plant imports. Available at: https://www.woodlandtrust.org.uk/media/1731/biosecurity-and-plant-imports-position-statement.pdf [Accessed 20/12/2020].

Woodland Trust, 2020. UK sourced and grown tree: why is it important to buy them? Available at: https://www.woodlandtrust.org.uk/plant-trees/uk-sourced-and-grown/ [Accessed 20/12/2020].

Appendix 1: What is the financial cost of control of Oak Processionary?

Literature Review

Defra provided a budget of £2 million toward the control of Oak Processionary in 2013, £1.4 million in 2014 and £1.2 million in 2015 (DEFRA, 2016). See Table 5.2 in DEFRA (2016) for more details. Note that these figures do not include funding from other organisations. A London Mayor Question from 2019 indicates that the budget was £2 million in 2019.

References

DEFRA, 2016. *Evaluation of the Oak Processionary Control Programme*, DEFRA, London.

Lord Mayor Question, 2019. Available at https://www.london.gov.uk/questions/2019/17746

Last updated 22/09/2021