Insights from GENEDEC

Brussels meeting

DG AGRI - dissemination meeting

Cord. Pierre-Alain Jayet
UMR Economie Publique INRA-AgroParisTech
email: jayet@grignon.inra.fr
http://www.grignon.inra.fr/economie-publique/genedec/

F. Arfini, W. Kleinhanss, B. Kuepker, P.A. Jayet

12 july 2007

Overview

1. The consortium, from the goals to the results
2. Incomes, productions, prices
3. Land use, the environment
4. Fixed factors, shadow prices
5. What about other economic agents
6. Land and entitlement

A few words about GENEDEC

Pierre-Alain Jayet

- 7 member States
  (France, Germany, Italy, UK, Greece, Ireland, Spain)
- 10 teams
  (INRA+EnviCare, CIRED, FAL, PARMA, VERONA, UREDAG, FORTH, TEAGASC, UMP, JRC)
- 42 months (01/03/05 - 31/08/07)
  $3 + 36 + 3$
- Average attendance during the 10 meetings : 25 persons

- To undertake socio-economic and environmental assessments of decoupling measures, by using a set of existing and modified models for various levels of analyses
- To cover the whole European Union thanks to a complete set of databases, including FADN
- Detailing :
  - To provide insights into the workability, the efficiency and the impacts of various scenarios of decoupling
  - To address quantitative assessments of the impacts of decoupled support schemes on production, land use and land prices ...
  - To have recourse to linear programming and positive mathematical programming, through the use of a set of micro-oriented farm-level models
  - To extend the analysis towards the new Member States ... on condition that representative and reliable data under the FADN ... sufficiently early in the project second year

- Surveys (stakeholders, policy makers), case studies
- Strong improvement of existing models based on mathematical programming (MP : LP and PMP), and attemps of coupling with partial equilibrium models
- Estimates of large series of variables provided by the runs of models (land use, production, income, shadow prices, environmental criteria)
- Methodological development (cross entropy methods for downscaling of MP model results and for the implementation of the regulation of non point source pollution problems)

Impact of decoupling on income, production and agricultural product prices

Bernd Kuepker

Policy

Base year / Target year: 2002 / 2013
Reference: Agenda 2000
Scenarios:

- SFP_nat:
  - National implementation in the MS
- SFP_hist:
  - Full decoupling,
  - Farm individual entitlement levels
- SFP_reg:
  - Full decoupling,
  - Flat rate payment
- SFP_par:
  - Analysis of the various options for partial decoupling
- Bond:
  - As SFP_hist
  - But no obligation to keep the land in GAEC condition

Price (2013)

	Relative change in comparison to Agenda 2000	
	SFP_nat / SFP_par %	SFP_hist / SFP_reg / Bond %
Wheat	**4.0**	**4.4**
Rye	**0.0**	**0.0**
Barley	**6.5**	**7.0**
Oats	**7.2**	**8.0**
Grain maize	**7.1**	**7.7**
Rape	**2.7**	**2.9**
Other oilseeds	**2.4**	**2.6**
Potatoes	**10.7**	**11.2**
Sugar beets	**3.6 / -36**	**3.7 / -36**
Milk	**-4.7**	**-4.2**
Beef	**11.8**	**16.9**
Pork	**2.0**	**2.3**
Sheep meat	**25.9**	**32.3**
Eggs	**2.2**	**2.4**
Poultry meat	**2.0**	**2.2**

Source: ESIM / IDEMA.

Impact of the national implementation on production in EU-15

		Agenda	SFP_nat
			change (%)
Cereals	1,000 t	200,505	-1.6
Concentr. feed	1,000 t	94,609	-6.2
Raw feed	1,000 t	49,502	41.9
Livestock	1,000 €	33,712	6.3
Livestock	1,000 LU	83,917	2.3
Milk	1,000 t	122,178	0.1

Source: AROPAj.

Impact of the national implementation on production in EU-15

		Agenda	SFP_nat
			change (%)
Cereals	1,000 t	200,505	-1.6
Concentr. feed	1,000 t	94,609	-6.2
Raw feed	1,000 t	49,502	41.9
Livestock	1,000 €	33,712	6.3
Livestock	1,000 LU	83,917	2.3
Milk	1,000 t	122,178	0.1

Source: AROPAj.

Impact of the national implementation on production in EU-15

		Agenda	SFP_nat
			change (%)
Cereals	1,000 t	200,505	-1.6
Concentr. feed	1,000 t	94,609	-6.2
Raw feed	1,000 t	49,502	41.9
Livestock	1,000 €	33,712	6.3
Livestock	1,000 LU	83,917	2.3
Milk	1,000 t	122,178	0.1

Source: AROPAj.

Impact of the national implementation on production in EU-15

		Agenda	SFP_nat
			change (%)
Cereals	1,000 t	200,505	-1.6
Concentr. feed	1,000 t	94,609	-6.2
Raw feed	1,000 t	49,502	41.9
Livestock	1,000 €	33,712	6.3
Livestock	1,000 LU	83,917	2.3
Milk	1,000 t	122,178	0.1

Source: AROPAj.

Impact of the national implementation on livestock production in Germany and Spain

Scope	Germany	Spain
Model	EU-FARMIS	PROMAPA.G
	Relative change to Agenda (%)	
Dairy cows	0.0	2.7
Suckler cows	-7.3	-3.6
Bulls	-11.1	-
Sheep	4.9	3.6

Source: FARMIS, PROMAPA.G.

Impact of the national implementation on livestock production in Germany and Spain

Scope	Germany	Spain
Model	EU-FARMIS	PROMAPA.G
	Relative change to Agenda (%)	
Dairy cows	0.0	2.7
Suckler cows	-7.3	-3.6
Bulls	-11.1	-
Sheep	4.9	3.6

Source: FARMIS, PROMAPA.G.

Impact of the national implementation on livestock production in Germany and Spain

Scope	Germany	Spain
Model	EU-FARMIS	PROMAPA.G
	Relative change to Agenda (%)	
Dairy cows	0.0	2.7
Suckler cows	-7.3	-3.6
Bulls	-11.1	-
Sheep	4.9	3.6

Source: FARMIS, PROMAPA.G.

Impact of the national implementation on livestock production in Germany and Spain

Scope	Germany	Spain
Model	EU-FARMIS	PROMAPA.G
	Relative change to Agenda (%)	
Dairy cows	0.0	2.7
Suckler cows	-7.3	-3.6
Bulls	-11.1	-
Sheep	4.9	3.6

Source: FARMIS, PROMAPA.G.

Impact of the national implementation on livestock production in Germany and Spain

Scope	Germany	Spain
Model	EU-FARMIS	PROMAPA.G
	Relative change to Agenda (%)	
Dairy cows	0.0	2.7
Suckler cows	-7.3	-3.6
Bulls	-11.1	-
Sheep	4.9	3.6

Source: FARMIS, PROMAPA.G.

Impact of alternative decoupling schemes on production in Germany

	Agenda	SFP_nat	SFP_hist	Bond
Production	**1,000 t**	**Relative change to reference (%)**		
Cereals	**44,632**	**-4.2**	**-6.8**	**-15.1**
Rape	**2,736**	**-7.6**	**-7.6**	**-24.4**
Sugar beets	**26,147**	**-8.4**	**-8.4**	**-8.4**
Milk	**30,012**	**0.0**	**0.0**	**0.0**
Beef	**1,077**	**-7.1**	**-4.7**	**-5.8**
Pork & poultry	**6,216**	**1.3**	**1.5**	**1.6**

Source: FARMIS.

Impact of alternative decoupling schemes on production in Germany

	Agenda	SFP_nat	SFP_hist	Bond
Production	**1,000 t**	**Relative change to reference (%)**		
Cereals	**44,632**	**-4.2**	**-6.8**	**-15.1**
Rape	**2,736**	**-7.6**	**-7.6**	**-24.4**
Sugar beets	**26,147**	**-8.4**	**-8.4**	**-8.4**
Milk	**30,012**	**0.0**	**0.0**	**0.0**
Beef	**1,077**	**-7.1**	**-4.7**	**-5.8**
Pork & poultry	**6,216**	**1.3**	**1.5**	**1.6**

Source: FARMIS.

Impact of alternative decoupling schemes on production in Germany

	Agenda	SFP_nat	SFP_hist	Bond
Production	**1,000 t**	**Relative change to reference (%)**		
Cereals	**44,632**	**-4.2**	**-6.8**	**-15.1**
Rape	**2,736**	**-7.6**	**-7.6**	**-24.4**
Sugar beets	**26,147**	**-8.4**	**-8.4**	**-8.4**
Milk	**30,012**	**0.0**	**0.0**	**0.0**
Beef	**1,077**	**-7.1**	**-4.7**	**-5.8**
Pork & poultry	**6,216**	**1.3**	**1.5**	**1.6**

Source: FARMIS.

Impact of alternative decoupling schemes on production in Germany

	Agenda	SFP_nat	SFP_hist	Bond
Production	**1,000 t**	**Relative change to reference (%)**		
Cereals	**44,632**	**-4.2**	**-6.8**	**-15.1**
Rape	**2,736**	**-7.6**	**-7.6**	**-24.4**
Sugar beets	**26,147**	**-8.4**	**-8.4**	**-8.4**
Milk	**30,012**	**0.0**	**0.0**	**0.0**
Beef	**1,077**	**-7.1**	**-4.7**	**-5.8**
Pork & poultry	**6,216**	**1.3**	**1.5**	**1.6**

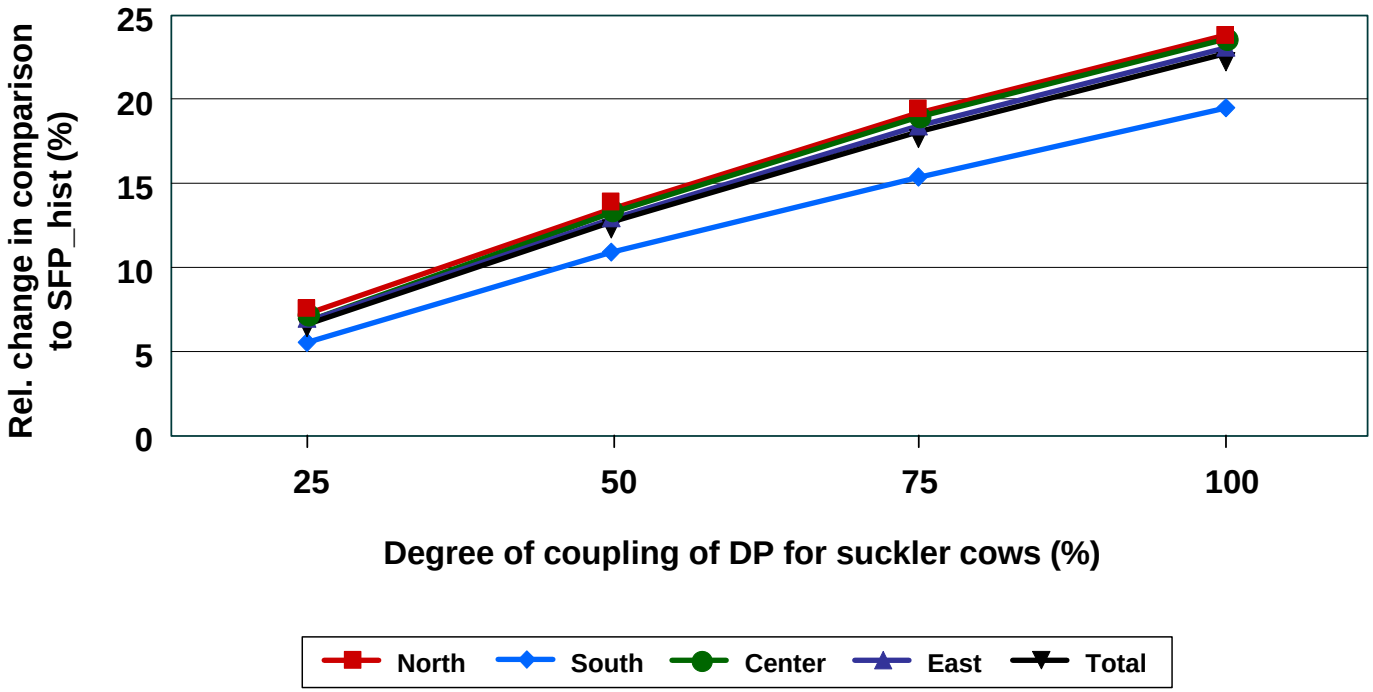
Source: FARMIS.

Impact of alternative decoupling schemes on production in Germany

	Agenda	SFP_nat	SFP_hist	Bond
Production	**1,000 t**	**Relative change to reference (%)**		
Cereals	**44,632**	**-4.2**	**-6.8**	**-15.1**
Rape	**2,736**	**-7.6**	**-7.6**	**-24.4**
Sugar beets	**26,147**	**-8.4**	**-8.4**	**-8.4**
Milk	**30,012**	**0.0**	**0.0**	**0.0**
Beef	**1,077**	**-7.1**	**-4.7**	**-5.8**
Pork & poultry	**6,216**	**1.3**	**1.5**	**1.6**

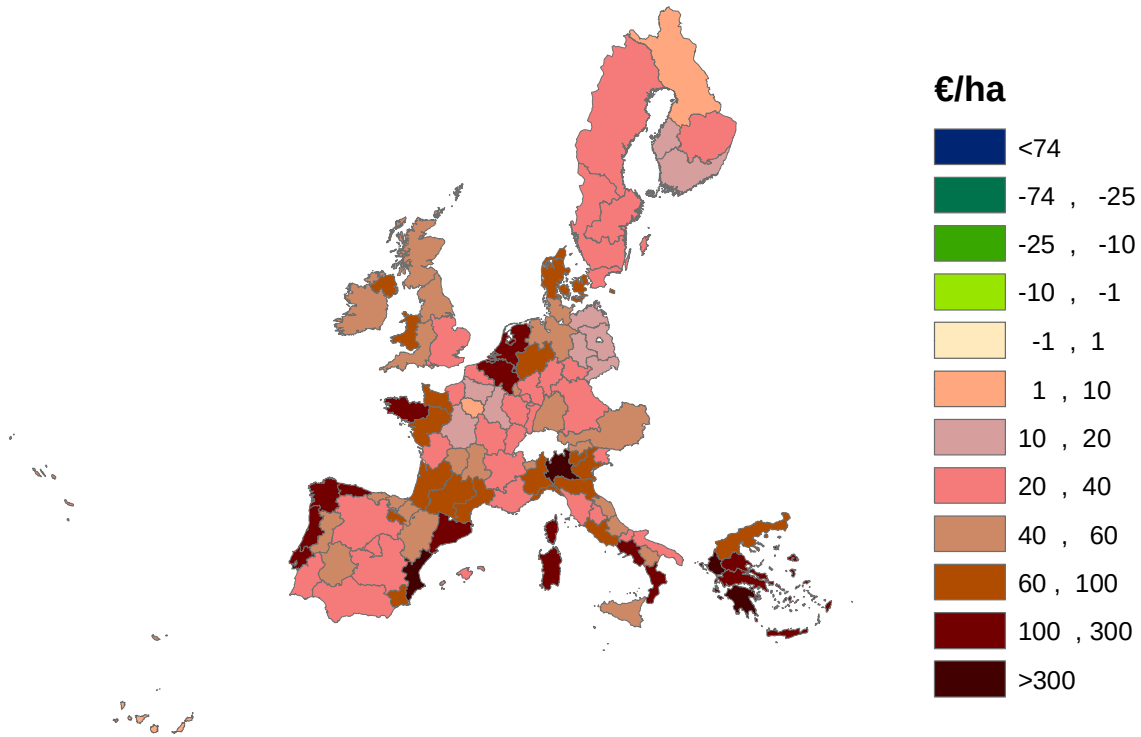
Source: FARMIS.

Impact of coupled payments of suckler cows on suckler cow production



Source: FARMIS; INLB-EU-GD AGRI/G.3.

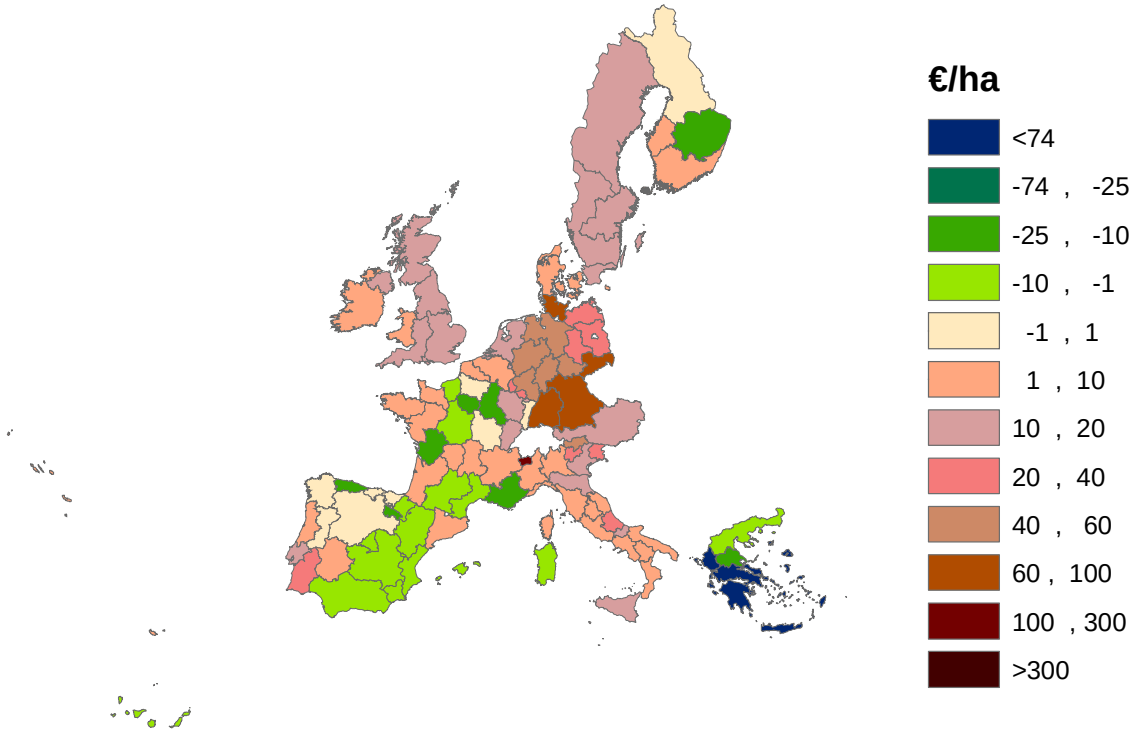
Impact of the Luxembourg agreement on Gross Margins in EU-15



Livestock adjustment / Reference (Agenda 2000)

Source : AROPAj

Impact of the Luxembourg agreement on Gross Margins in EU-15



Luxembourg / Agenda2000 with livestock adjustment

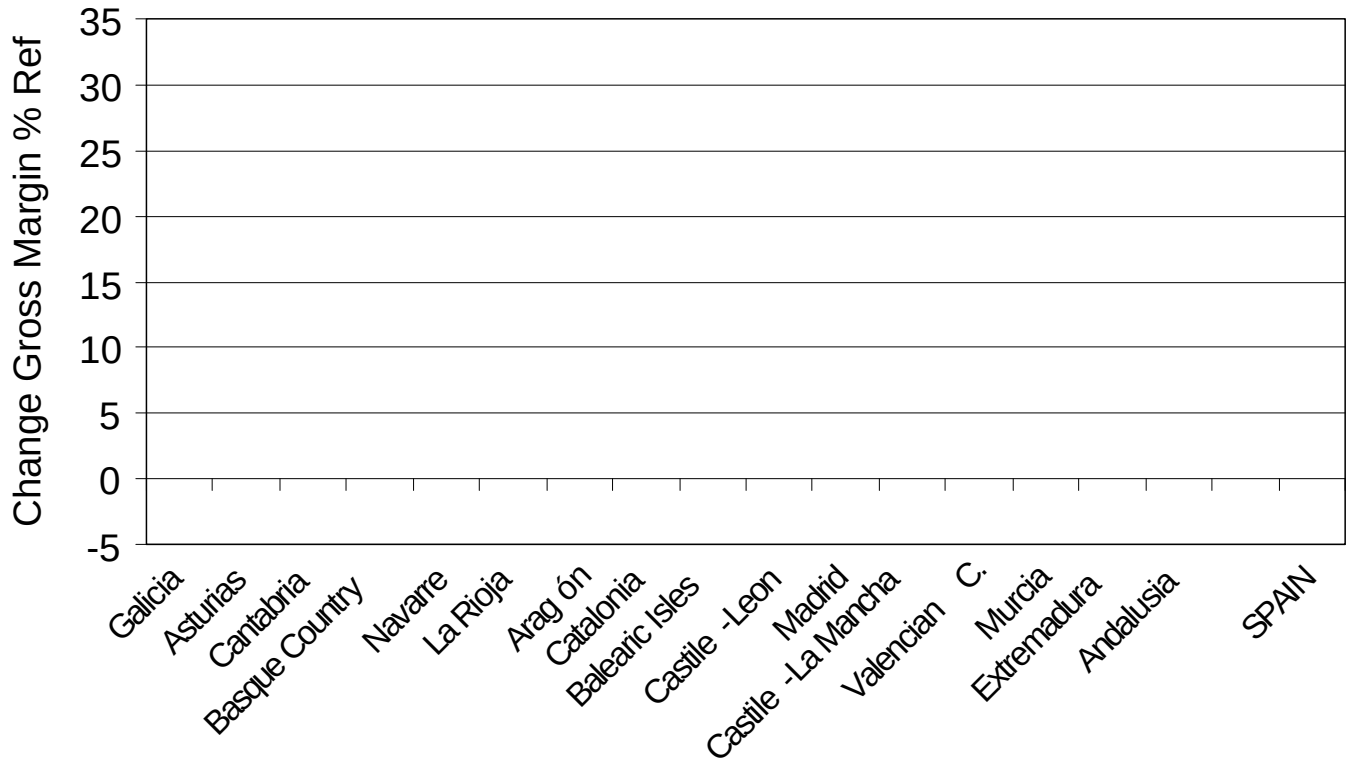
Source : AROPAj

Impact of the Luxembourg agreement on Gross Margins in EU-15

Comments

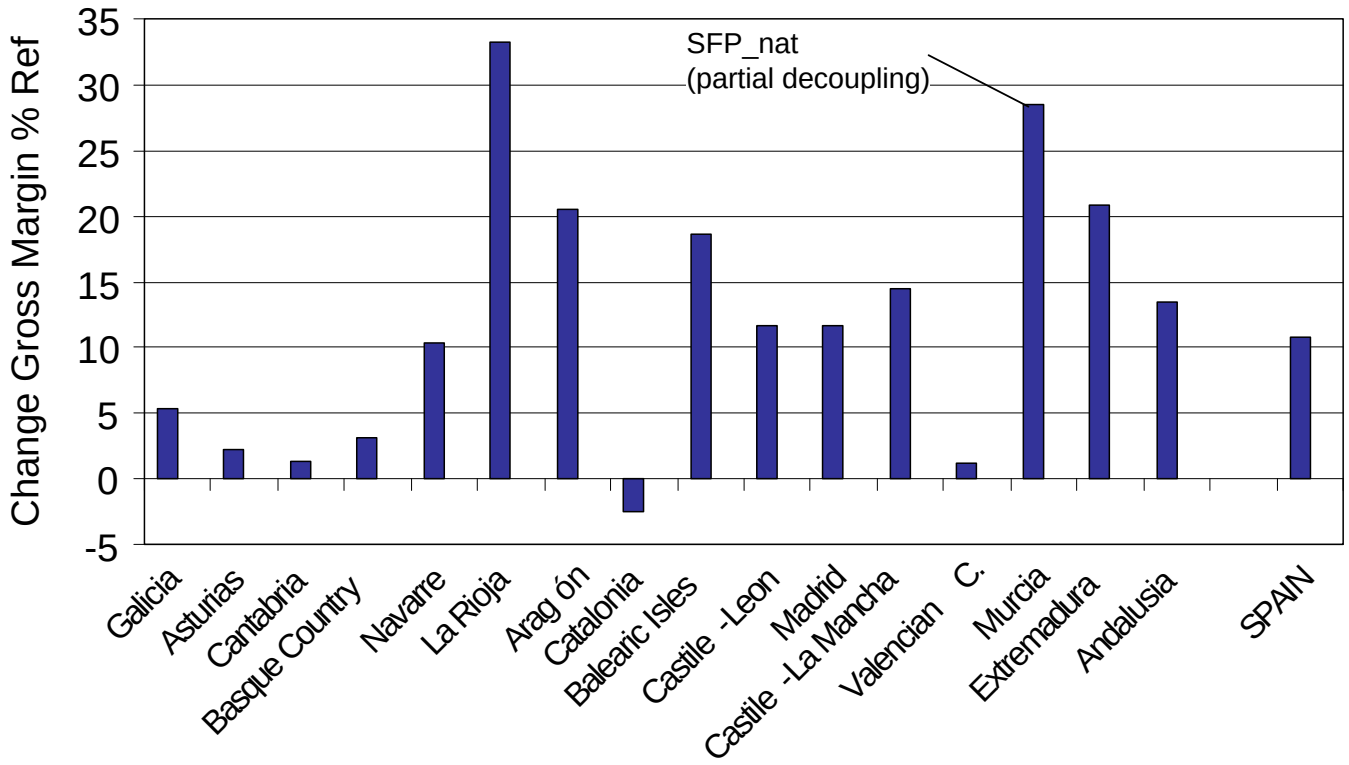
- Simulation runs in two steps
  1. Livestock adjustment ($|K - K_0| \leq 0.15 K_0$) with endogeneous budget adjustment
  2. Implementation of the Luxembourg agreement, based on the reference budget (except for Germany, due to the particular incentive toward pasture)
- The first step run necessarily leads to increasing gross margins
- The net sum of the two steps necessarily leads to increasing gross margins

