NAME OF THE ORGANISM: Ustilago hordei (USTIHO)

GENERAL INFORMATION ON THE PEST

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

Pest category:

Fungi **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: Cereals (including rice) sector

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

Not relevant
Conclusion:

* Candidate: Cereals (including rice) sector

**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):

This pest is present worldwide, including Europe (CABI, 1969).

HOST PLANT N°1: Avena sativa (AVESA) for the Cereals (including rice) sector.

Origin of the listing:

Agricultural SEWG
Plants for planting:

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:

Avena sativa is considered a main host in the CABI datasheet (CABI, 2012). The SEWG recommended to also regulate U. hordei on this host. **5 - Economic impact:**
Are there documented reports of any economic impact on the host?

Yes
Justification:

The SEWG recommended to also regulate U. hordei on this host, based on practical experience.
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)

Minor
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:

The SEWG recommended to also regulate U. hordei on this host. Losses may be unacceptable in some areas and under some conditions. **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:

Control through standards for field inspection and seed, and through seed treatment fungicides. These fungicides are not allowable for organic farming. **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 expertise available in the SEWG. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

Yes
Proposed Tolerance levels:

Zero tolerance for Pre-basic and Basic material, a tolerance for certified material (1 affected plant per 100m2), based on visual examination, with alternative risk management measures. **9 - Risk management measures:**
Is there a need to change the Risk management measure:

Yes
Proposed Risk management measure:

Pre-basic and Basic material:
(a) Field inspection of a representative sample of the plants in the crop at an appropriate time at which no affected plants are seen;
or, if this tolerance is not achieved at field inspection,
(b) Seed treatment with an approved fungicide or by an approved physical technique known to be effective against Ustilago hordei.

Certified material:
(a) Field inspection of a representative sample of the plants in the crop at an appropriate time at which not more than 1 affected plant per 100m2 is seen;
or, if this tolerance is not achieved at field inspection,
(b) Seed treatment with an approved fungicide or by an approved physical technique known to be effective against Ustilago hordei.

Inspection of pre and post control plots may be used as an additional risk management measure to avoid any build-up of infection levels during the chain of propagation. **REFERENCES:**

* CABI (2012) Datasheet report for Ustilago hordei (covered smut of barley), Crop Protection Compendium;

HOST PLANT N°2: Avena strigosa (AVESG) for the Cereals (including rice) sector.

Origin of the listing:

Agricultural SEWG
Plants for planting:

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 SEWG recommended to also regulate U. hordei on this host. Reference to covered smut being present in most years on strigosa in wales was made by Moore and Moore, 1950. References were difficult to find as often U. avenae and A. hordei are not differentiated on seed as the spores are difficult to distinguish visually. **5 - Economic impact:**
Are there documented reports of any economic impact on the host?

Yes
Justification:

The SEWG recommended to also evaluate U. hordei on this host, based on practical experience.
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)

Minor
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?

Conclusion:

Not candidate
Justification:

The SEWG recommended to also evaluate U. hordei on this host. The SEWG concluded that losses may be unacceptable in some areas and under some conditions. After a last consultation, experts of the coreHEWGplus commented that Avena strigosa is mainly used in the EU for green manure. Therefore they concluded that impact should be considered as acceptable. **CONCLUSION ON THE STATUS:**

Disqualified: Avena strigosa is mainly used in the EU for green manure. Remark: A. strigosa is host to either U. avenae or U. hordei, but it is hard to distinguish spores, so records may not be correctly attributed. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

No
Proposed Tolerance levels:

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

No
Proposed Risk management measure:

 **REFERENCES:**

* Moore WC & Moore FJ (1950) Cereal Diseases, Bulletin No. 129. Ministry of Agriculture and Fisheries, Her Majesty’s Stationery Office, London;

HOST PLANT N°3: Hordeum vulgare (HORVX) for the Cereals (including rice) sector.

