

APPROVED: 12 December 2023
doi: 10.2903/sp.efsa.2024.EN-8534

Pest survey card on members of the Andean Potato Weevil complex

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Abstract

This document provides the conclusions of the pest survey card that was prepared in the context of the EFSA mandate on plant pest surveillance (M-2020-0114) at the request of the European Commission. The full pest survey card for the members of the Andean Potato Weevil (APW) complex is published and available online in the EFSA Pest Survey Card gallery at the following link and will be updated whenever new information becomes available: <https://efsa.europa.eu/plants/planthealth/monitoring/surveillance/andean-potato-weevil-complex>

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Keywords: detection survey, delimiting survey, risk-based surveillance, *Premnotrypes*, *Phyrdenus*, *Rhigopsidius*, Union quarantine pest

Requestor: European Commission

Question number: EFSA-Q-2023-00601

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Acknowledgements: EFSA wishes to thank the following for the support provided to this scientific output: Jan Mertens, Tibor Bukovinszki and Martijn Schenk of the Netherlands Food and Consumer Product Safety Authority (NVWA) in the context of grant GP/EFSA/ALPHA/2021/11 for the preparation, Josep Jaques Miret for the review, Alicia Culot (trainee in EFSA Plant Health Monitoring team) and ISA expert Giulia Mattion (in the context of contract EOI/EFSA/SCIENCE/2020/01) for finalisation and publication of this survey card.

Suggested citation: EFSA (European Food Safety Authority), Mertens J, Bukovinszki T, Schenk M and Delbianco A, 2024. Pest survey card on members of the Andean Potato Weevil complex. EFSA supporting publication 2024:EN-8534. 6 pp. doi:10.2903/sp.efsa.2024.EN-8534. Available online: <https://efsa.europa.eu/plants/planthealth/monitoring/surveillance/andean-potato-weevil-complex>

ISSN: 2397-8325

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1 Introduction

This pest survey card was prepared in the context of the EFSA mandate on plant pest surveillance (M-2020-0114), at the request of the European Commission. Its purpose is to guide the Member States in preparing data and information for surveys on members of the Andean Potato Weevil (APW) complex (Coleoptera: Curculionidae). These are required to design statistically sound and risk-based pest surveys in line with current international standards. The 14 members of the APW complex are taxonomically clearly defined and are regulated as quarantine pests within the European Union. The 12 species within the genus *Premnotrypes* and *Rhigospidius tucumanus* only occur in the highland areas of the Andes. *Phyrdenus muriceus* is found in parts of South America, Central America, the Caribbean, the Antilles, and in some of the southern states of the US. All members of the APW complex are currently not known to occur in the EU. The climatic conditions and availability of host plants in the EU are suitable of at least some members of the APW complex. Members of this complex are only able to complete their development on Solanaceae. Depending on the species, pupal development takes place in soil (*Phyrdenus muriceus* and *Premnotrypes* spp.) or in tubers (*Rhigospidius tucumanus*). Potato would be the primary host for detection and delimiting surveys in the EU for the APW complex, while eggplant and tomato should be included in delimiting surveys for *P. muriceus*. The recommended approach for detection surveys is visual inspection of harvested tubers to detect larvae. Infested tubers should be sent to the lab for rearing of the larvae to adulthood and subsequent morphological identification.

2 The survey preparation

Table 1 addresses the key questions that are relevant for preparing a pest survey. First, the plant pest needs to be characterised in terms of its life cycle and biology. Then, the structure and size of the target population needs to be characterised and these analyses should be tailored to the situation in each Member State. Figure 1 gives examples of the components of a target population for the members of the APW complex and is not necessarily exhaustive. Finally, the detection process needs to be characterised in terms of the sequence of detection and identification methods required for the survey.

Table 1: Preparation of surveys for members of the APW complex

SURVEY QUESTION	SECTIONS	KEY INFORMATION
WHAT?	1. The pest and its biology	All species within the Andean Potato Weevil complex are clearly defined taxonomic entities. Members the APW complex have one or sometimes two generations per year. Depending on the species, pupal development takes place in soil (<i>Phyrdenus muriceus</i> and <i>Premnotrypes</i> spp.) or in tubers (<i>Rhigospidius tucumanus</i>). Adults emerge in spring and lay their eggs near host plants. Development time is highly variable and depends on the local climatic conditions and host plant phenology.

