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CROSS-BORDER COOPERATION IN THE MEDITERRANEAN

FruitFlyNet

A Location–aware System for Fruit Fly Monitoring and Pest Management Control

ReTIC

Real-Time Insect Counting System

Concept and development

Agricultural University of Athens

CRA
CONSIGLIO PER LA RICERCA E LA SPERIMENTAZIONE IN AGRICOLTURA

UIB Universitat de les Illes Balears

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The 2007-2013 ENPI CBC Mediterranean Sea Basin Programme is a multilateral Cross-Border Cooperation initiative funded by the European Neighbourhood and Partnership Instrument (ENPI). The Programme objective is to promote the sustainable and harmonious cooperation process at the Mediterranean Basin level by dealing with the common challenges and enhancing its endogenous potential. It finances cooperation projects as a contribution to the economic, social, environmental and cultural development of the Mediterranean region. The following 14 countries participate in the Programme: Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, Malta, Palestine, Portugal, Spain, Syria (participation currently suspended), Tunisia. The Joint Managing Authority (JMA) is the Autonomous Region of Sardinia (Italy). Official Programme languages are Arabic, English and French (www.enpicbcmed.eu).

The European Union is made up of 28 Member States who have decided to gradually link together their know-how, resources and destinies. Together, during a period of enlargement of 50 years, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance and individual freedoms. The European Union is committed to sharing its achievements and its values with countries and peoples beyond its borders.

The project FruitFlyNet total budget is 1.662.872,32€ and it is financed, on an amount of 1.496.585,09€ (90 %), by the European Union (ENPI CBC Mediterranean Sea Basin Programme) through the European Neighbourhood and Partnership Instrument.

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The aim of pest control

- To provide the public with fresh produce, with minimal insect damage, and pesticide residues.

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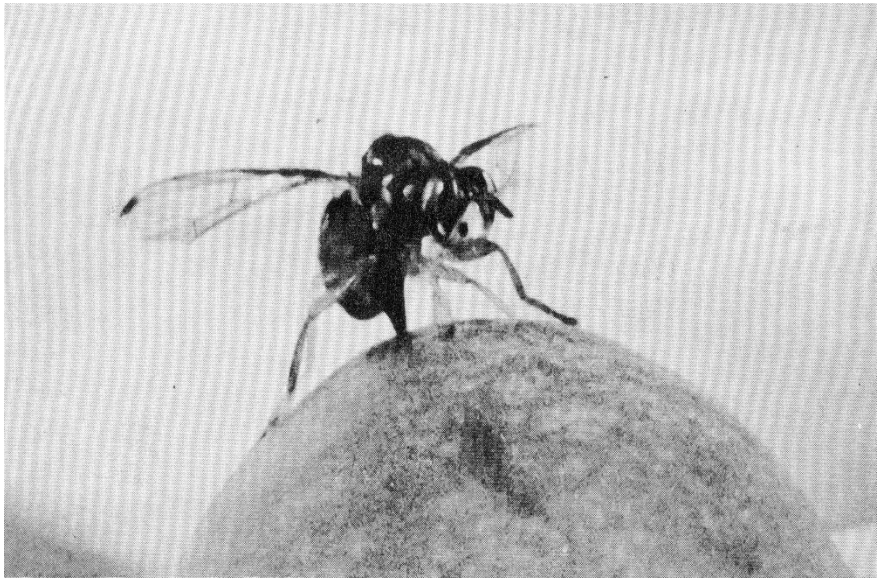
How insect pest control can be improved?

- By knowing the insect pest population level and their location through an insect monitoring system
- Targeting insect pest populations in time and space

Monitoring



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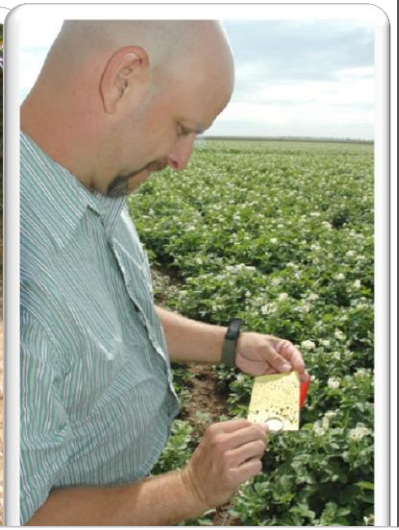
How does insect pest monitoring is performed today ?

- Someone needs to go out to the field and check the trap manually



How does insect pest monitoring is performed today ?

- To search for specific Insects, and to count them

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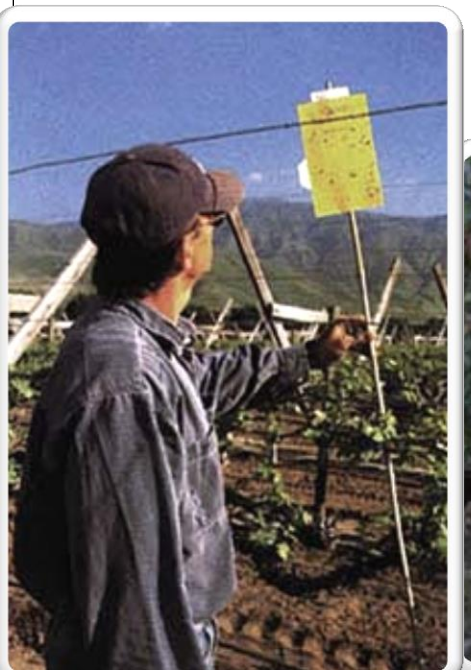
How does insect pest monitoring is performed today ?

- And to think: Do I need to spray?
  - When?
  - Where?



Problems with the current monitoring system:

1. Labor costs
2. Frequency
3. Specialist
4. Human Errors

Automatic Monitoring

Solution: Automatic monitoring

- The Goal:
  - To Develop an e-monitoring system, integrated with a **Re**al-time **T**rapping and **I**nsect **C**ounting - **ReTIC**

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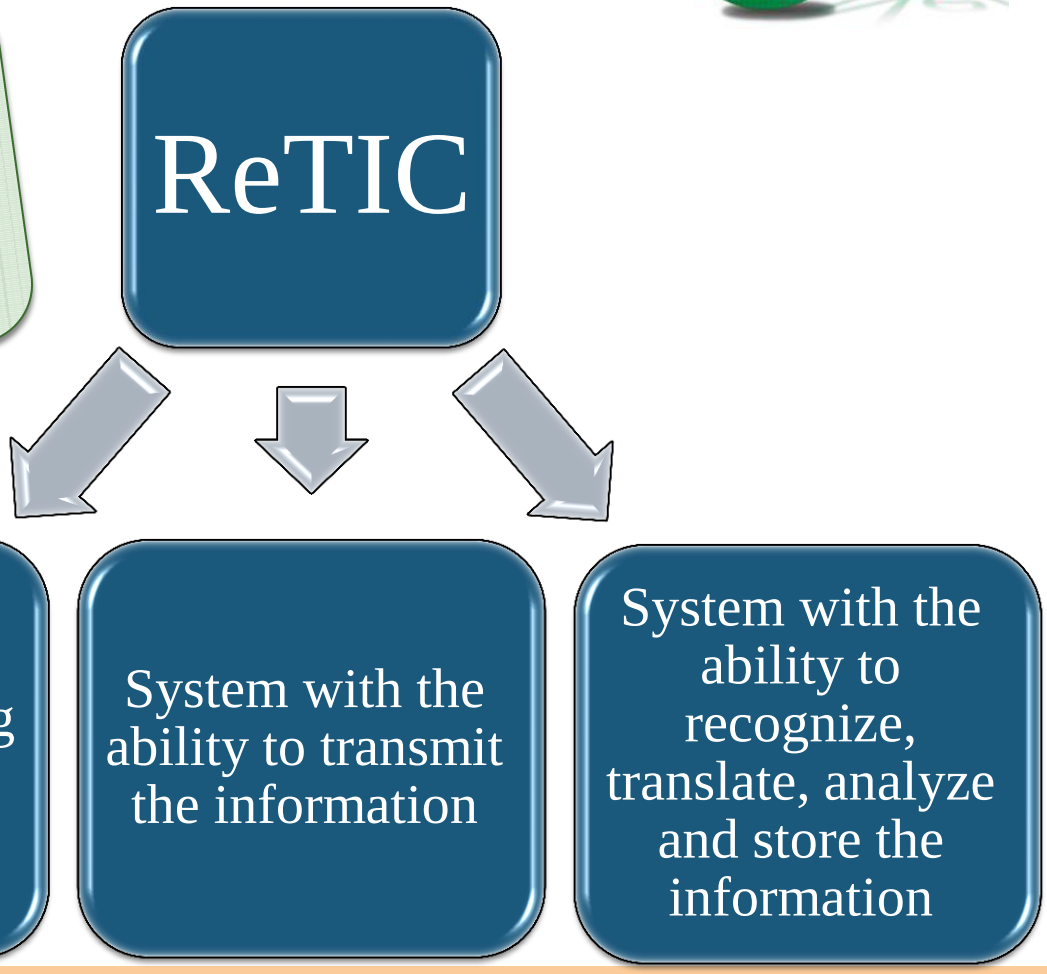
Solution: Automatic monitoring trap