Origin of the listing:

RNQP Questionnaire
Plants for planting:

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:

Ustilago hordei causes covered smut of barley. Seedlings are systemically infected by spores carried on the outside of the seeds or persisting in the soil. Shortly after flowering, infected tillers give rise to smutted ears (Some spores may be released during flowering) (Paveley et al., 1996). The diseased plants are stunted, and the grains are filled with a mass of black spores, enveloped by a transparent membrane until harvest. Thus losses arise from direct loss of infected ears. Seeds of barley are externally contaminated by U. hordei during harvesting, when smutted grains are broken open and release their content of spores onto seeds or soil. Infection by these or soil-borne spores then occurs at the time of seed germination. Seed certification and seed treatment are very effective in controlling the disease, which is now practically unknown in intensive cereal cultivation in Europe. If untreated farmer-saved seed is sown, however, these diseases reappear (EPPO, 1997).
Soil-borne inoculumn could have a potential role in infection of successive crops and volunteer plants grown from spilt contaminated seed from the previous year could in theory act as a disease source but these sources appear to be very rare because no references to this could be found. It is concluded seed can be considered as a significant pathway for the pest. **5 - Economic impact:**
Are there documented reports of any economic impact on the host?

Yes
Justification:

Yield losses arise from direct loss of infected ears, at harvest the sori are held together by almost intact glumes which are broken during combining, resulting in infestation of healthy grains with black teliospores. However the disease is very rare in the UK where the risk of in-crop losses is given as low if grown from certified seed, and moderate if seed is saved repeatedly without treatment, and the risk to adjacent crops is given as moderate only if kept as seed (Paveley et al., 1996). In Canada, the percentage of barley fields affected by smuts ranged from 51% in 1992 to 82% in 1995. The percentage of infected plants and therefore grain yield losses (with cereal smut disease the % infected plants equals the % yield loss) ranged from 0.2% in 1991 to 0.8% in 1989 (Thomas and Menzies, 1997). The largest loss attributable in Prairie Provinces of Canada to U. hordei in a single year was 0.7% in 1987 (Thomas, 1989).
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)

Minor
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:

Generally yield losses are below 1% but can be as high as 40% (CABI, 2012). The percentage of infected ears is directly proportional to grain loss. Spores are released at harvest and contaminate healthy seeds, re-establishing the disease in the next generation of seed produced. Potential for the disease to multiply within a few years is moderate if seed sown untreated (Paveley et al., 1996). Losses may be unacceptable in some areas and under some conditions. **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:

Control through standards for field inspection and seed, and mostly through seed treatment with fungicides. These fungicides are not allowable for organic farming. **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. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

Yes
Proposed Tolerance levels:

Zero tolerance for Pre-basic and Basic material, a tolerance for certified material (1 affected plant per 100m2), based on visual examination, with alternative risk management measures. **9 - Risk management measures:**
Is there a need to change the Risk management measure:

Yes
Proposed Risk management measure:

Pre-basic and Basic material:
(a) Field inspection of a representative sample of the plants in the crop at an appropriate time at which no affected plants are seen;
or, if this tolerance is not achieved at field inspection,
(b) Seed treatment with an approved fungicide or by an approved physical technique known to be effective against Ustilago hordei.

Certified material:
(a) Field inspection of a representative sample of the plants in the crop at an appropriate time at which not more than 1 affected plant per 100m2 is seen;
or, if this tolerance is not achieved at field inspection,
(b) Seed treatment with an approved fungicide or by an approved physical technique known to be effective against Ustilago hordei.

Inspection of pre and post control plots may be used as an additional risk management measure to avoid any build-up of infection levels during the chain of propagation. **REFERENCES:**

* CABI (1969) Distribution map for Ustilago hordei. Distribution Maps of Plant Diseases. Map 460;
* CABI (2012) Datasheet report for Ustilago hordei (covered smut of barley), Crop Protection Compendium;
* EPPO (1997) Good plant protection practice PP 2/11 (1) Barley. Bulletin OEPP/EPPO Bulletin 27, 339-361;
* Paveley ND, Rennie WJ, Reeves JC, Wray MW, Slawson DD, Clark WS, Cockerell V & Mitchell AG (1996) Cereal seed health and seed treatment strategies. HGCA Research Review 34, iv-131;
* Thomas PL (1989) Barley smuts in the Prairie Provinces of Canada, 1983-88. Canadian Journal of Plant Pathology 11, 133-136;