

Summary and review of consultation responses

A public and stakeholder consultation was held on the proposed policy change to allow the release of approved non-native augmentative arthropod biological control agents outside of glasshouses and into other protected structures, such as polytunnels, in England.

In summary, there were 12 responses to the consultation from four technical advisors, two researchers, three biological control suppliers, two growers, and one industry body. All 12 respondents were supportive of the proposed policy change.

In response to the specific questions/concerns raised:

Q (CABI) We note that climate change is going to make this barrier progressively less effective over time. It would be reassuring to have at least some monitoring of agent populations in the local area in the early years of release to confirm that historical absence of evidence really is evidence of absence when it comes to unexpected survival and establishment and potential non-target damage.

(Fera Science Ltd) In section 3 it is stated that “The Defra Risk and Horizon Scanning team have not received any reports of negative environmental impacts from the use of these agents. Although, low level impacts are unlikely to be picked up through the monitoring of suppliers, distributors and growers”. Hence, it is unclear what the non-target risk is. Is this something that should be monitored if use in polytunnels is authorised?

A Post release monitoring is encouraged for biological control agents to understand whether the agents have established in the environment and whether they have caused unintentional impacts. It is also prudent to monitor the efficacy of the agents. However, monitoring for establishment and unintended impacts in the environment will be difficult for growers and Defra would not want this to be a mandatory requirement in case it impedes use of these beneficial agents.

The impact of climate change on biological control agents and how this should be reflected in risk assessments is a topic that Defra will be investigating in the near future. In April 2022, an International Plant Protection Convention climate change action plan was adopted, and one of the actions is to “provide recommendation on the most appropriate means of incorporating climate change considerations into pest risk analysis and surveillance, whether

through the development of recommendations, guidelines (e.g., IPPC Guide), and/or the creation or modification of International Standards of Phytosanitary Measures". This will be a consideration for biological control agents as well as pests.

Q (CABI) One question we would like to raise is what the requirements will be for interested parties wishing to apply future biocontrol agents not on the list, outside of the glasshouse. Will a cold-tolerance study be required or some form of climatic matching?

A Applicants will need to show that an augmentative biological control agent will be unable to establish or cause unintended impacts in the environment. The amount of data required to demonstrate this will be dependent on the quality of data already available on the biocontrol agent and what that indicates about the potential establishment. Climate matching provides good supportive evidence that an agent would not be able to establish, but is unlikely to be sufficient on its own, so data from laboratory or field studies to show that it can either not complete its lifecycle or would not be able to survive the UK winter may be needed.

Q (Fera Science Ltd) Given that *Delphastus catalinae* has a Ltime50 at 5°C and maximum field survival of c. 40 days and 35 days respectively, does this not indicate a low-medium risk of establishment?

A Although the lab survival was around 40 days in the study by Bale and Walters (2002), field survival was only 35 days. Follow up studies by Simmons and Legaspi (2007) found that survival at 5°C was up to 16 days and eggs held at this temperature did not hatch, suggesting overwintering in the UK is very unlikely.

Q (ADAS) Given that *Neoseiulus californicus* has already been shown to have established in parts of the UK, and that it may be released to glasshouse crops which can then be planted outdoors (e.g., on plants that have been propagated under glass) – is there a strong argument for not being able to release it in poly tunnels?

And is there enough evidence of the risks to our native fauna from the successful overwintering of this species? Does more research need to be done on this?

A Defra would be happy to review the establishment status of *N. californicus* in England, but Defra would need to be provided with evidence that it is ordinarily resident = the population should have been present in the wild for a significant number of generations and should be considered to be viable in the

long term. For example, records of establishment across sites over multiple years would provide useful evidence.

If there is not sufficient evidence of its establishment in England, evidence would need to be provided to show that the species is host specific and/or would not cause environmental impacts in the UK.

Q (Koppert) We would just like to pick up on a small point in Table 3 (Summary information from the EPPO PM 6/3 List of biological control agents used in the EPPO region (EPPO, 2016). The term 'UK', in the column headed, 'EPPO countries used' should perhaps be removed, and replaced with the individual countries, whose devolved authorities all have their own non-native licensing systems. Over the years, continuing to use the term UK in this instance has caused much confusion, and continues to do so. For example, Scotland has prohibited the use of *N. californicus* even under glass, but if a grower were to look at Table 3, in this Defra consultation, they could be forgiven for assuming that this meant they were allowed to use this IBCA and end up inadvertently breaking the law.