Automatic
Green Energy (Solar Power)
Portable
Plug and play



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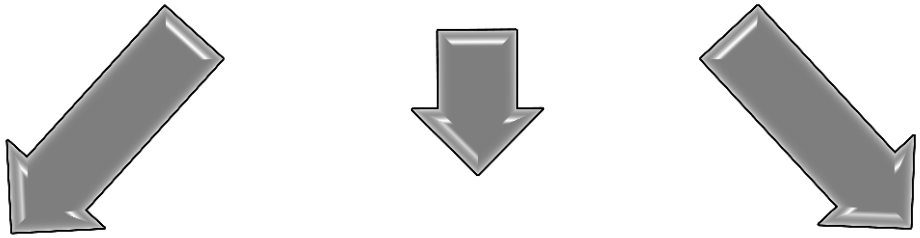
Monitoring Fruit Flies: Possibilities



Species specific chemical attractants

Such as:

- Pheromone
- Parapheromone

Color

As

Attractants

Food Simulators chemical attractants

Such as:

Ammonium salts

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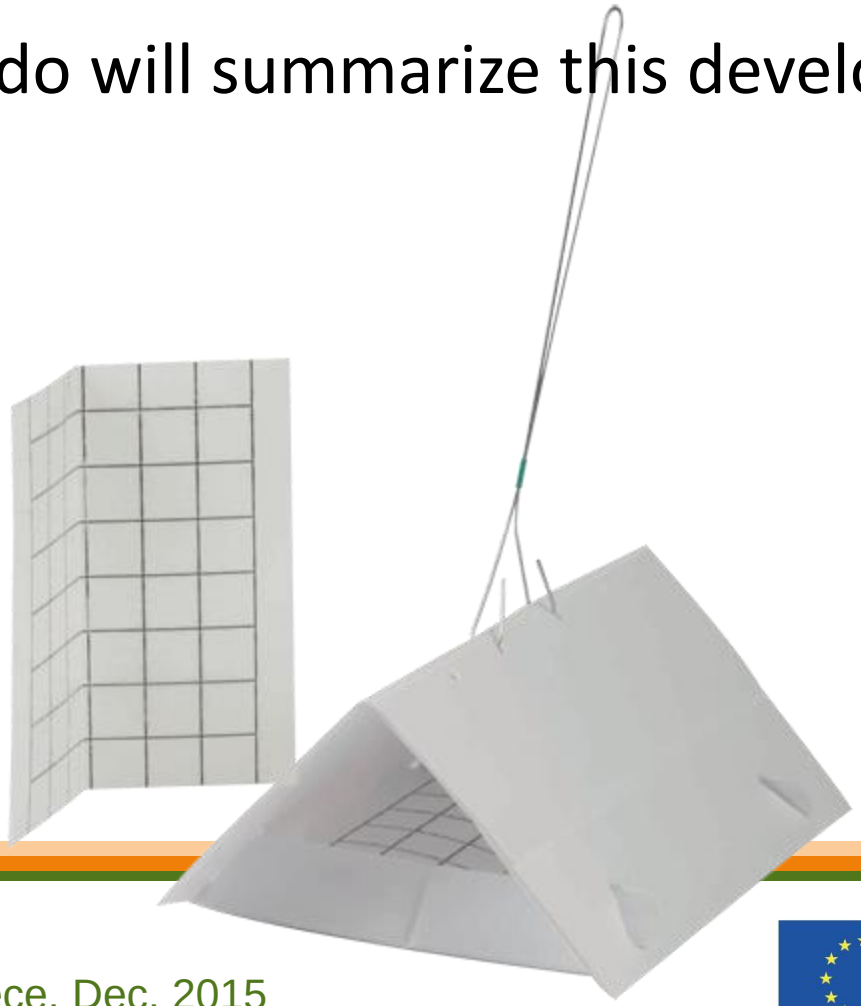
Delta-trap for Medfly [Mediterranean fruit fly]