Effect on Gross Margins in Spain



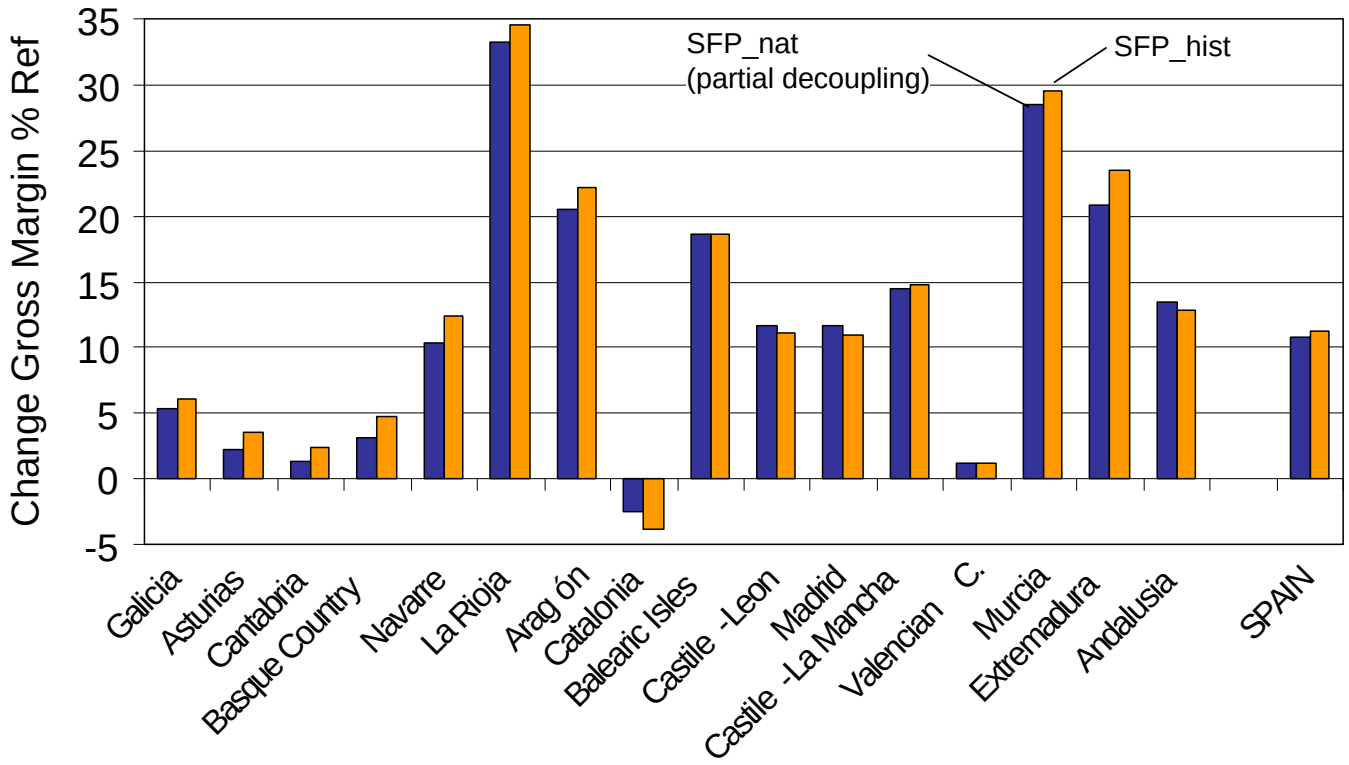
Source: PROMAPA.G.

Effect on Gross Margins in Spain



Source: PROMAPA.G.

Effect on Gross Margins in Spain



Source: PROMAPA.G.

Effects of alternative decoupling schemes on Farm Net Value Added (FNVA) in Germany

	Ref	SFP_nat	SFP_hist	Bond
	Mill. Euro	Relative change to reference (%)		
FNVA	**11,271**	**0.2**	**1.9**	**1.9**

Effects of alternative decoupling schemes on Farm Net Value Added (FNVA) in Germany

	Ref	SFP_nat	SFP_hist	Bond
	Mill. Euro	Relative change to reference (%)		
FNVA	**11,271**	**0.2**	**1.9**	**1.9**

Effects of alternative decoupling schemes on Farm Net Value Added (FNVA) in Germany

	Ref	SFP_nat	SFP_hist	Bond
	Mill. Euro	Relative change to reference (%)		
FNVA	**11,271**	**0.2**	**1.9**	**1.9**

- **Impact on sectoral FNVA in Germany is limited**
- **Main factors**

  Negative:
  - **Introduction of mandatory modulation**
  - **Reforms of the sugar and milk market**

  Positive:
  - **Increased market orientation**
  - **Increase of the general price level**

Effects of alternative decoupling schemes on Family Farm Income (FFI) in Germany

	Ref	SFP_nat	SFP_hist	Bond
	Mill. Euro	Relative change to reference (%)		
FFI	**5,587**	**-15.1**	**32.1**	**37.0**

Effects of alternative decoupling schemes on Family Farm Income (FFI) in Germany

	Ref	SFP_nat	SFP_hist	Bond
	Mill. Euro	Relative change to reference (%)		
FFI	**5,587**	**-15.1**	**32.1**	**37.0**

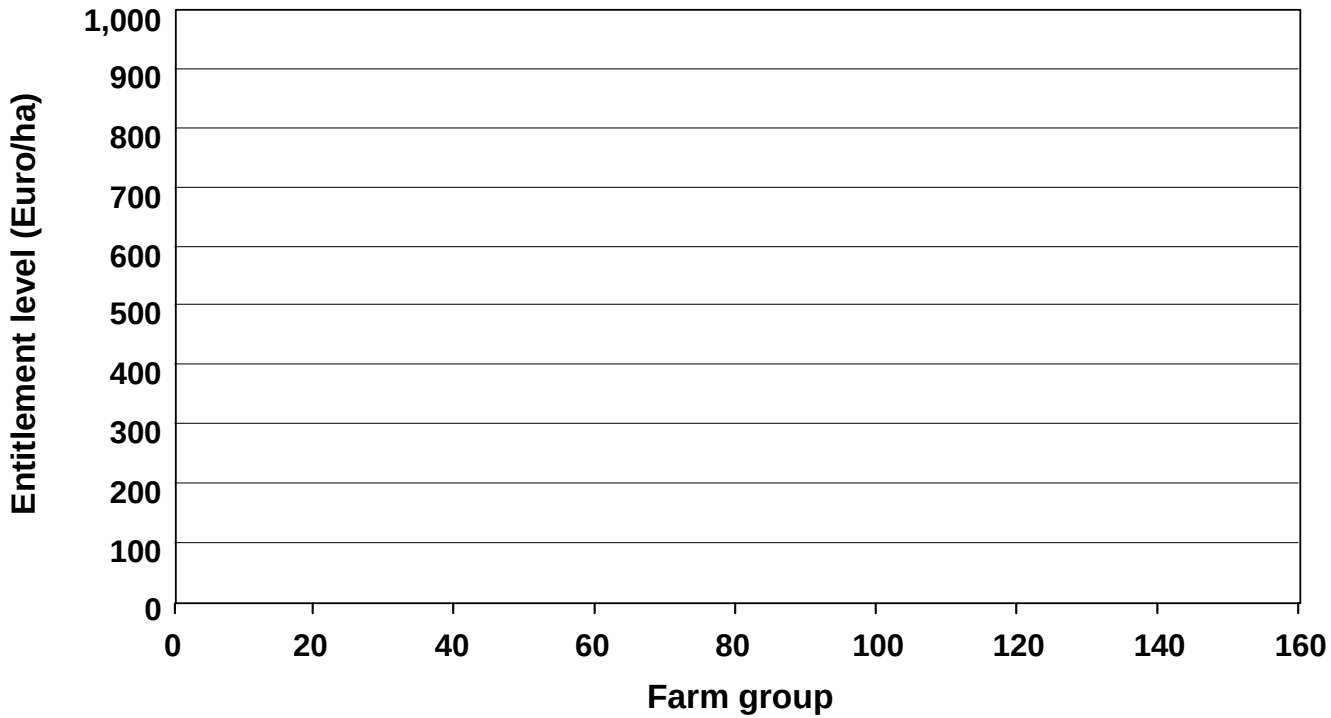
Effects of alternative decoupling schemes on Family Farm Income (FFI) in Germany

	Ref	SFP_nat	SFP_hist	Bond
	Mill. Euro	Relative change to reference (%)		
FFI	**5,587**	**-15.1**	**32.1**	**37.0**

- FFI takes into account factor ownership and measures the effect on the income of active farmers
- Impact on FFI depends on the implementation scheme
- Main factor: land rents
- The stronger the link between DP and land - the lower the indicator FFI

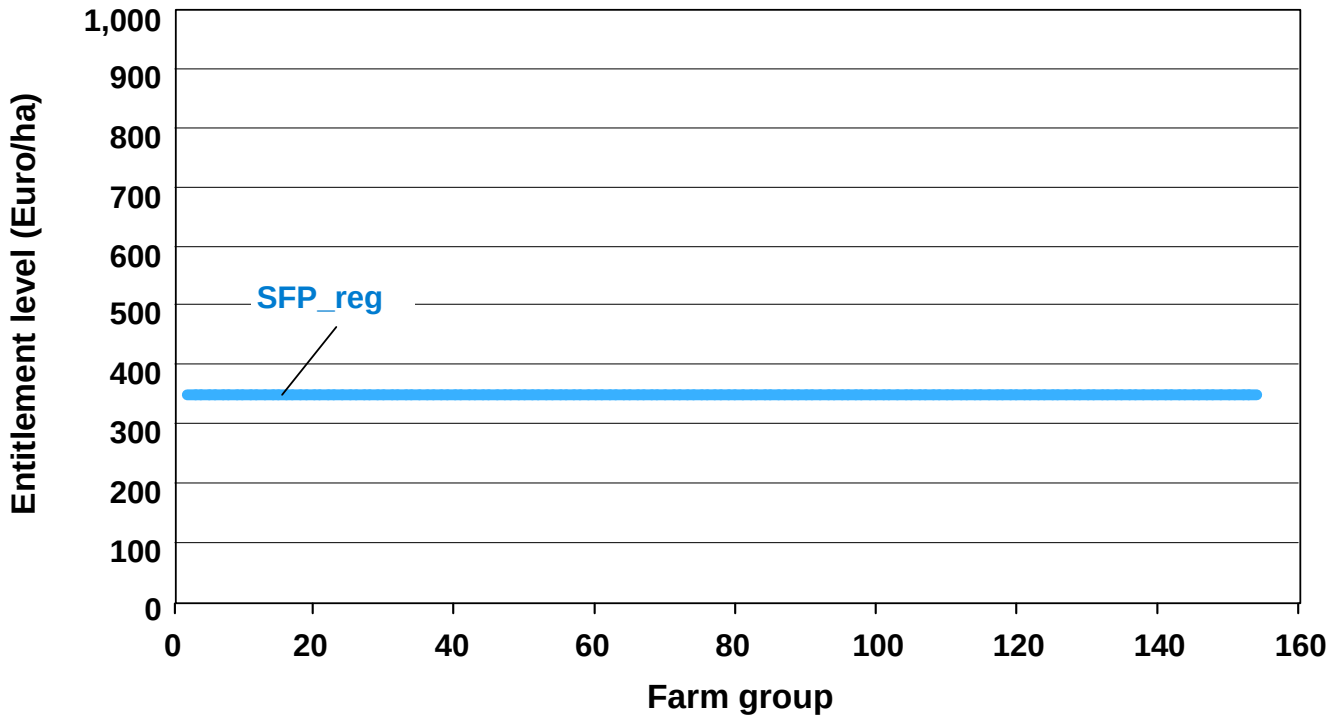
However, estimates concerning the impact on land rents heavily depend on model formulation

The level of entitlements in the regional - and the historical implementation



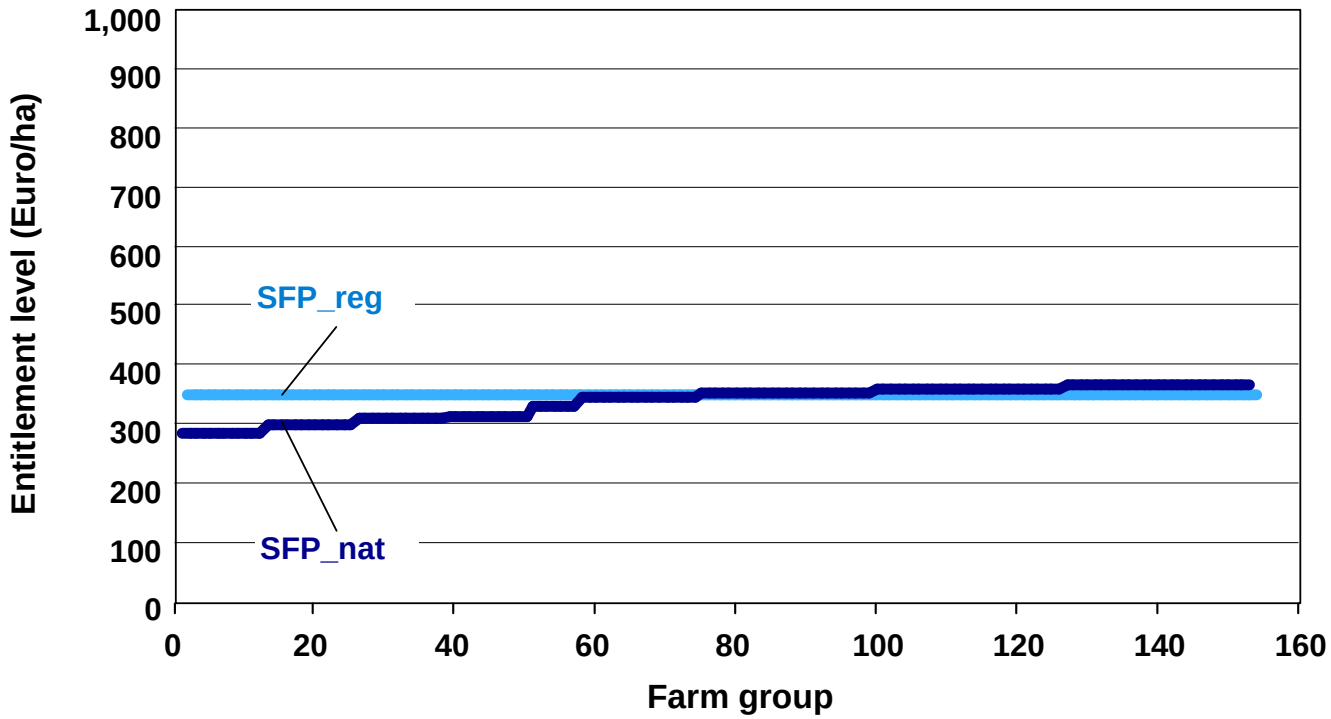
Source: FARMIS; INLB-EU-GD AGRI/G.3.

The level of entitlements in the regional - and the historical implementation



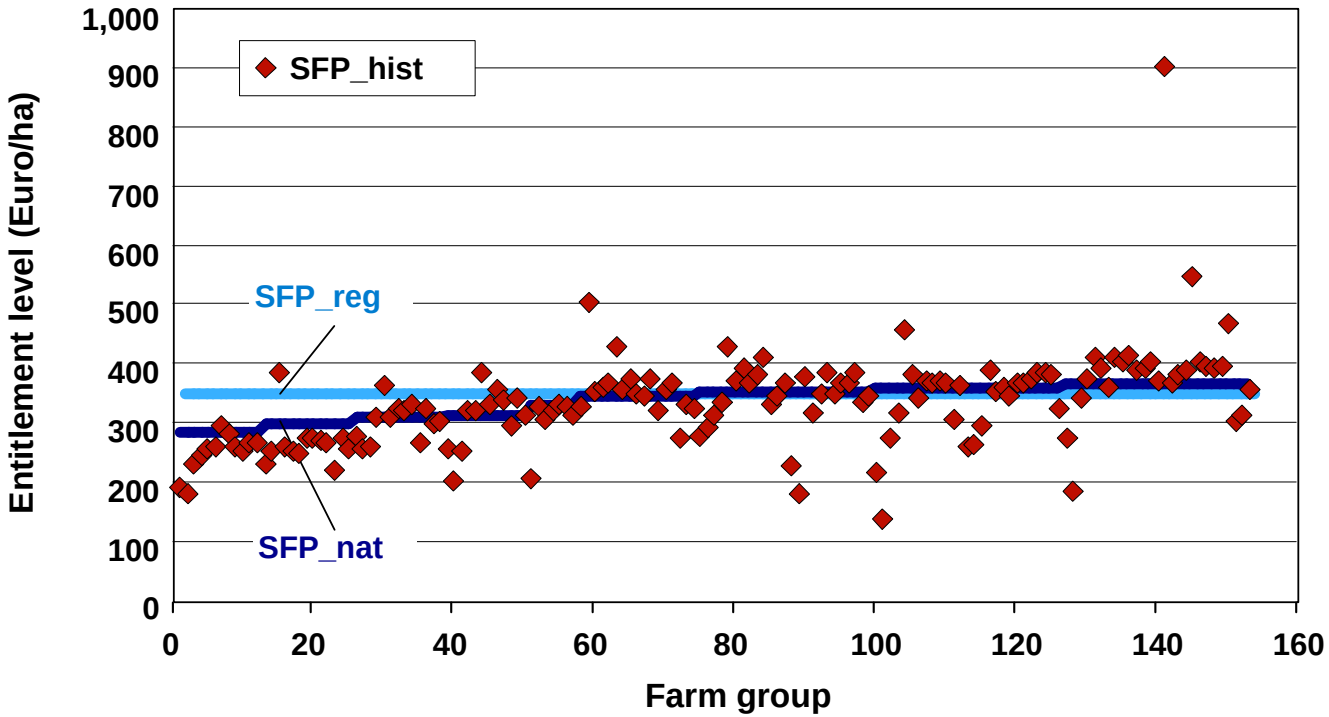
Source: FARMIS; INLB-EU-GD AGRI/G.3.

The level of entitlements in the regional - and the historical implementation



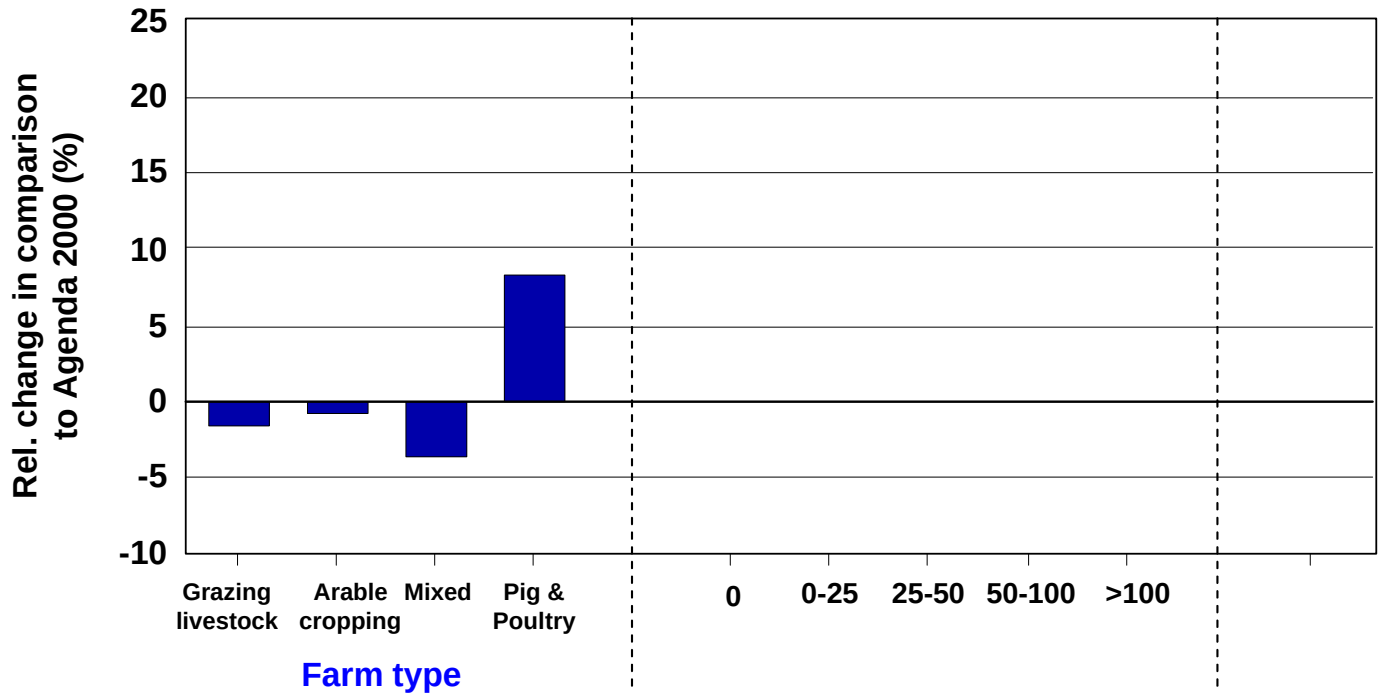
Source: FARMIS; INLB-EU-GD AGRI/G.3.

The level of entitlements in the regional - and the historical implementation



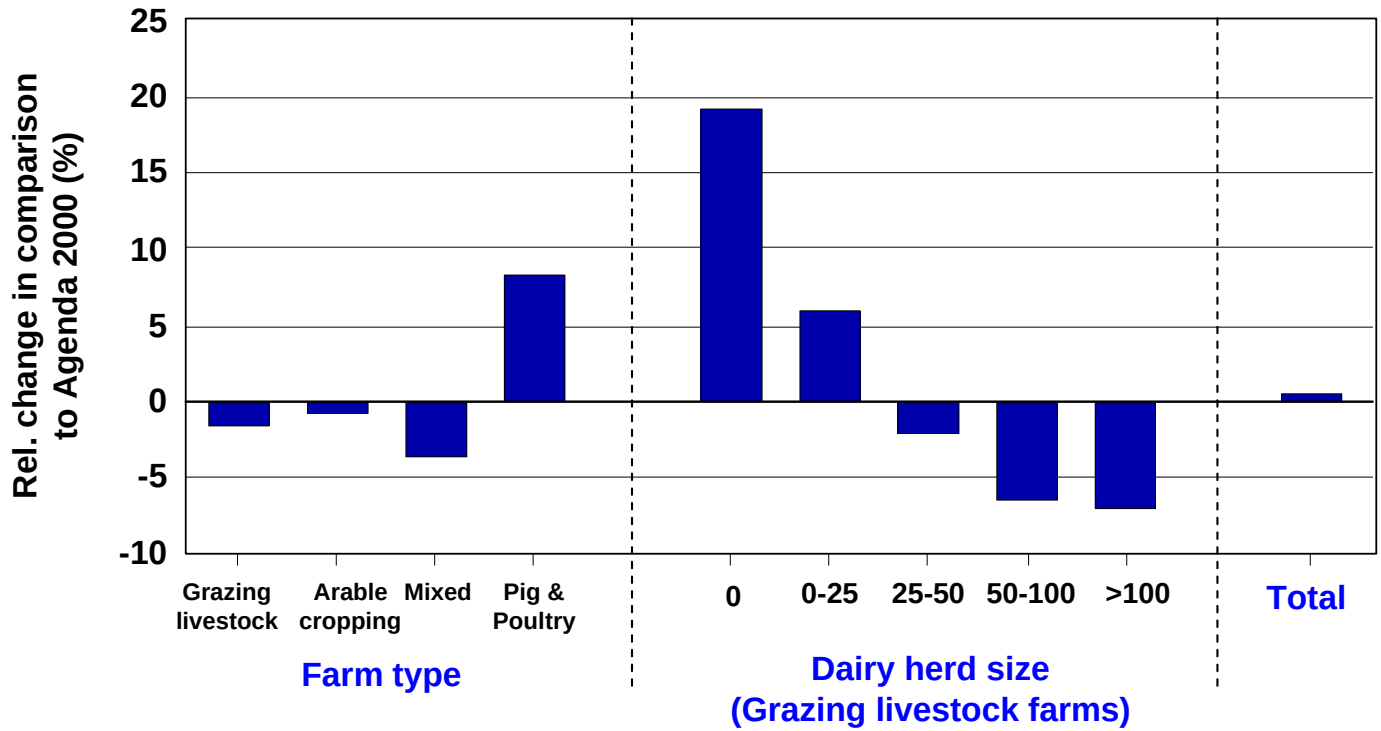
Source: FARMIS; INLB-EU-GD AGRI/G.3.

