NAME OF THE ORGANISM: Bemisia tabaci (BEMITA)

GENERAL INFORMATION ON THE PEST

Name as submitted in the project specification (if different to the preferred name):
 
  
Pest category:
 
Insecta **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: Ornamental sector

Is it justified that the pest is listed at a taxonomic rank below species level?
 
Not relevant  
Conclusion:

* Candidate: Ornamental 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 (2011); Belgium (2013); Bulgaria (2003); Croatia (2008); Cyprus (2011); Czech Republic (1994); France (2010); France/Corse (1998); Germany (1993); Greece (2013); Greece/Kriti (1994); Hungary (1993); Italy (1994); Italy/Sicilia (2008); Italy/Sardegna (1994); Malta (2012); Netherlands (2015); Poland (1992); Portugal (2008); Portugal/Madeira (2008); Spain (2015); Spain/Islas Canárias (2012); Spain/Islas Baleares (2011); Sweden (1998); United Kingdom (2010); United Kingdom/England (2009)  
Conclusion:
 
candidate  
Justification (if necessary):
 
Only non-European populations of Bemisia tabaci are listed in annex IA1 of Council directive 2000/29/EC. Data of the presence of this pest on the EU territory are available in EPPO Global Database (<https://gd.eppo.int/>). Experts commented that 'non-European populations' is usually only considered in relation to the origin of the plants/consignment on which the pest is found.

HOST PLANT N°1: Begonia x hiemalis (BEGEH) for the Ornamental sector.

Origin of the listing:
 
Commission Directive 93/49/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?**
 
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):**
 
No 
Conclusion:
 
Not candidate  
 
Justification:
 
Begonias are perennials and are propagated from cuttings. The host range of B. tabaci covers more than 1 000 species (Mound & Halsey, 1978; De Barro, 1995; Chu et al., 2006; Evans, 2007; Li et al. 2011; EFSA, 2013). There are some inconsistencies in various publications on the suitability of different Begonia species as being B. tabaci host plants. Bemisia tabaci is not listed on Begonia x hiemalis (EPPO Global Database; EFSA, 2013) though Begonia ravenii and B. semperflorens are listed as hosts (EFSA, 2013). In the unconfirmed host plants of EFSA (2013), compiled from DAF-GWA (2008) and Evans (2007), Begonia sp. is not included, although it is in the DAF-GWA (2008) table. Fransen (1994) reported 3 to 7 annual findings of B. tabaci on Begonia in the greenhouses in the Netherlands and concluded that this is perfect host plant for the pest. The infestation rate (nymphs and pupae density) of host plants of B. tabaci was categorized in four grades in China (Li et al., 2011). Begonia ravenii and Begonia semperflorens were classified in the 1st infestation grade (average number of B. tabaci nymphs and pupae ≤ 10/10 cm² leaf area). Dalmon et al. (2008) sampled B. tabaci greenhouse populations in southern France from begonia (Begonia x elatior= Begonia x hiemalis). Ornamental trade (mainly Poinsettia and Begonia spp.) is the main pathway of introduction and spread of Bemisia tabaci Mediterraneann species (MED, formerly referred to as biotype Q) to ornamental and vegetable greenhouses and to open fields in Brazil (Moraes et al., 2017). Six interceptions of B. tabaci on Begonia plant for plantings from the EU Member States have been reported in the EUROPHYT database from 1993 to 2011. Genus Begonia is included in De Barro (1995) ornamental host plant list. Experts concluded that plants for planting of Begonia x hiemalis are not a significant pathway, even though it may incidentally be a pathway for 'hitch-hikers'. **CONCLUSION ON THE STATUS:**
 
Disqualified: Not recommended for RNQP status - not a significant pathway for this host. **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:**

