



# **Pest Specific Contingency Plan for Outbreaks of *Anthonomus eugenii* (Pepper weevil) (March 2023)**



*Fig 1: Adult Anthonomus eugenii. Obtained from the EPPO A. eugenii images repository:  
<https://gd.eppo.int/taxon/ANTHEU/photos>*

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## Glossary

Acronym	Term
<b>DAFM</b>	The Department of Agriculture, Food and the Marine
<b>EFSA</b>	The European Food Safety Authority
<b>EPPO</b>	European Plant Protection Organisation
<b>IPPC</b>	International Plant Protection Convention
<b>ISPM</b>	International Standards for Phytosanitary Measures
<b>Pest</b>	Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products
<b>Plants</b>	Living plants and parts thereof, including seeds and germplasm
<b>Plant Product</b>	Unmanufactured material of plant origin (including grain) and those manufactured products that, by their nature or that of their processing, may create a risk for the introduction and spread of pests
<b>SOP</b>	Standard Operating Procedure
<b>UQP</b>	Union Quarantine Pest

# Definitions

For the purposes of this contingency plan, the following definitions apply:

- (a) 'Specified pest' means *Anthonomus eugenii* Cano
- (b) 'Host plants' Plants as outlined in [Appendix 3](#)

## 1. Introduction and scope

### 1.1. Introduction

This plan describes the management procedures activated in the case of an outbreak of *Anthonomus eugenii* in Ireland.

### 1.2 Scope

This document is restricted to activities specific to this pest and will be used in conjunction with the DAFM's General Contingency Plan for Plant Health which gives details of the teams and organizations involved in pest response in Ireland, and their responsibilities and governance.

## 2. Summary of the threat

### 2.1 *Anthonomus eugenii* threat

*Anthonomus eugenii* is currently considered to be one of the top 20 "high priority" plant pest threats facing the EU. This is based on the predicted severity of the economic, social and environmental risks it could pose to EU biosecurity. The pest is considered to pose such a significant threat based on the significant impacts it has had on pepper and aubergine cultivation in its native range and invaded territories in north America and the Caribbean.

*Anthonomus eugenii* is believed to be originally native to the regions around Mexico and central America. It is recognized as a considerable invasive pest since its introduction and subsequent recorded impacts in the USA and Canada in North America. To date, there have been two outbreaks in the EU (Netherlands – 2012 and Italy 2013) which required stringent eradication measures to eliminate the

established populations.

Of particular concern to Ireland are the potential impacts a national outbreak of *A. eugenii* could have on pepper production in under protected cultivation (e.g. greenhouses). An outbreak of *A. eugenii* in a pepper greenhouse in the Netherlands (2012) spread to several other pepper cultivation facilities before control measures were applied to eradicate the pest outbreak. An outbreak in an Irish producers facility could severely disrupt production and potentially spread to other nearby producers.

It is likely that the pest could not complete its lifecycle outdoors in the current Irish climate. EFSA (2018) modelling for the pest lifecycle indicated that currently, the pest may not be able to complete its full lifecycle in the Irish climate. However, there is uncertainty around the lower temperature tolerances as formal studies in this area are lacking (Fernandez *et al.*, 2020). The only possibility of the pest establishing in Ireland would likely be in heated production facilities which operate continuously throughout the year without a break in production (e.g. winter shut down or alternative crops) as the pest has no diapause and thus requires the continuous presence of host plants (EFSA 2020).

Further details on *A. eugenii* is provided in the factsheet in Appendix 1.

## 2.2 Pathways of entry to Ireland

### *Trade in infested commodities and hitchhiking:*

The most likely entry pathway for *A. eugenii* into Ireland is through trade, imports of infested host plants and produce are likely entry pathways for the pest. Imports from regions where the pest is present into the EU is what likely led to the two previous outbreaks in the EU. Inspections of imports conducted at Irish BCPs should reduce the likelihood of entry into Ireland via these pathways.

The pest has reported to have been spread, in the USA/Canada by hitchhiking on freight transportation. Adults can invade commodities of any description and be moved long distances to new locations in relatively short periods of time.