Re-distribution of income between farm types and size classes



Source: FARMIS; INLB-EU-GD AGRI/G.3.

Re-distribution of income between farm types and size classes



Source: FARMIS; INLB-EU-GD AGRI/G.3.

(I)

- Decoupling leads - given the ESIM price scenarios - to
  - A reduction of cereal, oil seed and protein-crop production
  - A reduction of beef production and the suckler cow herd
  - Pig & poultry production is only marginally affected
- Partial decoupling leads to a significant increase of production and to market distortions if decoupling approaches differ between Member States
- The actual impact of (partially) coupled payments on single activities depends strongly on the degree of decoupling applied for other production activities.
- In a Bond Scheme the impact would be more pronounced than in the decoupling options provided by the 2003 CAP reform

(II)

- The impact of decoupling on income differs depending on whether it is looked at FNVA or the income of active farmers.
  - FNVA: Income slightly increases
  - FFI: Income depends on the decoupling scheme
    - Decrease in a regional implementation
    - Increase when the link to land is cut or reduced : historical implementation, Bond Scheme
- Hence: if the primary goal of direct payments is to increase income of active farmers it is recommended to cut the link between DP and land
- All studies show that the impact of decoupling is heterogeneous depending on the scheme chosen and the agronomic conditions. Therefore, even if the model results indicate a trend that helps to decide if the policy is globally favourable or not, specific cases need to be taken into account. The average often hides the heterogeneity

Decoupling, land use and the environment

Pierre-Alain Jayet

Hypothesis for the presented model runs

- Unchanged prices (for these AROPAj runs)
- Unchanged UAA (but rental land market in FARMIS)
- Unchanged other "fixed factors" (but adjustment of the livestock in AROPAj possible inside the interval [85, 115] % of the 2002 livestock)
- Stylized CAP (no mitigation of the budget impact of incentives toward pasture in Germany in AROPAj)

Prospective, not forecasting

Overview of results from models

Model	Member State	cereals	C.O.P.	pastures
FARMIS	Germany	-4.8	-5.8	9.6
AROPAj	"	-10.0	-10.4	24.2
PROMAPA-G	Spain	-0.2	-1.4	-0.3
AROPAj	"	-2.4	-5.1	12.3
FARMIS	France	-5.1	-6.0	2.5
AROPAj	"	-10.2	-10.6	26.1
AGRISP	Italy	-15.6	-14.8	17.6
AROPAj	"	-7.0	-6.1	13.7
FARMIS	U.K.	-4.0	-4.7	0.1
AROPAj	"	-6.6	-6.4	7.9
AROPAj	UE-15	-8.7	-9.2	17.6

Change in allocated area from "Agenda2000" to "LuxembourgAgr."
(% of the base year area)

Land use and production use

M.S.	UAA Mha	Δ cereals Mha	Δ marketed Mt	Δ on-farm Mt	Δ milk cows LVU	Δ suckler cows LVU	Δ Tot. Livest. LVU
Belg	1.43	-0.06	-0.23	-0.13	0.00	-0.09	-0.39
Denm	2.44	-0.07	0.04	-0.32	0.00	-0.02	-0.36
Germ	14.73	-0.70	-0.80	-2.03	-0.07	-0.06	-1.15
Gree	1.22	-0.05	-0.10	-0.04	0.00	-0.01	0.16
Spai	11.33	-0.14	-0.01	-0.50	-0.04	-0.19	-0.69
Fran	24.04	-1.09	-0.89	-4.20	0.07	-0.52	-1.31
U.K.	11.65	-0.25	0.06	-0.97	-0.03	-0.28	-0.94
Irla	3.20	-0.05	0.01	-0.23	0.00	-0.11	-0.11
Ital	7.55	-0.26	-0.79	-0.67	0.01	-0.10	-0.05
Luxe	0.13	-0.02	-0.01	-0.08	0.00	0.00	-0.01
Nede	1.51	-0.01	-0.03	-0.03	-0.01	-0.01	-0.57
Osto	1.79	-0.09	-0.01	-0.31	-0.01	-0.01	-0.11
Port	1.99	-0.17	-0.11	-0.12	0.00	-0.04	-0.03
Finl	1.89	-0.05	0.11	-0.26	0.00	0.00	-0.06
Swed	2.64	-0.27	-0.28	-0.43	0.00	-0.02	-0.06
UE15	87.53	-3.30	-3.05	-10.32	-0.09	-1.47	-5.70

Use of produced cereals (change between Agenda2000 and LuxemburgAgrem.)

Source : AROPAj

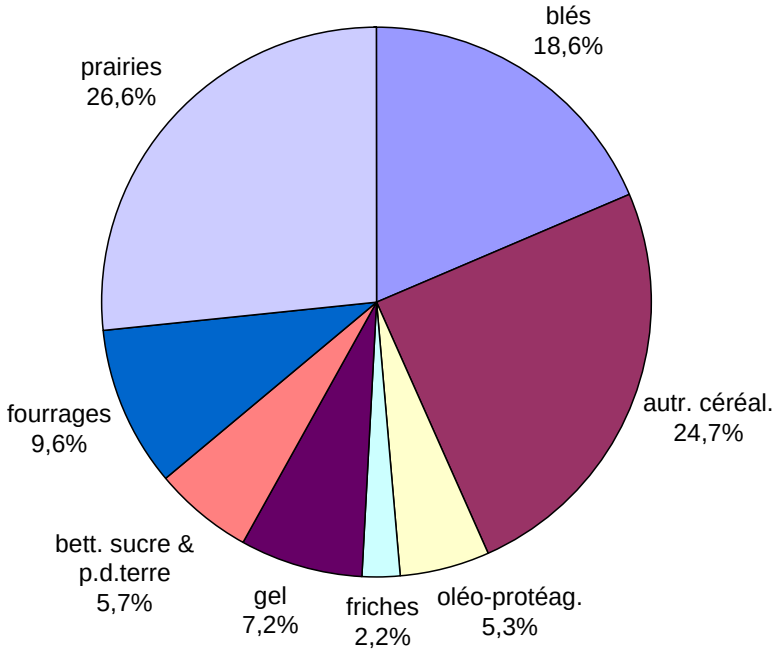
Land use and production use

Comments

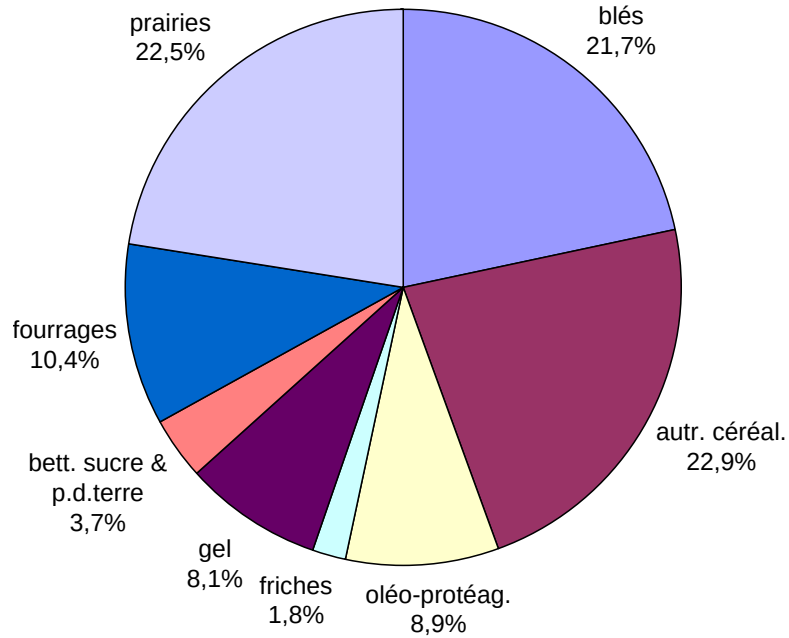
- Paradoxical converging results on increasing area devoted to grasslands ...
- ... even when livestock (i.e. suckler cows) is decreasing
- Possible unchanged level of marketed cereal quantities ...
- ... but strong decrease of on-farm consumption of cereals for feeding
- Recent increasing agricultural prices (i.e. cereals) are not here taken into account!

Agricultural land cover (% UAA)

UE-15 (∼ 88 Mha represented)



France (∼ 24 Mha represented)

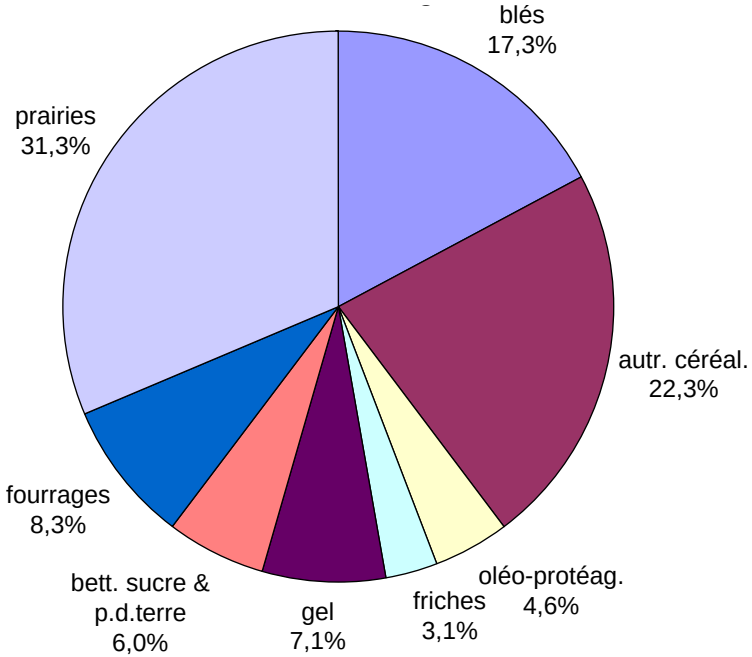


Reference (Agenda 2000)

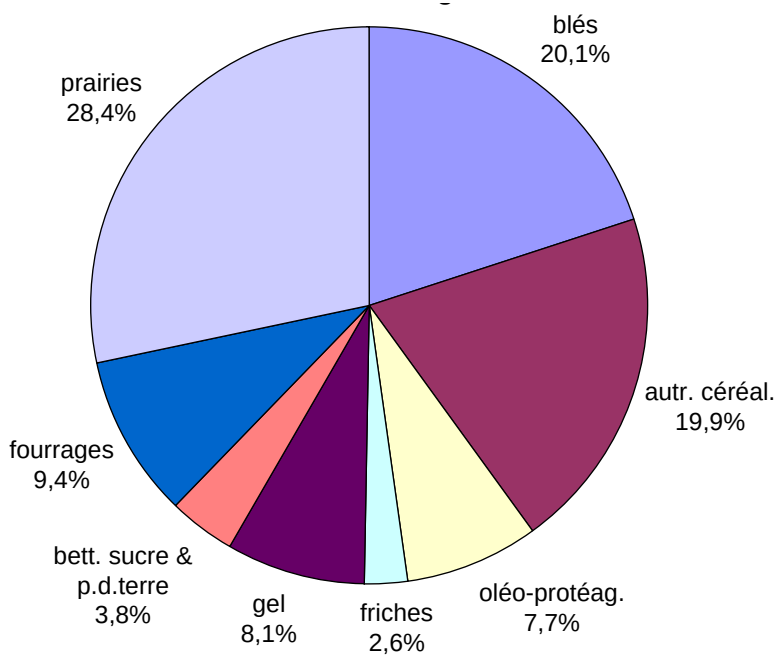
Source : AROPAj

Agricultural land cover (% UAA)

UE-15 (∼ 88 Mha represented)



France (∼ 24 Mha represented)

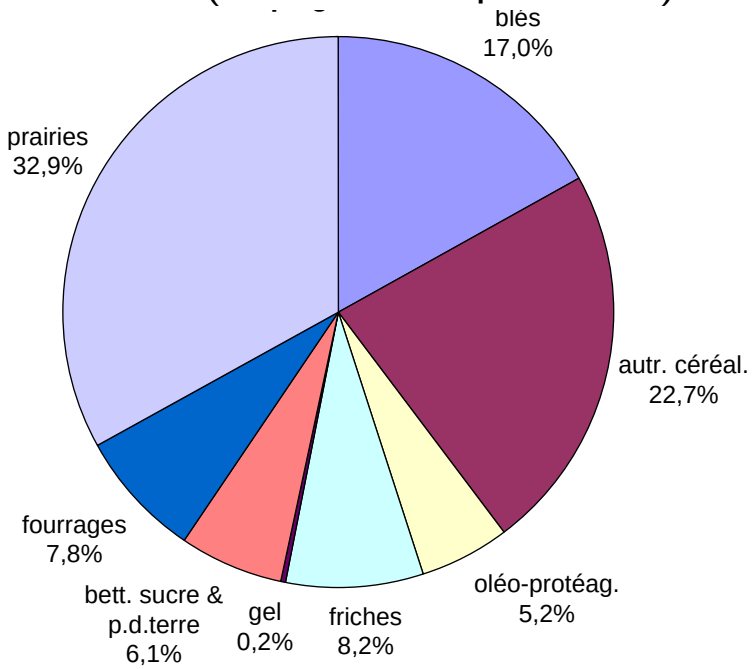


Luxembourg agreement

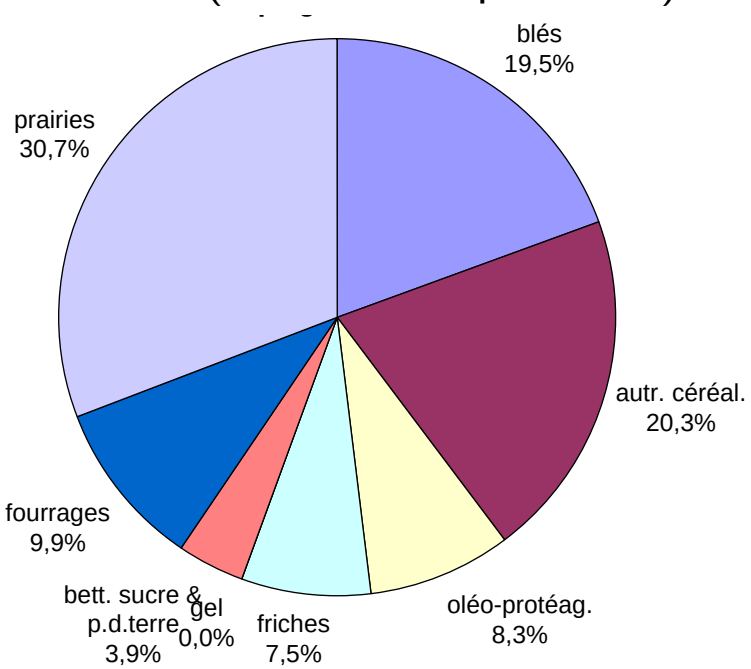
Source : AROPAj

Agricultural land cover (% UAA)

UE-15 (∼ 88 Mha represented)



France (∼ 24 Mha represented)



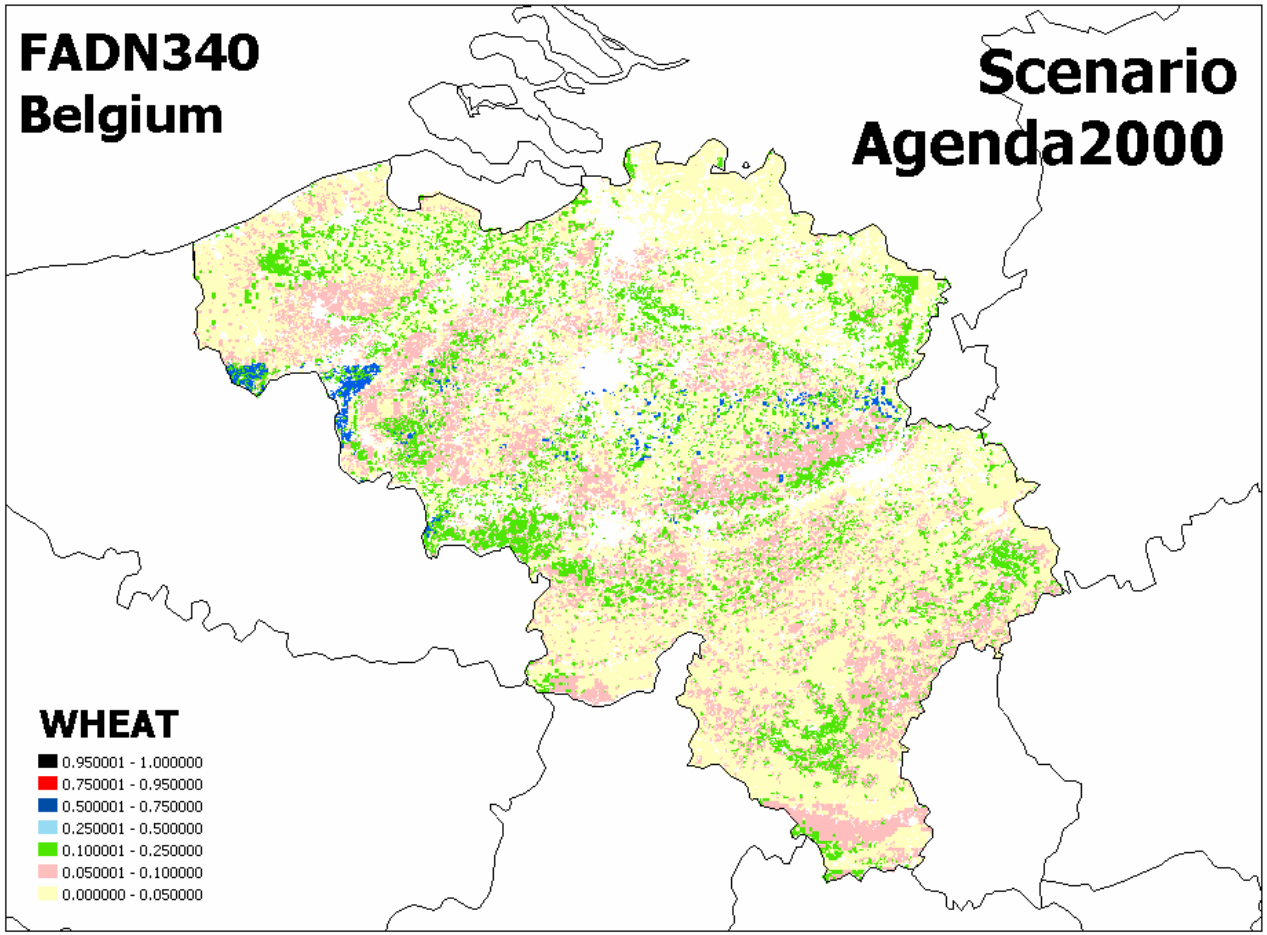
"Full" decoupling

Source : AROPAj

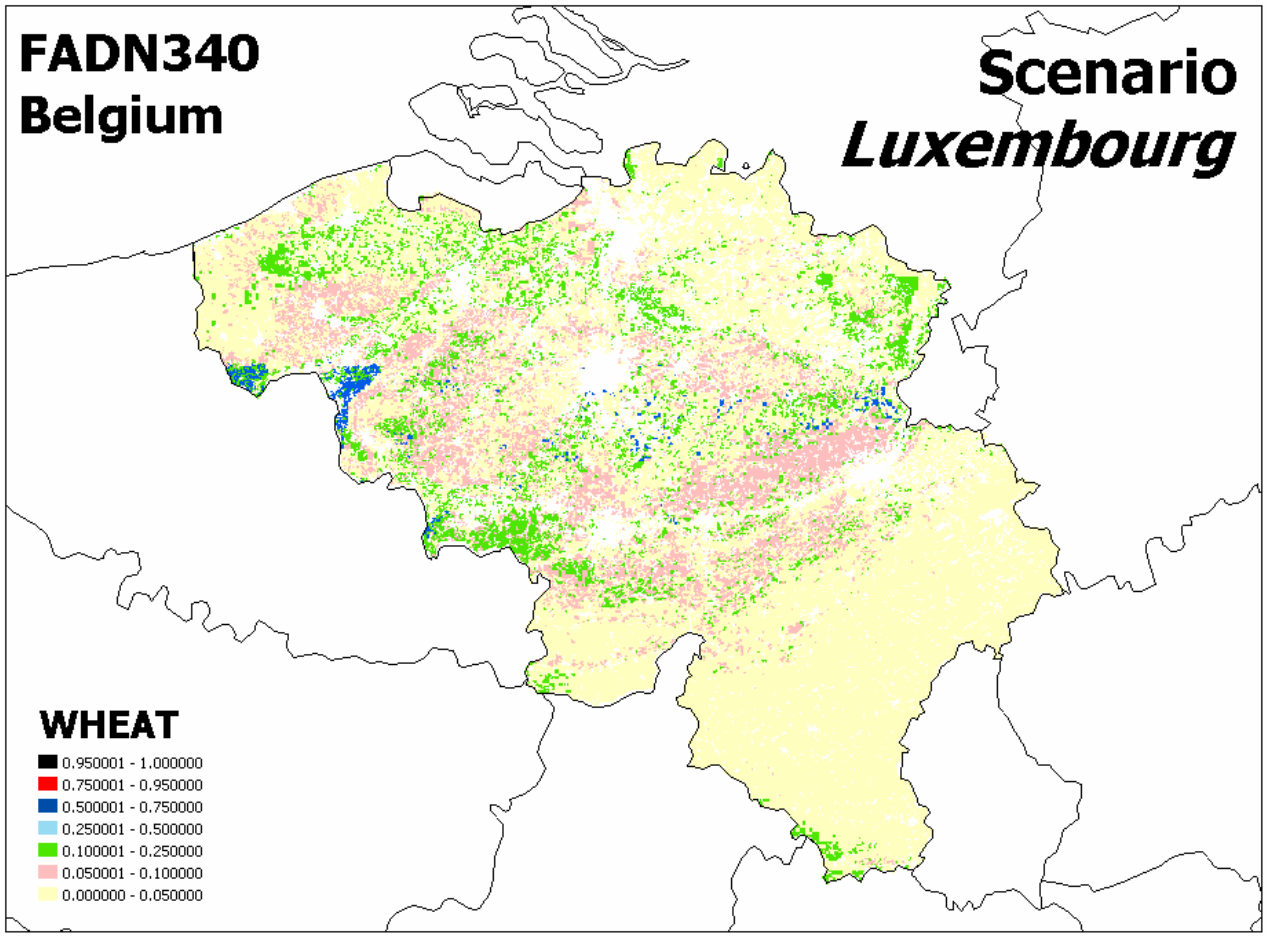
Method, at the FADN region scale (AROPAj)

- Crop location
  - Data
    - economical : FADN
    - physical : CLC, LUCAS, soil, climate, DEM
  - Prior location of crops
    - probability π_{ik} of finding of the crop k in a pixel i
      model : $\pi_{ik} = \frac{\beta_k x_{ik}}{\sum_l \beta_l x_{il}}$
      estimating of β parameter from LUCAS observations π and data x and estimating of $\hat{\pi}$
    - Probability p_{ik} of locating of "FADN" activities
      ("cross entropy") $min_p \sum_{i,k} p_{ik} ln(\frac{p_{ik}}{\hat{\pi}_{ik}})$ subject to constraints
- Location of the AROPAj farm groups
  Probability q_{ig} of locating of the FG g in the pixel i
  estimated with the use of p_{ik} and of the AROPAj areas provided by the FADN
- Down-scaled "AROPAj outputs"

Down scaling (AROPAj, LS adjustment $\leq$15%) - Agenda 2000

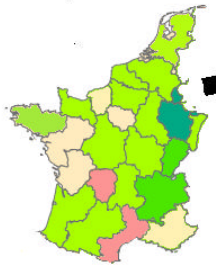


Down scaling (AROPAj, LS adjustment $\leq$15%) - "Luxembourg agrem."

