Science for Policy in the implementation of Plant Health Regulation

Jesus Barreiro-Hurle & Elisabetta Balzi
JRC

Protecting the EU plant health in a changing world
13 December 2019

European Commission

Remote sensing to support the early detection and management of pests

European Commission

Deteriorating plant health

Early detection

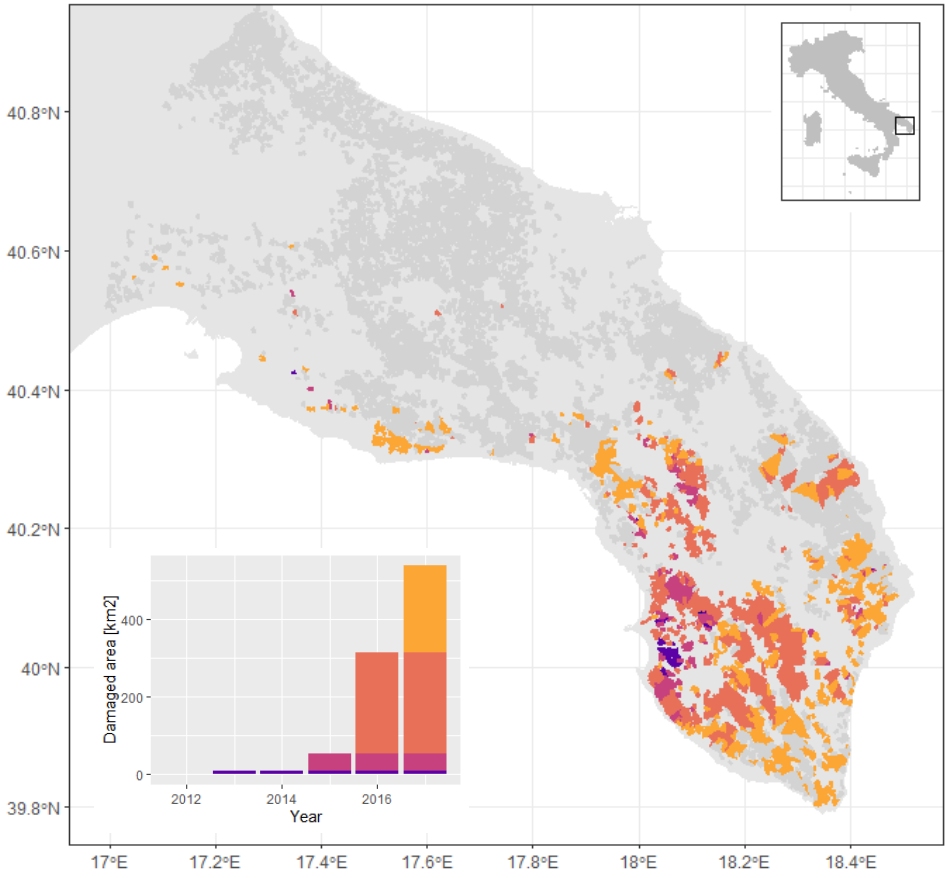
Damage mapping

European Commission

Early detection

With sensors on aircraft

Zarco Tejada *et al.* 2018 Nature Plants



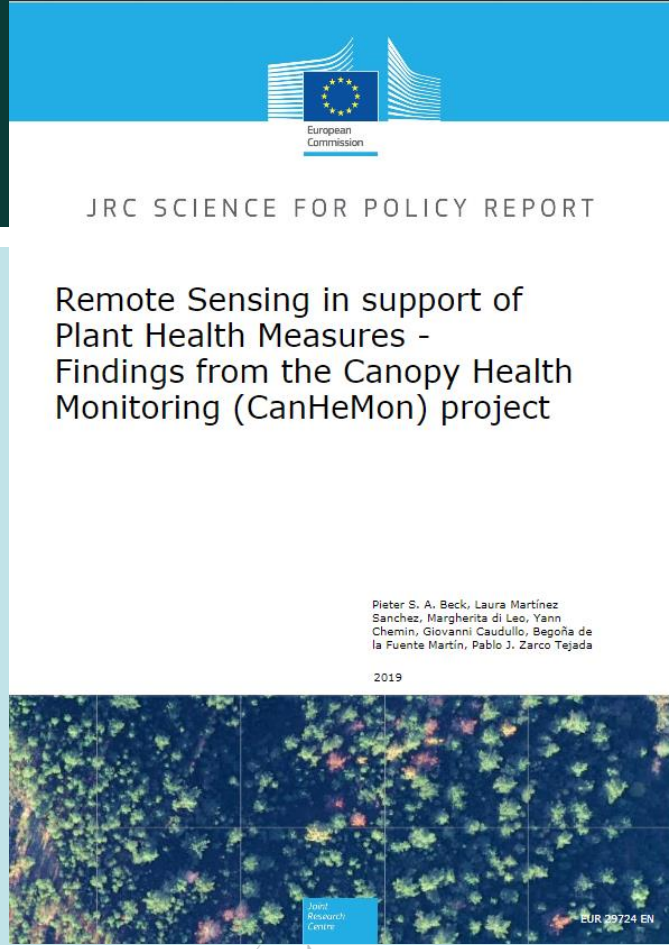
Damage mapping

With satellite sensors

European Commission

Take home messages

- Remote sensing will not replace traditional surveys or diagnostic tools, but often can make them more efficient or targeted
- There is no one-size-fits-all when using remote sensing. Instead, the technology should be tailored on case by case basis
- Some remote sensing applications can be deployed operationally, others are cutting-edge research
- The remote sensing field is moving forward quickly, thanks to, among others, the Copernicus programme, drones, and machine learning



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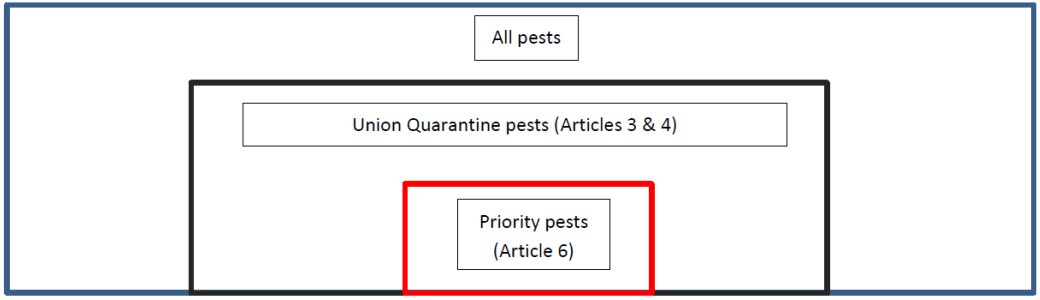
Remote sensing to support the early detection and management of pests

Assessment of the economic, social and environmental impact of pests as support to better preparedness and risk management