### *Natural dispersal:*

The chance of the pest reaching Ireland via natural dispersal (e.g. flight) is negligible. *Anthonomus eugenii* can fly, but is not considered a strong flyer (EFSA, 2020). Some observations indicate that adults can fly up to 2 km in one day (Fernandez *et al.*, 2020). Spread in regions where *A. eugenii* has established its spread averages about 2 km per year (EFSA, 2020). As the pest is not likely to be able to establish outdoors in central/northern Europe and flight is poor the chances of Ireland ever receiving naturally dispersing populations are low.

## 2.3 Current distribution

*Anthonomus eugenii* is considered native to the regions around Mexico and central America. The pest has since expanded its distribution range in North America by colonizing several southern and eastern US states and Hawaii.

Several Caribbean Islands have been successfully invaded by the pest such as the Dominican Republic, Jamaica and Puerto Rico.

The pest has also come to have established in several French Polynesian island in the pacific.

Occasional transient populations have been found in some Canadian provinces and resulted in significant damage. These populations were incapable of establishing outdoors and have died out over winter.

There have been two known introductions of the pest into the EU. Outbreaks in the Netherlands (2012) and Italy (2013) were detected early and eradicated (EFSA, 2020).

A map of its global distribution listed on the EPPO database in Appendix 2.

## 2.4 Factsheet and material for dissemination

A pest factsheet (DAFM Plant Pest Factsheet on *Anthonomus eugenii*) summarising the threat *A. eugenii* poses to Ireland is available on the DAFM website at the following [link](#) and in [Appendix 1](#). This publication is directed to professional operators, citizen scientists and the general public. Thus, this material should be used in information campaigns to prevent outbreaks, in cases of the suspicion of *A. eugenii* occurring and, in the cases, where an *A. eugenii* outbreak has been officially confirmed.

# 3. Legal Basis and Standards

## 3.1 Current legislation

*Anthonomus eugenii* is a Union quarantine pest listed in Annex II of Commission Implementing Regulation (EU) 2019/2072, and it is also listed as a priority pest under Commission Delegated Regulation (EU) 2019/1702.

The general requirements for surveys of quarantine organisms in the EU territory are laid down in Regulation (EU) 2016/2031 with specific obligations for professional operators laid down in Article 14 of Regulation (EU) 2016/2031 and DAFM's General Contingency Plan for Plant Health 3.1.(c)

In summary, the introduction into and spreading within all Member States of *A. eugenii* is prohibited. In case of detection, measures shall be taken to eradicate it.

## **3.2 Actions taken to prevent outbreaks**

### **3.2.1 Surveys**

*A. eugenii* is listed as a priority pest under Commission Delegated Regulation (EU) 2019/1702, DAFM is required by [Article 22-24 of Regulation \(EU\) 2016/2031](#) to perform annual surveys of the pest. Areas posing the highest risk to the introduction and spread of *A. eugenii* should be identified and targeted for surveillance, protected cropping areas for preferred hosts and surrounding areas around packing facilities as well as BCPs, airports and ports. Solanaceous weeds and ornamental plants grown in open ground, parks and gardens near high-risk sites should also be included (EFSA 2020).

### **3.2.2 Import Controls of Host Plants and Fruit**

Special requirements are laid down in Annex VII of (EU) 2019/2072 related to imports of host commodities from countries where *Anthonomus eugeneii* is known to occur these include Belize, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Puerto Rico, United States and French Polynesia. DAFM performs inspections on these commodities as outlined in DAFM Generic Contingency Plan for Plant Health in Ireland, Chapter 2.2.

## **3.3 Standards**

This plan shall be used in conjunction with:

- (a) EPPO Pest Risk Analysis for *Anthonomus eugenii* July 2013
- (b) EFSA Pest survey card on *Anthonomus eugenii*
- (c) ISPM 27 Diagnostic protocols for regulated pests
- (d) ISPM 15 Regulation of wood packaging material in international trade
- (e) ISPM 14 The use of integrated measures in a systems approach for pest risk management
- (f) ISPM 10 Requirements for the establishment of pest free places of production

- (g) ISPM 9 Guidelines for pest eradication programs
- (h) All other standards as outlined in DAFM Generic Contingency Plan for Plant Health in Ireland Chapter 2.1

