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**ENPI
CBCMED**
CROSS-BORDER COOPERATION
IN THE MEDITERRANEAN

FruitFlyNet

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

Παρακολούθηση και αντιμετώπιση του δάκου της ελιάς
με την ανάπτυξη και εφαρμογή ενός Ολοκληρωμένου
Συστήματος Υπηρεσιών Θέσης
(Location – Aware System)



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Δ. ΠΥΡΟΜΑΛΗΣ, Θ. ΤΣΙΛΙΓΚΙΡΙΔΗΣ



CRA
CONSIGLIO PER LA RICERCA
E LA SPERIMENTAZIONE
IN AGRICOLTURA



**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.enpicbmed.eu).

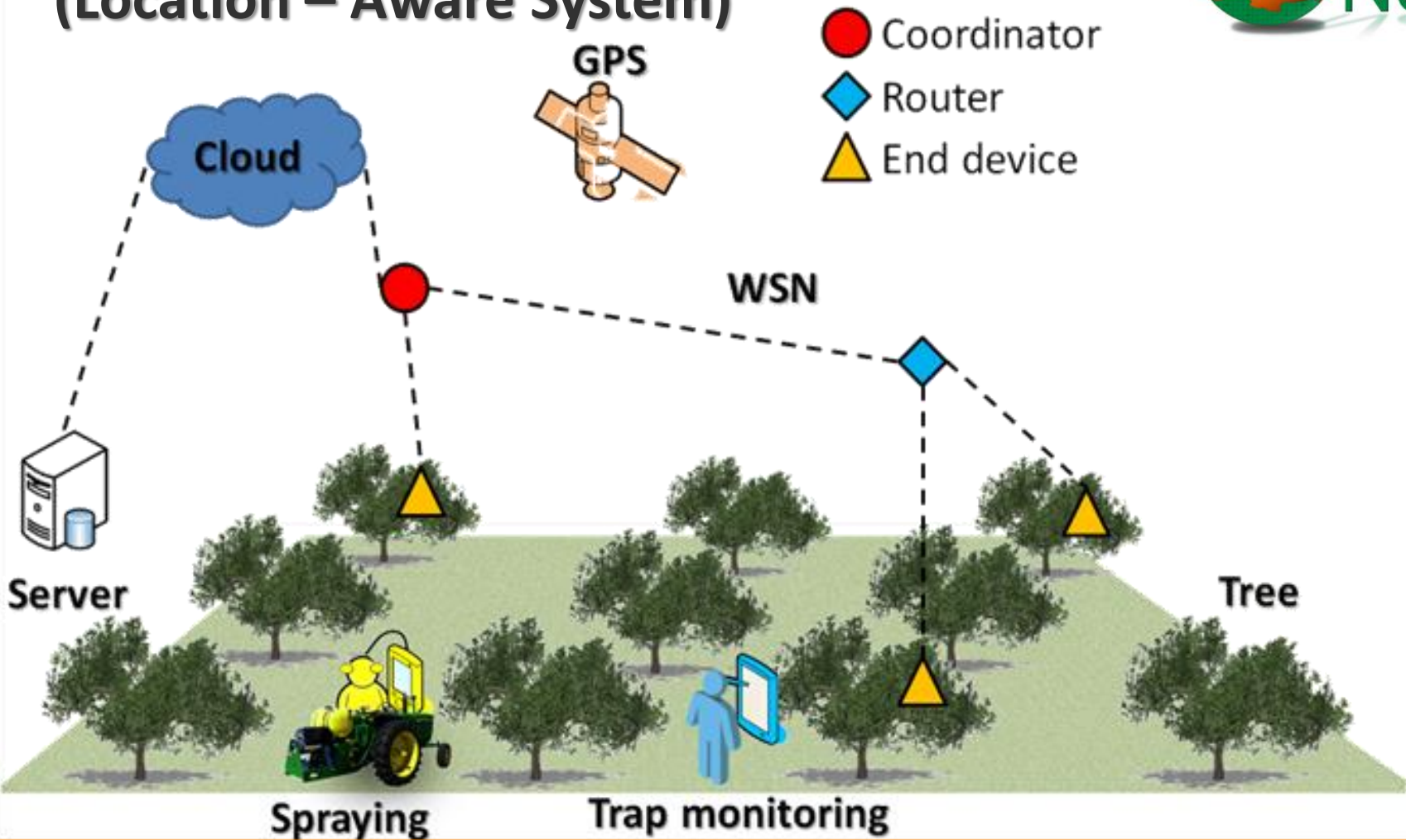
The European Union is made up of 28 Member States who have decided to gradually link together their know-how, resources and destinies. Together, during a period of enlargement of 50 years, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, 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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costas_pontikakos@yahoo.co.uk

Σύστημα Υπηρεσιών Θέσης (Location – Aware System)



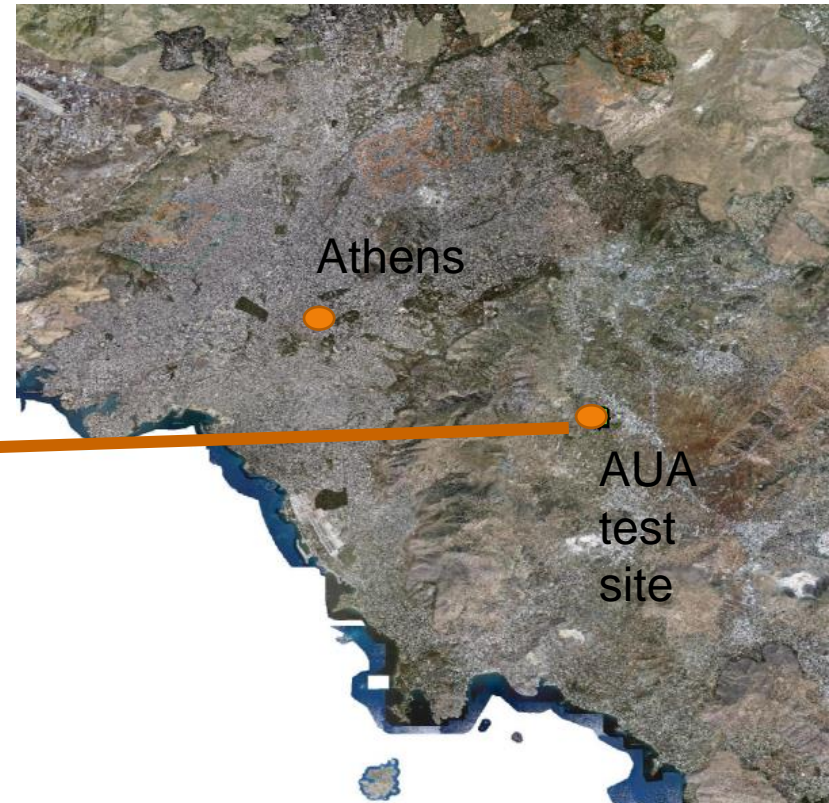
LAS architecture



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ΠΕΡΙΟΧΗ ΠΕΙΡΑΜΑΤΙΣΜΟΥ



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ΧΑΡΑΚΤΗΡΙΣΤΙΚΑ ΕΛΑΙΩΝΑ:

- 673 Δένδρα
- Ποικιλία: Μανάκι



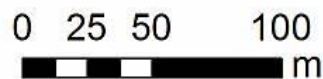
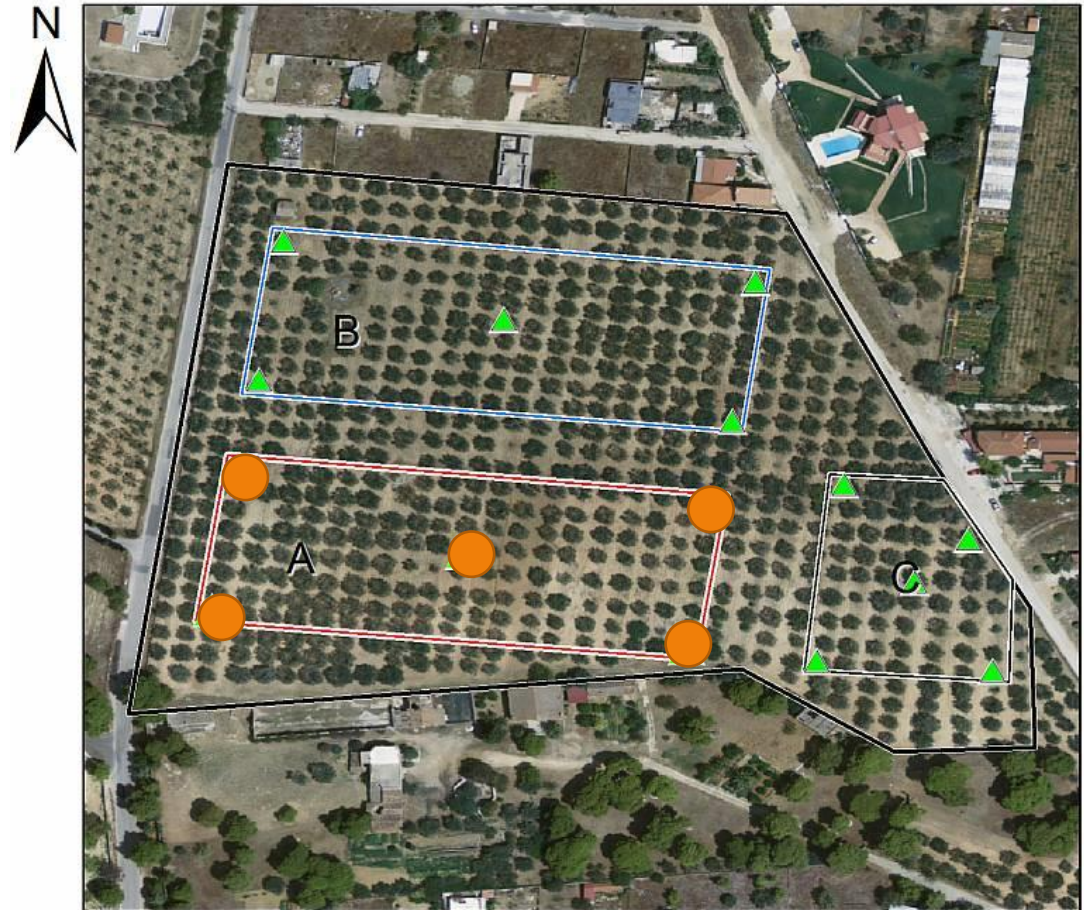
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ΧΑΡΑΚΤΗΡΙΣΤΙΚΑ Πειραματισμού:



