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[CMU-SC Joint Meeting - Brussels, 9-10 January 2006,](#)

Workpackage 3

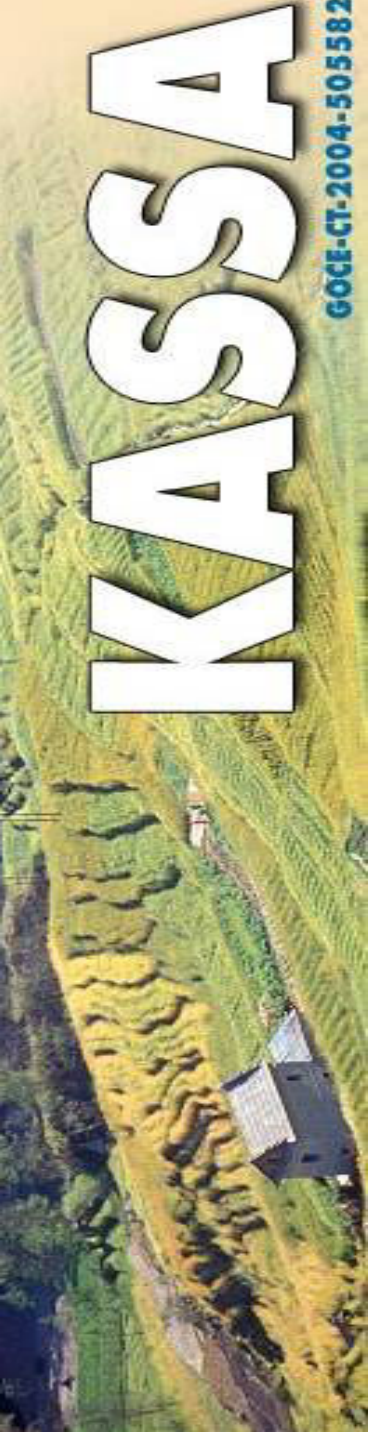
Validation of the

SYNTHESIS REPORT OF KASSA FINDINGS

Implications of KASSA results for Europe

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Implications of KASSA results for Europe

- CA in Europe : an on-going process
- Risks / Benefits of CA :
 - from farmers' point of view
 - from society point of view
- Change requirements
- Research strategy and proposals
- Conclusion : 3-5 messages

CA in Europe : an on-going process

- Areas under no ploughing are increasing in Europe because RT / DS meet two main farmers expectations:
 - Costs reduction (machinery, fuel)
 - Labour saving / organisation / drudgery
- This trend is likely to accelerate in the coming years because:
 - Fuel costs are increasing
 - Farm sizes are increasing
 - Need for increasing competitiveness
- A process out of control ?



Risks / Benefits of CA from farmers' point of view

- Conversion to RT / DS leads to 3 types of risks for farmers :
 - Technical
 - Economical
 - Sociological
- “Farmers adopt innovation to reduce risks” → How to ensure them?

Technical risks

- Main technical risks:
 - Machinery use / adaptation
 - Weeds control
 - Pests (slugs, mice) and diseases management
 - Soil structure and its consequences (humidity, temperature , root penetration...)
 - Crop residue and rotation management
- CA induces thorough changes in the functioning of the cropping system, leading to **revise the whole management process**
- Critical need of knowledge generation and dissemination (education, training, exchange of experiences) to avoid unfavourable effects:
 - Fuel costs do not decrease
 - Pesticides use increase
 - Soil fertility decrease