## **4. Official Measures to be taken if *A. eugenii* occurs**

### **4.1 Suspicion of the occurrence of *A. eugenii***

In the event of a suspicion of the occurrence of *A. eugenii*, specific pest specific guidelines to follow are not prescribed in EU legislation, therefore the general guidelines are followed as in as in the case of any suspected quarantine and priority pest finding. These general guidelines are laid out in [Regulation \(EU\) 2016/2031](#) and in DAFM Generic Contingency Plan for Plant Health in Ireland Chapters 3 & 4

### **4.2 Occurrence of *A. eugenii* is confirmed, establishment of demarcated areas**

The Department will establish a demarcated area consisting of an infested zone and a buffer zone. The buffer zone will have an initial width of at least 100m around the infested zone or to the extent of the facility where the outbreak occurs.

As soon as the presence of *A. eugenii* is officially confirmed in the territory of Ireland, without delay an initial demarcated area should be established as outlined in the DAFM Generic Contingency Plan for Plant Health in Ireland Chapter 5.3 coordinating with near member states and third countries where required. Infested plants should be immediately eradicated as detailed in section 4.5 below.

The demarcated area shall consist of an infested zone and a buffer zone. The infested zone is the zone where the presence of the specified organism has been confirmed, and which contains:

- (a) all plants and produce known to be infested by the pest concerned;
- (b) all plants and produce showing signs or symptoms indicating possible infestation



by that pest;

- (c) all other plants and produce liable to have been or become contaminated or infested by that pest, including plants liable to be infested due to their susceptibility to that pest and their close proximity to infested plants or common source of production, if known, with infested plants, or plants grown from them.

This zone will likely extend to the full protected production facility if the outbreak is identified in an Irish pepper crop or 100 m around the infested plants, whichever is deemed most appropriate based on the context of the outbreak.

#### *Infested zone*

*Anthonomus eugeni* does not appear to disperse far if hosts are nearby. *Anthonomus eugeni* adults are attracted to available nearby hosts by the volatile chemicals released from their flowers and fruits. During the Netherlands outbreak in 2012 all the secondary infested facilities were well within 2 km of the initial outbreak site (EFSA, 2020). Given the pest's host range it is likely any potential future outbreaks in Ireland will likely to occur in protected cultivation, most likely on crops of peppers. While there is widespread outdoor cultivation of potato crops in Ireland, *A. eugeni* can only feed on this species, not reproduce on it. Similarly, *A. eugeni* can feed on tomato, which is produced under protected cultivation in Ireland, but cannot reproduce on this crop.

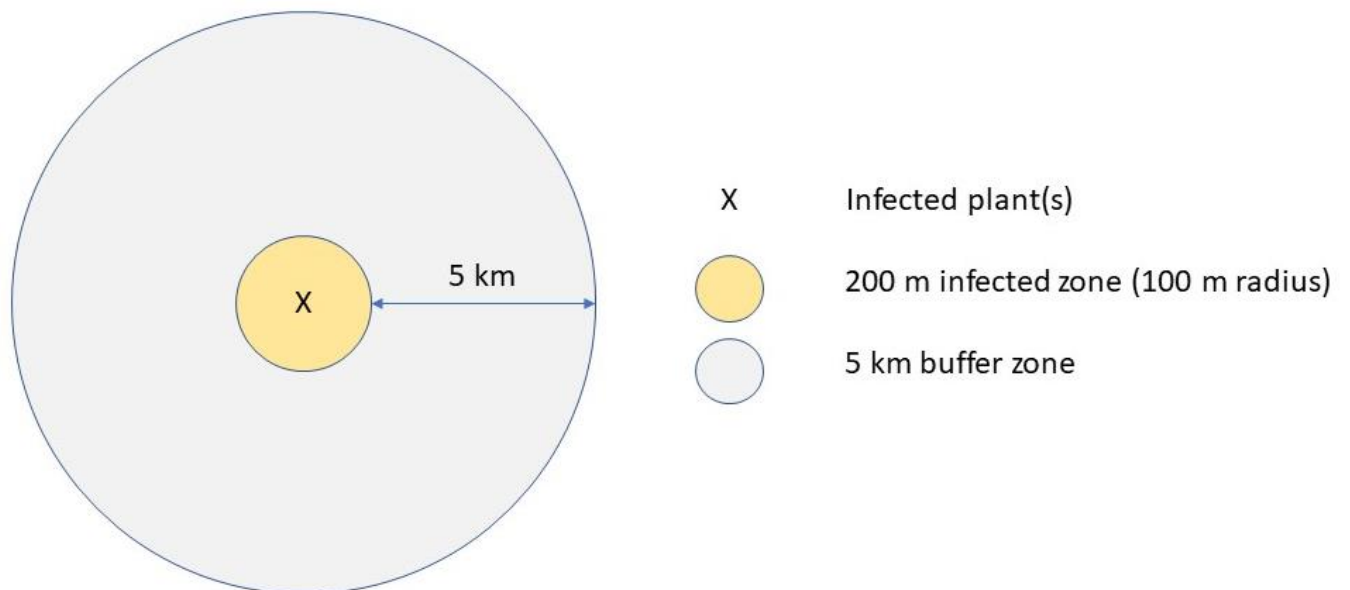
Therefore, the infested zone should consist of the glasshouse facility where an outbreak is likely to be found.