- 2 τεμάχια,
150 δένδρων
- Ηλεκτρονικές
παγίδες: 5 (●)



Traps
Type

▲ Normal trap

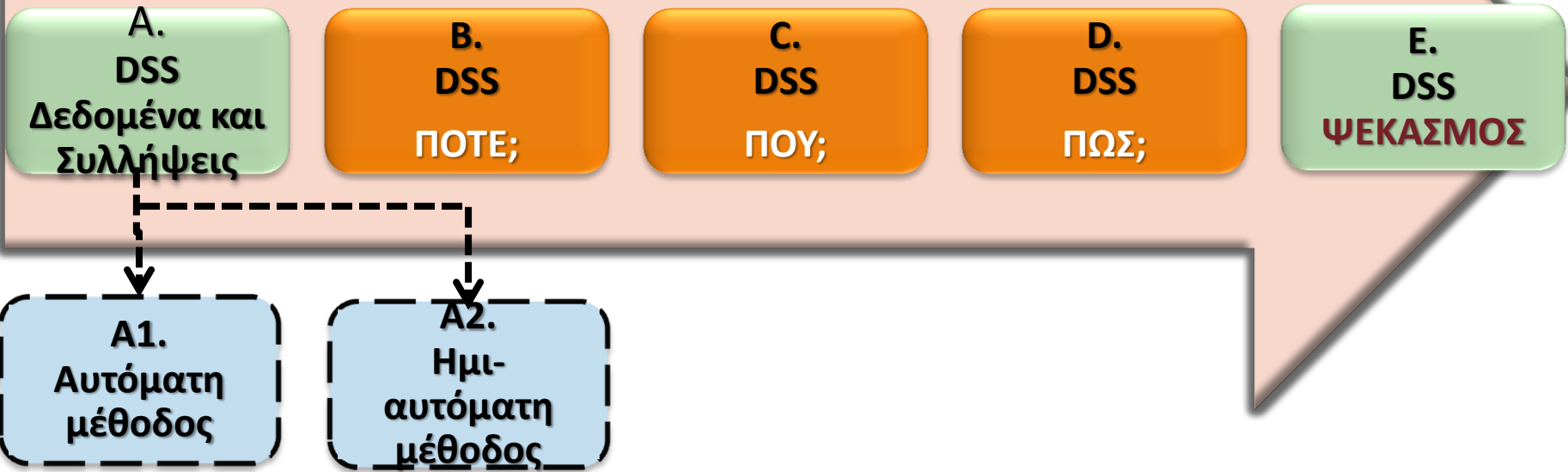
▲ Trap with camera



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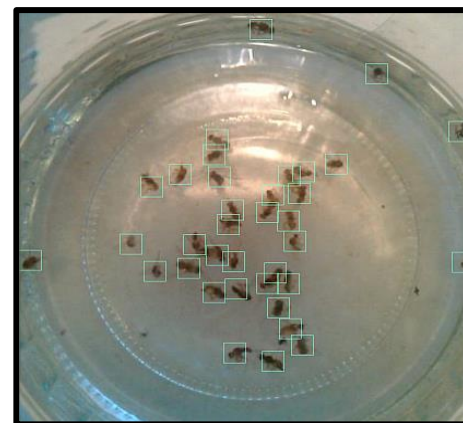
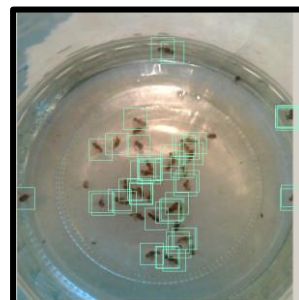
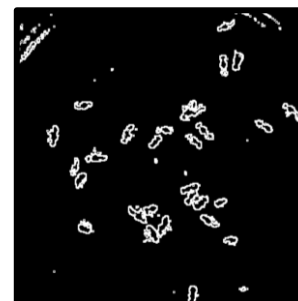
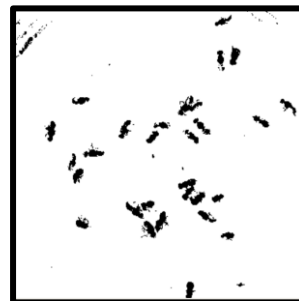
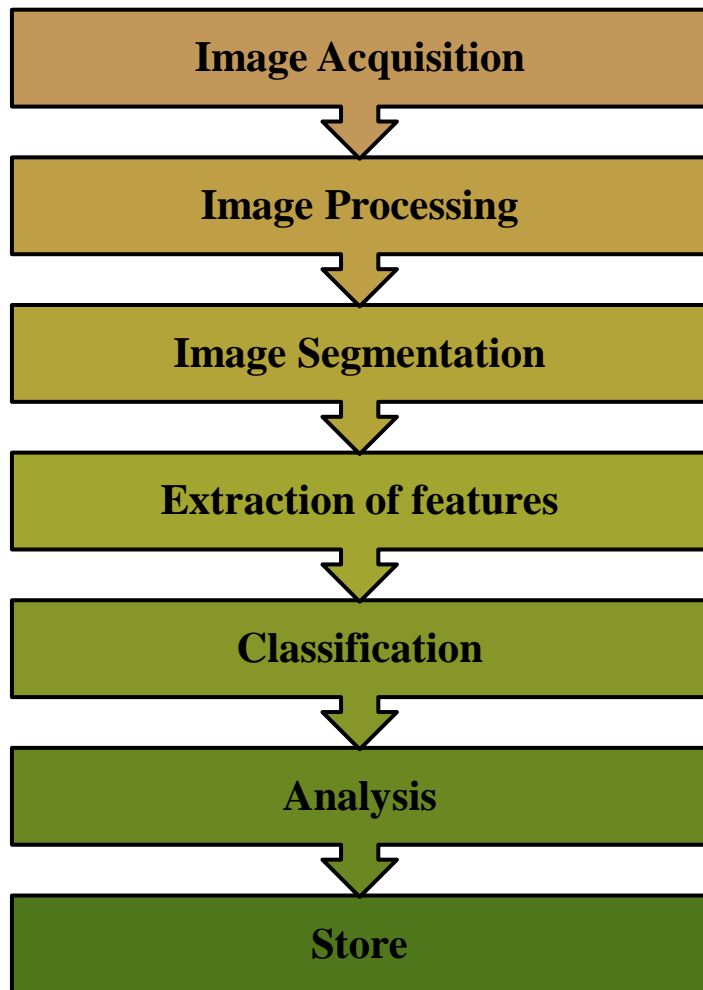
ΣΥΣΤΗΜΑ ΑΠΟΦΑΣΗΣ ΓΙΑ ΨΕΚΑΣΜΟ



