Friendly Fruit Berry School webinar

Pompage solaire : retour sur expérience

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How does photovoltaic work?
Solar pump

Diagram showing the components of a solar pump system:
- Photovoltaic Panel
- Controller
- Generator and Surge Protector
- Surge Protector
- Grounding Rod
- Submersible Pump
- Water Tank
Environmental elements

CO₂

Friendly Fruit Project
Friendly Fruit innovative solutions

On the rooftop

Sunlight concentration systems

located between greenhouses

outside cultivated area
On the rooftop
Friendly Fruit Project – Annual and Final Project Meeting

- 20 kWp
- 60 m

Flower nursery

Location in Italia: Palermo
Sunlight concentration system
Photovoltaic module placed between greenhouses
Photovoltaic system placed outside cultivated area
Possible solutions – photovoltaic (pv) systems

NORMAL PV PANEL

PV PANEL OVER ROOF

PV PANEL REFLECTIVE SYSTEM

PV PANEL REFLECTIVE SYSTEM
Solar pump performance

1 ha

Area = 22 m²
Power = 5 kW_p

Requirements = 6000 m³/year
Peak = 1700 m³/month

Static head = 50 m
Engine Power = 3,6 kW

Pipe length = 500 m

5 – 7 k€
5 €cent/kg strawberry
Solar pump performance

Productivity (m3/ha*d)

Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec

0  10  20  30  40  50  60  70  80  90  100

1 ha
Main steps to implement this practice

1. System fits for South-European or North-African climates
2. Located outside greenhouse to avoid shading
3. Water intake and energy need evaluation
4. Sizing and design
5. Choice of different solutions (conventional system, dual sides, with reflecting panels, solar trackers…)
6. Context analysis (irradiation)
7. System placement
8. Performance monitoring and maintenance
Practice Performances

**AGRONOMY & ENVIRONMENT**

- **Pesticide reduction effect**
  - Not expected.

- **Substitution of fossil fuel with renewable energy and stand-alone electricity production**
  - Mitigation of GHG emission.
  - No effect on yield and fruit quality.

- **Replacement of non-renewable resources' use**
  - GHG emission reduction.
  - No impact on the agronomic practice.

**Costs & benefits**

- **Initial investment required**

- **Low time required** for setting-up of the practice.

- **No extra time required** for management.

- **Maintenance costs are very low**
  - Service life at least 12 years.
  - The cost is less than 5€/kg strawberry.

**Operationality**

- **Ease to implement**
  - The practice does not require highly skilled staff.

- **Ready to use**

- **Positive outcome**

- **Neutral to positive outcome**

- **Areas of improvement**

- **Critical points**

Friendly Fruit Project
Key result

The use of a solar pump to extract the water needed for irrigation improves the environmental sustainability of strawberry cultivation.

About 22 m² photovoltaic panels → quantity of water necessary annually

Up to 150 gCO2eq saved for 1 kg of strawberry

Message to take home

The use of renewable energy is nowadays an essential element to make environmental friendly the plantations ensuring accessibility to a key production factor such as water.
Thanks for your attention