

Eastern spruce budworm (*Choristoneura fumiferana*), Western spruce budworm (*Choristoneura freeman*) & Black headed budworm (*Acleris gloverana* and *Acleris variana*)

Status

- There are several species of spruce budworm present in North America – often associated with large-scale fluctuating populations that when erupting can cause landscape scale defoliation, major tree mortality or decline in growth – particularly in spruce (*Picea*) and fir (*Abies*) species.
- These outbreaks, which generally peak every 30-40 years, can cause moderate/ severe defoliation over several million hectares. They have been part of the natural dynamics of the boreal forests over millennia but forest management has been implicated in affecting frequency and severity of outbreaks and climate change in an extension to the northern limits of the potential outbreak areas.
- Eastern spruce Budworm (*Choristoneura fumiferana*) occurs in eastern North America.
- Western spruce Budworm (*Choristoneura freemani*), occurs in western parts of North America.
- The black headed budworm, prevalent throughout north America, is now identified as two species: western (*Acleris gloverana*) and eastern (*Acleris variana*).
- Natural dispersal is by adult flight (potentially hundreds of km) with occasional passive dispersal for some species by larvae ballooning on threads.
- These species are absent in the EU and UK.
- A variety of control methods have been attempted, including pesticides. Latest techniques (in New Brunswick) focus on mating disruption using pheromones distributed from the air. Forest Research scientists visited the trials in 2017 and have reported on their observations.
- A citizen science project is helping to monitor outbreaks (<https://budwormtracker.ca/#/>).



Larva of *C. fumiferana*. Pupation takes place within the webbed foliage during late June and early July. Source J. Dewey, USDA, Bugwood.org.

Plant Health Centre

C/o James Hutton Institute, Invergowrie, Dundee DD2 5DA

Phone: +44 (0)1382 568 905

Email: info@planthealthcentre.scot; Web: www.planthealthcentre.scot

Scottish-specific issues

- Scotland's conifer forests are of significant economic and societal interest and so any additional threat to them would be of concern.
- Likelihood of arrival is low under current import regulations.
- There is no recent experience of interceptions or establishment.

Knowledge Gaps

- There are many fundamental gaps that exist in relation to the likely behaviour and performance of these budworm species in European conditions and in their ability to utilize host species grown in Scotland's forests.

PHC Perspective

- The spruce budworm (*Choristoneura* sp.) may appear a lower risk than some other pest threats but a watching brief is still necessary given the potential impact.
- The principal trade pathways for transfer of budworms are whole plants and cut branches of conifer hosts which could carry all life stages except adults (i.e. eggs, larvae (especially hibernating first/second instars in silken hibernacula) and pupae).
- The import of live plants and cut branches of conifers (*Abies*, *Larix*, *Picea*, *Pinus* and *Pseudotsuga*) from North America is prohibited under the EU Plant Health Directive because of the threat posed not only by budworms but also by other North American pests and diseases. This measure, if strictly applied, should prevent their introduction.

<https://secure.fera.defra.gov.uk/phiw/riskRegister/viewPestRisks.cfm?cslref=13547>

Key Priorities and Recommendations

- Watching brief with respect to developments, interceptions and any findings outside North America.
- Any changes to trade arrangements (and prohibition of plant/foliage imports from N America) need to be watched.

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