



# Valutazione economica della riduzione degli input nella coltivazione protetta in Europa

Workshop : Risultati del progetto europeo

“Euphoros - Efficient Use of inputs in Protected HORTiculture”

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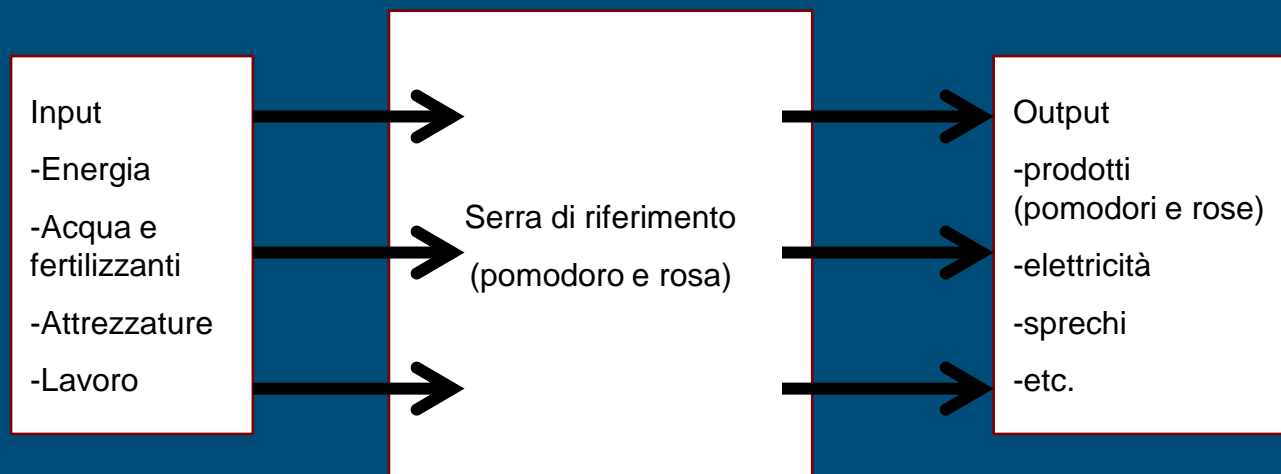
- Valutazione economica - introduzione
- Scenari e opzioni
- Sistemi di crescita chiusi
- Volume ridotto e maggiore durata dei substrati di crescita
- Nuovi tipi di serre multi-tunnel con ventilazione migliorata
- Webtool – Modello di simulazione economica
- Domande



# Valutazione economica – analisi costi-benefici

- Descrizione della situazione di riferimento: tutti i costi e benefici

Delimitazione  
sistema:  
livello aziendale



- Descrizione delle opzioni: costi specifici e benefici
- Indicatori economici:
  - risultato finanziario netto: bilancio benefici e costi
  - periodo di ammortamento: tempo in cui l'investimento è ripagato
  - capacità di investimento: investimento calcolato relativamente al bilancio aziendale

# Scenari e opzioni per ridurre gli input



## ■ Scenari

- 1. Pomodoro in serra multi-tunnel (Spagna/Italia)
- 2. Pomodoro in serra Venlo (Olanda)
- 3. Rosa in serra Venlo (Olanda)



## ■ Scelte di riduzione degli input per lo scenario 1

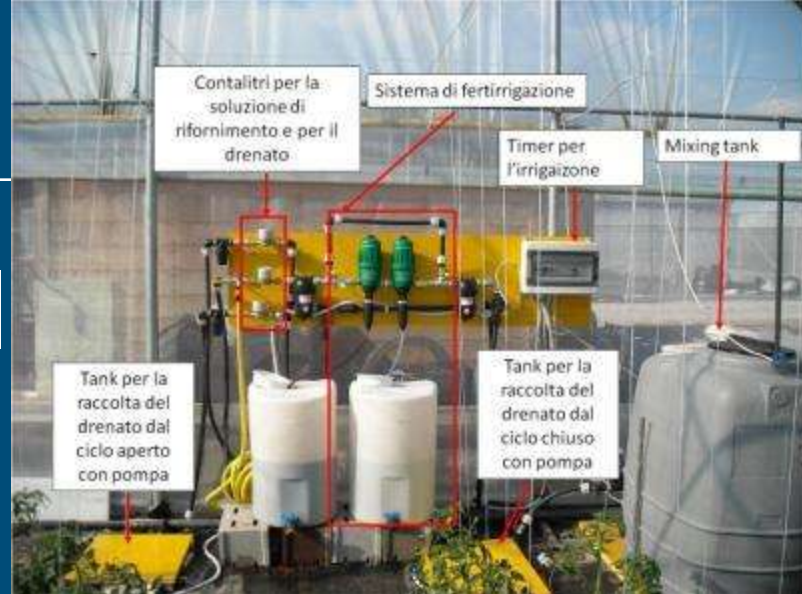
- Sistema di crescita chiuso
- Volume ridotto e maggiore durata dei substrati di crescita
- Nuovi tipi di serre multi-tunnel con ventilazione migliorata

# Sistema di crescita chiuso per il pomodoro

## Investimento e costi annui dei sistemi di coltivazione chiusi (€)

Componente del sistema	Investimento	Costo per ha /anno	Investimento	Costo per ha /anno
Scelta per ridurre gli input	Sistema chiuso		Sistema chiuso	
	Analisi chimiche di laboratorio		Analisi chimiche con quick test	
			Filtrazione UV (disinfezione)	
<b>Costi fissi</b>				
Filtro lento a sabbia	2500	250		
Componenti idraulici	5000	500		
Filtrazione UV			17500	2625
Filtrazione a sabbia grossa			5000	500
Quick tests			800	160
Costi di mantenimento		375		1165
Interessi		290		580
<b>Sub totale</b>		<b>1315</b>		<b>5030</b>
<b>Costi variabili</b>				
Analisi chimiche		600		160
Scansione DNA		600		600
Reagenti per analisi rapide				50
<b>Sub totale</b>		<b>1200</b>		<b>810</b>
<b>Costi totali</b>		<b>2515</b>		<b>5840</b>
<b>Risparmio di H2O+concimi</b>		<b>4650</b>		<b>4650</b>
<b>Risultati finanziari</b>		<b>2135</b>		<b>-1190</b>
<b>Periodo di ammortamento</b>		<b>2.4</b>		<b>8.7</b>

Source: UNIPI, Italy; Quantitative Information Greenhouse Horticulture 2010, 2010



Photos:  
UNIPI,  
Italy



- Sito test: Pistoia, Italia
- Azienda: 1 ha





# Volume ridotto e maggiore durata dei substrati crescita

Sacco di perlite dopo 3 anni di  
coltivazione

Risparmio substrati con maggiore durata e volume ridotto (€)			
Substrato in sacco (perlite)	Riferimento	Opzione 1	Opzione 2
	3 anni di vita	Riduzione 25% volume	4 anni di vita
Sacchi per ha	4650	4650	4650
Investimento (€/unità)	1.80	1.42	1.80
Investimento (€ totale)	8370	6591	8370
Deprezzamento (%)	33.3	33.3	25.0
Mantenimento+interessi (%)	7.5	7.5	7.5
Costo (€/ha)	3420	2690	2720
Risparmio ((€/ha)	-	730	700



Foto: Perlite Italiana, Milano, Italy

Source: EEFC, Almeria, Spain

- Scenario: Serra multi-tunnel, Spagna
- Pomodoro
- Azienda: 1 ha



# Euphoros webtool

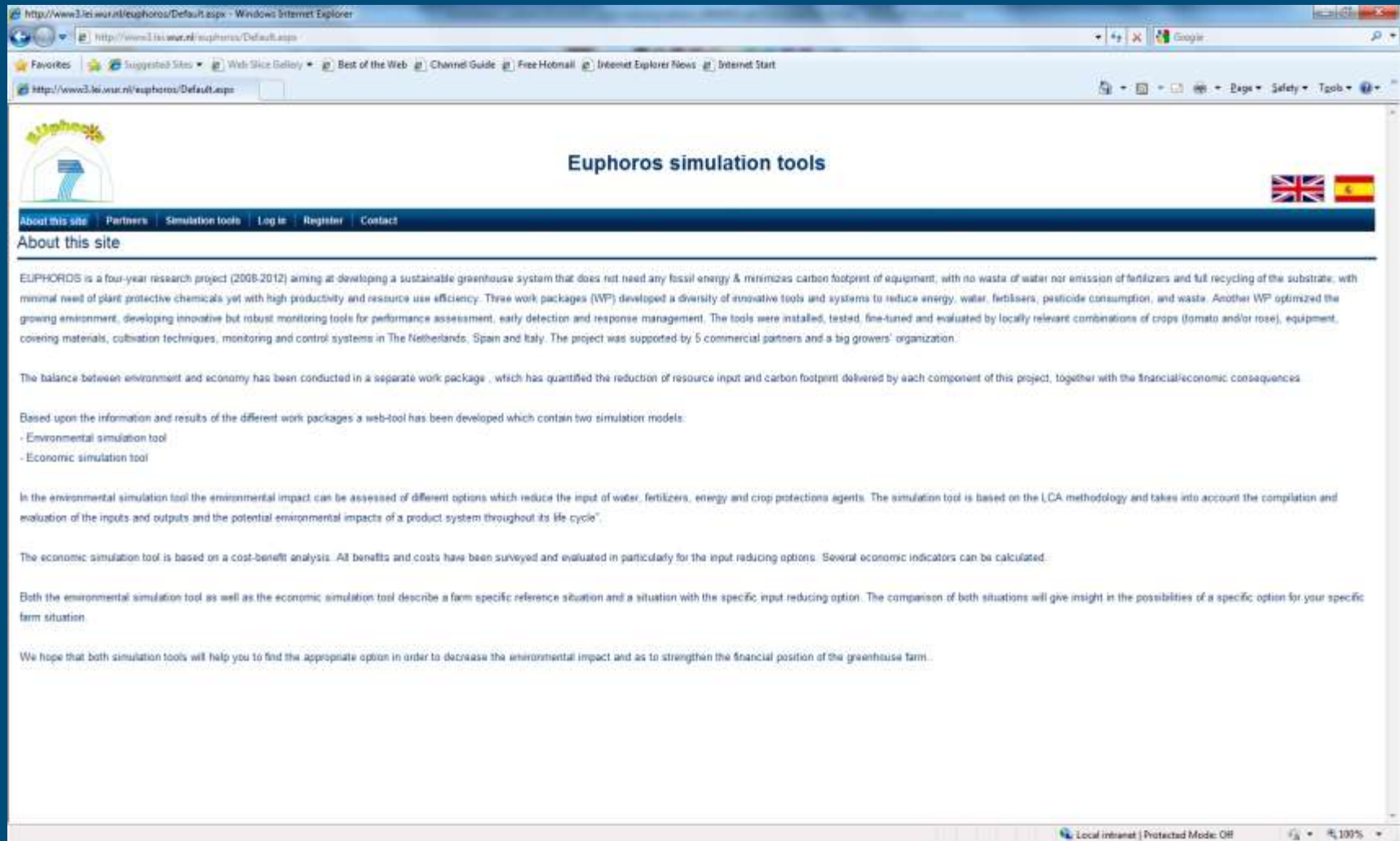
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Strumento di simulazione ambientale

**Strumento di simulazione economica > demo**



# Webtool – Strumento di simulazione economica



The screenshot shows a web browser window displaying the 'Euphoros simulation tools' website. The browser's address bar shows the URL 'http://www3.tni.wur.nl/euphoros/Default.aspx'. The website features a logo on the left and a navigation menu with links for 'About this site', 'Partners', 'Simulation tools', 'Log in', 'Register', and 'Contact'. The main content area is titled 'About this site' and contains several paragraphs of text describing the EUPHOROS project, its goals, and the simulation tools developed. The text mentions that the project aims to develop a sustainable greenhouse system with minimal fossil energy use and high productivity. It also notes that the simulation tools are based on LCA methodology and cost-benefit analysis.

**Euphoros simulation tools**

[About this site](#) | [Partners](#) | [Simulation tools](#) | [Log in](#) | [Register](#) | [Contact](#)

### About this site

EUPHOROS is a four-year research project (2008-2012) aiming at developing a sustainable greenhouse system that does not need any fossil energy & minimizes carbon footprint of equipment, with no waste of water nor emission of fertilizers and full recycling of the substrate, with minimal need of plant protective chemicals yet with high productivity and resource use efficiency. Three work packages (WP) developed a diversity of innovative tools and systems to reduce energy, water, fertilizers, pesticide consumption, and waste. Another WP optimized the growing environment, developing innovative but robust monitoring tools for performance assessment, early detection and response management. The tools were installed, tested, fine-tuned and evaluated by locally relevant combinations of crops (tomato and/or rose), equipment, covering materials, cultivation techniques, monitoring and control systems in The Netherlands, Spain and Italy. The project was supported by 5 commercial partners and a big growers' organization.

The balance between environment and economy has been conducted in a separate work package, which has quantified the reduction of resource input and carbon footprint delivered by each component of this project, together with the financial/economic consequences.

Based upon the information and results of the different work packages a web-tool has been developed which contain two simulation models:

- Environmental simulation tool
- Economic simulation tool

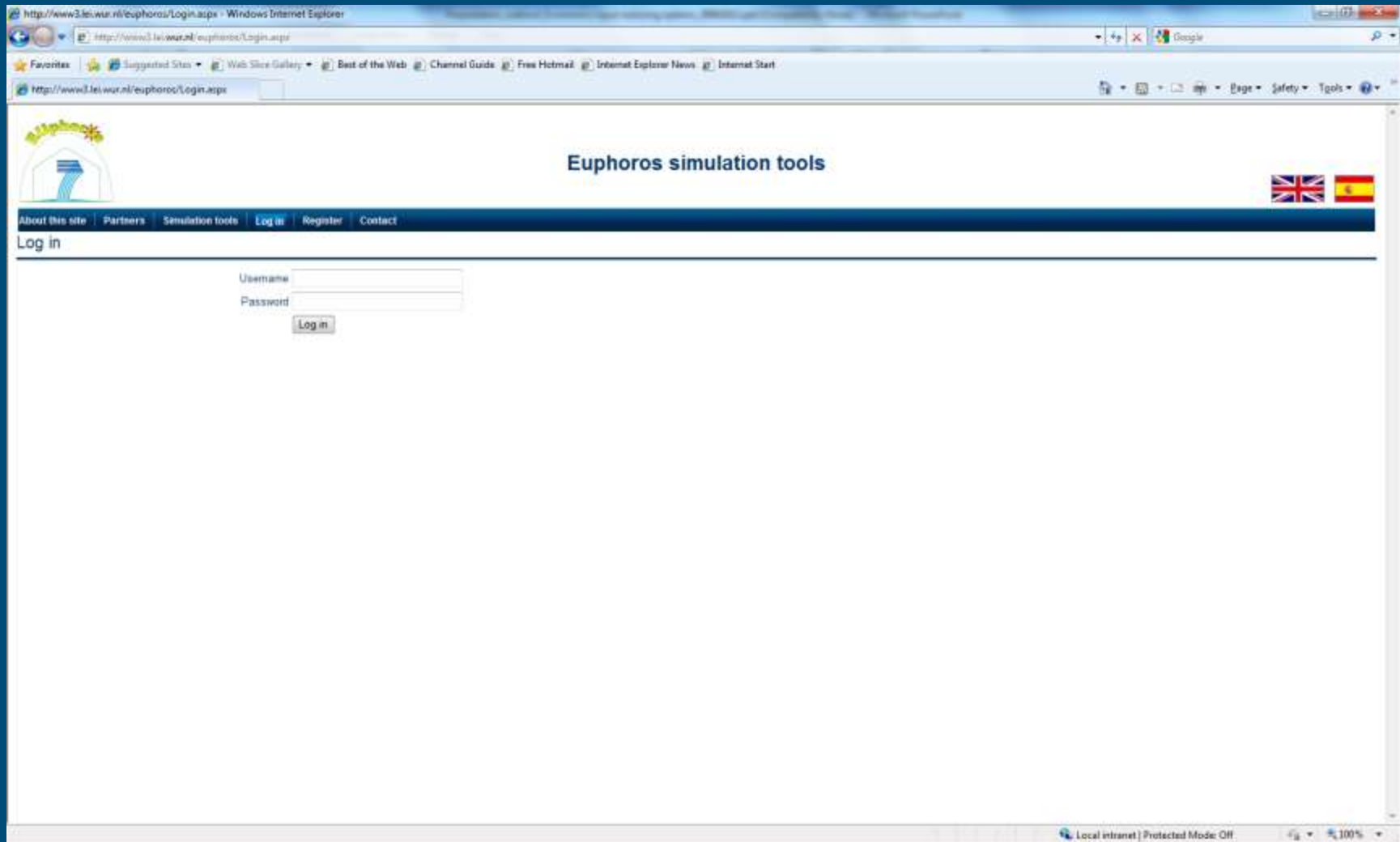
In the environmental simulation tool the environmental impact can be assessed of different options which reduce the input of water, fertilizers, energy and crop protection agents. The simulation tool is based on the LCA methodology and takes into account the compilation and evaluation of the inputs and outputs and the potential environmental impacts of a product system throughout its life cycle.

The economic simulation tool is based on a cost-benefit analysis. All benefits and costs have been surveyed and evaluated in particularity for the input reducing options. Several economic indicators can be calculated.

Both the environmental simulation tool as well as the economic simulation tool describe a farm specific reference situation and a situation with the specific input reducing option. The comparison of both situations will give insight in the possibilities of a specific option for your specific farm situation.

We hope that both simulation tools will help you to find the appropriate option in order to decrease the environmental impact and as to strengthen the financial position of the greenhouse farm.

# Webtool – Strumento di simulazione economica



The screenshot shows a web browser window with the address bar displaying `http://www3.lei.wur.nl/euphoros/Login.aspx`. The page title is "Euphoros simulation tools". The browser's address bar shows the URL `http://www3.lei.wur.nl/euphoros/Login.aspx`. The page features a navigation menu with links: "About this site", "Partners", "Simulation tools", "Log in", "Register", and "Contact". The "Log in" link is highlighted. Below the navigation menu, there is a "Log in" section with a form containing two input fields: "Username" and "Password", and a "Log in" button. The page also includes a logo on the left and flags for the United Kingdom and Spain on the right. The status bar at the bottom indicates "Local intranet | Protected Mode: Off" and a zoom level of "100%".

# Webtool – Strumento di simulazione economica

The screenshot shows the 'Euphoros simulation tools' web interface. The main heading is 'Euphoros simulation tools'. Below it, there is a navigation menu with 'Simulation tools' selected. The 'Economic simulation tool' is active, showing a sidebar with options like 'Manage scenarios', 'Manage reference data', and 'Manage option and calculate scenario'. The main content area displays 'Scenario information' for 'Scenario 1 Tomato Multi-tunnel'. It includes a description 'Option 1', year '2009', country 'Spain', greenhouse type 'Multi', and crop 'Tomato'. There are two small images of a greenhouse. Below this is the 'Reference data' section, which contains numerous input fields for various parameters such as production, prices, and costs. At the bottom of the reference data section are buttons for 'Save reference data' and 'Get default values'.

**Euphoros simulation tools**

Navigation: About this site | Partners | **Simulation tools** | Log out | Register | Contact

**Economic simulation tool**

Scenario information

Scenario: Scenario 1 Tomato Multi-tunnel

Description: Option 1

Year: 2009

Country: Spain

Greenhouse: Multi

Crop: Tomato

**Reference data**

Please enter values in €/m<sup>2</sup>, unless indicated otherwise

Production (kg/m <sup>2</sup> )	16.48	Fuel: gas, oil, propane	0.01	Labour: crop handling	1.38
Product price (€/kg)	0.58	electricity	0.2	Labour: management	1.08
Other output (sales of electricity)	0	Other energy: gas capacity	0	Contractors	0
Plant material	0.55	CO <sub>2</sub>	0	Interest costs	0.64
Fertilizers	0.6	Other crops assets	0.32	General costs	0.2
Water	0.2	Sales costs	0.14		
Crop protection	0.35	Tangible assets: depreciation	2.2		
Substrate	0.34	Tangible assets: maintenance	0.8		

Buttons: Save reference data | Get default values

# Webtool – Strumento di simulazione economica

The screenshot displays the 'Euphoros simulation tools' web application. The page title is 'Euphoros simulation tools'. The navigation menu includes 'About this site', 'Partners', 'Simulation tools', 'Log out', 'Register', and 'Contact'. The 'Simulation tools' menu is expanded, showing 'Economic simulation tool' and 'Environmental simulation tool'. The 'Economic simulation tool' is selected, and the 'Scenario information' section is visible. The scenario is 'Scenario 3 Tomato Multi-tunnel'. The description is 'Option 1', the year is '2009', the country is 'Spain', the greenhouse is 'Multi', and the crop is 'Tomato'. The option is 'Closed fertirrigation system: basic + quick chemical test'. There are three small images: a multi-tunnel greenhouse, a tomato plant, and a fertirrigation system. The 'Option data' section is also visible, with a note 'Please enter values in €/m2, unless indicated otherwise'. The 'Extra investment' is 0.83 and the 'Subsidy (in%)' is 0. There are two buttons: 'Save option data & calculate' and 'Get default values'.