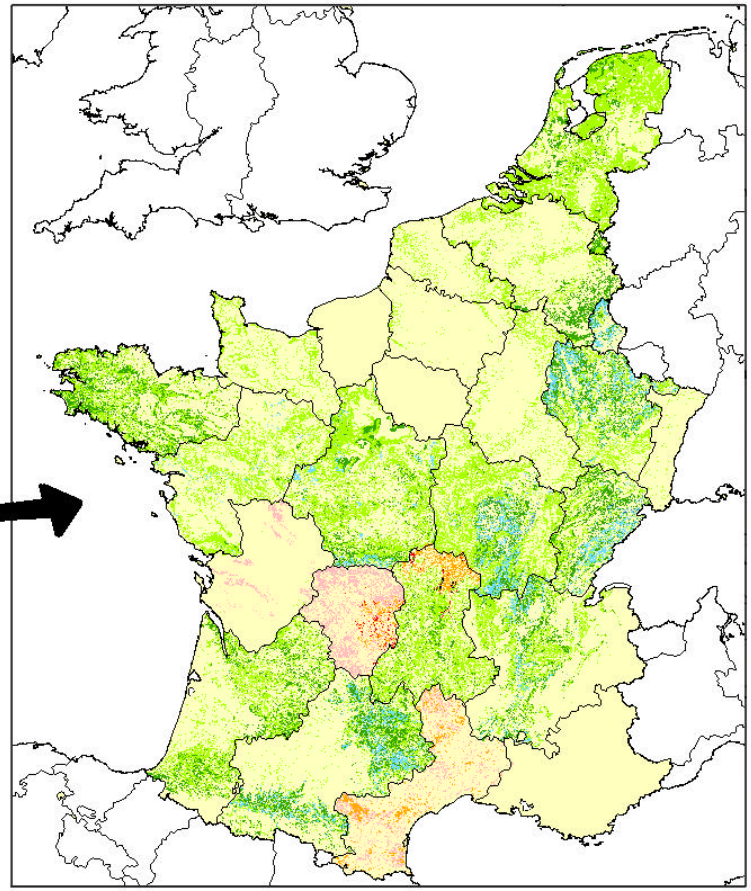


Down scaling (AROPAj, LS adjustment $\leq$15%)

AROPAj output (regional level)



Variation of area devoted to cereals between scenarios Luxembourg and agenda2000 (%)



Scenarios: Luxembourg - Agenda2000

CEREALS

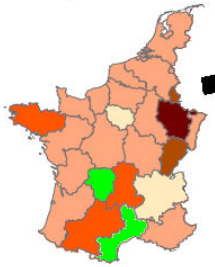
Variation of probabilities for land to be devoted to Cereals

- < -0.20
- -0.20 - -0.15
- -0.15 - -0.10
- -0.10 - -0.05
- -0.05 - -0.02
- -0.02 - 0.02
- 0.02 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- > 0.20

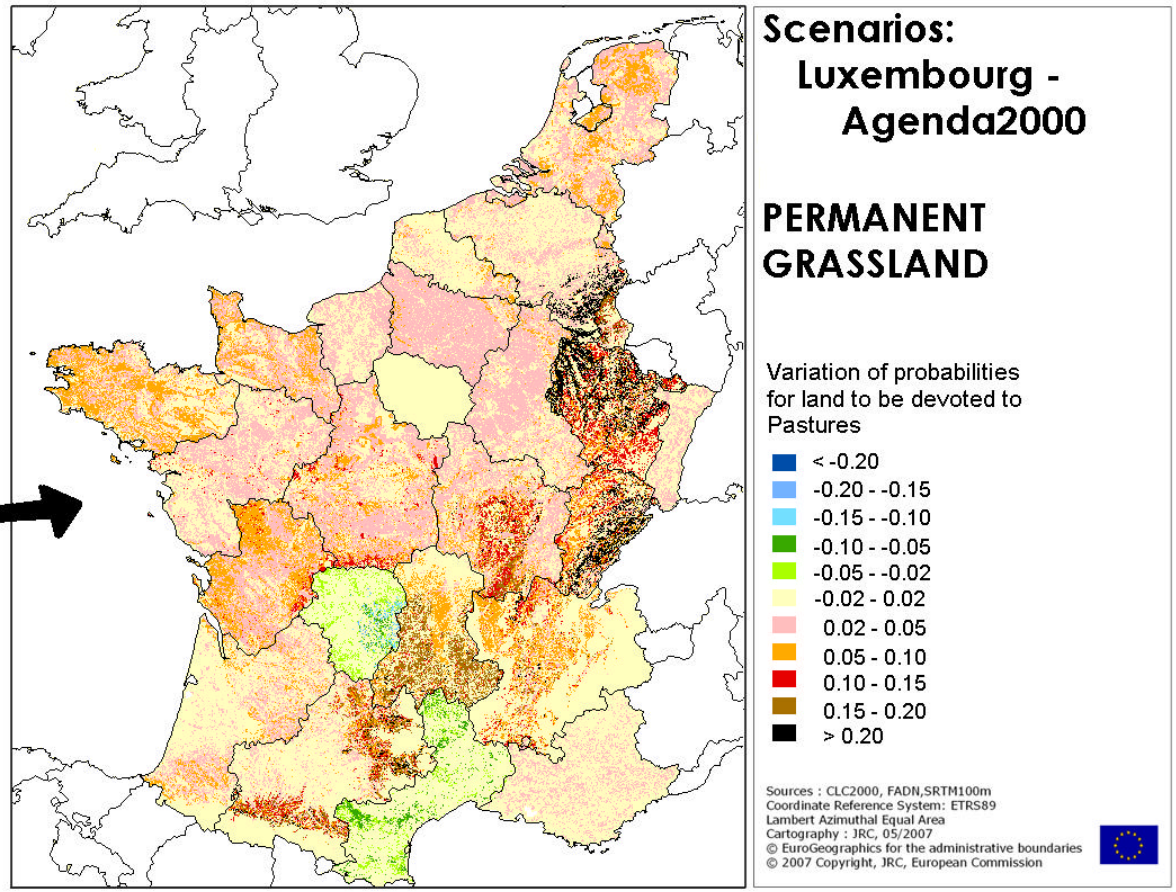
Sources : CLC2000, FADN,SRTM100m
Coordinate Reference System: ETRS89
Lambert Azimuthal Equal Area
Cartography : JRC, 05/2007
© EuroGeographics for the administrative boundaries
© 2007 Copyright, JRC, European Commission

Down scaling (AROPAj, LS adjustment $\leq$15%)

AROPAj output (regional level)



Variation of area devoted to pastures between scenarios Luxembourg and agenda2000 (%)



Greenhouse gas emissions

M.S.	Impact of Livestock adjustment (reference)	Added impacts of decoupling (Luxembourg) and LS adjust. Δ Lux+LSA - Ref
Belg	-8.5	-8.8
Denm	-4.9	-5.5
Germ	-4.6	-6.6
Gree	8.8	6.2
Spai	-2.4	-2.9
Fran	-3.1	-4.4
U.K.	-3.0	-5.6
Irla	-2.4	-2.2
Ital	0.1	-1.2
Luxe	-5.5	-11.6
Nede	-6.0	-4.9
Osto	-4.2	-6.0
Port	0.5	1.3
Finl	-1.4	0.3
Swed	-4.3	-4.1
UE15	-2.9	-4.2

Variation of GHG emissions (% related to the reference without LS adjustment)

Source : AROPAj

The environment in wider dimensions

- Bibliographic review covering different criteria
  Possible coupling with the GENEDEC models (i.e. for N_2O, NH_3)
  Bibliographic detailed analysis of landscape and bio-diversity (expected loss)
- Local problem of excess water use
  The case of aquifer in Castilla La Mancha : the compensatory allowance scheme (ambigous impact)
- Non-point source pollution problems
  - Nitrate leaching (application in the Greek island of Crete)
  - Methodology in order to transform a NPS problem into a PS problem (cross entropy)
  - Theoretical approach of combined problems of nitrate leaching and water excess demand in a dynamic framework

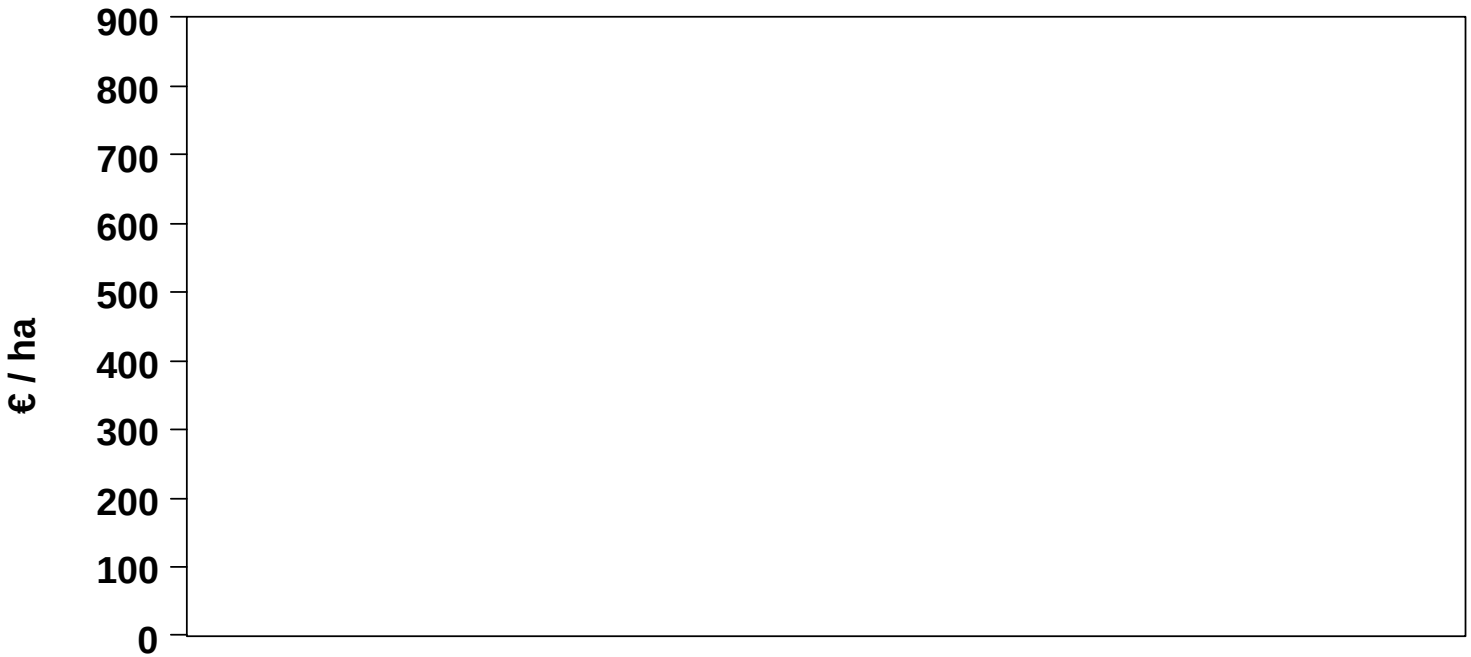
Land shadow price

Werner Kleinhanss

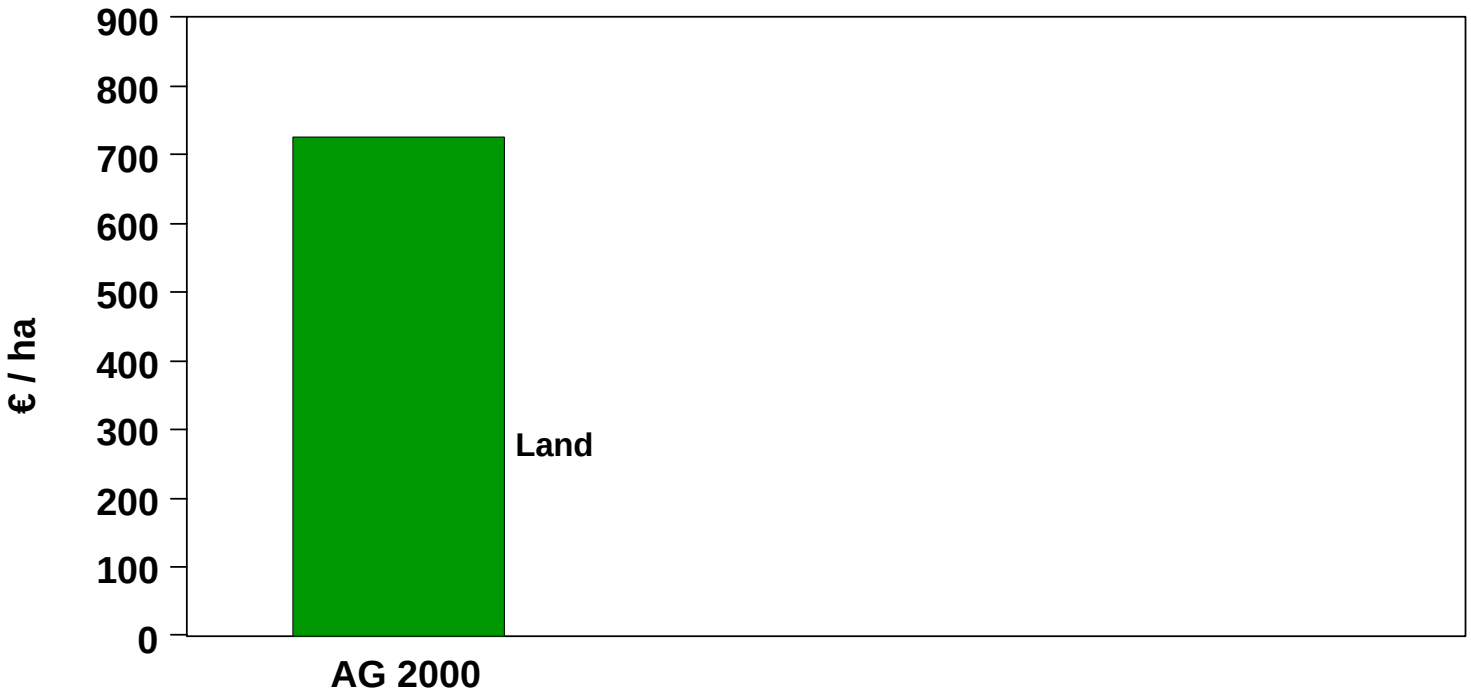
- Focus on land rental market
- Simplified approach to assess impacts of decoupling on land values
  $\Rightarrow$ dual values of land equations
  - Single farm groups
  - Land trade constraint for all farms within regions
- Different level / changes of dual values depending on model restrictions, specification of decoupling, cost function ...

		Model characteristics Constraints						Shadow prices (dual values) for land
Model	Partner	Model type	Land	Labour	Live-stock	Quota	Calibration wrt rental prices land	
AROPAj	INRA	LP	x	-	x	x	-	Land Set-aside / entitlement
PROMAPA.G	UPM	PMP	x	-	x	x	x	Irrigated land Non-irrigated land
AGRISP	U. PARMA	PMP	x	-	x	x	(?)	Land
FARMIS	FAL	PMP	x	x	x	x	x	Arable land Grassland (Land market modelling by simultaneous optimization of all farm groups within regions)

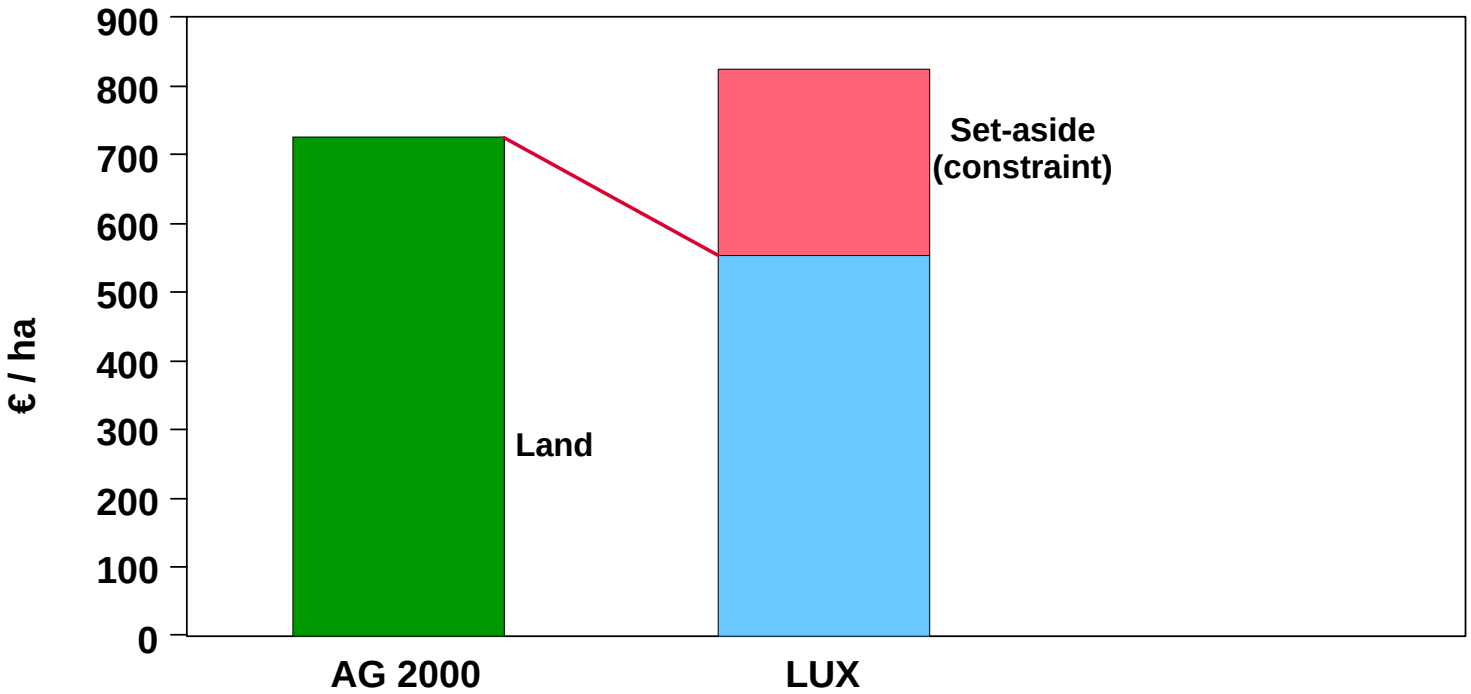
Composition of shadow values land/entitlements (EU-15), AROPAj-2007



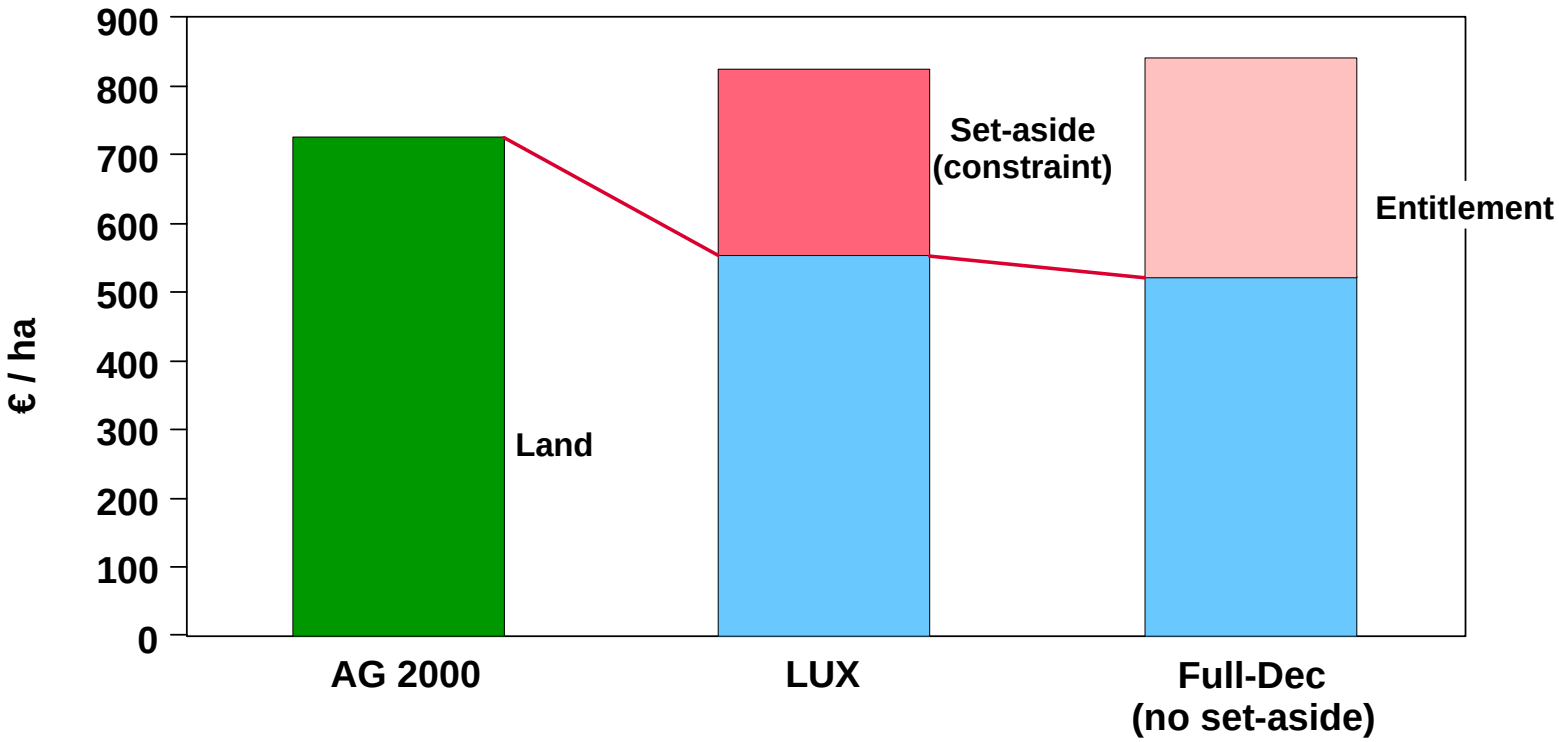
Composition of shadow values land/entitlements (EU-15, AROPAj-2007)