WHERE?	2. Target population	Potato is the preferred host of the members of the APW complex, but <i>P. muriceus</i> can also complete its development on eggplant and tomato. Detection and delimiting surveys on APW in the EU should focus on potatoes, while eggplants and tomatoes should be included in delimiting surveys for <i>P. muriceus</i> . Epidemiological unit: a homogeneous area with at least one individual host plant (such as a potato field, hectare, or NUTS area).
		Risk areas: e.g. the survey area may be subdivided based on variation in climatic suitability for the establishment of the members of the APW complex.
		Inspection unit: a potato tuber or a single host plant.
HOW?	3. Detection and identification	Recommended method: Visual examination of harvested tubers followed by morphological identification of adults in the lab.
WHEN?		Tubers should be inspected soon after harvest.

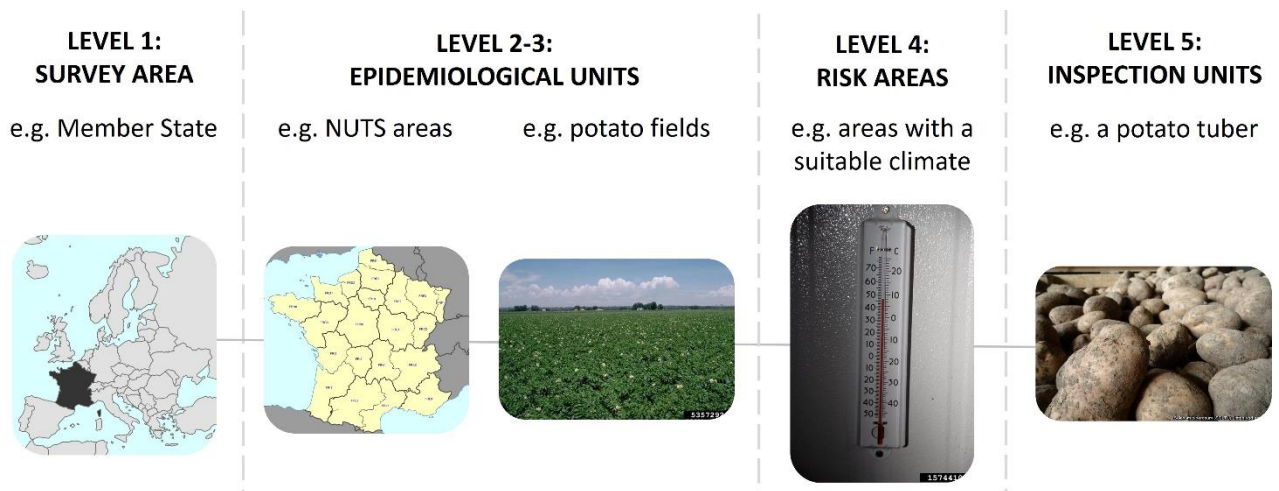


Figure 1: Example of the hierarchical structure of the target population for members of the APW complex (Sources: Eurostat, 2022 (levels 1–2); Howard F. Schwartz, Colorado State University, Bugwood.org (level 3); Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org (level 4); EPPO Global Database, courtesy of Muriel Suffert (level 5))

3 From survey preparation to survey design

Figure 2 shows the next steps after the survey preparation for designing statistically sound and risk-based detection and delimiting surveys of members of the APW complex. Guidance on the selection of type of survey, related survey preparation and design, is provided in the EFSA general guidelines for pest surveys¹.

