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## Pest survey card on *Unaspis citri*

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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 *Unaspis citri* 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/unaspis-citri>

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**Keywords:** citrus snow scale, *Citrus* spp., detection survey, delimiting survey, Diaspididae, risk-based surveillance, Union quarantine pest

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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 *Unaspis citri* surveys. These are required to design statistically sound and risk-based pest surveys, in line with current international standards. *Unaspis citri* is a Union quarantine pest native to southeast Asia with distribution in the EU limited to the Azores (PT). *Unaspis citri* can complete two to six generations per year. First instar nymphs and adult males are the only mobile stages of this insect. Heavy infestations spread to the twigs and leaves, resulting in dieback, and to fruit, where it produces yellowing and disfigurement. Specific requirements for the introduction of host plants for planting and fruit are laid down in EU legislation. *Unaspis citri* is a polyphagous pest. Detection surveys in the EU should focus on *Citrus* spp., while delimiting surveys following an outbreak should include all the known host plants. There is uncertainty as to whether the pest could become widely established in the EU citrus-growing regions. Visual examination of infested plant parts is the recommended method to detect *U. citri*, followed by morphological identification. Leaves and stems can be examined all year round but the recommended timing is spring and summer. Early summer to late autumn is recommended for fruit.

# 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 *Unaspis citri* 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 *Unaspis citri*

SURVEY QUESTION	SECTIONS	KEY INFORMATION
<b>WHAT?</b>	1. The pest and its biology	<i>Unaspis citri</i> can complete several overlapping generations per year, but 2–3 in cooler areas where eggs constitute the overwintering stage. The life cycle comprises five developmental stages for females (egg, three nymphal instars, and adult) and six for males (egg, two nymphal instars, prepupa and pupa, and adult). Only the first instar nymphs and adult males are mobile. Winged adult males are short-lived and may die soon after mating.

<b>WHERE?</b>	2. Target population	<i>Unaspis citri</i> is a polyphagous pest. Detection surveys in the EU should focus on <i>Citrus</i> spp., while delimiting surveys following an outbreak should include all the known host plants.
		Epidemiological units: individual homogeneous areas that contain at least one individual host plant (e.g. orchard, hectare, NUTS area).
		Risk areas: areas with citrus trees around risk locations (e.g. warehouses, packing house, processing plants).
<b>HOW?</b>	3. Detection and identification	Visual examination of infested plant parts. Morphological identification is the preferred method to confirm identity of <i>Unaspis citri</i> . No specific molecular identification method has been developed yet.
<b>WHEN?</b>		Leaves and stems can be examined all year round but the recommended timing is spring and summer. Early summer to late autumn is recommended for fruit.

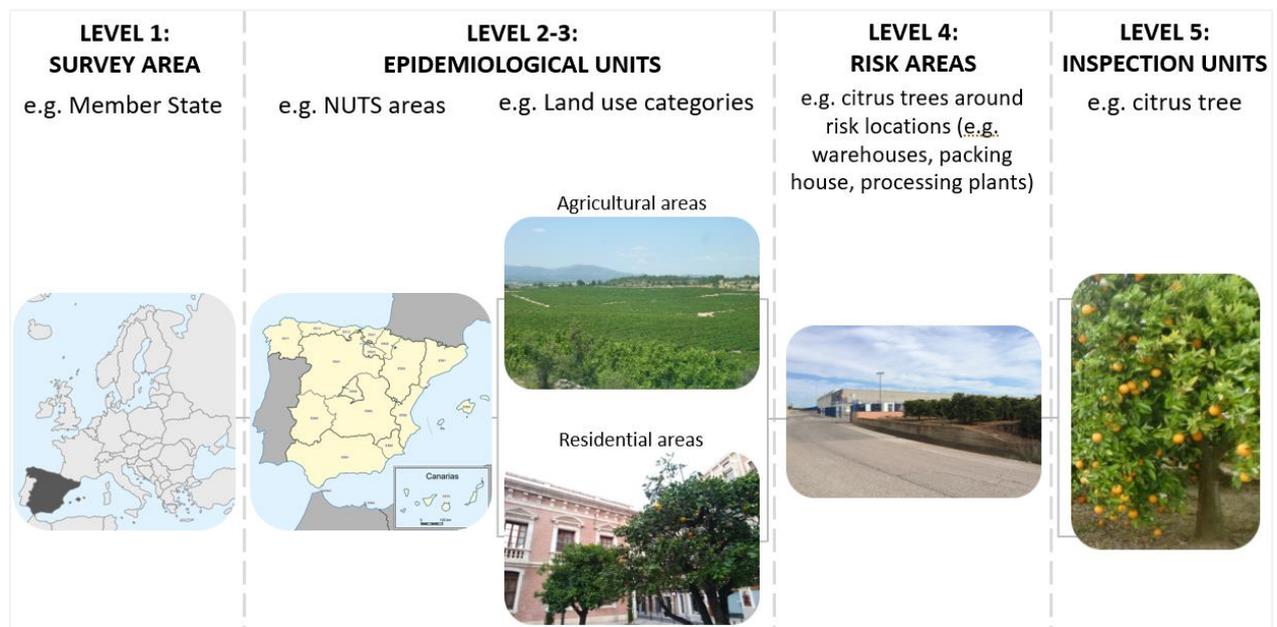


Figure 1: Example of the hierarchical structure of the target population for *Unaspis citri* (Sources: Eurostat, 2022 (levels 1–2); Antonio Vicent, IVIA (level 3 and level 5); Plant Health Service of Generalitat Valenciana (GVA) (level 4))

### 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 *Unaspis citri*. Guidance on the selection of type of survey, related survey preparation and design, is provided in the EFSA general guidelines for pest surveys<sup>1</sup>.