* Department of Agriculture and Food, Goverment of Western Australia (DAF-GWA) (2008) A list of recorded host plants of Bemisia tabaci including silverleaf whitefly. Previously available at <http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/ins/slwfhostlist.pdf>;
* Dalmon A, Halkett F, Granier M, Delatte H & Peterschmitt M (2008) Genetic structure of the invasive pest Bemisia tabaci: evidence of limited but persistent genetic differentiation in glasshouse populations. Heredity 100, 316–325;
* De Barro PJ (1995) Bemisia tabaci biotype B: a review of its biology, distribution and control. CSIRO Australia Division of Entomology Technical Paper. 1-55;
* De Barro PJ & Ahmed MZ (2011) Genetic networking of the Bemisia tabaci cryptic species complex reveals pattern of biological invasions. PloS ONE, 6, e25579. Available from <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0025579>;
* EFSA Panel on Plant Health (2013) (PLH) Scientific Opinion on the risks to plant health posed by Bemisia tabaci species complex and viruses it transmits for the EU territory. EFSA Journal 11, 3162. Available online: <http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2013.3162/epdf>;
* European and Mediterranean Plant Protection Organisation (EPPO) (2012) EPPO technical document no. 1061: EPPO study on the risk of imports of plants for planting. Available from www.eppo.int/QUARANTINE/EPPO\_Study\_on\_Plants\_for\_planting.pdf;
* Evans GA (2007) Host plant list of the whiteflies (Aleyrodidae) of the world. USDA/Animal Plant Health Inspection Service (APHIS), 290 pp. Available from <http://www.sel.barc.usda.gov:8080/1WF/WhiteflyHost.pdf>;
* Fransen JJ (1994) Bemisia tabaci in the Netherlands; here to stay? Pesticide Science 42, 129-134;
* Li SJ, Xue X, Ahmed MZ, Ren SX, Du YZ, Wu JH, Cuthbertson AGS & Qiu BL (2011) Host plants and natural enemies of Bemisia tabaci (Hemiptera, Aleyrodidae) in China. Insect Science 18, 101-120;
* Moraes LA, Marubayashi, Yuli VA, Ghanim M, Bello VH, De Marchi BR, Barbosa LF, Ramos-Sobrinho R, Boykin L, Krause-Sakate R & Pavan MA (2017) New invasion of Bemisia tabaci Mediterraneann species in in Brazil associated to ornamental plants. Phytoparasitica, 1-9;
* Mound LA & Halsey SH (1978) Whitefly of the World. A Systematic Catalogue of the Aleyrodidae (Homoptera) with Host Plant and Natural Enemy Data. British Museum (Natural History) and Chichester, Wiley, London, UK, 340 pp;

HOST PLANT N°2: Chrysanthemum x grandiflorum (Dendranthema x grandiflorum) (CHYHO) for the Ornamental sector.

Origin of the listing:
 
Commission Directive 93/49/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?**
 
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):**
 
No 
Conclusion:
 
Not candidate  
 
Justification:
 
The host range of B. tabaci covers more than 1 000 species (Mound and Halsey, 1978; De Barro, 1995; Chu et al., 2006; Evans, 2007; Li et al. 2011; EFSA, 2013). De Barro (1995), Evans (2007), DAF-GWA (2008) and EFSA (2013) listed Chrysanthemum x morifolium and Chrysanthemum sp as a host species of B. tabaci. The infestation rate (nymphs and pupae density) of host plants of B. tabaci was categorized in four grades in China whereas C. morifolium was classified at the 3rd infestation grade (average number of B. tabaci nymphs and pupae between 31–50 /10 cm² leaf area) (Li et al., 2011). Chrysanthemum is not mentioned in Fransen (1994) as an important host plant in Dutch greenhouse. No interceptions of B. tabaci on Chrysanthemum plants for planting were found in EUROPHYT from 1993 to 2011. However 22 interceptions of B. tabaci on Chrysanthemum cut flowers and branches with foliage were found. In Northern Europe, B. tabaci occurs in protected cultivation only while in southern Europe it is present in greenhouses and in open fields (distribution map of B. tabaci in open fields in Europe (EFSA, 2013)). Experts concluded that Dendranthema x grandiflorum should be considered as a significant host plant.  
Growing B. tabaci host plants under exclusion conditions may be highly effective in the management of this pest and its associated viruses in both field and greenhouse-grown crops, however detailed attention must be given to exclusion netting and entrances etc. For crops in fields or partly-covered facilities, in areas where the pest is established (the Mediterranean coastal region), infestation can take place by flying adults, up to a maximum of 7km in a 12-hour period, though this is not a limiting factor because, with the wide range of putative hosts, suitable host plants are mostly available, and under intensive production suitable host plants, densely spaced, are found within a short distance. Under protected cultivation, plant production is throughout the year and suitable crops follow and rotate at tight intervals, favouring the establishment and dispersal of B. tabaci. Whitefly adults can migrate over long distances via passive transport with wind. However, even considering a climate change scenario with an increase of on average + 2 °C, B. tabaci distribution will expand its most Northern limit but still will not establish outdoors in Northern EU Member States (EFSA, 2013). Experts concluded that B. tabaci should not be considered as an important pathway on this host. **CONCLUSION ON THE STATUS:**
 