A Countries mentioned in EPPO PM 6/3 are EPPO member countries. The UK is an EPPO member country and is also an International Plant protection Convention contracting party. Defra represents the UK National Plant Protection Organisation on behalf of all UK nations. That is why the UK is mentioned and not England, Wales, Scotland or Northern Ireland. However, Defra will consider clarifying this point in PM 6/3.

The full responses of each contributor are below.

Response 1 (Bioline Agrosiences)

Bioline agrees with the proposal to include licences for polytunnels alongside glasshouses when licencing non-native IBCA's, for all the reasons listed in the attached document.

Response 2 (CABI)

CABI is always keen to see nature-based solution used, wherever safe and sensible, in crop production which is one of the reasons we developed the [BioProtection portal](#). We concur with the points raised by ACRE and are also broadly supportive of the proposal to loosen the restrictions over the use outside of glasshouses which seems out of step with much of the rest of the region. We note that the data provided suggest that all but one of the biocontrol agents are unlikely to establish outside of protection and survive a British winter and agree that it is wise not to permit *Neoseiulus californicus* for external use. However, we do note that climate change is going to make this barrier progressively less effective over time. It would be

reassuring to have at least some monitoring of agent populations in the local area in the early years of release to confirm that historical absence of evidence really is evidence of absence when it comes to unexpected survival and establishment and potential non-target damage.

One question we would like to raise is what the requirements will be for interested parties wishing to apply future biocontrol agents not on the list, outside of the glasshouse. Will a cold-tolerance study be required or some form of climatic matching?

Response 3 (John Huibers, Tamar Nurseries)

Yes, I think we should licence the release for outdoor crops as well.

Response 4 (Hutchinsons)

As advisors on biological control agents on edible and non-edible crops, Hutchinsons wish to support this proposed change in the licensing. It makes logical sense and would bring us into line with most of our neighbouring countries in a similar climatic zone. Our clients wish to implement IPM strategies, and this will increase the options available to them.

I appreciate that you require more evidence with regards to *Neoseiulus californicus*, in terms of its establishment in the environment in the UK. It has correctly been identified as having the potential to become established, and in my view, in some instances that has already happened. In an AHDB-funded survey in 2010 (link below), *N. californicus* was identified as the most prevalent overwintering predatory mite found on 33 strawberry farms surveyed. The study refers to previously published data from 2001 identifying that *N. californicus* could be found in strawberry crops in south east England. Furthermore, I was involved in a MAFF-funded project (HH1921SHO, link below) which ran from 1996 to 1999, where we introduced *N. californicus* to dwarf hop crops in Kent and Herefordshire, under licence. Unfortunately, I do not have copies of the full reports of that work, but I do have summary documents if you cannot obtain the reports from your archive, and the attached paper gives some overview of the experiments and the results obtained.

<https://archive.ahdb.org.uk/sf-115-the-identification-of-over-wintering-predatory-mites-in-raspberry-and-strawberry-and-investigation-of-the-potential-for-on-farm-production>

<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=5238&FromSearch=Y&Publisher=1&SearchText=hops&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

Response 5 (Neil Audsley, Fera Science Ltd)

The document provides a summary of available evidence relevant to allowing the release of non-native augmentative arthropod biological control agents (BCAs) in polytunnels. The paper provides logical justification for lifting restrictions on release only in glasshouses, providing the example of the recent approval for the release in polytunnels of the mite (*Amblyseius swirskii*). Six BCAs are listed for consideration, with the conclusion that only one is not suitable for release in polytunnels due to its high risk of establishment.

Justification

1. There is a similar risk to glasshouses. Based on the evidence presented, especially from examples of glasshouses that have open vents and side panes of glass removed, I would agree that there is a similar risk of escape of BCAs from polytunnels. Given the size of predatory mites (c. 0.5 mm), it would be virtually impossible to prevent their escape from any greenhouse or polytunnel structure, open or closed.
2. The biological control agents are unlikely to establish outdoors. Except for *Neoseiulus californicus* the claim is that the proposed BCAs have a low risk of establishment. Table 2 summarises survival and each species is described in detail. There is no comment on any increase in risk of establishment due to the changes in our current climatic conditions, particularly milder winters. There is a lack of evidence on cold tolerance and field survival for *Amblyseius degenerans* although supporting evidence from its distribution and developmental studies indicate this species is unlikely to establish outdoors in the UK. Given that *Delphastus catalinae* has a L_{time50} at 5°C and maximum field survival of c. 40 days and 35 days respectively, does this not indicate a low-medium risk of establishment? The risk of establishment of *N. californicus* is high and supports the view that this species should not be authorised for release in polytunnels. Overall, the evidence supports the release of all BCAs, other than *N. californicus*, in polytunnels.
3. The biological control agents under licence are widely used in Europe. The wide use of the listed BCAs in the EPPO region support the recommendation for release in polytunnels.
4. Potential Risk. The increased risk in polytunnels is recognised and that the BCAs may have an impact on non-target organisms. In section 3 it is stated that “The Defra Risk and Horizon Scanning team have not received any reports of negative environmental impacts from the use of these agents. Although, low level impacts are unlikely to be picked up through the monitoring of suppliers, distributors and growers”. Hence, it is unclear what the non-target risk is. Is this something that should be monitored if use in polytunnels is authorised?

