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Observational science in the environmental risk assessment and management of GMOs EN

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Rights

Access to the resource(s)

Link to the resource(s)

? Observational science in the environmental risk assessment and management of GMOs *(English)*

Information on the content of the resource

Summary, abstract or table of contents

Abstract (Provided by Author)

Where there is a long history of use of a technology or where risk assessment relies upon sciences with firm theoretical grounding for prediction, there may be confidence that potential adverse effects of a product have been identified. However, in environmental risk assessment and management of genetically modified organisms (GMOs) uncertainties about the kind and severity of potential adverse effects can be high. In reviewing many other applications of monitoring in the medical and environmental sciences, we find that the appropriate use of a general surveillance (GS)-type approach to reducing uncertainties in the risk assessment as well as to identify unanticipated effects through monitoring of GMOs intended for release is warranted. GS-type approaches remain controversial for use in environmental risk assessment and management of GMOs even though they have been highly successful in other areas of biology. GS-approaches are grounded in comparative observational science and have much to offer the regulator wanting to safely release a GMO into the environment.

Introduction (from the article)

The international debate over how to apply monitoring for increasing certainty of the safety of released genetically modified organisms (GMOs) is frozen on two alternatives: case-specific monitoring (CSM) and general surveillance (GS). The experience level for applying GS for monitoring potential adverse environmental effects of GMOs is limited. Using recent examples from the research literature outside of GMO environmental risk assessment (ERA) and management, we find a place for combined and case-appropriate uses of both monitoring strategies.

Uncertainties about the kind and severity of potential adverse effects can be high in ERA. Monitoring of past and present status of indicators and identifying trends is critical for informing decisions on biological systems and for proving damage (CBD, 2012). GS-approaches are grounded in comparative observational science and have much to offer the regulator wanting to safely release a GMO into the environment.

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Risk assessment and risk management uses the best available science – and the best available understanding of the science – to maximize the potential of technology through its safe use. Where there is a long history of use of a technology or where risk assessment relies upon sciences with firm theoretical grounding for prediction, there may be confidence that potential adverse effects of a product have been identified.

A quality ERA requires quality science (Traxler et al., 2001). Biology has its theories but biology is not yet a science based on theory, in the way for example that technical sciences and engineering and physics can be. Biology has no arm that can make prediction very far from empirical observation whether that be the observation and manipulation of living things (e.g., ecology) or computation of patterns in molecules (e.g., bioinformatics).

Within these limitations to predictive power, even the ability to completely describe the living things in an environment ([Daniel, 2004] and [Rohwer, 2003]), how should a risk assessor and manager work?

Keywords for facilitating searching for information in the clearing-houses

Biosafety Thematic Areas

LMO use and transboundary movement
- Field trials
- LMOs for introduction into the environment (Environmental releases)

Scientific and technical issues
- Environmental monitoring
- Risk assessment
- Risk management

Would you like to recommend this document as background material for the “Guidance on Risk Assessment of Living Modified Organisms”?
https://bch.cbd.int/onlineconferences/ra_guidance_references.shtml

Yes

Author affiliation

Section(s) of the "Guidance on Risk Assessment of Living Modified Organisms" this background material is relevant to

1. Roadmap for risk assessment of living modified organisms
   - 1.5. Conducting the risk assessment
     - 1.5.5. Step 5: “Recommendation as to whether or not the risks are acceptable or manageable, including, where necessary, identification of strategies to manage these risks”
6. Monitoring of Living Modified Organisms Released into the Environment
   - 6.3. Monitoring and its purposes
   - 6.4. Development of a monitoring plan

6.4.2. Monitoring methods, baselines including reference points, and duration of monitoring (“how to monitor?”)

Does this resource address one or more specific LMOs?

No

Does this resource address one or more specific organisms?

No

Does this resource address one or more specific genetic elements?

No

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Further Information

Questions about the Cartagena Protocol on Biosafety or the operation of the Biosafety Clearing-House may be directed to the Secretariat of the Convention on Biological Diversity.

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