Disqualified: Not recommended for RNQP status - not an important pathway for this host. **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:**

* Chu D, Zhang YJ, Brown JK, Cong B, Xu BY, Wu QJ & Zhu GR (2006) The introduction of the exotic Q biotype of Bemisia tabaci from the Mediterranean region into China on ornamental crops. Florida Entomologist 89, 168-174;
* Department of Agriculture and Food, Goverment of Western Australia (DAF-GWA) (2008) A list of recorded host plants of Bemisia tabaci including silverleaf whitefly. Previously available at <http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/ins/slwfhostlist.pdf>;
* Dalmon A, Halkett F, Granier M, Delatte H & Peterschmitt M (2008) Genetic structure of the invasive pest Bemisia tabaci: evidence of limited but persistent genetic differentiation in glasshouse populations. Heredity 100, 316–325;
* Dalton R (2006) Whitefly infestations: the Christmas invasion. Nature 443, 898-900;
* De Barro PJ (1995) Bemisia tabaci biotype B: a review of its biology, distribution and control. CSIRO Australia Division of Entomology Technical Paper. 1-55;
* Drayton GM, Teulon DAJ, Workman PJ & Scott IAW (2009) The Christmas dispersal of Bemisia tabaci (Gennadius) in New Zealand. New Zeland Plant Protection 62, 310-314;
* EFSA Panel on Plant Health (2013) (PLH) Scientific Opinion on the risks to plant health posed by Bemisia tabaci species complex and viruses it transmits for the EU territory. EFSA Journal 11, 3162. Available online: <http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2013.3162/epdf>;
* European and Mediterranean Plant Protection Organisation (EPPO) (2012) EPPO technical document no. 1061: EPPO study on the risk of imports of plants for planting. Available from www.eppo.int/QUARANTINE/EPPO\_Study\_on\_Plants\_for\_planting.pdf;
* Evans GA (2007) Host plant list of the whiteflies (Aleyrodidae) of the world. USDA/Animal Plant Health Inspection Service (APHIS), 290 pp. Available from <http://www.sel.barc.usda.gov:8080/1WF/WhiteflyHost.pdf>;
* Fransen JJ (1994) Bemisia tabaci in the Netherlands; here to stay? Pesticide Science 42, 129-134;
* Li SJ, Xue X, Ahmed MZ, Ren SX, Du YZ, Wu JH, Cuthbertson AGS & Qiu BL, 2011. Host plants and natural enemies of Bemisia tabaci (Hemiptera, Aleyrodidae) in China. Insect Science 18, 101-120;
* McKenzie CL & Osborne LS (2017) Bemisia tabaci MED (Q biotype) (Hemiptera: Aleyrodidae) in Florida is on the move to residential landscapes and may impact open-field agriculture. Florida Entomologist 100(2):481-484. <https://doi.org/10.1653/024.100.0213>;
* Moraes LA, Marubayashi, Yuli VA, Ghanim M, Bello VH, De Marchi BR, Barbosa LF, Ramos-Sobrinho R, Boykin L, Krause-Sakate R & Pavan MA (2017) New invasion of Bemisia tabaci Mediterraneann species in Brazil associated to ornamental plants. Phytoparasitica, 1-9;
* Mound LA & Halsey SH (1978) Whitefly of the World. A Systematic Catalogue of the Aleyrodidae (Homoptera) with Host Plant and Natural Enemy Data. British Museum (Natural History) and Chichester, Wiley, London, UK, 340 pp;

HOST PLANT N°3: Dianthus caryophyllus (DINCA) for the Ornamental sector.