Recommendation

Providing the non-target risk should BCAs migrate from polytunnels is considered negligible, I'm in agreement with the recommendation that the restriction to release the arthropod augmentative biological control agents *A. limonicus*, *A. degenerans*, *A. montdorensis*, *D. catalinae* and *E. eremicus* to glasshouses is removed, and that they should be able to be released under all protected conditions.

Response 6 (David Talbot, ADAS)

I fully support the justification outlined in the attached for recommending that these biological control agents can be released outside of glasshouses. As a consultant with a keen interest in integrated crop management (ICM) and the use of bioprotectants, greater flexibility in the use of biological control agents will help more growers to transition to ICM. Most of the growers that I work with currently produce crops both under glass and within tunnels and the current restrictions on biological control agents under glass affects the type of structure that crops are grown within, to access a wider range of biological control agents for control of key pests such as thrips. Some crops that are currently produced under glass to utilise the full range of biological control agents in some cases should perform better in a polytunnel than under glass. Adopting the recommendations in the attached will help to increase the competitiveness of commercial horticulture in England.

Response 7 (Jude Bennison, ADAS)

I would like to support removing the restriction on releasing *Amblydromalus limonicus*, *Amblyseius degenerans*, *Amblyseius montdorensis*, *Delphastus catalinae* and *Eretmocerus eremicus* to glasshouses only, and allowing them to be released under all protected conditions including polythene tunnels.

I agree with the justifications given in the proposal you attached.

An increasing number of soft fruit crops and hardy ornamentals are now grown in poly tunnels rather than either outdoors or in glasshouses. Growers are now adopting the use of more IPM strategies, due to the withdrawal of chemical pesticides, pesticide resistance problems, fewer pesticides being approved for use in poly tunnels than in glasshouses, long harvest intervals and retail demands to reduce reliance on pesticides.

Increasing the range of biological control agents for use in IPM programmes will improve control of various pests causing problems in all protected crops including those grown in poly tunnels. For example, *A. limonicus*, *A. montdorensis* and *A. swirskii* are better predators of thrips than the native *Neoseiulus cucumeris* within their optimum temperature range. For example, they feed on both first and second instar thrips larvae whereas *N. cucumeris* only feeds on first instar larvae. In

addition, they also feed on whitefly eggs and young scales which is a benefit on crops that are attacked by both thrips and whitefly.

I look forward to being able to recommend the use of these predators to growers of all protected crops.

I'd like to add a few words about *Neoseiulus californicus*.

Given that this predator has already been shown to have established in parts of the UK, and that it may be released to glasshouse crops which can then be planted outdoors (e.g., on plants that have been propagated under glass) – is there a strong argument for not being able to release it in poly tunnels?

And is there enough evidence of the risks to our native fauna from the successful overwintering of this species? Does more research need to be done on this?

Growers of crops such as soft fruit and ornamentals would like to have the option of releasing this predator in poly tunnel crops for the following reasons:

- It is more tolerant of low and high temperatures than *Phytoseiulus persimilis*
- It will feed on other spider mites in addition to two-spotted spider mite
- It is more tolerant of chemical plant protection products than *P. persimilis*
- It is more reliable for spider mite control than our native *Amblyseius andersoni*.

Response 8 (Bransford Webbs Plant Company)

On behalf of The Bransford Webbs Plant Company, I fully endorse the recommendation outlined in the document for the 'Proposal to licence the release of augmentative arthropod biological control agents outside of glasshouses'.

For over a decade the company has been proactively developing and implementing an IPM system that relies heavily on the application of BCAs throughout the production process. We work closely with technical consultants from ADAS, Koppert and Hutchinsons to enable us to use BCAs in a truly IPM process. In very recent years the marked removal of many synthetic chemicals available to the horticulture industry has driven many growers like us to become much more reliant on biocontrols to protect their crops from not only pest damage but the added risk of being vectors for key crop diseases.

As illustrated in the proposal, we also grow a wide range of crops under different structures tailored to the needs of the plant. The ability to apply BCAs has become a significant factor in the choice of crop we are able to grow and the conditions we are limited to growing it under. This can severely restrict production at critical times of the year and consequently has an economic impact on the business.

