Expert Group on Plant Health Legislation, Discussion of the Delegated Act on Priority Pests

The updated methodology for the identification of the Union quarantine pests qualifying as priority pests

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European Commission

Outline of the presentation

1. Partners and roles
2. JRC methodology vs OECD guideline for composite indicators
3. The 25 indicators of the Impact Indicator for Priority Pests (I2P2) and its application to pilot pest Tilletia indica
4. Conclusions and further steps

Partners and roles

JRC
EUROPEAN COMMISSION

Selection of methodology
Translation of criteria to quantifiable indicators
Identification of data sources for hosts
Calculation of indicator value for pests
Calculation of the Impact Indicator of Quarantine Pests (IIQP) for selected pests

Competence Centre on COmposite INdicators and Scoreboards

Climate suitability for pests in the Union territory
Yield and quality impacts of pests on hosts
Time to detection of pests
Spread distance of pest / vector
Additional treatments needed when pest is present
Area under Natura 2000 potentially affected by pest

efsa
European Food Safety Authority

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

List of Union Quarantine pests to be assessed
Weights of individual indicators
Decision rule [cut-off value; number of pests; etc.]

Ad-hoc data requests
Presentation of existing methodologies
Consultation on methodology

Since January 16th….

- First Expert Group on Plant Health Legislation

Jan 2018

Feb 2018

- 8 MS submitted comments on JRC methodology [FI,DK,UK,SE,DE,N,IE,ES]

- JRC response to MS comments on the methodology

Mar 2018

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MS comments (overarching concerns) – JRC reply

- Avoid double counting indicators – indicator definition + correlation matrix
- Weights and uncertainty – DG SANTE + EFSA incorporated + sensitivity analysis
- Relationship between indicators and provisions – full correspondence in table (explicit reference to *orphan* criteria)
- Differentiated approaches crops vs trees – options under consideration
- Data availability – Pilot crop test show data available; trees waiting for MS submission
- MS specificities – EU28 indicators are constructed summing up MS specific indicators (where available)
- Pilot pests – coverage of hosts – annual crop, permanent crops and trees (polyphagous as sum of host specific impacts)

MS comments (Specific indicators) – JRC reply

5 Indicators discarded

- Additional producer costs – no data
- Public expenditure – non-discriminatory
- Capacity to boost other pests – included in production loss estimates by EFSA
- Damage or mortality of native plants – no clear definition of *native*
- Change in soil carbon stocks – no data

MS comments (Specific indicators) – JRC reply

5 Indicators discarded

3 Indicator redefined

- Share of MS affected to share of production affected (#2)
- Split of upstream and downstream effects (#10 & #11)
- Split of quality products and UNESCO World Heritage sites (#18 & #19)

MS comments (Specific indicators) – JRC reply

5 Indicators discarded

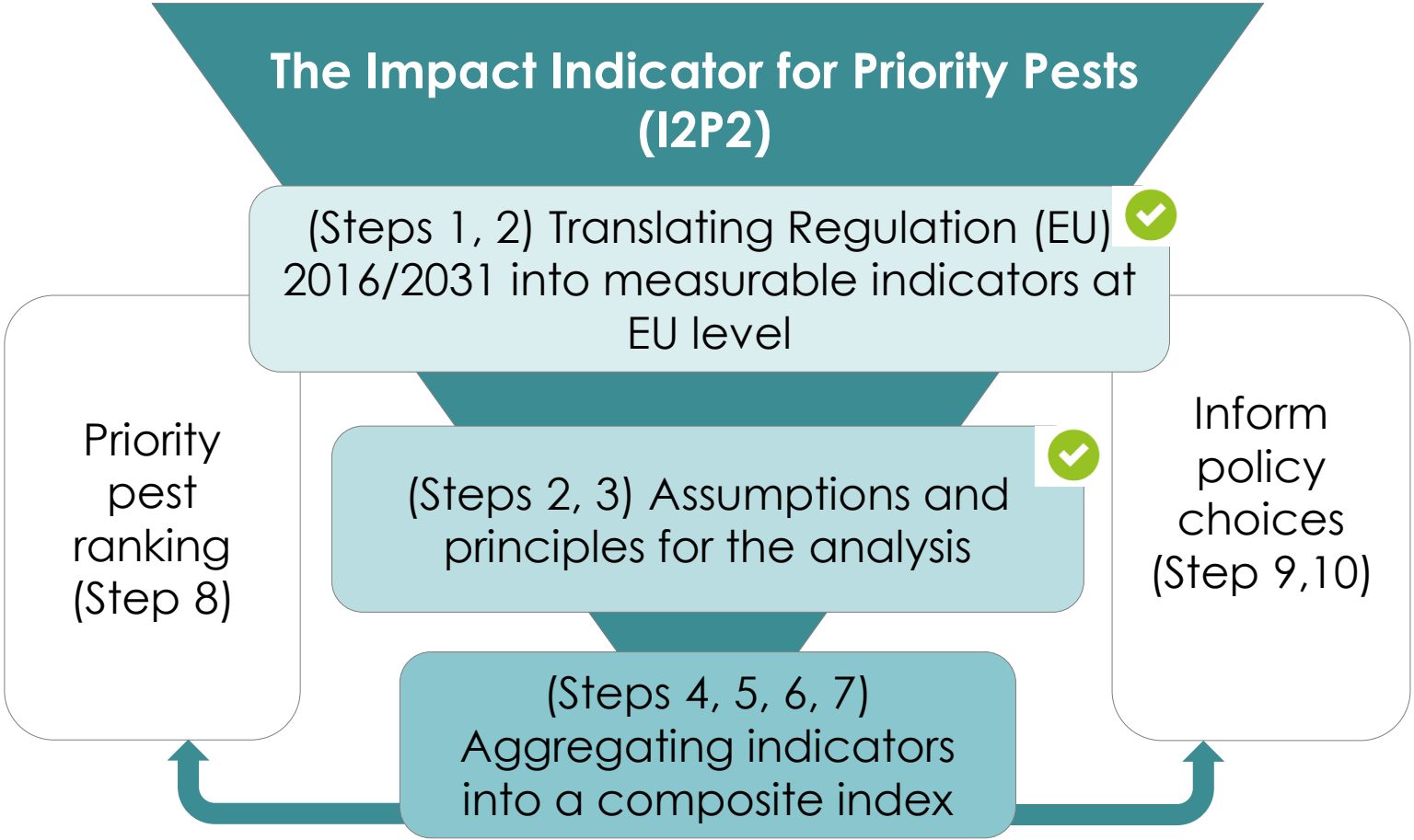
3 Indicator redefined

2 new indicators

- Capacity to produce aflatoxins
- Share of area under sustainable management practices

