

**Rural and Regional Affairs and Transport References**  
Answers to questions on notice  
**Agriculture, Fisheries and Forestry Portfolio**

**Inquiry:** Adequacy of Australia's biosecurity measures and response preparedness

**Question No:** IQ22-000019

**Hearing Date:** 10 August 2022

**Division/Agency:** Australian Chief Plant Protection Office

**Topic:** Origin of the varroa mite infestation

**Hansard Page:** 21 and 29

**Question Date:** 11 August 2022

**Question Type:** Spoken

**Senator Whish-Wilson and Senator Colbeck asked:**

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Senator WHISH-WILSON: I don't know exactly when the article was written. It didn't say 43 when it was published, but obviously that's a doubling of the zones from when the journalist submitted the article. In terms of the origin, the article also said that the origin may have been Williamtown, through the Department of Defence, or through the Defence base there. Has any work been done, that you're aware of, through the Department of Defence to establish whether that's where the infestation started?

Dr Vivian-Smith: The origin was mentioned to be in that Williamtown area. I'm not aware of any contact with the Department of Defence in relation to that. I have sought additional information from New South Wales in terms of the basis for their epidemiological assessment that the first detections were in that Williamtown area, 15 kilometres away from the Newcastle original detection. There are two potential lines of thinking. It's possible that it's come in from a ship. There were a lot of ships sitting in the area around Newcastle, during COVID, due to supply chain issues. The other hypothesis is it's come in via, perhaps, a hitchhiker in an aircraft. There isn't any substantial case that has been presented to me, at this point, it's just hypotheses.

Senator WHISH-WILSON: That's correct, it's just hypotheses, but I'd be interested, at some point, in following up what work is being done, I suppose, to pinpoint—

Dr Vivian-Smith: It's based on—thank you, Senator Whish-Wilson; we'll follow up on that. The key driver for this thinking is mite density being quite high in that area.

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Senator COLBECK: I have one final question. In relation to the measures at the border, where we have a number of sentinel hives around the country—and if you could provide on notice the number of those sentinel hives—a hive of bees on a ship or a boat that comes into port wanting to move off the ship to find somewhere to settle is not going to go to an existing hive, it's going to find somewhere to nest, so a bait or trap hive is more likely to find them than a sentinel hive. The sentinel hive, as I understand it, is a secondary mechanism for finding bees—we found them in Newcastle, but they've clearly come from somewhere else—you're more likely to find them in a trap hive. How many trap hives do we have? It can be monitored in real time via video, and I think you can provide us with some vision of that, which I'd appreciate in time. I'm interested in the balance between the trap hive versus the sentinel hive, because a trap hive would give us much earlier visibility of an incursion than a sentinel hive.

Dr Vivian-Smith: That's a really good question. The current program that's in place is called the National Bee Pest Surveillance Program. I don't have the exact number of hives that have been deployed around the country. That program is administered or managed by Plant Health

Australia and delivered by state and territory agencies. The program itself deploys a range of different surveillance activities. They use a mixture of different surveillance activities at high-risk locations to detect exotic bees and bee pests. That includes the sentinel hives that we've been talking about. They also include swarm and nest capture. If swarms or nests are detected in those locations, they are captured and dealt with. They also have standard catch boxes. These are the empty beehives that what we call an absconding swarm from a ship may find attractive and therefore provide early detection. In some locations there are also what we are referring to as remote catch boxes. These are empty beehives with remote sensing capabilities.

Also undertaken are activities such as floral sweep netting to look at the bee population in the area. That often takes place if, for example, there is a report of a swarm or feral nest, or if there's been a risk notified by vessels or imported cargo operators at the ports. There are also a range of other activities, such as hive frame inspection, alcohol wash and sugar shake, which are to detect the mites. There is drone uncapping, which is also an inspection technique to look for varroa mites and other bee pests. They utilise an acaricide or miticide application and then there's a sticky mat which is deployed as well so that the frass or detritus that drops out of the beehive drops onto that sticky mat, and that can contain mites. They also undertake additional sample collection for pests that might be carried by varroa mite, such as viruses. There are a range of activities.

