

Researching alternative, sustainable agricultural systems

A modelling approach by examples from Denmark

Hugo Fjelsted Alrøe and Erik Steen Kristensen
Danish Research Centre for Organic Farming
email: *hugo.alroe AT agrsci.dk*

Outline of presentation:

- Rapid technological and structural changes in agriculture
- The Bichel survey of phasing out pesticides in Denmark
- The methods used in the modelling approach
- Results from the scenarios of an all-organic Danish agriculture
- Discussion of the methodology - science and values
- Assessment of the model results - sustainability and precaution
- Lessons for systems science

The Bichel survey



Systems science and systems values

- Neither experiments nor environmental monitoring can prevent all systemic consequences - due to the time lag between the act and the measurable consequence and - due to ignorance of possible consequences
- Decisions based on risk assessments and economical decision theory will not prevent the systemic consequences of rapidly changing new technologies
- Acknowledging the human dependency, and growing influence, on the environment leads to a principle of precautionary acting
- The development of scientific strategies for handling uncertainty and ignorance involves value inquiry and ethics
- Sustainability as functional integrity and the principle of precaution are key examples of elements in a systemic ethics

Lessons for systems science

- Inquiry into values and basic perceptions involved is decisive in the modelling of alternative agricultural systems
- The presumptions of the model are related to the vision of a future state and the values related to this vision
- Value inquiry forms the basis for determining and critically evaluating the necessary presumptions
- And conversely, the scenario results make the value inquiry more precise and substantiated
- The involvement of experts in the value inquiry is crucial, in order to gain an informed critique of the presumptions
- Values are also important in the assessment of the model results
- Value inquiry constitutes a key element of situated systems science