RIPEST
(*RISK BASED PEST SURVEY TOOL*):

EFSA DEVELOPS A TOOL FOR DESIGNING MORE ROBUST AND HARMONIZED PEST SURVEYS IN THE EU

ALICE DELBIANCO

PLANTS UNIT – PLANT HEALTH MONITORING TEAM

EUROPEAN FOOD SAFETY AUTHORITY

EFSA PEST SURVEY TOOLKIT

Since 2017: *EC mandate to provide the MSs with a Toolkit for planning and execution of statistically sound and risk-based surveys of quarantine pests*

Check out the EFSA Pest Survey Toolkit HERE

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Survey preparation:
Pest survey cards
(100 pests +
non-EU Tephritidae)

WHERE?

WHAT?

HOW?

WHEN?

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Survey design:
General guidelines +
specific guidelines

WHERE?
WHAT?
HOW?
WHEN?

DETECTION METHODS:
method sensitivity

TARGET POPULATION:
structure and size

AIM OF THE SURVEY:
confidence level
and
design prevalence

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Survey design:
General guidelines +
specific guidelines

Sample size estimation:
RiBESS+

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DETECTION METHODS:
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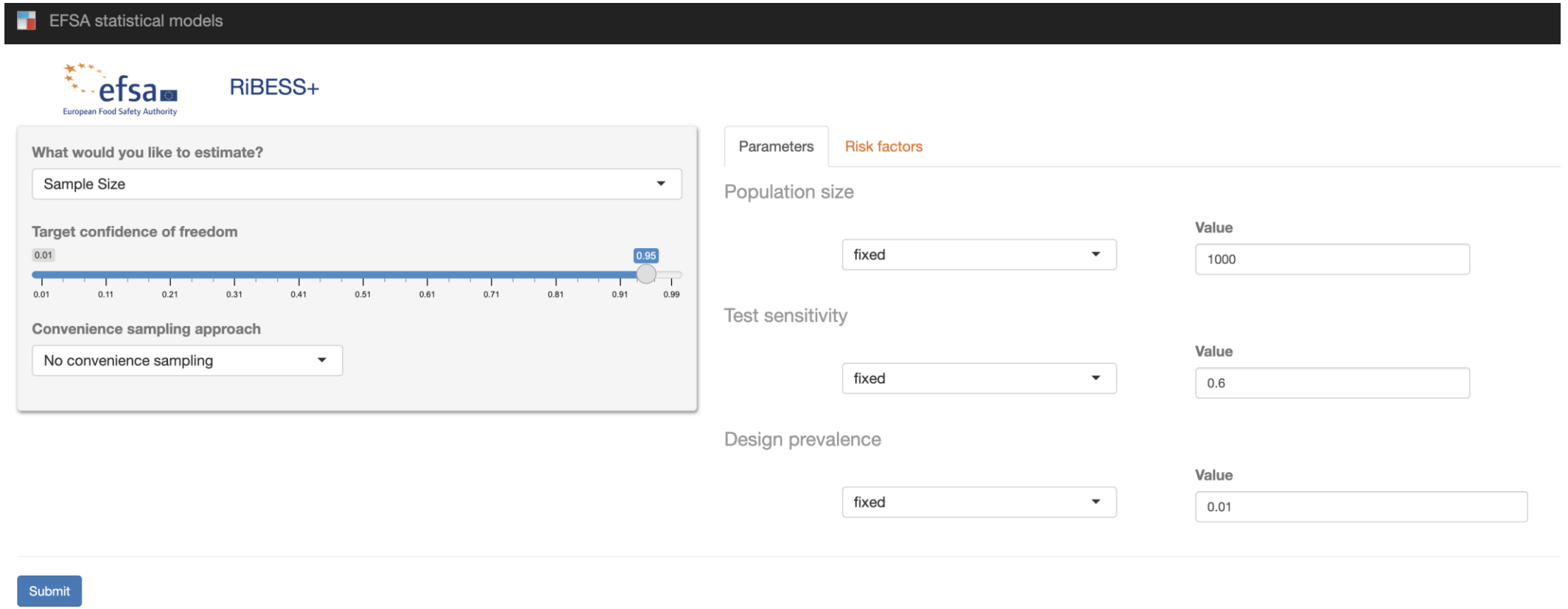
RIBESS+