Because it's put in place by state and territory agencies and managed by Plant Health Australia, I don't have a breakdown with me, but we can gather that information for you and provide it. We've also been undertaking some research to try and develop better techniques for monitoring pests—for example, eDNA, the department's funded program with the University of Canberra and James Cook University to try and identify bee pests and diseases efficiently using eDNA technology—for example, from rainbow bee-eater pellets as they gather bees, and they provide early detection systems. We're constantly looking at new and improved techniques.

**Answer:**

The NSW Government, through the Department of Primary Industries (DPI), has been leading the national response to the current incursion of *Varroa mite* in the Newcastle region. As part of response activities, one of the considerations for the Consultative Committee on Emergency Plant Pests is to determine the ability to identify the pathway for entry into and trace the spread of the pest within Australia. As such, NSW has been undertaking an investigation into the potential origin of the detection.

Current information provided by NSW DPI is that the area around Williamstown, including Tomago, Raymond Terrace, and Salt Ash has the highest density of infected premises, with clear indications of natural spread across the area. Additional analysis of extensive alcohol wash data indicates some of the highest infestation levels are also centred in this area.

However, due to the nature of the pest, it is likely that we will never know the exact first point of entry or how long it may have been present in Australia before detection.

As varroa mites survive for only a short period of time if not attached to a live bee, the greatest risk of introducing varroa to a new area is through the introduction of live bees. Therefore, the most effective biosecurity risk management strategies to prevent introduction are the prevention or early detection of live bees. The existing measures in place in relation to vessel and cargo inspections address this risk, but previous experience has shown that swarms may abscond prior to detection. To manage this risk, the National Bee Pest Surveillance Program

(NBPSP) provides an integrated early warning system enabling detection of high priority bee pests and diseases which may enter through high-risk entry pathways at international ports.

The program deploys various surveillance activities to detect exotic pest including sentinel hives, swarm and nest capture, standard catch-boxes (empty beehives), remote catch-boxes (empty beehives with remote sensing capabilities), floral sweep netting, hive frame inspection, alcohol wash, sugar shake, drone uncapping, acaricide application, sticky mat diagnostics, and sample collection for virus and mite diagnostics.

The NBPSP is administered and coordinated by Plant Health Australia at the national level and is delivered by state and territory departments of primary industries in respective jurisdictions.

A current breakdown of the NBPSP is provided below (provided by Plant Health Australia):

<b>Jurisdiction</b>	<b>Locations</b>	<b>No. of sentinel hives</b>	<b>No. of standard catch boxes</b>	<b>No. of remote catch boxes</b>
<b>QLD</b>	Port of Brisbane, Port of Townsville	6	16	6
<b>NSW</b>	Port Botany, Port Kembla, Newcastle	18	10	5
<b>VIC</b>	Port of Melbourne, Port of Geelong, Port of Portland, Westernport	18	29	4
<b>Tas</b>	Port of Bell Bay, Port of Hobart, Port of Devonport, Port of Burnie, Port Latta Triabunna	19	11	3
<b>NT</b>	Port of Darwin	4	8	0
<b>SA</b>	Port Adelaide, Adelaide airport	10	13	5
<b>WA</b>	Fremantle Harbour, Port of Bunbury, Geraldton Port, Kwinana, Perth airport, Esperance Port, Port of Albany	32	30	4
<b>Total</b>		107	117	27

Note: QLD also has a community hive program in Townsville which has not been counted in the sentinel hive numbers.

## **Rural and Regional Affairs and Transport References**

Answers to questions on notice

### **Agriculture, Fisheries and Forestry Portfolio**

**Inquiry:** Adequacy of Australia's biosecurity measures and response preparedness

**Question No:** IQ22-000020

**Hearing Date:** 10 August 2022

**Division/Agency:** Australian Chief Plant Protection Office

**Topic:** Compensation for pollinations services

**Hansard Page:** 22-23

**Question Date:** 11 August 2022

**Question Type:** Spoken

#### **Senator Whish-Wilson asked:**

Senator WHISH-WILSON: I'll put some more detailed questions to you on notice. I have two other very quick questions, if you don't mind, Chair. In terms of compensation and cost sharing under the act, I understand that there have already been some payouts by the federal government in relation to beehives that have been destroyed. Has compensation been considered for this pollination income or income forgone by industry participants who will no longer be able to earn that income because their bees won't be allowed to be moved?

Dr Locke: Under the emergency response arrangements, there's been no discussion about compensation for pollination services.

