NAME OF THE ORGANISM: Arabis mosaic virus (ARMV00)

GENERAL INFORMATION ON THE PEST

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

Pest category:

Viruses and viroids **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: Vegetable propagating and planting material (other than seeds) sector, Vine sector, Ornamental sector, Fruits (including hops) sector

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

Not relevant
Conclusion:

* Candidate: Vegetable propagating and planting material (other than seeds) sector, Vine sector, Ornamental sector, Fruits (including hops) sector

**2 – Status in the EU:**

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

No
Presence in the EU:

Yes
List of countries (EPPO Global Database):

Austria (2014); Belgium (2007); Bulgaria (1995); Croatia (2012); Czech Republic (2007); Denmark (1993); Finland (2011); France (2000); Germany (2009); Hungary (2009); Ireland (1997); Italy (2007); Latvia (1990); Lithuania (2006); Luxembourg (1996); Netherlands (2015); Poland (2012); Romania (2011); Slovenia (1996); Spain (2011); Sweden (1993); United Kingdom (1996); United Kingdom/England (2002); United Kingdom/Northern Ireland (1984); United Kingdom/Scotland (1994)
Conclusion:

candidate
Justification (if necessary):

Data of the presence of this pest on the EU territory are available in EPPO Global Database (<https://gd.eppo.int/>).

HOST PLANT N°1: Fragaria (1FRAG) 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?**

Yes
Conclusion:

Evaluation continues

Justification (if necessary):

Fragaria x ananassa is covered by EPPO PM 4/11 Standard. There are various varieties of ornamental strawberry grown, of different species such as F. chiloensis or F. vesca, with different flower colours or foliage. Fragaria chiloensis, F. vesca and F. x ananassa (cultivated strawberry) are all minor hosts according to the EPPO Global Database. Ornamental strawberry may be propagated vegetatively (e.g. cv. Lipstick) or by seed (alpine strawberry F. vesca). **4 - Are the listed plants for planting the main\* pathway for the "pest/host/intended use" combination? (\*: significant compared to others):**

Yes
Conclusion:

Candidate

Justification:

Some clones of Fragaria vesca (Alpine) showed chlorotic symptoms when infected with ArMV, but most are symptomless except for a loss of vigour. No immunity was detected amongst 13 species of Fragaria (F. chiloensis, F. corymbosa, F. cuneifolia, F. moschata, F. moupinensis, F, nilgerrensis F. nipponica, F. nubicola, F. orientalis, F. platypeltata, F. vesca, F. virginiana and F. viridis) (USDA, 1987). Compared to strawberry plants for fruit production symptoms seem to be less severe but this is based on limited information, so it is concluded they could react to the pest in a similar way. Therefore it is concluded plants for planting are a pathway, and can be considered a significant pathway compared to others. **5 - Economic impact:**
Are there documented reports of any economic impact on the host?

?
Justification:

No specific documented references could be found for impacts on ornamental strawberry, as distinct from F. x ananassa - cultivated strawberry.
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)

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:

Specific evidence cannot be found of economic impact on ornamental strawberries. Impacts on strawberries for fruit production have been recorded. Experts concluded that ornamental strawberries should not be considered as a significant pathway to economic damage in fruit production (only one among many vegetatively propagated ornamental hosts). **CONCLUSION ON THE STATUS:**

Disqualified: ornamentals are not a significant pathway to economic damage in fruit production (only one among many vegetatively propagated ornamental hosts). **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) (2013) Scientific opinion on the risk to plant health posed by Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus to the EU territory with the identification and evaluation of risk reduction options. EFSA Journal 2013;11(10):3377, 83 pp. doi:10.2903/j.efsa.2013.3377". <http://www.efsa.europa.eu/en/efsajournal/doc/3377.pdf>;
* EPPO (2008) Certification scheme for strawberry. Bulletin OEPP/EPPO Bulletin 38, 430–437;
* 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 Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus;
* United States Department of Agriculture (USDA) (1987) Virus Diseases of Small Fruit. Ed. Converse, R.H., Agriculture Handbook, 631. Available at: <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1394&context=bioscifacpub>;