- Generic statistical calculator
- No step-by-step guidance



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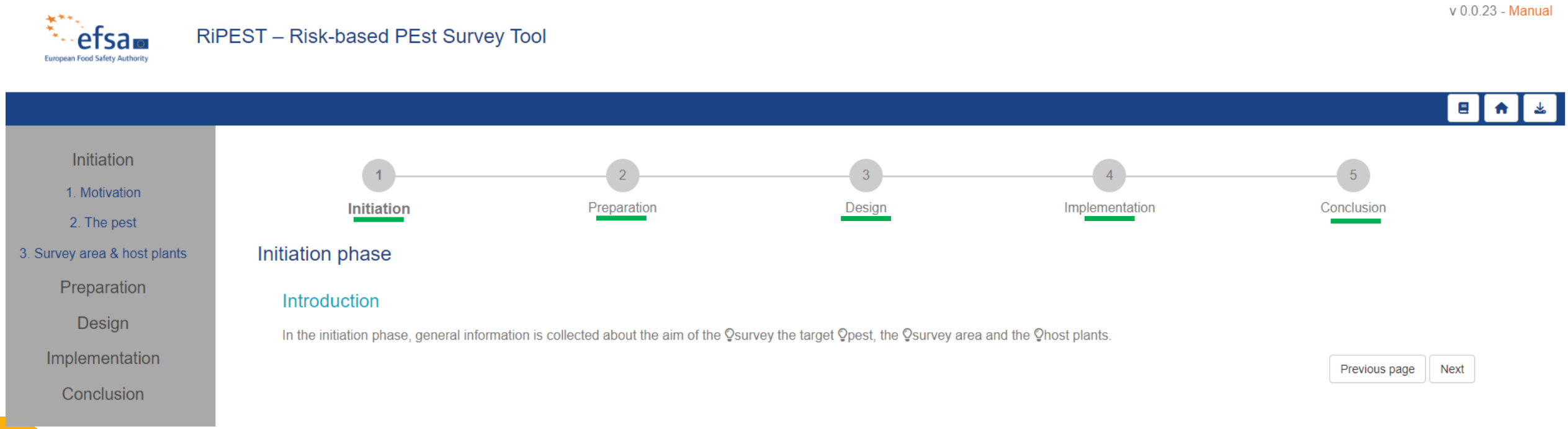
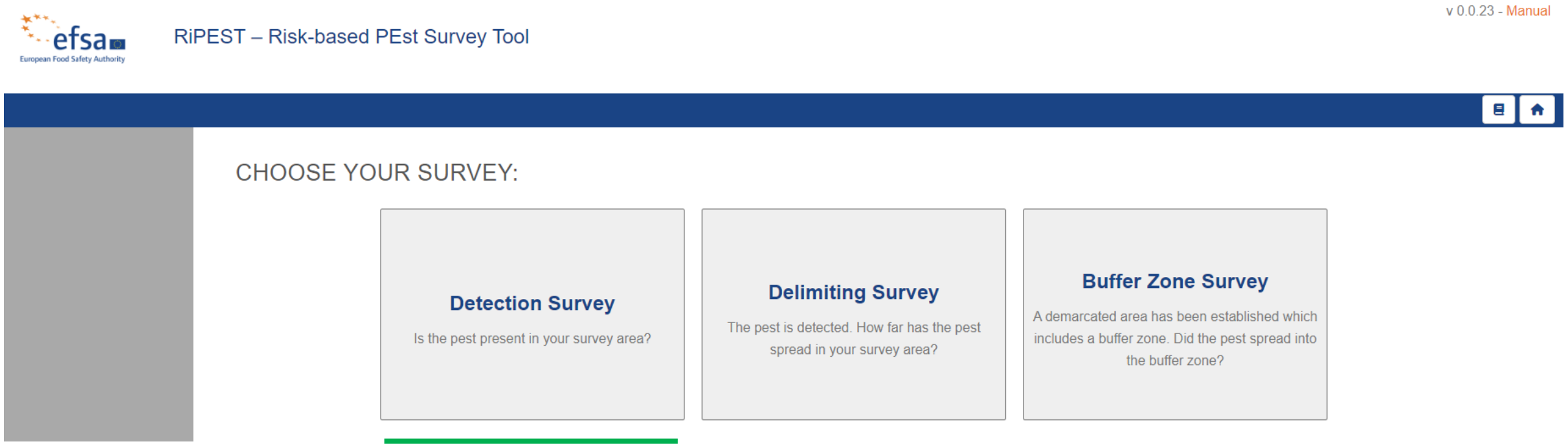
- Tailored to Plant Health
- As RiBESS+, it is freely accessible: register at https://r4eu.efsa.europa.eu/login



