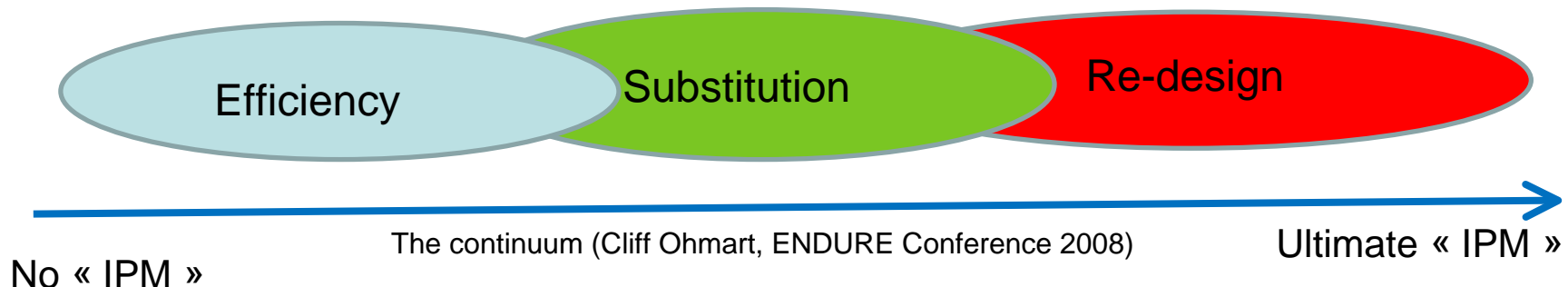# Arable System Case Study:

working-group potato-based

rotations

Why a Systems Approach within ENDURE?

- Explore the continuum between « no IPM » and the « Ultimate IPM » (Cliff Ohmart, ENDURE Conference 2008)

- Transition from conventional to sustainable systems (Hill & McRae, 1995)
  - Efficiency: dose reduction, DSS for assessing risks);
  - Substitution: resistant varieties, biological control;
  - Redesign: crop rotation;

- Consider other components of the socio-technical system;

Efficiency   Substitution   Re-design

The continuum (Cliff Ohmart, ENDURE Conference 2008)   Ultimate « IPM »

No « IPM »

Rationale for "System Case Studies"

1. Promoting alternative practices needs considering the **coherence** at various levels of agricultural systems:

   - the cropping system level: coherence between choice of variety, sowing date and density, nitrogen fertilisation and crop protection;

   - the farming system level: coherence between crop management, work organisation and machinery;

   - at the advisory system level: coherence between the intensity of cropping systems and advisory systems;

   - at the agro-industry level: coherence between intensive cropping systems and susceptibility to diseases of registered varieties;

   - at the market level: effects of commodity prices and "consumer demands" on the relative competitiveness of systems;

(JM Meynard, ENDURE AM 2007, Versailles)

Rationale for "System Case Studies"

2. Designing really innovative crop protection strategies needs

- Considering emerging technologies (DNA-based detection techniques, robotics, IT, etc),
- Revisiting breeding strategies and consider new traits (not only resistance)
- Exploring the potential of biological regulations, deployment of semiochemicals, etc;
- Taking advantage of landscape ecology and habitat manipulation;
- Exploring new rotations and changing farming systems;
- Analyzing "socio-economic" leverages (e.g., insurance schemes);

→ At the same time!

1. Current prevailing cropping systems (CS) and crop protection practices (baseline)

   - Widely used, a lot of data on performances

2. Existing Advanced systems (AS): organic, integrated production, …

   - Less adopted but data available on their performances

3. Innovative systems (IS1) through integration of existing technologies and/or practices (e.g., new rotations)

   - Not implemented, data on individual components only
   - How to extrapolate from crops to cropping systems?

