



LIFE AGRESTIC

Reduction of Agricultural GReenhouse gases EmiSsions
Through Innovative Cropping systems
LIFE17 CCM/IT/000062

**Action C2 - Development of a DSS for GHG
emission reduction at the cropping system level**

Horta srl
Via Sant'Alberto 327, Ravenna
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2° VISITA DI MONITORAGGIO



Action C2 - Development of a DSS for GHG emission reduction at the cropping system level

Action C2

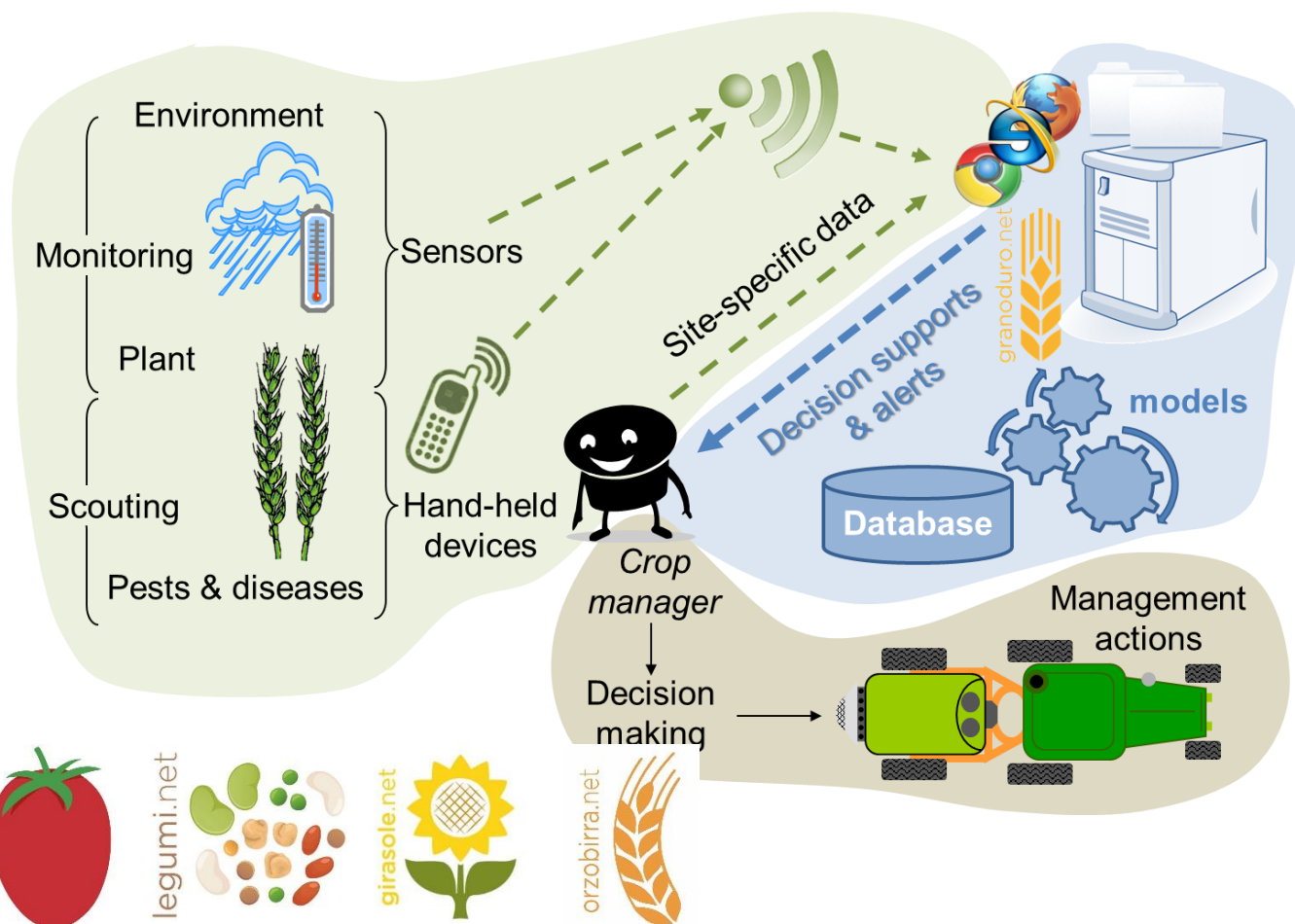
- **AIM** of the action:

Develop **tools for supporting decision-making process by farmers** for cultivating target crops and managing crop rotations to reach the goal of reducing GHG emissions (environmental sustainability), while maintaining (or better improving) crops' agronomic performances and farm income (economic sustainability)



Action C2 - Development of a DSS for GHG emission reduction at the cropping system level

- HORTA's **DSSs** are web based platforms



pomodoro.net



legumi.net



girasole.net



orzobirra.net



Action C2 - Development of a DSS for GHG emission reduction at the cropping system level

Sub-action C2.1 - Customization of the crop-specific DSSs

Analysis of current DSS versions to detect relevant gaps and new functionalities:

- i) selection of varieties
- ii) soil management options → reduce GHG emission and increase C-storage;
- iii) sowing and early growth enhancement → cover the soil as earliest as possible;
- iv) increase and measurement of plant biomass (both harvestable yield and residue), through optimized fertilization, water use efficiency, crop protection → increase C-storage in plant tissue.

Gaps and new functionalities will be discussed with the **Stakeholder Platform**



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Relevant gaps identified in crop specific DSS:

- Models for some diseases of legumes, wheat, sunflowers, are not yet considered in the DSSs:

Mechanistic models for diseases are being developed following the steps:

- Systematic literature review
- Development of the relational diagram
- Performance of *ad hoc* experiments (if needed for fill in gaps in knowledge)
- Development of mathematical equations
- Model validation

Model development is ongoing



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Sub-action C2.2 - Development of the catch crop DSS

Developing a new DSS to manage catch crops used to cover the soil in the intercropping period between harvesting of small grain cereals and sowing of the following crop.

The new DSS will be discussed with the **Stakeholder Platform** to collect advices.

Sub-action C2.3 - Test of the crop-specific and catch crop DSSs

Testing customized crop-specific and catch crop DSSs using data collected in demonstration sites (Action C3), at the end of each growing season.



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Sub-action C2.4 - Development of the cropping system DSS

Integration of crop-specific GHG-focused DSSs and catch crops DSS in a **unique DSS platform** for the optimized management of the legume-based efficient crop systems (ECSs).

The integrated DSS will support decision-making by farmers → the design will be discussed with the **Stakeholder Platform** to collect advices.

Sub-action C2.5 - Integration of the GHG emission model into the DSS

Inclusion of model for GHG emission dynamics calibrated by SSSA (sub-action C5.2) in the **Cropping system DSS** → DSS's users are able to quantify GHG emissions related to agronomic practices and calibrate their management decisions consequently.

