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

Workpackage 3

Validation of the

SYNTHESIS REPORT OF KASSA FINDINGS

Session IV-1

KNOWLEDGE GAPS & RESEARCH NEEDS

Rabah Lahmar

CIRAD, Avenue Agropolis, 34398 Montpellier Cedex 5, France





GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

What we need to learn for the
development of efficient CA
technologies?



GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

What we need to learn to
understand and anticipate the
impacts of CA technologies?

KASSA

GOCE-CT-2004-505582

GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

10 major
Research items



GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIAN PF	LAM PF
Technology targeting and recommendation domains	X	id	X	id

Better information and DSS on
site/environment specific suitability of CA
taking into account biophysical conditions
(soil, climate, GP....)

Where CA should be advised/recommended?

GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Research management and innovation systems	X	X	X	

New organisation and management of research;
Stakeholders involvement in knowledge generation, sharing and dissemination

GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Socioeconomics, policy and institutional change	X	X	X	id

What fosters or deters CA?

GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Implement development	X	X	X	X

Need for the development of implements adapted to farming conditions (biophysical & crop residue, farm size)

GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Weed, pest and disease management	X	X	X	

Integrated strategies for weed, pest and diseases management including less dependence on herbicides and the development of new herbicides.

GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Crop residues, cover crops and rotations	X	X	X	X

Identification of crops suitable for specific conditions: soil, temperature & water stress, GP, market,....;

CRM in situation of excess/deficit;

Crop-livestock integration.



GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Soil fertility management	X	X	X	X

Better understanding of nutrients use & cycling;
Are CA systems reducing the use fertilisers?



GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Water management and erosion control	?	X	X	X

CA technologies in irrigated areas?

Impact of CA on erosion (EUR, MED)?

Need for additional technology in tropical
conditions to control runoff and erosion.

GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Crop improvement/plant breeding		X	X	X

Develop in CA systems new breeds
more adapted to specific conditions (aridity,
excess of water, excess of salts....)

GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Organic farming	X			

Strategies for combining CA & OF practices
may be of high benefit

GAP OF KNOWLEDGE IN TECHNOLOGY DEVELOPMENT

Research item	EUR PF	MED PF	ASIAN PF	LAM PF
Technology targeting and recommendation domains	X	id	X	id
Research management and innovation systems	X	X	X	
Socioeconomics, policy and institutional change	X	X	X	id
Implement development	X	?	X	X
Weed, pest and disease management	X	X	X	
Crop residues, cover crops and rotations	X	X	X	X
Soil fertility management	X	X	X	X
Water management and erosion control	?	X	X	X
Crop improvement/plant breeding		X	X	X
Organic farming	X			

GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

10 major
Research items





GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	ME DPF	ASIAN PF	LAM PF
Yield improvement	X		X	

± 10/15 % compared to CT

Yields stability



GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Cost reduction	X	?	X	X

CA reduces labor, fuel and machinery costs.
But these cost savings can be offset
by increased costs
for herbicides, pesticides and fertilizers.

GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Food safety	X	X		

Impact of CA on the quality and safety
of the food chain.

Crop uptake of HM;

Mycotoxins



GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Water productivity	X	X		

WUE

Scarce water ecosystems

GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Input use efficiency (other than water)	X	X		X

Nutrients cycling /SOM
Use efficiency
Leaching





GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Erosion	X	X		

Water and wind erosion

GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Soil and water quality, pollution	X	X	X	X

Nitrate, Pesticides, HM, POP.../Soil
air, water and biodiversity ?

Soil quality indicators

GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Biodiversity and pest carryover	X	X	X	X

Impact of Change in biodiversity including
within soil;
Emergence of new pests and diseases?

GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
Greenhouse gas emissions	X	X	X	X

C sequestration/ CO₂, N_xO & CH₄ emissions



GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	MED PF	ASIA N PF	LAM PF
GMOs				X

?

GAP OF KNOWLEDGE IN IMPACT ASSESSMENT

Research item	EUR PF	MED PF	ASIAN PF	LAM PF
Yield improvement	X		X	
Cost reduction	X	?	X	X
Food safety	X	X		
Water productivity	X	X		
Input use efficiency	X	X		X
Erosion	X	X		
Soil and water quality, pollution	X	X	X	X
Biodiversity and pest carryover	X	X	X	X
Greenhouse gas emissions	X	X	X	X
GMOs				X



What we know?



Priorities for research?

A stylized world map is centered on an orange background. The map is white with several regions highlighted in different colors: Europe is dark blue, North America is yellow, South America is magenta, and India is green. The text "THANK YOU" is written in a large, black, serif font across the center of the map.

THANK YOU