

# Organic farming as a sustainable food production system and contributor to the climate change mitigation.

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## INTRODUCTION

### How organic agriculture brings sustainable measures?

- Agriculture must meet the twin challenge of: feeding a growing population while minimizing its global environmental impacts.
- Organic farming- a system aimed at producing food with minimal harm to ecosystems, animals or humans- is often proposed as a solution.

## OBJECTIVES

- Prove the improvement of soil characteristics grown organically.
- Evaluate and compare the performance behavior of organic and conventional yields.
- Show the nutritional and health benefits that can bring organic food consumption.
- Examine whether there is a difference in the organoleptic properties of organic food vs. conventional food.
- Verify if organic production reduces the environmental pollution and the emission of greenhouse gases associated to agriculture.

## RESULTS

Table 1: Comparison of organic vs. conventional farming. (studies summary)

Parameters	Organic farming vs convencional	Autors
Soil characteristics	Increase 0,35% of nitrogen and 2,5% of carbon Hard soils stability 20 to 40% higher	Pimentel <i>et al</i> , 2005
	Increase 159,4% microbial biomass Increase 21,6% of carbon and 30,2% of nitrogen	Reganold <i>et al</i> , 2010
Crop yields	Increase 50-60% efficiency in the use of fertilizers	Mader <i>et al</i> , 2002
	Increase (after 9 yr) between 18 and 19%	Teasdale <i>et al</i> , 2007
	Reduction of 25% in organic yields More infiltration and water retention capacity	Seufert <i>et al</i> , 2012
Reuction of contaminants	Reduction of nitrates in chinese cabbage	Raigón <i>et al</i> , 2002
	Reduction of nitrates in potatoes	Hajšlová <i>et al</i> , 2005
	Reduction of nitrates in grapefruit	Lester <i>et al</i> , 2007
Increase of nutrients	Higher concentration of Vit. C, Fe, Mg, P	Worthington, 2001
	Superiority 10 to 50 times in Ca, Mg, P, Fe	Heaton, 2002
	Increased antioxidant activity	Baranski, 2014
Sensory quality	Increased total sugars (more sweetness)	Rembiałkowska, 2000
	Improvment in smell, taste and crumb elasticity	Bjørn i Fruekilde, 2003
	Better taste, appearance and general acceptance	Reganold <i>et al</i> , 2010

## CONCLUSIONS

- The high organic matter levels in OA help to conserve soil resources and are beneficial soil during drought years.
- The performance of organic farming in general tends to be lower. Still can get closer to the conventional agriculture over time and under certain environmental conditions and handling practices.
- Organic plant products have a substantially lower concentration of nitrates and a higher content of nutritionally significant minerals than that found in the same products obtained by conventional agriculture.
- Organic agriculture offers multiple opportunities to reduce greenhouse gas emissions and counter global warming. For ex, reduces energy requirements by 25 to 50% compared to conventional agriculture.
- In order to fully benefit from the advantages of organic agriculture, the social, economic and institutional aspects also need to be considered.

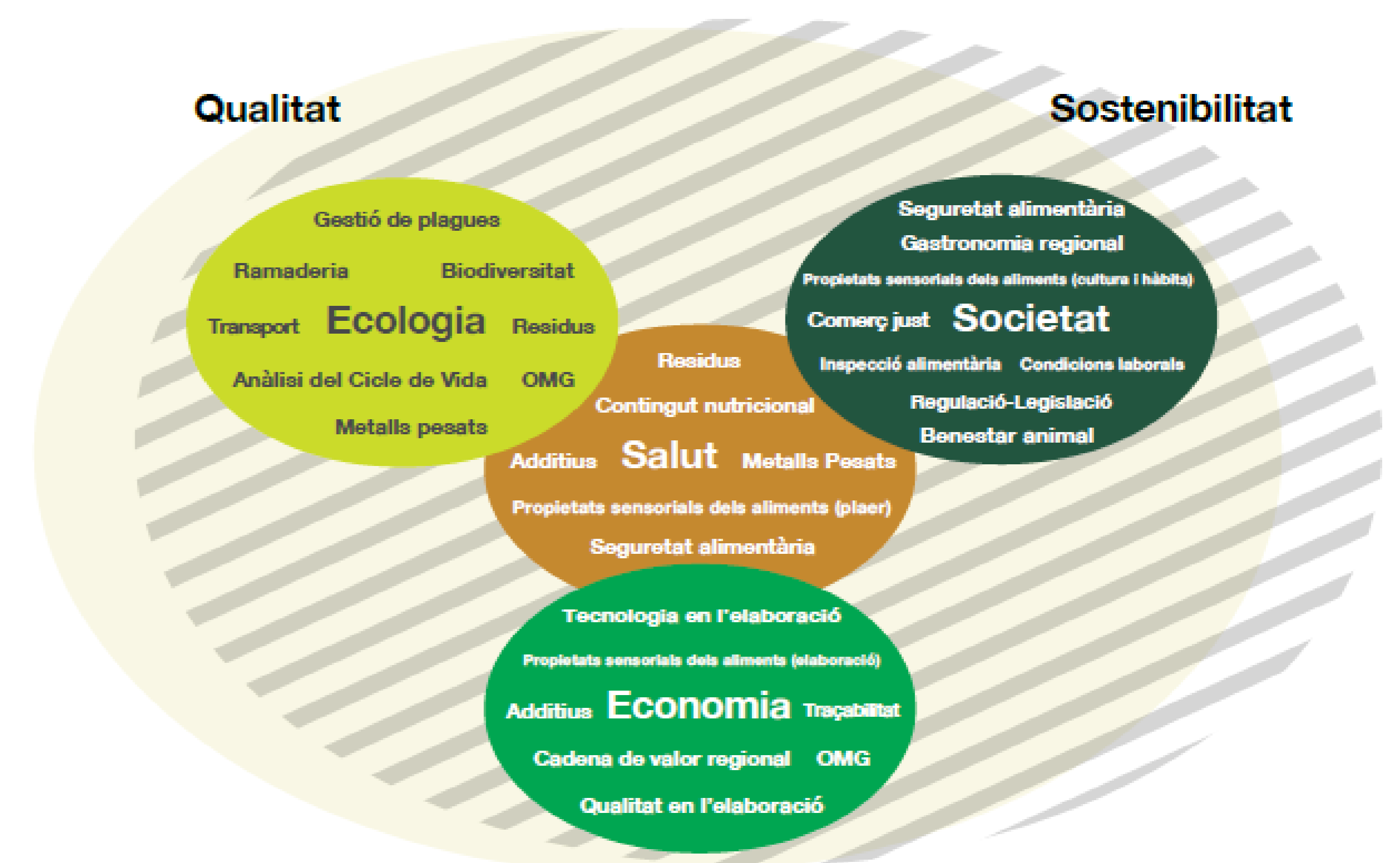


Figure 1: Relationship between sustainability and quality. Source: Riagón (2008)

## METODOLOGY



Figure 2: Agroecological land (Montseny) Source: J.Plaixats