#### *Buffer zone*

A buffer zone that extends to at least 5 km around an infested zone/protected cultivation unit is recommended to maximize the chances of capturing the fullest extent of the pest outbreak early. An outbreak of this pest will likely be in a pepper protected cultivation facility the impacts of which will likely be spotted soon after the population begins to grow (1 generation in 3 weeks at 21°C, 2 weeks at 27°C or 6 weeks at 15°C). The primary sites to inspect in the buffer region are other protected cultivation facilities that produce host plants (e.g. *C. annuum*, *S. lycopersicum*). Secondary sites to survey are outdoor fields containing host plants, likely potatoes (*S. tuberosum*), wild Solanaceous weeds or any other host detailed in [Appendix 3](#),

however the pest cannot reproduce on potatoes nor is likely to survive a winter. Once the pest is eradicated from protected cultivation facilities until the winter arrives it is highly likely the outbreak will be eradicated in the first year.

If the presence of the specified organism is confirmed in the buffer zone, or beyond, the delimitation of the infested zone(s) and buffer zone(s) shall immediately be reviewed and changed accordingly.



*Fig 2.* The layout of the infested zone and buffer zones for an outbreak of one infected plant or infested soil.

#### 4.3 No demarcated area

Member States need not establish demarcated areas, if one of the following conditions is satisfied:

- (a) There is evidence that the specified organism has been introduced into the area with plants, soil, freight material that were infested before their introduction into the area concerned; and it is ascertained that there is no establishment of the specified organism and that the spread and breeding of the specified organism is not possible due to its biology;
- (b) There is evidence that the presence of the specified organism is an isolated finding, immediately associated with a specified plant, soil, freight material, which is not expected to lead to establishment, and it is ascertained that there is no establishment of the specified organism and that the spread and breeding of the specified organism is not possible due to its biology. For the purposes of point (b),

the results of a specific investigation and eradication measures shall be taken into account. Such measures may consist of precautionary felling and destruction of specified plants and plant products and of destruction and disposal of wood packaging material, after they have been examined.

Where one of the conditions set out in Section 4.3 (a and b) is satisfied, the Competent Authority shall take the following measures:

- (a) immediate measures to ensure the prompt eradication of the specified organism and to exclude the possibility of its spread.
- (b) regular and intensive surveillance during the period covering at least one life cycle of the specified organism (2-6 weeks depending on ambient temperature) and one additional year, in a radius of at least 1 km around the place where the specified organism was found.
- (c) The destruction/disinfestation supervised by DAFM inspectors of any infested plant material, soil, freight material, equipment, machinery, storage facilities to remove the pest using an appropriate method.
- (d) the investigation of the origin of the infestation by the tracing of plants, soil or freight material as far as possible and the examination thereof for any sign of infestation. Priority should be given to previous and expected consignments of the same genus from an affected Importer.
- (e) activities to raise public awareness concerning the threat of that organism.
- (f) any other measure, which may contribute to the eradication of the specified organism, taking account of international standard for phytosanitary measures ('ISPM') No 9 and applying an integrated approach according to the principles set out in ISPM No 14.

