

How can models support risk assessment of plant pests and decision making?

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- Some comments on scope
- Perspectives from/for
 - risk assessment
 - risk management
- Uncertainty
- Data needs, complexity, and validation
- Spatial and temporal scales
- New challenges and modelling tools

Scope

- Models range from “mental images” to “complex systems models” – but too broad to be useful here, so restrict usage
- All models require quantification but not all quantification requires a model
- Models are only part of quantitative risk assessment – there should not be over-reliance on model outcomes, expert judgement is still required
- Models HAVE previously been used in support of qualitative risk assessments

Perspectives from/for risk assessment

- Risk assessment is “an autonomous system with feedback, not a linear chain”
- Dialogue with decision makers required on mandate
- However, first question in risk assessment is “can models assist experts” in carrying out their tasks - expert knowledge is still required
- How to avoid “curiosity-driven” development of models – is this a real problem?
- Quantification is necessary to operationalise risk reduction, but are models needed?

Perspectives from/for risk management

- Problems with acceptance/uptake of quantitative risk assessments – how general?
- Potential benefits for risk management are
 - “Better targeting” of resources
 - Prediction rather than just “follow-up”
 - Optimisation models and procedures seen as a bonus
- But:
 - May lead to challenges from third countries
 - Can models simultaneously enable “easier, better and quicker” decisions?
 - Are “Yes/No” decisions really made on the basis of models used in a risk assessment?

Uncertainty

- Uncertainty is equally part of qualitative approach to risk assessment
 - Models can make treatment of uncertainty more transparent
 - Uncertainty is informative and adds value to assessment
 - Uncertainty can be partitioned and weighted
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- Uncertainty over model structure can be problematic
 - Models always address only part of an assessment and hence only part of the uncertainty
 - More data can increase uncertainty
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- Communication of uncertainty is key
 - Is uncertainty really a problem for risk management?

Data needs, complexity and validation

- Host distribution data “deficient” but problems also with climate data
- Data on irrigated areas would be a real bonus
- Data for parameter estimation often lacking
- Model parsimony required with “poor data”
- Adding complexity into models may not reflect added knowledge
- Models may be “wrong” for the right reason, but also “right” for the wrong reason
- How can models in risk assessment be validated – retrospective analysis, but who pays?
- Reconciling conflicting model outcomes, a “shoot-out” or ensemble approach
- Guidance on which models and how to use them

Temporal and spatial scales

- How problematic are spatial units of different areas (e.g. NUTS regions)?
- Are country borders relevant?
- Long-term global/climate change perspectives are of value in risk management
- Adaptation/genetic change can occur over a relatively short time scale – implications for parameter estimation
- Can the timing of an initial pest incursion be determined – the “10-yr” rule of thumb?
- What is the life-span of an assessment?

Prioritisation

- Risk assessment can help prioritising pests and allocating resources, but risk ranking is not a risk assessment
- Pests lists represent “hazards not risks”
- They are “categorisations” rather than rankings
- Are models necessary for risk ranking?
- Are commodity pathways a better basis, or a required first step, for prioritisation
- How do you judge the outcome of a risk ranking exercise?

New challenges and modelling tools

- Epidemiologically-based surveillance – when and how, cf. animal health
- Statistical tools/models
 - Meta-analysis – evaluating effectiveness of RROs
 - Bayesian approaches – Implications for EKE, genetic groupings/”migration”
- Risk-based management of invasion – evaluating RROs, approximating control radius/zone
- Decision trees for decision making – “success” of models, how to interpret failure
- Socio-economic impacts – (complements EFSA risk assessments)
- Model platforms and sharing – “adaptable, searchable, executable, standards”