Abstract

Following a request from the European Commission, the EFSA Panel on Plant Health performed a pest categorisation of the seed-borne bacterium *Curtobacterium flaccumfaciens* pv. *flaccumfaciens*. The pest is regulated in Council Directive 2000/29/EC (Annex IIB) as a harmful organism whose introduction into, and spread within, the protected zones (PZ) of Greece, Portugal and Spain shall be banned if present on seeds of *Phaseolus vulgaris* and of *Dolichos*. The bacterium is widely distributed outside the EU and causes a systemic vascular disease (bacterial wilt of bean) as well as bacterial tan spot disease on soybean. The pest was sporadically recorded in several EU Member States in the past, but is currently not known to occur in the EU. The identity of the bacterium is well established and identification methods are available. The major host is common bean (*Phaseolus vulgaris*), but other crops and weeds are, or may be, hosts or play a role as reservoirs, with uncertainties. Seed transmission remains uncertain for minor and alternative host species. The main pathway for entry is seed. The role of other pathways (e.g. irrigation water and infected residues) is uncertain. Should the bacterium enter the EU (including the PZ), it may establish, spread and have an impact on its host crops. The use of healthy seeds is the most effective control measure. *Curtobacterium flaccumfaciens* pv. *flaccumfaciens* fits all the criteria assessed by EFSA to be regarded as a Union quarantine pest.

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**Keywords:** bacterial wilt of bean, European Union, pest risk, plant health, plant pest, quarantine, systemic vascular disease

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1. Introduction

1.1. Background and Terms of Reference as provided by the requestor

1.1.1. Background

Council Directive 2000/29/EC\(^1\) on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community establishes the present European Union plant health regime. The Directive lays down the phytosanitary provisions and the control checks to be carried out at the place of origin on plants and plant products destined for the Union or to be moved within the Union. In the Directive's 2000/29/EC annexes, the list of harmful organisms (pests) whose introduction into or spread within the Union is prohibited, is detailed together with specific requirements for import or internal movement.

Following the evaluation of the plant health regime, the new basic plant health law, Regulation (EU) 2016/2031\(^2\) on protective measures against pests of plants, was adopted on 26 October 2016 and will apply from 14 December 2019 onwards, repealing Directive 2000/29/EC. In line with the principles of the above mentioned legislation and the follow-up work of the secondary legislation for the listing of EU regulated pests, EFSA is requested to provide pest categorizations of the harmful organisms included in the annexes of Directive 2000/29/EC, in the cases where recent pest risk assessment/pest categorisation is not available.

1.1.2. Terms of Reference

EFSA is requested, pursuant to Article 22(5.b) and Article 29(1) of Regulation (EC) No 178/2002\(^3\), to provide scientific opinion in the field of plant health.

EFSA is requested to prepare and deliver a pest categorisation (step 1 analysis) for each of the regulated pests included in the appendices of the annex to this mandate. The methodology and template of pest categorisation have already been developed in past mandates for the organisms listed in Annex II Part A Section II of Directive 2000/29/EC. The same methodology and outcome is expected for this work as well.

The list of the harmful organisms included in the annex to this mandate comprises 133 harmful organisms or groups. A pest categorisation is expected for these 133 pests or groups and the delivery of the work would be stepwise at regular intervals through the year as detailed below. First priority covers the harmful organisms included in Appendix 1, comprising pests from Annex II Part A Section I and Annex II Part B of Directive 2000/29/EC. The delivery of all pest categorisations for the pests included in Appendix 1 is June 2018. The second priority is the pests included in Appendix 2, comprising the group of Cicadellidae (non-EU) known to be vector of Pierce’s disease (caused by Xylella fastidiosa), the group of Tephritidae (non-EU), the group of potato viruses and virus-like organisms, the group of viruses and virus-like organisms of Cydonia Mill., Fragaria L., Malus Mill., Prunus L., Pyrus L., Ribes L., Rubus L. and Vitis L. and the group of Margarodes (non-EU species). The delivery of all pest categorisations for the pests included in Appendix 2 is end 2019. The pests included in Appendix 3 cover pests of Annex I part A section I and all pests categorisations should be delivered by end 2020.

For the above mentioned groups, each covering a large number of pests, the pest categorisation will be performed for the group and not the individual harmful organisms listed under “such as” notation in the Annexes of the Directive 2000/29/EC. The criteria to be taken particularly under consideration for these cases, is the analysis of host pest combination, investigation of pathways, the damages occurring and the relevant impact.

Finally, as indicated in the text above, all references to ‘non-European’ should be avoided and replaced by ‘non-EU’ and refer to all territories with exception of the Union territories as defined in Article 1 point 3 of Regulation (EU) 2016/2031.

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\(^1\) Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community, OJ L 169/1, 10.7.2000, p. 1–112.

\(^2\) Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants, OJ L 317, 23.11.2016, p. 4–104.

\(^3\) Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety, OJ L 31/1, 1.2.2002, p. 1–24.
1.1.2.1. Terms of Reference: Appendix 1

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

**Annex IIAI**

(a) Insects, mites and nematodes, at all stages of their development

- Aleurocanthus spp.
- *Numonia pyrivorella* (Matsumura)
- *Anthonomus bisignifer* (Schenkling)
- *Oligonychus perditus* Pritchard and Baker
- *Anthonomus signatus* (Say)
- *Pissodes* spp. (non-EU)
- *Aschistonyx eppoi* Inouye
- *Scirtothrips aurantii* Faure
- *Carposina niponensis* Walsingham
- *Scirtothrips citri* (MoulteX)
- *Enarmonia packardi* (Zeller)
- *Enarmonia prunivora* Walsh
- *Grapholita inopinata* Heinrich
- *Hismonoxys phyctis*
- *Leucaspis japonica* Ckll.
- *Listronotus bonariensis* (Kuschel)
- *Aleuronaustus* spp.

