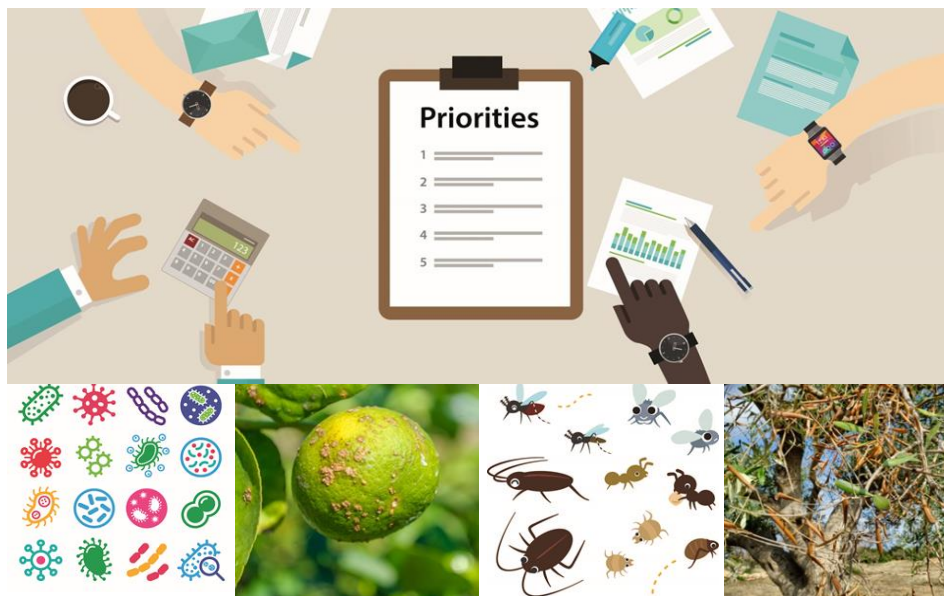


# Agenda item #3: Presentation of the final outcome (ranking) of the application of the I2P2 to the list of Union quarantine pests qualifying as potential priority pests.



Berta Sánchez  
**Jesús Barreiro-Hurle**  
Emilio Rodríguez-Cerezo  
Iria Soto-Embodas

European Commission  
Joint Research Centre (JRC)  
Unit D.4 Economics of Agriculture

# How to identify measurable indicators?

## OECD and JRC-COIN steps!

We are really done!

Indicators selection

Quantitative or qualitative measures

Data selection

Measuring indicators based on available statistics and experts

Normalization

Allows comparing indicators with different scales; dimensions or units

Weighting

To aggregate indicators based on weights set by the Legislator(s)

Uncertainty of data

Probabilities and sensitivity analysis

# I2P2: Final adjustments

I.19 – Presence of affected hosts on cultural heritage landmarks only for forestry hosts

Annex I Section 1 (all crops)– Landscape heritage  
Annex I Section 2 (important tree species) - Landscape as well as cultural or historical heritage for the Union

**JRC PROPOSAL** - Use two versions of I.19 depending on whether the host is a crop or a tree

For **crops** consider only responses to UNESCO WHL

For **trees** consider also presence in coat of arms, anthem and major works of arts

$$CH_k = \sum_{j=1}^{j=n} \sum_{i=1}^{i=28} X_i \quad \forall k[1,5]$$

$$CH = (0.5 \times CH_1)$$

$$CH = (0.5 \times CH_1) + \left( 0.5 \times \left( \frac{CH_2 + CH_3 + CH_4 + CH_5}{4} \right) \right)$$

