



Canadian Food  
Inspection Agency

Agence canadienne  
d'inspection des aliments

# Pest categorization

*Acalitus vaccinii* (Keifer)

Blueberry bud mite



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## Background

The purpose of this categorization is to determine whether *Acalitus vaccinii* (blueberry bud mite) has the potential to satisfy the criteria in the definition for a quarantine pest for the United Kingdom (UK). The method used by the CFIA to initiate and conduct this categorization is consistent with international guidelines set by the International Plant Protection Convention (IPPC). Definitions follow those listed in the IPPC's *Glossary of phytosanitary terms*.

**Initiation point:** This categorization was identified via a Commodity Risk Assessment on blueberry plants from Canada to the UK for the Jens-Georg Unger Plant Health Fellowship project, funded by the European and Mediterranean Plant Protection Organisation (EPPO). This project was led by a visiting scientist from the UK Department for the Environment, Food and Rural Affairs, utilising the tools and templates of the Canadian Food Inspection Agency and coordinating with experienced Canadian risk assessors.

**Identification of the PRA area:** The PRA area is all of the UK.

**Current regulatory status:** *Acalitus vaccinii* is not currently regulated as a pest in the UK. However, it is regulated as a quarantine pest in Chile, New Zealand and South Africa (EPPO 2022; IPPC 2016; MPI 2022). The entire *Acalitus* genus is listed as regulated by the United States (APHIS-USDA 2022).

## Identity of organism

**Name:** *Acalitus vaccinii* (Keifer) (Acarida: Eriophyidae)

**Synonyms:** *Aceria vaccinii* (Keifer)

*Eriophyes vaccinii* Keifer

**English common names:** blueberry bud mite

**French common names:** phytopte de l'airelle

### 1. Is the organism clearly a single taxonomic entity and can it be adequately distinguished from other entities of the same rank?

**Yes**

If no

**Go to 2**

Go to 11

*Acalitus vaccinii* belongs to the Eriophyidae family of mites known as the eriophyid mites (de Lillo and Skoracka 2010). This species was put in the *Acalitus* genus for possessing the foremost part of the fourth leg segment (known as a foretibial) with a hair-like feature (known as a seta or setae for plural) missing (Cromroy and Kuitert 2001; Keifer 1941). It can be distinguished from other *Acalitus* species by having shield setae directed backwards, between which it has a shield pattern with a pair of curved lines on the proximal part of the shield (Craemer 2018; Keifer 1941). It is also identified by the lengthwise furrows on the female genital coverflap (Cromroy and Kuitert 2001).

Eggs of *Acalitus vaccinii* are rounded and possess the typical appearance for eggs of eriophyid mites (Craemer 2018).

## Presence in the PRA area

### 2. Does the organism occur in the PRA area?

If yes

**No**

Go to 3

**Go to 5**

*Acalitus vaccinii* is not known to be present in the PRA area.

### 3. Is the organism widely distributed in the PRA area?

If yes Go to 11  
If no Go to 4

## Regulatory status

### 4. Is the organism under official control in the PRA area or is it a potential candidate for official control?

If yes Go to 5  
If no Go to 11

## Potential for establishment and spread in the PRA area

### 5. Does the PRA area have climatic conditions suitable for establishment and spread of the organism?

**Yes** **Go to 6**  
If no Go to 11

The blueberry bud mite is considered native to North America, in the United States (U.S.) and Canada (Weibelzahl and Liburd 2010). Eriophyid mites passively disperse by wind (de Lillo and Skoracka 2010; Weibelzahl and Liburd 2010), however *Acalitus vaccinii* can also spread by pollinating bees and, for shorter distances, by walking (to move to new growth on the plant) (Baker and Neunzig 1970; Weibelzahl and Liburd 2009). It was recently identified, outside of its native range, on cultivated blueberries in a single province (Mpumalanga) in South Africa. This long distance spread likely occurred via the import of plant material for propagation (Craemer 2018).