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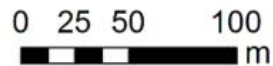
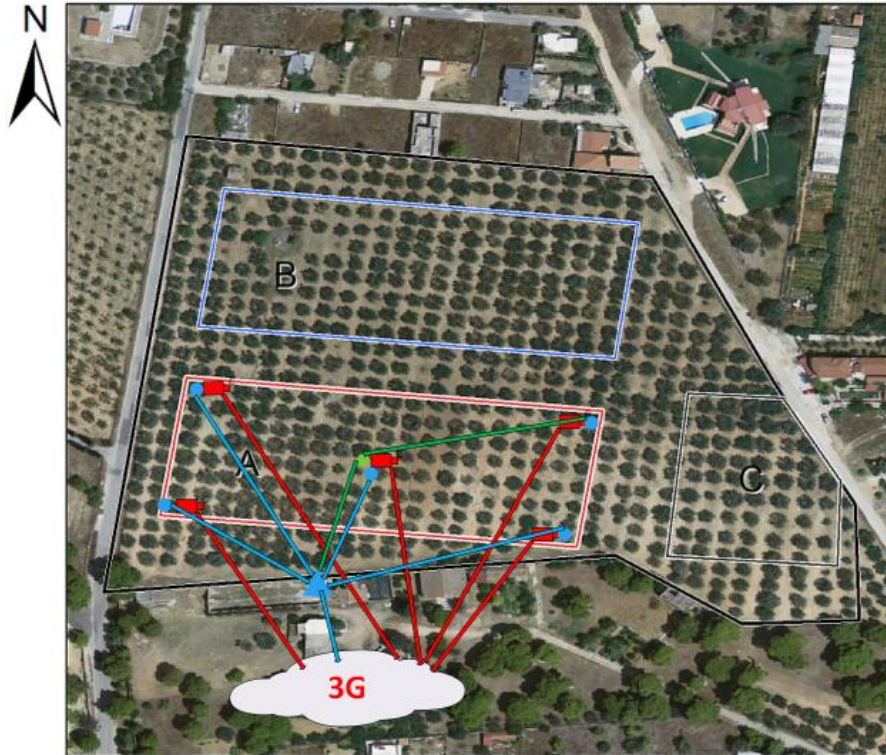
ΑΥΤΟΜΑΤΗ ΚΑΤΑΜΕΤΡΗΣΗ



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ΜΕΤΑΦΟΡΑ ΔΕΔΟΜΕΝΩΝ – ΔΙΚΤΥΟ Ή ΜΕΜΟΝΩΜΕΝΗ ΑΠΟΣΤΟΛΗ



Plot

- A: With LAS
- B: Without LAS
- C: Control

- Coordinator
- Camera (out of WMSN)
- Router Node
- Simple Node



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Ηλεκτρονική παγίδα



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Ηλεκτρονική παγίδα



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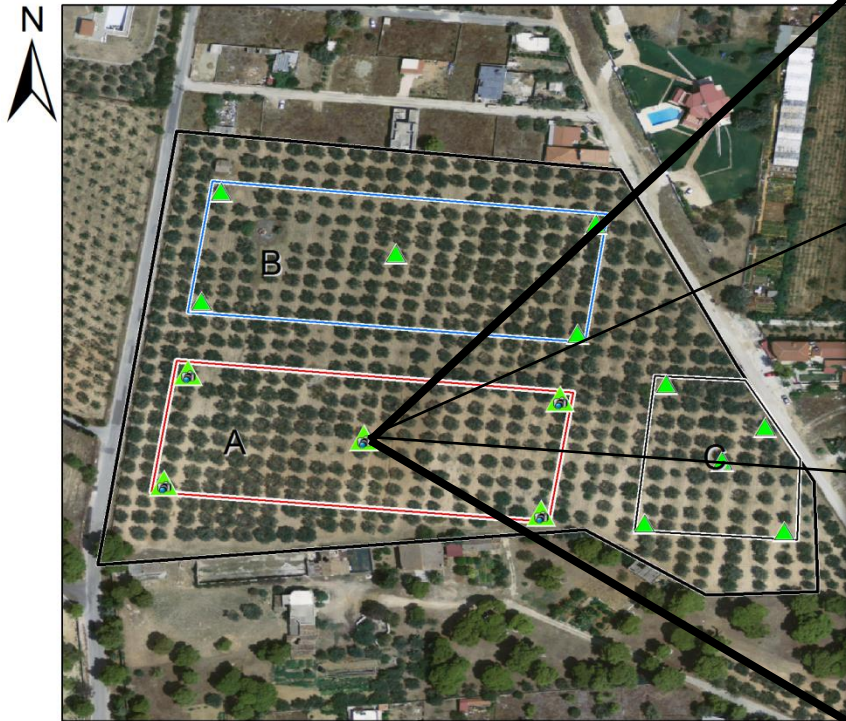


ΑΥΤΟΜΑΤΟ ΣΥΣΤΗΜΑ ΣΥΛΛΟΓΗΣ ΔΕΔΟΜΕΝΩΝ ΠΑΓΙΔΩΝ

ε-παγίδα



Περαματικός αγρός



0 25 50 100
m

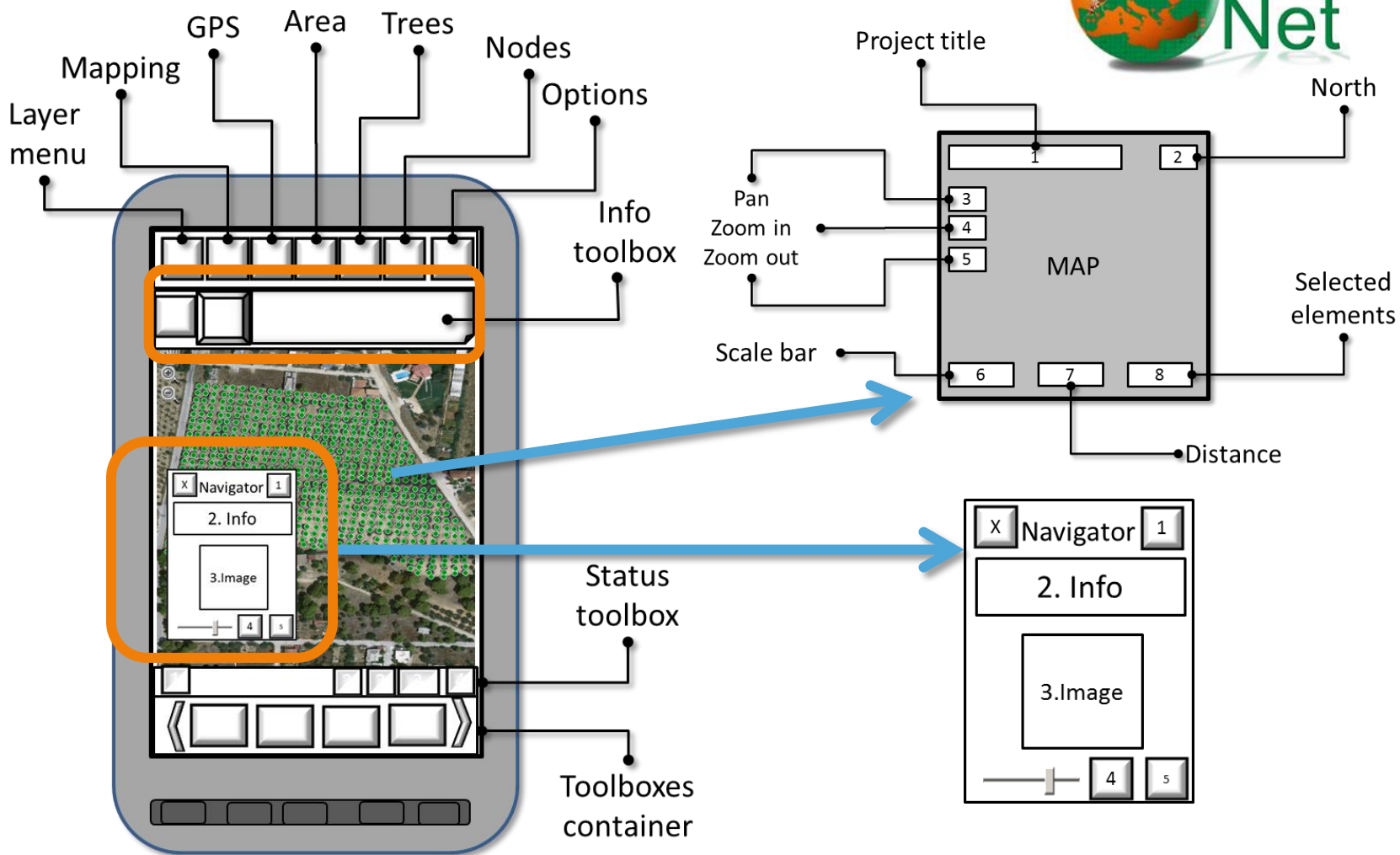


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TO KINH TO GIS



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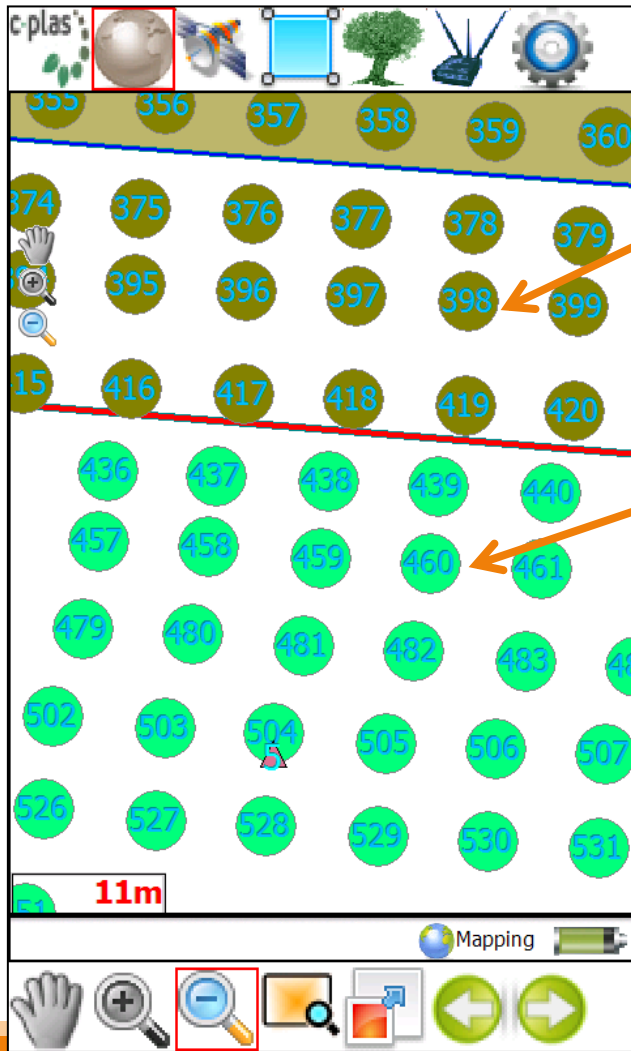
ΕΠΙΠΕΔΑ ΒΑΣΗΣ ΔΕΔΟΜΕΝΩΝ

- Traps
- Nodes
- Trees
- LAS
- Areas
- Raster 2
- Raster 1



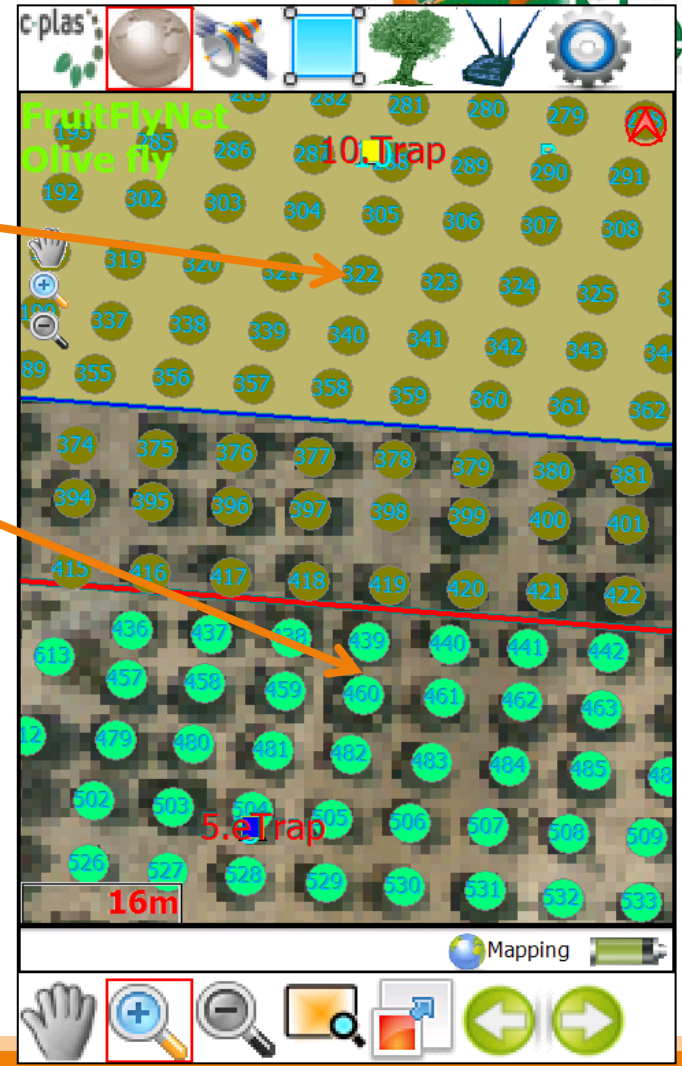
Edit tree Tree info Add tree

Π.χ. το επίπεδο των δένδρων



No LAS trees

LAS trees



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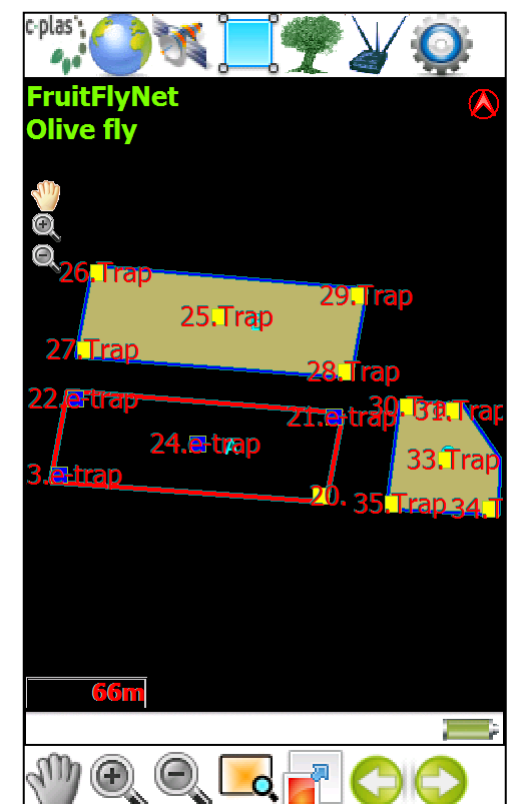
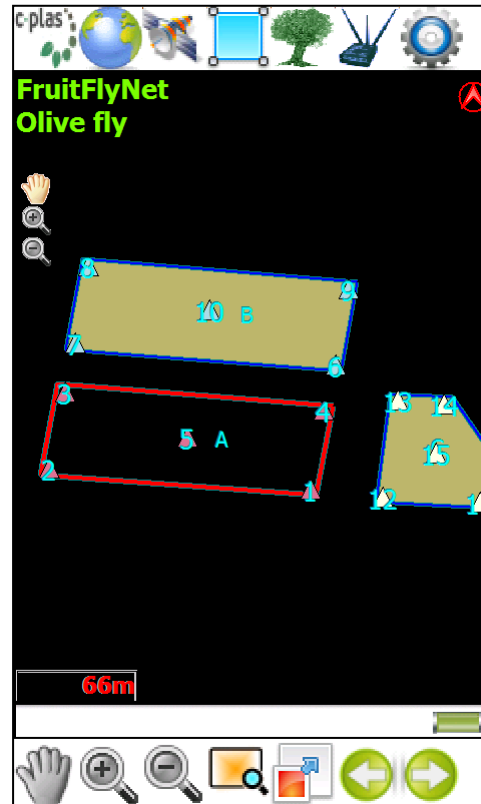
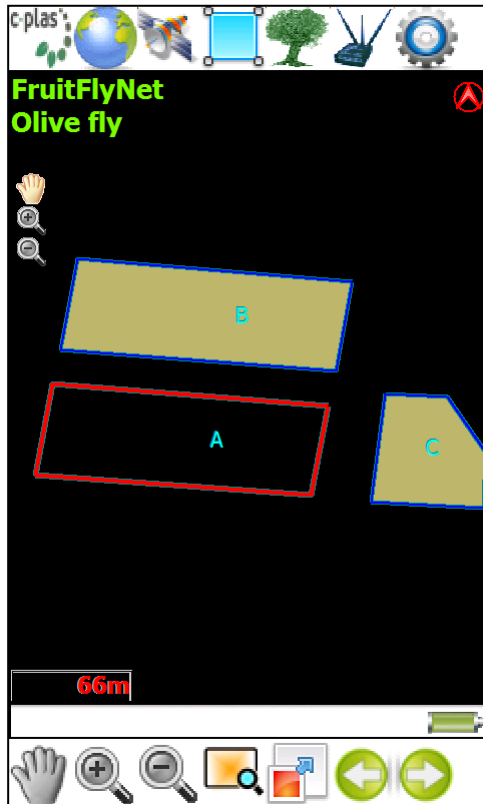
ΑΛΛΑ ΕΠΙΠΕΔΑ