(b) Bacteria

- Citrus variegated chlorosis
- *Erwinia* stewartii (Smith) Dye
- Xanthomonas campestris pv. oryzae (Ishiyama)
- Dye and pv. oryzicola (Fang. et al.) Dye

(c) Fungi

- *Alternaria alternata* (Fr.) Keissler (non-EU pathogenic isolates)
- *Elsinoe* spp. Bitanc. and Jenk. Mendes
- *Anisogramma anomala* (Peck) E. Müller
- *Fusarium oxysporum* f. sp. *albedinis* (Kilian and Maire) Gordon
- *Apiosporina morbosa* (Schwein.) v. Arx
- *Guignardia picirica* (Nosa) Yamamoto
- *Ceratocystis virescens* (Davidson) Moreau
- *Puccinia pittieriana* Hennings
- *Cercoseptoria pini-densiflorae* (Hori and Nambu) Deighton
- *Cercospora angolensis* Carv. and Mendes
- *Stegophora ulmea* (Schweinitz: Fries) Sydow & Sydow
- *Venturia nashicola* Tanaka and Yamamoto

(d) Virus and virus-like organisms

- Beet curly top virus (non-EU isolates)
- Little cherry pathogen (non-EU isolates)
- Black raspberry latent virus
- Naturally spreading psorosis
- Blight and blight-like
- Palm lethal yellowing mycoplasm
- Cadang-Cadang viroid
- Satsuma dwarf virus
- Citrus tristeza virus (non-EU isolates)
- Tatter leaf virus
- Leprosis
- Witches’ broom (MLO)

**Annex IIB**

(a) Insect mites and nematodes, at all stages of their development

- *Anthonomus grandis* (Boh.)
- *Ips cembrae* Heer
- *Cephalcia lariciphila* (Klug)
- *Ips duplicatus* Sahlberg
- *Dendroctonus micans* Kugelan
- *Ips sexdentatus* Börner
- *Gilphinia hercyniae* (Hartig)
- *Ips typographus* Heer
- *Goniapterus scutellatus* Gyll.
- *Sternochet us mangiferae* Fabricius
- *Ips amitinus* Eichhof
(b) Bacteria

*Curtobacterium flaccumfaciens pv. flaccumfaciens* (Hedges) Collins and Jones

(c) Fungi

*Glomerella gossypii* Edgerton

*Hypoxylon mammatum* (Wahl.) J. Miller

*Gremmeniella abietina* (Lag.) Morelet

1.1.2.2. Terms of Reference: Appendix 2

List of harmful organisms for which pest categorisation is requested per group. The list below follows the categorisation included in the annexes of Directive 2000/29/EC.

**Annex IAI**

(a) **Insects, mites and nematodes, at all stages of their development**

Group of Cicadellidae (non-EU) known to be vector of Pierce’s disease (caused by *Xylella fastidiosa*), such as:

1) *Carneocephala fulgida* Nottingham
2) *Draeculacephala minerva* Ball
3) *Graphocephala atropunctata* (Signoret)

Group of Tephritidae (non-EU) such as:

1) *Anastrepha fraterculus* (Wiedemann)
2) *Anastrepha ludens* (Loew)
3) *Anastrepha obliqua* Macquart
4) *Anastrepha suspensa* (Loew)
5) *Dacus ciliatus* Loew
6) *Dacus curcurbitae* Coquillet
7) *Dacus dorsalis* Hendel
8) *Dacus tryoni* (Froggatt)
9) *Dacus tsuneonis* Miyake
10) *Dacus zonatus* Saund.
11) *Epochra canadensis* (Loew)
12) *Pardalaspis cyanescens* Bezzi
13) *Pardalaspis quinaria* Bezzi
14) *Pterandrus rosa* (Karsch)
15) *Rhacochaena japonica* Ito
16) *Rhagoletis completa* Cresson
17) *Rhagoletis fausta* (Osten-Sacken)
18) *Rhagoletis indifferens* Curran
19) *Rhagoletis mendax* Curran
20) *Rhagoletis pomonella* Walsh
21) *Rhagoletis suavis* (Loew)

(b) **Viruses and virus-like organisms**

Group of potato viruses and virus-like organisms such as:

1) Andean potato latent virus
2) Andean potato mottle virus
3) Arracacha virus B, oca strain
4) Potato black ringspot virus
5) Potato virus T
6) non-EU isolates of potato viruses A, M, S, V, X and Y (including Yo, Yn and Yc) and potato leafroll virus

Group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., such as:

1) Blueberry leaf mottle virus
2) Cherry rasp leaf virus (American)
3) Peach mosaic virus (American)
4) Peach phony rickettsia
5) Peach rosette mosaic virus
6) Peach rosette mycoplasm
7) Peach X-disease mycoplasm
8) Peach yellows mycoplasm
9) Plum line pattern virus (American)
10) Raspberry leaf curl virus (American)
11) Strawberry witches’ broom mycoplasma
12) Non-EU viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.
Annex IIAI
(a) Insects, mites and nematodes, at all stages of their development
Group of Margarodes (non-EU species) such as:
1) Margarodes vitis (Phillipi) 3) Margarodes prieskaensis Jakubski
2) Margarodes vredendalensis de Klerk

1.1.2.3. Terms of Reference: Appendix 3
List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

Annex IAI
(a) Insects, mites and nematodes, at all stages of their development

| Insects | Mites | Nematodes |
|---------|-------|-----------|
| Acleris spp. (non-EU) | Longidorus diadecturus | Eveleigh and Allen |
| Amauromyza maculosa (Malloch) | Monochamus spp. (non-EU) | |
| Anomala orientalis Waterhouse | Myndus crudus | Van Duzee |
| Arrhenodes minutus Drury | Nacobbus aberrans (Thorne) | Thorne and Allen |
| Choristoneura spp. (non-EU) | Naupactus leucoloma | Boheman |
| Conotrachelus nenuphar (Herbst) | Premnotrypes spp. (non-EU) | |
| Diabrotica barberi Smith and Lawrence | Scaphoideus luteolus | Van Duzee |
| Diabrotica undecimpunctata howardi Barber | Spodoptera eridania | Cramer |
| Diabrotica undecimpunctata undecimpunctata Mannerheim | Spodoptera frugiperda | (Smith) |
| Diabrotica virgifera zeae Krysan & Smith | | |
| Diaphorina citri Kuway | Thrips palmi | Karny |
| Heliothis sea (Boddie) | Xiphinema americanum | Cobb sensu lato (non-EU populations) |
| Hirschmanniella spp., other than Hirschmanniella gracilis (de Man) | Xiphinema californicum | Lamberti and Bleve-Zacheo |
| Liriomyza sativae Blanchard | | |