* Changes in **indicators** highlighted in slides by a yellow star ★

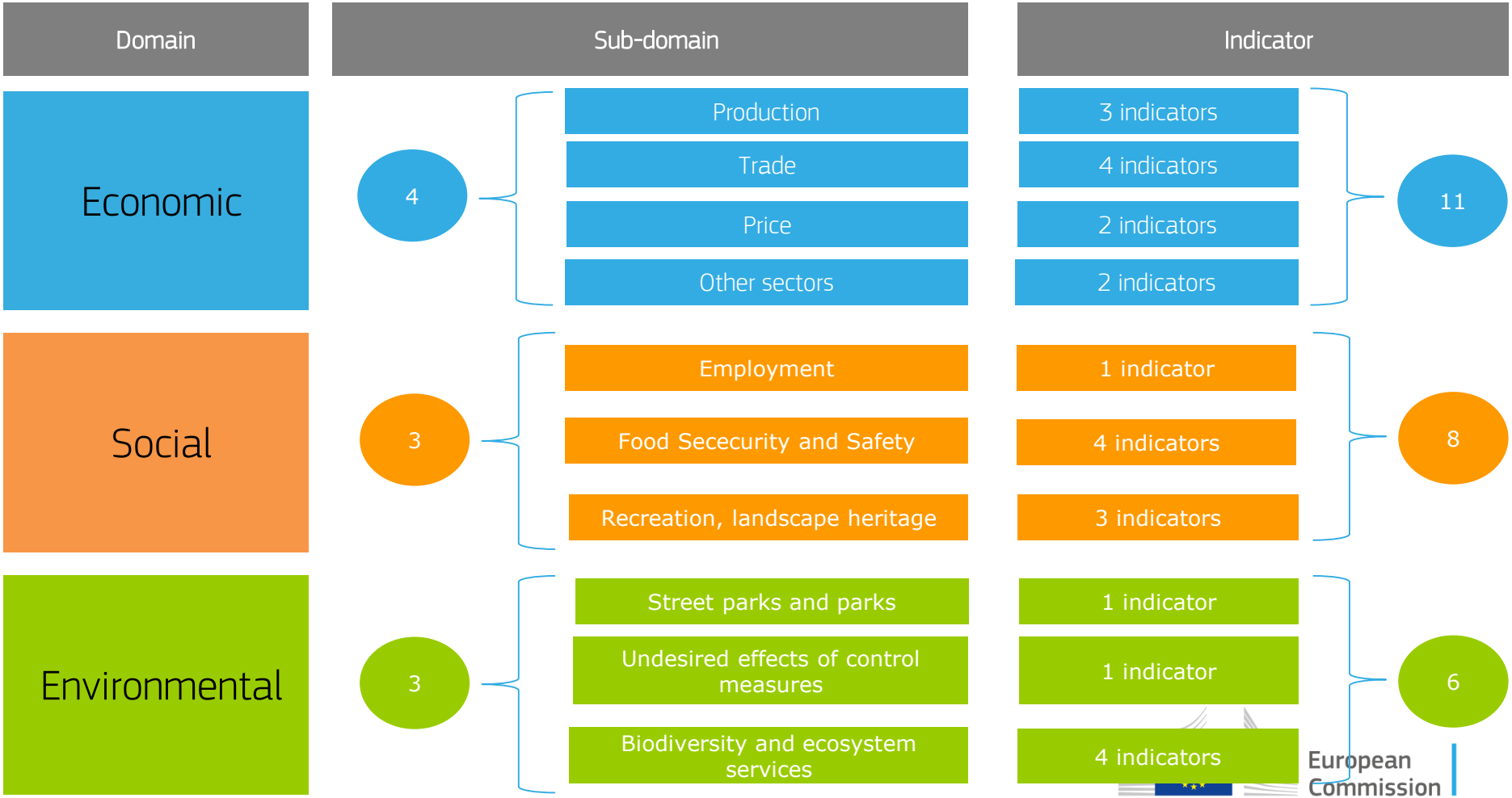
JRC methodology follows the OECD guideline for developing a composite indicator


The Impact Indicator for Priority Pests (I2P2)
(Steps 1, 2) Translating Regulation (EU) 2016/2031 into measurable indicators at EU level
(Steps 2, 3) Assumptions and principles for the analysis
(Steps 4, 5, 6, 7) Aggregating indicators into a composite index
Priority pest ranking (Step 8)
Inform policy choices (Step 9,10)

(Steps 1, 2) Translating Regulation (EU) 2016/2031 into measurable indicators at EU level

Step 1. Theoretical Framework

- Based on Regulation 2016/2031 and regulation criteria for selection of priority pests
- Indicators grouped into 3 hierarchical levels: domain, sub-domain and indicator
- All indicator positively correlated with I2P2 construct


Domain
Sub-domain
Indicator
Economic
4
Production
Trade
Price
Other sectors
3 indicators
4 indicators
2 indicators
2 indicators
11
Social
3
Employment
Food Sececurity and Safety
Recreation, landscape heritage
1 indicator
4 indicators
3 indicators
8
Environmental
3
Street parks and parks
Undesired effects of control measures
Biodiversity and ecosystem services
1 indicator
1 indicator
4 indicators
6
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(Steps 1, 2) Translating Regulation (EU) 2016/2031 into measurable indicators at EU level

Step 1. Theoretical Framework

- Based on Regulation 2016/2031 and regulation criteria for selection of priority pests
- Indicators grouped into 3 hierarchical levels: domain, sub-domain and indicator
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Step 2. Data Selection

- Preference given to quantitative data
- Data sources chosen based on coverage of EU28 and pests
- When no quantitative data available, indicators based on expert input (EFSA EKE)

Orphan Regulation criteria	Reason	Indirectly cover by
Cost of control measures (A1 S1 P4 b)	Lack of reliable data	Indicator #21
Effects on existing production practices (AI S1 P4 d)	Lack of reliable data	Indicator #21
Costs of environmental restoration and prevention measures (AI S1 P4 p)	Lack of reliable data	Indicator #21
Costs of replanting and/or losses due to the necessity of growing substitute plants (AI S1 P4 c)	Lack of data Not discriminatory across pests	None
Resources needed for additional research and advice (AI S1 P4 l)	Not discriminatory across pests	None
Effects on native plants (AI S1 P4 f)	Not discriminatory across pests	None

(Steps 2, 3) Assumptions and principles for the analysis

Step 2. Data Selection

Step 3. Imputation of missing data (Not applicable - missing data avoided)

*Details on assumptions are included in the following slides

Assumptions for the selection of data sources

- Quantitative or qualitative components based on the **existing evidence and data available**
- Use only the **most representative and reliable official statistical data**
- Expert assessment by **EFSA Expert Knowledge Elicitation (EKE) process**
- **Alternatives to official EU datasets** and expert elicitation explored when EU wide data is not available (i.e. MS consultation of forestry data)
- **Non-discrimination across pests,** all data sources available for all host-pest