For the purposes of point (d), the examination shall include targeted destructive sampling.

The measures referred to in points (a) to (f) shall be presented in the form of a report.

#### **4.4 Restriction on the movement of plant, produce and soil**

- (a) Host plants and fruit originating in a demarcated area may be moved within the Union only if they are accompanied by a plant passport prepared and issued in accordance with [Section 2 of Regulation 2016/2031](#).
- (b) The place of production shall be registered in accordance with [Article 65 of Regulation 2016/2031](#) and [ISPM 10](#) guidelines.

- (c) The place of production shall have been subjected annually to at least two meticulous official inspections carried out at appropriate times and shall show no sign of infestation by the specified organism. The inspection shall include monitoring pest traps and crop walks.
- (d) Movement of soil out of the infested area will be restricted, if necessary, until disinfection can be undertaken and subsequently inspected/confirmed by DAFM inspectors.
- (e) Movement of equipment and machinery out of the infested area will be restricted until disinfection can be undertaken and subsequently inspected/confirmed by DAFM inspectors.

#### **4.5 Professional Operators**

Professional operator will act in accordance with the direction of the Department to eradicate the pest, prevent its further spread, and provide the information necessary to conduct trace forward/back investigations.

- a) Where a professional operator receives an official confirmation concerning the presence of the pest in plants, plant products or other objects which are under that operator's control, the Department will give direction on the actions to be taken.
- b) The professional operator shall immediately take the necessary measures to prevent the spread of the pest. On a case-by-case basis, the Department will provide instructions concerning those measures, the professional operator shall act in accordance with those instructions.
- c) Where so instructed by the Department, the professional operator shall take the necessary measures to eradicate the pest from the plants, plant products or other objects which are under its control.
- d) Unless otherwise instructed by the Department, the professional operator shall, without delay, withdraw from the market the plants, plant products and other objects which are under that operator's control and in which the pest could be present.
- e) The professional operator shall provide to the Department the necessary information to conduct a trace forward/back investigation.

#### **4.6 Eradication and containment measures**

Where the finding of *Anthonomus eugenii* is officially confirmed, the Department will immediately take all necessary phytosanitary measures to eradicate the pest from the infested zone.

Once a demarcated area is established DAFM inspectors shall conduct the following activities, where appropriate:

- (a) In the case of an outbreak in a protected cultivation facility, quarantine procedures will be enacted. Actions on the site will aim to restrict the further spread of the pest, these may include but are not limited to sealing the protected cultivation facility, restricting the movement of people and materials in and out of the facility.
- (b) the immediate destruction or disinfestation of infested plants and produce with symptoms caused by the specified organism, the examination of those plants and produce for any sign of infestation and the complete disinfestation of their soil. These may require an insecticidal spray aimed at the production facility, equipment and plants prior to herbicide application aimed at killing host plants. Removal of the crop should take place at night to reduce the risk of spread of adults before destruction by shredding followed by incineration or deep burial. Material being moved for destruction should be done so in sealed containers to prevent the specified pest from escaping, the containers should also be destroyed. Protected cultivation facilities should be fumigated following crop removal and cleaning requiring a crop free period was required of 2 weeks with a minimal temperature of 20°C (van der Gaag and Loomans 2013).
- (c) where appropriate, the disinfestation/disposal of potentially infested soil/growing medium in the production facility. Soil eradication measures can include steaming, burial (at least 2 meters deep), treatment with suitable plant protection products or biocontrol agents if available.
- (d) where appropriate, the powered rotovation of potentially infested soil/growing medium to a depth of at least 10 cm during dry conditions within the infested zone if decided necessary. Whether this action is appropriate will be decided upon in the specific action plan in the event of an outbreak based on the site conditions;
- (e) trapping strategies using sticky traps and lures followed by destruction of captured specimens, Intensive monitoring was required during the two week period post destruction pheromone traps (10/ha) (van der Gaag and Loomans 2013).
- (f) treatments against adults and larvae using chemical or biocontrol agents. It may be necessary to obtain plant protection product approvals for emergency application of Plant Protection Products considered necessary for the control of, foliage, weeds, or herbaceous plants in accordance with DAFM Generic Contingency Plan for Plant Health in Ireland Chapter 8.8.1 (e).
- (g) prohibition of any movement of potentially infested material out of the demarcated area;
- (h) investigation of the origin of the infestation by the tracing of plants, produce and freight material, as far as possible, and the examination thereof for any sign of infestation;
- (i) replacement of host plants by other plant species, where appropriate;
- (j) prohibition of planting of new host plants in the open air in the area, except for the places of protected production where complete eradication is more easily achievable;
- (k) intensive surveillance for the presence of the *A. eugenii* in the buffer zone, which shall include at least one inspection per year.