4. Innovative systems (IS2) involving new technologies or approaches

   - No data available, ex-ante expert-based assessment only
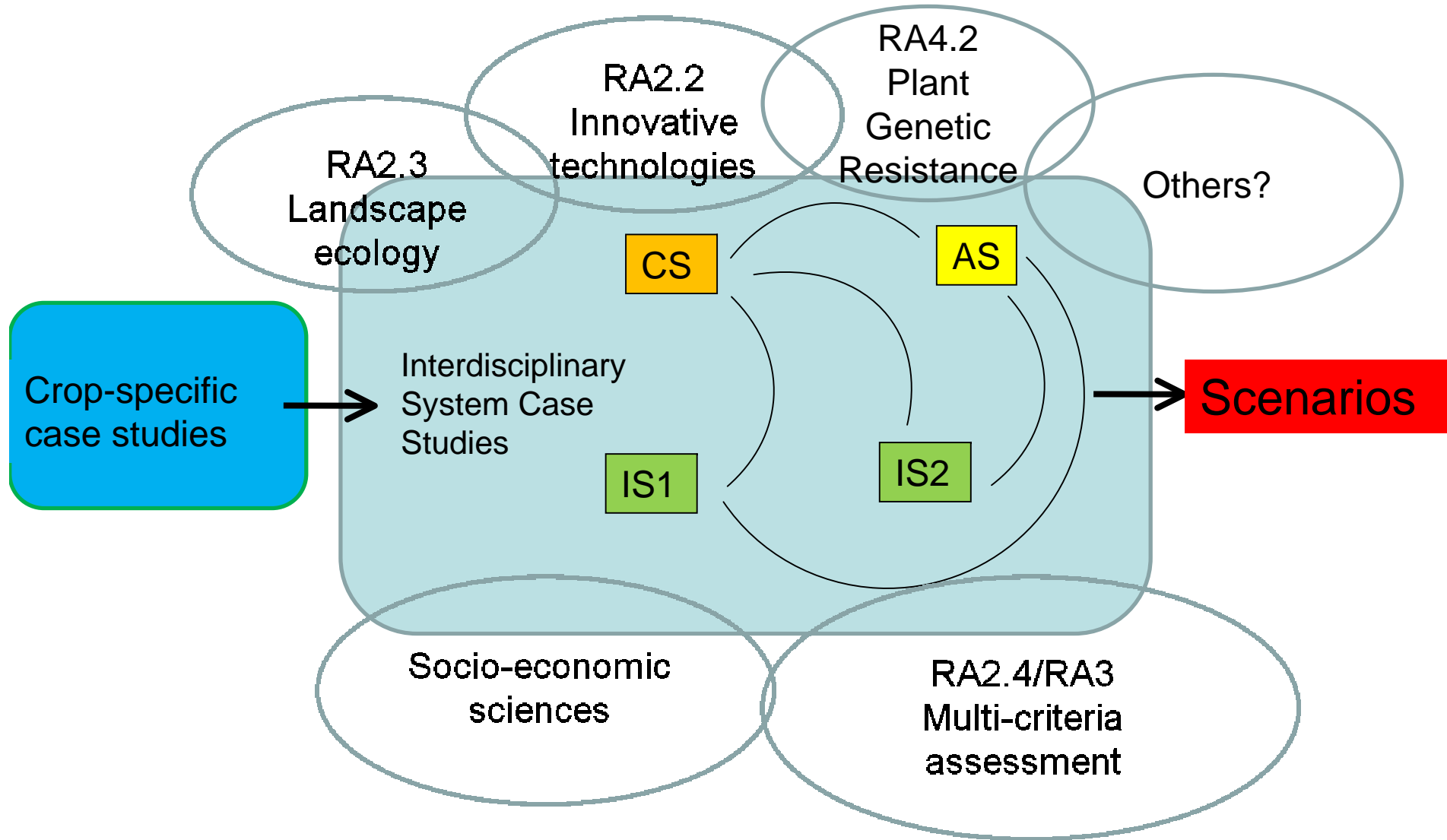
Potato-based rotations

- Proposal 18 months (January 2009-June 2010)
- Partners: WUR, INRA, ACTA, AU, IHAR, JKI, CNR
- Task a: System analysis
- Task b: IPM scenarios
- Task c: Innovative systems
- Task d: Bottlenecks & recommendations
- Task e: Reporting & dissemination

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