Step-by-step guidance: from survey initiation to conclusion

RIPEST


efsa
European Food Safety Authority
RiPEST – Risk-based PEst Survey Tool
v 0.0.23 - Manual
CHOOSE YOUR SURVEY:
Detection Survey
Is the pest present in your survey area?
Delimiting Survey
The pest is detected. How far has the pest spread in your survey area?
Buffer Zone Survey
A demarcated area has been established which includes a buffer zone. Did the pest spread into the buffer zone?

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2. The pest

In case the survey is aimed to detect multiple pests at the same time, this procedure needs to be done multiple times. This tool only considers one pest at a time.

What is the target pest of the survey?

Xylella fastidiosa

What is the status of the pest in your target population?

Absent

When was the last survey conducted for the same pest and target population?

Select a year

Please provide the year of the last survey.

2022

Which survey(s) was(were) conducted in that year?

Detection survey

Previous Next

RIPEST

3. Survey area

Member State

Belgium

What is the survey area?

Select the area (NUTS 0,1,2,3)

Select the appropriate NUTS classification.

NUTS 2

Selected NUTS: Prov. Luxembourg (BE), Prov. Namur, Prov. Hainaut

Total suvrey area [Ha]: 1191018

Example with 3 provinces in Belgium

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3. Inspection units

Plant

The target population size is an estimation of the number of host plants in the survey area. When the target population size cannot be estimated the user can choose for an infinite target population size. This can possibly overestimate the sample size needed for the survey.

Epidemiological units

How can you divide the target population?

- ○ Administrative units (NUTS)
- ○ Land use (Agricultural areas, urban areas, forest areas and other areas)
- ◉ Administrative units and land use
- ○ User defined

Select the appropriate NUTS classification.

NUTS 2

Label epidemiological unit	Number of inspection units in Forests	Number of inspection units in agricultural areas	Number of inspection units in urban areas	Number of inspection units in other areas
Prov. Luxembourg (BE)	600000	45000	30000	0
Prov. Namur	300000	70000	5000	0
Prov. Hainaut	500000	80000	2000	0

RIPEST

Detection & identification methods

What type of survey procedure is applied in the field to detect the pest?

Visual examination (incl. macroscopic identification of the pest and sampling for laboratory analysis)

Which sampling matrix or matrices are collected?

Leaf

The sensitivity of the field procedure is termed sampling effectiveness, which is defined as the probability to collect an infested sample from an infested unit.

What is the sampling effectiveness? [%]

70

The sensitivity of the laboratory procedure is characterized by the diagnostic sensitivity, which is defined as the probability to detect the pest in an infested sample, following a specific sampling and/or diagnostic protocol. Such protocol may involve multiple steps (e.g. screening, detection and confirmation). These steps are usually sequential, meaning that samples only proceed to the next step when positive (e.g. confirmation is only performed when detection is positive). The sensitivity of each step should be known or should be estimated in order to calculate the diagnostic sensitivity of the laboratory procedure.

Please describe the main steps (e.g. screening, isolation, extraction, sample preparation, detection, confirmation) in the laboratory procedure:

ELISA followed by qPCR

Please select the specific laboratory methods.