A temperature of 19°C is sufficient for this pest to complete its lifecycle (Baker and Neunzig 1970) though the population of *Acalitus vaccinii* has been observed to decline in the summer months, potentially due to the high temperatures (Baker and Neunzig 1968; Baker and Neunzig 1970). In addition, mild winters, between 1-15°C, are thought to encourage population growth, spread, and resultant damage of this pest (Craemer 2018; Ngubane 2018), as all life stages remain viable and

continue feeding (Ngubane 2018). Given that the average winter temperatures of the UK are between 1-7°C (Met Office 2022), it is likely that *Acalitus vaccinii* would be capable of establishment and spread in these conditions.

## 6. Does the PRA area have ecological conditions suitable for establishment and spread of the organism?

**Yes**

If no

**Go to 7**

Go to 11

*Acalitus vaccinii* attacks species of both cultivated (including *Vaccinium corymbosum*) and wild blueberry (such as *V. angustifolium*), in addition to the wild relative *Gaylussacia baccata* (Keifer 1941). Some *Vaccinium* species have been free of this mite, suggesting some potential pest resistance (Keifer 1941; Neunzig and Galletta 1977). This is significant as, in the UK, *Vaccinium* species are present in urban areas (e.g. gardens) and/or in cultivated areas such as fields, nurseries, and garden centres, that could enable the establishment and spread of this mite (GBIF 2022; RHS 2022a; RHS 2022b).

Populations of this mite can be controlled with the pathogenic fungus *Hirsutella thompsonii* (Baker and Neunzig 1970; Weibelzahl and Liburd 2009), which is believed to be present in the UK (UKSI 2022). Predatory mites associated with *Acalitus vaccinii* have also been identified yet they do not appear to have a significant impact on populations of *A. vaccinii* (Baker and Neunzig 1970).

## Potential for economic and environmental consequences in the PRA area

### 7. Is the organism a known pest in its area of current distribution?

**Yes**

If no

**Go to 9**

Go to 8

An infestation of *Acalitus vaccinii* may be spotted by reddish buds with rough bumps on bud scales. This pest resides in the bud. Its feeding causes distorted flowers and buds that are desiccated or fail to open, resulting in berry and leaf loss (Cromroy and Kuitert 2001; Weibelzahl and Liburd 2010). Berries can also develop in a roughened and misshapen manner. As a result of this mite, crop losses of over 60% have been reported (Cromroy and Kuitert 2001) though the entire crop has been destroyed in the past, though the damage was sporadic (Bailey and Bourne 1946; Darrow *et al.* 1951). In its introduced

range, in South Africa, yield of blueberry fruit has decreased by 80% following the detection of this mite species. The level of symptoms and estimated infestation of this pest varied by variety from 30-90% (Craemer 2018).

**8. Does the organism have intrinsic attributes that indicate that it could cause significant harm to plants?**

If yes Go to 9  
If no Go to 11

**9. With specific reference to the plants or habitats which occur in the PRA area, could the organism by itself, or acting as a vector, cause significant damage or loss to plants leading to negative economic, environmental, societal or export market impacts?**

**Yes** **Go to 10**  
If no Go to 11

Blueberry species, such as *Vaccinium corymbosum*, are cultivated in the UK. The value of the GB blueberry-growing economy is currently valued at £32 million ex-farm (Jack Evans, British Summer Fruits, *pers. comm.*, Jun. 10, 2022). Blueberry plants are also grown as ornamental plants in gardens (RHS 2022a). Finally, native *Vaccinium* species, such as *V. vitis-idaea* and *V. myrtillus* in the wild, could also be affected by this mite though their host status is unknown. However, no social or environmental impacts as a result of *Acalitus vaccinii* have been reported in its current geographical range.

## Conclusion

**10. This organism has the potential to satisfy the definition of a quarantine pest.**

11. This organism does not fulfill all of the criteria for a quarantine pest.

*Acalitus vaccinii* is currently believed to be absent from the UK. Based on our current knowledge of this pest, it appears likely that it could establish in UK blueberry plantations and cause damage to the UK. It has already demonstrated an ability to spread outside of its native range, as shown by its restricted presence in South Africa, and significantly impact the yield of blueberry crops. Therefore, this organism has the potential to satisfy the definition of a quarantine pest and a Pest Risk Analysis is recommended.

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