ΠΕΡΙΟΧΕΣ

+ ΣΤΑΘΜΟΙ

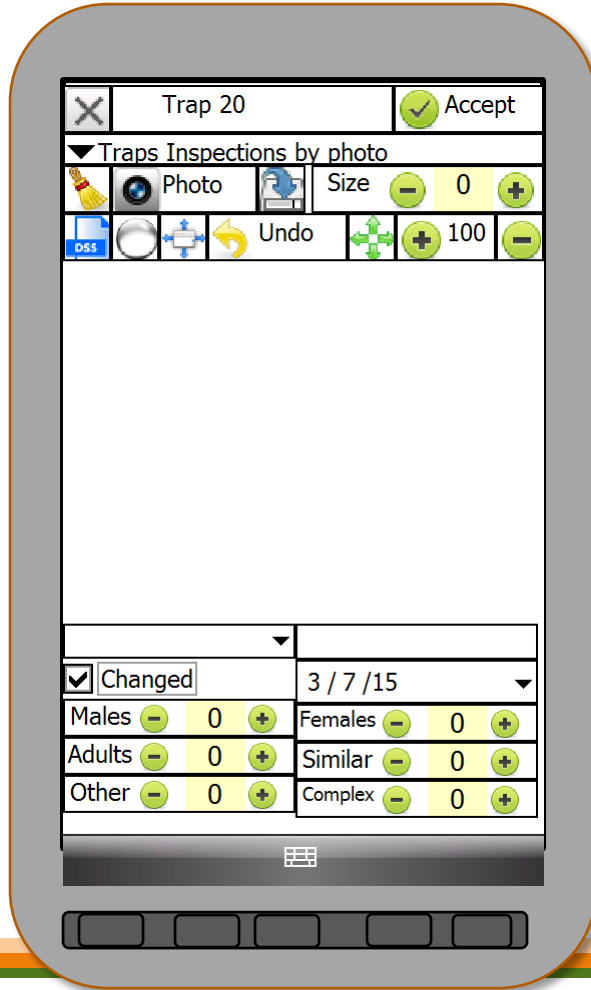
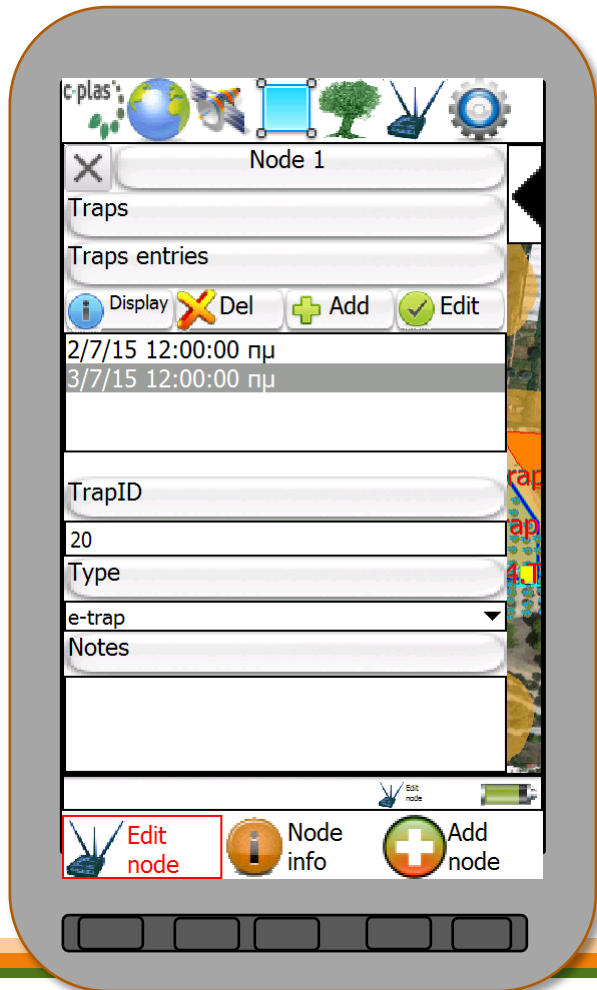
+ ΠΑΓΙΔΕΣ



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ΛΗΨΗ ΔΕΔΟΜΕΝΩΝ ΣΥΛΛΗΨΕΩΝ ΜΕ ΤΟ ΗΜΙ-ΑΥΤΟΜΑΤΟ ΣΥΣΤΗΜΑ



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ΔΕΙΓΜΑΤΟΛΗΨΙΑ ΚΑΡΠΩΝ (BBCH και ΠΡΟΣΒΟΛΗ)



ΤΕΜΑΧΙΟ LAS



Mobile GIS

Tree ID:560

Tree ID:560(Sample:13)

Samples entries

Display Del Add Edit

3/7/15 7:16:17 μμ

Fruits

50

Infested Fruits

0

BBCH

72 BBCH guide

Notes



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ΠΡΟΣΤΑΤΕΥΟΜΕΝΕΣ ΠΕΡΙΟΧΕΣ

ΜΗ
ΨΕΚΑΖΟΜΕΝΗ
ΖΩΝΗ



B. DSS: NOTE;

| BBCH RANGE | SPRAYING |
|------------|----------|
| A | 1st |
| B | 2nd |
| C | Others |

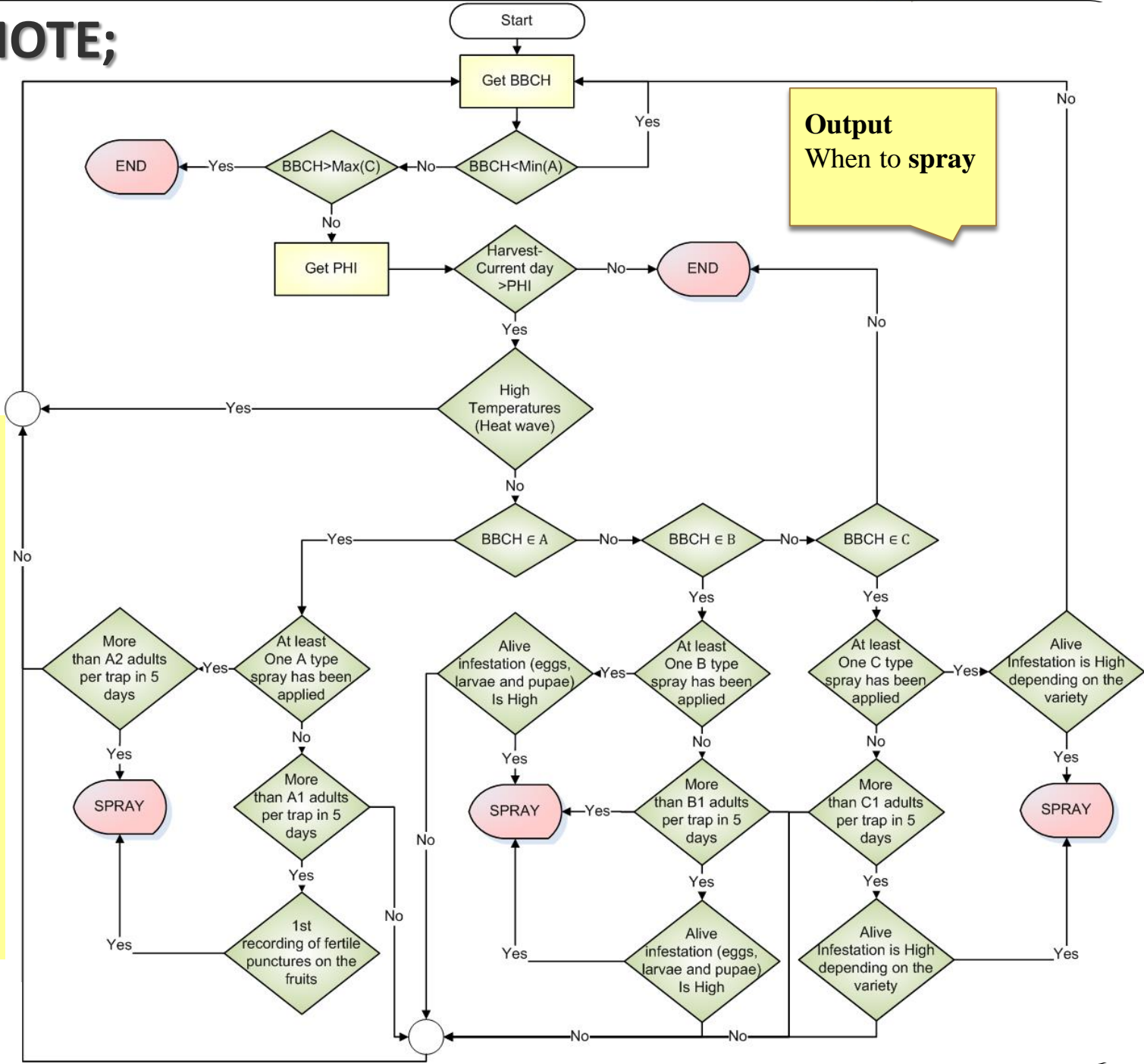
Main Parameters

BBCH a scale used to identify the phenological development stages of the plant

PHI (Pre-Harvest Interval)