- (l) activities to raise public awareness concerning the threat of that organism and the measures adopted to prevent its introduction into and spread within the Union, including the conditions regarding movement of specified plants and produce;
- (m) where necessary, specific measures to address any particularity or complication that could reasonably be expected to prevent, hinder or delay eradication, in particular those related to the accessibility and adequate eradication of all plants that are infested or suspected of infestation, irrespective of their location, public or private ownership or the person or entity responsible for them as outlined in DAFM's General Contingency Plan for Plant Health 4.1.1.
- (n) any other measure outlined in DAFM Generic Contingency Plan for Plant Health in Ireland Chapter, which may contribute to the eradication of the specified organism, taking account of ISPM No 9 and applying an integrated approach according to the principles set out in ISPM No 14.

#### 4.7 Action Plan

Where the presence *Anthonomus eugenii* is officially confirmed, the Department will immediately adopt an action plan setting out in detail the measures for the eradication of the pest, or its containment, as well as a time schedule for the application of those measures.

The pest specific action plan will describe the actions required to deal with an outbreak of *Anthonomus eugenii* and will provide detail on:

- a) Imposing control measures on the movement of host plant material, and eradication measures for a specified period in the infested area
- b) The timetable for implementing these measures
- c) The design and organisation of the surveys to be carried out
- d) The number of visual examinations, sampling and tests to be carried out by laboratories
- e) The methodology for sampling and testing as per ISPM 31 guidelines where appropriate,
- f) Conducting an investigation to determine the source and extent of the outbreak,
- g) Demarcation of the infested area,
- h) Demarcation of the infested plant material,
- i) The implementation of containment measures, such as buffer zones, to prevent further spread,
- j) Disposal of infected plant material in accordance with best practices,
- k) Appropriate biocontrol treatments of equipment, machinery and infested area,
- l) Monitoring the effectiveness of the measures taken.

The action plan shall be based on this contingency plan and will be communicated to the professional operators concerned, as required.

The Department will notify the Commission and the other Member States of the action plans it has adopted.

#### **4.8 Lifting of the demarcated areas**

Where, the specified organism is not detected in a demarcated area (Section 4.3) for a period of up to 1 year that demarcation may be lifted. In such cases, the Member State concerned shall notify the Commission and other Member States.

#### **4.9 Annual surveys in the demarcated area for *A. eugenii***

DAFM will conduct annual surveys for *A. eugenii* within the demarcated area(s) using a range of surveillance strategies. The specific strategy measures will be decided in the action plan drawn up in the event of an outbreak. Surveillance and monitoring will include but will not be limited to, deployment of attract lures, visual examination of hosts plant species for feeding damage and adults.

## **5. Criteria for declaring eradication / change of policy**

### **5.1 Termination of eradication actions**

In the case where no demarcated area has been established (i.e. *A. eugenii* infested plants, produce, soil or freights were recently introduced or it is demonstrated it was an isolated finding), official measures can end.

A declaration for eradication for *A. eugenii* should only be made after no specimens have been found over two successive lifecycles followed by subsequent surveys in the demarcated area over a year. The duration of the lifecycle of the pest will depend on the temperature inside the production facility, however, if establishing on crops/plants outdoors a lifecycle may be possible over a much longer time and could potentially reinfest the facility at a later date. Therefore, if the specified organism is not detected in a demarcated area for a period of 1 year, that demarcation may be lifted. In such cases, the Member State concerned shall notify the Commission and other Member States

Should surveys reveal that *A. eugenii* has become established over such an area that eradication is not considered feasible, DAFM may consider applying containment measures. See also procedures laid out in DAFM Generic Contingency Plan for Plant Health in Ireland Chapter 6.