Assumptions on reference scenario for impact assessment

- Pest is **already present throughout the area of potential establishment** in the EU

- Pest has reached **a stable spatial distribution / maximum potential abundance** based on the current environmental conditions and production practices

- Yield/quality losses are evaluated in a **time frame long enough to take into account the temporal variation** in pest population dynamics

- For **polyphagous pests**, indicators aggregated for all pest-host pairing when cardinal data and using maximum value for shares or ratios

(Steps 4, 5, 6, 7)
Aggregating indicators into a composite index

TO BE COMPLETED

Indicators for all pests needed

Step 4. Multivariate analysis

- Correlation analysis between indicators and indicator into types of impacts

Step 5. Normalisation

- To allow unbiased aggregation

Step 6. Weighting and aggregation

- From 25 indicators to I2P2
- Avoid implicit importance derived from indicator construction

Crops versus trees

Step 7. Uncertainty and sensitivity analysis

- Uncertainty incorporated by EFSA inputs and SA of rankings related to weights

Priority pest ranking (Step 8)

Inform policy choices (Step 9,10)

TO BE COMPLETED

I2P2 for all pests needed

Step 8. Back to the data

- Identification of driving indicators of the ranking (individual indicators vs ranking based on composite indicator)
- Selection criteria for priority pest [minimum threshold, number of PP, etc.]

Step 9. Links to other indicators

- Comparison of ranking with those resulting from other classification

Step 10. Visualisation of the results

- Factsheets, Qlik Sense software…

The UPDATED Impact Indicator for Priority Pests (I2P2) and its application to pilot pest *Tilletia indica*

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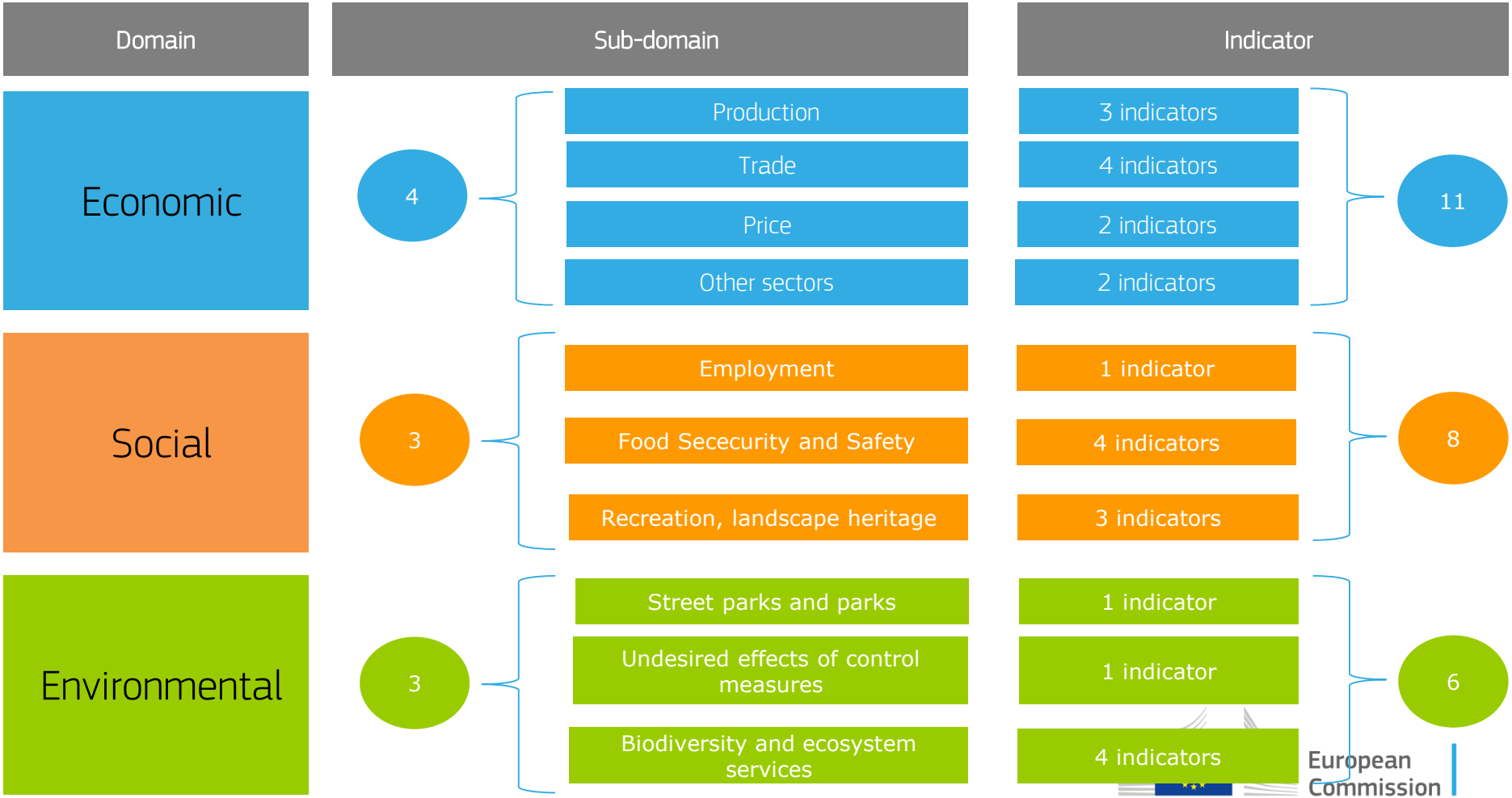
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Domain	Sub-domain	Indicator
Economic impact	Production impacts	I.1 Maximum value of production losses ★
		I.2 Share of EU production affected ★
		I.3 Difficulty of eradication ★
	Trade impacts	I.4 Number of importing countries banning trade
		I.5 Export losses
		I.6 Share of production exported
		I.7 Trade dispersion ★
	Price and market Impacts	I.8 Change in domestic price
		I.9 Ratio of domestic production over imports
	Impacts on other agents	I.10 Upstream effect ★
		I.11 Downstream effect ★

I.1 Maximum value of production losses

EFSA input on Yloss & Qloss/MS specific yields / perennial crops final decision based on quality of data received

$$(I.1)\ PL = \sum_{j=1}^{j=n} \sum_{i=1}^{i=28} \left[\left(A_{j,i}\ x\ Y_{j,i}\ x\ P_{j,i} x\ r_{loss\ i,j} \right) + \left(A_{j,i}\ x\ Y_{j,i}\ x\ \left(1 - r_{loss\ i,j}\right) x Q_{lossi,j} x (P_{j,i} - P'_{j,i}) \right) \right]$$