Economical risks

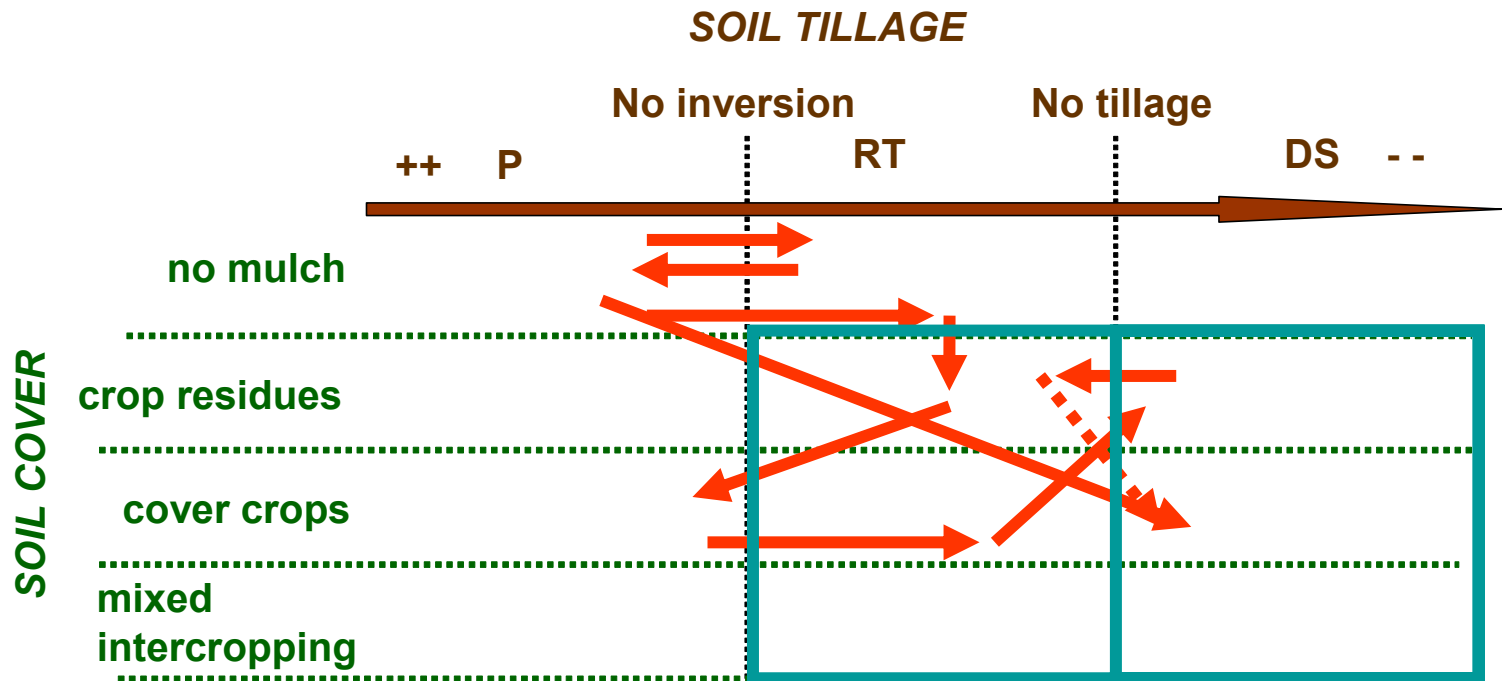
- Main economical risks:
 - Specific machinery is expensive to afford / to adapt
 - Generally, yields do not increase (and may decrease)
 - Costs may not be reduced (offset by pesticides, cover crops, fertilisers...)
- High financial risk during the transition period because:
 - Some positive aspects supposed to appear several years after the conversion
 - Farmers have to acquire new know-how

Sociological risks

- Giving up ploughing represents a cultural revolution because it is considered as a symbolic and a basic practice in agriculture
- Farmers who practice CA may be marginalized:
 - Of the neighbourhood
 - Of the extension services (difficulty for extensionists to answer farmers' requests)
- Key role of farmers' networks → membership feeling

Consequences of the risks/benefits analysis

- Risks + no evident short term benefits + no strong crisis → 'step by step' process
- CA adoption vs CA adaptation: CA is a learning process
- What is CA in a step by step process ?



Risks / Benefits from society point of view

Benefits

- *Erosion mitigation*
- *Water conservation*
- *SOM conservation*
- *Nutrient pollution*
- *Biodiversity (including landscape)*
- *Climate change*
 - *Greenhouse gas*
 - *Resilience*
- *Rural development*
 - *Dynamism of innovation system*
 - *Pluri-activity*
 - *Leading role, identity of farmers*