DAS-ELISA QPCR

What is the diagnostic sensitivity of the full laboratory procedure? [%]

78

Previous Continue

EFSA et al., 2020. Guidelines for statistically sound and risk-based surveys of *Xylella fastidiosa*. EFSA supporting publication 2020:EN-1873.

RIPEST

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What is the diagnostic sensitivity of the full laboratory procedure? [%]

78

Previous Continue

Poster n.48 (Marina E. Martino):
HOW TO COMBINE DETECTION AND IDENTIFICATION METHODS TO MAXIMISE THE METHOD SENSITIVITY FOR THE SURVEILLANCE OF *XYLELLA FASTIDIOSA*

EFSA et al., 2020. Guidelines for statistically sound and risk-based surveys of *Xylella fastidiosa*. EFSA supporting publication 2020:EN-1873.

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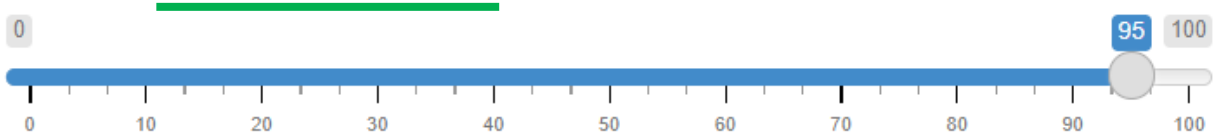
1. Estimate sample size

The confidence level and the design prevalence define the aim of the survey and are important to draw the conclusion of the survey. The selection of both these parameters require to find a compromise between available resources and the level of risk the risk managers are willing to accept.

Overall Confidence Level[%]



Plant

Design prevalence

Design prevalence [%]

1

Simulate

RIPEST

Sample Size Table

The overall achieved confidence level: 95.07%

Epidemiological unit	Population size	Theoretical sample size	Theoretical achieved confidence level
Prov. Luxembourg (BE) and Forests	600000.00	61.00	0.28
Prov. Luxembourg (BE) and Agricultural areas	45000.00	61.00	0.28
Prov. Luxembourg (BE) and Urban areas	30000.00	61.00	0.28
Prov. Luxembourg (BE) and Other areas	0.00	0.00	0.00
Prov. Namur and Forests	300000.00	61.00	0.28
Prov. Namur and Agricultural areas	70000.00	61.00	0.28
Prov. Namur and Urban areas	5000.00	61.00	0.28
Prov. Namur and Other areas	0.00	0.00	0.00
Prov. Hainaut and Forests	500000.00	61.00	0.28
Prov. Hainaut and Agricultural areas	80000.00	61.00	0.28
Prov. Hainaut and Urban areas	2000.00	61.00	0.29
Prov. Hainaut and Other areas	0.00	0.00	0.00

You get your sample size for each epidemiological unit and you can proceed with survey implementation!

RIPEST


Detection survey
Initiation
Preparation
Design
Implementation
Conclusion
1
Initiation
2
Preparation
3
Design
4
Implementation
5
Conclusion
Conclusion
Was the pest found during the survey?
Yes
No
Previous Page

RIPEST

Conclusion

Was the pest found during the survey?

○ Yes ◉ No

Plant

Refresh/update

	Epidemiological unit	Population size	Theoretical sample size	Theoretical achieved confidence level	Negative samples	Undetermined samples
1	Prov. Luxembourg (BE) and Forests	600000	61	0.2839		
2	Prov. Luxembourg (BE) and Agricultural areas	45000	61	0.284		
3	Prov. Luxembourg (BE) and Urban areas	30000	61	0.2841		
4	Prov. Luxembourg (BE) and Other areas	0	0	0		
5	Prov. Namur and Forests	300000	61	0.2839		
6	Prov. Namur and Agricultural areas	70000	61	0.284		
7	Prov. Namur and Urban areas	5000	61	0.2847		
8	Prov. Namur and Other areas	0	0	0		
9	Prov. Hainaut and Forests	500000	61	0.2839		
10	Prov. Hainaut and Agricultural areas	80000	61	0.284		
11	Prov. Hainaut and Urban areas	2000	61	0.2859		
12	Prov. Hainaut and Other areas	0	0	0		

Calculate achieved confidence level

RIPEST

Conclusion

Was the pest found during the survey?