# I2P2 Crops

# 20 pests assessed

*Tilletia i.*

*Xanthomonas c.*

*Phyllosticta c.*

*Synchytrium e.*

*Clavibacter m.*

*Candidatus l.*

*Flavescence d.*

*Sprodoptera f.*

*Ralstonia s.*

*Anastrepha l.*

*Rhagoletis p.*

*Popillia j.*

*Bactrocera d.*

*Bactrocera z.*

*Bactericera c.*

*Antonomus e.*

*Xylella f.*

*Thaumatotibia l.*

*Thrips p.*

*Conotrachelus n.*

# RANKING

	I2P2		ECO	SOC	ENV
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.8104	1	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.5117	4	3	2
<i>Thaumatotibia leucotreta</i> (Citrus codling moth)	3	0.4714	8	2	3
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3750	2	5	5
<i>Conotrachelus nenuphar</i>	5	0.3349	10	6	4
<i>Anthonomus eugenii</i>	6	0.2960	5	9	7
<i>Bactericera cockerelli</i>	7	0.2792	7	4	14
<i>Rhagoletis pomonella</i> (Apple maggot fly)	8	0.2728	3	12	10
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	0.2246	11	10	11
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	10	0.2068	17	11	8
<i>Anastrepha ludens</i> (Mexican fruit fly)	11	0.2051	16	14	6
<i>Bactrocera zonata</i> (Peach fruit fly)	12	0.1983	15	13	9
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	13	0.1958	9	16	12
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	14	0.1747	12	7	17
<i>Thrips palmi</i>	15	0.1707	20	8	13
<i>Xanthomonas citri</i> (Citrus canker)	16	0.1321	19	18	15
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	17	0.1262	18	19	16
<i>Tilletia indica</i> (Karnal bunt of wheat)	18	0.1220	6	20	20
<i>Clavibacter michiganensis ssp. Sepedonicus</i> (bacterial ring rot of potato)	19	0.1126	13	15	19
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.0930	14	17	18

# RANKING

Group #1 I2P2 > 0.40 + ranking 1<sup>st</sup> or 2<sup>nd</sup> for any domain

	I2P2		ECO	SOC	ENV
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.8104	1	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.5117	4	3	2
<i>Thaumatotibia leucotreta</i> (Citrus codling moth)	3	0.4714	8	2	3
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3750	★ 2	5	5
<i>Conotrachelus nenuphar</i>	5	0.3349	10	6	4
<i>Anthonomus eugeni</i>	6	0.2960	5	9	7
<i>Bactericera cockerelli</i>	7	0.2792	7	4	14
<i>Rhagoletis pomonella</i> (Apple maggot fly)	8	0.2728	3	12	10
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	0.2246	11	10	11
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	10	0.2068	17	11	8
<i>Anastrepha ludens</i> (Mexican fruit fly)	11	0.2051	16	14	6
<i>Bactrocera zonata</i> (Peach fruit fly)	12	0.1983	15	13	9
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	13	0.1958	9	16	12
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	14	0.1747	12	7	17
<i>Thrips palmi</i>	15	0.1707	20	8	13
<i>Xanthomonas citri</i> (Citrus canker)	16	0.1321	19	18	15
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	17	0.1262	18	19	16
<i>Tilletia indica</i> (Karnal bunt of wheat)	18	0.1220	6	20	20
<i>Clavibacter michiganensis</i> ssp. <i>Sepedonicus</i> (bacterial ring rot of potato)	19	0.1126	13	15	19
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.0930	14	17	18



# RANKING

Group #1 I2P2 > 0.40 + ranking 1<sup>st</sup> to 3<sup>rd</sup> for any domain

Group #2 I2P2 > 0.20 + ranking 1<sup>st</sup> to 10<sup>th</sup> for any domain

	I2P2		ECO	SOC	ENV
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.8104	1	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.5117	4	3	2
<i>Thaumatotibia leucotreta</i> (Citrus codling moth)	3	0.4714	8	2	3
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3750	2	5	5
<i>Conotrachelus nenuphar</i>	5	0.3349	10	6	4
<i>Anthonomus eugenii</i>	6	0.2960	5	9	7
<i>Bactericera cockerelli</i>	7	0.2792	7	4	14
<i>Rhagoletis pomonella</i> (Apple maggot fly)	8	0.2728	3	12	10
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	0.2246	11	10	11
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	10	0.2068	17	11	8
<i>Anastrepha ludens</i> (Mexican fruit fly)	11	0.2051	16	14	6
<i>Bactrocera zonata</i> (Peach fruit fly)	12	0.1983	15	13	★ 9
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	13	0.1958	★ 9	16	12
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	14	0.1747	12	★ 7	17
<i>Thrips palmi</i>	15	0.1707	20	★ 8	13
<i>Xanthomonas citri</i> (Citrus canker)	16	0.1321	19	18	15
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	17	0.1262	18	19	16
<i>Tilletia indica</i> (Karnal bunt of wheat)	18	0.1220	★ 6	20	20
<i>Clavibacter michiganensis ssp. Sepedonicus</i> (bacterial ring rot of potato)	19	0.1126	13	15	19
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.0930	14	17	18