HOST PLANT N°2: Fragaria (1FRAG) for the Fruits (including hops) 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?**

Yes
Conclusion:

Qualified **CONCLUSION ON THE STATUS:**

Recommended for listing as an RNQP, based on EPPO PM 4 Standard. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

No
Proposed Tolerance levels:

Zero tolerance based at least on visual examination for all categories of material, and on testing for Pre-basic and Basic material. A failure rate at 2%, for all viruses together, is proposed for the certified Fragaria material. **9 - Risk management measures:**
Is there a need to change the Risk management measure:

Yes
Proposed Risk management measure:

Based on a visual examination carried out during the last growing season at an appropriate time for the expression of symptoms.
- Non-certified material (‘CAC’): Plants showing symptoms of nepoviruses should be rogued out and destroyed immediately (or if symptoms are not clear, plants may be tested and need not be destroyed if found free).
- Pre-basic, Basic, Certified material, additional measures (in addition to non-certified) could include:
• Testing of pre-basic and basic;
• Isolation;
• Soil testing for virus vector nematodes.
Justification (if necessary):

For Fragaria, two visual examinations are mandatory in the Marketing directive. However the SEWG concluded that for this virus, only one inspection would be sufficient. **REFERENCES:**

* EFSA Panel on Plant Health (PLH) (2013) Scientific opinion on the risk to plant health posed by Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus to the EU territory with the identification and evaluation of risk reduction options. EFSA Journal 2013;11(10):3377, 83 pp. doi:10.2903/j.efsa.2013.3377". <http://www.efsa.europa.eu/en/efsajournal/doc/3377.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 Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus;

HOST PLANT N°3: Olea europaea (OLVEU) for the Fruits (including hops) sector.

**CONCLUSION ON THE STATUS:**

Not evaluated: from the fruit Marketing Directive (see Terms of reference)

HOST PLANT N°4: Prunus avium (PRNAV) for the Fruits (including hops) sector.

**CONCLUSION ON THE STATUS:**

Not evaluated: from the fruit Marketing Directive (see Terms of reference)

HOST PLANT N°5: Prunus cerasus (PRNCE) for the Fruits (including hops) sector.

**CONCLUSION ON THE STATUS:**

Not evaluated: from the fruit Marketing Directive (see Terms of reference)

HOST PLANT N°6: Rheum (1RHEG) for the Vegetable propagating and planting material (other than seeds) sector.

**CONCLUSION ON THE STATUS:**

Not evaluated: This pest/host combination was not identified by any EU MS in the RNQP Questionnaire as requiring a revision of current thresholds and or a revision of current management measures. This pest/host combination was not identified by the experts of the vegetable SEWG as being a candidate for the RNQP Status with specific tolerance levels and/or specific risk management measures. Experts recommended that this pest/host combination should be covered in the future by the 'substantially free from' requirement that will remain in the Vegetable propagating and planting (excluding seeds) EU Marketing Directives.

HOST PLANT N°7: Ribes (1RIBG) for the Fruits (including hops) sector.

**CONCLUSION ON THE STATUS:**

Not evaluated: from the fruit Marketing Directive (see Terms of reference)

HOST PLANT N°8: Rosa (1ROSG) for the Ornamental sector.

Origin of the listing:

Commission Directive 93/49/EEC
Plants for planting:

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

Yes
Conclusion:

Evaluation continues

Justification (if necessary):

Experts proposed to continue the evaluation regarding the economic impact. **4 - Are the listed plants for planting the main\* pathway for the "pest/host/intended use" combination? (\*: significant compared to others):**

Yes
Conclusion:

Candidate

Justification:

Rose plants are a pathway for AMV and the virus is transmitted by Longidorus and Xiphinema virus vector nematodes in the soil. For certified material, testing of nuclear stock and precautions to prevent infection by AMV are included in the Rosa EPPO PM 4 Standard.
The use of fields (or soil media) for planting uninfested by the vectors (or if present found free by testing), weed control and prevention of infested soil from entering the field or facility, would mean that infested plants for planting could then be the main source of infection by AMV. **5 - Economic impact:**
Are there documented reports of any economic impact on the host?