Origin of the listing:
 
Commission Directive 93/49/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?**
 
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):**
 
No 
Conclusion:
 
Not candidate  
 
Justification:
 
Bemisia tabaci (European populations) is not listed on this host (EPPO Global Database) and is only given as an unconfirmed host (EFSA, 2013), though there is three references where it occurs on carnation (Beitia et al, 2016; DAF-GWA, 2008; Evans, 2007). Dianthus is not mentioned in Fransen (1994) as an important host plant in Dutch greenhouse as well as in De Barro (1995) and Li et al. (2011). Only two interceptions of B. tabaci on Dianthus plants for planting from third countries are reported in EUROPHYT from 1993 to 2011. Experts concluded that plants for planting of carnation are not a significant pathway, even though it may incidentally be a pathway for 'hitch-hikers'. **CONCLUSION ON THE STATUS:**
 
Disqualified: Not recommended for RNQP status - not a significant pathway for this host. **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:**

* Beitia F, Asís JD, Pedro L de, Goula M & Tormos J (2016) Importance of feeding behaviour on life cycle in the zoophytophagous bug Dicyphus geniculatus. Bulletin of Insectology 69, 173-180;
* Department of Agriculture and Food, Goverment of Western Australia (DAF-GWA) (2008) A list of recorded host plants of Bemisia tabaci including silverleaf whitefly. Previously available at <http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/ins/slwfhostlist.pdf>;
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* Drayton GM, Teulon DAJ, Workman PJ & Scott IAW (2009) The Christmas dispersal of Bemisia tabaci (Gennadius) in New Zealand. New Zeland Plant Protection 62, 310-314;
* EFSA Panel on Plant Health (2013) (PLH) Scientific Opinion on the risks to plant health posed by Bemisia tabaci species complex and viruses it transmits for the EU territory. EFSA Journal 11, 3162. Available online: <http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2013.3162/epdf>;
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HOST PLANT N°4: Euphorbia pulcherrima (EPHPU) for the Ornamental sector.

Origin of the listing:
 
Commission Directive 93/49/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?**
 
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):**
 
Yes 
Conclusion:
 
Candidate  
 
Justification:
 
The host range of B. tabaci covers more than 1 000 species (Mound and Halsey, 1978; De Barro, 1995; Chu et al., 2006; Evans, 2007; Li et al. 2011; EFSA, 2013). Euphorbia pulcherrima and Euphorbia sp are listed as the main ornamental host plants of B. tabaci (Mound and Halsey, 1978; De Barro, 1995; Chu et al., 2006; Dalton, 2006; Evans, 2007; DAF-GWA; 2008; Dalmon et al. 2008; Drayton et al., 2009; Li et al., 2011; EFSA, 2013). In 1987-1993, Fransen (1994) reported an average of 10 annual findings of B. tabaci on Euphorbia pulcherrima in the greenhouses in the Netherlands. The infestation rate (nymphs and pupae density) of host plants of B. tabaci was categorized in four grades in China (Li et al., 2011). Euphorbia pulcherrima was classified with the highest infestation rate – 4th grade (average number of B. tabaci nymphs and pupae > 50/10 cm² leaf area) (Li et al., 2011). Ornamental trade, particularly the poinsettia pathway, was proposed as the main pathway of introduction (and spread) of B. tabaci MEAM1 and Med in the United States (Dalton, 2006), China (Chu et al., 2006), New Zealand (Drayton et al., 2009) and Brazil (Moraes et al., 2017). For the period 1993–2011, 189 interceptions (16% of all interceptions) of B. tabaci are registrated on Euphorbia plants for planting originating from third countries. 325 interceptions on plants for planting from the EU are reported on Euphorbia spp. (61% of all interceptions). Most of interceptions in the EU originating from the Netherlands (46 %) and Germany (17 %) (EUROPHYT; EFSA, 2013). Euphorbia pulcherrima and Hibiscus are the main host plants infested with B. tabaci in the greenhouses in Bulgaria (EPPO Global Database, 2012; EFSA, 2013).  
Except in the Mediterranean coastal region (Cyprus, Greece, Malta, Italy, south of France, certain parts of Spain and Portugal), B. tabaci occurrence is restricted in the EU to greenhouses. Growing B. tabaci host plants under exclusion conditions may be highly effective in the management of this pest and its associated viruses in both field and greenhouse-grown crops, however detailed attention must be given to exclusion netting and entrances etc. For crops in fields or partly-covered facilities, in areas where the pest is established (the Mediterranean coastal region), infestation can take place by flying adults, up to a maximum of 7km in a 12-hour period, though this is not a limiting factor because, with the wide range of putative hosts, suitable host plants are mostly available, and under intensive production suitable host plants, densely spaced, are found within a short distance. Under protected cultivation, plant production is throughout the year and suitable crops follow and rotate at tight intervals, favouring the establishment and dispersal of B. tabaci. Whitefly adults can migrate over long distances via passive transport with wind. However, even considering a climate change scenario with an increase of on average + 2 °C, B. tabaci distribution will expand its most Northern limit but still will not establish outdoors in Northern EU Member States (EFSA, 2013). Experts concluded that the level of importance of the pathway depends very much on conditions e,g, areas of concentrated glasshouse production versus areas where protected cultivation units are isolated from one another (as for Dendranthema) but evidence of plants as pathway is much stronger for this host.  
In conclusion, it is suggested plants for planting would be a significant pathway for crops grown in protected facilities in most of the countries where the pest is not present outside in the environment.  
For Mediterranean coastal region (Cyprus, Greece, Malta, Italy, south of France, certain parts of Spain and Portugal, for field and protected crops, plants for planting would not be a significance source because of the natural dispersal of the pest by flight/wind and the likely ability to eventually enter protected facilities. **5 - Economic impact:**  
Are there documented reports of any economic impact on the host?
 