Priority Pests listed under the general Plant Health Law (Reg. 2016/2031)

Pest categorization



Note: the figure is not to scale

- Not present in the EU, present in a limited area or with scarce, irregular, isolated and infrequent presences.
- Most severe economic, environmental **or** social impact

Annual surveys (Art. 24)
Contingency plan (Art. 25)
Simulation exercises (Art. 26)
Action plan for eradication (Art. 27)

JRC & EFSA: integrating economics & pathology

European Commission

JRC TECHNICAL REPORTS

The Impact Indicator for Priority Pests (I2P2): a tool for ranking pests according to Regulation (EU) No 2016/2031

Sánchez, Berta
Barreiro-Hurle, Jesús
Soto Embodas, Iria
Rodriguez-Cerezo, Emilio

2019

EUR 29793 EN

European Commission

Directorate-General for Health and Food Safety (DG SANTE)

A joint methodology on Priority Pests

SCIENTIFIC REPORT

EFSA Journal

ADOPTED: 17 May 2019
doi: 10.2903/j.efsa.2019.5731

Report on the methodology applied by EFSA to provide a quantitative assessment of pest-related criteria required to rank candidate priority pests as defined by Regulation (EU) 2016/2031

European Food Safety Authority (EFSA),
Richard Baker, Gianni Gilioli, Carsten Behring, Denise Candiani, Andrey Gogin, Tomasz Kaluski, Mart Kinkar, Olaf Mosbach-Schulz, Franco Maria Neri, Riccardo Siligato, Giuseppe Stancanelli and Sara Tramontini