Tilletia indica – Potential proportion of loss in yield (r_{loss})	
Percentile	**Percentage**
1st	0.005
25th	0.025
50th	**0.050**
75th	0.100
99th	0.544

Tilletia indica – Potential proportion of remaining production after yield loss that would result in lower quality (Qloss)	
Percentile	**Percentage**
1st	0.1
25th	1.0
50th	**2.1**
75th	3.9
99th	11.7

Source: EFSA (2018) - Data presented is the yield loss without taking into account climate suitability & host distribution. Specific values per MS take into account these two factors

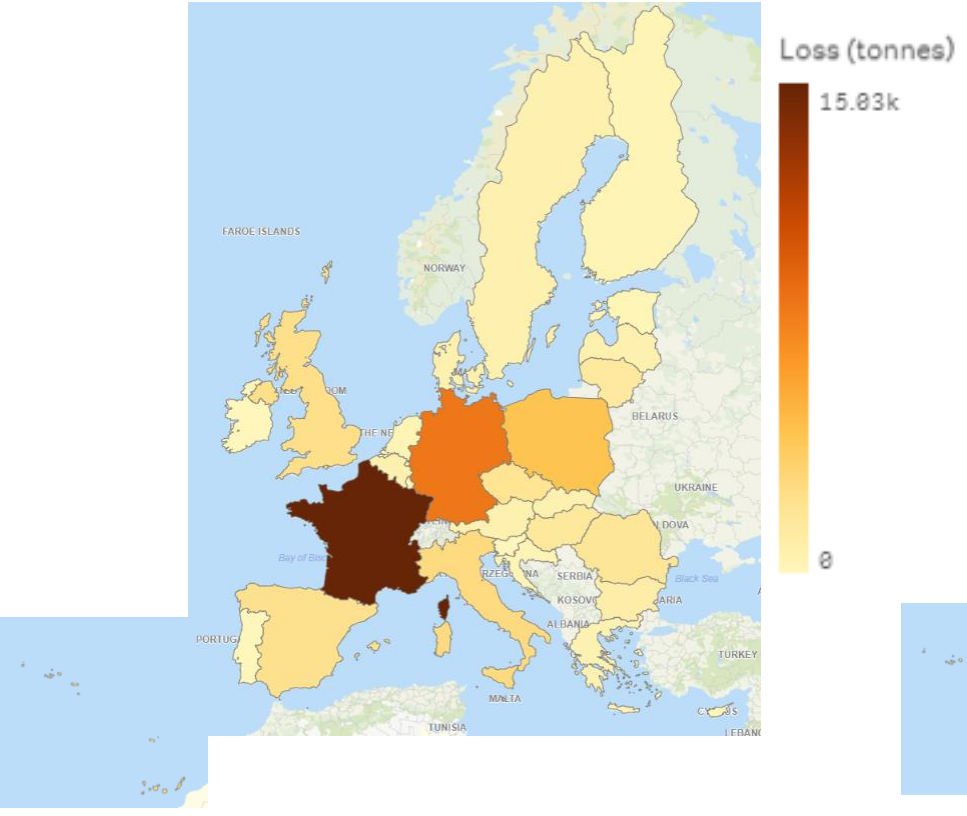
Indicator I.1 Maximum production loss applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result (EU28 aggregates)				
	Bread wheat	**Durum wheat**	**Triticale**	**Total**
Host planted area (1000 has)	24,100	2,478	2,934	29,512
Yield (tonnes/ha)	5.9	3.4	4.2	-
Price of the commodity with normal quality (€/tonne)	192	254	144	-
Price of the commodity with reduced quality (€/tonne)	173	229	130	-
Potential proportion of loss in yield (%)	0.050	0.050	0	-
Potential proportion of remaining production after yield loss that would result in lower quality (%)	2.1	2.1	0	-
I.1 Maximum value of production losses (million €)	45	3.9	**0**	48.9

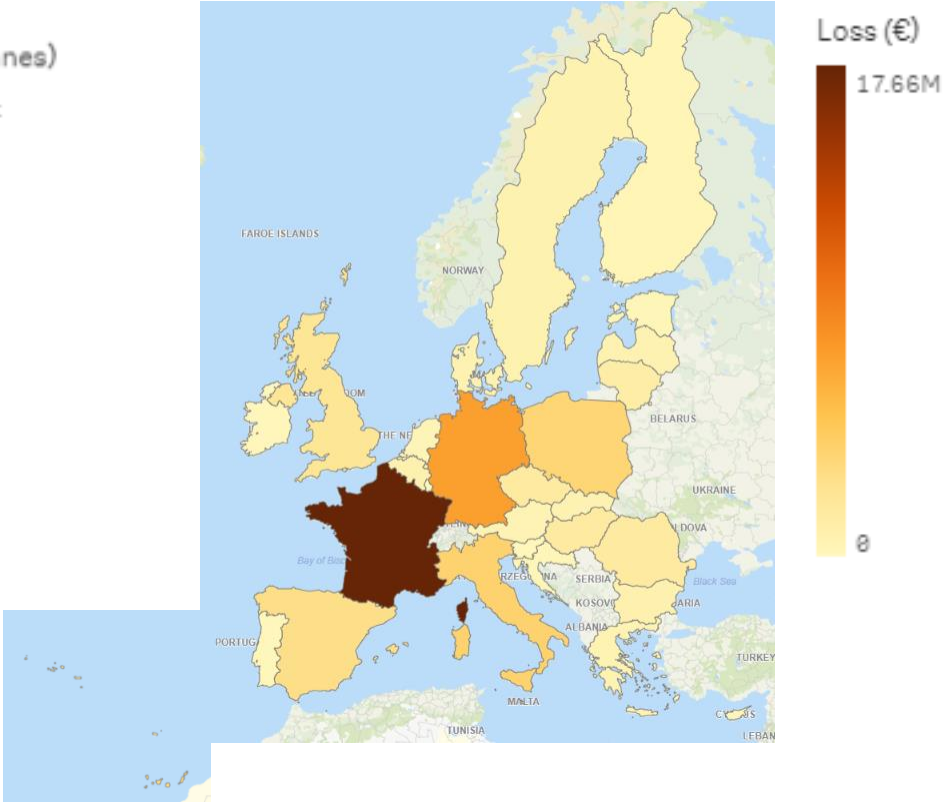
Source: EFSA (2018) and EUROSTAT (2013-2016)

I.1 Maximum value of production losses

Only yield loss (in tonnes)



Yield and quality loss (in euros)



I.2 Share of EU production affected

From share of MS to share of production

$$(I.2)\ PA = \sum_{j=1}^{j=n}\sum_{i=1}^{i=28} PL_{j,i} \Big/ \sum_{j=1}^{j=n}\sum_{i=1}^{i=28} TP_{j,i}$$

Source:
EUROSTAT
(2013-2016)

Indicator I.2 Share of EU production value affected applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result (EU28 aggregates)		
Hosts	**Production loss (million €)**	**Total Production (million €)**
Bread wheat	45	26,917
Durum wheat	3.9	2,150
Triticale	0	1,793
I.2 Share of EU production value affected (in %)		**0.08**

I.3 Difficulty of eradication

Source: EFSA (2018)

Totally redone

$$(I.3)\ DE = TD\ x\ SR$$

Tilletia indica – Duration until detection (TD) - years	
Percentile	**Years**
2.5th	4
25th	9
50th	**12**
75th	15
97.5th	22

Tilletia indica – Spread rate (SR) **- meters per year**	
Percentile	**m yr^{-1}**
2.5th	29
25th	467
50th	**1,238**
75th	2,631
97.5th	7,459

Indicator I.3 Difficulty of eradication applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Time for detection after entry (yr)	12
Spread rate (m yr^{-1})	1,238
I.3 Difficulty of eradication	**14,856**

I.4 Number of importing countries banning trade

$$(I.4)\ NICBT = \sum_{j=1}^{j=n} IC_j - ICnb_j$$

Source: EFSA 2018 and COMEXT data for EXTRA EU 28 (2013-2016)

The number of importing countries banning trade is 118

Tilletia indica – Number of importing countries not banning trade with EU (ICnb)

Number of importing countries not banning trade with EU for *T.indica: 6*	
Pest is present (10)	***Pest has Quarantine status***
South Africa	Argentina
Brazil	Brazil
Mexico	Canada
United States of America	Chile
Afghanistan	Paraguay
India	United States of America
Iran	Uruguay
Iraq	Bahrain
Nepal	China
Pakistan	Israel
	Jordan
	Kazakhstan
	Uzbekistan
	Azerbaijan
	Belarus
	Moldova
	Norway
	Russia
	Turkey
	Ukraine

Tilletia indica –Number of importing countries (IC)

Number of countries importing wheat from the EU: 124

I.5 Export losses

$$(I.5)\ XL = \sum_{j=1}^{j=n} \sum_{i=1}^{i=n} Xb_{ji}$$

Tilletia indica – Value of exports to countries banning trade with EU (billion €)	
All countries	**5.5**

Source: COMEXT data for EXTRA EU 28 (2013-2016)

Export losses for *Tilletia indica* are **5.5 billion euros.**

I.6 Share of production exported

$$(I.6)\quad \max_{\forall j} SPX = \frac{\sum_{i=1}^{i=n} Xb_{ji}}{TP_j}$$

Source: EUROSTAT and COMEXT data for EXTRA EU 28 (2013-2016)

***Tilletia indica – Quantity of exports to countries listed in I.4 (Xb)* (1000 t)**	
All countries - wheat	**26,869**

Tilletia indica – Total production (TP) (1000t)		
Bread wheat	Durum wheat	Total
142,945	8,331	**151,276**

Indicator I.6 Share of production exported applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Quantity of exports with countries banning trade to EU (1000 t)	26,869
Total production of wheat (1000 t)	151,276
I.6 Share of production exported (%)	**18%**

I.7 Trade dispersion

Changed to assure positive correlation with I2P2

$$(I.7)\ TD = \sum_{i=1}^{i=n} \left(\frac{\sum_{j=1}^{j=n} Xb_{ji}}{\sum_{j=1}^{j=n} \sum_{i=1}^{i=j} Xb_{ji}} \right)^2$$

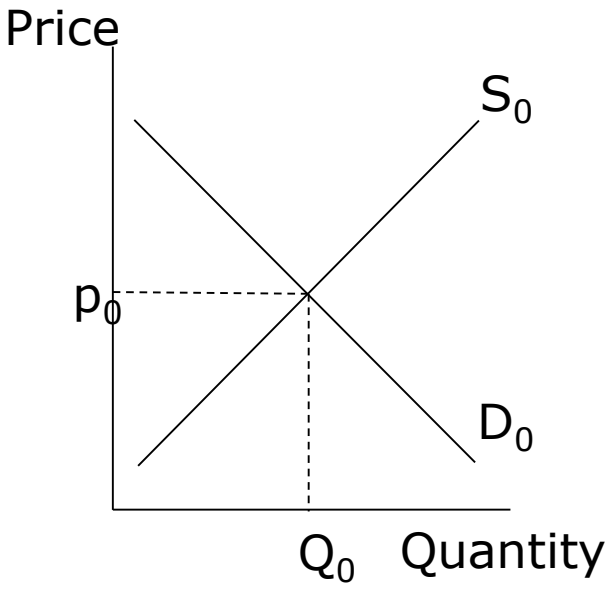
Tilletia indica – Quantity of exports to countries listed in I.4 (Xb) **(1000 t)**	
All countries - wheat	**26,869**

Source: COMEXT data for EXTRA EU 28 (2013-2016)

Trade dispersion takes the value of 0.91

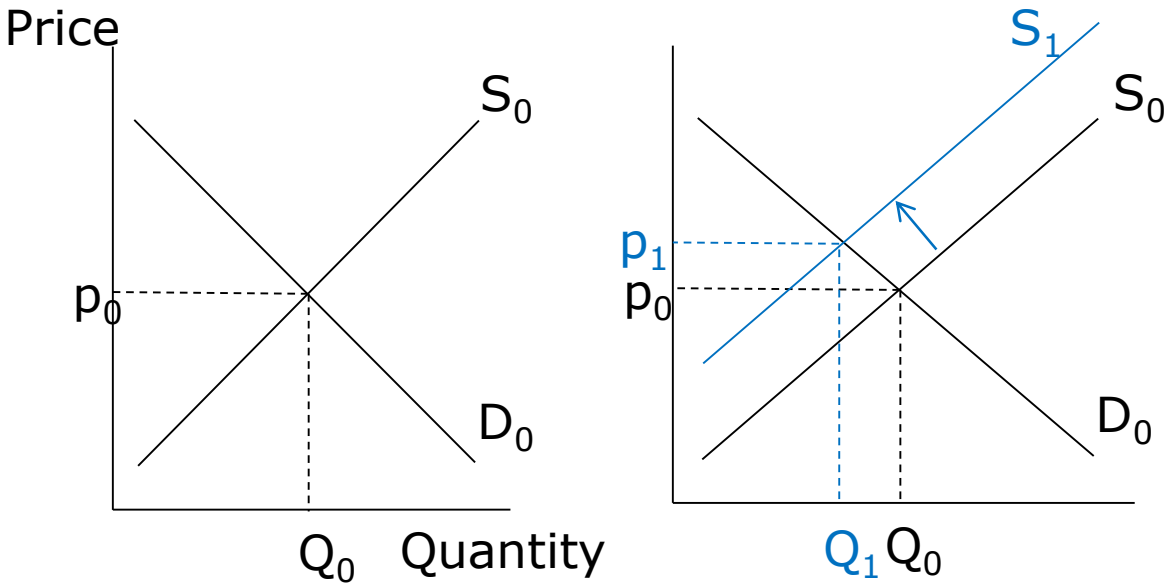
EU's exports are distributed evenly among the different trading partners and compliance and transaction costs would be high, thus the impact severe

a) Market equilibrium before pest outbreak



a) Market equilibrium before pest outbreak

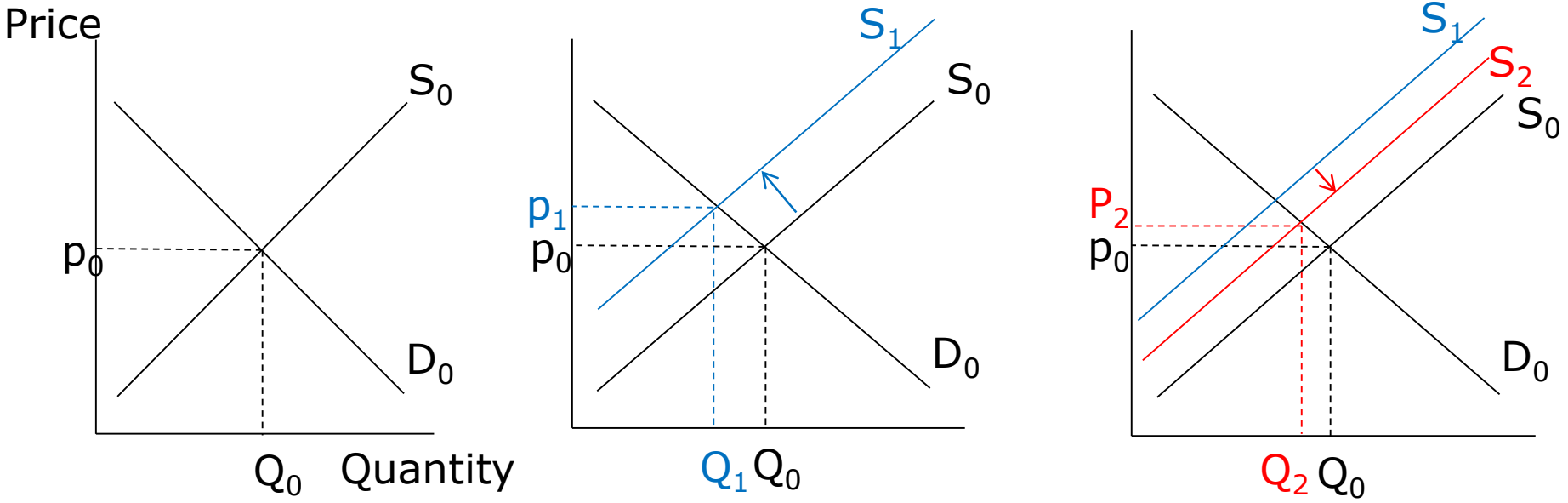
b) Reduced yield → Reduced EU supply (Q_1) → Increased price (P_1)



a) Market equilibrium before pest outbreak

b) Reduced yield → Reduced EU supply (Q_1) → Increased price (P_1)

c) Export ban → Increased EU supply ($S_2=S_1+X$) → increased price (P_2)



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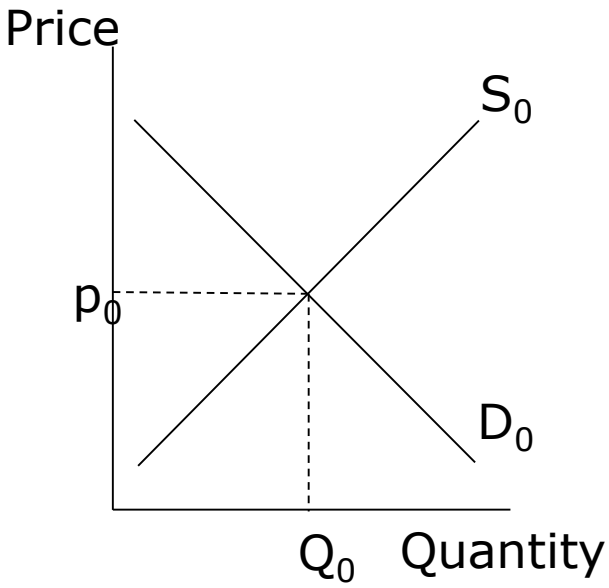
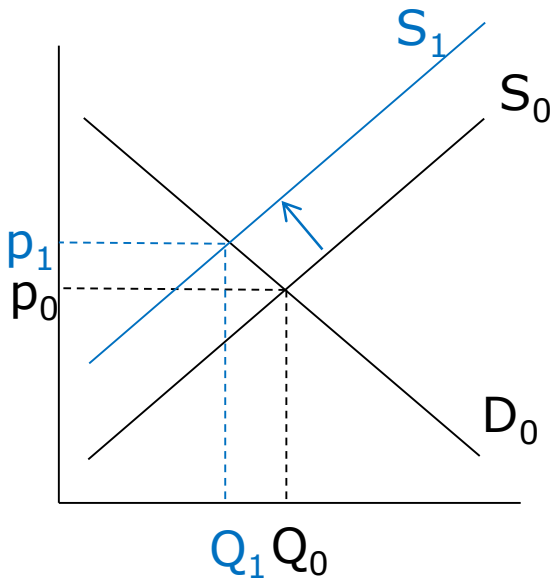
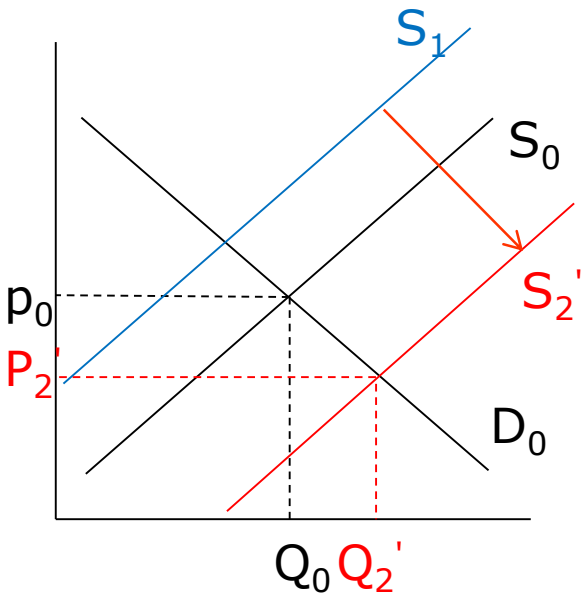
a) Market equilibrium before pest outbreak

b) Reduced yield → Reduced EU supply (Q_1) → Increased price (P_1)

c) Export ban → Increased EU supply ($S_2=S_1+X$) → increased price (P_2')







I.8 Change in domestic price

$$(I.8)\ \ \Delta P\ = \max_{\forall j} \left| (\Delta Q_j\ x\ \frac{1}{E_j}) \right|$$

Tilletia indica – Change in domestic supply for wheat (ΔQ) (%)	
$\Delta Q = \frac{-PL + Xb}{TP + M - X}$	**21**

Source: EUROSTAT and COMEXT data for EXTRA EU 28 (2013-2016)

Tilletia indica – Own price elasticity of demand (E)	
Wheat	**-0.22**

Source: CAPRI (average of MS specific elasticities)

Indicator I.8 Change in domestic price applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Total production (1000 t)	151,276
Quantity of imports (1000 t)	5,067
Quantity of exports (1000 t)	28,526
Maximum value of production losses (1000 t)	48
Quantity of exports to countries banning trade with EU (1000 t)	26,869
Change in domestic supply (%)	21%
Own price elasticity if demand	-0.22
I.8 Change in domestic price (%)	**95**

I.9 Ratio of domestic production over imports

$$(I.9)\ RDP = \begin{cases} 0, & if\ \Delta Q_j > 0 \\ \max\limits_{1<j<n}\left(\dfrac{\Delta Q_j}{M_j}\right), & if\ \Delta Q_j < 0 \end{cases}$$

Source: EUROSTAT and COMEXT data for EXTRA EU 28 (2013-2016)

Indicator I.9 Ratio of domestic production of wheat over imports applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Change in domestic supply (1000 t)	26,821
Quantity of imports (1000 t)	5,067
I.9 Ratio of domestic production over import (%)	**0**

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I.10 Upstream effect

$$(I.10)\ UE = \sum_{j=1}^{j=n}\left(PL_j x \sum_{k=1}^{k=n} OM_{jk}\right)$$

Source: EUROSTAT, EFSA and EU 28 BioSAMs (2010)

Indicator I.10. Upstream effect applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Maximum value of production losses (million euros)	9.4
Sum of multiplier effects	1.8
I.10. Upstream effect (million Euros)	**17**

Note: Only yield loss is considered for this indicator

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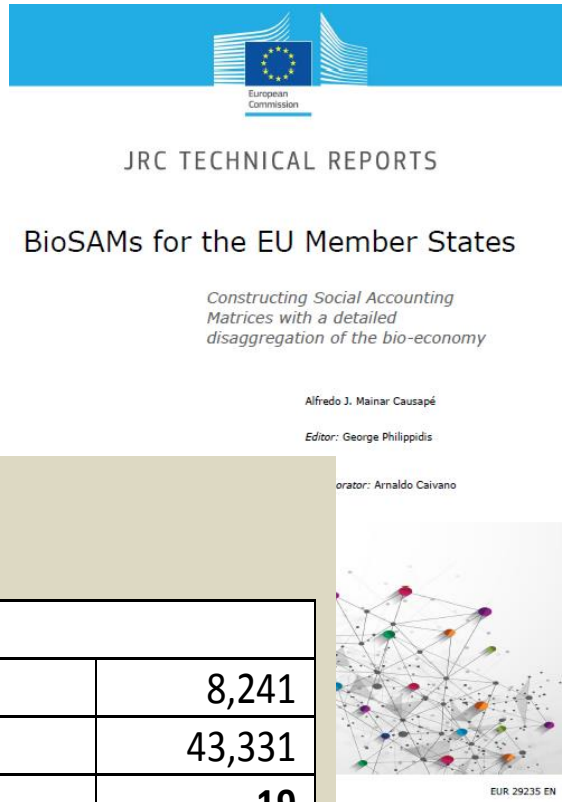
I.11 Downstream effect

$$(I.11)\ DE = \max_{\forall j} \frac{\sum_{k=1}^{k=n} ID_{jk}}{TP_j}$$



Indicator I.11. Downstream effects applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Intermediate demand (million euros)	8,241
Total production value BIOSAM (million euros)	43,331
I.11. Downstream effect (%)	**19**

Source: EU 28 BioSAMs (2010)

Domain	Sub-domain	Indicator
Social impact	Impact on employment	I.12 Job losses
	Impact on Food Security and Food safety	I.13 Share of caloric supply
		I.14 Share of protein supply
		I.15 Share of fat supply
		I.16 Ability to produce aflatoxins ★
	Impact on recreation, landscape and cultural heritage	I.17 Share of holdings with OGA
		I.18 Products covered by EU quality labels ★
		I.19 UNESCO World Heritage sites

I.12 Job losses

$$(I.12)\ JL = \sum_{j=i}^{j=n} \sum_{i=1}^{i=28} \left(A_{ji}\, x\, \frac{PL_{ji}}{TP_{ji}} x L_{ji} \right)$$

Tilletia indica – Labour need for the production (L) (AWU ha^{-1})	
Specialist cereals	**0.03**

Source: EUROSTAT (2013) - From the different farm types for which data is available, specialist cereals best represent the labour needs for wheat

Tilletia indica– Production loss in quantity (PL) (1000 t)	
Host	**Value**
Bread wheat	45.2
Durum wheat	2.8
Triticale	0
TOTAL	48

Source: Own calculation based on EUROSTAT (2013-2016)

Tilletia indica – Total production (TP) (1000t)		
Bread wheat	Durum wheat	Total
142,945	8,331	**151,276**

Note: Only yield loss is considered for this indicator

Indicator I.12 Job losses applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Wheat planted area in EU (1000 has)	26,578
Maximum production loss for wheat (1000 t)	48
Total production of wheat (1000 t)	151,276
Labour need for the production (AWU per ha)	0.03
I.12. Job losses (AWU)	**217.5**

Note: reported values are EU28 averages; however the indicator is calculated aggregating MS specific values. Therefore applying the indicator formula to the values reported does no lead to the reported results.