As the technical supervisor for The Bransford Webbs Plant Company, I have first-hand experience of this issue and find it increasingly frustrating that our very effective use of biological controls is hindered by the current legislation.

In order for us to continue to be a competitive and environmentally sustainable industry in this country, it is essential we adopt the recommendations proposed in the report.

Response 9 (Agricultural Industries Confederation Ltd)

Summary

AIC supports the recommendation that the restriction to release the arthropod augmentative biological control agents *Amblydromalus limonicus*, *Ambylseioides degenerans*, *Amblyseioides montdorensis*, *Delphastus catalinae* and *Eretmocerus eremicus* to glasshouses is removed, and that they should be able to be released under all protected structures.

About the AIC

The Agricultural Industries Confederation (AIC) is the agri-supply industry's leading trade association with over 230 Members in the agri-supply trade and represents £8 billion turnover at farmgate. AIC represents several sectors within the agri-supply industry including Animal Feed; Crop Protection and Agronomy; Fertilisers; Grain and Oilseed; and Seed.

Members of the Crop Protection and Agronomy Sector employ over 1,100 BASIS qualified agronomists. Of these circa 850 are on farm each day providing agronomic advice to professional farmers and growers across GB. Members provide agronomic advice on crops grown in glasshouses and polytunnels as well as supplying inputs including professional plant protection products (PPPs) and decision support system tools. The consultation topic is therefore of interest to members.

Response

AIC supports the recommendation that the restriction to release the arthropod augmentative biological control agents *A. limonicus*, *A. degenerans*, *A. montdorensis*, *D. catalinae* and *E. eremicus* to glasshouses is removed, and that they should be able to be released under all protected conditions.

We accept the decision not to relax the restrictions on *N. californicus*, given its potential to establish in the UK.

We support the decision that in the future the release of agents outside of glasshouses will be made on a case-by-case basis.

Removing the restriction for use of the listed arthropod augmentative biological control agents in polytunnels will support Government policy to increase the use of biopesticides (a focus of the draft National Action Plan for the Sustainable Use of Pesticides).

In addition, availability of conventional plant protection products (PPPs) has decreased significantly over the past 22 years. A study by the EU PEST Committee in September 2018. See 'The impact of Regulation (EC) No 1107/2009 on innovation and development of alternatives and new plant protection products'.

The report states that in 2000, there were over 900 active substances approved for use in the EU. By 2008, that number decreased to 425 (53% decrease). In 2018 it dropped further to 352 (17% decrease).

Only 5-8% of these products were withdrawn for safety reasons. The vast majority were voluntarily withdrawn by the registrants who did not wish to or could not afford to support them for commercial reasons.

Industry stakeholders are concerned that the costs and resources required to renew the approval of PPPs under the new independent GB PPP regime may further reduce PPP availability for GB farmers and growers.

Following EU Exit AIC understands that many EU based PPP manufacturers are unlikely to support active substances for the GB market due for renewal. This is due to the additional fees to access the GB market relative to pre-EU Exit when the fees for renewal of approval to access EU (including GB) allowed access to 28 markets, not one. As renewal dates for GB are not now synchronised with EU renewal dates, due to the three-year moratorium on GB renewals, the timings for submission of data packages also vary, requiring additional resource to support an active substance for the GB market alone.

As a result, AIC understands that availability of conventional PPPs for GB farmers and growers could decrease as they may not be supported at renewal.

This is more likely to impact active substances and products used in niche areas, in particular the horticulture sector, as the volume of use may not justify the resource needed to support the active / product through the renewal process.

Hence pragmatic decisions on the use of PPPs, including biopesticides and in this case non-native augmentative arthropod biological control agents outside of glasshouses are very welcome.

Response 10 (Koppert)

We are writing to support the above proposal and agree with almost the entire content.

However, we would like to raise the fact that even if the invertebrate biological control agents (IBCA) listed did manage to overwinter, it is very difficult to see what harm they could do to native fauna and flora.

For example:

Amblydromalus limonicus and *Amblyseius montdorensis*

These mites will only predate certain species of whitefly, with particular preference for *Bemisia tabaci* (Gennadius) and *Trialeurodes vaporariorum* (Westwood). Their host range does not include the UK native species *Aleyrodes proletella* (Linnaeus), the cabbage whitefly, which is probably a pity from the point of view of the brassica growers. They are also not known to prey on *Aleyrodes lonicerae*, although it is not clear whether or not the latter is a UK native, or an introduced pest. We occasionally find these two species of whitefly in pepper crops in the UK, but we do not find that any of these beneficial mites help with control, so it is just as well that whitefly do not pose a threat, currently, to this crop.

