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Claire Mosnier, Anaïs Boutry, Michel M. Lherm, Jean Devun

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ANNUAL MEETING  
OF THE EUROPEAN FEDERATION OF ANIMAL SCIENCE



# Sensitivity of beef cattle farms to weather hazards according to their forage systems



C. Mosnier , M. Lherm, J. Devun

- 1 : INRA, UMR1213 Herbivore, F-63122 Saint-Genès Champanelle
- 2 : Institut de l'Élevage, 9 allée Pierre de Fermat, F-63170 Aubière

# Introduction



- Importance of grassland in suckler cow system
- Currently : a public fund compensates farmers in the event of agricultural calamities
- Replaced by private pasture yield insurance?
  - **Obj1: Quantify the impacts of grassland yield variability on farm production and on economic results**
- In theory diversification of forage systems decreases farm exposure to weather risks and enhance flexibility
  - **Obj2 : Is variability reduced in farms with forage crops or silage grass?**

# Method



- Descriptive analysis of real farm data
- Indicator of pasture yield variation = variation of the total quantity of grass harvested by livestock unit relative to farm average value
- Farm typology of forage system
  - « Forage crop » : forage crops > 1% of forage area
  - « silage » : silage represents more > 15% of the pasture area harvested in 1st cut
  - « hay only »