(b) Fungi

| Fungi | |
|-------|-------|
| Ceratocystis fagacearum (Bretz) Hunt | Mycosphaerella larici-leptolepis | Ito et al. |
| Chrysomyxa arctostaphyli Dietel | Mycosphaerella populorum | G. E. Thompson |
| Cronartium spp. (non-EU) | Phoma andina | Turkensteen |
| Endocronartium spp. (non-EU) | Phyllosticta solitaria | Ell. and Ev. |
| Guignardia laricina (Saw.) Yamamoto and Ito | Septoria lycopersici | Speg. var. malagutii Ciccarone and Boerema |
| Gymnosporangium spp. (non-EU) | | |
| Inonotus weirii (Murril) Kotlaba and Pouzar | Thecaphora solani | Barrus |
| Melampsora farlowii (Arthur) Davis | Trechispora brinkmannii | (Bresad.) Rogers |

(c) Viruses and virus-like organisms

| Viruses and virus-like organisms | |
|---------------------------------|-------|
| Tobacco ringspot virus | Pepper mild tigré virus |
| Tomato ringspot virus | Squash leaf curl virus |
| Bean golden mosaic virus | Euphorbia mosaic virus |
| Cowpea mild mottle virus | Florida tomato virus |
| Lettuce infectious yellows virus | |

(d) Parasitic plants

| Parasitic plants |
|------------------|
| Arceuthobium spp. (non-EU) | |
Annex IAII

(a) Insects, mites and nematodes, at all stages of their development

Meloidogyne fallax Karssen

Rhizoecus hibisci Kawai and Takagi

Popillia japonica Newman

(b) Bacteria

Clavibacter michiganensis (Smith) Davis et al. ssp. sepedonicus (Spieckermann and Kotthoff) Davis et al.

Ralstonia solanacearum (Smith) Yabuuchi et al.

(c) Fungi

Melampsora medusae Thümen

Synchytrium endobioticum (Schilbersky) Percival

Annex I B

(a) Insects, mites and nematodes, at all stages of their development

Leptinotarsa decemlineata Say

Liriomyza bryoniae (Kaltenbach)

(b) Viruses and virus-like organisms

Beet necrotic yellow vein virus

1.2. Interpretation of the Terms of Reference

Curtobacterium flaccumfaciens pv. flaccumfaciens is one of a number of pests listed in the Appendices to the Terms of Reference (ToR) to be subject to pest categorisation to determine whether it fulfils the criteria of a quarantine pest or those of a regulated non-quarantine pest for the area of the European Union (EU) excluding Ceuta, Melilla and the outermost regions of Member States referred to in Article 355(1) of the Treaty on the Functioning of the European Union (TFEU), other than Madeira and the Azores.

Since C. flaccumfaciens pv. flaccumfaciens is regulated in protected zones (PZ) only, the scope of the categorisation is the territory of the PZ (Greece, Portugal and Spain), thus the criteria refer to the PZ instead of the EU territory.

2. Data and methodologies

2.1. Data

2.1.1. Literature search

A literature search on C. flaccumfaciens pv. flaccumfaciens was conducted at the beginning of the categorisation, using ISI Web of Science and Scopus databases, for the period 1922–2017. As search terms, the scientific name of this plant pathogen (i.e. full name, or limited to species or pathovar) as well as of the disease it causes were used. Relevant papers were then selected and reviewed. Further references and information were obtained from experts, from citations within the references and grey literature.

2.1.2. Database search

Pest information, on host(s) and distribution, was retrieved from the EPPO Global Database (EPPO, 2018).

Data about the import of commodity types that could potentially provide a pathway for the pest to enter the EU were obtained from EUROSTAT.

The Europhyt database was consulted for pest-specific notifications on interceptions and outbreaks. Europhyt is a web-based network run by the Directorate General for Health and Food Safety (DG SANTE), and is a subproject of PHYSAN (Phyto-Sanitary Controls) specifically concerned with plant health information. The Europhyt database manages notifications of interceptions of plants or plant products that do not comply with EU legislation, as well as notifications of plant pests detected in the...
territory of the Member States (MS) and the phytosanitary measures taken to eradicate or avoid their spread.

2.2. Methodologies

The Panel performed the pest categorisation for *C. flaccumfaciens* pv. *flaccumfaciens*, following guiding principles and steps presented in the EFSA guidance on the harmonised framework for pest risk assessment (EFSA PLH Panel, 2010) and as defined in the International Standard for Phytosanitary Measures No 11 (FAO, 2013) and No 21 (FAO, 2004).

In accordance with the guidance on a harmonised framework for pest risk assessment in the EU (EFSA PLH Panel, 2010), this work was started following an evaluation of the EU’s plant health regime. Therefore, to facilitate the decision-making process, in the conclusions of the pest categorisation, the Panel addresses explicitly each criterion for a Union quarantine pest and for a Union regulated non-quarantine pest in accordance with Regulation (EU) 2016/2031 on protective measures against pests of plants, and includes additional information required as per the specific terms of reference received by the European Commission. In addition, for each conclusion, the Panel provides a short description of its associated uncertainty.

Table 1 presents the Regulation (EU) 2016/2031 pest categorisation criteria on which the Panel bases its conclusions. All relevant criteria have to be met for the pest to potentially qualify either as a quarantine pest or as a regulated non-quarantine pest. If one of the criteria is not met, the pest will not qualify. A pest that does not qualify as a quarantine pest may still qualify as a regulated non-quarantine pest which needs to be addressed in the opinion. For the pests regulated in the PZ only, the scope of the categorisation is the territory of the PZ, thus the criteria refer to the PZ instead of the EU territory.

It should be noted that the Panel’s conclusions are formulated respecting its remit and particularly with regard to the principle of separation between risk assessment and risk management (EFSA founding regulation (EU) No 178/2002); therefore, instead of determining whether the pest is likely to have an unacceptable impact, the Panel will present a summary of the observed pest impacts. Economic impacts are expressed in terms of yield and quality losses and not in monetary terms, while addressing social impacts is outside the remit of the Panel, in agreement with the EFSA guidance on a harmonised framework for pest risk assessment (EFSA PLH Panel, 2010).