Yes  
Justification:
 
B. tabaci is considered to be one of the most serious threats to crop cultivation worldwide, predominantly because of the large number of viruses it transmits. It is a sap-sucking insect that can reduce the vigour of plants and excrete a sticky, sugary substance, called honeydew, on the leaves, stems and fruits of its host plants. Adults can also transmit important virus diseases to major vegetable crops, but ornamental species, with only a few exceptions (e.g. Eustoma sp., Lisianthus sp., Manihot sp.), are not considered host plants for viruses transmitted by B. tabaci. Euphorbia pulcherrima is therefore not affected by B. tabaci transmitted viruses but circulatively transmitted viruses (begomoviruses) can also be carried by viruliferous B. tabaci insects along non-hosts plants (EFSA, 2013).  
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?
 
Yes  
Conclusion:
 
Candidate  
Justification:
 
Viruliferous B. tabaci insects may not pose an unacceptable risk to the ornamentals but can transfer viruses to vegetable crops sometimes grown in the same premises. Ornamentals may therefore pose an unacceptable risk to plants in the vegetable sector. Appropriate protection measures need to be in place to limit yield losses, and this also includes crops not affected by viruses transmitted by B. tabaci (ornamentals) but on which insect populations can develop rapidly (EFSA, 2013). **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:**
 
Recommended for listing as an RNQP, based on data (including evidence of high level of findings on this host, and indirect economic impact). **8 - Tolerance level:**  
Is there a need to change the Tolerance level:
 
Yes  
Proposed Tolerance levels:
 
Zero tolerance based on visual examination. **9 - Risk management measures:**  
Is there a need to change the Risk management measure:
 
Yes  
Proposed Risk management measure:
 
(a) A representative sample of host plants (including weeds) at the site of production have been inspected and found free from Bemisia tabaci during the last growing period before dispatch;  
or  
(b) Measures have been taken at the site of production aimed at the elimination of Bemisia tabaci, and the plants have then been inspected and found free from Bemisia tabaci. **REFERENCES:**