Main Inputs

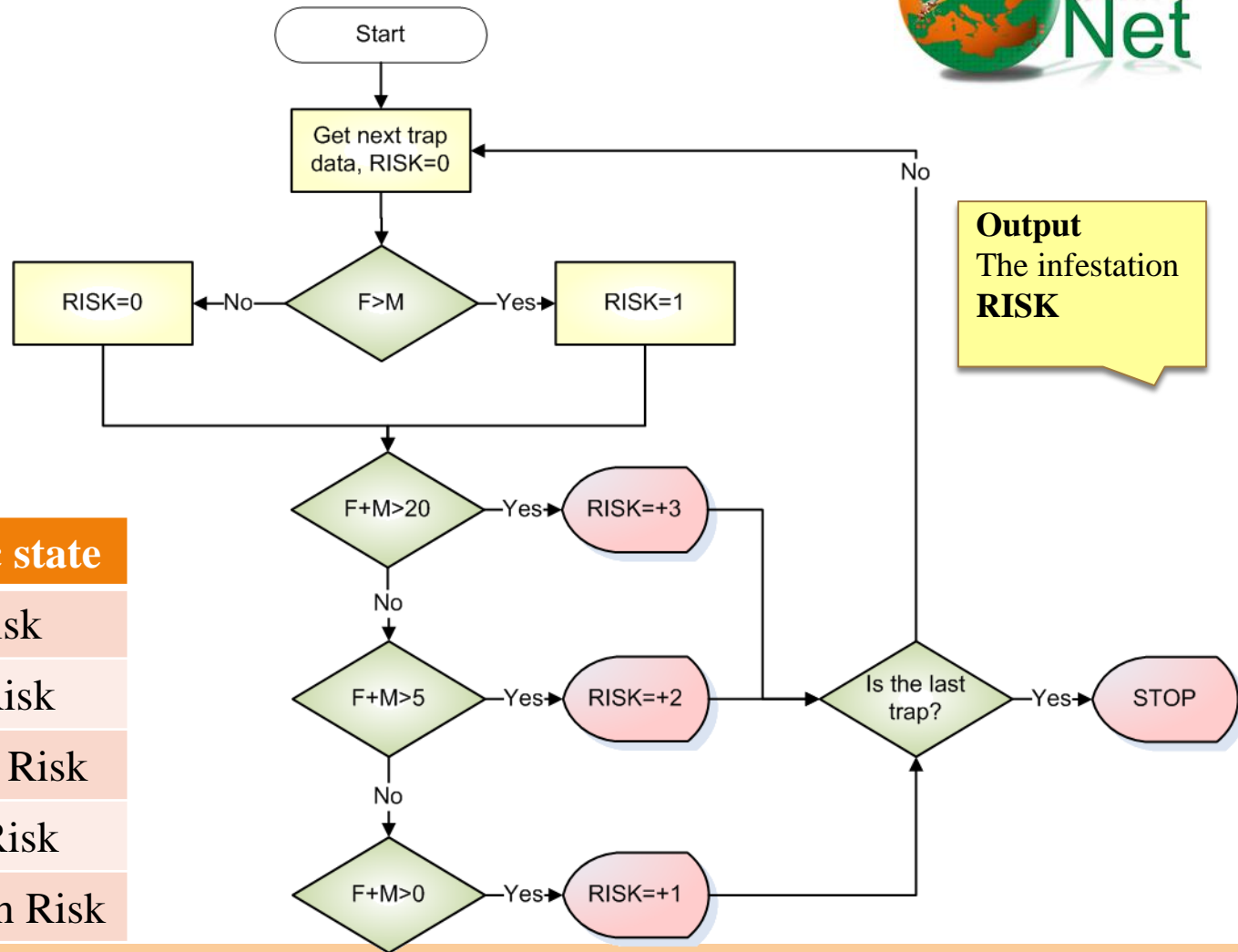
Temperature->WSN
Trap captures (adults)
 -> e-trapping, mTrapping
Alive Infestation->mGIS



C. DSS: ΠΟΥ;



Inputs
Trap captures
 M: Males adults
 F: female adults
 -> e-trapping, mTrapping



Output
 The infestation
RISK

| Risk value | symbolic state |
|------------|----------------|
| 0 | No Risk |
| 1 | Low Risk |
| 2 | Average Risk |
| 3 | High Risk |
| 4 | Very High Risk |



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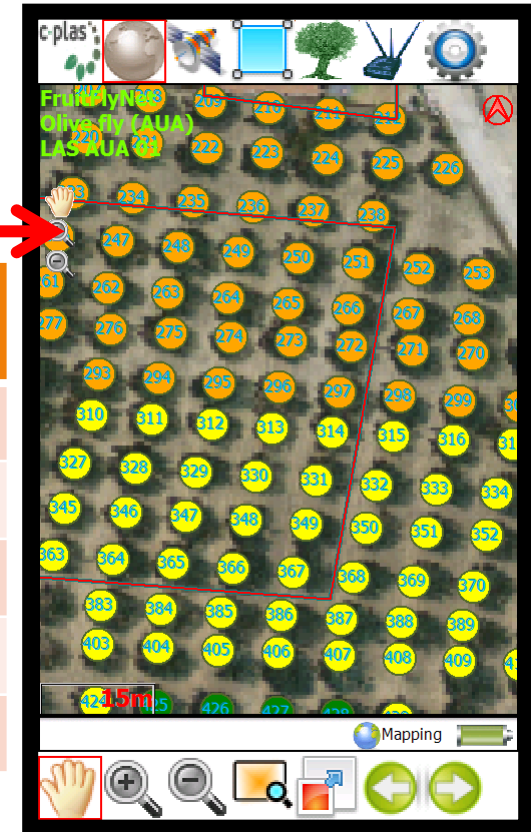


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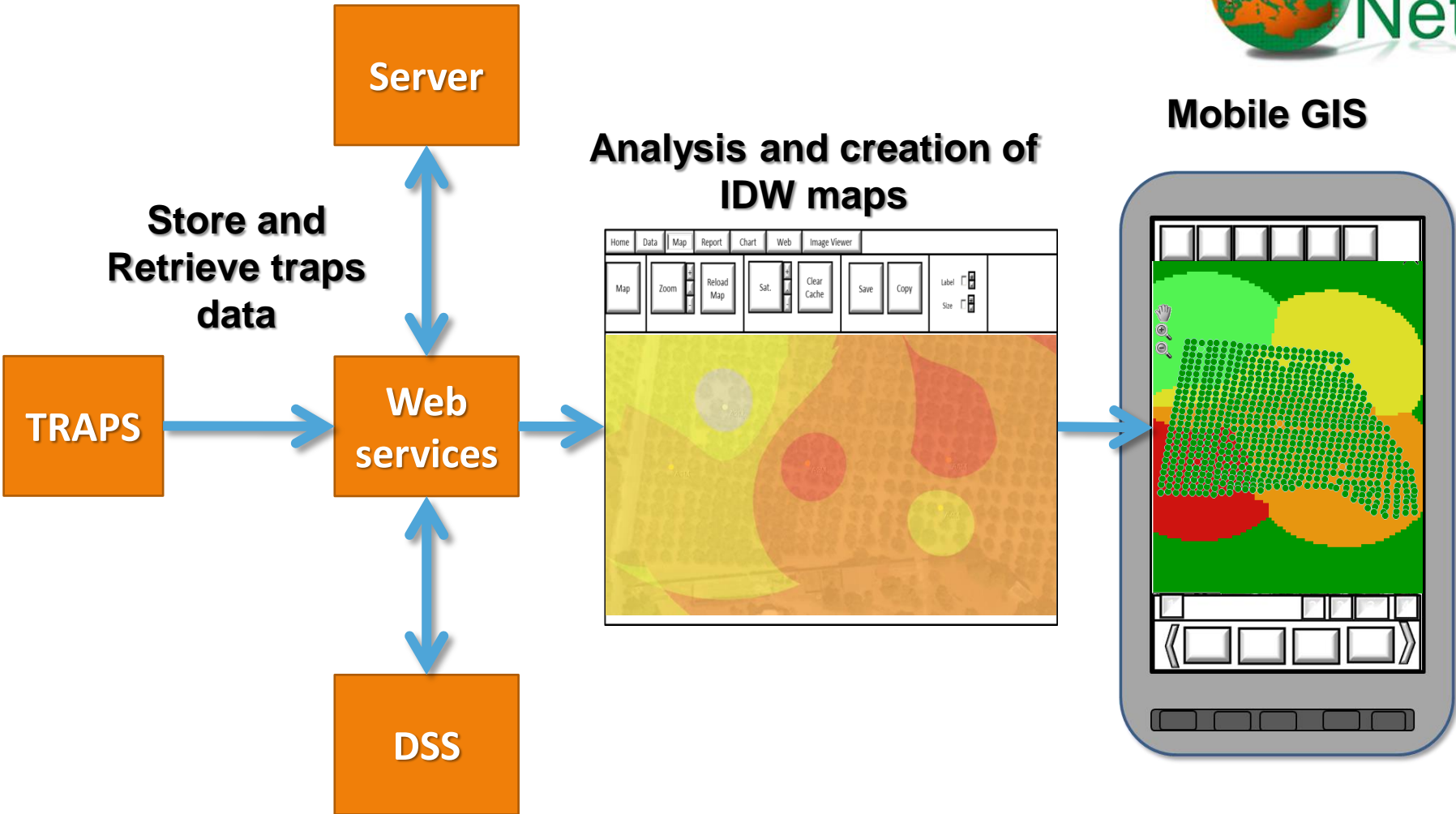
DSS C: Που θα γίνει ψεκασμός



| Βαθμός επικινδυνότητας | Λεκτικό Επικινδυνότητας |
|------------------------|-------------------------|
| 0 | Καθόλου |
| 1 | Χαμηλή |
| 2 | Μέτρια |
| 3 | Υψηλή |
| 4 | Πολύ υψηλή |