*Table 1:* Pest categorisation criteria under evaluation, as defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column)

| Criterion of pest categorisation | Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest | Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35) | Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest |
|---------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Identity of the pest (Section 3.1) | Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible? | Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible? | Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible? |
| Absence/presence of the pest in the EU territory (Section 3.2) | Is the pest present in the EU territory? If present, is the pest widely distributed within the EU? Describe the pest distribution briefly! | Is the pest present in the EU territory? If not, it cannot be a PZ quarantine organism | Is the pest present in the EU territory? If not, it cannot be a regulated non-quarantine pest. (A regulated non-quarantine pest must be present in the risk assessment area) |
### Criterion of Pest Categorisation

| Regulatory status (Section 3.3) | Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest | Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35) | Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest |
|--------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| If the pest is present in the EU but not widely distributed in the risk assessment area, it should be under official control or expected to be under official control in the near future | The PZ system aligns with the pest free area system under the International Plant Protection Convention (IPPC). The pest satisfies the IPPC definition of a quarantine pest that is not present in the risk assessment area (i.e. PZ) | Is the pest regulated as a quarantine pest? If currently regulated as a quarantine pest, are there grounds to consider its status could be revoked? |

### Pest Potential for Entry, Establishment and Spread in the EU Territory (Section 3.4)

| Pest potential for entry, establishment and spread in the EU territory (Section 3.4) | Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest | Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35) | Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Is the pest able to enter into, become established in, and spread within, the EU territory? If yes, briefly list the pathways! | Is the pest able to enter into, become established in, and spread within, the PZ areas? | Is the pest able to enter into, become established in, and spread within, the PZ areas? | Is entry by natural spread from EU areas where the pest is present possible? |
| Would the pests’ introduction have an economic or environmental impact on the EU territory? | Would the pests’ introduction have an economic or environmental impact on the PZ areas? | Would the pests’ introduction have an economic or environmental impact on the PZ areas? | Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting? |

### Potential for Consequences in the EU Territory (Section 3.5)

| Potential for consequences in the EU territory (Section 3.5) | Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest | Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35) | Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest |
|-----------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Are there measures available to prevent the entry into, establishment within or spread of the pest within the EU such that the risk becomes mitigated? | Are there measures available to prevent the entry into, establishment within or spread of the pest within the PZ areas such that the risk becomes mitigated? | Are there measures available to prevent the entry into, establishment within or spread of the pest within the PZ areas such that the risk becomes mitigated? | Is it possible to eradicate the pest in a restricted area within 24 months (or a period longer than 24 months where the biology of the organism so justifies) after the presence of the pest was confirmed in the protected zone? |

### Available Measures (Section 3.6)

| Available measures (Section 3.6) | Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest | Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35) | Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest |
|----------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential quarantine pest were met and (2) if not, which one(s) were not met | A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential PZ quarantine pest were met, and (2) if not, which one(s) were not met | A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential regulated non-quarantine pest were met, and (2) if not, which one(s) were not met |

### Conclusion of Pest Categorisation (Section 4)

The Panel will not indicate in its conclusions of the pest categorisation whether to continue the risk assessment process, but, following the agreed two-step approach, will continue only if requested by the risk managers. However, during the categorisation process, experts may identify key elements and knowledge gaps that could contribute significant uncertainty to a future assessment of risk. It would be useful to identify and highlight such gaps so that potential future requests can specifically target the major elements of uncertainty, perhaps suggesting specific scenarios to examine.
3. **Pest categorisation**

3.1. **Identity and biology of the pest**

3.1.1. **Identity and taxonomy**

C. *flaccumfaciens* pv. *flaccumfaciens* (Hedges) Collins & Jones (Hedges, 1922) is a well-defined Gram-positive bacterium of the family Microbacteriaceae.

According to the current classification (Collins and Jones, 1984; Young et al., 1996, 2004; Bull et al., 2010), the species *C. flaccumfaciens* includes the following pathovars (pv.) that have distinct host ranges and that can easily be distinguished: pv. *flaccumfaciens*, pv. *betae*, pv. *oortii*, pv. *poinsettiae* and pv. *ilicis*. The pathovars *basellae* (Chen et al., 2000) and *betica* (Chen et al., 2007) have also been described and proposed, but so far they have not been officially accepted by the International Society for Plant Pathology, Committee on the Taxonomy of Plant Pathogenic bacteria.

3.1.2. **Biology of the pest**

*C. flaccumfaciens* pv. *flaccumfaciens* causes a systemic vascular disease, called bacterial wilt of bean (Hedges, 1922, 1926a). It also causes bacterial tan spot disease on soybean (Dunleavy, 1983). Leaves of infected bean plants are flaccid, as well as the entire plant, particularly during the hottest hours of the day or under moisture stress. This is due to bacterial plugging of the vascular system, blocking the physiological acropetal water movement. Other foliar symptoms consist of interveinal necrotic lesions ("firing"), with irregular margins and sometimes surrounded by yellow borders and haloes. In susceptible cultivars, wilting occurs 7–9 days after infection while firing appears about 7 days later. On bean seedlings and young plants, disease severity and mortality are higher than on adult plants. Generally, plant death occurs around 18–23 days after infection. The time course of the disease is most rapid above 27–30°C and under water stress, because these conditions seem to promote *C. flaccumfaciens* pv. *flaccumfaciens* multiplication and host systemic colonisation, as well as to enhance the negative effect of bacterial-suppressed water supply (Hedges, 1926a).

Seeds produced by plants infected by *C. flaccumfaciens* pv. *flaccumfaciens* are systemically infected via the vascular system (Schuster and Smith, 1983; Hsieh et al., 2006). Generally, infected seeds appear asymptomatic, as well as infected pods, while sometime infected seeds are discoloured or yellow, orange or purple irregularly pigmented on their surface or on the hilus (Schuster and Christiansen, 1957; Schuster et al., 1968; Huang et al., 2006; Harveson and Vidaver, 2008; Harveson et al., 2015; Osdaghi and Lak, 2015; Osdaghi et al., 2016). Secondary (i.e. non-seed-borne) infections occur through wounds, made by rain and hailstorms, and infrequently through stomata (Evtushenko and Takeuchi, 2006).

*C. flaccumfaciens* pv. *flaccumfaciens* is a seed-borne pathogen for common bean (Hedges, 1926b; Hsieh et al., 2006; Camara et al., 2009). It can overwinter, survive and remain viable in seeds, even up to 24 years under laboratory conditions, while on infected bean residues may survive under field conditions for about 8 months, depending on soil type, moisture content, and climatic conditions (Silva Júnior et al., 2012). Infected seeds are considered the most important source of inoculum and means for the pathogen spread over long and short distances (Hedges, 1926b; Zaumeyer, 1932; Zaumeyer and Thomas, 1957; Hsieh et al., 2006; Camara et al., 2009; Bastas and Sahin, 2017).