Senator WHISH-WILSON: Is it permitted, though? Would it be feasible for that to occur? Would that be something the federal government could consider under the act or is it precluded?

Dr Locke: I think we'd have to take that on notice, but we don't own the full response deed. That is jointly owned between governments and industry—

Senator WHISH-WILSON: That's right.

Dr Locke: and so it has a specifically narrow scope to containment and eradication.

Senator WHISH-WILSON: The feedback I've got is that there would be, obviously, a number of bee owners who would be under significant financial pressure to find work for their bees in the current situation. I know this is a very new thing. This is the first time we've had this infestation, but the industry has been preparing for it for some time, and there will be a lot of people out of pocket because of this.

Dr Locke: Yes—understood, Senator. I think those are live discussions. Probably the main focus remains still on the eradication program, and the current technical view is that that's possible and should still be pursued, yes.

#### **Answer:**

Under the Emergency Plant Pest Response Deed (EPPRD), the National Management Group has endorsed a response plan for the Varroa destructor incursion in NSW, including cost sharing between the Australian Government, state and Northern Territory governments and affected industries. NSW is conducting the response.

Plant Health Australia is the custodian for the EPPRD. The EPPRD allows for the cost sharing of payments made by a government party to impacted commercial beekeepers/growers and these are termed Owner Reimbursement Costs (ORC). ORCs are defined in the EPPRD and are subject to a number of criteria being met and processes being followed. Different industry sectors (including honey production) have different formulae that are applicable to them. Each cropping sector (as represented through an industry party) utilises an agreed evidence

framework to translate the formulae and guidelines in the EPPRD into a specific calculation of ORCs payment for growers in an auditable, transparent and fair way.

The formula for the honeybee industry is outlined in paragraph 4.4.17 of schedule 6 of the EPPRD and does not include the financial loss by the beekeeper in respect of not being able to provide a pollination service.

ORC payments for the Varroa response will be disbursed by the NSW Rural Assistance Authority. The Australian Government does not have a role in assessing or making these payments.

The EPPRD is available online at: [planthealthaustralia.com.au/biosecurity/emergency-plant-pest-response-deed/](http://planthealthaustralia.com.au/biosecurity/emergency-plant-pest-response-deed/)

## Rural and Regional Affairs and Transport References

Answers to questions on notice

### Agriculture, Fisheries and Forestry Portfolio

**Inquiry:** Adequacy of Australia's biosecurity measures and response preparedness

**Question No:** IQ22-000021

**Hearing Date:** 10 August 2022

**Division/Agency:** Australian Chief Plant Protection Office

**Topic:** EPBC impacts of fipronil use

**Hansard Page:** 23

**Question Date:** 10 August 2022

**Question Type:** Spoken

#### Senator Whish-Wilson asked:

Senator WHISH-WILSON: This is my last line of questioning. I've been looking at the fipronil licensing arrangements. It's something I've used in the past, as a vineyard owner, for European wasps, and I'm quite familiar with its application. Obviously, there are going to have to be massive applications of fipronil just with the 6,700 square kilometre area that's been zoned off at the moment. With APVMA approval for a baiting station every 500 metres, within a 10-kilometre radius, you're looking at 400 baits over that area. I think we've estimated that about 8,500 baits would be needed that would be monitored every hour and recycled every three days. It's a very big undertaking just in the area we've already got. Will you be checking from a federal environment point of view the potential impacts on native bees and other biology or biological ecosystem services?

Dr Vivian-Smith: The fipronil baiting is being carried out by the New South Wales DPI under the APVMA permit conditions, and that's probably a matter for the APVMA and the New South Wales Department of Primary Industries. I know that they're consulting with the state EPA as well, as part of that process, so there's quite a joined-up approach.

Senator WHISH-WILSON: The federal government would have oversight under EPBC of potential impacts, though, wouldn't they?

Mr Metcalfe: Yes, and that would have been an issue for this department prior to the machinery-of-government changes; it's now a matter for the Department of Climate Change, Energy, Environment and Water. We can let them know of your interest, Senator, but we're not aware of any active work from their point as to whether it triggers any triggers under the EPBC Act.

Senator WHISH-WILSON: If you could. Obviously I support the use of this to try and rein in this problem, but, if the scale continues to expand and we're using a significant amount of this stuff, it is potentially quite damaging to the environment, so it may be something we have to have a look at.