○ Yes ◉ No

Plant

Refresh/update

	Epidemiological unit	Population size	Theoretical sample size	Theoretical achieved confidence level	Negative samples	Undetermined samples
1	Prov. Luxembourg (BE) and Forests	600000	61	0.2839	61	0
2	Prov. Luxembourg (BE) and Agricultural areas	45000	61	0.284	61	5
3	Prov. Luxembourg (BE) and Urban areas	30000	61	0.2841	79	0
4	Prov. Luxembourg (BE) and Other areas	0	0	0	0	0
5	Prov. Namur and Forests	300000	61	0.2839	60	0
6	Prov. Namur and Agricultural areas	70000	61	0.284	58	3
7	Prov. Namur and Urban areas	5000	61	0.2847	70	0
8	Prov. Namur and Other areas	0	0	0	0	0
9	Prov. Hainaut and Forests	500000	61	0.2839	61	0
10	Prov. Hainaut and Agricultural areas	80000	61	0.284	60	1
11	Prov. Hainaut and Urban areas	2000	61	0.2859	61	0
12	Prov. Hainaut and Other areas	0	0	0	0	0

Calculate achieved confidence level

RIPEST

Epidemiological unit	Population size	Theoretical sample size	Theoretical achieved confidence level	Negative samples	Undetermined samples	Actual achieved confidence level
Prov. Luxembourg (BE) and Forests	600000	61	0.2839	61	0	0.2839
Prov. Luxembourg (BE) and Agricultural areas	45000	61	0.284	61	5	0.284
Prov. Luxembourg (BE) and Urban areas	30000	61	0.2841	79	0	0.3513
Prov. Luxembourg (BE) and Other areas	0	0	0	0	0	0
Prov. Namur and Forests	300000	61	0.2839	60	0	0.28
Prov. Namur and Agricultural areas	70000	61	0.284	58	3	0.2721
Prov. Namur and Urban areas	5000	61	0.2847	70	0	0.3193
Prov. Namur and Other areas	0	0	0	0	0	0
Prov. Hainaut and Forests	500000	61	0.2839	61	0	0.2839
Prov. Hainaut and Agricultural areas	80000	61	0.284	60	1	0.28

Conclusion for inspection unit Plant: The survey area is free form the pest, based on a survey with confidence level of 95.63% and a design prevalence of 1%.

Download report

Download report EUROPHYT

Download excel file to be uploaded in EUROPHYT Survey platform!

RIPEST

- **Many other functionalities**:
  - RiPEST will be prefilled by **Relational Database** containing for all UQPs the info present in survey cards (host plants, detection methods, etc) → dropdown lists
  - Possibility to add **Risk factors** → risk-based survey
  - Reallocate samples within epidemiological units
  - Upload shapefile of hosts distribution
  - Upload shapefile of environmental suitability
  - …and more!