Trade-off
↔

Risks

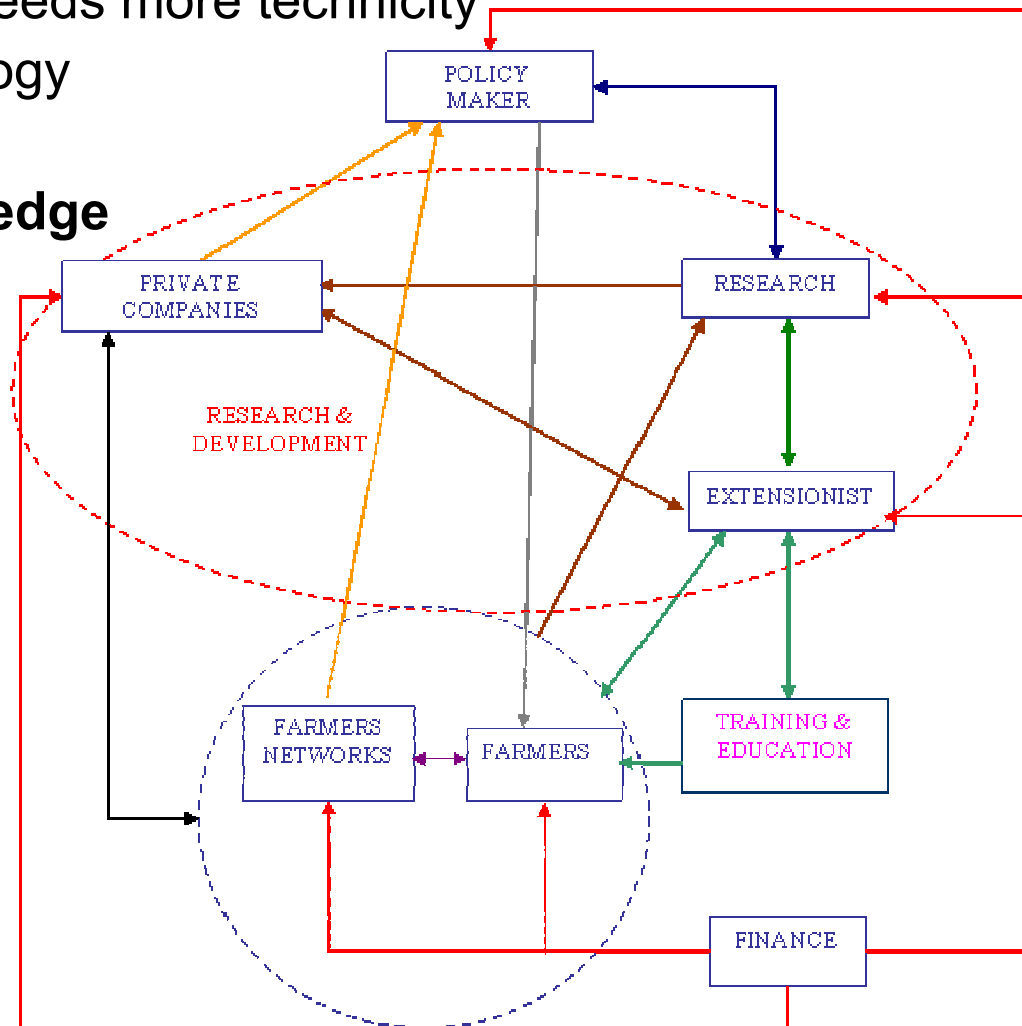
- *Pesticides pollution*
 - *Food quality ? (mycotoxins, ...)*
 - *NxO emission*
 - *Employment*
-
- Multifunctionality
 - Hotly debated but very little documented
 - Cover crops play a crucial role on the agro. and env. impacts
 - Impact assessment needs up-scaling and long term approaches

Change requirements

I should change what I can change → Why? Where? How?
CA implementation needs more technicity

- Access to technology
- Access to finance
- **Access to knowledge**
 - To develop an efficient management process
 - To assess and anticipate the impacts

→ The governance issue



Research strategy

- Research gaps → we need to learn:
 - For the development of efficient CA technologies
 - To assess and anticipate the impacts
- For an efficient research strategy, we need :
 1. to link both aspects together because:
 - Impacts depend on the technology development
 - Efficient CA development needs impact assessment (agro. + eco. + env.) → suitable indicators for DSS
 2. to study the system functioning because it is the only mean to make this link → Integrative approach, Multi disciplinarity
 3. Global / Local researches because functioning (interactions) is very sensitive to local specificity
 4. Short / Long term researches (experiments, models)
 5. Partnership (multi-stakeholders platforms...)

Research proposals

- **Low inputs CA** (pesticides, nitrogen)
 - Integrated weeds and pests management
 - Cover crops and rotation
 - Breeding → cash crops + cover crops
- **Conservation / improvement of soil quality**
 - Soil quality indicators
 - Dynamic of SOM in the long-term time period and C sequestration
 - Soil biological activity (including roots) and its effects on soil structure, nutrient turnover ...
 - Erosion mitigation
- **Management of biodiversity**
 - Impacts of CA on biodiversity
 - Impacts of biodiversity on the management process
- **Water management**
 - Water efficiency and availability
 - Flooding mitigation

Research proposals

- **Implementation and propagation of CA**
 - Development of new machinery
 - Profitability : market conditions, savings, investments, transition
 - Suitability : biophysical and **sociological** conditions
 - Appropriate local and global policy
 - Propagation of CA: knowledge transfer, support for farmers initiatives, advisory services
- **Food quality and health**
 - Pesticides use and behaviour
 - Mycotoxins in preharvest contamination of crops
 - Reducing the uptake of heavy metals and organic pollutants into crops, animals

Conclusions

- Process toward CA is already on-going
- Package transfer seems difficult to succeed:
 - ‘how’ is site specific
 - ‘why’ is likely generic but it is a black box
- Need for linking socio-technical development to impact assessment → more understanding of the system functioning
- Knowledge generation and sharing is the key point (education...)
- To succeed, there is a strong need for partnership → new governance