However, the biology and the epidemiology of the bacterium are still incompletely understood, for instance regarding the role of irrigation water on secondary infections (Harveson et al., 2015). No limiting environmental conditions for the disease are expected, provided host plants may grow. More important, evidence is accumulating about *C. flaccumfaciens* pv. *flaccumfaciens* associated with other crops as alternative hosts, including some grown in rotation with dry beans (e.g. wheat, corn, sunflower, alfalfa, barley, black oat, white oat, canola and ryegrass) and several Solanaceous plants (Harveson et al., 2015; Gonçalves et al., 2017; Osdaghi et al., 2018). However, seed transmission in other minor or alternative hosts has not been demonstrated yet.
3.1.3. Intraspecific diversity

The species *C. flaccumfaciens* shows intraspecific diversity leading to the distinction of various pathovars that infect different crops (Section 3.1.1). These pathovars can be easily discriminated through laboratory tests (Tegli et al., 2002; Guimaraes et al., 2003).

Within the pathovar *flaccumfaciens*, variants have been described based on pigments that may be produced in vitro on agarised media or in vivo in seeds (Schuster and Christiansen, 1957; Schuster et al., 1968; Huang et al., 2006; Harveson and Vidaver, 2008; Harveson et al., 2015; Osdaghi and Lak, 2015; Osdaghi et al., 2016). Those variants may also differ in their virulence (Harveson and Vidaver, 2008; Osdaghi et al., 2016).

3.1.4. Detection and identification of the pest

**Are detection and identification methods available for the pest?**

**Yes,** the organism can be identified in vitro or in planta by various techniques.

Symptoms caused by *C. flaccumfaciens pv. flaccumfaciens* on plants may be sometimes confused with those caused by *Xanthomonas axonopodis pv. phaseoli* (Harveson et al., 2015). Infected seeds can be very often asymptomatic (Tegli, 2011).

Semi-selective media for in vitro growth of *C. flaccumfaciens pv flaccumfaciens* are available (Mizuno and Kawai, 1993; Tegli et al., 1998; Maringoni and Camara, 2006; Maringoni et al., 2006), but methods based on isolation are quite time-consuming and insufficiently specific (Tegli, 2011).

Polymerase chain reaction (PCR) tests with two different sets of primers have been designed for the identification of *C. flaccumfaciens pv. flaccumfaciens* isolated colonies and for its detection from bean seeds (Guimaraes et al., 2001; Tegli et al., 2002). However, only one of them was demonstrated to reliably detect all the strains of *C. flaccumfaciens pv. flaccumfaciens*, including the different pigmented variants found so far (Tegli et al., 2002; Osdaghi et al., 2018). Accordingly, an EPPO diagnostic standard exists for *C. flaccumfaciens pv. flaccumfaciens* (Tegli, 2011).

3.2. Pest distribution

3.2.1. Pest distribution outside the EU

*C. flaccumfaciens pv. flaccumfaciens* is present in North and South America, Africa, Asia and Australia (Figure 1 and Table 2).
Figure 1: Global distribution map for *Curtobacterium flaccumfaciens* pv. *flaccumfaciens* (from the EPPO Global Database, accessed on 14 May 2018)

Table 2: Global distribution of *Curtobacterium flaccumfaciens* pv. *flaccumfaciens* (extracted from the EPPO Global Database accessed on 14 May 2018)

| Continent | Country | Status – EPPO GD |
|-----------|---------|------------------|
| Africa    | Mauritius | Present, no details |
| Africa    | Tunisia | Present, restricted distribution |
| Africa    | Brazil Distrito Federal, Goias, Mato Grosso do Sul, Minas Gerais, Parana, Santa Catarina, Sao Paulo | Present, restricted distribution, Present, no details |
| America   | Canada Alberta, Manitoba, Ontario, Quebec, Saskatchewan | Present, restricted distribution, Present, no details |
| America   | Colombia | Present, no details |
| America   | Mexico | Absent, unreliable record |
| America   | United States of America Colorado, Connecticut, Idaho, Iowa, Michigan, Montana, Nebraska, North Dakota, Ohio, Oregon, Virginia, Wisconsin, Wyoming | Present, restricted distribution, Present, no details |
| America   | Venezuela | Present, no details |
| Asia      | Iran | Present, restricted distribution |
| Europe    | Albania | Absent, unreliable record |
| Europe/Asia | Russia (Southern Russia and Far East) | Present, restricted distribution |
| Europe    | Switzerland | Absent, invalid record |
| Europe    | Serbia | Absent, pest no longer present |
| Europe    | Ukraine | Absent, pest no longer present |
| Europe    | Turkey | Present, few occurrences |
3.2.2. Pest distribution in the EU

The pest was sporadically recorded in several EU MS in the past, but is currently not known to occur in the EU (Table 3).

A restricted distribution was reported for Romania with uncertainty (see below), but the Romanian NPPO replied upon inquiry that there are 'no recent data confirming the presence of *C. flaccumfaciens pv. flaccumfaciens* in Romania' (pers. comm., Florica Gogu, Romanian Phytosanitary Authority, 2 May 2018). The bacterium is now considered to be absent, eradicated in Germany (pers. comm., Ernst Pfeilstetter, Julius Kühn-Institut, 24 April 2018).

Regarding the situation of *C. flaccumfaciens pv. flaccumfaciens* in Romania, strong uncertainties existed on the reliability of the previous record of presence, which was based on invalid references, not related to *C. flaccumfaciens pv. flaccumfaciens* but to its close relative *C. flaccumfaciens pv. oortii* (Marinescu and Hatisi, 1984), or to data of susceptibility tests on common bean to its phytopathogenic bacteria including *C. flaccumfaciens pv. flaccumfaciens* (Phang et al., 1974).

In Germany, *C. flaccumfaciens pv. flaccumfaciens* was found and identified on soybean in 2011, and was then eradicated. Its origin was attributed to imported soybean seeds (Sammer and Reiher, 2012).

For the other EU MS where the disease occurred in the past (Belgium, Bulgaria, Greece, Hungary and Poland), no detailed information was found.

