# Assessment of the proposal to delist Strawberry latent C virus (STLCV) from the EPPO A1 List of pests recommended for regulations as quarantine pests

**26-31064**

## Decision

Based on this PRA, decision was made to remove strawberry latent C virus (STLCV) from the EPPO A1 List of pests recommended for regulation as quarantine pests in 2026. STLCV does not meet the criteria for categorisation of a pest as a quarantine pest for identity.
Conclusions are summarized in Table 1.

**Table 1.** Summary of conclusions for all investigated criteria (criteria considered not met for the quarantine pest categorisation are shown in bold)

| ***ISPM 11, Stage 2, section 2.1.1 Elements of categorisation*** | ***Relevant section in Express PRA*** | ***Conclusion*** |
|---|---|---|
| **Identity of the pest (i.e. clear identity)** | **1** | **STLCV does not meet the 'clear identity' criterion for categorisation as a quarantine pest because the causal agent has not been identified since the time a virus was suspected, despite recent attempts.** |
| Presence or absence in the PRA area | 6 | In the absence of data, STLCV is considered absent from the EPPO region. |
| Regulatory status | 5 | STLCV is regulated in some EPPO countries. |
| Potential for economic consequences (including environmental consequences) in the PRA area | 12, 13 | There is too much uncertainty (incl. on identity and coinfections) to conclude on whether the criterion on potential for 'economic consequences (including environmental consequences) in the PRA area' is fulfilled. |

**Suggested citation**: EPPO (2026) Report of a delisting Pest Risk Analysis for Strawberry latent C virus (STLCV). EPPO, Paris. Available at https://gd.eppo.int/taxon/STLCV0/documents

**Express Pest Risk Analysis:**
**Strawberry latent C virus (STLCV)**

Prepared by the EPPO Secretariat and reviewed by the Panel on Phytosanitary Measures in 2025-10, and by the Working Party on Phytosanitary Regulations in 2026-06, following a country consultation in 2026-03/05.

## Stage 1. Initiation

**Reason for performing the PRA:**
STLCV was added to the EPPO A1 List in 1977 as Strawberry latent C virus, following addition to the 'European Economic Community 'EEC Plant Health Directive'. At that time, PRAs were not prepared. An EPPO datasheet was published in 1984 and revised in 1996 (EPPO/CABI, 1996). STLCV is included in the EPPO certification scheme for strawberry, first approved in 1994 and revised in 2008 (EPPO, 2008).
In June 2025, the Working Party on Phytosanitary Regulations agreed that the *Process for delisting of pests from EPPO A1 and A2 Lists* could be tested with three pilot pests, including Strawberry latent C virus (hereafter STLCV). Consequently a draft PRA for delisting was prepared following PM 5/5 *Decision-support scheme for an express PRA*, only providing some general information as well as the necessary sections/information which can be used as reasons supporting delisting from EPPO A1/A2 Lists.

**PRA area:** EPPO region in September 2025 (map at https://www.eppo.int/ABOUT_EPPO/eppo_members).

The proposal uses the EPPO Standard PM 5/5 *Decision-Support Scheme for an Express Pest Risk Analysis* (available at http://archives.eppo.int/EPPOStandards/pra.htm), as provided in the *Process for delisting of pests from EPPO A1 and A2 Lists*. This PRA focuses on the criteria that may affect its categorisation as a quarantine pest: only the sections related to identity of the pest (see 1), presence or absence in the PRA area (see 6), regulatory status (see 5), and potential for economic consequences (see 12, 13) have been investigated.

## Stage 2. Pest risk assessment

### 1. Taxonomy

| *Investigated?* | *Yes* **X** | *No* ☐ |
|---|---|---|

Strawberry latent C is a poorly described disease, first reported in 1942 (Martin and Tzanetakis, 2006; Tzanetakis et al., 2025). Electron microscopy studies on infected material observed particles with typical rhabdovirus morphology in infected leaves (EFSA, 2014 and OEPP/EPPO, 1986 citing Yoshikawa et al., 1986; EFSA, 2014 citing Yoshikawa and Inouye, 1988). EFSA (2014) notes that '*these observations were based on a limited number of SLCV sources and that the link between the rhabdovirus-like particles observed and the symptoms caused by SLCV in indicator plants remains to be established*'.

ISPM 11 states that the causal agent of particular symptoms that has **not yet been fully identified** may fulfil the 'clear identity' criterion for categorisation as a quarantine pest, provided it was shown to produce **consistent symptoms** and to be **transmissible**.
**'not yet been fully identified'**. No isolates of STLCV are available (Martin & Tzanetakis, 2006, 2013). EFSA (2014) notes that there is a possibility that STLCV '*might have been mistaken as a separate virus species, but it may only represent either a particular strain of a known strawberry virus or a complex of several strawberry viruses*'. A collaborative work authored by over 180 virologists (Tzanetakis et al., 2025) notes that HTS analyses have failed to identify new agents in clones of *F. vesca* infected by a nucleorhabdo-like virus and labeled as 'latent C' in the National Clonal Repository in Oregon (USA) (citing Diaz-Lara et al. 2021; Martin RR and Tzanetakis IE, unpublished). Given this and inconsistencies of the agent description, Tzanetakis et al. (2025) conclude that characterization of strawberry latent C virus as described in the literature is not currently possible. Tzanetakis *et al*. (2025) classify STLCV amongst 'phantom agents' and recommend their removal from regulatory lists.

- **'consistent symptoms'**. STLCV normally produces symptoms on cultivated strawberries only in combination with some other viruses (OEPP/EPPO, 1986). Martin & Tzanetakis (2006) note that a wide range of symptoms has been attributed to STLCV, although it cannot be excluded that some isolates may be due to mixed infections with other viruses. STLCV is characterised (detected and diagnosed) through differential symptoms in a range of strawberry indicators (EFSA, 2014 citing McGrew, 1987). EFSA (2014) notes it is unclear whether the differential symptoms always allow identification, in particular '*in situations of mixed infection with other strawberry viruses, which might themselves induce symptoms in the SLCV non-sensitive indicators*'.
- **'transmissible'**. STLCV can be transmitted by grafting and aphids (Martin and Tzanetakis, 2006 citing Converse, 1987).

**STLCV does not meet the 'clear identity' criterion for categorisation as a quarantine pest because the causal agent has not been identified since the time a virus was suspected, despite recent attempts.**

**2. Pest overview**

Not developed. See OEPP/EPPO (1996).

| | | | |
|---|---|---|---|
| **3. Is the pest a vector?** | *Investigated?* | *Yes* ☐ | *No* **X** |
| **4. Is a vector needed for pest entry or spread?** | *Investigated?* | *Yes* ☐ | *No* **X** |

| | | | |
|---|---|---|---|
| **5. Regulatory status of the pest** | *Investigated?* | *Yes* **X** | *No* ☐ |

According to 'categorisation' information in EPPO Global Database, STLCV is currently regulated by the following EPPO countries (note that this information may not be up-to-date): Morocco, Tunisia, Israel, Jordan, Republic of Moldova, Norway, Russian Federation, Serbia, Türkiye, Ukraine.

In the EU, STLCV was initially named in the list of regulated pests in EU Directive 2000/29. In EU implementing regulation 2019/2072, it was not named but covered under the category of non-European viruses, viroids and phytoplasmas of *Cydonia*, *Fragaria*, *Malus*, *Prunus*, *Pyrus*, *Ribes*, *Rubus* and *Vitis*. Following the assessment in EFSA (2019), the regulation was modified to specify the viruses concerned, and STLCV is not mentioned anymore.

**STLCV is regulated in some EPPO countries.**

| | | | |
|---|---|---|---|
| **6. Distribution** | *Investigated?* | *Yes* **X** | *No* ☐ |

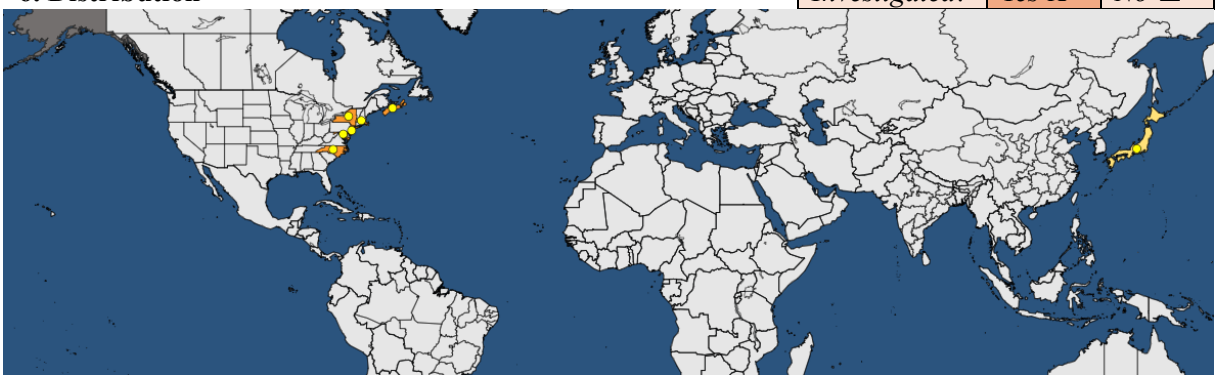


**Fig 1.** Distribution in EPPO Global Database https://gd.eppo.int/taxon/STLCV0/distribution (EPPO GD, 2025). Legend: Data on presence is shown by displaying a bright yellow dot together with an orange background. For large countries, geographical data is given as far as possible at provinces/state level.

EFSA (2014) notes there is a '*significant uncertainty*' on the geographical distribution of SLCV – i.e. including its absence in the EU – because many varieties do not show symptoms and the lack of simple detection assays.

**In the absence of data, STLCV is considered absent from the EPPO region.**

**7. Host plants and their distribution in the PRA area**

| *Investigated?* | *Yes* ☐ | *No* **X** |
|---|---|---|

See EPPO Global Database https://gd.eppo.int/taxon/STLCV0/hosts.

| | | | |
|---|---|---|---|
| **8. Pathways for entry** | *Investigated?* | *Yes* ☐ | *No* **X** |
| **9. Likelihood of establishment outdoors in the PRA area** | *Investigated?* | *Yes* ☐ | *No* **X** |
| **10. Likelihood of establishment in protected conditions in the PRA area** | *Investigated?* | *Yes* ☐ | *No* **X** |
| **11. Spread in the PRA area** | *Investigated?* | *Yes* ☐ | *No* **X** |

| | | | |
|---|---|---|---|
| **12. Impact in the current area of distribution**<br>**13. Potential impact in the PRA area** | *Investigated?* | *Yes* **X** | *No* ☐ |

The report of the Working Party on Phytosanitary Regulations (1977) that added STLCV to the EPPO A1 List indicates that '*SLCV causes no serious symptoms alone, but could cause moderate to severe degeneration of the host when in combination with other viruses. The potential of SLCV in EPPO region was difficult to assess; it would be unlikely to cause losses if virus-free stocks are established, unless European vars were more sensitive than those in the USA. However, since European vars depend on some tolerance, this, with SLCV, could mean earlier degeneration. The Chairman (GB) thus felt it justifiable to add SLCV to the A1 List.*'

Information available points to possible impact of the virus on its own on some strawberry cultivars, and in co-infection with some viruses (details in section 3.5.1 of EFSA, 2014, citing others). The importance of the virus was due to synergism with other strawberry viruses (Martin & Tzanetakis, 2006; OEPP/EPPO, 1986 citing Miller, 1960; Bolton, 1974). However, it is difficult to rule out that some isolates reported may be due to coinfection with other viruses (Martin & Tzanetakis, 2006). '*Despite a significant damage potential, particularly when in co-infection with other strawberry viruses, it appears that the importance and impact of SLCV have almost completely disappeared in North America. This is most probably a consequence of modern strawberry cultural practices, including the systematic use of certified plants for planting and the use of short rotation cycles which limit the build-up of infected materials. Such strategies are also widely used in the EU and have widely contributed to the general reduction of the impact of strawberry-infecting viruses* (EFSA, 2014 citing others). In the EPPO region, modern strawberry cultural practices are also widely used, but certification schemes are not always implemented (from information gathered during the RNQP Project Part 2). Consequently, the argument in EFSA (2014) is not used here to propose delisting of STLCV.

**There is too much uncertainty (incl. on identity and coinfections) to conclude on whether the criterion on potential for 'economic consequences (including environmental consequences) in the PRA area' is fulfilled.**

**14. Identification of the endangered area**

| *Investigated?* | *Yes* ☐ | *No* **X** |
|---|---|---|

**15. Overall assessment of risk**

Based on this assessment, STLCV does not meet the criteria for categorisation as a quarantine pest for pest identity. Deletion from the EPPO A1 List is therefore recommended.

**Stage 3. Pest risk management**

**16. Phytosanitary measures**

| *Investigated?* | *Yes* ☐ | *No* **X** |
|---|---|---|

Not developed.

**17. Uncertainty**

No key uncertainty were identified affecting the recommendation for delisting.

The following uncertainties were identified:

- Distribution of STLCV.
- Potential impact on cultivars currently used in the EPPO region.

## 18. Remarks

All published scientific literature on STLCV identified during the preparation of this PRA pre-dates OEPP/EPPO (1996) except two general articles on strawberry viruses (Martin & Tzanetakis, 2006, 2013) and an article on phantom diseases. A general Internet search on 'strawberry latent C' did not identify other publications.

## 19. REFERENCES


EFSA (2014) Scientific Opinion on the pest categorisation of Strawberry latent C virus. EFSA Journal 12(7), 3771. 22 pp.

EFSA (2019) Scientific Opinion on the pest categorisation of non-EU viruses of Fragaria L. EFSA Journal 17(9), 5766. 69 pp. https://doi.org/10.2903/j.efsa.2019.5766

EPPO (2008) EPPO Standard PM 4/11(2). Certification scheme for strawberry. Schemes for the production of healthy plants for planting. *Bulletin OEPP/EPPO Bulletin* 38, 430–437

EPPO GD (2025) EPPO Global Database (GD). gd.eppo.int (Accessed on 2025-11-01)

EPPO/CABI (1996) Strawberry crinkle cytorhabdovirus. In: *Quarantine pests for Europe*. 2nd edition (Ed. by Smith, I.M.; McNamara, D.G.; Scott, P.R.; Holderness, M.). CAB INTERNATIONAL, Wallingford, UK..

Martin RR, Tzanetakis IE (2006) Characterization and recent advances in detection of strawberry viruses. Plant Disease 90, 384-396.

Martin RR, Tzanetakis IE (2013) High risk strawberry viruses by region in the United States and Canada: Implications for certification, nurseries, and fruit production. Plant Disease 97, 1358-1362.

Tzanetakis IE et al. (2025) Streamlining global germplasm exchange: integrating scientific rigor and common sense to exclude phantom agents from regulation. Plant disease 109(4), 736-755. https://doi.org/10.1094/PDIS-04-24-0745-FE