# Prioritization options

## Group 1

*Xylella f.*

*Popillia j.*

*Thaumatotibia l.*

## Group 2

*Candidatus l.*

*Conotrachelus n.*

*Anthonomus e.*

*Bactericera c.*

*Rhagoletis p.*

*Sprodoptera f.*

*Bacterocera d.*

*Anastrepha l.*

# Sensitivity analysis: crops

## a) alternative weights

	I2P2	ECO	SOC	ENV
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.7694	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.4748	4	3
<i>Thaumatomyia leucotreta</i> (Citrus codling moth)	3	0.4252	8	2
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3976	2	5
<i>Conotrachelus nenuphar</i>	5	0.3166	10	6
<i>Anthonomus eugenii</i>	6	0.3034	5	9
<i>Rhagoletis pomonella</i> (Apple maggot fly)	7	0.2982	3	12
<i>Bactericera cockerelli</i>	8	0.2867	7	4
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	0.2248	11	10
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	10	0.2171	9	16
<i>Anastrepha ludens</i> (Mexican fruit fly)	11	0.1888	16	14
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	12	0.1882	17	11
<i>Bactrocera zonata</i> (Peach fruit fly)	13	0.1842	15	13
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	14	0.1795	12	7
<i>Tilletia indica</i> (Karnal bunt of wheat)	15	0.1695	6	20
<i>Thrips palmi</i>	16	0.1429	20	8
<i>Clavibacter michiganensis ssp. Sepedonicus</i> (bacterial ring rot of potato)	17	0.1302	13	15
<i>Xanthomonas citri</i> (Citrus canker)	18	0.1262	19	18
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	19	0.1251	18	19
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.1072	14	17

40 – 20 –  
40

50 – 25 –  
25

Group 1

NO CHANGE



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	IPPC		FCO	FCG	FNW
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.7694	1	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.4748	4	3	2
<i>Thaumatotibia leucotreta</i> (Citrus codling moth)	3	0.4252	8	2	3
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3976	2	5	5
<i>Conotrachelus nenuphar</i>	5	0.3166	10	6	4
<i>Anthonomus eugenii</i>	6	0.3034	5	9	7
<i>Rhagoletis pomonella</i> (Apple maggot fly)	7	0.2982	3	12	10
<i>Bactericera cockerelli</i>	8	0.2867	7	4	14
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	0.2248	11	10	11
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	10	0.2171	9	16	12
<i>Anastrepha ludens</i> (Mexican fruit fly)	11	0.1888	16	14	6
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	12	0.1882	17	11	8
<i>Bactrocera zonata</i> (Peach fruit fly)	13	0.1842	15	13	9
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	14	0.1795	12	7	17
<i>Tilletia indica</i> (Karnal bunt of wheat)	15	0.1695	6	20	20
<i>Thrips palmi</i>	16	0.1429	20	8	13
<i>Clavibacter michiganensis ssp. Sepedonicus</i> (bacterial ring rot of p...)	17	0.1302	13	15	19
<i>Xanthomonas citri</i> (Citrus canker)	18	0.1262	19	18	15
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	19	0.1251	18	19	16
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.1072	14	17	18

40 – 20 –  
40

50 – 25 –  
25

Group 1

NO CHANGE

Group 2

G.f.d. in / B.d. out

40 – 20 –  
40

	I2P2	ECO	SOC	ENV	
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.7694	1	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.4748	4	3	2
<i>Thaumatotibia leucotreta</i> (Citrus codling moth)	3	0.4252	8	2	3
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3976	2	5	5
<i>Conotrachelus nenuphar</i>	5	0.3166	10	6	4
<i>Anthonomus eugenii</i>	6	0.3034	5	9	7
<i>Rhagoletis pomonella</i> (Apple maggot fly)	7	0.2982	3	12	10
<i>Bactericera cockerelli</i>	8	0.2867	7	4	14
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	0.2248	11	10	11
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	10	0.2171	9	16	12
<i>Anastrepha ludens</i> (Mexican fruit fly)	11	0.1888	16	14	6
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	12	0.1882	17	11	8
<i>Bactrocera zonata</i> (Peach fruit fly)	13	0.1842	15	13	9
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	14	0.1795	12	7	17
<i>Tilletia indica</i> (Karnal bunt of wheat)	15	0.1695	6	20	20
<i>Thrips palmi</i>	16	0.1429	20	8	13
<i>Clavibacter michiganensis ssp. Sepedonicus</i> (bacterial ring rot of p...)	17	0.1302	13	15	19
<i>Xanthomonas citri</i> (Citrus canker)	18	0.1262	19	18	15
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	19	0.1251	18	19	16
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.1072	14	17	18