* Chu D, Zhang YJ, Brown JK, Cong B, Xu BY, Wu QJ & Zhu GR (2006) The introduction of the exotic Q biotype of Bemisia tabaci from the Mediterranean region into China on ornamental crops. Florida Entomologist 89, 168-174;
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* Dalmon A, Halkett F, Granier M, Delatte H & Peterschmitt M (2008) Genetic structure of the invasive pest Bemisia tabaci: evidence of limited but persistent genetic differentiation in glasshouse populations. Heredity 100, 316–325;
* Dalton R (2006) Whitefly infestations: the Christmas invasion. Nature 443, 898-900;
* De Barro PJ (1995) Bemisia tabaci biotype B: a review of its biology, distribution and control. CSIRO Australia Division of Entomology Technical Paper. 1-55;
* Drayton GM, Teulon DAJ, Workman PJ & Scott IAW (2009) The Christmas dispersal of Bemisia tabaci (Gennadius) in New Zealand. New Zeland Plant Protection 62, 310-314;
* EFSA Panel on Plant Health (2013) (PLH) Scientific Opinion on the risks to plant health posed by Bemisia tabaci species complex and viruses it transmits for the EU territory. EFSA Journal 11, 3162. Available online: <http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2013.3162/epdf>;
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* Evans GA (2007) Host plant list of the whiteflies (Aleyrodidae) of the world. USDA/Animal Plant Health Inspection Service (APHIS), 290 pp. Available from <http://www.sel.barc.usda.gov:8080/1WF/WhiteflyHost.pdf>;
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* Li SJ, Xue X, Ahmed MZ, Ren SX, Du YZ, Wu JH, Cuthbertson AGS & Qiu BL, 2011. Host plants and natural enemies of Bemisia tabaci (Hemiptera, Aleyrodidae) in China. Insect Science 18, 101-120;
* McKenzie CL & Osborne LS (2017) Bemisia tabaci MED (Q biotype) (Hemiptera: Aleyrodidae) in Florida is on the move to residential landscapes and may impact open-field agriculture. Florida Entomologist 100(2):481-484. <https://doi.org/10.1653/024.100.0213>;
* Moraes LA, Marubayashi, Yuli VA, Ghanim M, Bello VH, De Marchi BR, Barbosa LF, Ramos-Sobrinho R, Boykin L, Krause-Sakate R & Pavan MA (2017) New invasion of Bemisia tabaci Mediterraneann species in Brazil associated to ornamental plants. Phytoparasitica, 1-9;
* Mound LA & Halsey SH (1978) Whitefly of the World. A Systematic Catalogue of the Aleyrodidae (Homoptera) with Host Plant and Natural Enemy Data. British Museum (Natural History) and Chichester, Wiley, London, UK, 340 pp;

HOST PLANT N°5: Gerbera (1GEBG) for the Ornamental sector.

Origin of the listing:
 
Commission Directive 93/49/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?**
 
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):**
 
No 
Conclusion:
 
Not candidate  
 
Justification:
 
The host range of B. tabaci covers more than 1 000 species (Mound and Halsey, 1978; De Barro, 1995; Chu et al., 2006; Evans, 2007; Li et al. 2011; EFSA, 2013). De Barro (1995), Evans (2007), DAF-GWA (2008), Dalmon et al. (2008) Li et al., (2011) and EFSA (2013) listed Gerbera as a host species of B. tabaci. Gerbera jamesonii was categorized at the 3rd infestation grade in China (average number of B. tabaci nymphs and pupae between 31–50 /10 cm² leaf area) (Li et al., 2011). Fransen (1994) reported 3 to 7 annual findings of B. tabaci on Gerbera in the greenhouses in the Netherlands and concluded that this is perfect host plant for the pest. Only two interceptions of B. tabaci on Gerbera for plants for planting from third countries are reported in EUROPHYT from 1993 to 2011.  
Except in the Mediterranean coastal region (Cyprus, Greece, Malta, Italy, south of France, certain parts of Spain and Portugal), B. tabaci occurrence is restricted in the EU to greenhouses. Growing B. tabaci host plants under exclusion conditions may be highly effective in the management of this pest and its associated viruses in both field and greenhouse-grown crops, however detailed attention must be given to exclusion netting and entrances etc. For crops in fields or partly-covered facilities, in areas where the pest is established (the Mediterranean coastal region), infestation can take place by flying adults, up to a maximum of 7km in a 12-hour period, though this is not a limiting factor because, with the wide range of putative hosts, suitable host plants are mostly available, and under intensive production suitable host plants, densely spaced, are found within a short distance. Under protected cultivation, plant production is throughout the year and suitable crops follow and rotate at tight intervals, favouring the establishment and dispersal of B. tabaci. Whitefly adults can migrate over long distances via passive transport with wind. However, even considering a climate change scenario with an increase of on average + 2 °C, B. tabaci distribution will expand its most Northern limit but still will not establish outdoors in Northern EU Member States (EFSA 2013). Experts concluded that B. tabaci should not be considered as an important pathway on this host. **CONCLUSION ON THE STATUS:**
 
Disqualified: Not recommended for RNQP status - not an important pathway for this host (few interceptions on plants for planting). **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:**

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HOST PLANT N°6: Hibiscus rosa-sinensis (HIBRS) for the Ornamental sector.

