



MACS  
February 18<sup>th</sup> - 19<sup>th</sup>  
Dammam, Saudi Arabia



ministero delle politiche  
agricole alimentari e forestali

## MACS 2021 - Italy

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# Meetings - preliminary

- G20 meeting of the Ministries of Agriculture: tentative date, June or September.
- G20 Agriculture Deputies meetings: tentative date, March and June
- G20 MACS, site to be selected, likely vicinity to agro-industrial plants to facilitate a technical visit: tentative date early May, in any case prior to the G20 meeting of the Ministries.
- Side events: number, topics and site(s) to be identified. A follow up of workshops already run is also possible. G20 countries will be consulted.

# Priority themes for the Italian Ministry of agriculture

- Sustainability of agri-food systems: circular economy, climate change mitigation and adaptation, biodiversity, forestry, resilience of agri-food systems, food quality and safety.
- Innovation: artificial intelligence applications, certification of food products, data access and availability, technology transfer, cutting edge technologies.
- Inclusiveness in agriculture: women, young farmers, smallholders.

# Research areas of interest

Possible topics for G20 MACS to work on during the G20 Italian Presidency

<b>DIGITAL_AGRICULTURE</b>	<b>GENETICS</b>	<b>BIOECONOMY</b>	<b>HORTICULTURE</b>
<b>PLANT_PROTECTION</b>	<b>ZOOTECNICS</b>	<b>FORESTRY</b>	<b>MECHATRONICS</b>

## Digital Agriculture: traceability via Blockchain

- The Blockchain is a software framework which allows creating a distributed ledger of transactions.
- When coupled to an information system, it allows applications to trace agricultural products from production to consumers.
- One critical point is the fully independent characterization of agricultural management.
- Prototypes are begin developed using data from precision agriculture machinery and from other sources as electronic field books required to get subsidies, to feed smart contracts in blockchain transactions.

## Cloud services and applications, the project AgriDigit

- Improvement of data coverage of production chains and of spatial resolution in Italy;
- Improvement of system monitoring, proximal sensing, workflows;
- Improvement of availability of modelling resources;
- Application of IA and blockchain technologies;
- Development of cloud microservices and SaaS;
- Development of applications using the services developed via private companies.



## Sequencing the genome and the pan-genome of crop species to leverage crop genetic diversity

- Crop genetic diversity is a reservoir of genes and alleles that could contribute to modern breeding (i.e. resistant genes).
- The modern approach to understand the genetic diversity is the sequencing of a set of representative genotypes of a given species (pangenome analysis), to identify useful genes and alleles.
- Italy is actively involved in the genome and pan-genome sequencing of many crops (i.e. published in 2019: eggplant and durum wheat) and new programs for pangenome analyses are in progress to leverage genetic diversity and sustain plant breeding.





## New breeding techniques

- New breeding techniques (NBT), primarily genome editing and cisgenesis, allow introducing new traits in modern cultivars
- NBTs are an essential tools for sustainable agriculture (i.e. cultivars adapted to expected climatic changes and more resistant to diseases).
- A national project dedicated to NBT (BIOTECH) funded by Ministry of Agriculture is currently ongoing in Italy under the coordination of CREA
- The BIOTECH project operates on 16 species relevant for Italian agriculture (i.e. cereals, vegetables, fruit trees) aiming to increase yield and abiotic stress resistance, improve quality, and introduce new disease resistant traits.