## **6. Evaluation and review of the contingency plan**

### **6.1 Review and future versions**

This contingency plan should be reviewed regularly to consider updates on legislation, control measures, susceptible host plants, pest distribution, pest biology, diagnostics and any other relevant amendments. Should any outbreak of *A. eugenii* occur, effectiveness of the measures applied, and lessons learned should be included in further reviews of this contingency plan. Reviews will be carried out in accordance with DAFM Generic Contingency Plan for Plant Health in Ireland Chapter 13.

## **7. Minimum Resources**

The minimum resources to be made available and the procedures for making those additional resources available in case of a confirmed or suspected presence of *A. eugenii* are as outlined in DAFM Generic Contingency Plan for Plant Health in Ireland Chapters 5.2.

## **8. Command Structure**

The roles, responsibilities, and chain of command of the bodies involved are as laid down in DAFM Generic Contingency Plan for Plant Health in Ireland Chapter 8.

## **9. External Communication**

Measures for provision of information to Commission, other member states and all stakeholders in the event of a confirmed or suspected presence of *A. eugenii* shall be in accordance with DAFM Generic Contingency Plan for Plant Health in Ireland Chapter 11.

## **10. Training and Testing of Personnel**

Principles concerning the training of personnel of the competent authorities and, where appropriate, the bodies, public authorities, laboratories, professional operators and other persons shall be in accordance with DAFM Generic Contingency Plan for Plant Health in Ireland Chapter 12



# Appendices

## Appendix 1: Biology of *Anthonomus eugenii*

# DAFM Plant Pest Factsheet

## *Anthonomus eugenii* Pepper weevil

EU  
Priority  
Pest!



Fig 1 *Anthonomus eugenii* adult on pepper

### Pest Characteristics

- **Pest:** *Anthonomus eugenii*
- **Common name:** Pepper weevil
- **Hosts:** *Anthonomus eugenii* is a significant pest of pepper cultivation, mainly bell pepper (*Capsicum annuum*) and chilli pepper (e.g. *Capsicum frutescens*). The pest can also have an impact on aubergine (*Solanum melongena*). While the pest feeds on several other species (particularly *Solanum spp*), it cannot complete its lifecycle (reproduce) on all of them, such as potato (*S. tuberosum*) and tomato (*S. lycopersicum*).
- **Invasive Risk:** The risk of this pest reaching Europe is very high. There have been two previous introductions of *A. eugenii* into the EU. The pest has been previously found in greenhouses in the Netherlands (2012) and Italy (2013). On both occasions the pest was successfully eradicated.
- **Entry Pathways:** The most likely entry into the EU is on imports of host plants and their produce (e.g. fruit) from regions where the pest is present.
- **Symptoms:** Infestations are difficult to detect in the early stages when adults first colonise host plants (Fig 1). Detecting adults early can be undertaken by trapping using yellow sticky traps or pheromone lures (Fig 2a). Visual symptoms on host fruits are damage such as feeding scars, aborted fruit around the base of the plant (abscised) and adult exit holes. Infested fruit may also show signs of discolouration (Fig 2).



Fig 2: *Anthonomus eugenii* adult immobilized on a yellow pheromone sticky trap (a), discoloration and exit hole on chilli fruit (b), adult exit hole on damaged *Capsicum* (c), aborted *Capsicum* with dried calyx (d) More photos are available on the [EPPO Database](#)



An Roinn Talmhaíochta,  
Bia agus Mara  
Department of Agriculture,  
Food and the Marine