Origin of the listing:
 
Ornamental 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):**
 
Yes 
Conclusion:
 
Candidate  
 
Justification:
 
The host range of B. tabaci covers more than 1 000 species (Mound and Halsey, 1978; De Barro, 1995; Chu et al., 2006; Evans, 2007; Li et al. 2011; EFSA, 2013). Hibiscus rosa-sinensis and Hibiscus spp. are listed as one of the main ornamental host plants of B. tabaci by Evans (2007), DAF-GWA, (2008) and Dalmon et al. (2008). For the period 1987 to 1993, Fransen (1994) reported 3 to 7 annual findings of B. tabaci on Hibiscus in the greenhouses in the Netherlands and concluded that this is perfect host plant for the pest. Chu et al. (2006) reported that the main reason for the introduction of B. tabaci into China was Euphorbia and Hibiscus plants for planting. The infestation rate (nymphs and pupae density) of host plants of B. tabaci was categorized in four grade in China (Li et al., 2011). Hibiscus rosa-sinensis was classified with the highest infestation rate (4th grade: average number of B. tabaci nymphs and pupae > 50/10 cm² leaf area) (Li et al., 2011).  
Hibiscus was the host plant driver for B. tabaci MED whitefly infestations in 17 retails and 8 wholesale nurseries and in Florida residential landscapes (McKenzie and Osborne, 2017). Fifty one interceptions (4% of all interceptions) of B. tabaci are registered on Hibiscus plants for planting originating from third countries from 1993 to 2011. One hundred and five (17 % of the total interceptions) on Hibiscus planting originating from the EU Member States are reported on Hibiscus (17 % of the total interceptions) (EUROPHYT; EFSA, 2013). Euphorbia pulcherrima and Hibiscus are the main host plants infested with B. tabaci in the greenhouses in Bulgaria (EPPO Global Database, 2012; EFSA, 2013). Seven Hibiscus spp are considered field-verified host plants 8 are unconfirmed host plants (EFSA, 2013).  
Except in the Mediterranean coastal region (Cyprus, Greece, Malta, Italy, south of France, certain parts of Spain and Portugal), B. tabaci occurrence is restricted in the EU to greenhouses. Growing B. tabaci host plants under exclusion conditions may be highly effective in the management of this pest and its associated viruses in both field and greenhouse-grown crops, however detailed attention must be given to exclusion netting and entrances etc. For crops in fields or partly-covered facilities, in areas where the pest is established (the Mediterranean coastal region), infestation can take place by flying adults, up to a maximum of 7km in a 12-hour period, though this is not a limiting factor because, with the wide range of putative hosts, suitable host plants are mostly available, and under intensive production suitable host plants, densely spaced, are found within a short distance. Under protected cultivation, plant production is throughout the year and suitable crops follow and rotate at tight intervals, favouring the establishment and dispersal of B. tabaci. Whitefly adults can migrate over long distances via passive transport with wind. However, even considering a climate change scenario with an increase of on average + 2 °C, B. tabaci distribution will expand its most Northern limit but still will not establish outdoors in Northern EU Member States (EFSA, 2013). Experts concluded that the level of importance of the pathway depends very much on conditions e,g, areas of concentrated glasshouse production versus areas where protected cultivation units are isolated from one another.  
In conclusion, it is suggested plants for planting would be a significant pathway for crops grown in protected facilities in most of the countries where the pest is not present outside in the environment.  
For Mediterranean coastal region (Cyprus, Greece, Malta, Italy, south of France, certain parts of Spain and Portugal, for field and protected crops, plants for planting would not be a significance source because of the natural dispersal of the pest by flight/wind and the likely ability to eventually enter protected facilities. **5 - Economic impact:**  
Are there documented reports of any economic impact on the host?
 