Composition of shadow values land/entitlements (EU-15), AROPAj-2007



Composition of shadow values land/entitlements (EU-15), AROPAj-2007

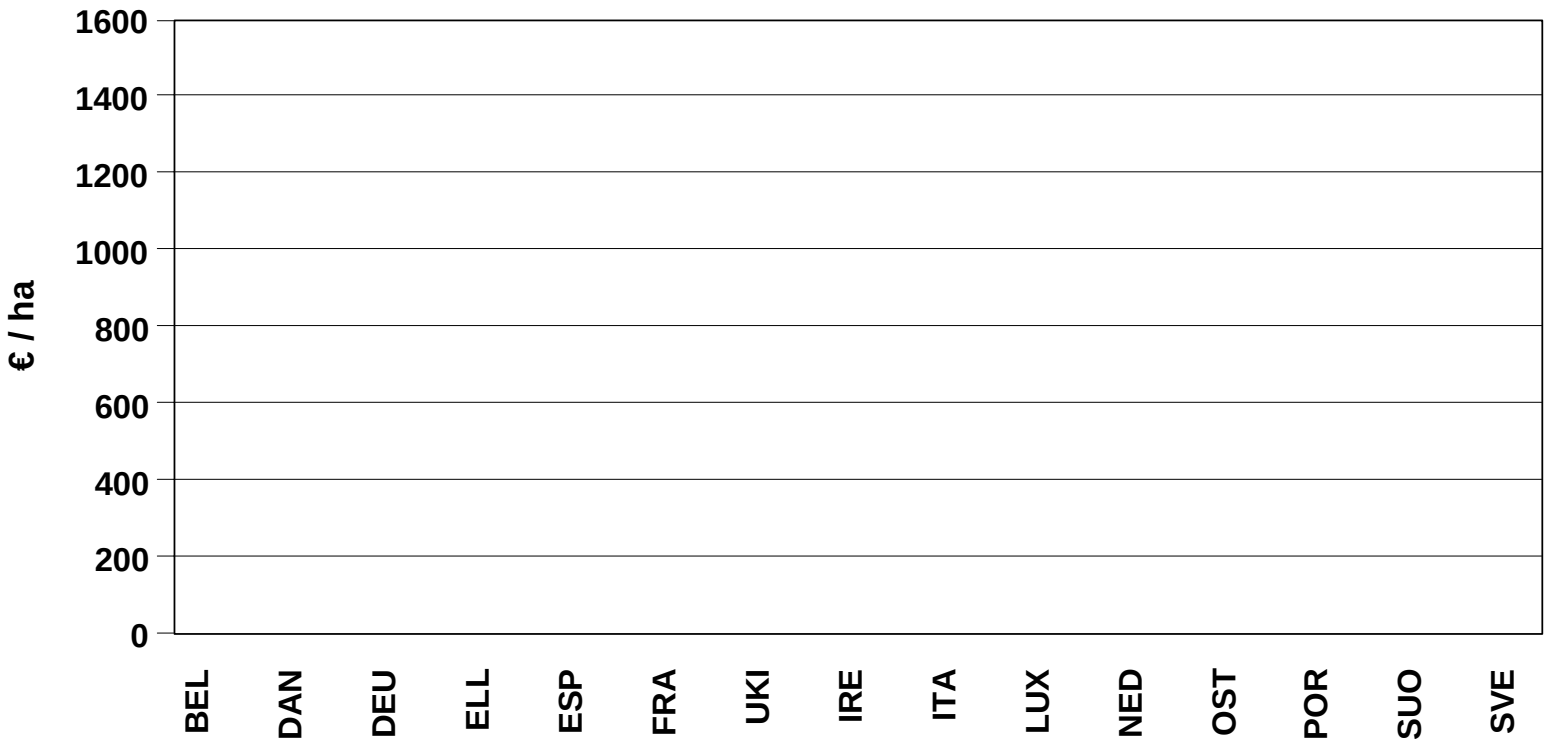


Composition of shadow values land/entitlements (EU-15), AROPAj-2007

Comments

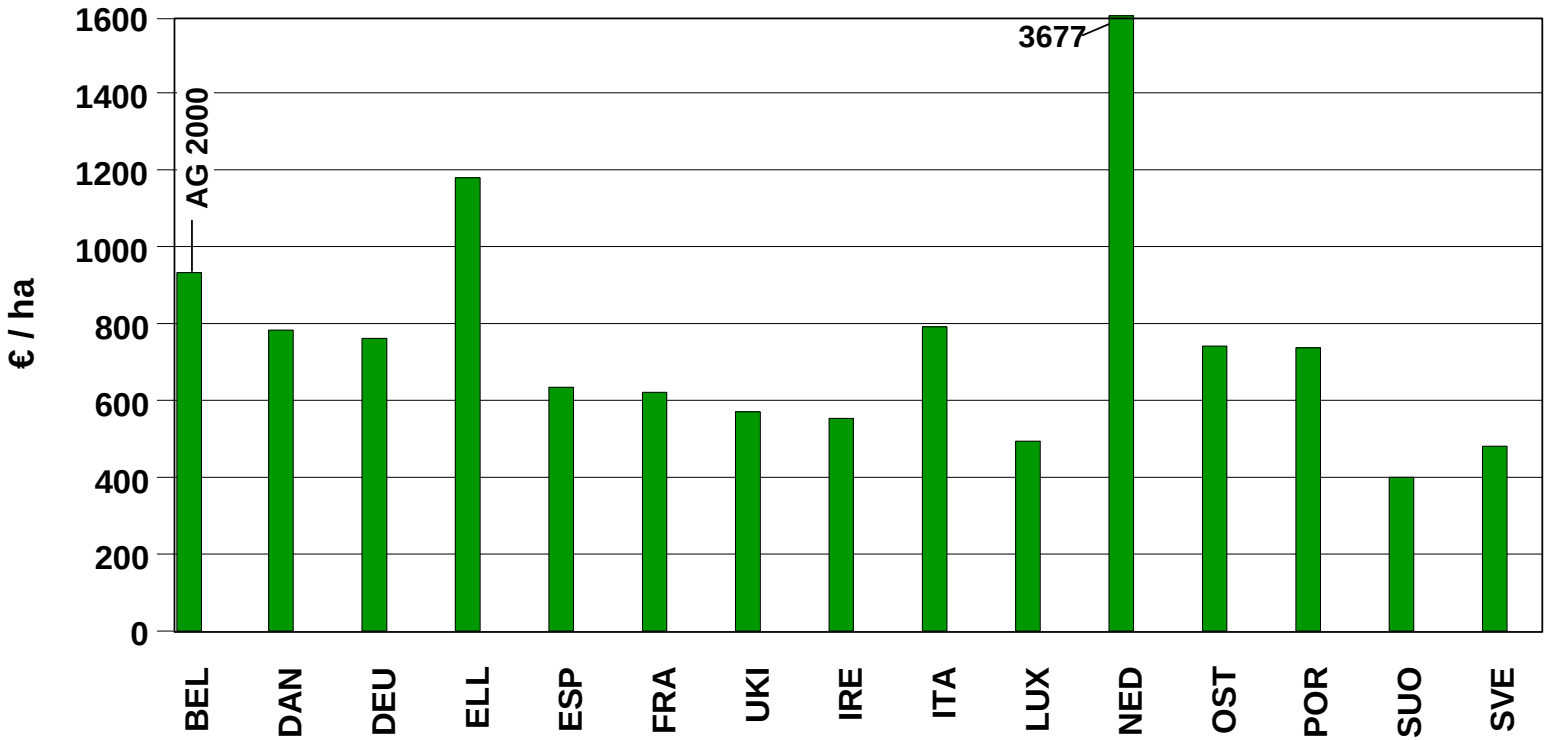
- The different compounds of the land shadow prices are related to the prices and to the constraints exiting in the model for which the "UAA" is explicitly used (the mathematical "envelop theorem")
- The "land" compound is related to the availability of the land fixed factor ("UAA"), and the shadow price implicitly takes account of all payments related to agricultural activities
- The "set-aside constraint" refers to the link between the "UAA" and the set-aside level (the stylized introduction of the set-aside constraint in the Luxembourg agreement)
- The "entitlement" refers to payments when they are directly related to the available eligible area
- The total shadow price should be compared to the rental land value, taking account of the fact that here labour is not taken into account (the difference between the shadow price and the rent could be considered like a proxy of the average marginal value of the labour time spent on one hectare)

Shadow values for land EU-15



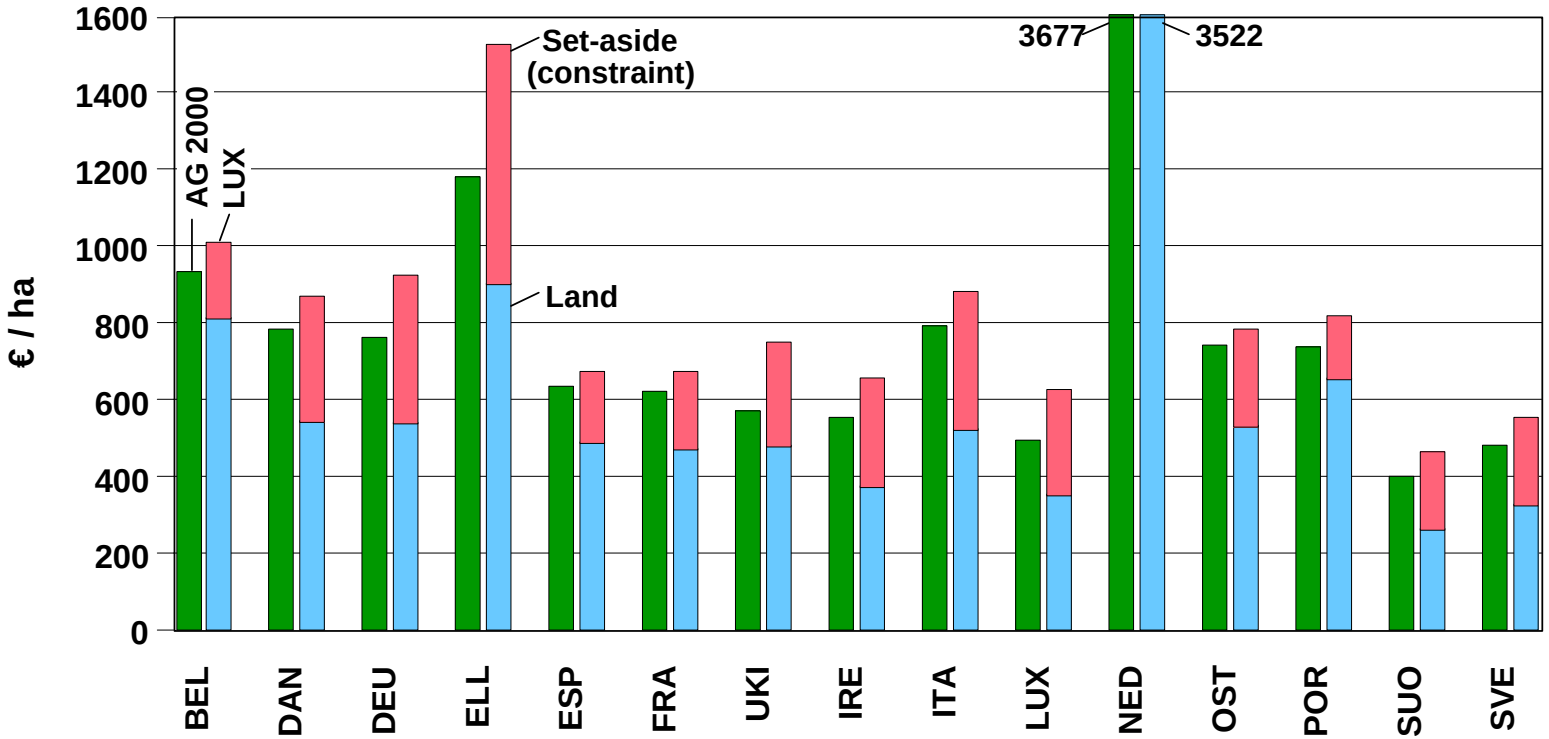
Source: AROPAj, Genedec D4.

Shadow values for land EU-15



Source: AROPAj, Genedec D4.

Shadow values for land EU-15

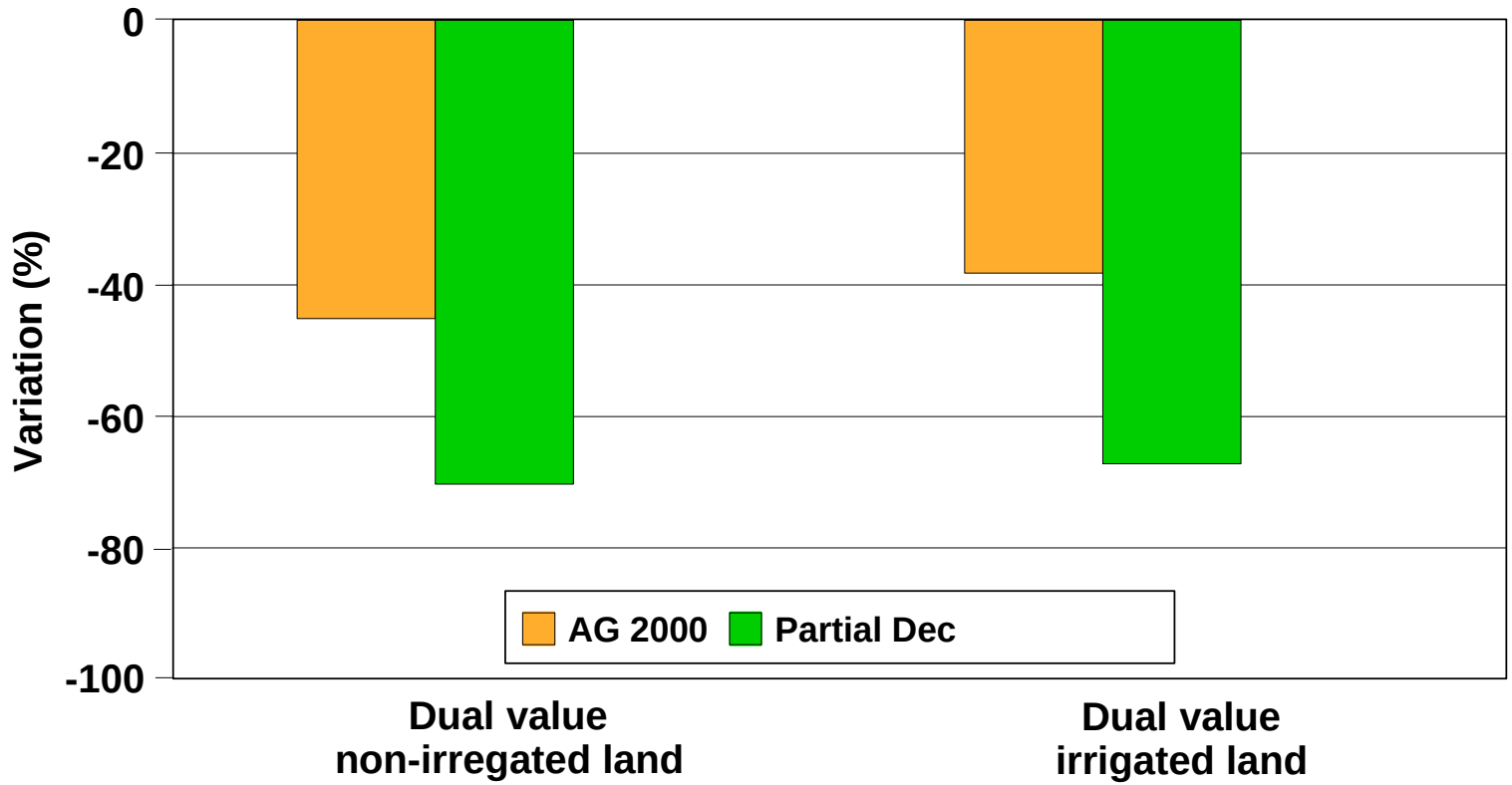


Source: AROPAj, Genedec D4.

Spain: Dual values of land - variation wrt base year

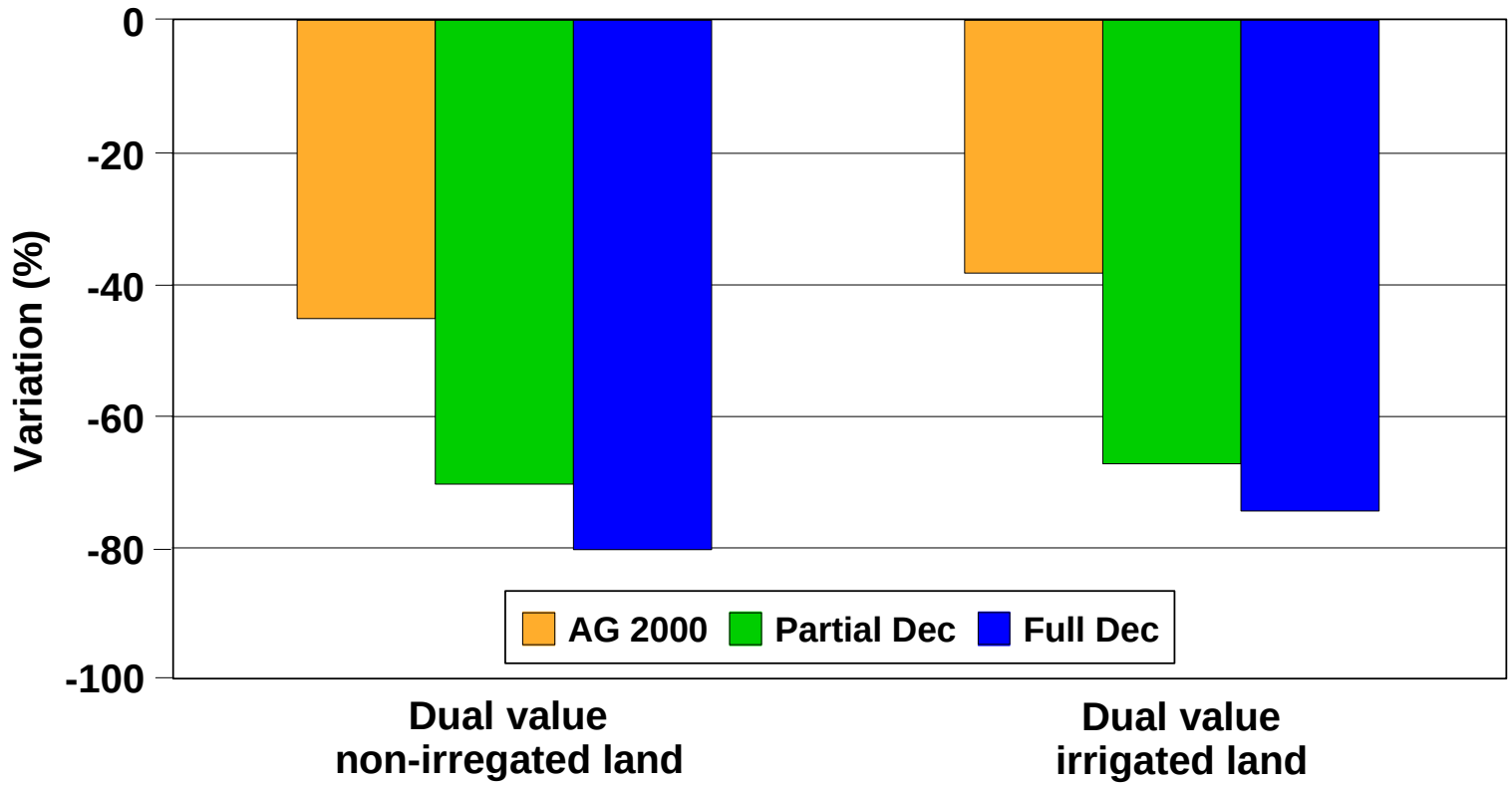
Source: PROMAPA..G, Genedec D7.

Spain: Dual values of land - variation wrt base year



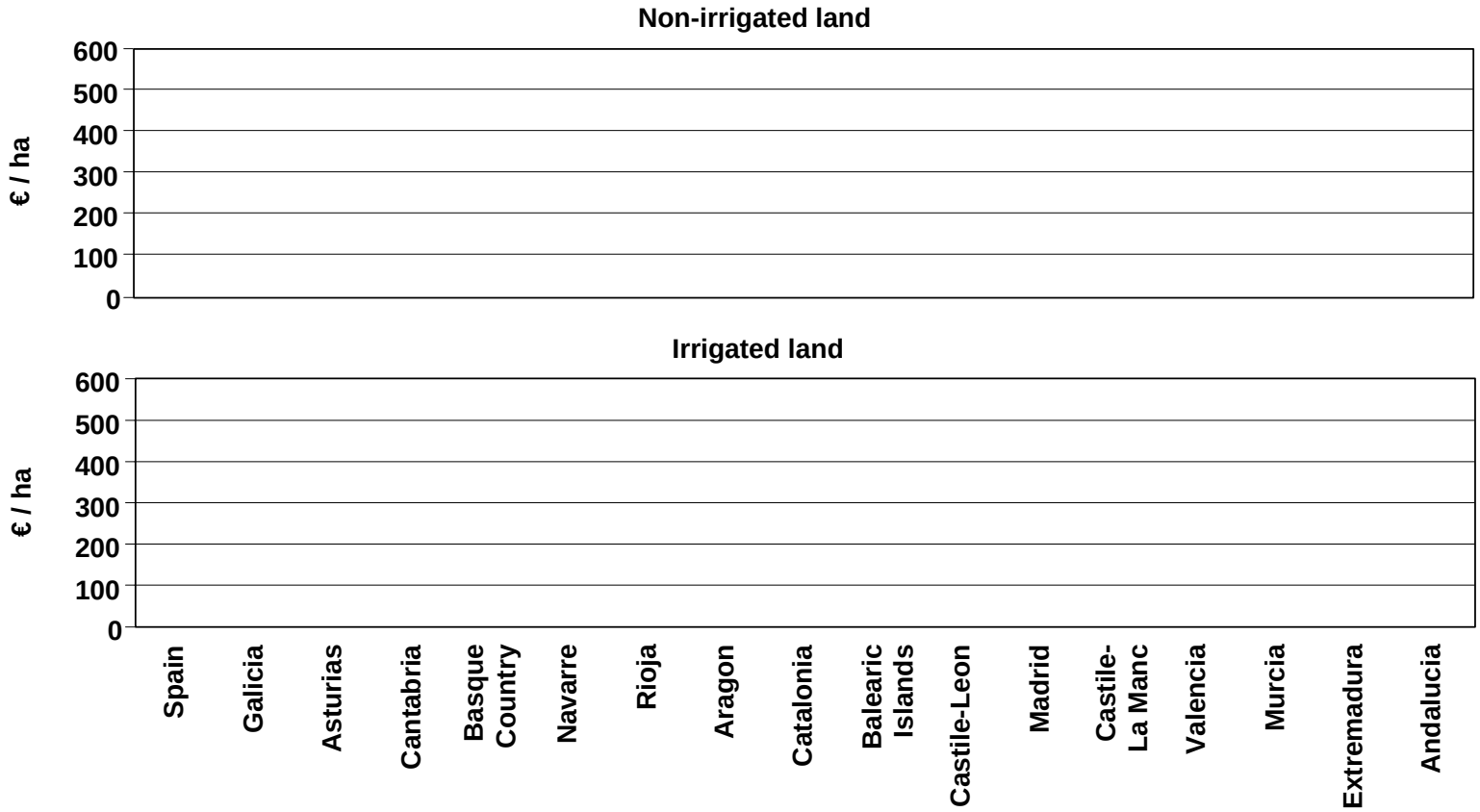
Source: PROMAPA..G, Genedec D7.

Spain: Dual values of land - variation wrt base year

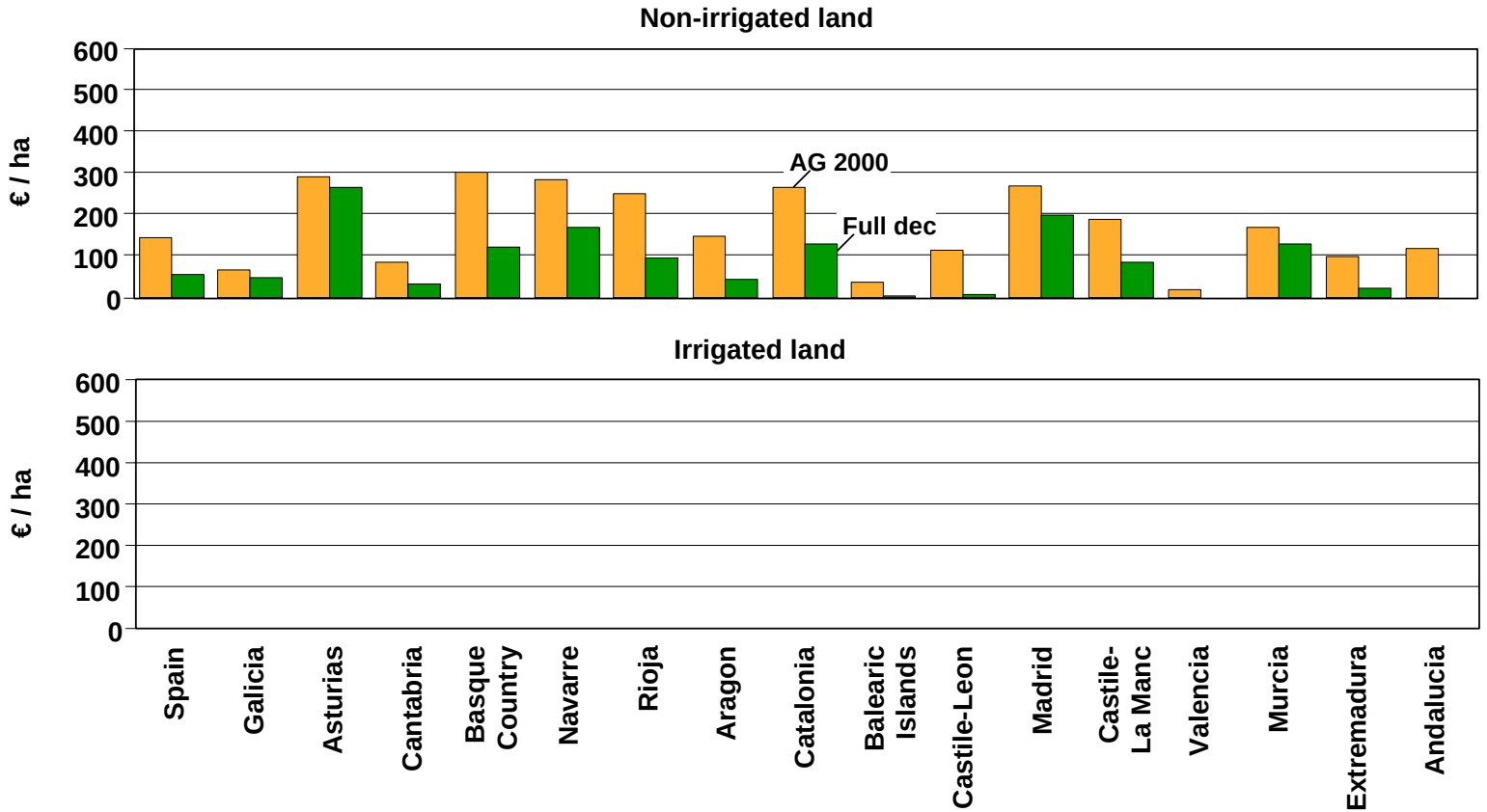


Source: PROMAPA..G, Genedec D7.