Yes
Justification:

AMV or SLRV apparently induced either symptomless infection in rose cultivars and Rosa spp., or leaf symptoms ranging from small chlorotic flecks to severe chlorotic mosaic and, occasionally, plant death. After 7 years in soil containing viruliferous nematodes, AMV and/or SLRV were transmitted to c. 80% of healthy plants. AMV and particularly SLRV were each damaging to field-grown maiden rose bushes. Diseased bushes were less vigorous and half of the AMV-infected bushes conformed to the British Standards Institution specifications for maiden bush roses (Thomas, 1984).
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)

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:

Experts of the SEWG stopped the evaluation, considering that a 'substantially free from' requirement (absence of visual symptoms on the traded material) should be sufficient for this pest/host combination. Later, experts of the coreHEWGplus considered that this pest could cause significant damage on Rosa. **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?**

Yes

Conclusion:

candidate
Justification:

 **7- Is the quality of the data sufficient to recommend the pest to be listed as a RNQP?**

Yes

Conclusion:

Candidate
Justification:

 **CONCLUSION ON THE STATUS:**

Not recommended for listing as an RNQP: This pest/host combination was not identified by any EU MS in the RNQP Questionnaire as requiring a revision of current thresholds and or a revision of current management measures. This pest/host combination was not identified by the experts of the ornamental SEWG as being a candidate for the RNQP Status with specific tolerance levels and/or specific risk management measures. It was analysed by coherence with the other host plants analysed during the RNQP project, because of the listing of the pest in Annex IIA2 of Council Directive 2000/29/EC. Experts concluded that this pest/host/intended use combination meets all the criteria for RNQP status. However, the requirement for absence of visual symptoms on the traded material (current general 'Substantially free from' requirement in the EU) was considered to be sufficient. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

No
Proposed Tolerance levels:

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

No
Proposed Risk management measure:

Delisting. **REFERENCES:**

* EFSA Panel on Plant Health (PLH) (2013) Scientific opinion on the risk to plant health posed by Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus to the EU territory with the identification and evaluation of risk reduction options. EFSA Journal 11, 3377. Available at: <http://www.efsa.europa.eu/en/efsajournal/doc/3377.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 Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus;
* Thomas BJ (1984) Epidemiology of three viruses infecting the rose in the United Kingdom. Annals of Applied Biology 105, 213-222;

HOST PLANT N°9: Rubus (1RUBG) for the Fruits (including hops) 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?**

Yes
Conclusion:

Qualified **CONCLUSION ON THE STATUS:**

Recommended for listing as an RNQP, based on EPPO PM 4 Standard. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

No
Proposed Tolerance levels:

Zero tolerance based at least on visual examination for all categories of material, and on testing for Pre-basic and Basic material. A failure rate at 0.5%, for all viruses together, is proposed for the certified Rubus material. **9 - Risk management measures:**
Is there a need to change the Risk management measure:

Yes
Proposed Risk management measure:

Based on a visual examination carried out during the last growing season at an appropriate time for the expression of symptoms.
- Non-certified material (‘CAC’): Plants showing symptoms of nepoviruses should be rogued out and destroyed immediately (or if symptoms are not clear, plants may be tested and need not be destroyed if found free).
- Pre-basic, Basic, Certified material, additional measures (in addition to non-certified) could include:
• Testing of pre-basic and basic;
• Isolation;
• Soil testing for virus vector nematodes. **REFERENCES:**