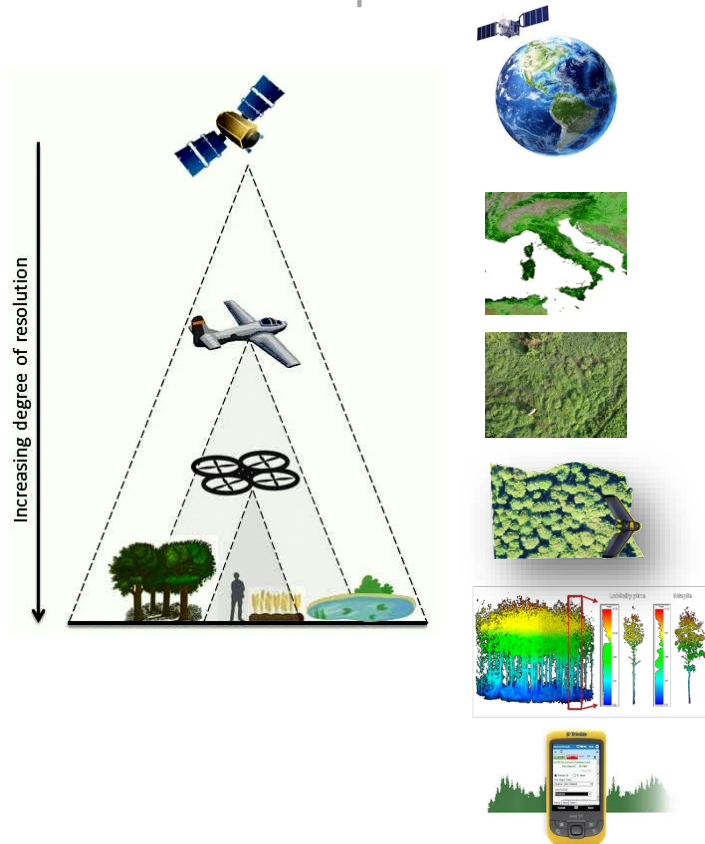


# UNderstanding and Improving the Sustainability of agroECOlogical farming systems in the EU

- **H2020 Multiactor Project 2018-2021**
- **Transdisciplinary consortium** with 18 partners across 16 countries
- **Key objective:** to strengthen the sustainability of European farming systems, through co-constructing improved strategies and incentives for agroecological approaches.
- **Expected impact:** to improve the knowledge base of agro-ecological farming in the EU to inform future policies at the European, national and regional levels