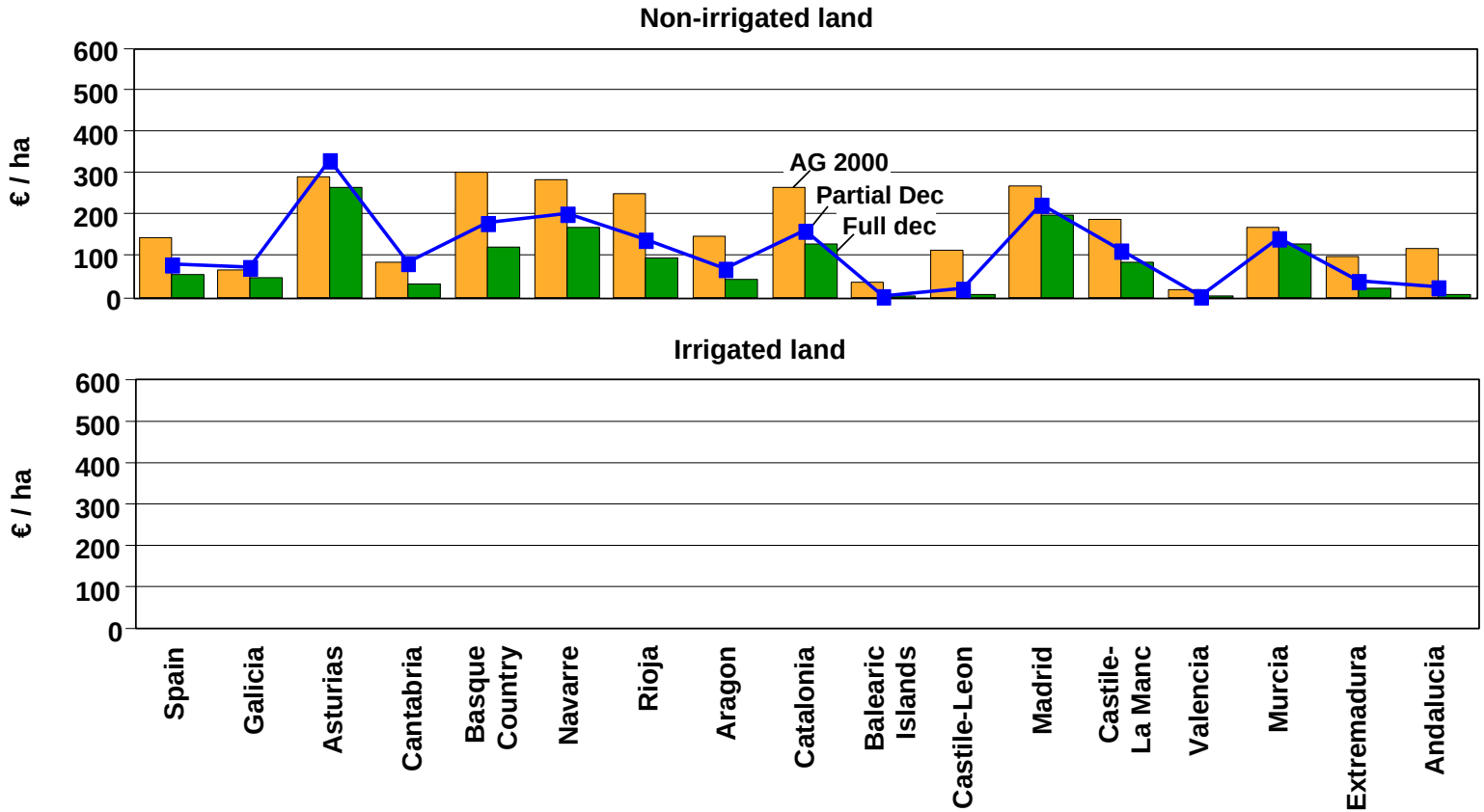
Spain: Dual values for land



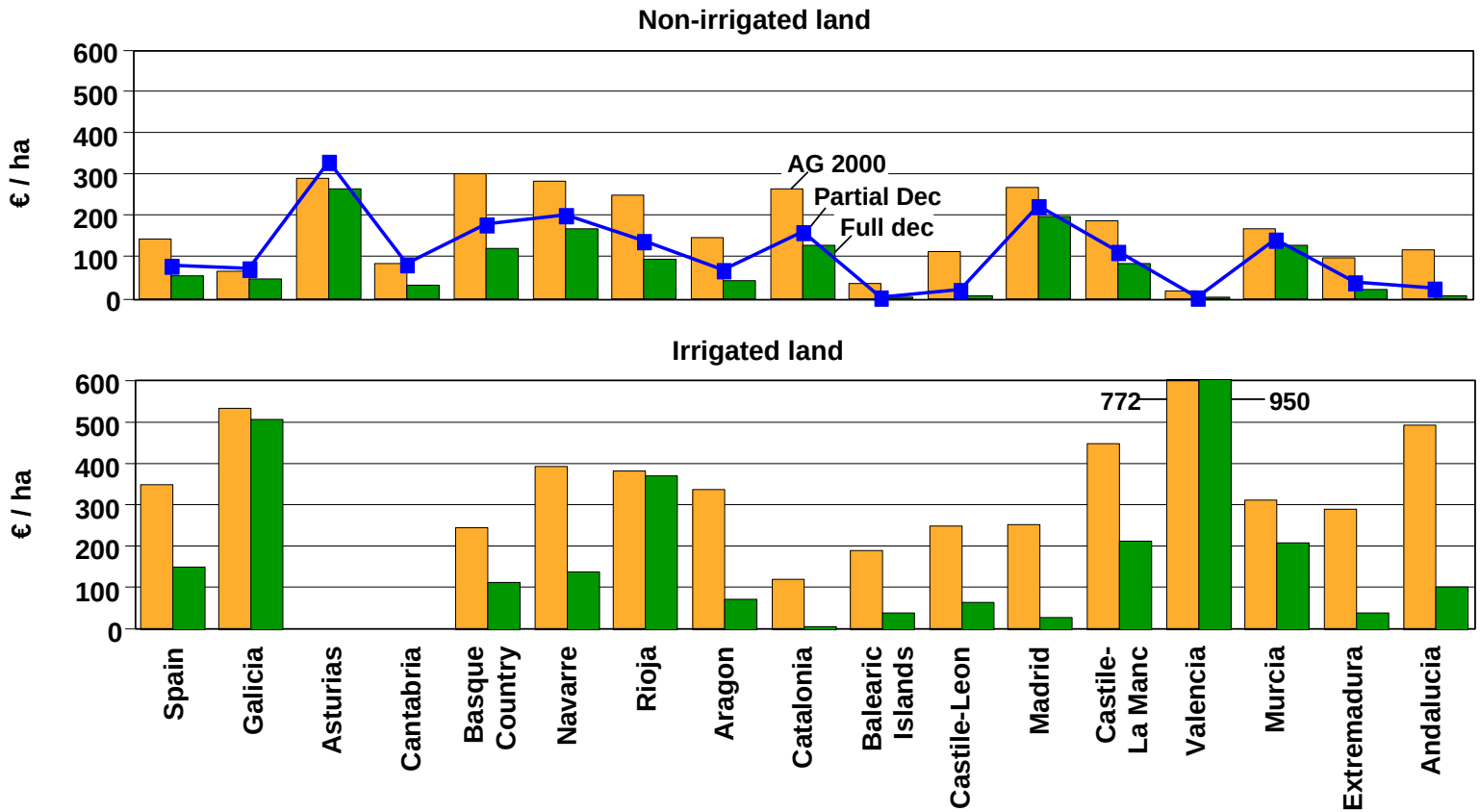
Spain: Dual values for land



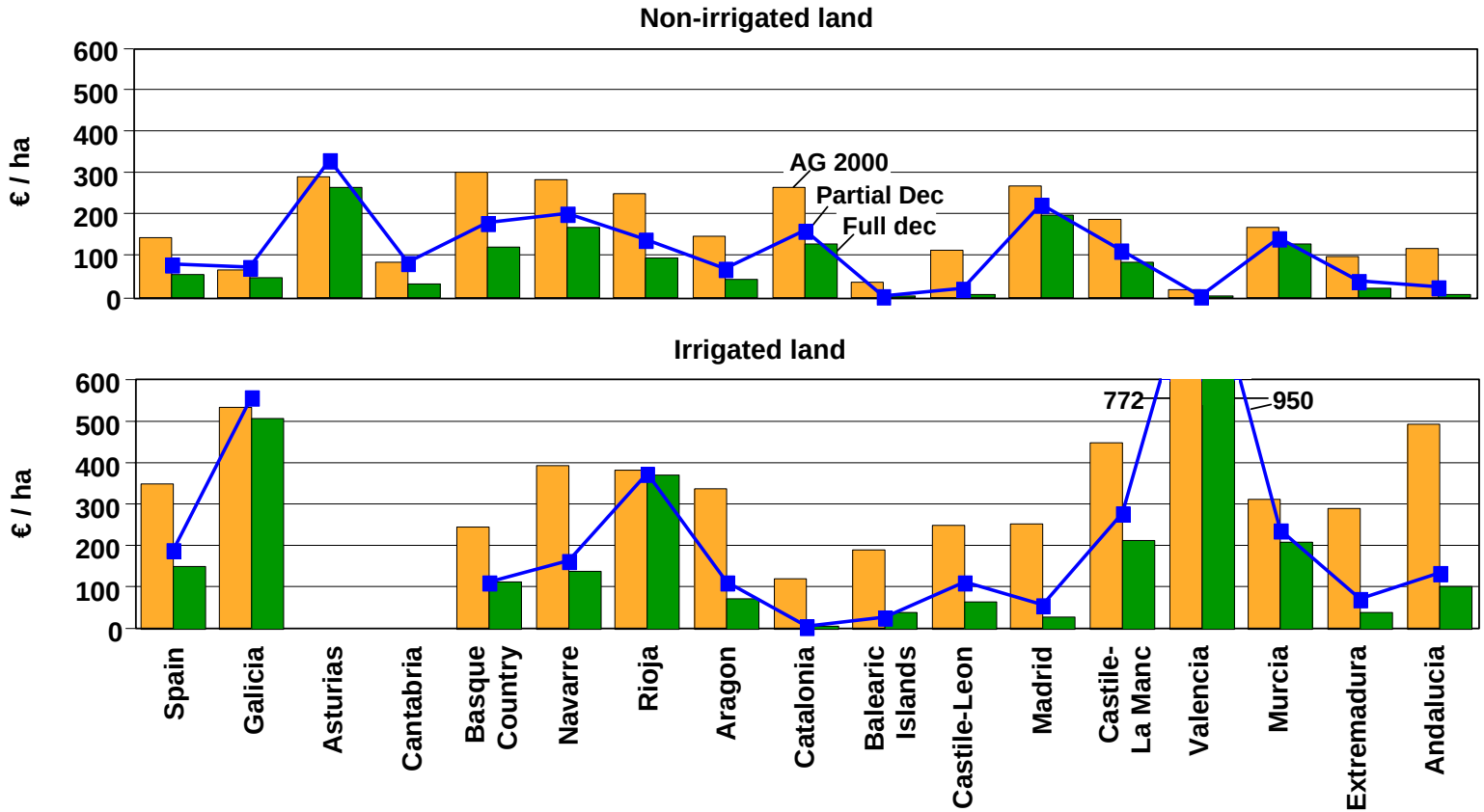
Spain: Dual values for land



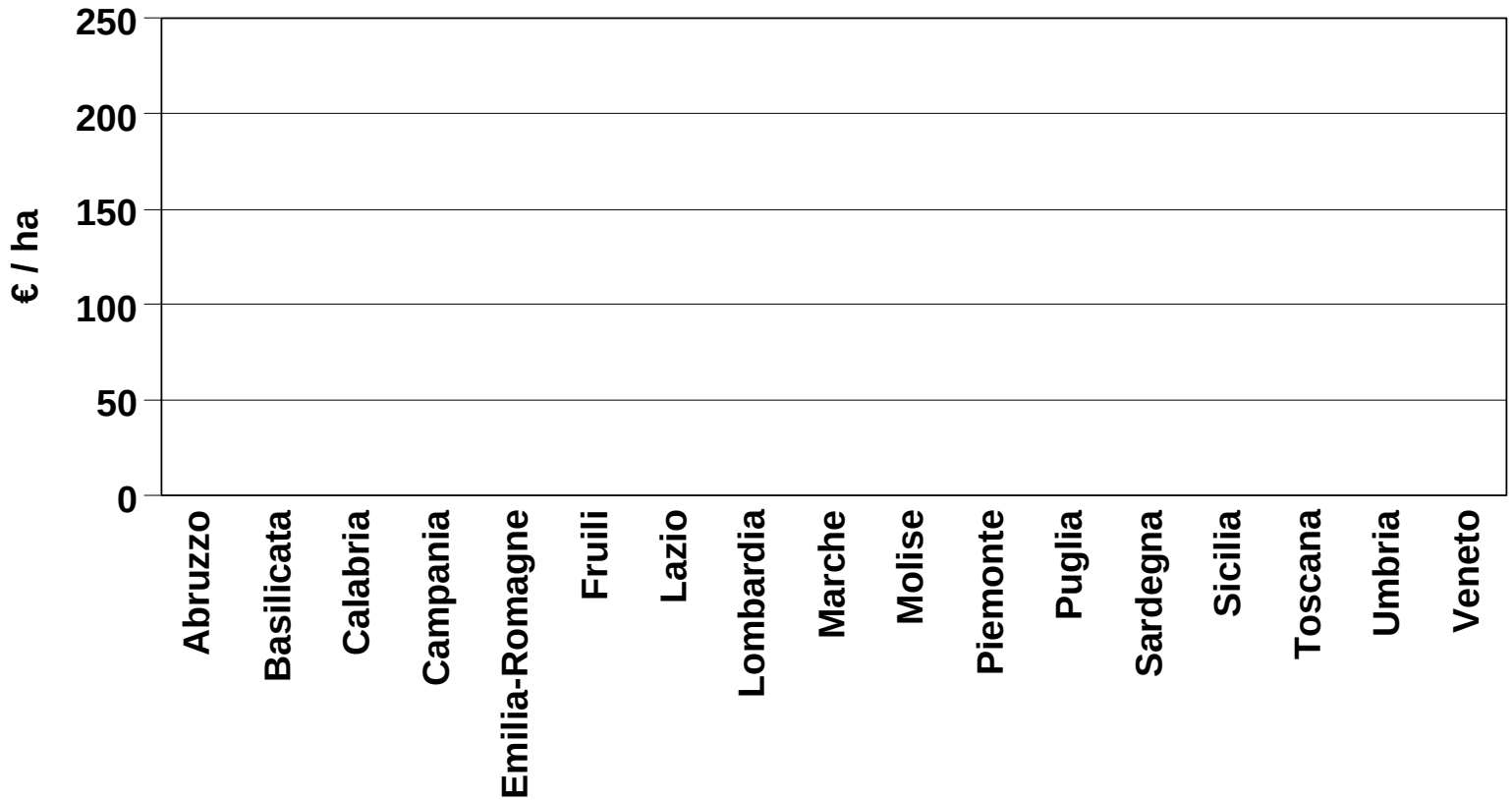
Spain: Dual values for land



Spain: Dual values for land

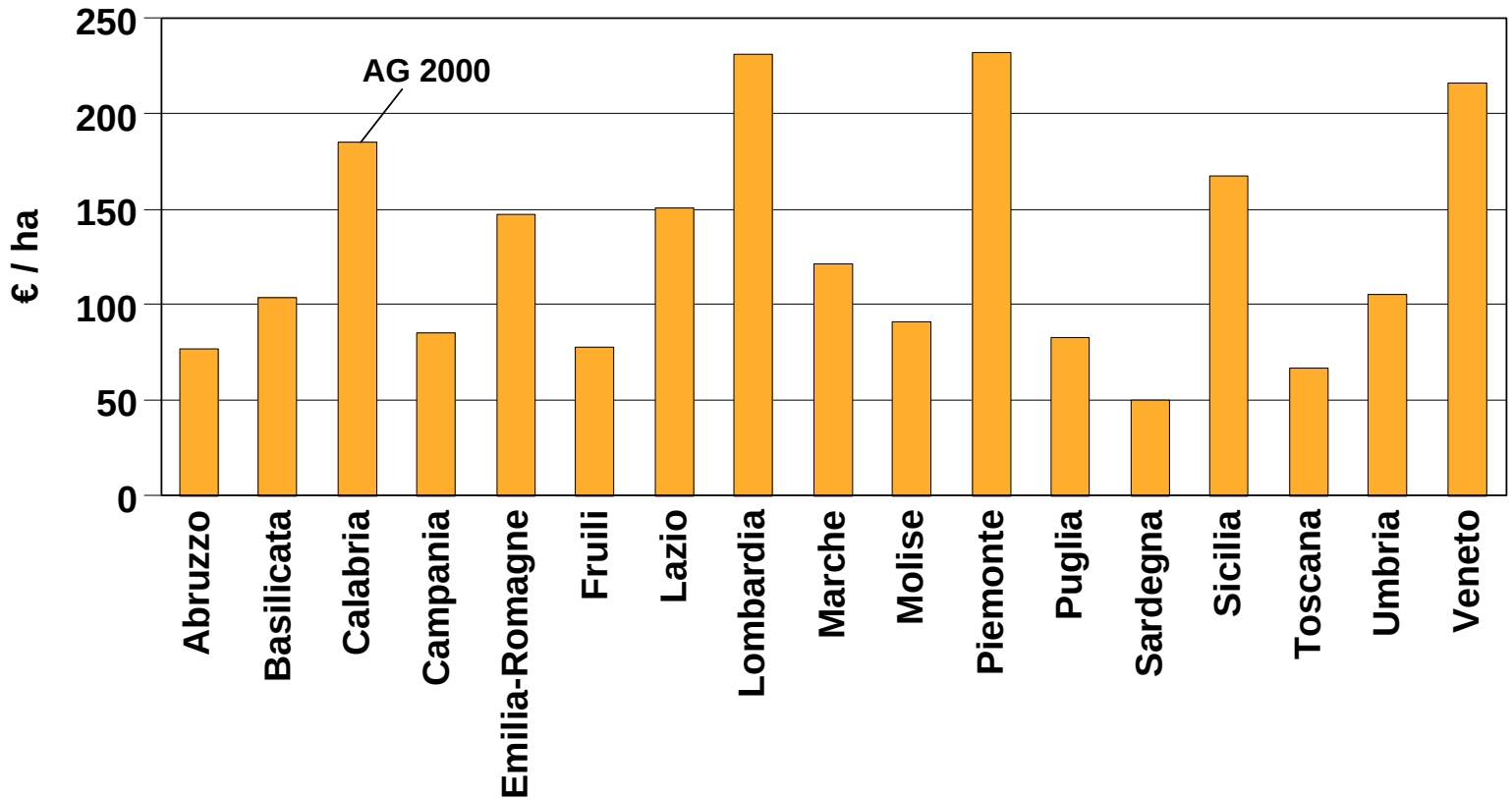


Italy: Shadow prices for land



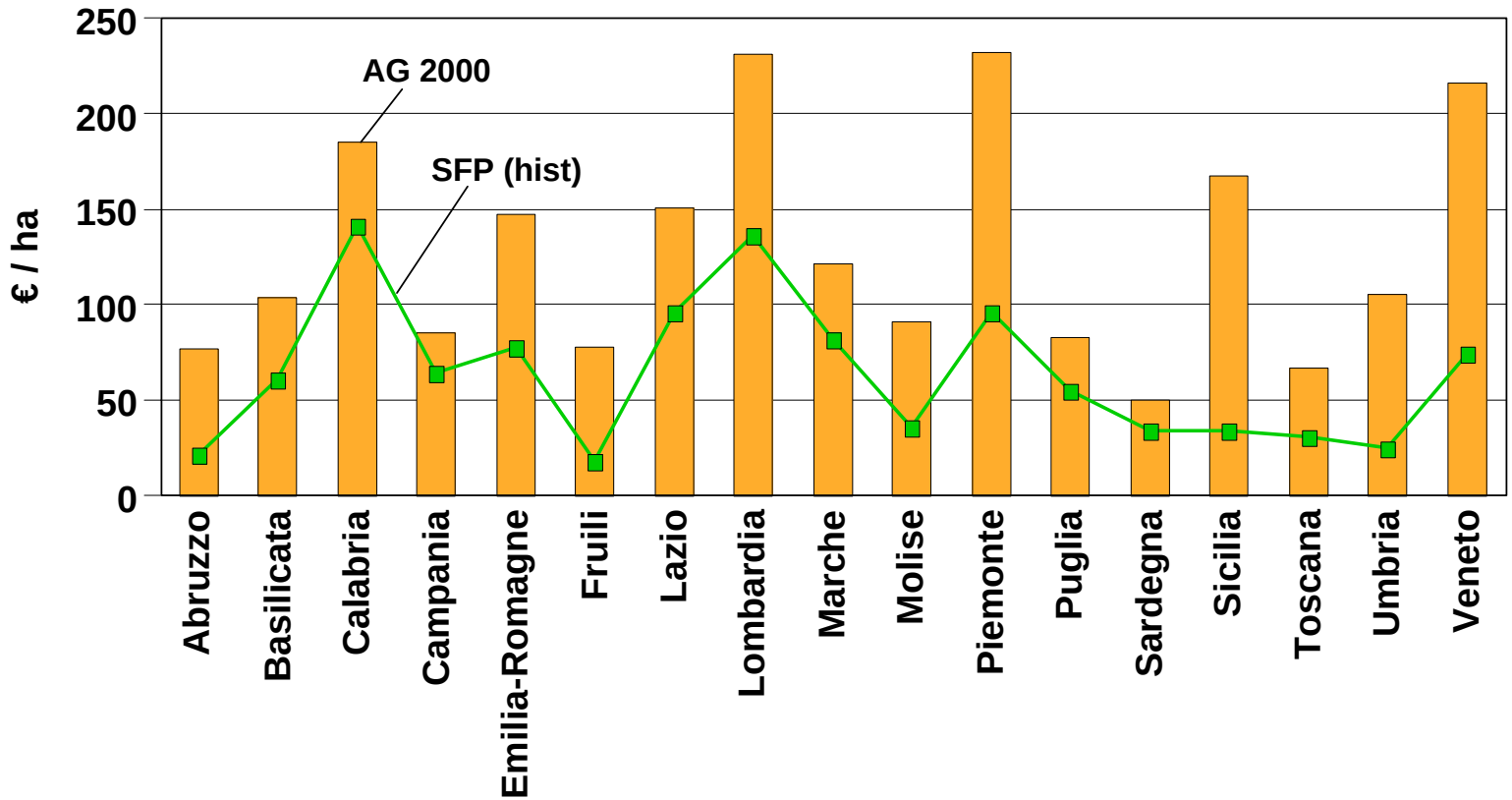
Source: U. Parma, Genedec D4.

Italy: Shadow prices for land



Source: U. Parma, Genedec D4.

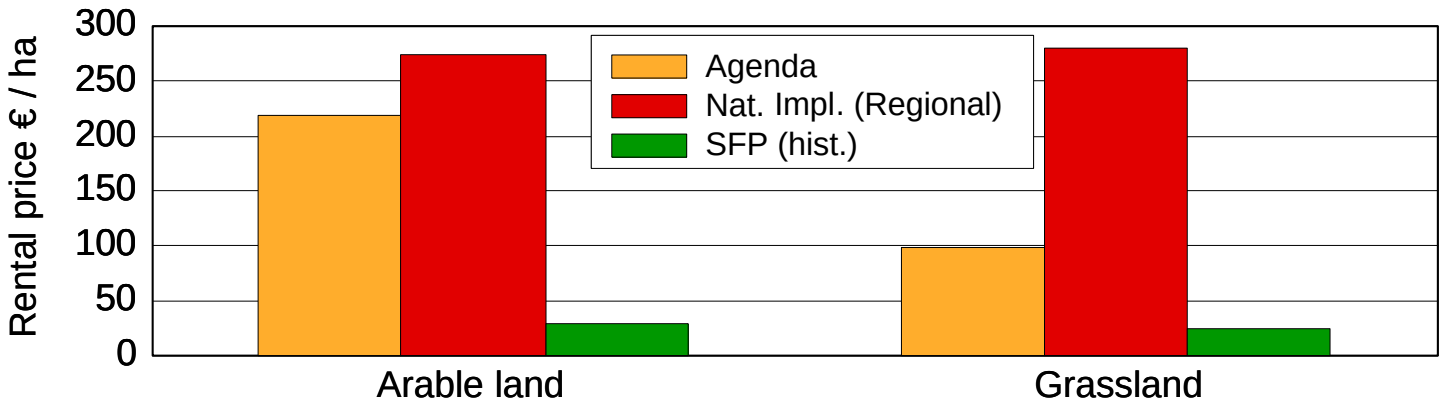
Italy: Shadow prices for land



Source: U. Parma, Genedec D4.