**Table 3:** Distribution of *Curtobacterium flaccumfaciens pv. flaccumfaciens* in the EU (extracted from the EPPO Global Database accessed on 14 May 2018)

| Continent | Country     | Status – EPPO GD                      |
|-----------|-------------|---------------------------------------|
| Europe    | Belgium     | Absent, pest no longer present         |
| Europe    | Bulgaria    | Absent, pest no longer present         |
| Europe    | France      | Absent, no details                     |
| Europe    | Greece      | Absent, no details                     |
| Europe    | Germany     | Absent, eradicated                     |
| Europe    | Hungary     | Absent, no details                     |
| Europe    | Italy       | Absent, confirmed by survey            |
| Europe    | Netherlands | Absent, confirmed by survey            |
| Europe    | Poland      | Absent, pest no longer present         |
| Europe    | Portugal    | Absent, confirmed by survey            |
| Europe    | Romania     | Absent, pest no longer present         |
| Europe    | Spain       | Absent, pest eradicated                |

The pest was sporadically recorded in several EU MS in the past, but is currently not known to occur in the EU (Table 3).

A restricted distribution was reported for Romania with uncertainty (see below), but the Romanian NPPO replied upon inquiry that there are 'no recent data confirming the presence of *C. flaccumfaciens pv. flaccumfaciens* in Romania’ (pers. comm., Florica Gogu, Romanian Phytosanitary Authority, 2 May 2018). The bacterium is now considered to be absent, eradicated in Germany (pers. comm., Ernst Pfeilstetter, Julius Kühn-Institut, 24 April 2018).

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In Germany, *C. flaccumfaciens pv. flaccumfaciens* was found and identified on soybean in 2011, and was then eradicated. Its origin was attributed to imported soybean seeds (Sammer and Reiher, 2012).

For the other EU MS where the disease occurred in the past (Belgium, Bulgaria, Greece, Hungary and Poland), no detailed information was found.

**Table 3:** Distribution of *Curtobacterium flaccumfaciens pv. flaccumfaciens* in the EU (extracted from the EPPO Global Database accessed on 14 May 2018)

| Continent | Country     | Status – EPPO GD                      |
|-----------|-------------|---------------------------------------|
| Europe    | Belgium     | Absent, pest no longer present         |
| Europe    | Bulgaria    | Absent, pest no longer present         |
| Europe    | France      | Absent, no details                     |
| Europe    | Greece      | Absent, no details                     |
| Europe    | Germany     | Absent, eradicated                     |
| Europe    | Hungary     | Absent, no details                     |
| Europe    | Italy       | Absent, confirmed by survey            |
| Europe    | Netherlands | Absent, confirmed by survey            |
| Europe    | Poland      | Absent, pest no longer present         |
| Europe    | Portugal    | Absent, confirmed by survey            |
| Europe    | Romania     | Absent, pest no longer present         |
| Europe    | Spain       | Absent, pest eradicated                |

The pest was sporadically recorded in several EU MS in the past, but is currently not known to occur in the EU (Table 3).

A restricted distribution was reported for Romania with uncertainty (see below), but the Romanian NPPO replied upon inquiry that there are 'no recent data confirming the presence of *C. flaccumfaciens pv. flaccumfaciens* in Romania’ (pers. comm., Florica Gogu, Romanian Phytosanitary Authority, 2 May 2018). The bacterium is now considered to be absent, eradicated in Germany (pers. comm., Ernst Pfeilstetter, Julius Kühn-Institut, 24 April 2018).

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In Germany, *C. flaccumfaciens pv. flaccumfaciens* was found and identified on soybean in 2011, and was then eradicated. Its origin was attributed to imported soybean seeds (Sammer and Reiher, 2012).

For the other EU MS where the disease occurred in the past (Belgium, Bulgaria, Greece, Hungary and Poland), no detailed information was found.

**Table 3:** Distribution of *Curtobacterium flaccumfaciens pv. flaccumfaciens* in the EU (extracted from the EPPO Global Database accessed on 14 May 2018)

| Continent | Country     | Status – EPPO GD                      |
|-----------|-------------|---------------------------------------|
| Europe    | Belgium     | Absent, pest no longer present         |
| Europe    | Bulgaria    | Absent, pest no longer present         |
| Europe    | France      | Absent, no details                     |
| Europe    | Greece      | Absent, no details                     |
| Europe    | Germany     | Absent, eradicated                     |
| Europe    | Hungary     | Absent, no details                     |
| Europe    | Italy       | Absent, confirmed by survey            |
| Europe    | Netherlands | Absent, confirmed by survey            |
| Europe    | Poland      | Absent, pest no longer present         |
| Europe    | Portugal    | Absent, confirmed by survey            |
| Europe    | Romania     | Absent, pest no longer present         |
| Europe    | Spain       | Absent, pest eradicated                |
C. flaccumfaciens pv. flaccumfaciens is currently not known to occur in the PZ (Greece, Portugal and Spain) (EPPO, 2018).

3.3. Regulatory status

3.3.1. Council Directive 2000/29/EC

Curtobacterium flaccumfaciens pv. flaccumfaciens is listed in Council Directive 2000/29/EC only for seeds of Phaseolus vulgaris and of Dolichos for the PZ of Greece, Portugal and Spain. Details are presented in Tables 4 and 5.

3.3.2. Legislation addressing the hosts of Curtobacterium flaccumfaciens pv. flaccumfaciens

Table 4: Curtobacterium flaccumfaciens pv. flaccumfaciens in Council Directive 2000/29/EC and Implementing Regulation 2016/873/EC

| Annex II, Part B | Harmful organisms whose introduction into, and spread within, certain protected zone shall be banned if they are present on certain plants or plant products |
|------------------|--------------------------------------------------------------------------------|
| (b) Bacteria     |                                                                                   |
| Specie           | Subject of contamination | Protected zone                          |
| 1. Curtobacterium flaccumfaciens pv. flaccumfaciens | Seeds of Phaseolus vulgaris L. and Dolichos Jacq. | Greece, Portugal and Spain |

Table 5: Regulated hosts and commodities that may involve C. flaccumfaciens pv. flaccumfaciens in Annex V of Council Directive 2000/29/EC

| Annex V | Plants, plant products and other objects which must be subject to a plant health inspection (at the place of production if originating in the Community, before being moved within the Community—in the country of origin or the consignor country, if originating outside the Community) before being permitted to enter the Community |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part A  | Plants, plant products and other objects originating in the Community                                                                                                                                |
| Section II | Plants, plant products and other objects which are potential carriers of harmful organisms of relevance for certain protected zones, and which must be accompanied by a plant passport valid for the appropriate zone when introduced into or moved within that zone |
| 1.8. | Seeds of [...] Dolichos Jacq. and Phaseolus vulgaris L. |

| Part B. | Plants, plant products and other objects originating in territories, other than those territories referred to in part A |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I. | Plants, plant products and other objects which are potential carriers of harmful organisms of relevance for the entire Community |

| Section I | Plants, intended for planting, other than seeds but including seeds of [...] Phaseolus L. |
|-----------|---------------------------------------------------------------------------------------|
| Section II | Plants, plant products and other objects which are potential carriers of harmful organisms of relevance for certain protected zones |
| 5. | Seeds of Dolichos Jacq [...] and Phaseolus vulgaris L. |

3.3.3. Other legislation addressing the bean seed production marketed within the Community

Vegetable seed should be allowed to be marketed only if it has been officially examined and certified, according to Council Directive 2002/55/EC.