Scenario information

Scenario: Scenario 3 Tomato Multi-tunnel

Description: Option 1

Year: 2009

Country: Spain

Greenhouse: Multi

Crop: Tomato

Option: Closed fertirrigation system: basic + quick chemical test

Option data

Please enter values in €/m2, unless indicated otherwise

Extra investment: 0.83

Subsidy (in%): 0


Save option data & calculate

Get default values

# Webtool – Strumento di simulazione economica

Economic\_RPT\_Multitunnel\_option 1.pdf - Adobe Reader

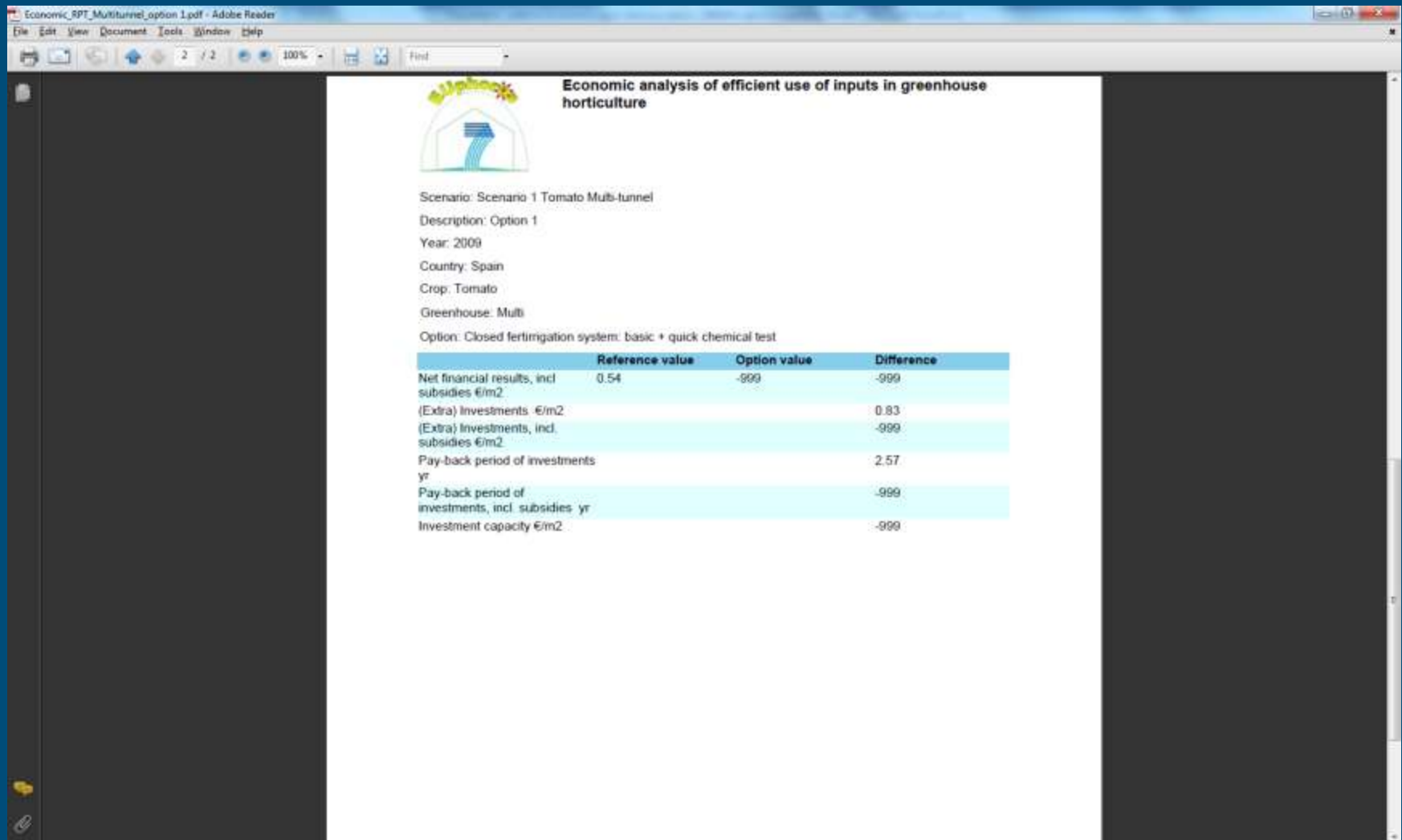
Economic analysis of efficient use of inputs in greenhouse horticulture



Scenario: Scenario 1 Tomato Multi-tunnel  
Description: Option 1  
Year: 2009  
Country: Spain  
Crop: Tomato  
Greenhouse: Multi  
Option: Closed fertirrigation system, basic + quick chemical test

	Reference value	Option value	Difference
<b>Benefits (€/m<sup>2</sup>)</b>			
Production (kg/m <sup>2</sup> )	16.48	16.48	0
Product price (€/kg)	0.58	0.58	0
Turnover - product €/m <sup>2</sup>	9.56	9.56	0
Other output (sales of electricity)	0	0	0
Total output €/m <sup>2</sup>	9.56	9.56	0
<b>Variable costs (€/m<sup>2</sup>)</b>			
Plant material	0.56	0.56	0
Fertilizers	0.6	0.17	-0.43
Water	0.2	0.16	-0.04
Crop protection	0.35	0.35	0
Substrate	0.34	0.34	0
Fuel: gas, oil, propane	0.01	0.01	0
Energy: electricity	0.2	0.2	0
Other energy: gas capacity	0	0	0
CO <sub>2</sub>	0	0	0
Other crop assets	0.32	0.4	0.08
Sales costs	0.14	0.14	0
Total variable costs	2.72	2.34	-0.38
<b>Fixed costs (€/m<sup>2</sup>)</b>			
Tangible assets: depreciation	2.2	2.37	0.17
Tangible assets: maintenance	0.8	0.84	0.04
Labour: crop handling	1.38	1.38	0
Labour: management	1.08	1.08	0
Contractors	0	0	0
Interest costs	0.64	0.66	0.02
General costs	0.2	0.2	0
<b>Extra investment</b>			
<b>Subsidy</b>			
<b>Extra yield</b>			
Total fixed costs €/m <sup>2</sup>	5.3	5.53	0.23
Total costs €/m <sup>2</sup>	9.02	8.86	-0.16
<b>Economic indicator</b>			
Net financial results €/m <sup>2</sup>	0.54	0.7	0.16