Group 1

NO CHANGE

Group 2

G.f.d. in / B.d. out

50 – 25 –  
25

	I2P2	ECO	SOC	ENV	
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.7675	1	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.4943	3	2	2
<i>Thaumatotibia leucotreta</i> (Citrus codling moth)	3	0.4187	9	3	3
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3880	2	5	5
<i>Conotrachelus nenuphar</i>	5	0.3187	10	6	4
<i>Anthonomus eugenii</i>	6	0.2992	6	9	7
<i>Bactericera cockerelli</i>	7	0.2937	5	4	14
<i>Rhagoletis pomonella</i> (Apple maggot fly)	8	0.2789	4	12	10
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	0.2535	7	10	11
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	10	0.2180	8	16	12
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	11	0.1982	12	7	17
<i>Anastrepha ludens</i> (Mexican fruit fly)	12	0.1791	16	14	6
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	13	0.1780	17	11	8
<i>Bactrocera zonata</i> (Peach fruit fly)	14	0.1742	15	13	9
<i>Thrips palmi</i>	15	0.1601	19	8	13
<i>Tilletia indica</i> (Karnal bunt of wheat)	16	0.1445	11	20	20
<i>Clavibacter michiganensis ssp. Sepedonicus</i> (bacterial ring rot of p...)	17	0.1280	13	15	19
<i>Xanthomonas citri</i> (Citrus canker)	18	0.1178	20	18	15
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	19	0.1162	18	19	16
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.1053	14	17	18

Group 1

NO CHANGE



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Commission

40 – 20 –  
40

	I2P2	ECO	SOC	ENV
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.7694	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.4748	4	3
<i>Thaumotobia leucotreta</i> (Citrus codling moth)	3	0.4252	8	2
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3976	2	5
<i>Conotrachelus nenuphar</i>	5	0.3166	10	6
<i>Anthonomus eugenii</i>	6	0.3034	5	9
<i>Rhagoletis pomonella</i> (Apple maggot fly)	7	0.2982	3	12
<i>Bactericera cockerelli</i>	8	0.2867	7	4
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	0.2248	11	10
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	10	0.2171	9	16
<i>Anastrepha ludens</i> (Mexican fruit fly)	11	0.1888	16	14
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	12	0.1882	17	11
<i>Bactrocera zonata</i> (Peach fruit fly)	13	0.1842	15	13
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	14	0.1795	12	7
<i>Tilletia indica</i> (Karnal bunt of wheat)	15	0.1695	6	20
<i>Thrips palmi</i>	16	0.1429	20	8
<i>Clavibacter michiganensis</i> ssp. <i>Sepedonicus</i> (bacterial ring rot of p...	17	0.1302	13	15
<i>Xanthomonas citri</i> (Citrus canker)	18	0.1262	19	18
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	19	0.1251	18	19
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.1072	14	17

Group 1

NO CHANGE

Group 2

G.f.d. in / B.d. out

50 – 25 –  
25

	I2P2	ECO	SOC	ENV
<i>Xylella fastidiosa</i> (Pierce's disease)	1	0.7675	1	1
<i>Popillia japonica</i> (Japanese beetle)	2	0.4943	3	2
<i>Thaumotobia leucotreta</i> (Citrus codling moth)	3	0.4187	9	3
<i>Candidatus liberibacter</i> (Citrus greening)	4	0.3880	2	5
<i>Conotrachelus nenuphar</i>	5	0.3187	10	6
<i>Anthonomus eugenii</i>	6	0.2992	6	9
<i>Bactericera cockerelli</i>	7	0.2937	5	4
<i>Rhagoletis pomonella</i> (Apple maggot fly)	8	0.2789	4	12
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	0.2535	7	10
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	10	0.2180	8	16
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	11	0.1982	12	7
<i>Anastrepha ludens</i> (Mexican fruit fly)	12	0.1791	16	14
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	13	0.1780	17	11
<i>Bactrocera zonata</i> (Peach fruit fly)	14	0.1742	15	13
<i>Thrips palmi</i>	15	0.1601	19	8
<i>Tilletia indica</i> (Karnal bunt of wheat)	16	0.1445	11	20
<i>Clavibacter michiganensis</i> ssp. <i>Sepedonicus</i> (bacterial ring rot of p...	17	0.1280	13	15
<i>Xanthomonas citri</i> (Citrus canker)	18	0.1178	20	18
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	19	0.1162	18	19
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.1053	14	17

Group 1

NO CHANGE

Group 2

G.f.d. + R.s. in  
B.d. + A.l. out



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# **Sensitivity analysis: crops**