- Specific attractants exist
- Aramando will summarize this development



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YELLOW-STICKY TRAP
ReTIC PROTOTYPE

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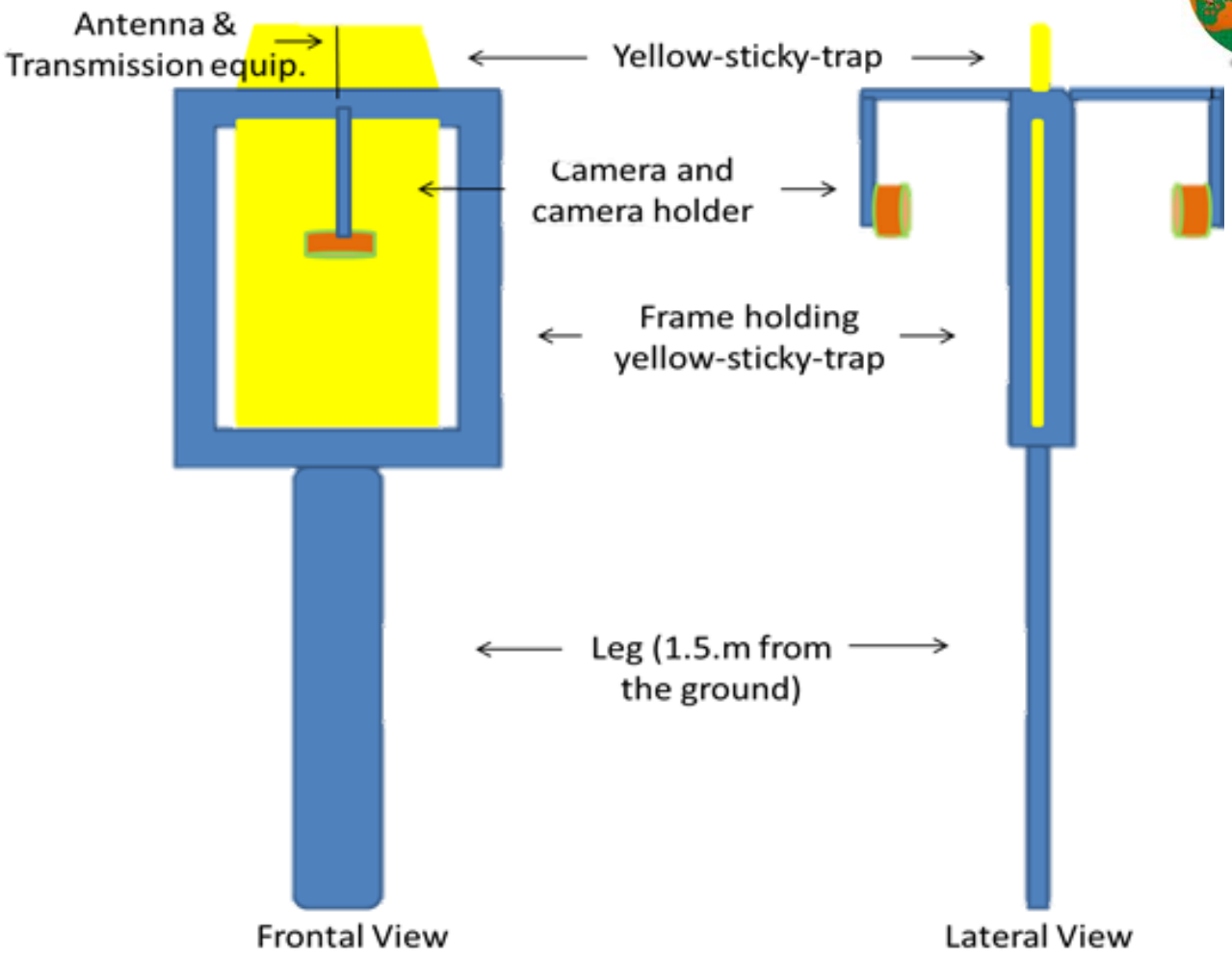
The Idea (original prototype)