* EFSA Panel on Plant Health (PLH) (2013) Scientific opinion on the risk to plant health posed by Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus to the EU territory with the identification and evaluation of risk reduction options. EFSA Journal 2013;11(10):3377, 83 pp. doi:10.2903/j.efsa.2013.3377". <http://www.efsa.europa.eu/en/efsajournal/doc/3377.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 Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus;

HOST PLANT N°10: Rubus (1RUBG) 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?**

Yes
Conclusion:

Evaluation continues

Justification (if necessary):

Rubus is covered by EPPO PM 4/10 Standard. There are at least 10 species of Rubus grown for ornamental purposes for different flower colours or foliage. Experts decided to continue the evaluation in regards to the economic impact. **4 - Are the listed plants for planting the main\* pathway for the "pest/host/intended use" combination? (\*: significant compared to others):**

Yes
Conclusion:

Candidate

Justification:

Usually propagated vegetatively and no references could be found to the susceptibility or resistance of ornamental Rubus as compared to the variation in normal Rubus cultivars, so it is proposed to conclude they would react to the pest in a similar way. **5 - Economic impact:**
Are there documented reports of any economic impact on the host?

?
Justification:

No specific documented references could be found for impacts on ornamental Rubus species as distinct from fruiting species.
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)

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:

Specific evidence cannot be found of economic impact on ornamental rubus. Impacts on rubus for fruit production have been recorded. Experts concluded that ornamental strawberries should not be considered as a significant pathway to economic damage in fruit production (only one among many vegetatively propagated ornamental hosts). **CONCLUSION ON THE STATUS:**

Disqualified: Experts considered that rubus grown as ornamentals are not a significant pathway to economic damage in fruit production (only one among many vegetatively propagated ornamental hosts). **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) (2013) Scientific opinion on the risk to plant health posed by Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus to the EU territory with the identification and evaluation of risk reduction options. EFSA Journal 2013;11(10):3377, 83 pp. doi:10.2903/j.efsa.2013.3377". <http://www.efsa.europa.eu/en/efsajournal/doc/3377.pdf>;
* EPPO (2009) Certification scheme for Rubus. Bulletin OEPP/EPPO Bulletin 39, 271–277;
* 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 Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus;

HOST PLANT N°11: Vitis (1VITG) for the Vine sector.

Origin of the listing:

Council Directive 68/193/EEC
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?**

Yes
Conclusion:

Qualified **CONCLUSION ON THE STATUS:**

Recommended for listing as an RNQP, based on EPPO PM 4 Standard. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

Yes
Proposed Tolerance levels:

Zero tolerance based on visual examination, and on testing stock nurseries for Pre-basic, Basic and Certified material. Experts also agreed to below the failure rate for nepoviruses from 10% to 5% for the non-certified material (within a 10 % overall limit for virus symptoms). **9 - Risk management measures:**
Is there a need to change the Risk management measure:

Yes
Proposed Risk management measure:

Based on visual examination carried out at least twice during the last growing season at appropriate times for the expression of symptoms.
- Non-certified ('standard'): not more than 5% [reduced from current 10%] of plants showing symptoms of nepoviruses (Arabis mosaic virus, Grapevine fanleaf virus and Cherry leaf roll virus) and not more than 10% of plants showing any virus symptoms and all plants showing symptoms rogued out and destroyed within two weeks.
- Pre-basic (“initial”), Basic, Certified: additional measures (in addition to non-certified) could include an isolation distance from other vines, a periodic testing of mother plants, a soil testing for virus vector nematodes, and a rest period from host plants of the virus before planting. **REFERENCES:**

* EFSA Panel on Plant Health (PLH) (2013) Scientific opinion on the risk to plant health posed by Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus to the EU territory with the identification and evaluation of risk reduction options. EFSA Journal 2013;11(10):3377, 83 pp. doi:10.2903/j.efsa.2013.3377". <http://www.efsa.europa.eu/en/efsajournal/doc/3377.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 Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus;