



Colloquium 10

Pest risk assessment

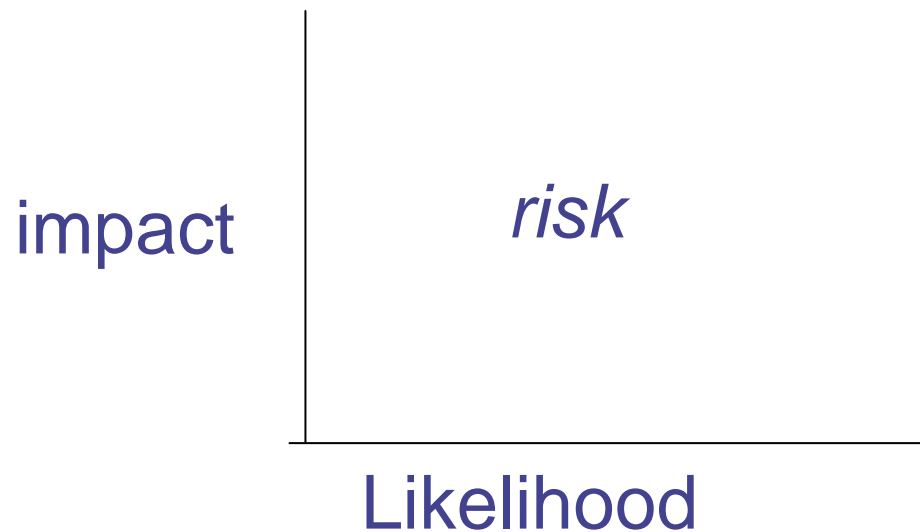
Science in support of phytosanitary decision making in the European Community

Discussion Group 3

Methodologies in pest risk assessment: qualitative vs. quantitative approaches in the assessment of pest impacts

Day 1

Firm view of group that economic impacts must be included in risk assessment



Six Questions

1. Do we have a common definition of economic, environmental and social impacts?
2. When and how to use quantitative and qualitative approaches to assess commercial impacts.
3. Methods for measuring environmental and social impacts.
4. What time horizon should a risk assessment look to?
5. How to combine economic (commercial) environmental and social impacts.
6. Methods for summarising economic uncertainty.

Do we have a common definition of economic, environmental and social impacts? (John Mumford)

- No
- Should we?
- Yes
- Why?
- To be consistent, transparent

UKNNRA Risk Likelihoods

Score	Description	Definition	Frequency definition
1	Very unlikely	This sort of event is theoretically possible, but is never known to have occurred and is not expected to occur	1 in 10,000 years
2	Unlikely	This sort of event has not occurred anywhere in living memory	1 in 1,000 years
3	Possible	This sort of event has occurred somewhere at least once in recent years, but not locally	1 in 100 years
4	Likely	This sort of event has happened on several occasions elsewhere, or on at least one occasion locally in recent years	1 in 10 years
5	Very likely	This sort of event happens continually and would be expected to occur	Once a year

These slides were presented in the plenary session and followed by discussion and may not necessarily represent the final conclusions

UKNNRA Impact definitions

Score	Description	Monetary loss and response costs	Health Impact	Environmental impact	Social impact
4	Major	?1m-?10m /yr	Significant irreversible effects locally or reversible effects over large area	Long-term irreversible ecosystem change, spreading beyond local area	Some permanent change of activity locally, concern expressed over wider area
5	Massive	?10m + /yr	Widespread, severe, long-term, irreversible health effects	Widespread, long-term population loss or extinction, affecting several species with serious ecosystem effects	Long-term social change, significant loss of employment, migration from affected area

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Group comments

- Welcomed this approach, found guidance very useful
- Helped that economic impacts, environmental impacts and social impacts were described
- It was noted that within guidance there was consideration of
 - geographic scale,
 - time scale,
 - reversibility of change, and
 - number of species
- Elements could be broken down further

Group Comments

- providing a range of options across elements of impact allows assessor to select according to available data
- Notice “health impacts” \neq plant health impacts does mean human health impacts!
- Medical point of view social impacts closely linked to human health impact

Group Comments

- social impact can be loss of employment
- but unemployment can be contributory factor to a number of human health issues
- Recognised this would be difficult to deal with so group thought could pass this sort of thing to another EFSA Panel

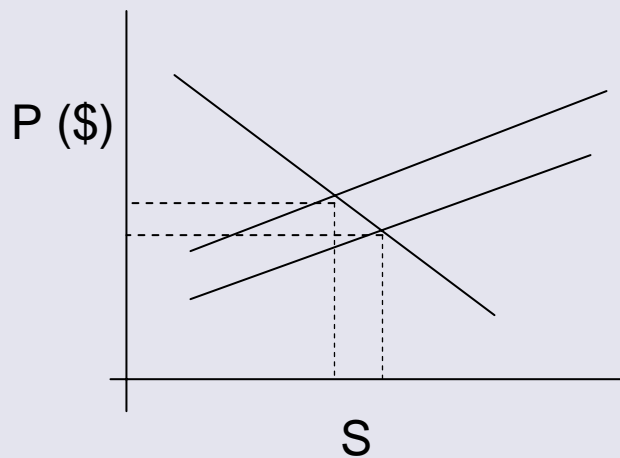
Group Comments

- Using a word scale for likelihood and impact, one could combine them to determine risk in a grid
- Was much debate in group about whether this was risk assessment and or risk management.
- Strong views expressed but moved on

What quantitative techniques are available?

Scale ?

- Industry sector
- Economic
- Supply & demand
- Partial equilibrium



- Individual grower
- Financial
- Changes in costs & revenues

	\$'000	\$'000
Sales		76
Variable costs		
seed	12	
herbicide	16	
fuel	14	
pest control	2	
other	<u>1</u>	
		<u>(63)</u>
Gross margin (Fixed costs)		<u>13</u>

What qualitative approach are available?

- When no quantitative data is available, may find linguistic terms describing impacts
 - **Free text**
- Establish a ranking of words
 - **Low, medium, high**

Advantages & disadvantages of approaches

<u>Quantitative approaches</u>	<u>Qualitative approaches</u>
Consistency/ data intense	Flexible / inconsistent
Suggests precision / but uncertainty exists	Eases communication
Expensive / worth it?	Less costly?

Comments

- Lack of data means qualitative approach most common
- Where data exists difficulty is linking epidemiological data to economic data
- Using numbers to indicate elements of risk does not make the assessment quantitative
- Semi-quantitative approach combines quantitative and qualitative approaches
- In a quantitative assessment, uncertainties may be so large that expressing the result numerically does not help
- so is expressed linguistically

Comments

- Quantitative methods may be preferred, are sophisticated but rarely are sufficient data available
- Free form text is best avoided

- money is a universal metric, may be reported in literature - thus describing impacts in financial terms can very much aid communication

- A standardised set of terms should be adopted with a range of descriptions to provide guidance to assessors

- Sophisticated techniques should be developed to combine likelihoods and impacts to determine risk

3. Quantitative and qualitative methods for measuring environmental and social (including impacts on human health) impacts. (Marc Kenis)

Issues

Agreed that environmental impacts are often the most difficult to answer

- Few examples e.g. > 300 papers studying alien insects, 59 species, 46 had documented significant ecological impact worldwide (4 in Europe) (Kenis *et al.*, submitted)

- Are methods to monetize environmental impacts e.g. travel cost, contingent valuation - Expensive, site specific, some criticism of techniques

- Multi-criteria analysis

Issues

- Since commercial impacts more immediate, easier to value this aspect of impact has been used most often in risk assessment
- Now recognise environmental & social impacts have become elevated within risk assessment systems
- need to develop methods to enable such impacts to be included in RA

4. What level of analytical depth and what time frame should the impact assessment have? (Francoise Petter)

- Over what time span & how much detail?

Issues

- Societal values change over time
- 20 years ago pest risk assessment would have focussed on risk to agricultural production
- Nowadays secure food supply allows society to look beyond production to other aspects of well being – environmental & social

Issues

- Given attitudes change, how stable are predictions we make now?
- Less stable / more uncertainty over a longer time period
- Environmental impacts may take generations before unacceptable impacts are realised

Issues

- Time frame should depend upon pest and its impacts,
- rather than select a fixed period, should be flexible and align with pest
- Long term impacts are important but if decision can be made based on short term then that is sufficient
- In future more long term thinking is to be expected

5. How to combine the assessments of economic, environmental and social impacts? (Alfons Oude Lansink)

One possibility: Multicriteria Analysis

$$\text{Impact} = w_1 \text{ Econ} + w_2 \text{ Env} + w_3 \text{ Soc}$$

- If impacts are combined using MCA then:
 - **What weights should be attached to each of the impacts?**
 - **Who should determine weights? Risk managers? Scientists?**

Issues

- Most thought risk managers should set weighting
- Stakeholder consultation to set weightings
- Doesn't have to be a quantitative assessment to use weighting – are techniques to weight words
- weightings can change over time
- If separate social impacts from human health impacts than fail to capture all impacts and assessment can lack credibility

Issues

- Much debate about combining elements of impact
- No consensus within group

6. Methods for summarizing uncertainty and dealing with lack of data.

(Annemarie Breukers)

Issues

- Data requirements proportional to approach taken
- Usually the case that requirements > availability
- Where data exists, care needed in interpreting it for PRA area
 - Historical
 - Experimental
 - Expert judgement
 - extrapolation

Issues

- Reliable quantitative data preferred
- Where lacking combination of expertise (from different disciplines, pest, host, PRA systems)

Issues

- Uncertainty
- How to validate predictions
- Taking quantitative / stochastic approach lacks transparency
- Can be difficult to communicate risk to stakeholders (including risk managers)

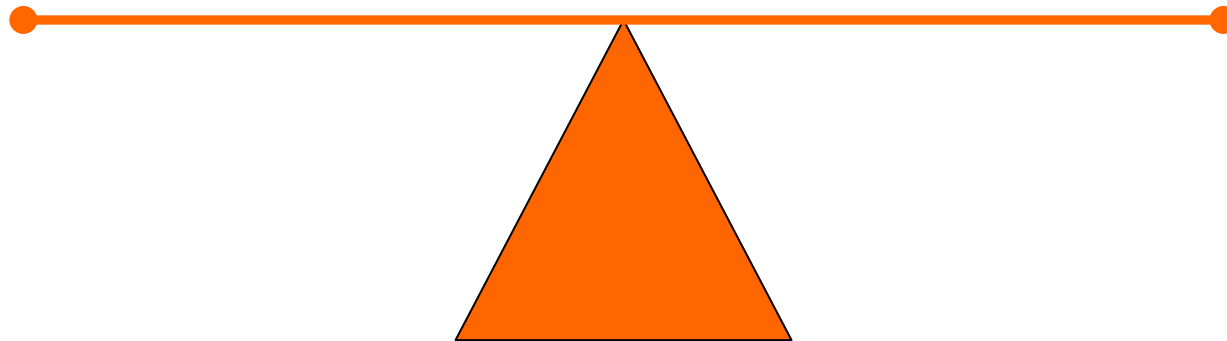
Issues

-Risk assessors need to work closely with risk managers

Decisions

- Scientifically rigorous
- Economically rigorous
- Best use of data
- Deal with uncertainty
- Communication

- Time available
- Information available
- Other resources
- Added benefit
- Practical decision tool



Subject to revision

END

Now for discussion