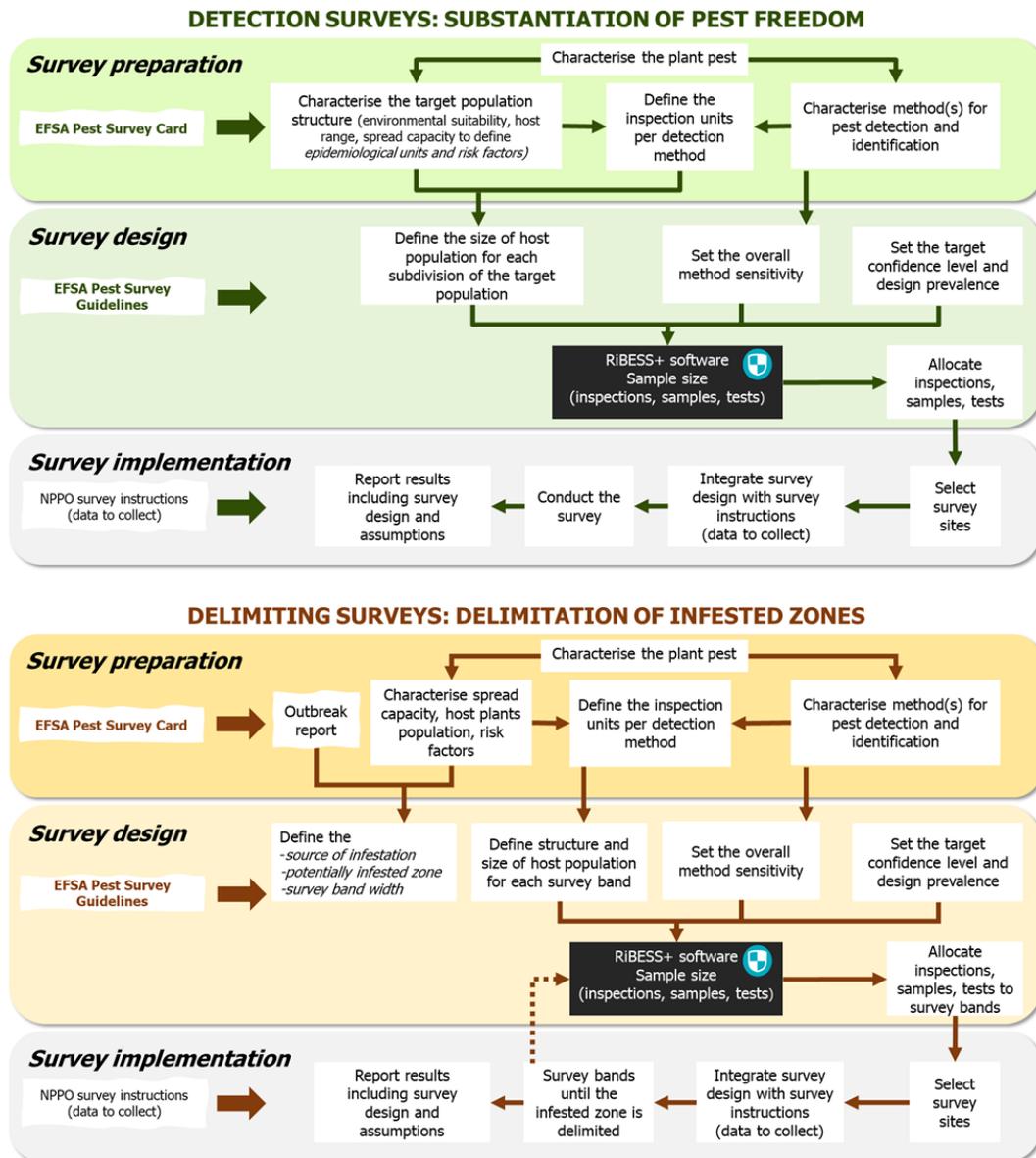


Figure 2: Steps required for the preparation, design and implementation of detection and delimiting surveys, in accordance with the methodology for statistically sound and risk-based surveillance<sup>1</sup>

<sup>1</sup> 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 *Unaspis citri*: <https://efsa.europa.eu/plants/planthealth/monitoring/surveillance/unaspis-citri>
- Pest categorisation on *Unaspis citri*: <https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2018.5187>
- 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>