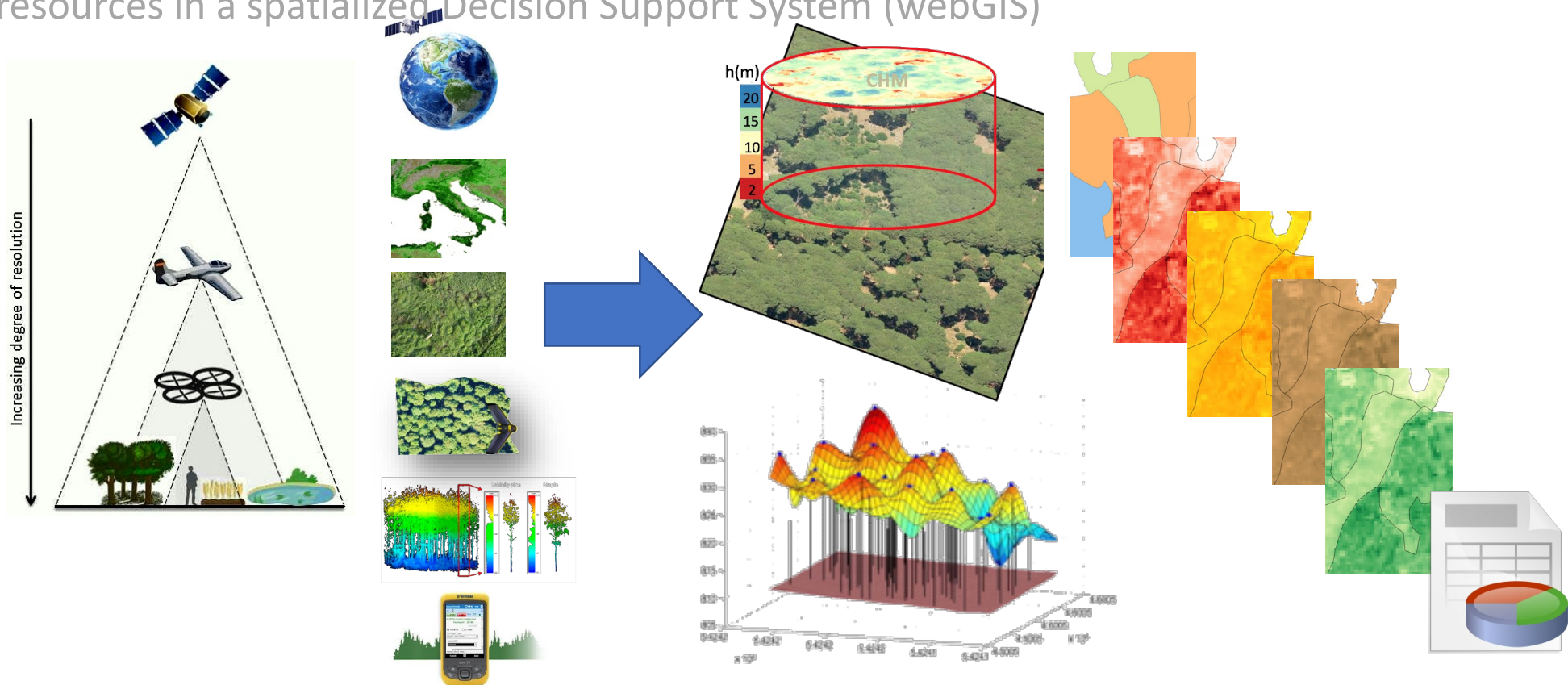


- Create a multi-objective information dataset of forest resources at national scale
- Integrate multiscale and multisource information using ICT technologies
- Make information accessible for management and sustainable development of national forest resources in a spatialized Decision Support System (webGIS)



# ICT and forestry

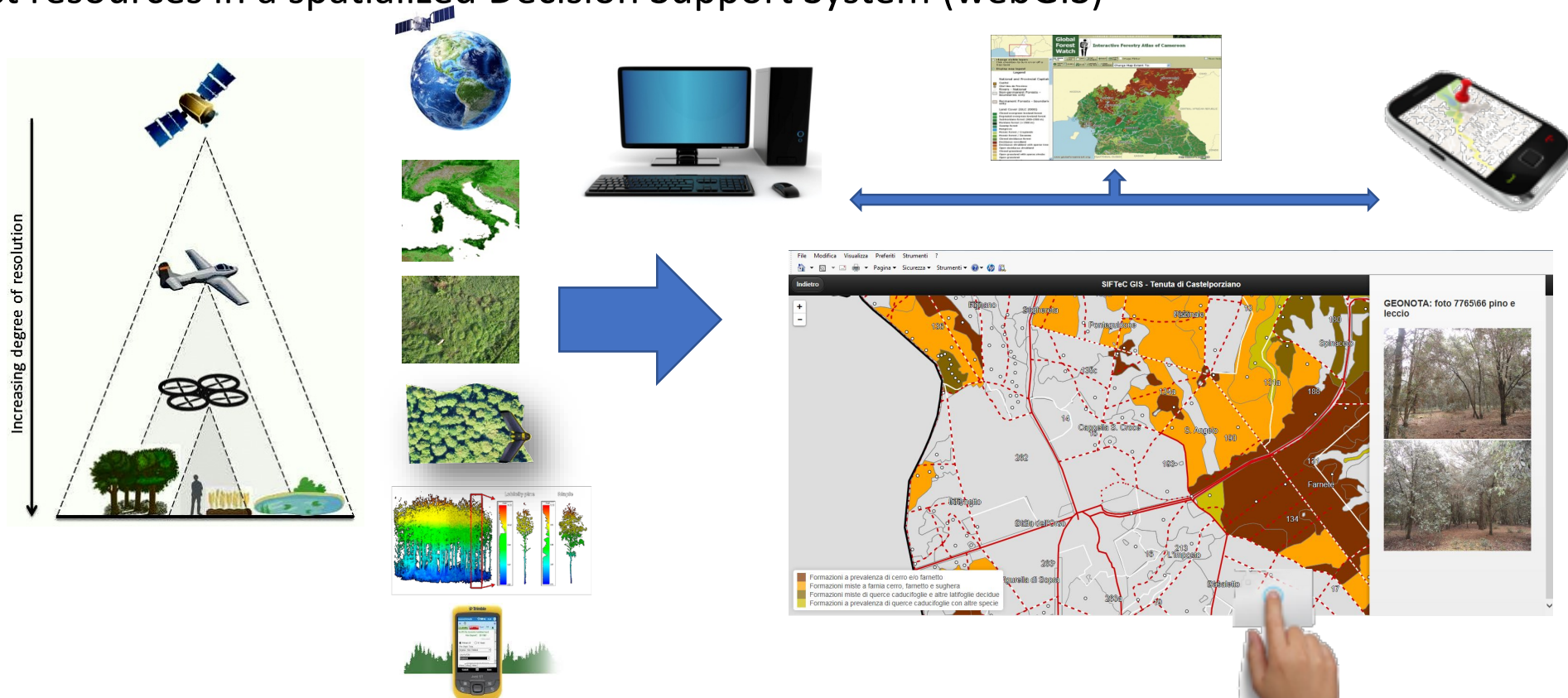
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## Biological control of agriculture alien insect pests