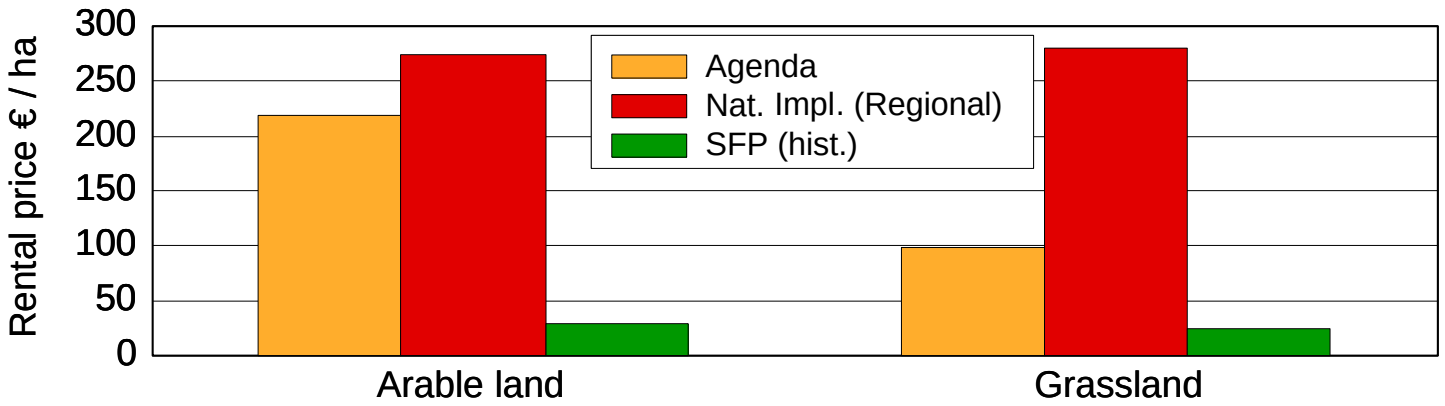
Impacts of decoupling on land shadow prices (Germany)

Impacts of decoupling on land shadow prices (Germany)



Source: FARMIS (2006).

Impacts of decoupling on land shadow prices (Germany)

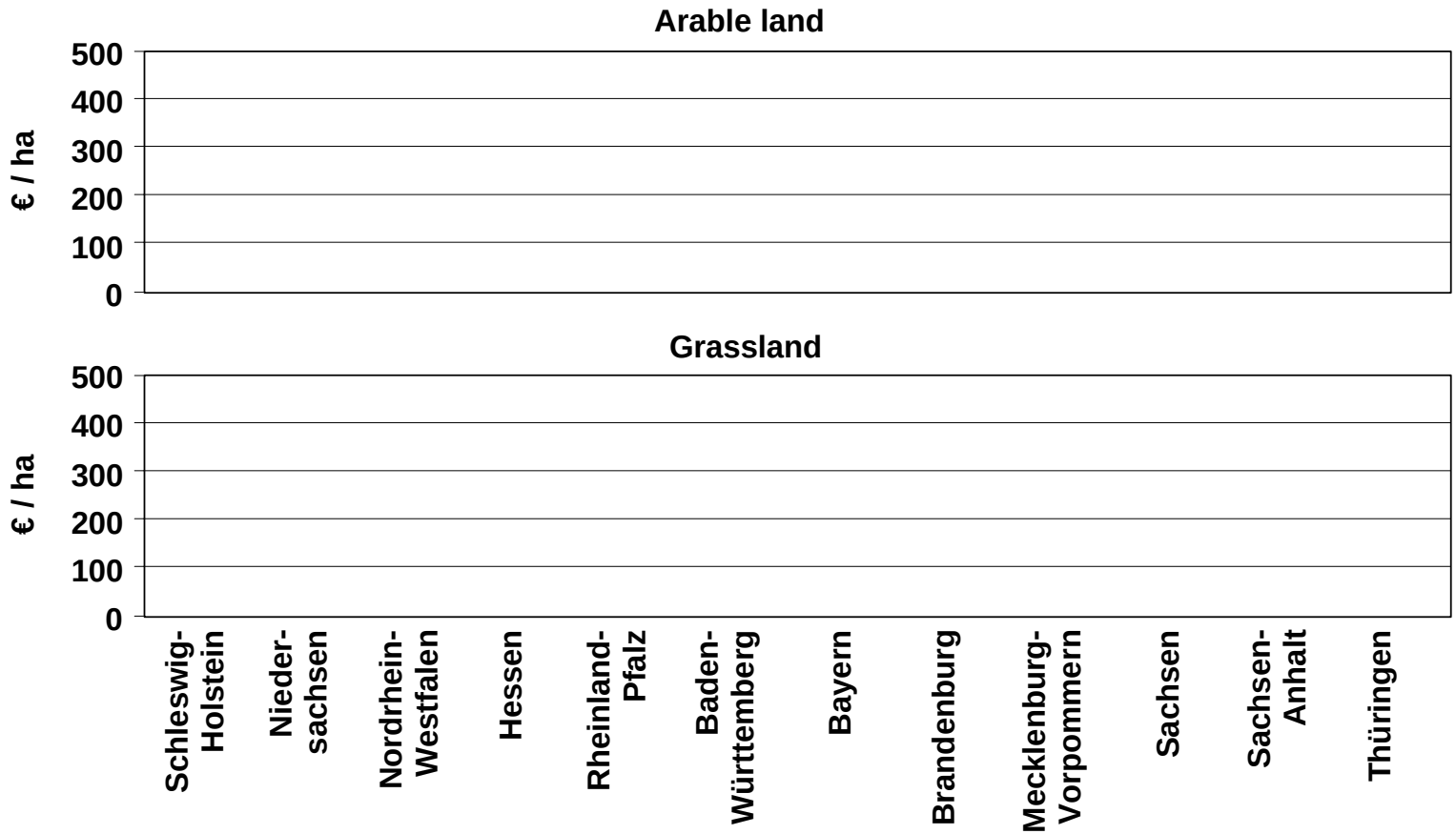


Impacts on net income

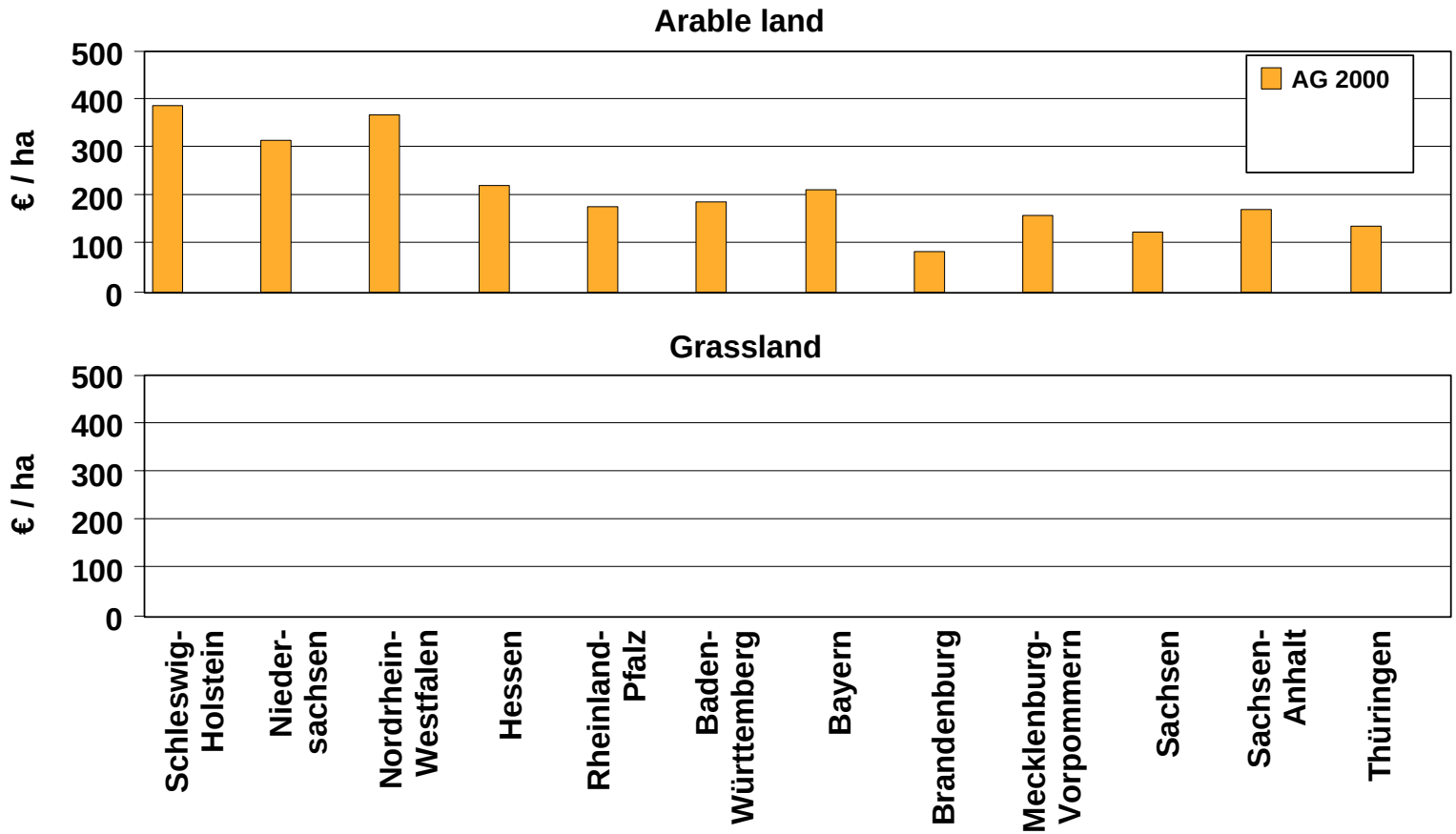
	Ref	Nat_Impl	SFP_hist
	Mio. €	Δ wrt Ref %	
FNVA	11,271	0,2	1,9
Net income	5,587	-15,1	32,1

Source: FARMIS (2006).