# DAFM Plant Pest Factsheet



Fig 3 *Anthonomus eugenii* lifecycle

- **Distribution:** *Anthonomus eugenii* is native to the regions of the central America's and Mexico. The pest has come to establish in several Caribbean islands, several southern/eastern US states, Hawaii and some Pacific islands (Fig 4).
- **Dispersal:** Adults are capable of flight, and can potentially spread up to 2 km per day. Populations appear spread no more than 1-2 kms per season.
- **Climatic suitability:** *Anthonomus eugenii* is a tropical / sub-tropical species which struggles to establish in temperate areas. The pest is not considered capable of establishing in the Irish environment.
- **Lifecycle:** Adults are initially attracted to host plants by volatiles released from the flowers and fruit. In host plants males attract the females by releasing an aggregation pheromone. After mating females lay their eggs in feeding punctures made on host plants. While fruits are the preferred site for egg laying, flower buds and open flowers can also be used. Larvae feed on seeds and tissue completing their developmental lifecycle to adults inside the fruit. Larvae undergo 3 developmental stages called instars (1- 5 mm) before pupation. Adults emerge from pupa and may remain inside the fruits for a few days before boring an exit hole and emerging. Adults reach lengths of 2-3.5 mm in length. At cool temperatures (~15°C) it about takes 6 weeks for the pest to complete a lifecycle.
- **If suspected:** If you find suspected symptoms or specimens, please submit images to DAFM at: [plantpestreport@agriculture.gov.ie](mailto:plantpestreport@agriculture.gov.ie)



Fig 4: World map of *A. eugenii* distribution taken from the EPPO database ([Link](#))

Photo credits: Fig 1, 2 3 EPPO ([Link](#))



An Roinn Talmhaíochta,  
Bia agus Mara  
Department of Agriculture,  
Food and the Marine



**Appendix 2: *Anthonomus eugenii* distribution worldwide**



Fig 2: Map showing distribution of *Anthonomus eugenii* worldwide as of 21.02.2023 © EPPO (<https://gd.eppo.int/taxon/ANTHEU/distribution>)

### Appendix 3: Host plants of *Anthonomus eugenii*

Latin name	Presence in the European Union	Host plants: reproduction possible	Host plants: food source for adults, no reproduction known
<b><i>Capsicum annuum</i></b>	Yes, commercial and hobby (sweet pepper and chilli pepper)	X	
<b><i>C. baccatum</i></b>	Hobby (chilli pepper)	X	
<b><i>C. chinense</i></b>	Hobby (chilli pepper)	X	
<b><i>C. frutescens</i></b>	Hobby (chilli pepper)	X	
<b><i>C. pubescens</i></b>	Hobby (chilli pepper)		
<i>Solanum americanum</i>	Cultivated, rare casual. Western and southern central Europe	X	
<i>S. carolinense</i>	Locally naturalised. Italy	X	
<i>S. dimidiatum</i>	No	X	
<i>S. elaeagnifolium</i>	Locally naturalised. Southern Europe	X	
<b><i>S. melongena</i></b>	Commercial and hobby (eggplant)	X	
<i>S. nodiflorum</i>	No	X	
<i>S. pseudocapsicum</i>	Pot plant, locally naturalised. South- western Europe	X	
<i>S. pseudogracile</i>	No	X	
<i>S. ptychanthum</i>	No	X	
<i>S. rantonettii</i>	Yes (greenhouses, gardens)	X	
<i>S. rostratum</i>	Locally naturalised. Italy	X	
<i>S. triquetrum</i> *	No	X	
<i>S. axillifolium</i> **	No	X	
<i>S. madrense</i> **	No	X	
<i>S. nigrum</i> **	Common weed (black nightshade)	X	
<i>S. trydynamum</i> **	No	X	
<i>S. tuberosum</i> *	Commercial and hobby (potato)		X
<i>Datura stramonium</i>	Weed (jimsonweed)		X
<i>S. lycopersicum</i>	Commercial and hobby (tomato)		X
<i>Nicotiana alata</i>	Garden plant (sweet-scented tobacco)		X
<i>Petunia parviflora</i>	Garden plant (petunia)		X
<i>Physalis pubescens</i>	Hobby (husk tomato)		X

\* Fruit not tested; \*\*No feeding observed.

The preferred hosts of the pest are presented in bold (EFSA 2020).

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EFSA, 2020. van der Gaag, D.J., Schenk, M., Loomans, A., Delbianco, A. and Vos, S., 2020. Pest survey card on *Anthonomus eugenii*. EFSA Supporting Publications, 17(6), p.1887E.

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