NAME OF THE ORGANISM: Candidatus Phytoplasma ulmi (Elm phloem necrosis phytoplasma) (PHYPUL)

GENERAL INFORMATION ON THE PEST

Name as submitted in the project specification (if different to the preferred name):

Pest category:

Bacteria **1- Identity of the pest/Level of taxonomic listing:**
Is the organism clearly a single taxonomic entity and can it be adequately distinguished from other entities of the same rank?

Yes
Is the pest defined at the species level or lower?:

Yes
Can listing of the pest at a taxonomic level higher than species be supported by scientific reasons or can species be identified within the taxonomic rank which are the (main) pests of concern?

* Not relevant: Forest reproductive material sector, Ornamental sector

Is it justified that the pest is listed at a taxonomic rank below species level?

Not relevant
Conclusion:

* Candidate: Forest reproductive material sector, Ornamental sector

Justification (if necessary):

When replying to the RNQP Questionnaire for the Forestry Sector, ENA only proposed the listing of Ulmus procera. However ENA confirmed later by email that they would agree with a listing at a level higher than species: Host range is confined to the family Ulmaceae, and mostly to the Ulmus genus. At least 13 Ulmus species are considered as host plants (EFSA, 2014). Experts decided to perform the evaluation of the RNQP status for the entire Ulmus genus as well as for Zelkova serrata, belonging to the Ulmaceae family, which is also a host plant (EFSA, 2014) and could be used as rootstock. **2 – Status in the EU:**

Is this pest already a quarantine pest for the whole EU?

No
Presence in the EU:

Yes
Conclusion:

candidate
Justification (if necessary):

Even though this pest is listed in annex IA1 (quarantine pest, absent from the EU) of Council Directive 2000/29/EC, this pest is a candidate for the RNQP status according to the IIA2AWG. Data of the presence of this pest on the EU territory are available in EPPO Global Database (<https://gd.eppo.int/>). Since no targeted surveys are undertaken, the distribution of CPu in Europe is unclear and suspected to be underestimated (EU COM, 2014). More recently the pest was found in 2016 in Croatia (Katanic et al., 2016) and in Slovenia (to be published). The pest is probably native from the EU in regards to the high genomic diversity found on the European territory.

HOST PLANT N°1: Ulmus (1ULMG) for the Forest reproductive material sector.

Origin of the listing:

IIA2AWG
Plants for planting:

Plants intended for planting, other than seeds **3 - Is the pest already listed in a PM4 standard on the concerned host plant?**

No
Conclusion:

Evaluation continues **4 - Are the listed plants for planting the main\* pathway for the "pest/host/intended use" combination? (\*: significant compared to others):**

?
Conclusion:

Justification:

CPu is graft transmissible and is efficiently transmitted through plant propagation material, which is widely used by nurseries. However, in area where the pest is present, CPu is also transmitted by sap-feeding insects (e.g. Macropsis glandacea, Allygidius furcatus, Cixius sp., Lassus scutellaris). Philaenus spumarius is also identified as a vector. Vectors are persistently and systemically infected after a latent period. Controlling the vectors of CPu is quite impracticable in natural environments (EFSA, 2014). Experts considered that there are no practical measures to prevent infections of seedlings in forest nurseries by vectors, which are very good fliers (only nets, no insecticide suppression is effective). **5 - Economic impact:**
Are there documented reports of any economic impact on the host?

Yes
Justification:

Cpu has been reported to cause leaf yellowing and epinasty, witches' brooms, phloem degeneration, and root and tree mortality (EFSA, 2014). High impact (plant mortality) is registered in USA. Elm species in European forests are usually considered less susceptible; the symptoms reported are associated with decline but less often with plant mortality (EU COM, 2014). The SEWG concluded that ‘Ca Phytoplasma ulmi’ is only really harmful for North American elms. The economic impact is considered as acceptable for European elms.
Remark: elm cultivars obviously could be infected in ornamental nurseries (eg. Ulmus cultivar Morfeo (elm) in the United Kingdom) and the pathogen CPu could be transferred to saplings – for these vegetatively produced horticultural saplings some restrictions could be applied. However it is not a concern for forest nurseries.
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)

Minimal
Is the economic impact due to the presence of the pest on the named host plant for planting, acceptable to the propagation and end user sectors concerned?