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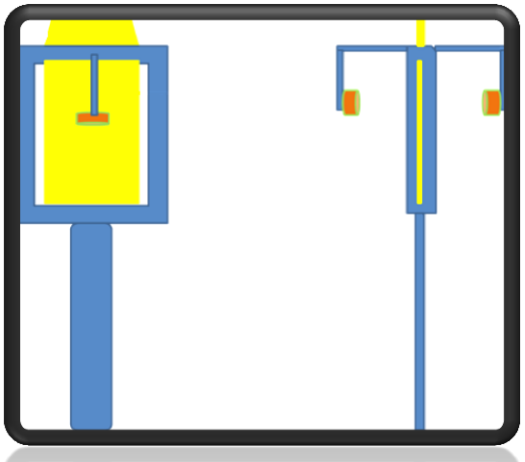
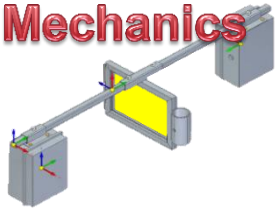


Mechanics



Hardware & Software

Optics

Power

Communication

Image Analysis

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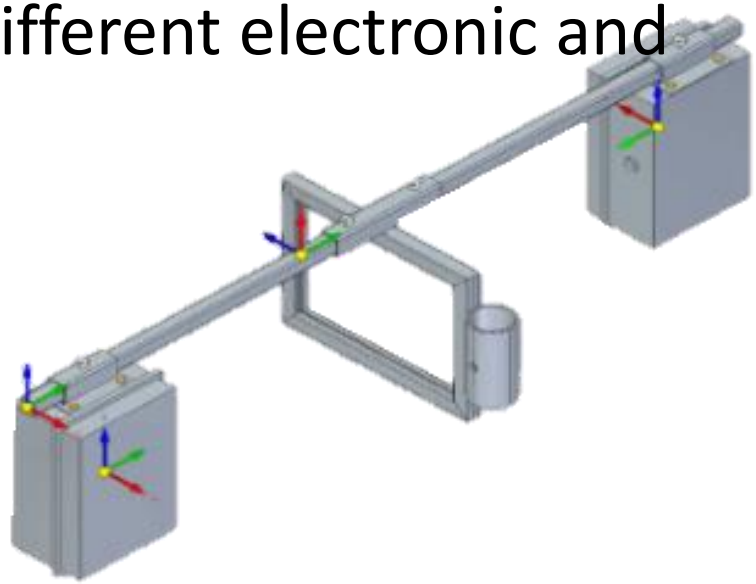
Mechanics

- Based on the current monitoring trap: Yellow sticky trap
- Based on the need to adapt two cameras at the right focal distance
- Based on the need to add the different electronic and transmission components