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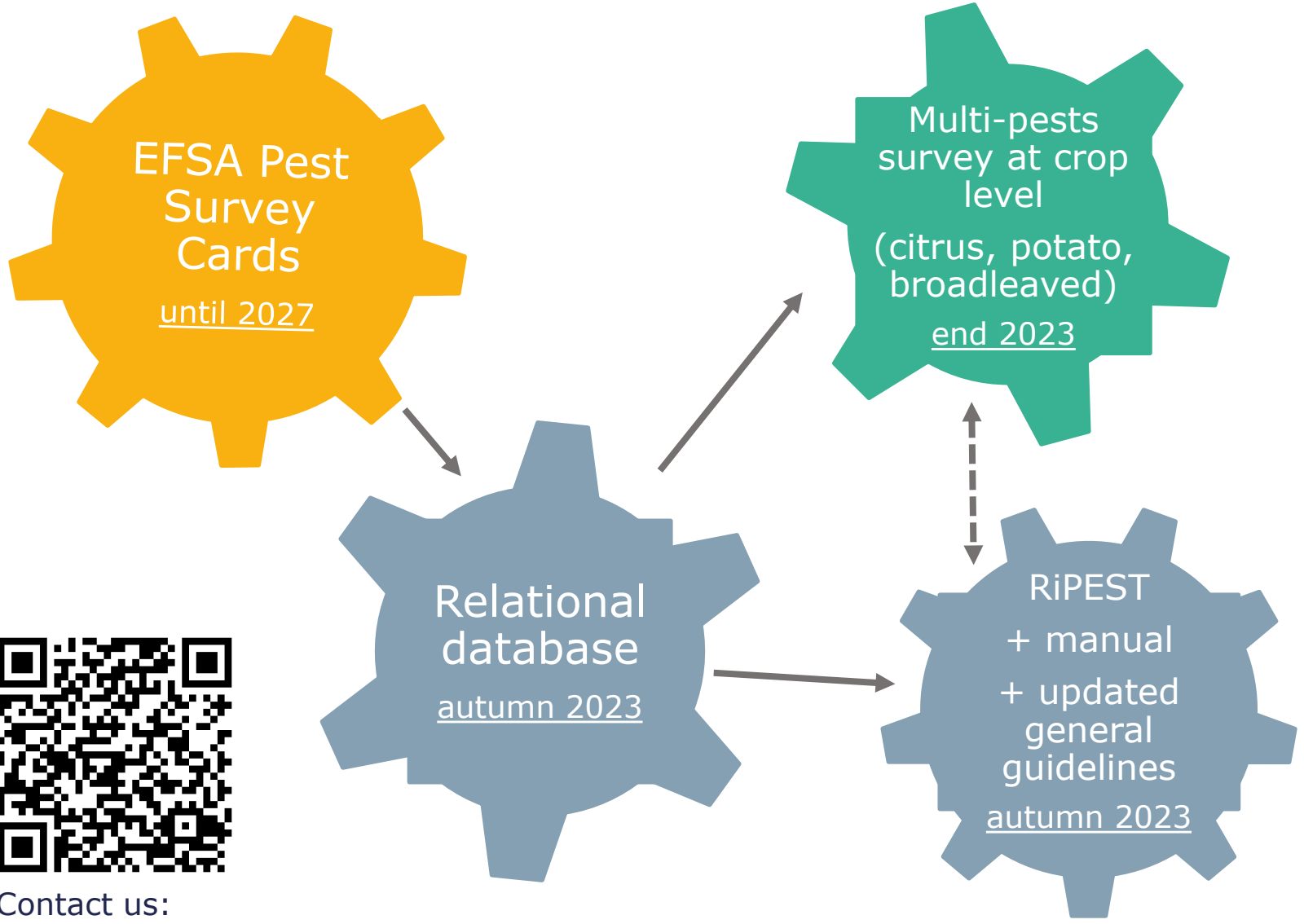
WHAT'S NEXT?

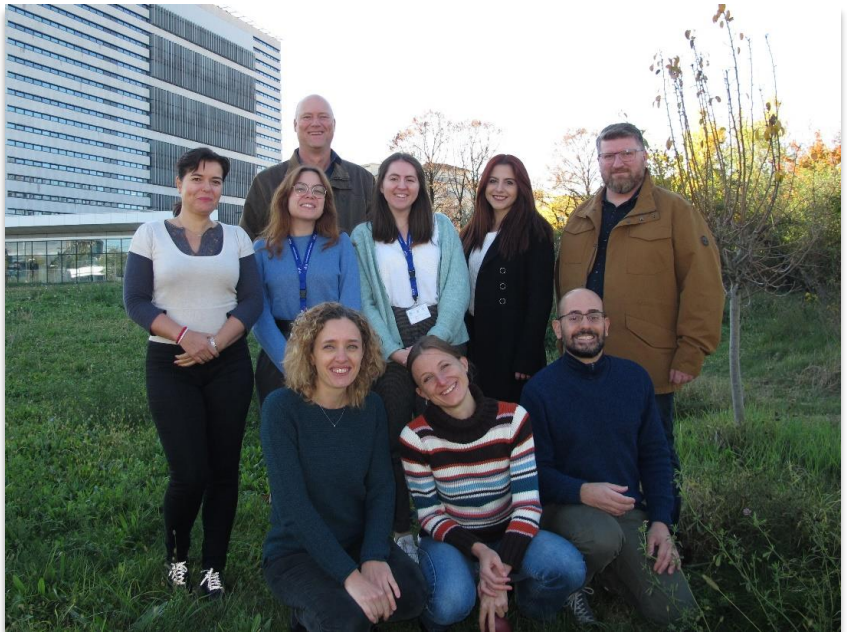


Communication and trainings:
workshops, e-learning course and webinars to MSs Network and third countries