The mites also only predate certain species of thrips, primarily western flower thrips, *Frankliniella occidentalis* (Pergrande) and *Thrips tabaci* (Knapp et al., 2013; Steiner and Goodwin, 2002) and both have some effect against the introduced pest species *Echinothrips americanus* (Morgan), amongst a few others. *Amblydromalus limonicus* is not known to predate the UK native thrips species *Thrips fuscipennis*, *Thrips major*, or *Frankliniella intonsa*, much to the disappointment of many growers. *Amblyseius montdorensis* will predate *Thrips tabaci*.

Amblyseius degenerans

Koppert no longer produces this mite, so we will not comment on this species.

Amblyseius swirskii

Koppert UK's licence has already been extended to include polytunnels, as outlined in the proposal, and all Koppert UK's licences have been altered to allow use of these non-natives under The Eden Project Biomes. As with *A. limonicus* and *A. montdorensis*, *A. swirskii* only predate certain species of whitefly, with preference for *B. tabaci* and *T. vaporariorum* (Bolckmans et al., 2005; Calvo et al., 2009, 2012; Hoogerbrugge et al., 2005; Nomikou et al., 2003; Pijnakker and Messelink, 2005), and this does not include the UK native species *Aleyrodes proletella*, the cabbage whitefly, and it is not known to prey on *Aleyrodes lonicerae*.

Delphastus catalinae and *Eretmocerus eremicus*

These two IBCAs are whitefly specialists. *Delphastus catalinae* has a strong preference for *B. tabaci* and *T. vaporariorum* eggs, larvae/nymphs and pupae.

Eretmocerus eremicus is very efficient at the control of *B. tabaci* nymphs (Hoddle et al., 1997, 1998) and *T. vaporariorum* (Koppert BV's own R&D).

Again, there are no records of these IBCAs preying on UK native species *A. proletella* or *A. lonicerae*. As before, although these two species of whitefly are occasionally found in pepper crops in the UK, these IBCAs are not seen to help with control.

Amblyseius montdorensis and *Neoseiulus californicus*

Amblyseius montdorensis will predate a few species of herbivorous spider mites, in the absence of its preferred prey of whiteflies and thrips.

Neoseiulus californicus is a spider mite specialist, particularly of the UK non-native *Tetranychus urticae*, the two-spotted spider mite, and the fruit tree red spider mite, *Panonychus ulmi*. In the absence of its prey, it can survive on pollen, however reproductive capacity decreases. Establishment in the absence of its primary host, *T. urticae*, is therefore considered slim.

As before, it is unclear which, if any, of the spider mite species present in the UK are native or have been introduced.

Reference to 'UK' in Table 3

We would just like to pick up on a small point in Table 3 (Summary information from the EPPO PM 6/3 List of biological control agents used in the EPPO region (EPPO, 2016)). The term 'UK', in the column headed, 'EPPO countries used' should perhaps be removed, and replaced with the individual countries, whose devolved authorities all have their own non-native licensing systems. Over the years, continuing to use the term UK in this instance has caused much confusion, and continues to do so. For example, Scotland has prohibited the use of *N. californicus* even under glass, but if a grower were to look at Table 3, in this Defra consultation, they could be forgiven for assuming that this meant they were allowed to use this IBCA and end up inadvertently breaking the law.

Closing statement

We would like to highlight that Koppert's ultimate focus is on responsible pest management and professional expertise. We do believe the current over-cautionary approach to non-native IBCA licensing in England is too strict and could actually unintentionally promote unsustainable practices, such as the use of conventional synthetic chemical pesticides, which indeed are often harmful to the native fauna and flora.

Response 11 (Elysia Bartel, ADAS)

I would like to add my support for removing the restriction on releasing augmentative biocontrol agents *Amblydromalus limonicus*, *Amblyseius degenerans*, *Amblyseius montdorensis*, *Delphastus catalinae* and *Eretmocerus eremicus* to glasshouses only. Licensing these biocontrol agents for use in polytunnels will help to improve the standard of biocontrol in UK horticulture and may help to attract more investment from international biocontrol companies.

I agree with the justification given in the proposal and would like to add that while it is good that the licences for releasing biocontrols require that any negative impacts are reported to Defra, independent research will be necessary to determine the impact of these releases on the environment, in both glasshouses and polytunnels.

This is particularly relevant for *N. californicus*; although this mite has the potential to establish in the UK, further research is required to determine whether establishment of this mite has a negative, neutral, or positive impact on native fauna.

Response 12 (Biobest)

We support the option of using beneficials outside the greenhouse too, including protected structures.