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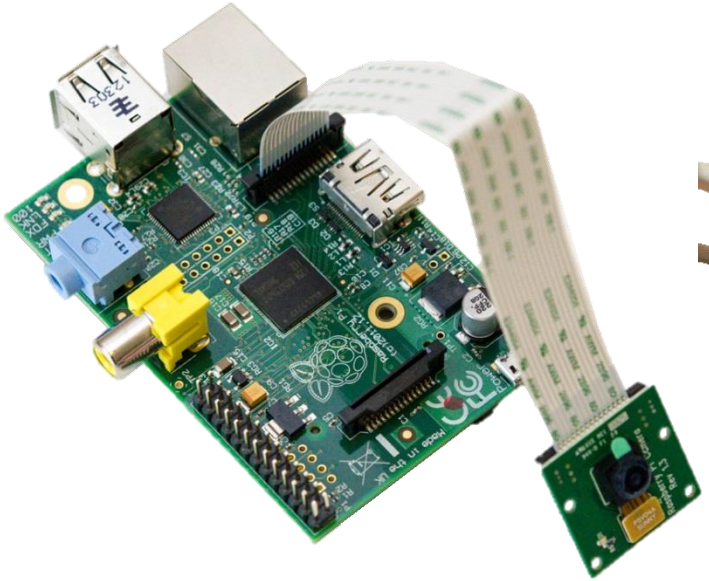
Hardware, Optics & Software



Linux

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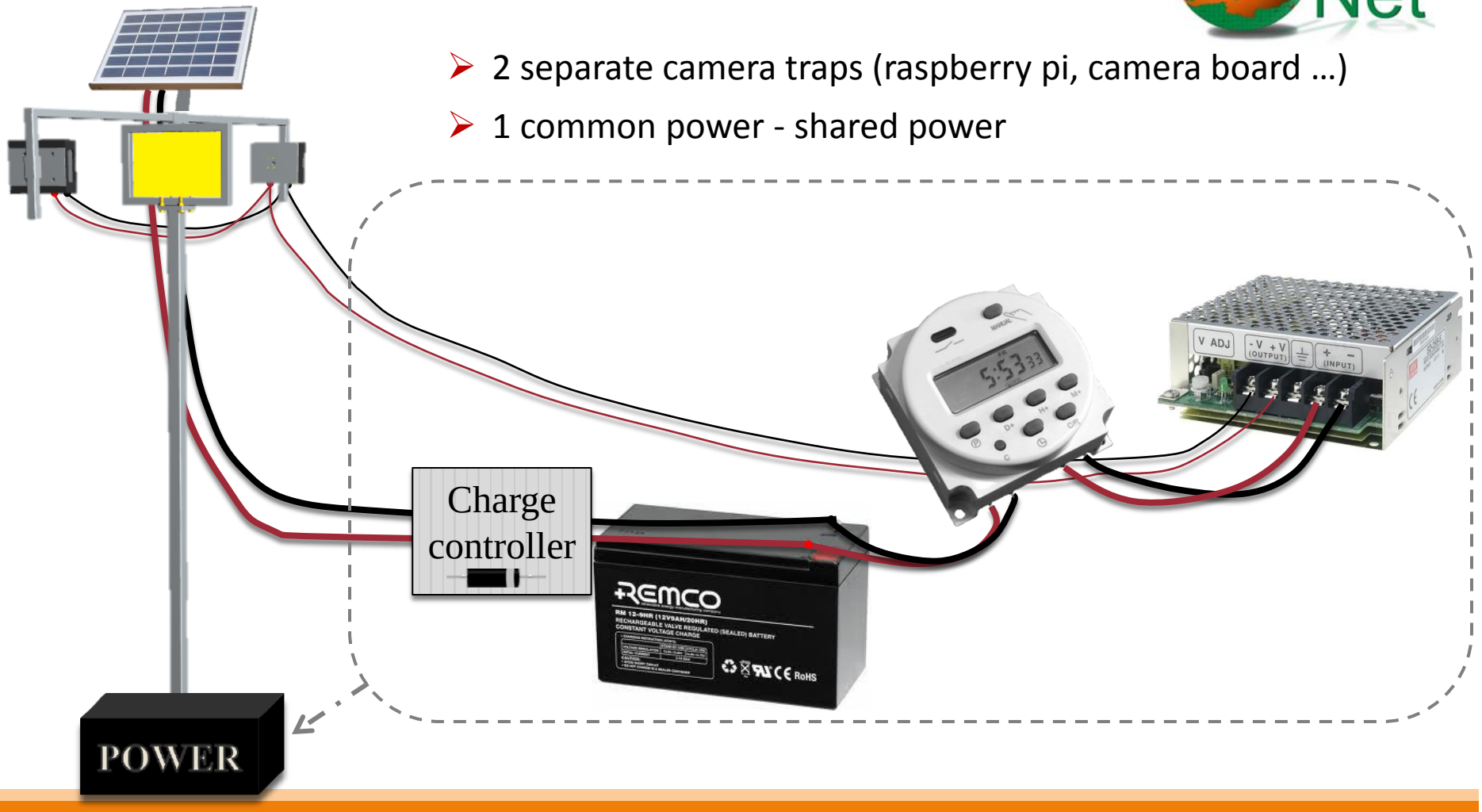
Power Scheme