- a) alternative weights**
- b) incorporating uncertainty**



Pest	Median	Q25		Q75	
	Ranking	Ranking	Change	Ranking	Change
<i>Xylella fastidiosa</i> (Pierce's disease)	1	1	=	1	=
<i>Popillia japonica</i> (Japanese beetle)	2	2	=	2	=
<i>Thaumatotibia leucotreta</i> (Citrus codling moth)	3	3	=	3	=
<i>Candidatus liberibacter</i> (Citrus greening)	4	4	=	5	-1
<i>Conotrachelus nenuphar</i>	5	5	=	4	1
<i>Anthonomu eugeni</i>	6	6	=	8	-2
<i>Bactericera cockerelli</i>	7	7	=	7	=
<i>Rhagoletis pomonella</i> (Apple maggot fly)	8	10	-2	6	2
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	8	1	9	=
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	10	11	-1	10	=
<i>Anastrepha ludens</i> (Mexican fruit fly)	11	9	2	11	=
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	12	12	=	12	=
<i>Bactrocera zonata</i> (Peach fruit fly)	13	13	=	13	=
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	14	15	-1	14	=
<i>Thrips palmi</i>	15	14	1	15	=
<i>Xanthomonas citri</i> (Citrus canker)	16	17	-1	16	=
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	17	18	-1	17	=
<i>Clavibacter michiganensis ssp. Sepedonicus</i> (bacterial ring rot of potato)	18	16	2	18	=
<i>Tilletia indica</i> (Karnal bunt of wheat)	19	19	=	19	=
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	20	=	20	=

Q - 25

Group 1

Group 2

NO CHANGE

NO CHANGE

Pest	Median	Q25		Q75	
	Ranking	Ranking	Change	Ranking	Change
<i>Xylella fastidiosa</i> (Pierce's disease)	1	1	=	1	=
<i>Popillia japonica</i> (Japanese beetle)	2	2	=	2	=
<i>Thaumatotibia leucotreta</i> (Citrus codling moth)	3	3	=	3	=
<i>Candidatus liberibacter</i> (Citrus greening)	4	4	=	5	-1
<i>Conotrachelus nenuphar</i>	5	5	=	4	1
<i>Anthonomu eugeni</i>	6	6	=	8	-2
<i>Bactericera cockerelli</i>	7	7	=	7	=
<i>Rhagoletis pomonella</i> (Apple maggot fly)	8	10	-2	6	2
<i>Spodoptera frugiperda</i> (Fall armyworm)	9	8	1	9	=
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	10	11	-1	10	=
<i>Anastrepha ludens</i> (Mexican fruit fly)	11	9	2	11	=
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	12	12	=	12	=
<i>Bactrocera zonata</i> (Peach fruit fly)	13	13	=	13	=
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	14	15	-1	14	=
<i>Thrips palmi</i>	15	14	1	15	=
<i>Xanthomonas citri</i> (Citrus canker)	16	17	-1	16	=
<i>Phyllosticta citricarpa</i> (Black spot of citrus)	17	18	-1	17	=
<i>Clavibacter michiganensis ssp. Sepedonicus</i> (bacterial ring rot of potato)	18	16	2	18	=
<i>Tilletia indica</i> (Karnal bunt of wheat)	19	19	=	19	=
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	20	=	20	=

Q - 25

Q - 50

Group 1

Group 2

Group 1

Group 2

NO CHANGE

NO CHANGE

NO CHANGE

NO CHANGE



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# I2P2 forestry

# 6 pests assessed

*Agrilus a.*

*Agrilus p.*

*Ceratocystis f.*

*Anoplophora g.*

*Bursaphelencus x.*

*Dendrolimus s.*

# RANKING

Group #1 I2P2 > 0.50 + ranking 1<sup>st</sup> any domain

		I2P2		ECO	SOC	ENV
Anaplophora glabripennis		1	0.5659	6	1	1
AgrilusAnxius (Bronze birch borer)		2	0.3925	2	2	4
Dendrolimus sibiricus		3	0.3037	4	5	2
Bursaphelenchus xylophilus (Pine wood nematode)		4	0.2752	5	3	3
Agrilus planipennis (Emerald ash borer)		5	0.2690	★ 1	4	5
Ceratocystis fagacearum (Oak wilt)		6	0.1185	7	6	6