# Webtool – Strumento di simulazione economica



The screenshot shows a PDF document titled "Economic analysis of efficient use of inputs in greenhouse horticulture". The document includes a logo of a greenhouse with a blue arrow pointing upwards. Below the logo, the following information is provided:

Scenario: Scenario 1 Tomato Multi-tunnel  
Description: Option 1  
Year: 2009  
Country: Spain  
Crop: Tomato  
Greenhouse: Multi  
Option: Closed fertirrigation system: basic + quick chemical test

	Reference value	Option value	Difference
Net financial results, incl. subsidies €/m2	0.54	-999	-999
(Extra) Investments €/m2			0.83
(Extra) Investments, incl. subsidies €/m2			-999
Pay-back period of investments yr			2.57
Pay-back period of investments, incl. subsidies yr			-999
Investment capacity €/m2			-999



# Webtool – Strumento di simulazione economica

Scenario: Scenario 1 Tomato Multi-tunnel 1  
Description: Option 2  
Year: 2009  
Country: Spain  
Crop: Tomato  
Greenhouse: Multi  
Option: New type multi-tunnel: improved ventilation

	Reference value	Option value	Difference
Benefits (€/m2)			
Production (kg/m2)	16.48	31.4	14.92
Product price (€/kg)	0.58	0.6	0.02
Turnover - product €/m2	9.56	18.68	9.12
Other output (sales of electricity)	0	0	0
Total output €/m2	9.56	18.68	9.12
Variable costs (€/m2)			
Plantmaterial	0.56	1.08	0.52
Fertilizers	0.6	1.17	0.57
Water	0.2	0.41	0.21
Crop protection	0.35	0.45	0.1

# Webtool – Strumento di simulazione economica

http://www3.zsl.wur.nl/euphoros/economicOptionData.aspx - Windows Internet Explorer

http://www3.zsl.wur.nl/euphoros/economicOptionData.aspx

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http://www3.zsl.wur.nl/euphoros/economicOpti...

**Euphoros simulation tools**

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Economical simulation tool  
Manage scenarios  
Manage reference data  
Manage option and calculate scenario  
Environmental simulation tool

**Economic simulation tool**

Scenario information

Scenario: Scenario Tomato Multi-tunnel 2

Description: Option 4

Year: 2009

Country: Spain

Greenhouse: Multi

Crop: Tomato

Option: Free option with estimated reduction of inputs

**Option data**

Reduction in %

Water 0

Fertilizers 0

Crop protection 0

Substrate 0

Fuel gas, oil, propane 0

Other energy: gas capacity 0

Electricity 0

Save option data & calculate

Get default values

Local intranet | Protected Mode: Off 100%

# Webtool – Strumento di simulazione economica

- Altri scenari e opzioni
- Scenario 2: Pomodoro in serra Venlo (NL)
  - Metodo di coltivazione a risparmio energetico
  - Serre a parete doppia (3 facce con strato antiriflettente e 1 strato a bassa energia)
- Scenario 3: Rosa in serra Venlo (NL)
  - Serre con vetro ad alta diffusione di luce e strato antiriflettente
  - Substrato di crescita ridotto (Unità di produzione singola, SPU rock) e talee a fioritura sincronizzata (in plugs)

# Webtool – Environmental and economic simulation

- Webtool sarà operativo nel 2012
- Versione in Spagnolo, Italiano, etc?

# Grazie per la vostra attenzione

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C'è qualche domanda?

Per ulteriori informazioni:

- [www.glastuinbouw.wur.nl](http://www.glastuinbouw.wur.nl)
- [www.lei.wur.nl](http://www.lei.wur.nl)