3.4. Entry, establishment and spread in the EU

3.4.1. Host range

The major host of C. flaccumfaciens pv. flaccumfaciens is Phaseolus vulgaris (Tegli, 2011). Other Leguminosae crops are reported as hosts of this pest (EPPO, 2018), specifically several other species belonging to the genus Phaseolus, to the genera Vigna and Dolichos, including hyacinth bean (Lablab purpureus, syn. D. lablab), plus pea (Pisum sativum) and soybean (Glycine max).
The scientific literature also mentions as Leguminosae hosts the species *Lupinus polyphyllus* (Schuster and Sayre, 1967), *Cicer arietinum*, *Vicia faba*, *Vicia villosa*, *Lens culinaris* (Osdaghi et al., 2016) and *Zornia* spp. (Lenné et al., 1985), in addition to the Amaranthaceae species *Amaranthus retroflexus* and *Chenopodium album* (Schuster, 1959), and to *Ipomoea lonicophylla* (*"cowvine morning glory"*) (Conde and Diatloff, 1991).

Moreover, the host range of *C. flaccumfaciens* pv. *flaccumfaciens* may even be wider, with the bacterium able to adapt to new hosts. *C. flaccumfaciens* pv. *flaccumfaciens* was recently detected and isolated from several crops often grown in rotation with beans, such as wheat, corn, sunflower, alfalfa, barley, black oat, white oat, canola, ryegrass, and Solanaceous plants (Harveson et al., 2015; Gonçalves et al., 2017; Osdaghi et al., 2018). This makes the extent of the host range uncertain.

Among the regulated hosts of the bacterium (*P. vulgaris* and *Dolichos* spp.), there are currently few common bean genotypes resistant or tolerant to *C. flaccumfaciens* pv. *flaccumfaciens*, that so far have been identified outside the EU. Among them, only some are considered suitable for commercial production (Maringoni, 2002; Souza et al., 2006; Valentini et al., 2011; Urrea and Harveson, 2014).

Host plants are widely grown throughout the EU (Section 3.4.3) and surfaces are increasing (EUROSTAT, 2016).

### 3.4.2. Entry

| Is the pest able to enter into the protected zone? |
|--------------------------------------------------|
| **Yes**, the pest could enter the EU (including the PZ) on infected host seed. |

*C. flaccumfaciens* pv. *flaccumfaciens* could enter the EU (including the PZ) with:

- infected host seeds.

This pathway is closed by regulation for *Phaseolus vulgaris* and *Dolichos* spp. destined to the EU PZ, where *C. flaccumfaciens* pv. *flaccumfaciens* may still enter through infected seeds of non-regulated host plants (see Section 3.4.1), similarly to the rest of the EU.

No records of interception of *C. flaccumfaciens* pv. *flaccumfaciens* were registered in the Europhyt database between 2005 and October 2017. Nevertheless, the other reports from Spain and Germany suggest that introduction could be linked to the import of infected seeds. Although the origin of these seeds was not reported, this hypothesis is supported by the observation that just one or two cultivars of the host were found to be affected (Sammer and Reiher, 2012; Trapiello and González, 2012).

### 3.4.3. Establishment

| Is the pest able to become established in the protected zones? |
|---------------------------------------------------------------|
| **Yes**, the pest could established in the EU (including the PZ), as host plants are present and climatic conditions are favourable. |

Based on earlier reports and the information retrieved (EPPO, 2018), *C. flaccumfaciens* pv. *flaccumfaciens* can establish in the EU including the PZ. Host plants are widely grown throughout the EU. In 2015, dry pulses were grown on 2.2 million hectares in the EU (about 2% of the total arable land), with a production of about 5 million tonnes. France and the UK were the largest producer (both countries account for about 18% of the total production of the EU in tonnes), followed by Poland (about 14%). Additionally, Spain and Poland covered more than two-fifths of the grown area of dry pulses (over 0.5 million hectares) in the EU (EUROSTAT, 2016). The production of soybean has been recently increasing in Europe.

Provided that host plants are present, there is no evidence suggesting that climatic conditions might limit the establishment of *C. flaccumfaciens* pv. *flaccumfaciens*, both in the EU and in the PZ.
3.4.4. Spread

**Is the pest able to spread within the protected zone following establishment?**

Yes, the pest could spread within the EU (including the PZ) via movement of infected seed and other plant parts.

**Regulated Non-Quarantine Pests (RNQP): Is spread mainly via specific plants for planting, rather than via natural spread or via movement of plant products or other objects?**

Yes, plants for planting (i.e. seed) are the main means of spread of the pathogen.

The bacterium can spread at short and long distances mainly through movement of infected seeds (Hedges, 1926b; Zaumeyer, 1932; Zaumeyer and Thomas, 1957; Hsieh et al., 2006; Camara et al., 2009; Bastas and Sahin, 2017).

However, any part of an infected plant or its residues can be a potential source of inoculum (Silva Junior et al., 2012; Gonçalves et al., 2017). Several irrigation methods are reported to enhance survival and dispersion of *C. flaccumfaciens pv. flaccumfaciens* within fields where infected plants and/or their residues are present (Harveson and Yonts, 2007). Nevertheless, the importance of those pathways for spread is poorly documented.

3.5. Impacts

**Would the pests’ introduction have an economic or environmental impact in the protected zones?**

Yes, with uncertainties.

**RNQP: Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?**

Yes, with uncertainties.

In countries where the disease occurs, its incidence is variable. Values higher than 90% have been recorded in those USA bean-growing regions where *C. flaccumfaciens pv. flaccumfaciens* is endemic (Harveson et al., 2015). The recent *C. flaccumfaciens pv. flaccumfaciens* epidemics in North America, after about 20 years of absence, with the emergence of new pigmented variants, seem to be related to an increase in the virulence of the pathogen, which is attributed to jumps from alternative hosts (Harveson and Vidaver, 2008; Osdaghi et al., 2016).