# RANKING

Group #1 I2P2 > 0.50 + ranking 1<sup>st</sup> any domain

Group #2 I2P2 > 0.30 + ranking 1<sup>st</sup> to 3<sup>rd</sup> for any domain

		I2P2		ECO	SOC	ENV
Anaplophora glabripennis		1	0.5659	6	1	1
AgrilusAnxius (Bronze birch borer)		2	0.3925	2	2	4
Dendrolimus sibiricus		3	0.3037	4	5	2
Bursaphelenchus xylophilus (Pine wood nematode)		4	0.2752	5	★ 3	★ 3
Agrilus planipennis (Emerald ash borer)		5	0.2690	★ 1	4	5
Ceratocystis fagacearum (Oak wilt)		6	0.1185	7	6	6

# RANKING

Group #1 I2P2 > 0.50 + ranking 1<sup>st</sup> any domain

Group #2 I2P2 > 0.30 + ranking 1<sup>st</sup> to 3<sup>rd</sup> for any domain

Group #3 I2P2 > 0.20 + ranking 1<sup>st</sup> to 5<sup>th</sup> in any domain

		I2P2		ECO	SOC	ENV
Anaplophora glabripennis		1	0.5659	6	1	1
AgrilusAnxius (Bronze birch borer)		2	0.3925	2	2	4
Dendrolimus sibiricus		3	0.3037	4	5	2
Bursaphelenchus xylophilus (Pine wood nematode)		4	0.2752	5	3	3
Agrilus planipennis (Emerald ash borer)		5	0.2690	1	4	5
Ceratocystis fagacearum (Oak wilt)		6	0.1185	7	6	6

# Prioritization options

## Group 1

*Anoplophora g.*

## Group 2

*Agrilus a.*

*Dendrolimus s.*

## Group 3

*Bursaphelencus x.*

*Agrilus p.*



# Sensitivity analysis: forestry

## a) alternative weights

# 40 – 20 – 40

	I2P2		ECO	SOC	ENV
Anaplophora glabripennis	1	0.5532	6	1	1
AgrilusAnxius (Bronze birch borer)	2	0.3710	2	2	4
Dendrolimus sibiricus	3	0.3364	4	5	2
Agrilus planipennis (Emerald ash borer)	4	0.2947	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)	5	0.2886	5	3	3
Ceratocystis fagacearum (Oak wilt)	6	0.1320	7	6	6

Group 1

NO CHANGE

# 50 – 0 – 50

	I2P2		ECO	SOC	ENV
Anaplophora glabripennis	1	0.5341	6	1	1
Dendrolimus sibiricus	2	0.3854	4	5	2
AgrilusAnxius (Bronze birch borer)	3	0.3388	2	2	4
Agrilus planipennis (Emerald ash borer)	4	0.3332	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)	5	0.3088	5	3	3
Ceratocystis fagacearum (Oak wilt)	6	0.1522	7	6	6

# 40 – 20 – 40

	I2P2		ECO	SOC	ENV
Anaplophora glabripennis	1	0.5532	6	1	1
AgrilusAnxius (Bronze birch borer)	2	0.3710	2	2	4
Dendrolimus sibiricus	3	0.3364	4	5	2
Agrilus planipennis (Emerald ash borer)	4	0.2947	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)	5	0.2886	5	3	3
Ceratocystis fagacearum (Oak wilt)	6	0.1320	7	6	6

Group 1

NO CHANGE

Group 2

NO CHANGE

# 50 – 0 – 50

	I2P2		ECO	SOC	ENV
Anaplophora glabripennis	1	0.5341	6	1	1
Dendrolimus sibiricus	2	0.3854	4	5	2
AgrilusAnxius (Bronze birch borer)	3	0.3388	2	2	4
Agrilus planipennis (Emerald ash borer)	4	0.3332	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)	5	0.3088	5	3	3
Ceratocystis fagacearum (Oak wilt)	6	0.1522	7	6	6



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# 40 – 20 – 40

	I2P2		ECO	SOC	ENV
Anaplophora glabripennis	1	0.5532	6	1	1
AgrilusAnxius (Bronze birch borer)	2	0.3710	2	2	4
Dendrolimus sibiricus	3	0.3364	4	5	2
Agrilus planipennis (Emerald ash borer)	4	0.2947	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)	5	0.2886	5	3	3
Ceratocystis fagacearum (Oak wilt)	6	0.1320	7	6	6

Group 1

NO CHANGE

Group 2

NO CHANGE

Group 3

NO CHANGE

# 50 – 0 – 50

	I2P2		ECO	SOC	ENV
Anaplophora glabripennis	1	0.5341	6	1	1
Dendrolimus sibiricus	2	0.3854	4	5	2
AgrilusAnxius (Bronze birch borer)	3	0.3388	2	2	4
Agrilus planipennis (Emerald ash borer)	4	0.3332	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)	5	0.3088	5	3	3
Ceratocystis fagacearum (Oak wilt)	6	0.1522	7	6	6