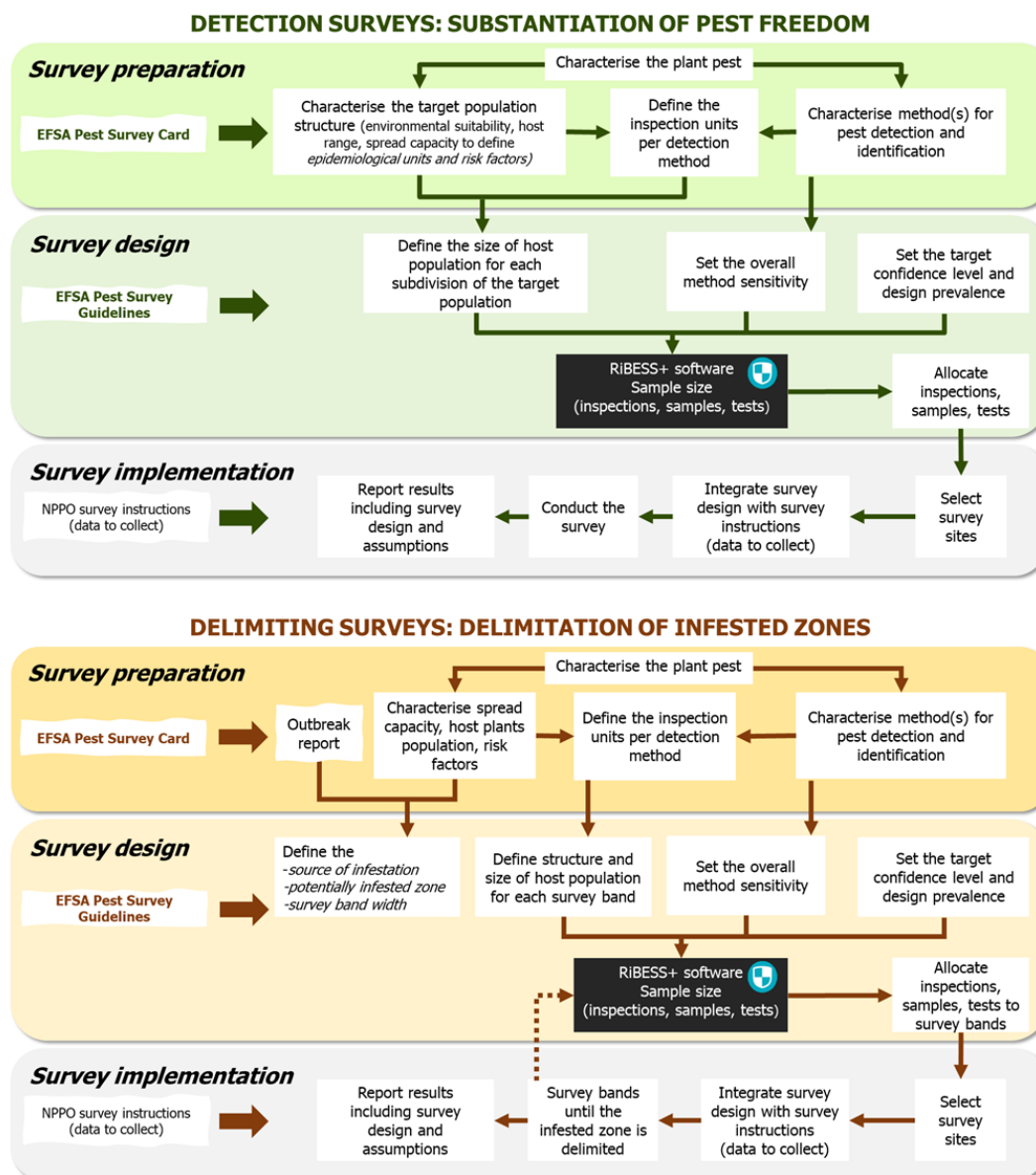


Figure 2: Steps required for the preparation, design and implementation of detection and delimiting surveys, in accordance with the methodology for statistically sound and risk-based surveillance¹

¹ EFSA (European Food Safety Authority), Lázaro E, Parnell S, Vicent Civera A, Schans J, Schenk M, Cortiñas Abrahantes J, Zancanaro G and Vos S, 2020. General guidelines for statistically sound and risk-based surveys of plant pests. EFSA supporting publication 2020:EN-1919. 65 pp. doi:10.2903/sp.efsa.2020.EN-1919 <https://efsa.onlinelibrary.wiley.com/doi/10.2903/sp.efsa.2020.EN-1919>

Relevant EFSA outputs

- General guidelines for statistically sound and risk-based surveys of plant pests: <https://efsa.onlinelibrary.wiley.com/doi/10.2903/sp.efsa.2020.EN-1919>
- Pest survey card on members of the APW complex: <https://efsa.europa.eu/plants/planthealth/monitoring/surveillance/andean-potato-weevil-complex>
- Pest categorisation of the Andean Potato Weevil (APW) complex (Coleoptera: Curculionidae): <https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2020.6176>
- Index of the EFSA Plant Pest Survey Toolkit: <https://efsa.europa.eu/plants/planthealth/monitoring/surveillance/index>
- EFSA Pest Survey Card gallery: <https://efsa.europa.eu/plants/planthealth/monitoring/surveillance/gallery>
- Pest survey cards: what, when, where and how to survey? <https://efsa.europa.eu/plants/planthealth/monitoring/surveillance/video-pest-survey-card>
- The statistical tool RiPEST: <https://r4eu.efsa.europa.eu/app/surveillance>
- The RiPEST manual: <https://zenodo.org/doi/10.5281/zenodo.8335472>
- The statistical tool RiBESS+: <https://r4eu.efsa.europa.eu/app/ribess>
- The RiBESS+ manual: <https://zenodo.org/doi/10.5281/zenodo.664465>
- The RiBESS+ video tutorial: <https://youtu.be/qYHqrCiMxDY>