However, no information is available on the yield losses observed in the EU and in the PZ where the pathogen has occasionally been reported to be present in the past.

3.6. Availability and limits of mitigation measures

**Are there measures available to prevent the entry into, establishment within or spread of the pest within the protected zones such that the risk becomes mitigated?**

Yes, see Section 3.6.2.

The only effective mitigation measure to prevent the entry, establishment and spread of the pest is to rely on healthy seeds (e.g. ban of import of seeds, seed production in pest free areas, pest free places of production or pest free sites of production).

Chemical treatments with pesticides or copper are not efficient against *C. flaccumfaciens pv. flaccumfaciens*. The use of antibiotics against plant pathogens is forbidden in the EU.

The broader use of resistant cultivars could also be an efficient mitigation measure provided that resistant commercial cultivars are available.

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4 See Section 2.1 on what falls outside EFSA’s remit.
3.6.1. Phytosanitary measures

*C. flaccumfaciens* pv. *flaccumfaciens* is listed in Council Directive 2000/29/EC only for seeds of *Phaseolus vulgaris* and of *Dolichos*, for the EU PZ (Greece, Portugal and Spain). However, the host range of the pathogen encompasses many other plant species (Section 3.4.1), for which similar measures (e.g. ban of importing seeds, seed production in pest free areas, pest free places of production or pest free sites of production) could be introduced.

An EPPO diagnostic standard exists for *C. flaccumfaciens* pv. *flaccumfaciens* (Tegli, 2011), whose wide and systematic application would be essential to limit its entry and spread both in the EU including the PZ.

Measures given by the Council Directive 2002/55/EC on certification and inspections aim to guarantee the health status of seeds before marketing.

3.6.1.1. Biological or technical factors limiting the feasibility and effectiveness of measures to prevent the entry, establishment and spread of the pest

- Absence of information on genetic resources for resistance in cultivars commonly grown in Europe;
- Infected seeds are generally asymptomatic.

3.6.1.2. Biological or technical factors limiting the ability to prevent the presence of the pest on plants for planting

- Limitations related to the analysis of seed (e.g. sensitivity, threshold).

3.6.2. Control methods

- Use of healthy and certified seed;
- Use of resistant cultivars;
- Cultural practices (e.g. proper crop rotation and ploughing of infested plant residues).

3.7. Uncertainty

- Information on the natural distribution of cultivated and wild hosts other than *P. vulgaris*;
- Role of reservoirs and pathways other than seeds (e.g. irrigation water and infected residues);
- Status of the pest in the EU, as many records date back to a long time ago;
- Seed transmission by other minor and alternative hosts.

4. Conclusions

All criteria assessed by EFSA for consideration as potential Union quarantine pest are met (Table 6).
**Table 6:** The Panel’s conclusions on the pest categorisation criteria defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column)

| Criterion of pest categorisation | Panel’s conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest | Panel’s conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest | Key uncertainties |
|----------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------|
| Identity of the pest (Section 3.1) | The identity of the pest is clear | The identity of the pest is clear | None |
| Absence/presence of the pest in the EU territory (Section 3.2) | The pest was sporadically recorded in several EU Member States in the past, but is currently not known to occur in the EU | The pest was sporadically recorded in several EU Member States in the past, but is currently not known to occur in the EU | Not all notifications are updated |
| Regulatory status (Section 3.3) | Currently regulated in Directive 2000/29/EC on seed of *Phaseolus vulgaris* and *Dolichos* spp. in protected zones only (Greece, Portugal and Spain). *Phaseolus vulgaris* seed is also regulated in the marketing Directive 2002/55/EC. | Currently regulated in Directive 2000/29/EC on seed of *Phaseolus vulgaris* and *Dolichos* spp. in protected zones only (Greece, Portugal and Spain). *Phaseolus vulgaris* seed is also regulated in the marketing Directive 2002/55/EC. | None |
| Pest potential for entry, establishment and spread in the EU territory (Section 3.4) | The pest is able to enter the EU, the main pathway being seed. Should it enter, it may establish. It may then spread through seeds and other minor pathways (irrigation) | Plants for planting (i.e. seed) are the main means of spread of the pathogen | There is uncertainty on the extent of the host range. Seed transmission by minor and alternative hosts has not been demonstrated |
| Potential for consequences in the EU territory (Section 3.5) | Yes, should the pest be introduced in the EU, it may have economic impacts | Yes, should the pest be introduced in the EU, it may have an impact on the intended use of plants for planting. | No information was found on the yield losses in the EU MS where presence was declared |
| Available measures (Section 3.6) | Use and release of healthy seeds (e.g. pest free production, certification) | Use and release of healthy seeds (e.g. pest free production, certification) Cultural practices, (e.g. proper crop rotation and ploughing of infested plant residues) | None |
| Conclusion on pest categorisation (Section 4) | All criteria assessed by EFSA for consideration of *C. flaccumfaciens* pv. *flaccumfaciens* as potential Union quarantine pest are met | The criterion on pest presence in the EU is not met | |
| Aspects of assessment to focus on/scenarios to address in future if appropriate | The main knowledge gaps concern: - The natural distribution on cultivated and wild hosts other than *P. vulgaris*; - The role of reservoirs and pathways other than seed (e.g. irrigation water and infected residues); - The status of the pest in the EU as many records date back to a long time ago; - Seed transmission by minor and alternative hosts. | | |

*Curtobacterium flaccumfaciens* pv. *flaccumfaciens*: pest categorisation
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### Abbreviations

| Abbreviation | Full Form |
|--------------|-----------|
| DG SANTE     | Directorate General for Health and Food Safety |
| EPPO         | European and Mediterranean Plant Protection Organization |
| FAO          | Food and Agriculture Organization |
| IPPC         | International Plant Protection Convention |
| MS           | Member State |
| PCR          | polymerase chain reaction |
| PLH          | EFSA Panel on Plant Health |
| PZ           | Protected Zone |
| RNQP         | Regulated Non-Quarantine Pest |
| TFEU         | Treaty on the Functioning of the European Union |
| ToR          | Terms of Reference |

*Curtobacterium flaccumfaciens pv. flaccumfaciens:* pest categorisation

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