#### Answer:

The Department of Agriculture, Fisheries and Forestry contacted the Department of Climate Change, Energy, Environment and Water and has provided advice regarding the Senator's interest in the issue.

Advice provided by NSW Department of Primary Industries regarding the use of fipronil baiting, confirms that as per the agreed response plan developed in partnership with the honeybee industry, fipronil baiting will be used to euthanise honeybees suspected of being infested by the Varroa mite.

NSW DPI are following the guidelines as set out by the permit approved by the Australian Pesticides and Veterinary Medicines Authority. The permit has precautions in place to protect all native non-target wildlife and other fauna. An officer must be present at the baiting station for the duration of baiting to ensure that non-target animals are not consuming the chemical, including native bees. Bait stations are also covered by a cage to limit the exposure of non-target species to the chemical.

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### Agriculture, Fisheries and Forestry Portfolio

**Inquiry:** Adequacy of Australia's biosecurity measures and response preparedness

**Question No:** IQ22-000022

**Hearing Date:** 10 August 2022

**Division/Agency:** Australian Chief Plant Protection Office

**Topic:** Commonwealth powers to enforce a national standstill on the transfer of beehives

**Hansard Page:** 23

**Question Date:** 10 August 2022

**Question Type:** Spoken

#### Senator Whish-Wilson asked:

Senator WHISH-WILSON:...The last question from me is: in terms of the legal powers of the Commonwealth under the act, does the Commonwealth have the ability to enforce a national standstill on the transfer of beehives or is it something that you need to work with Plant Health and the states on?

Dr Vivian-Smith: I think we'll have to take that one on notice. Currently the standstill is being enforced by New South Wales, and all their legal requirements are outlined in the New South Wales Government Gazette.

Mr Metcalfe: We'll take it on notice, but I'm not aware of any federal legislation that overrides state legislation. The Commonwealth Biosecurity Act is very much about our role at the border. Any biosecurity issues that occur within Australia are regulated by the states and territories; that's always been the case since Federation.

Dr Locke: And these are activities that are regulated by the states and territories, so it would seem unusual if we had the power to override them—particularly for a nationally agreed plan. But we can have a look at that.

Senator WHISH-WILSON: Once an emergency's been declared, the nationally agreed plan kicks in with its predetermined parameters. Under the act, doesn't the minister have the power to veto beehive movements?

Dr Locke: We can take that on notice. The way these mechanisms work is there's the predetermined set of mechanisms that allow access to the financial resources of industry and governance, and they're managed under deeds—in this case, looked after by Plant Health Australia, an independent organisation. It doesn't require the minister to do anything. Basically, parties agree on a response plan—which in this case is prepared by New South Wales, being the location of the incursion. That plan has to be agreed by jurisdictions and by industry, and that enables access to the financial resources that are already flowing into New South Wales because of that.

Mr Metcalfe: I'll double-check for accuracy, but I'm almost 100 per cent confident there would be required to be a constitutional referral of powers should the states agree that the Commonwealth should have some overriding step-in power. The very reason we have these deeds and other instruments is in recognition of the fact there is no overriding Commonwealth power here. It is very much the role of the states and territories, in a collaborative way, to work on these issues, and the Commonwealth's role is primarily in a coordination sense and as a funder, or a part funder, of the response.



**Answer:**

The Emergency Plant Pest Response Deed (EPPRD) is a formal legally binding agreement (a deed) between the Australian Government, all state and territory governments, 38 peak plant industry bodies (as at 15 August 2022), and Plant Health Australia (PHA). It supports the rapid and effective response to a detection of an emergency plant pest, such as Varroa destructor, by setting out prior agreement on the governance (decision making) and funding mechanisms for a national eradication response. PHA is the custodian of the EPPRD which came into effect in October 2005. The company has the dual roles of helping to ensure that responses are carried out in accordance with the provisions of the agreement and progressive improvement to meet the needs of signatories.

In the context of the current emergency response declared under the EPPRD, response activities are being required or undertaken and powers are being exercised under relevant States and Territory legislation. The Agriculture Minister does not have powers under the *Biosecurity Act 2015* to override state legislation regarding movement of hives occurring under these response arrangements.