Abstract

In agreement with Article 6(2) of the Regulation (EU) 2016/2031 on protective measures against pests of plants, the European Commission has been tasked by the Council and European Parliament to establish a list of Union quarantine pests which qualify as priority pests. The prioritisation is based on the severity of the economic, social and environmental impact that these pests can cause in the Union territory. The Commission's Joint Research Centre (JRC) is in charge of developing a methodology based on a multi-criteria decision analysis and composite indicators. In this context, EFSA has provided technical and scientific data related to these pests, in particular: (i) the potential host range and distribution of each of these pests in the Union territory at the level of NUTS2 regions; (ii) parameters quantifying the potential consequences of these pests, e.g. crop losses in terms of yield and quality, rate of spread and time to detection. Expert knowledge elicitation methodology has been applied by EFSA in order to provide those parameters in a consistent and transparent manner.

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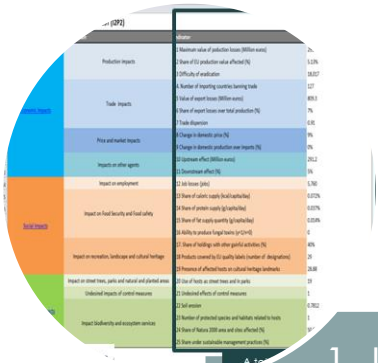
Keywords: control, detection, host plants, potential distribution, quality loss, spread, yield loss

Requestor: European Commission
Question number: EFSA-Q-2017-00558
Correspondence: alpha@efsa.europa.eu