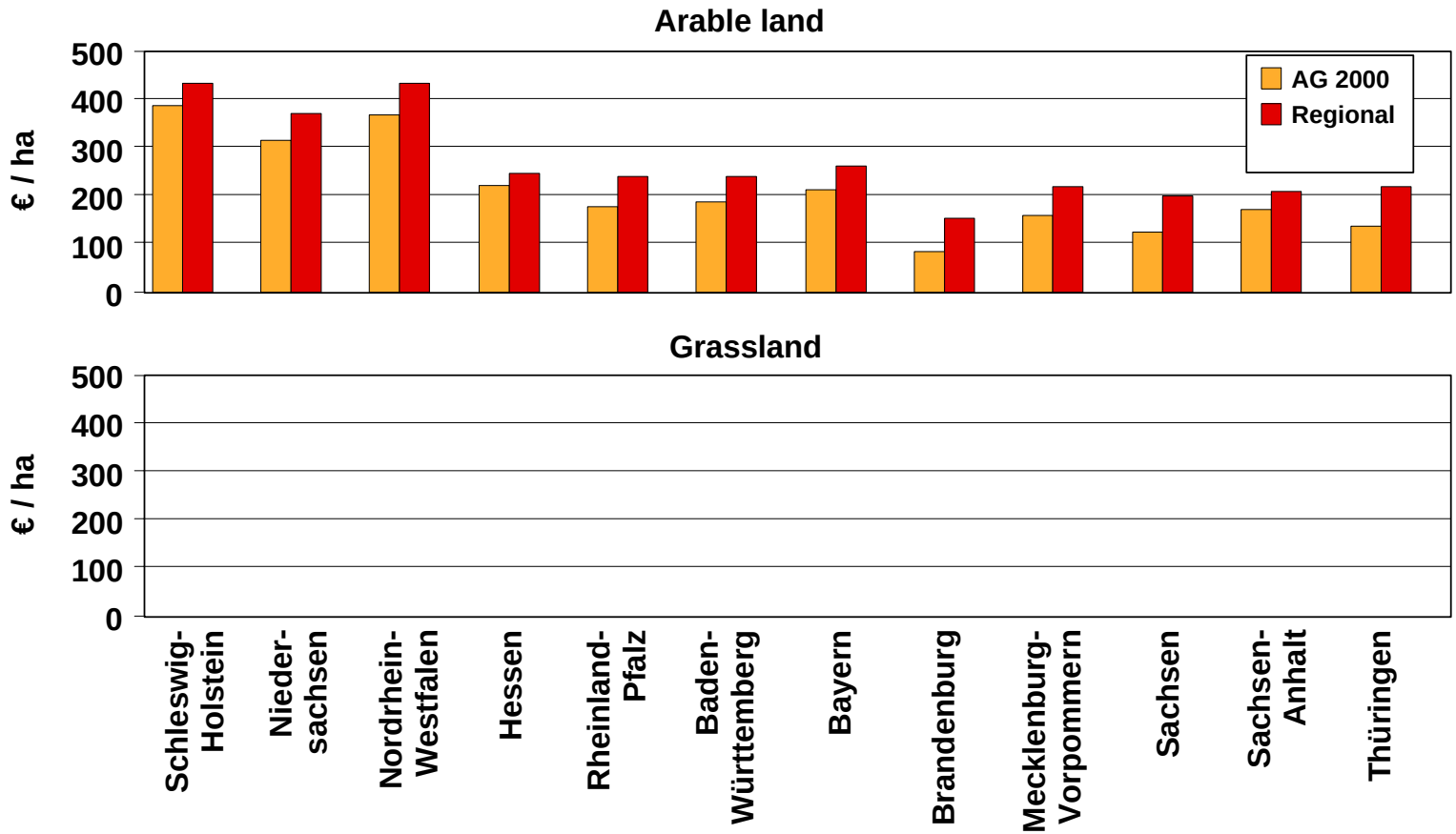
Germany : Shadow prices for land



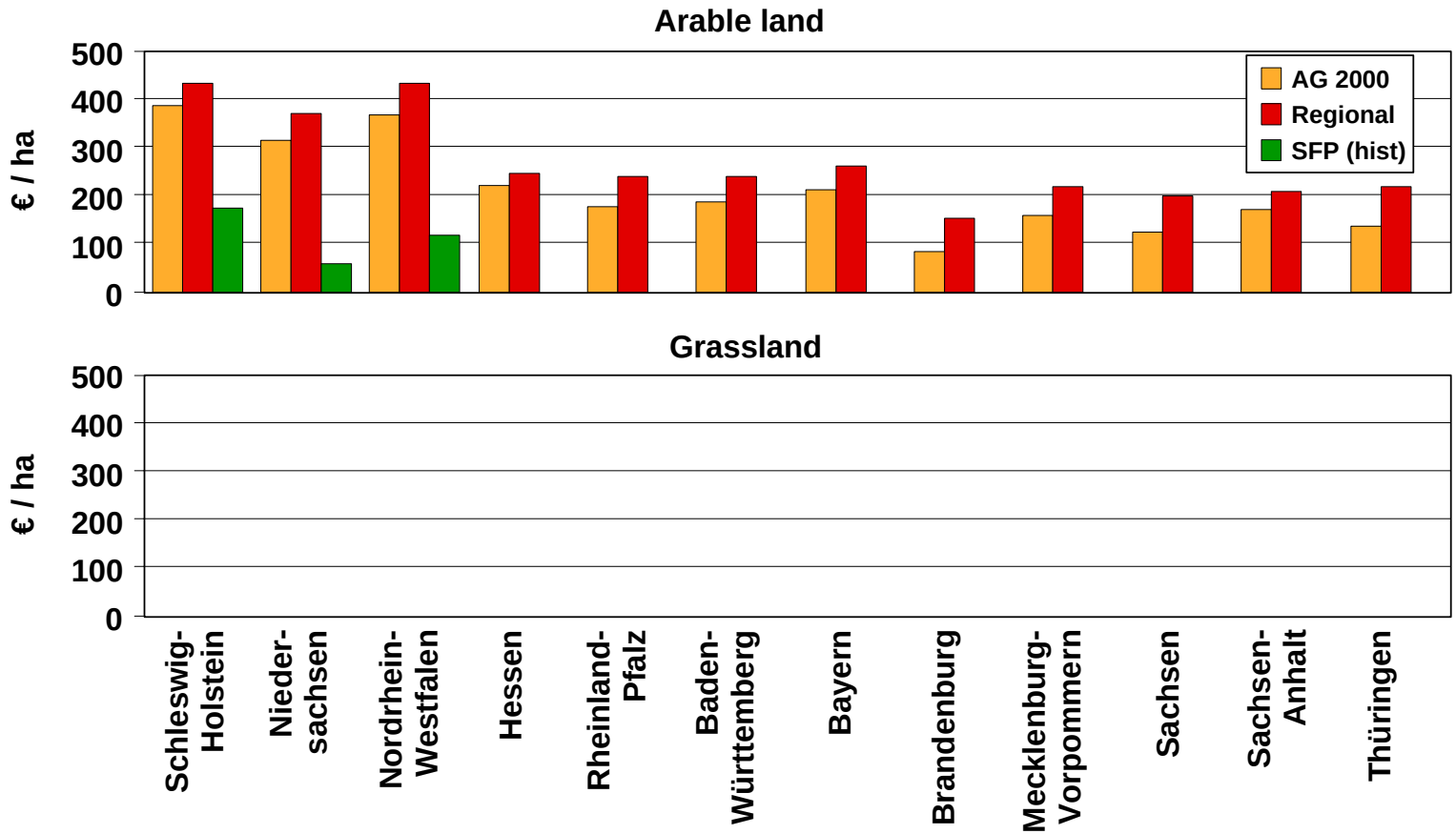
Germany : Shadow prices for land



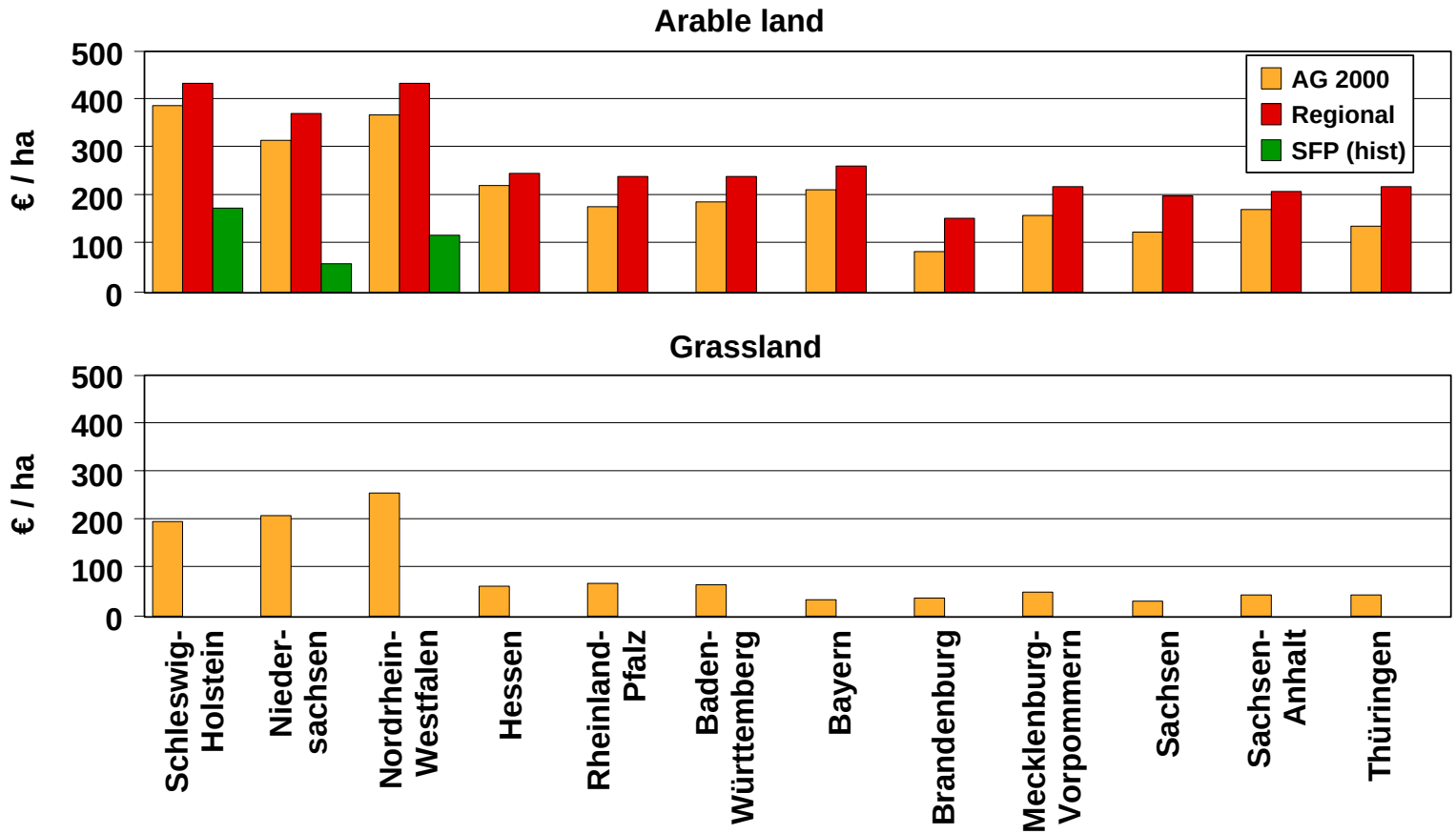
Germany : Shadow prices for land



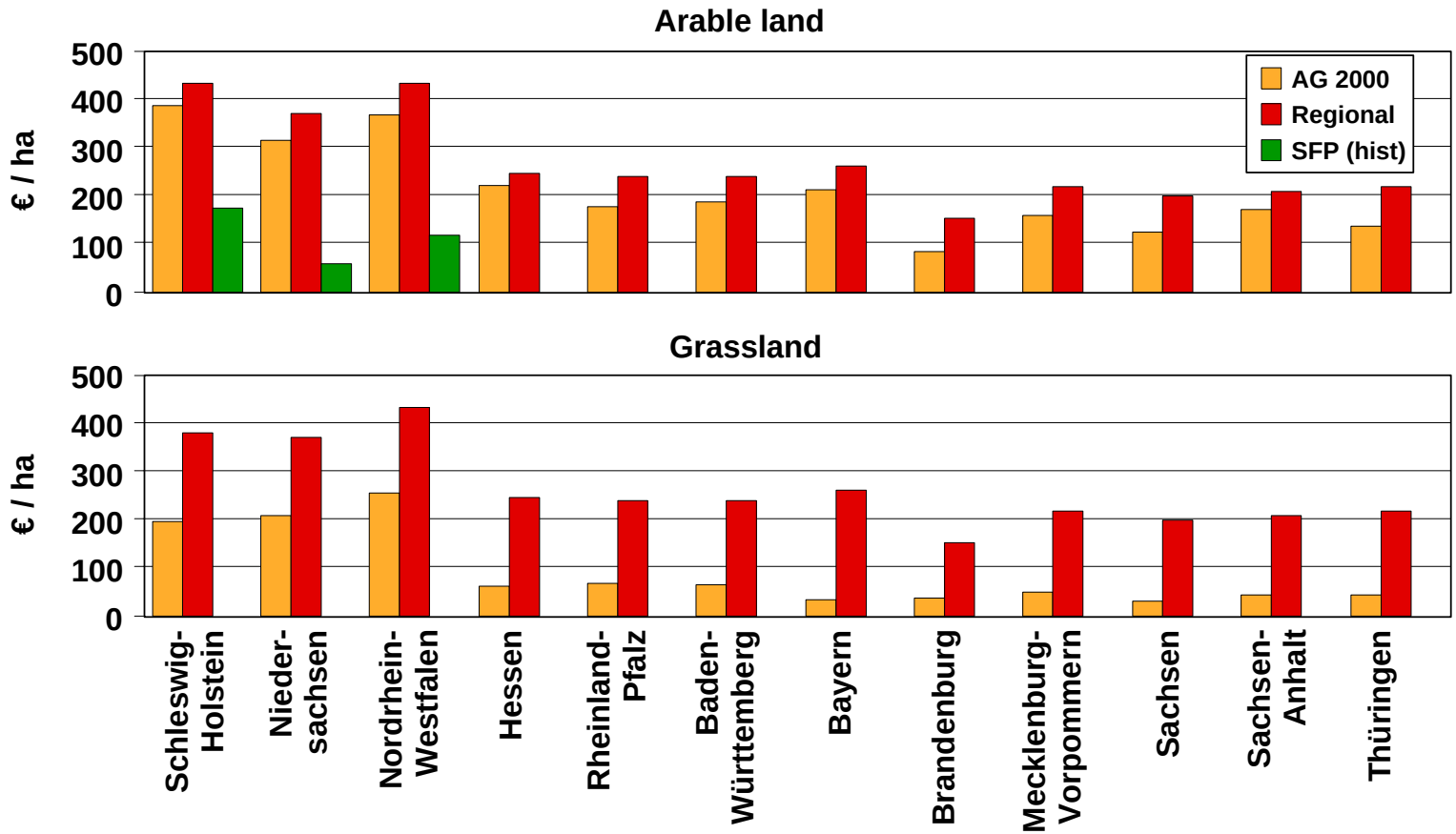
Germany : Shadow prices for land



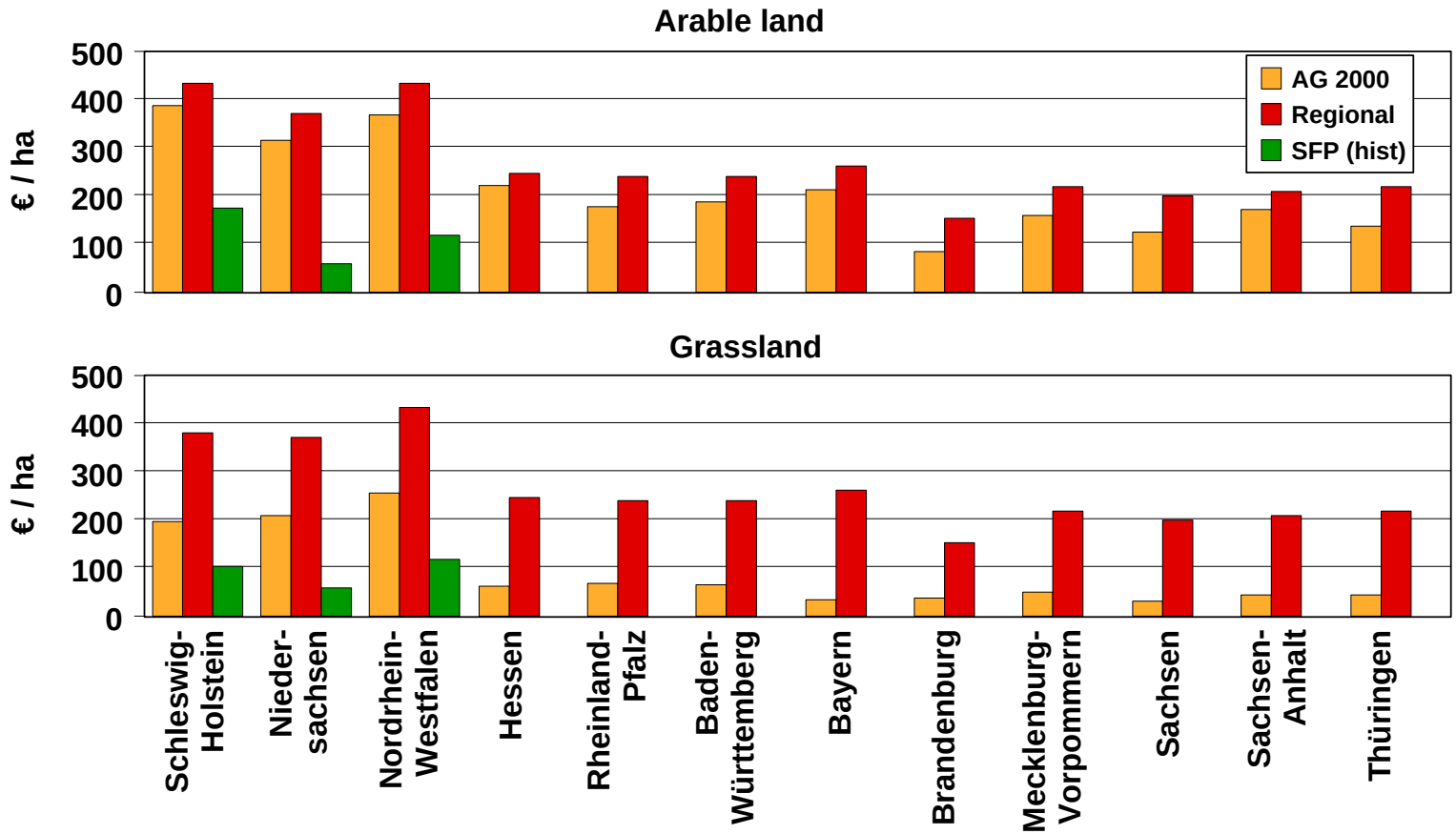
Germany : Shadow prices for land



Germany : Shadow prices for land



Germany : Shadow prices for land



- Change of dual land values (DV) depending on level of entitlements / number of entitlements and eligible hectares
  - n entitlements $<<$ n hectares $\Longrightarrow$ DV excl. entitlements (historic)
  - n entitlements $>>$ n hectares $\Longrightarrow$ DV including entitlements (regional)
  - ... in a static context
- Need for land market modelling including trade of entitlements, taking into account land ownership / structural change

Structural change, food chain, and regional convergence

Filippo Arfini

Overview

Objective of the WPs 4, 3, and 6

- Evaluate the impact of the decoupling on
- Structural change,
- Food chain and rural development,
- European Regions aggregation

The drivers

The socio economic implication and the strategies adopted by farmers and others economic agent in respect farm structure, land allocation, labor (family and hired), quality and participation in network.

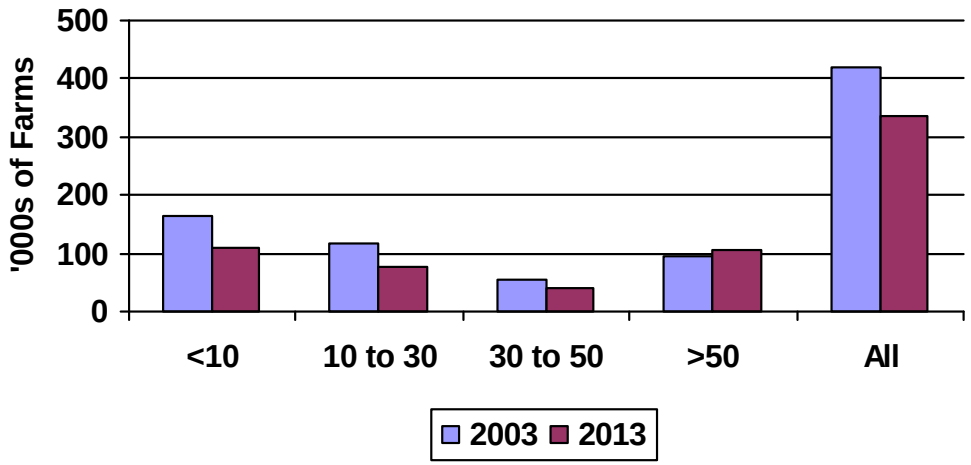
Farm size

- The bigger and most productive farms tend to increase in size with the result to be competitive through gains in the return of scale.
- The bigger and most productive farms tend to increase in size with the result to be competitive through gains in the return of scale.
- This general trend that has always existed in the agricultural world doesn't seem to be slowed down by decoupling. The results we obtained can not precise whether the trend of concentration accelerates with decoupling or not.
- This result is robust since concentration is observed in almost every type of farming, independently from geographical and pedoclimatic conditions.

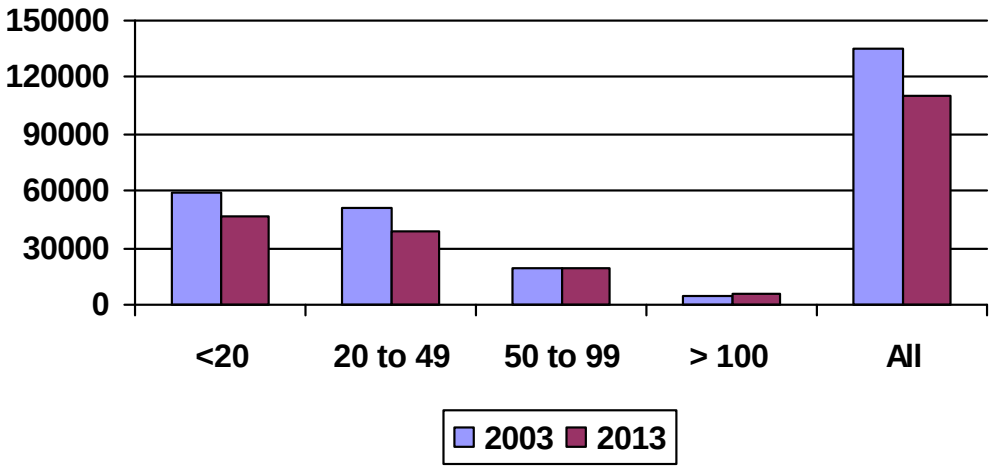
Farm specialization

- Decoupling could lead for the bigger most productive farms in fertile areas to an intensification and specialization of production, reinforcing the regional specialization.
- Smaller farms that manage to survive seem to prefer the diversification of their productions, in order to mutualize the risk and emphasize on the quality of their products, seeking to develop differentiated markets.

Current and projected farm size distribution by using Stationary Markov Chain



Germany



Ireland

The hypothesis is that each farmers play a role not inside to a "generic" market, but inside to a specific "food chain" and then the sustainability of the system is due to the capability of the food chain to react at the decoupling systems creating a new equilibrium that is not just economical.

The following case studies have been analyzed

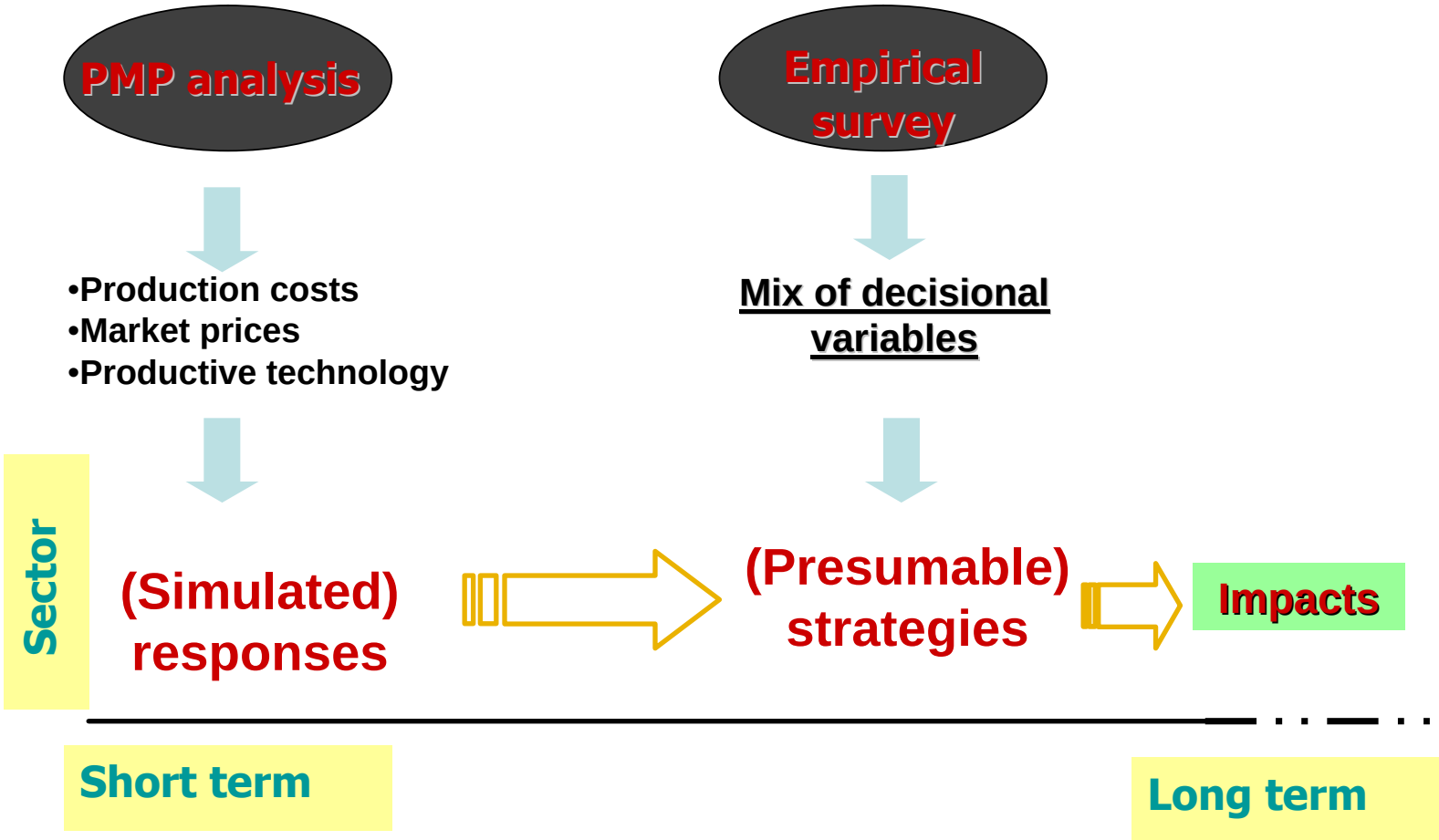
Italy

- ☐ Durum Wheat in Tuscany
- ☐ Parmigiano Reggiano cheese in Emilia-Romagna
- ☐ Beef sector (in Veneto)

Other countries

- ☐ Ireland - Milk
- ☐ Spain - Milk
- ☐ Germany - Rye
- ☐ France - Soft Wheat
- ☐ UK - Soft Wheat

Methodology for the socio-economic assessment

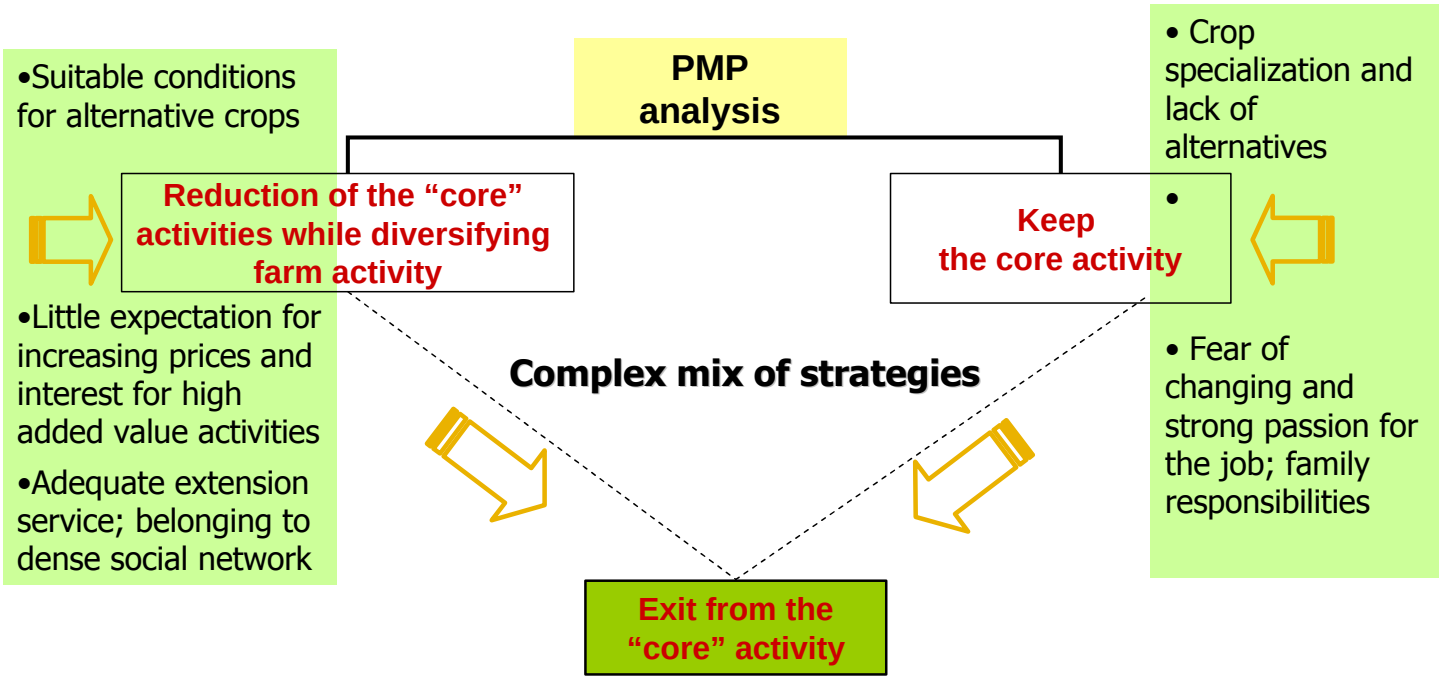


Effect on supply

Effect of decoupling on some relevant European food chains (Var. % with respect the baseline)

Main agricultural processes	Case Studies						
	Cereal food chain				Milk food chain		
	Durum Wheat in Italy	Soft Wheat in France	Soft Wheat in UK	Rye in Germany	Milk in Parmesan area	Milk in Spain	Milk in Ireland
	Small farms						
Cereals	-14,9	=	-8,4	-46,3	-20,3	-55	-100
Oilseeds	+51.5		-7,5	-87,2			
Fodder crops	+15.6		+5.2	+48.8	+8.6	+3.9	+1.5
Milk production					-3,9	-39.4	-0,2
	Big farms						
Cereals	-12,3	-2,9	-15	-20,4	=	-7	-64,6
Oilseeds	+39.8	-1,35	-11,7	-15,4			
Fodder crops	+12.8	+32.5	+4.9	+35.4	=	+1.5	+4.7
Milk production					=	-2,4	-0,1

Effect on farmers strategies



Effect on farmers strategies on Labor: the farm model results

The farm models based on PMP methdology show a reduction in the labor contribution of family in farm activities, much more in the small farms than in the bi farms. In general, SFP leads to less labor needs by the farm activities.

Effect of decoupling on farm labor
(Var. % with respect the baseline)

Type of labor	Case Studies						
	Cereal food chain				Milk food chain		
	Durum Wheat in Italy	Soft Wheat in France	Soft Wheat in UK	Rye in Germany	Milk in Parmesan area	Milk in Spain	Milk in Ireland
	Small farms						
Family labor	-7.8	=	-7.4	-28.7	-8.8	-31.3	=
Non-family labor		=	-21.0	-100.0			-7.4
	Big farms						
Family labor	-10.2	=	=	=	=	=	=
Non-family labor	-53.8	=	-20.3	-6.7	-0.6	-17.1	-0.2

Effect on farmers strategies on Labor: the results achieved by the household model

- Decoupling brakes the link between production and the payment and thus reduces the return to farm labour
- However - the decoupled payment increases the non-labour income of the household
- Econometric models using Irish FADN data shows that for majority decoupling increases the probability of non-farm work and reduces the probably of farm work
- Small farms are more affected by SFP, in term of reduction of the efforts dedicated to the farm activity. There is a risk of abandonment of the productive part of farm activity, where farmers would only work the land on minimum requirements in order to keep it eligible (good agricultural practices).

Main comments (1)

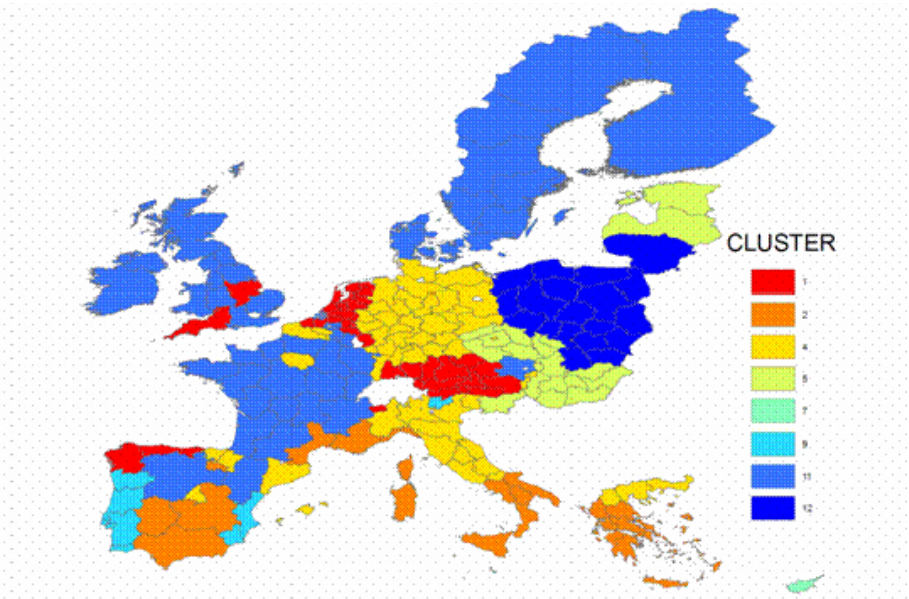
- Role of networks in defining the strategy of farmers: the discrepancy between model results and the predicted farmer strategy can be due to the lack of participation in a network where the information can flow among the participants.
- The responses given by holders are in part influenced by a strategic distortion due to the low level of information owned and by the incertitude about the future market scenarios (prices)
- Small farms are more affected by the SFP, in term of reduction of the efforts dedicated to the farm activity (risk of deactivation)
- SFP produces a reduction of the contribution of the hired and family labor
- Gross margin should increase, but the reduction agricultural product prices could strongly influence the farm revenue.

Main comments (2)

- Diversification of farmer production push to the birth of new economic possibility on the territory and to new "quality chain" inducing positive rural effect.
- Variation in supply effect food chain only when are highly dependent form local row material provider from local suppliers (Parmigiano Reggiano, small mills for Durum Wheat, cheese in Spain, bread with rye).
- Chain depend from national and international foodstuff are not effected by SFP and don't contribute to maintain agricultural local system (Part of the Durum Wheat, Soft Wheat in France and UK) with negative rural effect.
- Increase the role of the quality for lead also to increase the level of the competence and competition.
- Presence of institutional constraints (milk quota) influence reorganization of the sector and reduce efficiency.
- Need of better integration between actors along the chain and participation to networks

Do the CAP measures (decoupling) guarantee a social sustainability at territorial level for agriculture?

Results at territorial level in EU 25 show that this objective is not achieved everywhere. Decoupling will not imply a higher impact on socio-economic dynamics at territorial level



Basically, there is no change in the geography of the EU related to decoupling

New CAP, based on the single farm payment designed to serve multiple goals, is not likely to fully achieve any of them.

1. The effects of Agenda 2000, that represent the base for the application of the SFP of 2003 reform, have not significantly alter the geographical and economic patterns of support.
2. The CAP reform's impact on the EU-15 seems to be limited, while on the impact EU-25 is strong, induced by the enlargement of the beneficiaries.
3. The new CAP support policy has a rather limited impact on regional income disparities and falls short in making any substantial contribution to limiting regional income gaps.
4. For some aspects the Pillar I measures acts against social cohesion in the EU-25, since the majority of CAP expenditures are granted to the most prosperous regions.

For the Social Cohesion:

1. More emphasis on IIo Pillar with different policy and different instruments ;
2. More Integration of all policies at the territorial level

- Reaction by farm holder trough the adoption of new strategies that can vary in relation the character of the food chain and the family objectives and constraints;
- Reduction of workers in agriculture and exit of small farm, but increasing of part time and sustainability of farm household;
- Strong "fear" about price market evolution and "short" vision about the future;
- Need of integration and coordination inside the chain also by increasing the role of farmers "Product Organization" and their bargain power;
- Increase the level of divulgation and assistance (technical and economical) toward farmers in order to help diversification process and the definition of new strategic plan;
- Increase the level of divulgation and assistance (technical and economical) toward farmers in order to help diversification process and the definition of new strategic plan;
- Increase the level of quality for foodstuff and farm efficiency;
- Enforce the role of the Second Pillar in order to help small farms especially in LFA.

Controversial views

Pierre-Alain Jayet

Short run efficiency

- Entitlement should be kept as far as possible from production and factors, if not, choice in outputs and inputs are dramatically dependent on entitlement linked to anyone of them
- Distorted effects are socially costly
- The final" step of decoupling should be the "bond scheme" ...
- ... but possible transfers make the bonds less and less socially accepted when shareholders are more and more far from the agricultural systems

Options for the future

- Past CAP experience on agricultural market regulation (already paid by taxpayers and consumers), useful for the future
- First attempt on environmental regulation more and more integrated in the CAP
- New stakes : raw product prices, specially energy, which could lead agriculture to supply more and more new non-food outputs
- Strong irreversible effects could occur with land abandonment
- There should be the need of a less manipulable as possible asset on which entitlement should be related
- Is it something better than land to attest that the entitlement is used for agricultural activities ?