I.13 Share of caloric supply

$$(I.13)\ SCS = \sum_{j=1}^{j=n} \frac{CS_j}{TCS}$$

Source: FAO Food Balance Sheet data at EU level - latest year available (2013)

Indicator I.13. Caloric supply applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Wheat and wheat products food supply quantity in EU (kcal/capita/day)	786
Total food supply quantity including all commodities in EU (kcal/capita/day)	3,409
I.13. Caloric supply (%)	**23%**

I.14 Share of protein supply

$$(I.14)\ SPS = \sum_{j=1}^{j=n} \frac{PS_j}{TPS}$$

Source: FAO Food Balance Sheet data at EU level - latest year available (2013)

Indicator I.14. Share of protein supply applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Wheat and wheat products protein supply quantity in EU (g/capita/day)	25
Total protein supply quantity including all commodities in EU (g/capita/day)	104
I.14. Protein supply (%)	**24%**

I.15 Share of fat supply

$$(I.15)\ SFS = \sum_{j=1}^{j=n} \frac{FS_j}{TFS}$$

Source: FAO Food Balance Sheet data at EU level - latest year available (2013)

Indicator I.15. Share of fat supply applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Wheat and wheat products fat supply quantity in EU (g/capita/day)	4
Total fat supply quantity including all commodities in EU (g/capita/day)	140
I.15. Fat supply (%)	**2.5%**

I.16 Ability to produce aflatoxins

$$(I.16)\ CPA = \begin{cases} 1 & if\ Yes \\ 0 & if\ No \end{cases}$$

Source: EFSA (2018)

Indicator I.16. Ability to produce aflatoxins applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Tilletia indica ability to produce aflatoxins	No
I.16. Ability to produce aflatoxins (1 / 0)	**0**

I.17 Share of holdings with OGA

$$(I.17)\ SHOGA = \max\left(\frac{\sum_{i=1}^{i=28} HOGA_{ij}}{\sum_{i=1}^{i=28} H_{ij}}\right)\forall j$$

Source: EUROSTAT (2013) - From the different farm types for which data is available, specialist cereals best represent the OGA for wheat

Indicator I.17.Share of holdings with other gainful activities applied to pilot pest Tilletia indica

Summary of data used for calculation of the indicator and final result	
Other gainful activities for specialist field crops (number of holdings)	1,361,760
Total number of holdings for specialist field crops (number of holdings)	3,197,190
I.17. Share of holdings with other gainful activities (%)	**43%**

European Commission

I.18 Products covered by EU quality labels

A count variable of Protected Designation of Origin (**PDO**), Protected Geographical Indication (**PGI**) and Traditional Speciality Guaranteed (**TSG**)

Tilletia indica – Quality Schemes

Quality Schemes related to Wheat and wheat products in EU
1. Farine de blé noir de Bretagne/ Gwinizh du Breizh (FR)
2. Farine de Petit Épeautre de Haute Provence (FR)
3. Petit Épeautre de Haute Provence (FR)
4. Fränkischer Grünkern (DE)
5. Farro di Monteleone di Spoleto (IT)
6. Farro della Garfagnana (IT)
7. Gofio Canario (ES)

Source: Expert assessment based on DOOR (Database of Origin & Registration).

I.19 UNESCO World Heritage sites

NEW REQUEST TO MS

A count variable of **UNESCO World Heritage List** where the host is present and limiting factor

Tilletia indica – World Heritage Sites

Wheat and wheat products World Heritage List in EU (number of WHL sites)
No WHL sites related to wheat have been identified

Source: Expert assessment based on World Heritage List by MS.

Domain	Sub-domain	Indicator
Environmental impact	Impact on street trees, parks and natural and planted areas	I.20 Use of hosts as street trees and in parks
	Undesired impacts of control measures	I.21 Undesired effects of control measures ★
	Impact biodiversity and ecosystem services	I.22 Soil erosion
		I.23 Effect on biodiversity and wildlife
		I.24 Share of Natura 2000 area affected
		I.25 Share under sustainable management practices ★

I.20 Use of hosts as street trees and in parks

$$(I.20)\ USTP = \sum_{i=1}^{i=28} \sum_{j=1}^{j=n} QPS_{i,j}$$

Tilletia indica – Use of hosts as street trees and in parks (USTP)

Abundance scale of use of hosts (0-4)	
Host	
Bread wheat	**0**
Durum wheat	**0**
Triticale	**0**
TOTAL	**0**

Note: Own calculations for EU28 using indicator formula based on MS responses to ad-hoc consultation

Abundance scale used in the measurement of the indicator and share of presence	
Share of presence	*Abundance scale*
Less than 1%	1
Between 1% and 20%	2
Between 21% and 50%	3
More than 50%	4

Source: Ad-hoc forestry data requested to MS

I.21 Undesired effects of control measures

Redone following EFSA explanation

$$(I.21)\ UECM = \max_{\forall j} CM_j$$

Description of the control measures needed	**CM indicator**
Effective control measures are not available/feasible in the EU	**0**
PPPs applied against other pests in the risk assessment area are effective also against the given pest, with no need to increase the amount of treatments	**0**
PPPs applied against other pests in the risk assessment area are effective also against the given pest, only if the amount of treatments is increased	**1**
A high increase in the amount of treatment is not sufficient to control the pest: only integrated strategies combining different tactics can be envisaged	**2**

Tilletia indica – Undesired effects of control measures

Additional treatments for *T. indica*	
PPPs applied against other pests in the risk assessment area are effective also against the given pest, with no need to increase the amount of treatments	**0**

I.22 Soil erosion

This indicator will be based on **soil water erosion rates per land cover group**, but is still under construction

http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_soil_erosion

European Commission

I.23 Effect on biodiversity and wildlife

A count variable of the number of species and habitat related to each of the hosts listed in under the **Council Directive 92/43/EEC** and the **Directive 2009/147/EC of the European Parliament and of the Council**

The value for bread wheat, durum wheat and triticale is 0 species and habitats affected.

JRC outsourced TA for matching of hosts species and habitats

I.24 Share of Natura 2000 area affected

$$(I.24)\ SN2Ka = \max_{\forall j}(NSR; NAR)$$

Description of the control measures needed
NSR is the share of Natura 2000 sites
NAR is the share of Natura 2000 area potentially affected by an outbreak

I.25 Share under sustainable management practice

Tilletia indica – Share of area under sustainable management practices (SFM)

Share of total area fully converted or under conversion to organic farming	
Crop	**Share under organic farming**
Wheat and spelt	0.41

European Commission

UNESCO World Heritage List

(Steps 4, 5, 6, 7) Aggregating indicators into a composite index

Priority pest ranking (Step 8)

Inform policy choices (Step 9,10)

NEW REQUEST TO MS

Step 4. Multivariate analysis

Step 5. Normalisation

Step 6. Weighting and aggregation

Step 7. Uncertainty and sensitivity analysis

Step 8. Back to the data

Step 9. Links to other indicators

Step 10. Visualisation of the results

FURTHER STEPS

European Commission

Thanks for your attention

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