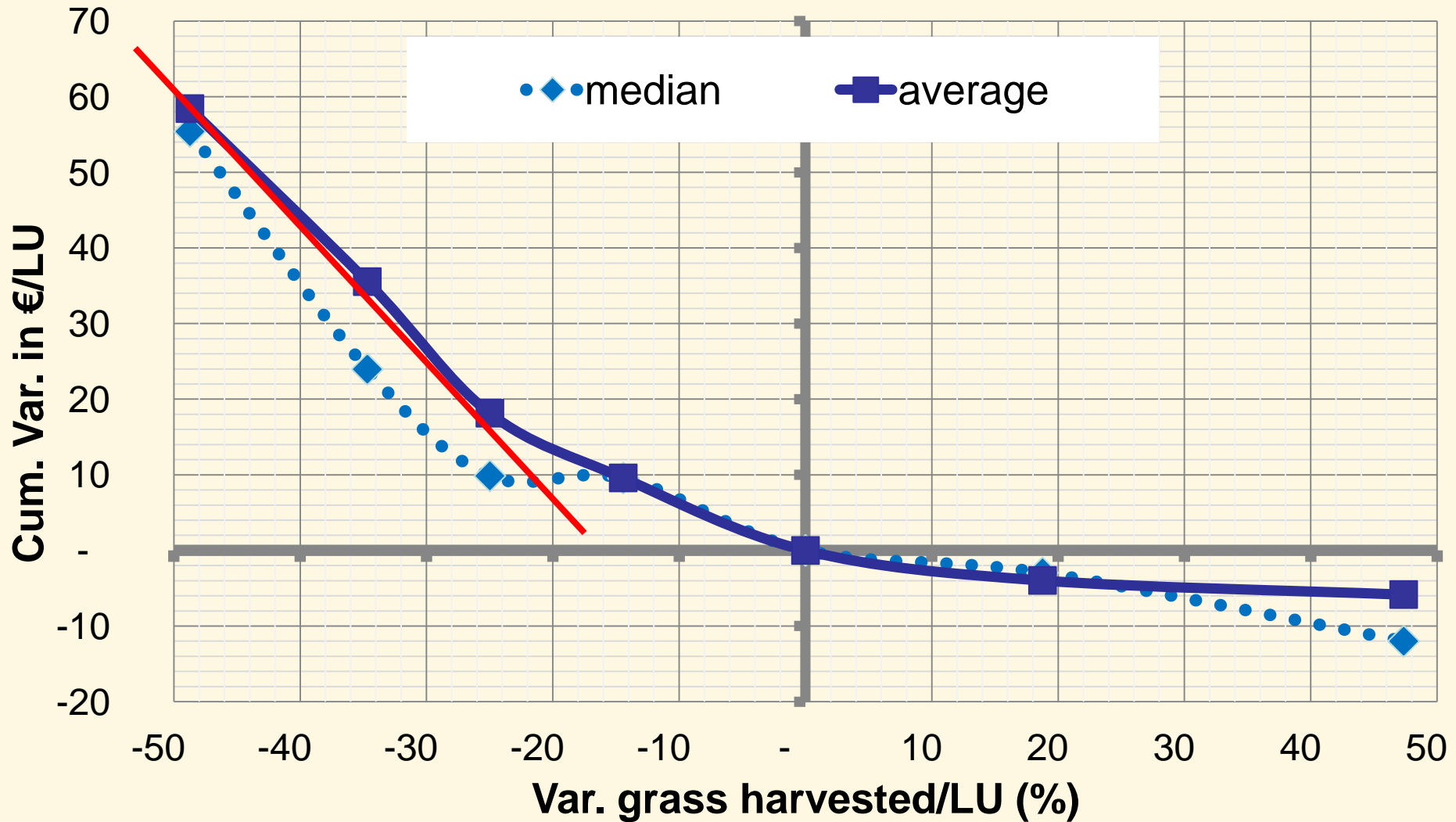
# Data

- French national panel data base from « Réseaux d'élevage »
  - Economic and technical Farm Data over the period 2000-2009
- Farm re-sampling
  - Farm present > 5 years
  - Regions where the three forage systems are present
  - Farm specialized in beef production and selling mostly lean males

	Forage Crop	grass silage	Hay	total
Nb of observations	627	464	444	1535
UAA (ha)	129	128	125	128
Livestock Unit	128	124	100	119
forage crop (% forage area)	6	0	0	3
male fattening (%)	24	11	14	18

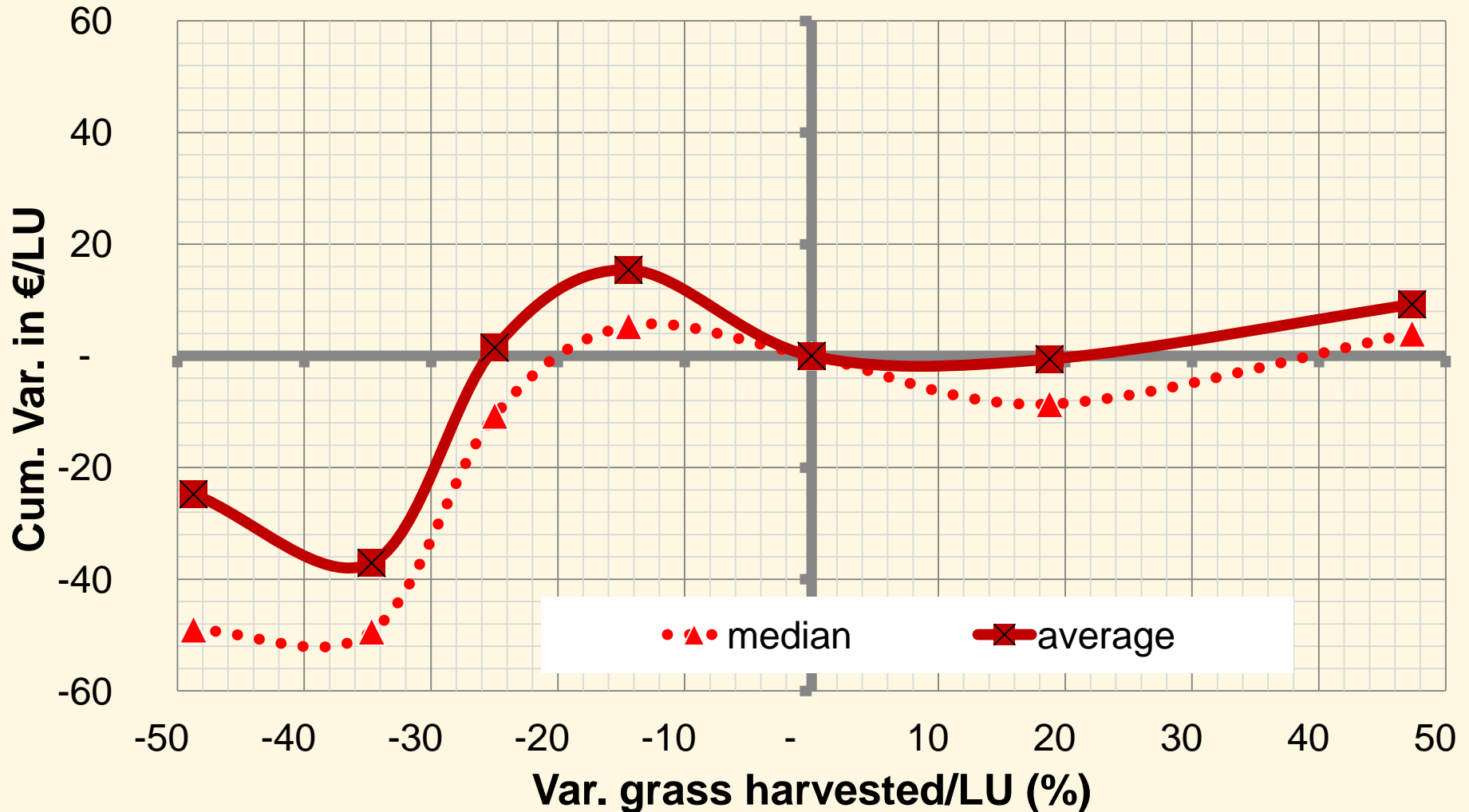
# Results: impact of grass production variation

- Cumulated variation of **production costs** (€/LU)



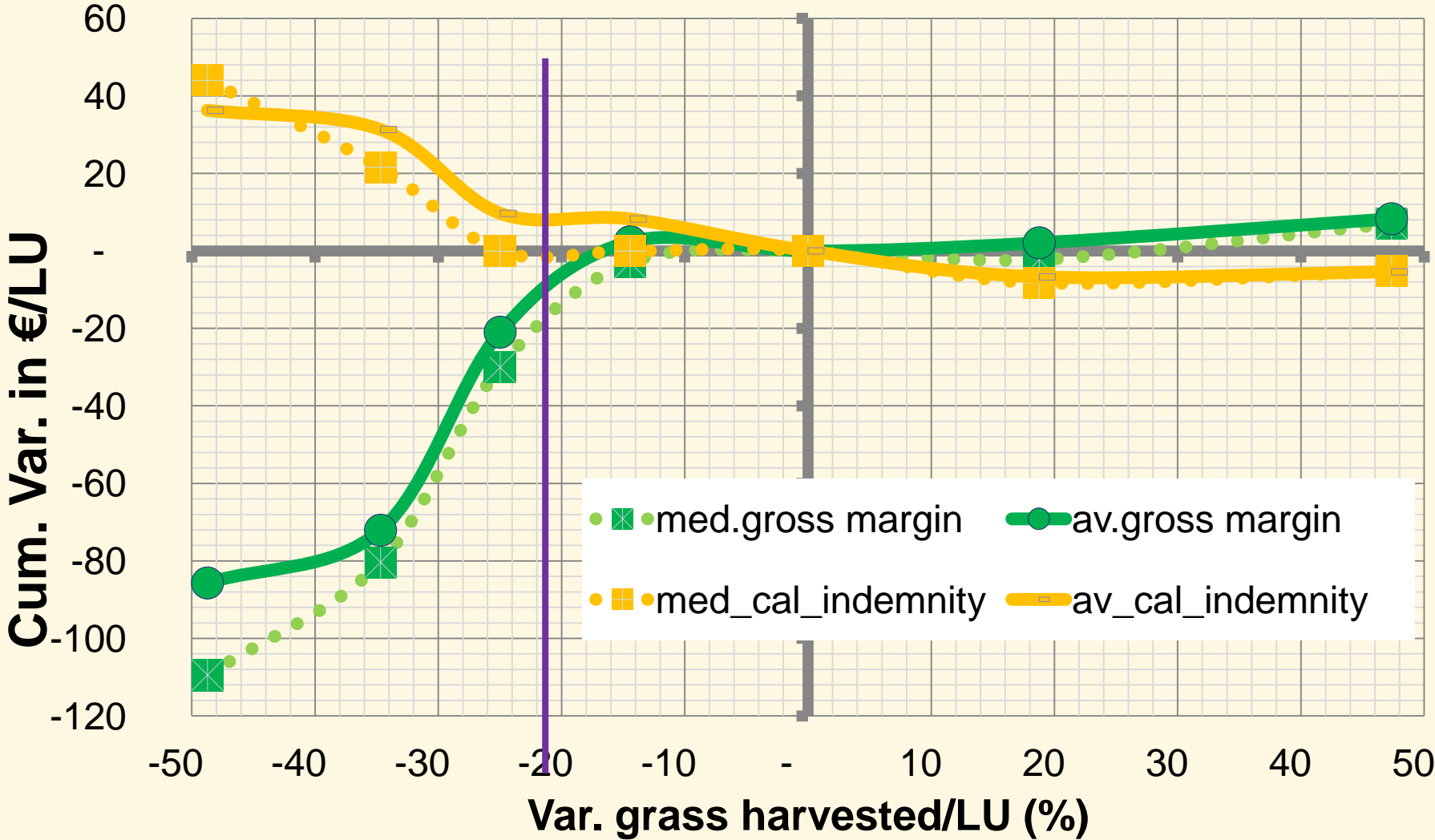
# Results: impact of grass production variation

- Cumulated variation of animal and forage area receipt (€/LU)



# Results: impact of grass production variation

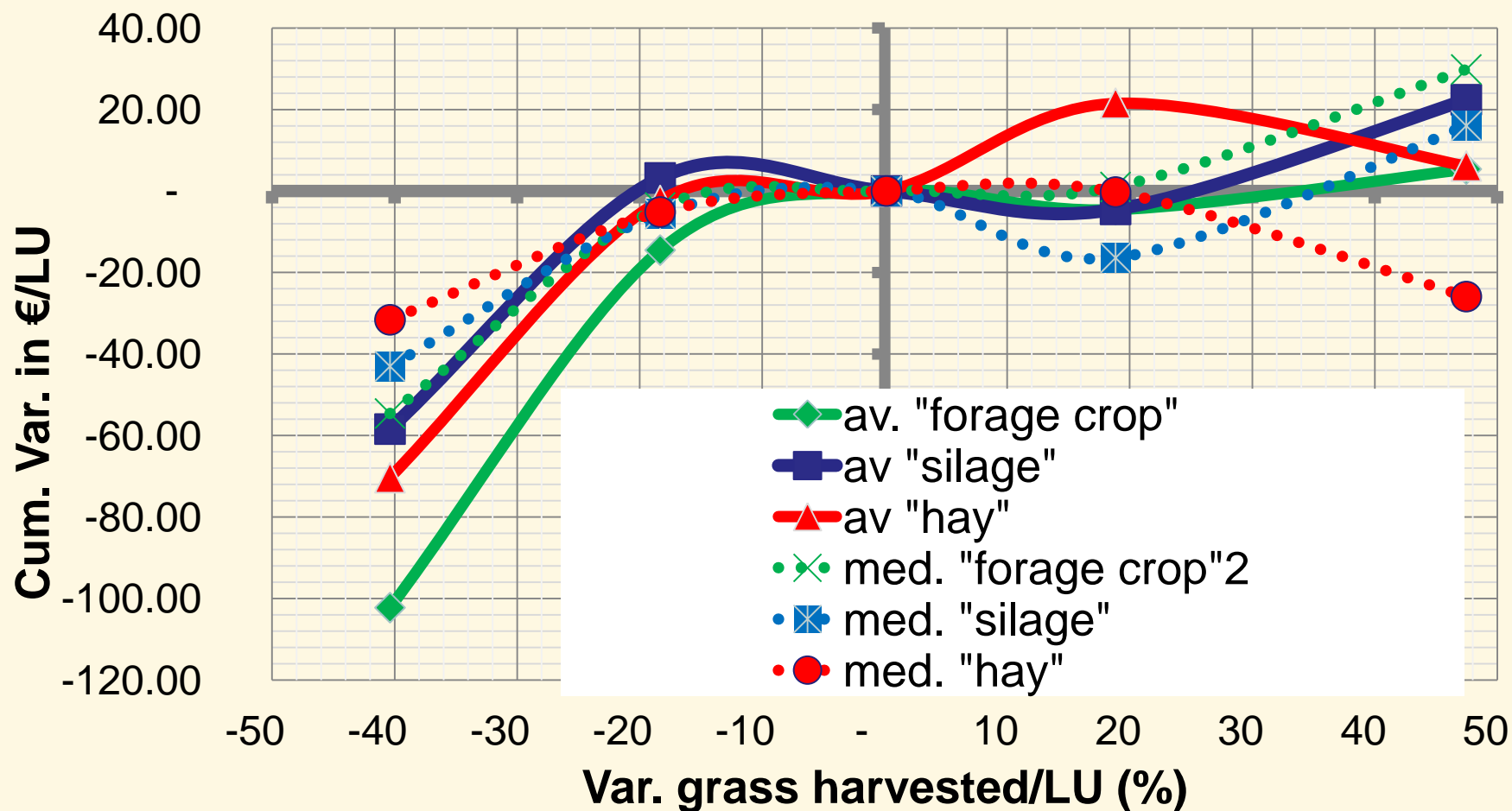
■ Cumulated variation of **gross margin** (€/LU)





# Results : differences between forage systems

- Cumulated variation of **gross margin** (€/LU)



# Results : differences between forage systems

	Average			Inter annual Standard deviation		
	Forage crop	Silage	Hay only	Forage crop	Silage	Hay only
Receipt /LU	639	647	573	78	75	84
Op. cost/LU	288	285	209	46	48	42
GM/LU	351	362	365	82	80	87
Net profit/WU	18 516	17 737	23 038	11 195	10 981	14 428

Note: Tukey test : significantly *highest* and *lowest* value at 5% confidence

# Conclusion : main results

## ■ Pasture yield variability

➤ Economic resilience of suckler cow farm for variation of grass harvested per LU above -20%, but important impact below -20%

## • Forage system

-No clear advantage of forage crops and silage grass in reducing exposure to risk nor in improving average economic result

# Conclusion : limits and perspectives



## ■ Limits

- Importance of overall variability : structural farm changes, price variability, market crisis
- Accuracy of grass production estimation by farmers ?

## ■ Perspective

- Differences of sensitivity between regions, farm size, forage stock..?
- Methodology :
  - More integrative econometric methods
  - Mathematical programming modification



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