State and territory government agencies are responsible for managing responses to emergency plant pests that are detected within their jurisdiction and do so under their relevant state/territory biosecurity legislation. All aspects of movement restrictions or destruction activities are subject to the powers and requirements of the specific state/territory biosecurity legislation. The EPPRD is a cost sharing arrangement and does not have any legislative/regulatory powers. Movement restrictions that are agreed by the industry/government funding parties as necessary to support the eradication strategy will be outlined in the response plan and may be subject to cost sharing under the EPPRD.

## **Rural and Regional Affairs and Transport References**

Answers to questions on notice

### **Agriculture, Fisheries and Forestry Portfolio**

**Inquiry:** Adequacy of Australia's biosecurity measures and response preparedness

**Question No:** IQ22-000023

**Hearing Date:** 10 August 2022

**Division/Agency:** Australian Chief Plant Protection Office

**Topic:** Date minister advised of the varroa mite incursion

**Hansard Page:** 24

**Question Date:** 10 August 2022

**Question Type:** Spoken

#### **Senator White asked:**

Senator WHITE: When was the minister for agriculture advised of the varroa mite incursion in New South Wales?

Dr Locke: I'm not sure we've got the exact date. My colleagues might. He was advised as soon as we had the notification.

Dr Vivian-Smith: I don't have the exact date when the minister was advised of the notification. I can take that one on notice.

#### **Answer:**

The Minister was advised of the confirmed detection via notification to the Ministers Office on 24 June 2022, the same day formal diagnostic confirmation of the detection confirming varroa mite was received.

**Rural and Regional Affairs and Transport References**  
Answers to questions on notice  
**Agriculture, Fisheries and Forestry Portfolio**

**Inquiry:** Adequacy of Australia's biosecurity measures and response preparedness

**Question No:** IQ22-000024

**Hearing Date:** 10 August 2022

**Division/Agency:** Australian Chief Plant Protection Office

**Topic:** DAFF staff engaged in the varroa mite response

**Hansard Page:** 25

**Question Date:** 10 August 2022

**Question Type:** Spoken

**Senator White asked:**

Senator WHITE: Are you able to estimate how many DAFF staff have been engaged in the varroa mite response?

Dr Vivian-Smith: I'll have to take that one on notice; I don't think we've done that estimate. Yes, I'll take that on notice.

...

Dr Vivian-Smith: Just to give you an idea of the scale of the response: yesterday, the number of personnel on duty in the New South Wales control centres was 259, and that included a range of staff from different agencies across New South Wales as well as volunteer beekeepers and industry liaison officers.

**Answer:**

NSW are leading the national response and oversee the operational aspects of responding under the national response arrangements. The department of Agriculture, Fisheries and Forestry contribute staff to the operational (on-ground) response at the request of NSW. The department have had 2 staff provided to NSW working in the State Control centre as liaison officer and in leading operations function.

Within the department there are approximately 30 staff working on or contributing to aspects of the varroa mite response including the provision of secretariat services to the Consultative Committee on Emergency Plant Pests and the National Management Group, undertaking preparedness and planning roles.

Operationally, the department has had 40 staff undertaking surveillance and monitoring for feral bee nests at high-risk ports around Australia including at the Port of Newcastle, Adelaide, Sydney, Perth and Brisbane.

NSW as the lead agency for the national response on 17 August 2022 has reported having a total of 1399 different personnel utilised as part of the response since the initial detection of varroa mite. This includes staff from NSW government including Department of Primary Industries, Local Land Services, National Parks and Wildlife, Environment Protection Agency and Department of Regional NSW. There have also been many volunteers engaged including volunteer beekeepers, NSW Rural Fire Service and Industry Liaison officers. In addition to the 1399 personnel there are also technical specialists, lab staff and compliance officers as well as staff from other agencies including the department, ACT Biosecurity, Fire and Rescue NSW and interjurisdictional agencies that have not been recorded in the numbers. On 17 August 2022 there were 255 personnel on duty in both the State Control Centre and Local Control Centre directly responding to the outbreak.

There are also significant numbers of NSW and Victorian government agency staff deployed to undertake surveillance and monitoring in the almond pollination areas.

## Rural and Regional Affairs and Transport References

Answers to questions on notice

### Agriculture, Fisheries and Forestry Portfolio

**Inquiry:** Adequacy of Australia's biosecurity measures and response preparedness

**Question No:** IQ22-000025

**Hearing Date:** 10 August 2022

**Division/Agency:** Australian Chief Plant Protection Office

**Topic:** Varroa mite eradication

**Hansard Page:** 30

**Question Date:** 10 August 2022

**Question Type:** Spoken

#### Senator Roberts asked:

Senator ROBERTS: Thank you. Is it true that Australia is the only country that, up until this recent infestation, hadn't had varroa mite?