efsa
European Food Safety Authority

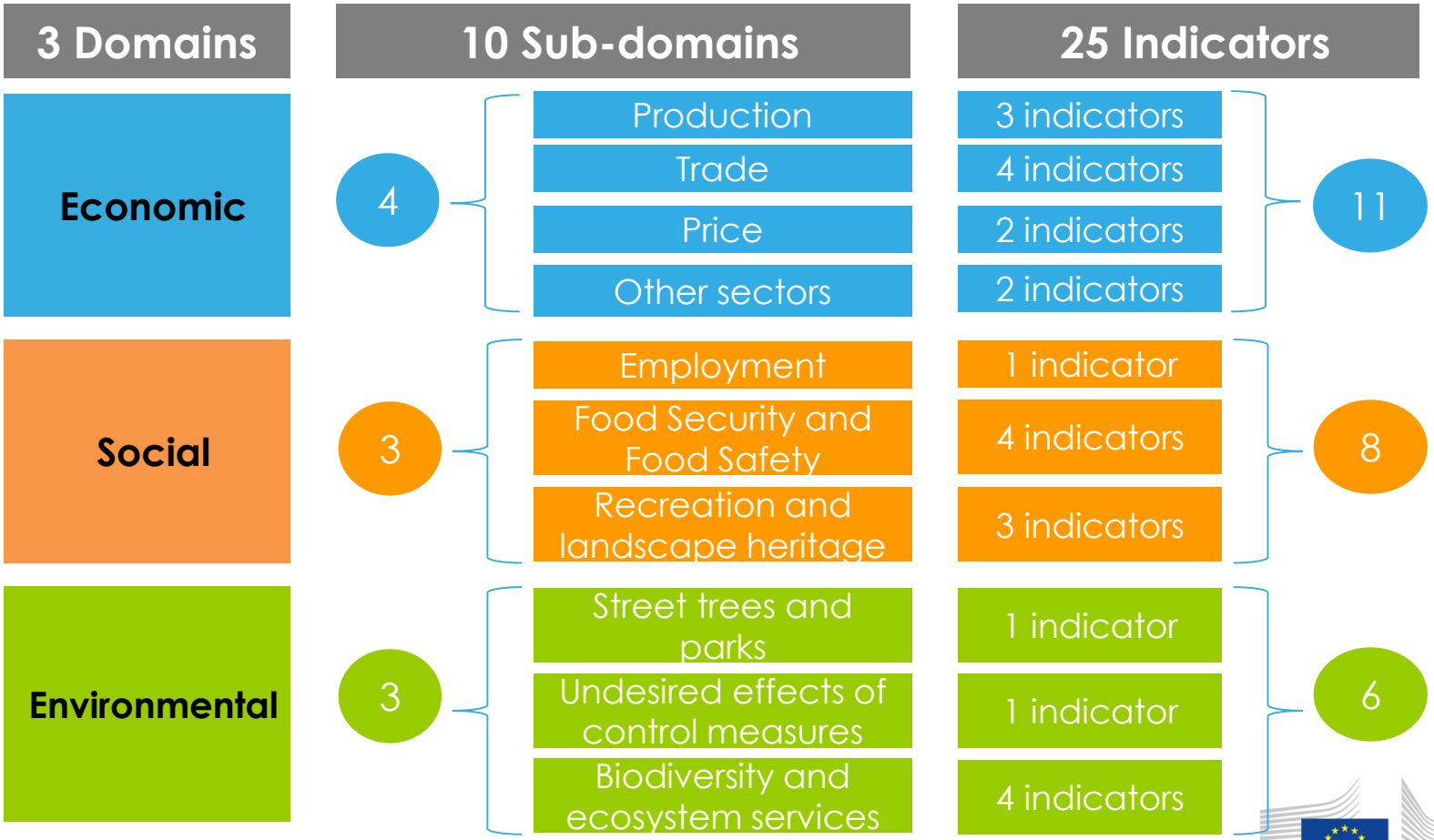
Commission

Structure of the I2P2



1. Indicators selection
(Reg. criteria/data availability)

Quantitative / qualitative measures by HOST / PEST



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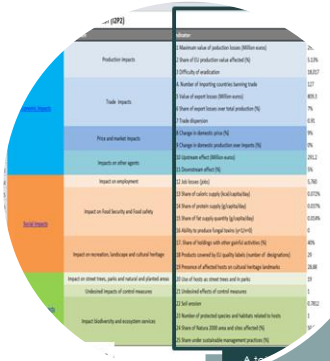
Structure of the I2P2



1. Indicators selection
(Reg. criteria/data availability)

Quantitative / qualitative measures by HOST / PEST

RANKING

Pest	I2P2		Ranking by domains		
	Rank	Value	Economic	Social	Environmental
Xylella fastidiosa (Pierce's disease)	1	0.8104	1	1	1
Popillia japonica (Japanese beetle)	2	0.5117	4	3	2
Thaumatotibia leucotreta (Citrus codling moth)	3	0.4714	8	2	3
Candidatus Liberibacter (Citrus greening)	4	0.3750	2	5	5
Conotrachelus nenuphar	5	0.3349	10	6	4
thonomus eugenii	6	0.2960	5	9	7
rericera cockerelli	7	0.2792	7	4	14
tis pomonella (Apple maggot fly)	8	0.2728	3	12	10
frugiperda (Fall armyworm)	9	0.2246	11	10	
la (Oriental fruit fly)	10	0.2068	17	11	
-cran fruit fly)	11	0.2051	16		
	12	0.1983			
-f nematode)	13				

2. Normalization and weighting

Aggregate indicators and compare pests

European Commission

RANKING (pest affecting crops example)

Pest	I2P2		Ranking by domains		
	Rank	Value	Economic	Social	Environmental
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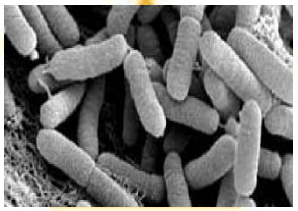
Bactericera cockerelli	7	0.2792	7	4	14
Rhagoletis pomonella (Apple maggot fly)	8	0.2728	3	12	10
Spodoptera frugiperda (Fall armyworm)	9	0.2246	11	10	11
Bactrocera dorsalis (Oriental fruit fly)	10	0.2068	17	11	8
Anastrepha ludens (Mexican fruit fly)	11	0.2051	16	14	6
Bactrocera zonata (Peach fruit fly)	12	0.1983	15	13	9
Grapevine flavescence doree (Flavescence doree of grapevine)	13	0.1958	9	16	12
Ralstonia solanacearum (Bacterial wilt; Brown rot)	14	0.1747	12	7	17
Thrips palmi	15	0.1707	20	8	13
Xanthomonas citri (Citrus canker)	16	0.1321	19	18	15
Phyllosticta citricarpa (Black spot of citrus)	17	0.1262	18	19	16
Tilletia indica (Karnal bunt of wheat)	18	0.1220	6	20	20
Clavibacter michiganensis ssp. Sepedonicus (Bacterial ring rot of potato)	19	0.1126	13	15	19
Synchytrium endobioticum (Wart disease of potato)	20	0.0930	14	17	18