Yes  
Justification:
 
B. tabaci is considered to be one of the most serious threats to crop cultivation worldwide, predominantly because of the large number of viruses it transmits. It is a sap-sucking insect that can reduce the vigour of plants and excrete a sticky, sugary substance, called honeydew, on the leaves, stems and fruits of its host plants. Adults can also transmit important virus diseases to major vegetable crops, but ornamental species, with only a few exceptions (e.g. Eustoma sp., Lisianthus sp., Manihot sp.), are not considered host plants for viruses transmitted by B. tabaci. Hibiscus is therefore not affected by B. tabaci transmitted viruses but circulatively transmitted viruses (begomoviruses) can also be carried by viruliferous B. tabaci insects along non-hosts plants (EFSA, 2013).  
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?
 
Yes  
Conclusion:
 
Candidate  
Justification:
 
Viruliferous B. tabaci insects may not pose an unacceptable risk to the ornamentals but can transfer viruses to vegetable crops sometimes grown in the same premises. Ornamentals may therefore pose an unacceptable risk to plants in the vegetable sector. Appropriate protection measures need to be in place to limit yield losses, and this also includes crops not affected by viruses transmitted by B. tabaci (ornamentals) but on which insect populations can develop rapidly (EFSA, 2013). **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:**
 
Recommended for listing as an RNQP, based on data (including evidence of high level of findings on this host and indirect economic impact). However this host plant is outside the scope of the project because not mentioned in the ornamentals directive. This host is cited as an example of other hosts which could be considered for measures similar to those proposed for Euphorbia pulcherrima. **8 - Tolerance level:**  
Is there a need to change the Tolerance level:
 
Yes  
Proposed Tolerance levels:
 
Zero tolerance based on visual examination. **9 - Risk management measures:**  
Is there a need to change the Risk management measure:
 
Yes  
Proposed Risk management measure:
 
(a) A representative sample of host plants (including weeds) at the site of production have been inspected and found free from Bemisia tabaci during the last growing period before dispatch;  
or  
(b) Measures have been taken at the site of production aimed at the elimination of Bemisia tabaci, and the plants have then been inspected and found free from Bemisia tabaci. **REFERENCES:**

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HOST PLANT N°7: Pelargonium (1PELG) for the Ornamental sector.

Origin of the listing:
 
Commission Directive 93/49/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?**
 
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):**
 
No 
Conclusion:
 
Not candidate  
 
Justification:
 
The host range of B. tabaci covers more than 1 000 species (Mound and Halsey, 1978; De Barro, 1995; Chu et al., 2006; Evans, 2007; Li et al. 2011; EFSA, 2013). De Barro (1995), DAF-GWA (2008), Li et al., (2011) and EFSA (2013) listed Pelargonium as a host species of B. tabaci. Pelargonium hortorum was categorized at the 2nd infestation grade in China (average number of B. tabaci nymphs and pupae between 11–30/10 cm² leaf area) (Li et al., 2011). Pelargonium sp with 1-2 annually findings is not categorized as a perfect host plant of B. tabaci in Dutch greenhouses (Fransen, 1994). Only two interceptions of B. tabaci on Pelargonium plants for planting from third countries are reported in EUROPHYT from 1993 to 2011.  
Except in the Mediterranean coastal region (Cyprus, Greece, Malta, Italy, south of France, certain parts of Spain and Portugal), B. tabaci occurrence is restricted in the EU to greenhouses. Growing B. tabaci host plants under exclusion conditions may be highly effective in the management of this pest and its associated viruses in both field and greenhouse-grown crops, however detailed attention must be given to exclusion netting and entrances etc. For crops in fields or partly-covered facilities, in areas where the pest is established (the Mediterranean coastal region), infestation can take place by flying adults, up to a maximum of 7km in a 12-hour period, though this is not a limiting factor because, with the wide range of putative hosts, suitable host plants are mostly available, and under intensive production suitable host plants, densely spaced, are found within a short distance. Under protected cultivation, plant production is throughout the year and suitable crops follow and rotate at tight intervals, favouring the establishment and dispersal of B. tabaci. Whitefly adults can migrate over long distances via passive transport with wind. However, even considering a climate change scenario with an increase of on average + 2 °C, B. tabaci distribution will expand its most Northern limit but still will not establish outdoors in Northern EU Member States (EFSA 2013). Experts concluded that B. tabaci should not be considered as an important pathway on this host. **CONCLUSION ON THE STATUS:**
 
Disqualified: Not recommended for RNQP status - not an important pathway for this host (few interceptions on plants for planting). **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:**

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