- 2 separate camera traps (raspberry pi, camera board …)
- 1 common power - shared power



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Communication

ReTIC trap sends data and images through

- Cellular communication
- Wi-Fi
- Wired internet connection

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Image Analysis: Currently being developed

Separate objects From the background

Eliminate big/small Objects

Identify specific fly type

WORK IN PROGRESS; NOT COMPLETED

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Final Prototype

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APPLICATIONS

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Ein Yahav

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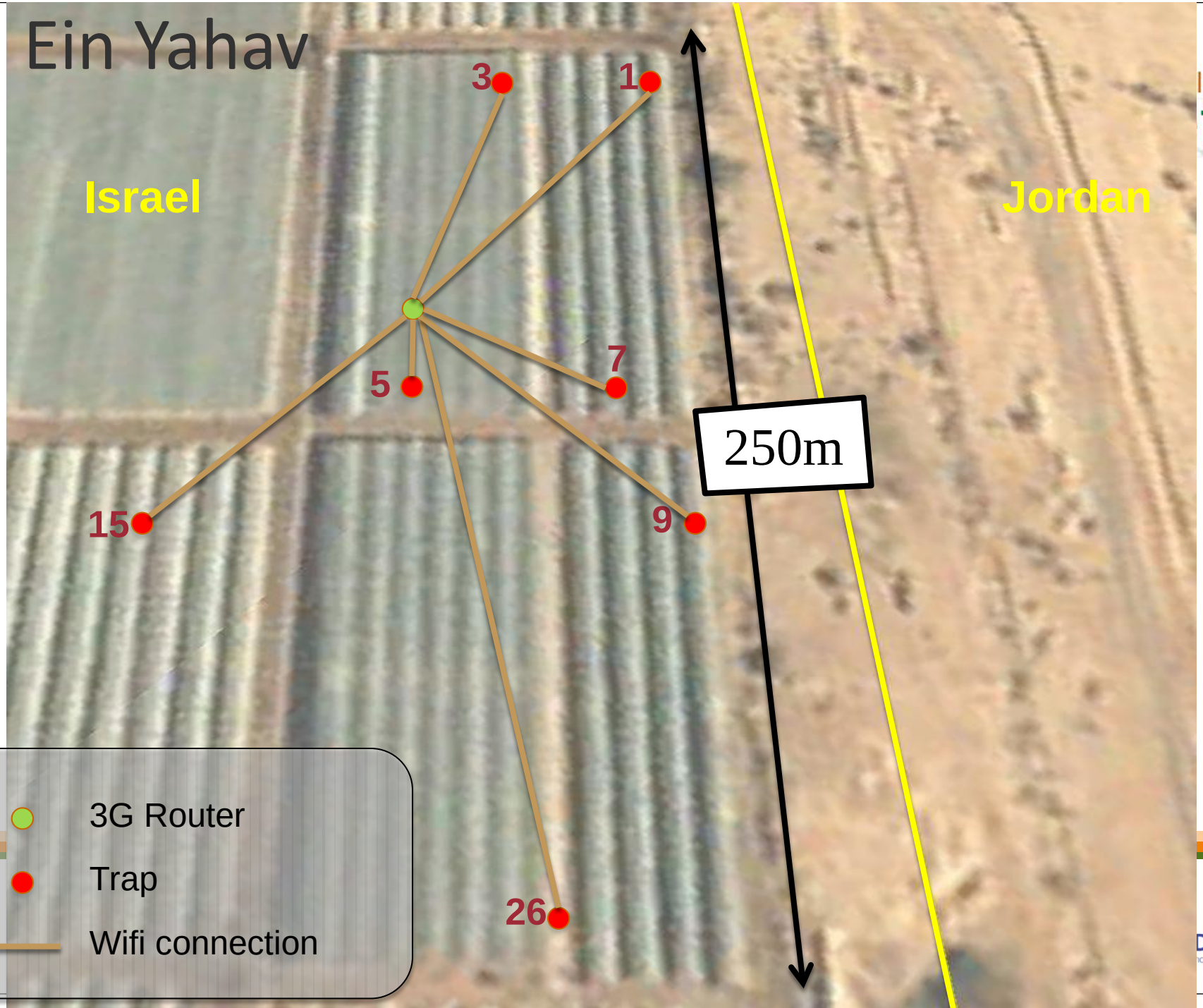