# 40 – 20 – 40

		I2P2		ECO	SOC	ENV
Anaplophora glabripennis		1	0.5532	6	1	1
AgrilusAnxius (Bronze birch borer)		2	0.3710	2	2	4
Dendrolimus sibiricus		3	0.3364	4	5	2
Agrilus planipennis (Emerald ash borer)		4	0.2947	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)		5	0.2886	5	3	3
Ceratocystis fagacearum (Oak wilt)		6	0.1320	7	6	6

Group 1

NO CHANGE

Group 2

NO CHANGE

Group 3

NO CHANGE

# 50 – 0 – 50

		I2P2		ECO	SOC	ENV
Anaplophora glabripennis		1	0.5341	6	1	1
Dendrolimus sibiricus		2	0.3854	4	5	2
AgrilusAnxius (Bronze birch borer)		3	0.3388	2	2	4
Agrilus planipennis (Emerald ash borer)		4	0.3332	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)		5	0.3088	5	3	3
Ceratocystis fagacearum (Oak wilt)		6	0.1522	7	6	6

Group 1

NO CHANGE

# 40 – 20 – 40

	I2P2		ECO	SOC	ENV
Anaplophora glabripennis	1	0.5532	6	1	1
AgrilusAnxius (Bronze birch borer)	2	0.3710	2	2	4
Dendrolimus sibiricus	3	0.3364	4	5	2
Agrilus planipennis (Emerald ash borer)	4	0.2947	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)	5	0.2886	5	3	3
Ceratocystis fagacearum (Oak wilt)	6	0.1320	7	6	6

Group 1

NO CHANGE

Group 2

NO CHANGE

Group 3

NO CHANGE

# 50 – 0 – 50

	I2P2		ECO	SOC	ENV
Anaplophora glabripennis	1	0.5341	6	1	1
Dendrolimus sibiricus	2	0.3854	4	5	2
AgrilusAnxius (Bronze birch borer)	3	0.3388	2	2	4
Agrilus planipennis (Emerald ash borer)	4	0.3332	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)	5	0.3088	5	3	3
Ceratocystis fagacearum (Oak wilt)	6	0.1522	7	6	6

Group 1

NO CHANGE

Group 2

NO CHANGE



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# 40 – 20 – 40

	I2P2		ECO	SOC	ENV
Anaplophora glabripennis	1	0.5532	6	1	1
AgrilusAnxius (Bronze birch borer)	2	0.3710	2	2	4
Dendrolimus sibiricus	3	0.3364	4	5	2
Agrilus planipennis (Emerald ash borer)	4	0.2947	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)	5	0.2886	5	3	3
Ceratocystis fagacearum (Oak wilt)	6	0.1320	7	6	6

Group 1

NO CHANGE

Group 2

NO CHANGE

Group 3

NO CHANGE

# 50 – 0 – 50

	I2P2		ECO	SOC	ENV
Anaplophora glabripennis	1	0.5341	6	1	1
Dendrolimus sibiricus	2	0.3854	4	5	2
AgrilusAnxius (Bronze birch borer)	3	0.3388	2	2	4
Agrilus planipennis (Emerald ash borer)	4	0.3332	1	4	5
Bursaphelenchus xylophilus (Pine wood nematode)	5	0.3088	5	3	3
Ceratocystis fagacearum (Oak wilt)	6	0.1522	7	6	6

Group 1

NO CHANGE

Group 2

NO CHANGE

Group 3

NO CHANGE

# Sensitivity analysis: forestry

- a) alternative weights
- b) incorporating uncertainty



Pest	Median Ranking	Q25		Q75	
		Ranking	Change	Ranking	Change
<i>Anaplophora glabripennis</i>	1	1	=	1	=
<i>AgrilusAnxius (Bronze birch borer)</i>	2	2	=	2	=
<i>Dendrolimus sibiricus</i>	3	3	=	4	-1
<i>Bursaphelenchus xylophilus (Pine wood nematode)</i>	4	5	-1	3	1
<i>Agrilus planipennis (Emerald ash borer)</i>	5	4	1	5	=
<i>Ceratocystis fagacearum (Oak wilt)</i>	6	6	=	6	=