EKEs:
method sensitivity and level of prevalence at detection for priority pests

Contact us:
plants@efsa.europa.eu

THANKS FOR YOUR ATTENTION!



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Check out the EFSA Pest Survey Toolkit HERE

cc

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RIPEST

v 0.0.18 - Manual

RiPEST – Risk-based PEst Survey Tool

Welcome to RiPEST

This tool is developed as an interactive guide to help the user to plan and execute a statistically sound and risk-based survey on plant pests. It has been developed based on the following EFSA guidance document:

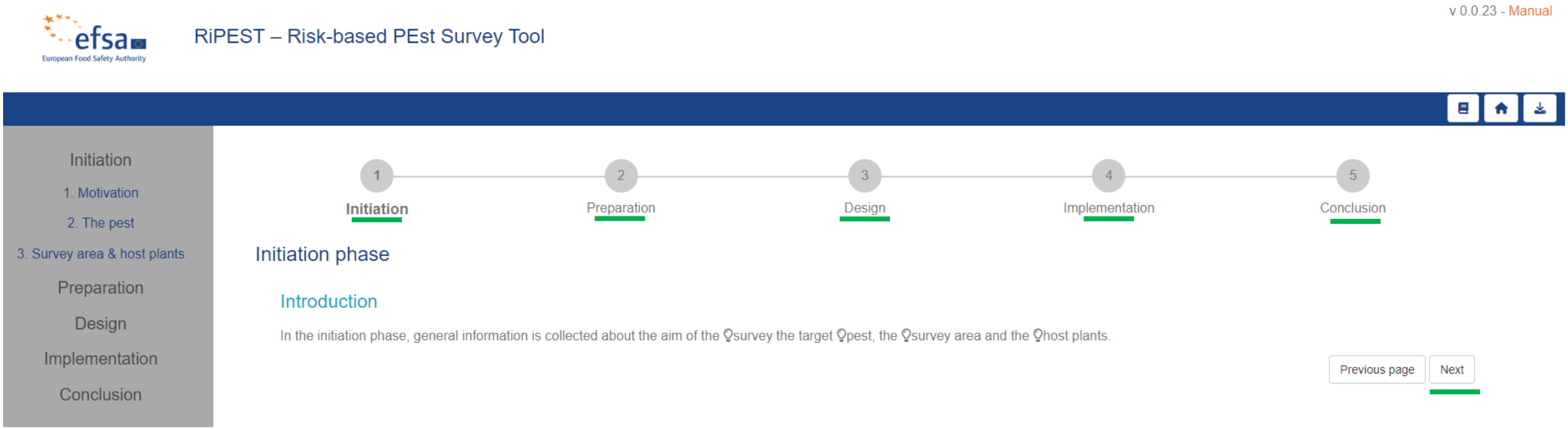
- EFSA (European Food Safety Authority), Lázaro E, Parnell S, Vincent Civera A, Schans J, Schenk M, Cortiñas Abrahantes J, Zancanaro G and Vos S, 2020a. General guidelines for statistically sound and risk-based surveys of plant pests. EFSA supporting publication 2020:EN-1919. 65 pp. doi:10.2903/sp.efsa.2020.EN-1919

Based on the online application RiBESS+ that implements statistical methods for estimating the sample size, design prevalence (achieved design prevalence), global (and group) sensitivity (achieved confidence level), and probability of freedom from disease.

A session can be downloaded at any point during the survey process. This way the survey can be continued or edited at a later point in time.

Load Survey | ▶ Start New Survey

RIPEST



From survey initiation to conclusion