C. DSS – Χάρτες επικινδυνότητας



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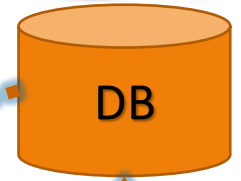
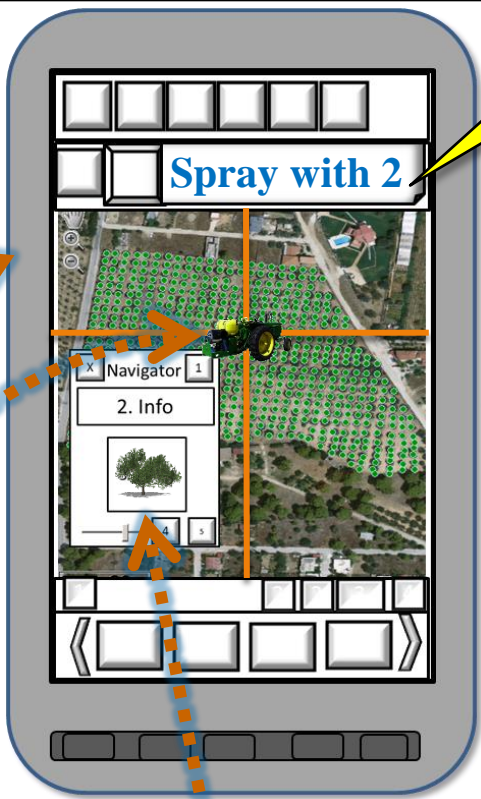


D. DSS: ΕΦΑΡΜΟΓΗ

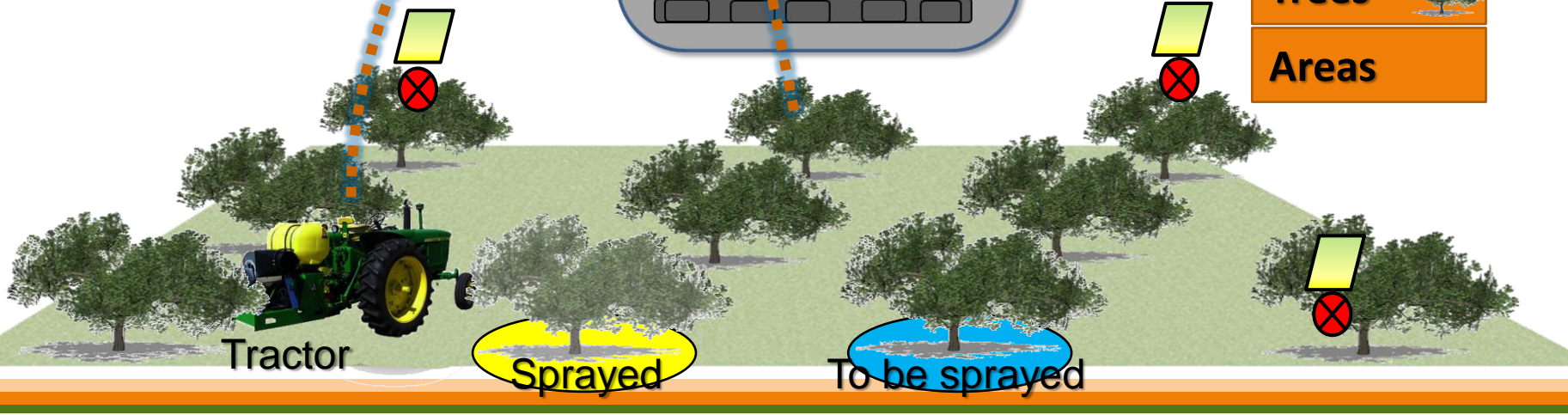
DSS results



GPS



- Sensors
- Traps
- Trees
- Areas



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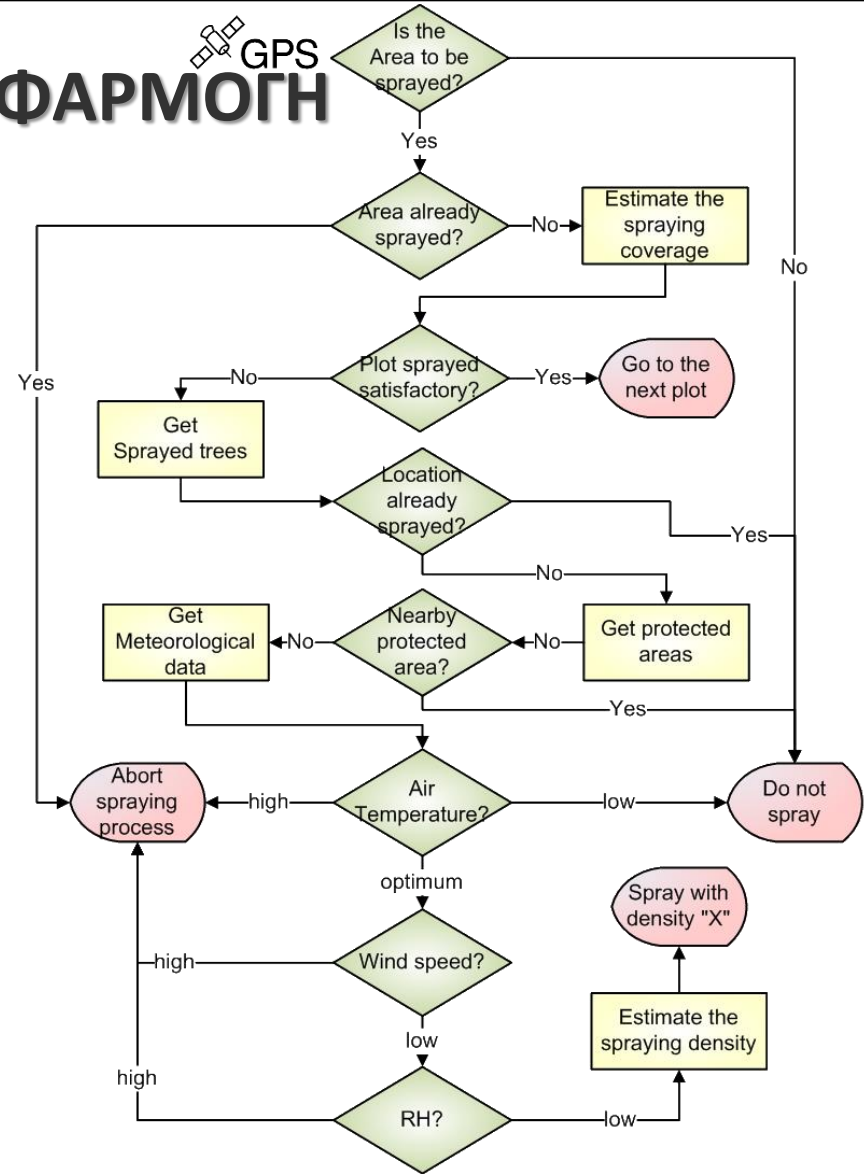