- Artificial Intelligence for species detection
- Simulation modelling on the impact of climate change scenarios

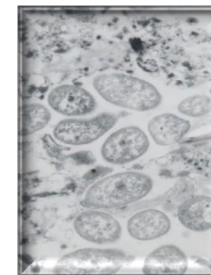
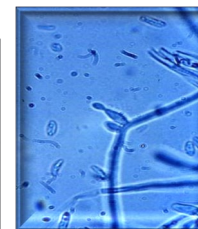
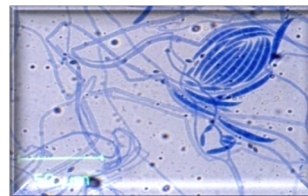
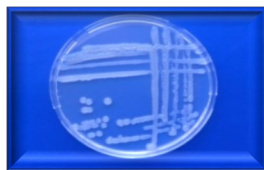
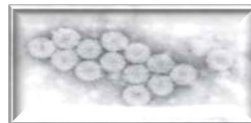




## Data and model resources on pesticides

### Information on 14.500 plant protection products and over 600 active principles

- timing for application
- crops and fruit trees
- pests and diseases
- restrictions to use
- health hazards
- producer
- simulation data



# New cultures to limit cheese loss/depreciation

## BIOPROTECTION

Quality preservation  
shelf life extension

- Selection of protective cultures
- Application in dairy scale

*Late  
blowing  
in hard  
cheese*



*Late blowing  
in (semi) hard  
(pasta filata)  
cheese*



*Blowing in  
goat cheese*



*Blu  
discoloration  
in fresh pasta  
filata cheese*





## Greenhouses horticulture through digital technologies

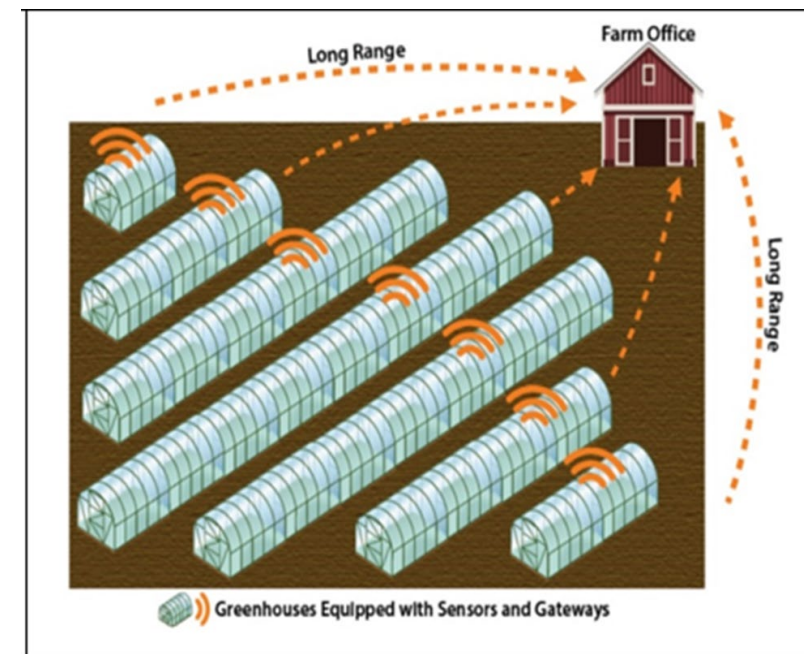
### Innovative Greenhouse Support System in the Mediterranean Region (PRIMA project: iGUESS-MED)

