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;

The continuum (Cliff Ohmart, ENDURE Conference 2008)
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)
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
Fostering ENDURE integration

- RA2.3 Innovative technologies
- RA2.2 Plant Genetic Resistance
- RA4.2 Case studies
- Interdisciplinary System Case Studies
- Socio-economic sciences
- RA2.4/RA3 Multi-criteria assessment
- Others?
- Scenarios

Crop-specific case studies
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