D. DSS: ΠΩΣ - ΕΦΑΡΜΟΓΗ

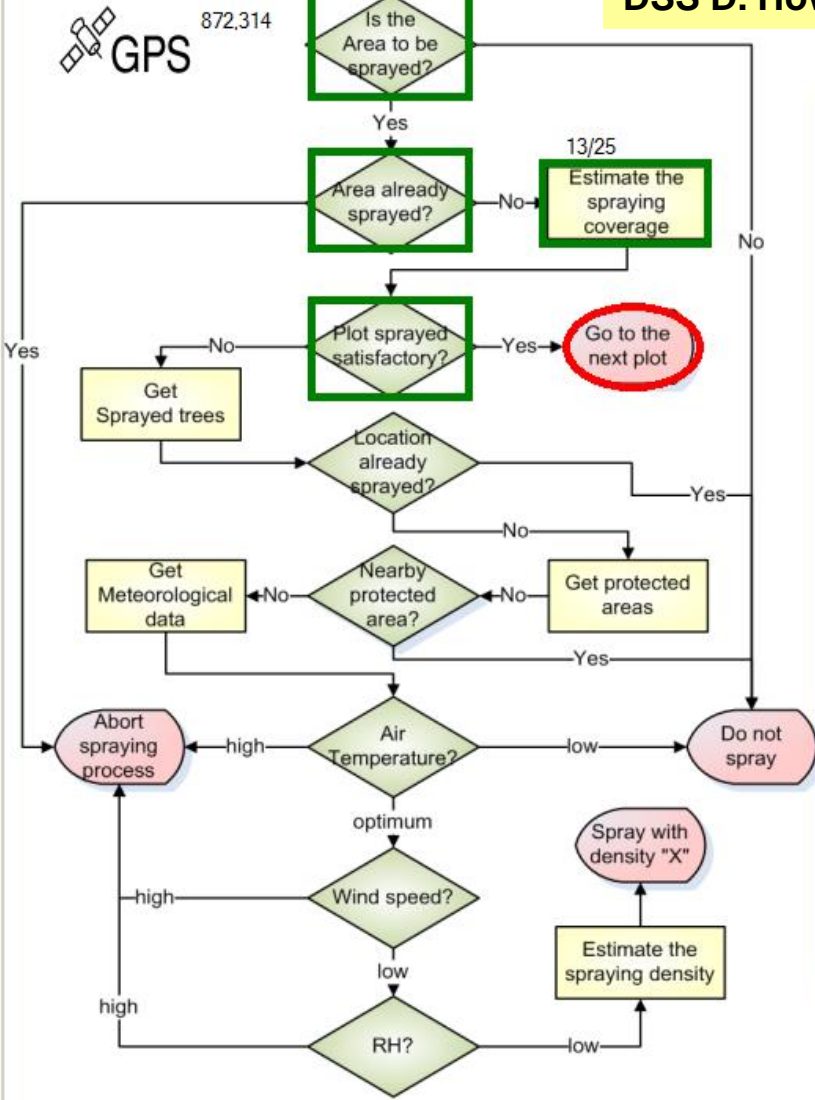


Input
 Trees
 Spray
 Sensors
 Traps
 Polygons

Output
 Go to the next plot
 Abort spraying
 Do not spray
 Spray with specific density



DSS D. How to spray



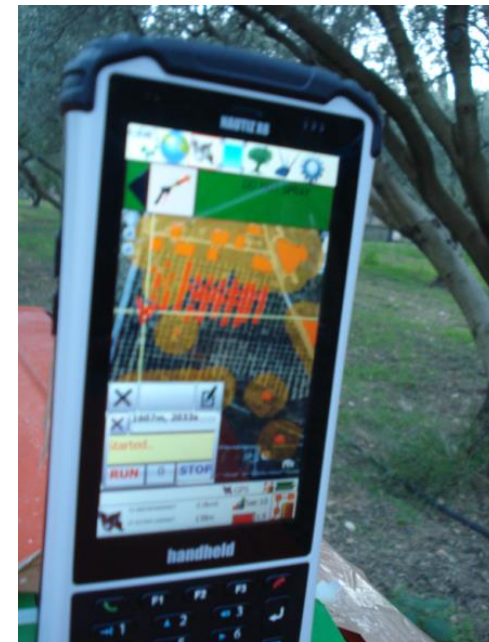
The simulator interface displays the following components:

- Control Panel:** Buttons for 'Reset', 'Run DSS', 'Get Sensors', and 'Show'. A large green button labeled '=> GO TO THE NEXT PLOT' is prominent.
- Sensors Panel:**
 - Temp.: 26oC
 - Wind: 4km/h
 - RH: 49%
- Map View:** An aerial view of an orchard with several plots outlined in different colors (blue, green, red, orange). A 'No spray' sign is overlaid on one of the plots.
- Bottom Panel:** 'Info bar' and 'Data view' buttons.

Ψεκασμός (Συμβατικό τεμάχιο-No LAS)



Καταγραφή



7th meeting of the IOBC/WPRS , Kalamata, Greece
11-14 May 2015



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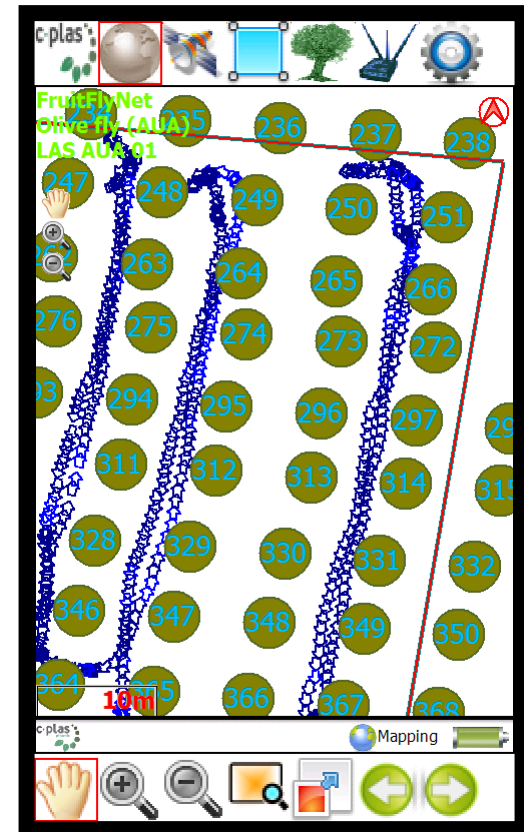


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Ψεκασμός (Συμβατικό τεμάχιο - No LAS)



- Καταγραφή διαδρομής



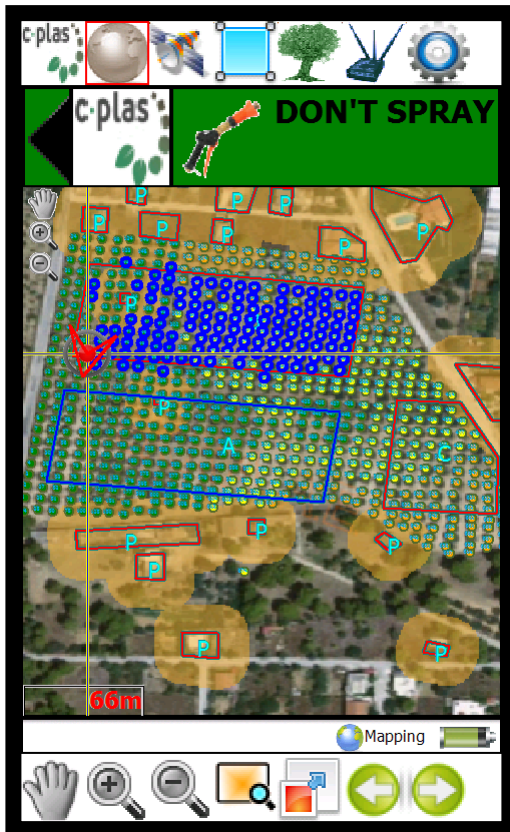
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Ψεκασμός (Συμβατικό τεμάχιο - No LAS)



DSS D: Πως θα γίνει ο ψεκασμός



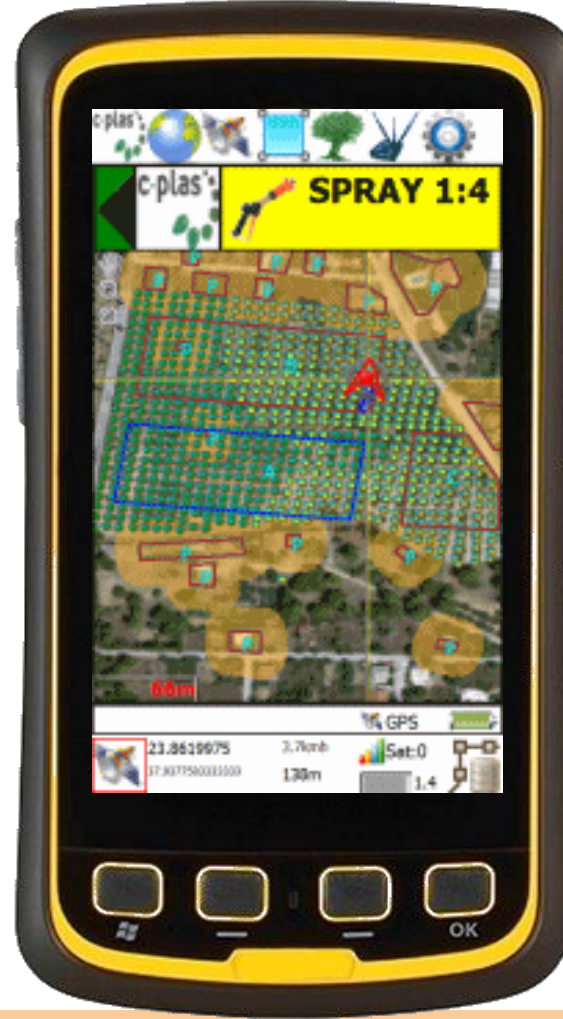
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Ψεκασμός (Συμβατικό τεμάχιο - No LAS)



DSS D: Πως θα γίνει ο ψεκασμός



Πρώτα (προφανή) αποτελέσματα:

- Σπατάλη ψεκαστικού (ψεκάστηκαν περισσότερα δέντρα)
- Ψεκασμός εκτός περιοχής ψεκασμού



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FruitFly Net

ΕΥΧΑΡΙΣΤΩ ΠΟΛΥ ΓΙΑ ΤΗΝ
ΠΡΟΣΟΧΗ ΣΑΣ



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