Q - 25

Group 1

Group 2

Group 3

NO CHANGE

NO CHANGE

NO CHANGE

Pest	Median	Q25		Q75	
	Ranking	Ranking	Change	Ranking	Change
<i>Anaplophora glabripennis</i>	1	1	=	1	=
<i>AgrilusAnxius</i> (Bronze birch borer)	2	2	=	2	=
<i>Dendrolimus sibiricus</i>	3	3	=	4	-1
<i>Bursaphelenchus xylophilus</i> (Pine wood nematode)	4	5	-1	3	1
<i>Agrilus planipennis</i> (Emerald ash borer)	5	4	1	5	=
<i>Ceratocystis fagacearum</i> (Oak wilt)	6	6	=	6	=

Q - 25

Group 1

Group 2

Group 3

NO CHANGE

NO CHANGE

NO CHANGE

Q - 75

Group 1

Group 2

Group 3

NO CHANGE

B.x. in / D.s. out

B.x. out / D.s. in

# I2P2 Agroforestry

# RANKING

					<b>I2P2</b>		<b>ECO</b>	<b>SOC</b>	<b>ENV</b>
Anoplophora chinensis (citrus long-horned beetle)					1	0.7477	1	1	1
Aromia bungii (Redneck longhorned beetle)					2	0.2731	2	2	2

# Sensitivity analysis: agroforestry

# If ranked with crops

	I2P2		ECO	SOC	ENV
<i>Anoplophora chinensis</i> (citrus long-horned beetle)	1	0.6417	2	2	1
<i>Xylella fastidiosa</i> (Pierce's disease)	2	0.6231	1	1	2
<i>Popillia japonica</i> (Japanese beetle)	3	0.3841	5	4	4
<i>Thaumatotibia leucotreta</i> (Citrus codling moth)	4	0.3704	10	3	5
<i>Candidatus liberibacter</i> (Citrus greening)	5	0.3457	3	6	7
<i>Aromia bungii</i> (Redneck longhorned beetle)	6	0.3410	12	10	3
<i>Anthonomus eugeni</i>	7	0.2850	7	11	6
<i>Bactericera cockerelli</i>	8	0.2649	8	5	14
<i>Conotrachelus nenuphar</i>	9	0.2525	11	8	8
<i>Rhagoletis pomonella</i> (Apple maggot fly)	10	0.2474	4	13	11
<i>Spodoptera frugiperda</i> (Fall armyworm)	11	0.2164	13	12	10
<i>Grapevine flavescence doree</i> (Flavescence doree of grapevine)	12	0.1850	9	18	15
<i>Anastrepha ludens</i> (Mexican fruit fly)	13	0.1669	16	16	9
<i>Bactrocera dorsalis</i> (Oriental fruit fly)	14	0.1635	18	14	12
<i>Bactrocera zonata</i> (Peach fruit fly)	15	0.1624	17	15	13
<i>Ralstonia solanacearum</i> (Bacterial wilt; Brown rot)	16	0.1585	14	7	18
<i>Thrips palmi</i>	17	0.1529	20	9	16
<i>Tilletia indica</i> (Karnal bunt of wheat)	18	0.1207	6	20	20
<i>Xanthomonas citri</i> (Citrus canker)	19	0.1176	19	19	17
<i>Synchytrium endobioticum</i> (Wart disease of potato)	20	0.0905	15	17	19

# If ranked with forestry

	I2P2		ECO	SOC	ENV
Anoplophora chinensis (citrus long-horned beetle)	1	0.7060	1	1	7
Anaplophora glabripennis	2	0.3692	7	2	1
Dendrolimus sibiricus	3	0.2333	5	3	2
AgrilusAnxius (Bronze birch borer)	4	0.2302	3	4	4
Agrilus planipennis (Emerald ash borer)	5	0.2231	2	7	5
Bursaphelenchus xylophilus (Pine wood nematode)	6	0.2045	6	5	3
Aromia bungii (Redneck longhorned beetle)	7	0.1902	4	8	7
Ceratocystis fagacearum (Oak wilt)	8	0.0976	8	6	6

# Thanks for your attention

[Jesus.BARREIRO-HURLE@ec.europa.eu](mailto:Jesus.BARREIRO-HURLE@ec.europa.eu)

[Berta.SANCHEZ@ec.europa.eu](mailto:Berta.SANCHEZ@ec.europa.eu)

[Emilio.RODRIGUEZ-CEREZO@ec.europa.eu](mailto:Emilio.RODRIGUEZ-CEREZO@ec.europa.eu)

[Iria.SOTO-EMBODAS@ec.europa.eu](mailto:Iria.SOTO-EMBODAS@ec.europa.eu)