Development and testing of a **Decision Support System (DSS)** for the MED greenhouses

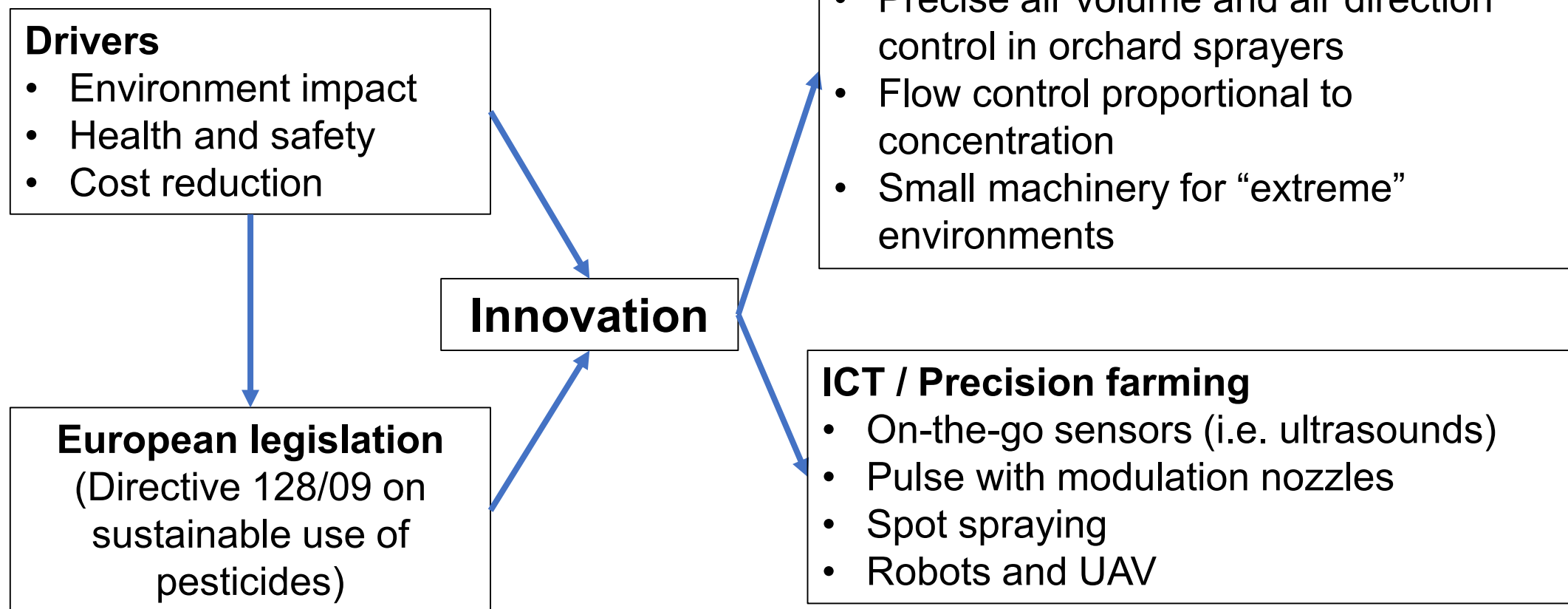
- **optimizing the fertigation management** under low quality water conditions
- **reduce the use of chemicals** by a sustainable and integrated pests and diseases control
- **Improved** and cost-effective **efficiency of climatic control procedures**

**Tomato** as reference crop / **Low-tech greenhouses** typical of the MED region

⇒ application of **sensor technology, IoT, agronomic management via simulation.**



## Actions on going





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*Thanks for you attention and see  
you in Italy next year!*