

# **Economic analysis of organic vs. conventional citrus production in Spain**

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# SCOPE OF STUDY



**Pluriannual crops: Orange, Mandarin**  
**Valencia Province**  
**Small farms**

**Number of plots in study:**

	Oranges	Mandarins
conventional	1,225	2,275
organic	11	14

# INDICATORS



- **Net Actual Value (NAV)**
- **Internal Rate of Return (IRR)**
- **Recuperation Time (RT)**

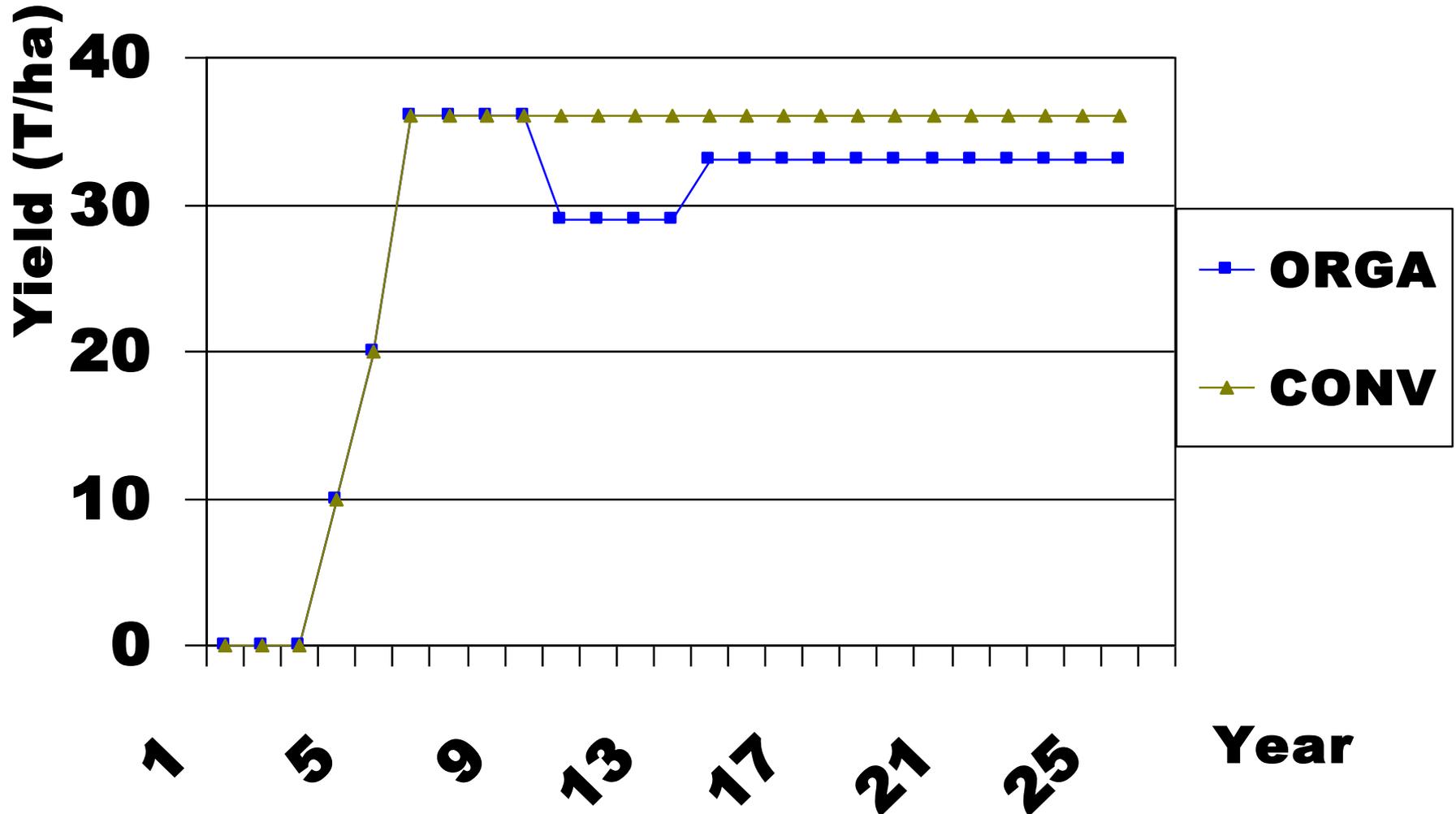
# **HYPOTHESES**



- **Time horizon = 25 years**
  - **Formation = 5 yrs**
  - **Full production = 20 yrs**
- **Conversion after 10 years**
- **Rented equipment**
- **No subsidy for organic**

# MAIN DIFFERENCES IN YIELDS

## Oranges



# MAIN DIFFERENCES IN YIELDS



<b>Yield (T/ha)</b>	<b>Conventional</b>	<b>Organic</b>	<b>Difference</b>
<b>Orange (Y1)</b>	<b>36</b>	<b>29</b>	<b>-20%</b>
<b>Orange (Y+4)</b>	<b>36</b>	<b>32.5</b>	<b>-9.7%</b>
<b>Mandarin (Y1)</b>	<b>28</b>	<b>22.5</b>	<b>-19.6%</b>
<b>Mandar. (Y+4)</b>	<b>28</b>	<b>25</b>	<b>-10.7%</b>

# MAIN DIFFERENCES IN COSTS

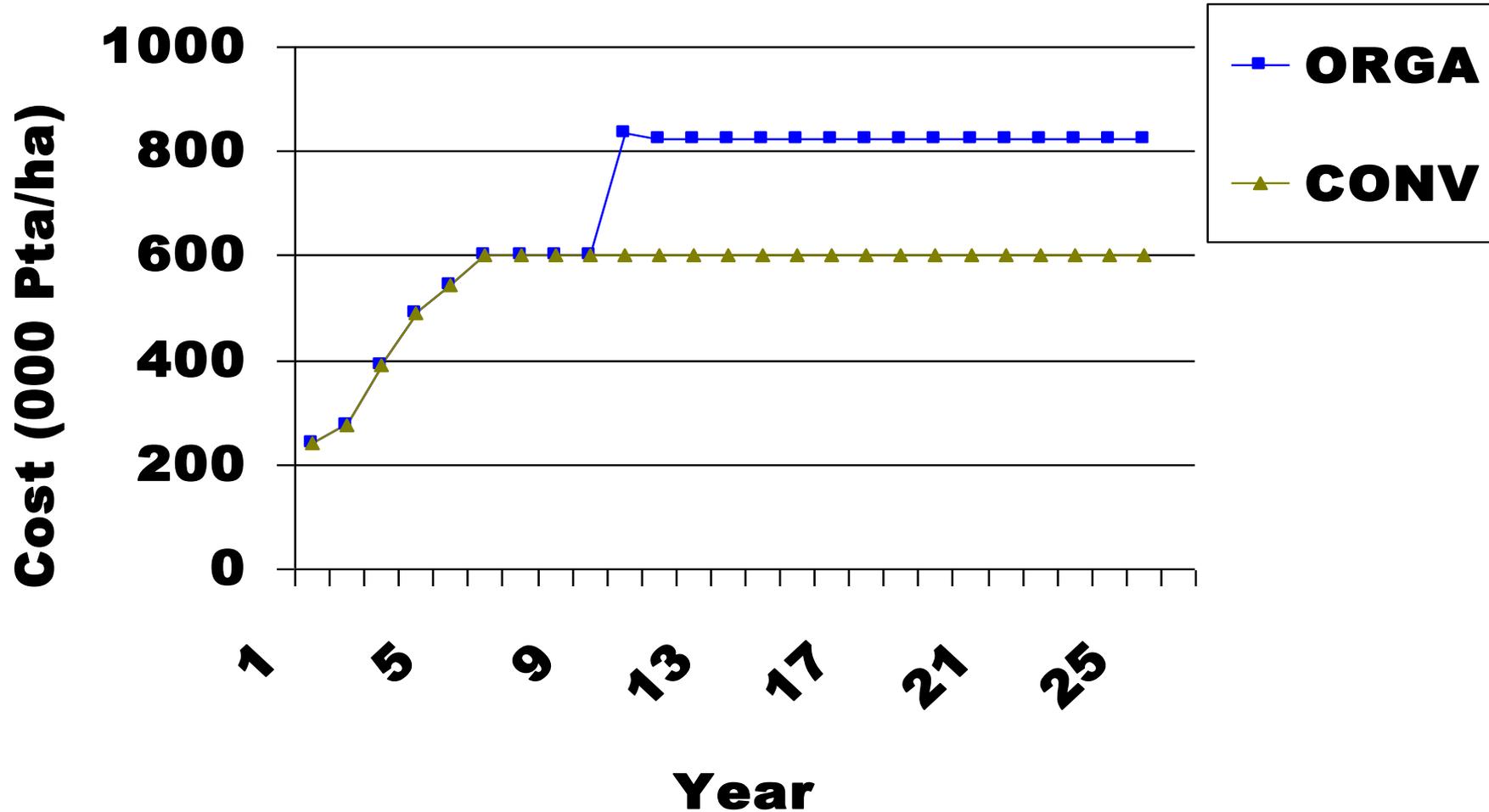
## Oranges



<b>Cost (Ptas/ha/yr)</b>	<b>Conventional</b>	<b>Organic</b>	<b>Difference</b>
<b>Fertilizers</b>	75,000	165,000	120%
<b>Pesticides</b>	135,000	13,000	-90%
<b>Labour</b>	173,000	433,000	150%
<b>Certification</b>	0	1,000	-
<b>Other</b>	417,000	411,000	-1.4%
<b>Total</b>	800,000	1,023,000	27.9%

# MAIN DIFFERENCES IN COSTS

## Oranges



# Financial Analysis



## Hypotheses:

- ⌘ Markets in surplus situation
- ⌘ Inflation = 2.5%
- ⌘ Cost increase = 1%
- ⌘ Org price premium
- ⌘ No subsidy for organic
- ⌘ No grower price variation

# Financial Analysis

	Orange (conv)		Orange (orga)	
	IRR	12,40%	IRR	10,14%
act. rate	NAV	Recuper. Time	NAV	Recuper. Time
3%	2.799.604	11	1.755.467	14
4%	2.250.987	12	1.331.022	15
5%	1.785.531	12	972.779	15
6%	1.388.985	13	669.121	16
7%	1.049.797	14	410.670	18
8%	758.556	14	189.819	21

# Financial Analysis

	Mandarin (conv.)		Mandarin (organic)	
	IRR	17,00%	IRR	15,94%
Act. rate	NAV	Recup. Time	NAV	Recup. Time
3%	6.680.638	8	6.139.639	8
4%	5.642.241	8	5.137.559	8
5%	4.756.158	8	4.286.810	8
6%	3.996.630	9	3.561.214	9
7%	3.342.728	9	2.939.582	9
8%	2.777.376	9	2.404.688	9

# Sensitivity of Analysis



- ⌘ Profitability of both systems depends on prices and costs
- ⌘ **Profitability of organic systems more sensitive to variations in these factors**
- ⌘ Sensitivity higher for oranges than for mandarins

# Effect of price premium Oranges

Organic price premium	IRR (organic)	IRR (conventional)
+ 40 %	15.29	12.40
+ 30 %	12.87	12.40
+ 20 %	10.14	12.40
+ 10 %	6.70	12.40
0	Negative	12.40

# Effect of price premium Mandarins

Organic price premium	IRR (organic)	IRR (conventional)
+ 40 %	20.80	17
+ 30 %	18.51	17
+ 20 %	15.94	17
+ 10 %	13.04	17
0	9.66	17

# CONCLUSIONS

## Organic citrus in Spain

⌘ **Conventional more profitable  
(current conditions)**

⌘ **But difference is small**

⌘ Difference more marked for orange than  
for mandarin

⌘ Organic more sensitive to variations in  
prices and costs

⌘ Organic more profitable only if price  
premium > 30%

# CONCLUSIONS



## Key parameters to analyse:

⌘ Fall in yields

☑ Recovery possible; improve techniques

⌘ Difference in costs

☑ **Labour**, organic matter, certification (1st yr)

⌘ Differences in prices (premium may drop)

**All these factors vary over time**

**=> consider various scenarios**