Some figures for the pests in the podium



Xylella fastidiosa

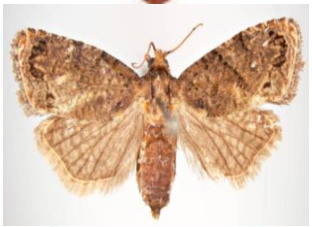
5.5 billion EUR of agricultural production at risk

103 protected habitat and species potentially affected

Popillia japonica (Japanese beetle)

2.4 billion EUR of agricultural production at risk

158 countries we trade with might restrict imports from EU



Thaumatotibia leucotreta (Citrus codling moth)

1.2 billion EUR of agricultural production at risk

0.21% of total protein intake at risk

Note - Results for the median scenario

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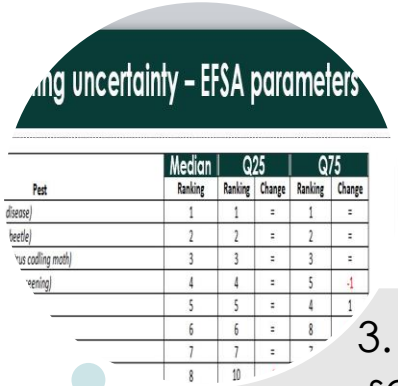
Structure of the I2P2

Stakeholder consultation

MS feedback



Pest	Median	Q25		Q75	
	Ranking	Ranking	Change	Ranking	Change
disease)	1	1	=	1	=
beetle)	2	2	=	2	=
us codling moth)	3	3	=	3	=
ening)	4	4	=	5	-1
	5	5	=	4	1
	6	6	=	8	
	7	7	=		
	8	10			

3. Uncertainty and sensitivity analysis

Pest	I2P2		Ranking by domains		
	Rank	Value	Economic	Social	Environment.
Xylella fastidiosa (Pierce's disease)	1	0.8104	1	1	1
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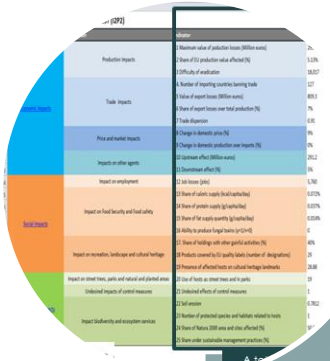

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COMMISSION DELEGATED REGULATION (EU) 2019/1702

of 1 August 2019

supplementing Regulation (EU) 2016/2031 of the European Parliament and of the Council by establishing the list of priority pests

ANNEX
List of priority pests

Agrilus anxius Gory

Agrilus planipennis Fairmaire

Anastrepha ludens (Loew)

Anoplophora chinensis (Thomson)

Anoplophora glabripennis (Motschulsky)

Anthonomus eugenii Cano

Aromia bungii (Faldermann)

Bactericera cockerelli (Sulc.)

Bactrocera dorsalis (Hendel)

Bactrocera zonata (Saunders)

Bursaphelenchus xylophilus (Steiner et Bührer) Nickle *et al.*

Candidatus Liberibacter spp., causal agent of Huanglongbing disease of citrus/citrus greening

Conotrachelus nenuphar (Herbst)

Dendrolimus sibiricus Tschetverikov

Phyllosticta citricarpa (McAlpine) Van der Aa

Popillia japonica Newman

Rhagoletis pomonella Walsh

Spodoptera frugiperda (Smith)

Thaumatotibia leucotreta (Meyrick)

Xylella fastidiosa (Wells *et al.*)

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