Dr Vivian-Smith: It's the largest continent without varroa mite. There are a few islands, and I don't have a list of exactly which were free of varroa mite or not. But varroa mite has spread very widely globally since the 1980s, and Australia is the only continent free of varroa mite. Even New Zealand has varroa mite, other than a few small offshore islands.

Senator ROBERTS: Thank you. Has it been eradicated anywhere?

Dr Vivian-Smith: Not to my knowledge. We can find out about that. There may have been localised eradications, but I don't believe there have been any successful eradications.

Generally the detection of the varroa mite has been too late when they have first detected it and it has been too widespread.

#### Answer:

*Varroa destructor* has spread almost worldwide within a period of about 50 years from initial detections in Asia and Europe in the 1950s and 60s to the establishment in New Zealand from 2000 (De Jong, Morse & Eickwort 1982; Traynor et al. 2020). Delays in the detection of *V. destructor* incursions, the number of infected hives, and area of infestation have meant that the mite could not be eradicated in countries including New Zealand and the United States (MAF 2002).

While no countries have successfully reported eradication of *V. destructor*, a 2016 publication reported the mite was successfully eradicated from Gorgona, a 220-hectare island in Italy (Giusti et al. 2016). The island's single apiary was treated bi-yearly with thymol-based and oxalic acid treatments and a miticide treatment was applied in 2009; however, the authors note the eradication could not be linked to treatment alone. *Varroa destructor* could not be eradicated from Jersey, a 11,820-hectare island in the Channel Islands with a higher number of apiaries (Giusti et al. 2016).

Australia has continued to remain free of Varroa mite, including successful eradications of *Varroa jacobsoni* incursions in Townsville, Queensland in 2016, 2019, and 2020 (DAFF 2022). Early surveillance systems and effective biosecurity measures mean that Australia is well placed to manage the current outbreak *V. destructor* outbreak in NSW.

The following examples highlight key differences in the current extent of Australia's *V. destructor* outbreak compared to other countries where eradication has not been possible.

## **New Zealand**

*Varroa destructor* was first detected in beehives at a small apiary in Auckland (upper North Island) in April 2000. A delimiting survey conducted in April to June 2000 determined that approximately 22% of over 3000 apiary sites were infested with *V. destructor* in the greater Auckland area and 10% of apiaries were infested in the upper North Island area (Stevenson et al. 2005). More than 4000 colonies were found to be infested with the mite (Goodwin 2004). In a focussed 35km area around the Auckland CBD, 641 of the 877 apiary sites were tested for *V. destructor* and 178 apiary sites returned positive tests (Stevenson et al. 2005). Based on the delimitation survey, it was estimated *V. destructor* had been present for three to five years (Iwasaki et al. 2015; Goodwin 2004).

## **United States**

A single varroa mite was found in Maryland in 1979 (Sanford et al. 1998). No further infestations were found in the United States until September 1987 when *V. destructor* was detected in bee colonies over 2000 km apart in Florida and Wisconsin, which were suspected to be linked due to commercial movement of bees (de Guzman, Rinderer & Stelzer 1997; Sanford et al. 1998; Connor 2015). Although the initial infested hives were destroyed, *V. destructor* was detected in 19 of 67 counties in Florida by October 1987 (Connor 2015). *Varroa destructor* was recorded in 13 US states including Florida, Maine and Washington within six months (APHIS 1988) and 19 states within two years of the initial detection (Connor 2015).

## **Europe**

*Varroa destructor* has spread throughout Europe without any concerted eradication attempts since its introduction in the 1960s. As summarised by De Jong, Morse & Eickwort (1982), widespread infestations were reported in western Russia in 1965. *Varroa destructor* was reported in Bulgaria in 1967 and Romania in 1975, although it was likely present in these countries for at least three to five years prior to detection. Similarly, *V. destructor* was not recognised in west Germany until 1977 but is suspected to have arrived with bee colonies imported for research in 1971 or queens imported by private beekeepers in 1975 or 1976 (De Jong, Morse & Eickwort 1982).

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