Yes
Is there unacceptable economic impact caused to other hosts (or the same host with a different intended use) produced at the same place of production due to the transfer of the pest from the named host plant for planting?

No
Conclusion:

Not candidate
Justification:

Economic impact is so far minimal (susceptible North American species of Ulmus, rather nonsusceptible and prevalence of asymptomatic infections in European elms). **CONCLUSION ON THE STATUS:**

Disqualified: economic impact is minimal and considered as acceptable for the forestry sector. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

Yes
Proposed Tolerance levels:

Delisting. **9 - Risk management measures:**
Is there a need to change the Risk management measure:

Yes
Proposed Risk management measure:

Delisting. **REFERENCES:**

* EFSA Panel on Plant Health (PLH) (2014) Scientific Opinion on the pest categorisation of Elm phloem necrosis mycoplasm. EFSA Journal 2014; 12(7):3773, 34 pp. doi:10.2903/j.efsa.2014.3773". <http://www.efsa.europa.eu/en/efsajournal/doc/3773.pdf>;
* EU COM (2014) Recommendation of the Working Group on the Annexes of the Council Directive 2000/29/EC – Section II – Listing of Harmful Organisms as regards the future listing of Elm phloem necrosis mycoplasma (renamed Candidatus Phytoplasma ulmi);
* Katanic Z, Krstin L, Jezic M, Zebec M & Curkovic-Perica M (2016) Molecular characterization of elm yellows phytoplasmas in Croatia and their impact on Ulmus spp. Plant Pathology 65, 1430-1440;

HOST PLANT N°2: Ulmus (1ULMG) for the Ornamental sector.

Origin of the listing:

IIA2AWG
Plants for planting:

Plants intended for planting, other than seeds **3 - Is the pest already listed in a PM4 standard on the concerned host plant?**

No
Conclusion:

Evaluation continues **4 - Are the listed plants for planting the main\* pathway for the "pest/host/intended use" combination? (\*: significant compared to others):**

?
Conclusion:

Justification:

CPu is graft transmissible and is efficiently transmitted through plant propagation material, which is widely used by nurseries. However, in area where the pest is present, CPu is also transmitted by sap-feeding insects (e.g. Macropsis glandacea, Allygidius furcatus, Cixius sp., Lassus scutellaris). Philaenus spumarius is also identified as a vector. Vectors are persistently and systemically infected after a latent period. Controlling the vectors of CPu is quite impracticable in natural environments (EFSA, 2014). Bonsai elm ornamental are more susceptible than varieties used in forest strands. There is gap of knowledge about host plant sensitivity and the ecology and behavior of vector species. Because of these uncertainties, plant for planting is still considered as a significant pathway compared to other pathways. CPu is still candidate for the RNQP Status. **5 - Economic impact:**
Are there documented reports of any economic impact on the host?

Yes
Justification:

Cpu has been reported to cause leaf yellowing and epinasty, witches' brooms, phloem degeneration, and root and tree mortality (EFSA, 2014). High impact (plant mortality) is registered in USA. Elm species in European forests are usually considered less susceptible; the symptoms reported are associated with decline but less often with plant mortality. However, sensitive American species are also grown in the EU (EU COM, 2014).
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)

Medium
Is the economic impact due to the presence of the pest on the named host plant for planting, acceptable to the propagation and end user sectors concerned?

No
Conclusion:

Candidate
Justification:

Ornamental Elm may be more susceptible than forest strands. **6 - Are there feasible and effective measures available to prevent the presence of the pest on the plants for planting at an incidence above a certain threshold (including zero) to avoid an unacceptable economic impact as regards the relevant host plants?**

No

Conclusion:

not candidate
Justification:

According to EFSA (2014) and EPPO (1997) controlling the vectors of CPu is quite impracticable in natural environments and it is not possible to cure a plant infected by Cpu. **CONCLUSION ON THE STATUS:**

Disqualified: no feasible and effective measures available. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

Yes
Proposed Tolerance levels:

Delisting. **9 - Risk management measures:**
Is there a need to change the Risk management measure:

Yes
Proposed Risk management measure:

Delisting. **REFERENCES:**

* EFSA Panel on Plant Health (PLH) (2014) Scientific Opinion on the pest categorisation of Elm phloem necrosis mycoplasm. EFSA Journal 2014; 12(7):3773, 34 pp. doi:10.2903/j.efsa.2014.3773". <http://www.efsa.europa.eu/en/efsajournal/doc/3773.pdf>;
* EU COM (2014) Recommendation of the Working Group on the Annexes of the Council Directive 2000/29/EC – Section II – Listing of Harmful Organisms as regards the future listing of Elm phloem necrosis mycoplasma (renamed Candidatus Phytoplasma ulmi);

HOST PLANT N°3: Zelkova serrata (ZELSE) for the Forest reproductive material sector.

Origin of the listing:

Forestry SEWG
Plants for planting:

Plants intended for planting, other than seeds **3 - Is the pest already listed in a PM4 standard on the concerned host plant?**

No
Conclusion:

Evaluation continues **4 - Are the listed plants for planting the main\* pathway for the "pest/host/intended use" combination? (\*: significant compared to others):**

?
Conclusion:

Justification:

CPu is graft transmissible and is efficiently transmitted through plant propagation material, which is widely used by nurseries. However, in area where the pest is present, CPu is also transmitted by sap-feeding insects (e.g. Macropsis glandacea, Allygidius furcatus, Cixius sp., Lassus scutellaris). Philaenus spumarius is also identified as a vector. Vectors are persistently and systemically infected after a latent period. Controlling the vectors of CPu is quite impracticable in natural environments (EFSA, 2014). Experts considered that there are no practical measures to prevent infections of seedlings in forest nurseries by vectors, which are very good fliers (only nets, no insecticide suppression is effective). **5 - Economic impact:**
Are there documented reports of any economic impact on the host?

Yes
Justification:

Several plants of Z. serrata grown in Ancona, Marche region (central eastern Italy), have shown symptoms of chlorosis which involve the whole plant or some
of the branches, foliar reddening on one or more branches, attenuation of apical dominance and proliferation of lateral shoots, witches’ broom, reduced
growth and stunting of the plant (Romanazzi & Murolo, 2008).
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)

Minimal
Is the economic impact due to the presence of the pest on the named host plant for planting, acceptable to the propagation and end user sectors concerned?

Yes
Is there unacceptable economic impact caused to other hosts (or the same host with a different intended use) produced at the same place of production due to the transfer of the pest from the named host plant for planting?

No
Conclusion:

Not candidate
Justification:

Economic impact is so far minimal for the forestry sector. **CONCLUSION ON THE STATUS:**

Disqualified: economic impact is minimal and considered as acceptable for the forestry sector. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

No
Proposed Tolerance levels:

Not recommended for the RNQP status. **9 - Risk management measures:**
Is there a need to change the Risk management measure:

No
Proposed Risk management measure:

Not recommended for the RNQP status. **REFERENCES:**

* EFSA Panel on Plant Health (PLH) (2014) Scientific Opinion on the pest categorisation of Elm phloem necrosis mycoplasm. EFSA Journal 2014; 12(7):3773, 34 pp. doi:10.2903/j.efsa.2014.3773". <http://www.efsa.europa.eu/en/efsajournal/doc/3773.pdf>;
* EU COM (2014) Recommendation of the Working Group on the Annexes of the Council Directive 2000/29/EC – Section II – Listing of Harmful Organisms as regards the future listing of Elm phloem necrosis mycoplasma (renamed Candidatus Phytoplasma ulmi);
* Murolo S & Romanazzi G (2008) Infestations of Candidatus Phytoplasma ulmi in Ulmus parvifolia, Ulmus sp. and Zelkova serrata trained as bonsais. Journal of Plant Pathology 90, 345-349;
* Romanazzi G & Murolo S (2008) 'Candidatus Phytoplasma ulmi' causing yellows in Zelkova serrata newly reported in Italy. Plant Pathology (2008) 57, 1174.
* Katanic Z, Krstin L, Jezic M, Zebec M & Curkovic-Perica M (2016) Molecular characterization of elm yellows phytoplasmas in Croatia and their impact on Ulmus spp. Plant Pathology 65, 1430-1440;