Ein Yahav
Israel
Jordan
3
1
7
5
15
9
26
250m
3G Router
Trap
Wifi connection

Ein Yahav

Ein Yahav

Database & Website

http://gis.agri.gov.il/fruitflynet/index.php

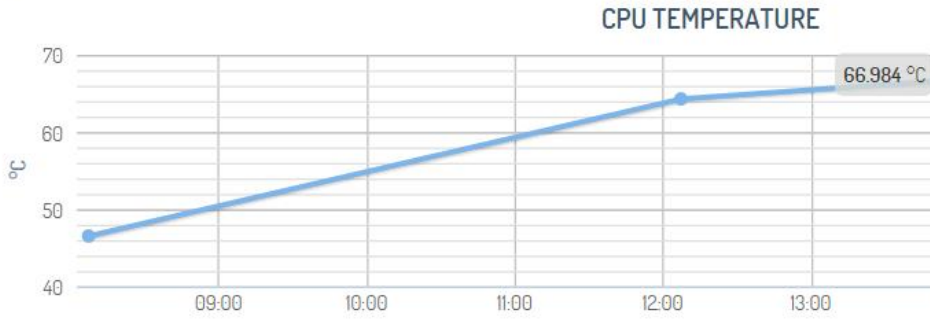
ARO Node List:

Neg01A
Neg01B
trap01
trap05
trap07
trap09
trap1
trap15
trap26
trap3
trap5

Date:

2015-04-01
2015-04-02
2015-04-03
2015-04-04
2015-04-05

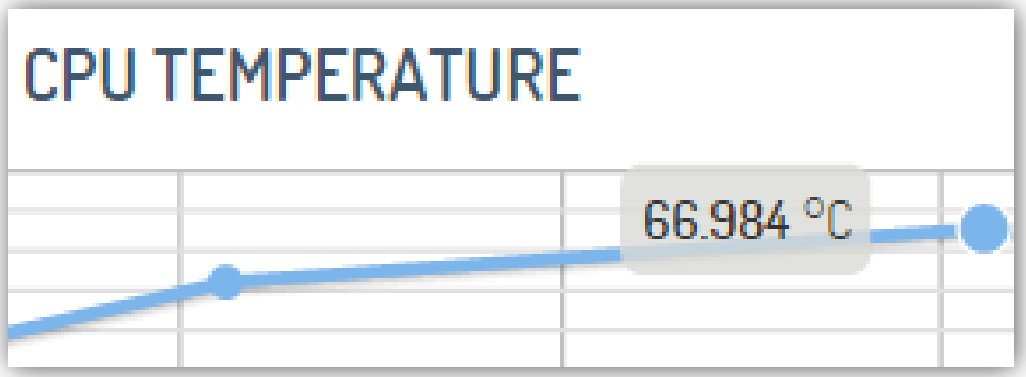
trap15 18/05/2015



08:07:10

12:07:08

14:07:05



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Nitzana

10.06.2015 13:00
Produced by ARO, Ministry of Agriculture, Israel
01B
Produced by ARO, Ministry of Agriculture, Israel
01A
10.06.2015 13:00

Conclusion

- The ReTIC prototype provided an initial system to automatize monitoring.
- The ReTIC served as a pre-system to apply Decision Support Systems and manage fruit flies.

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Ben Shaked
ben@volcani.agri.gov.il

Thank you!!!

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